Northern Territory Town Camps

Electrical Infrastructure

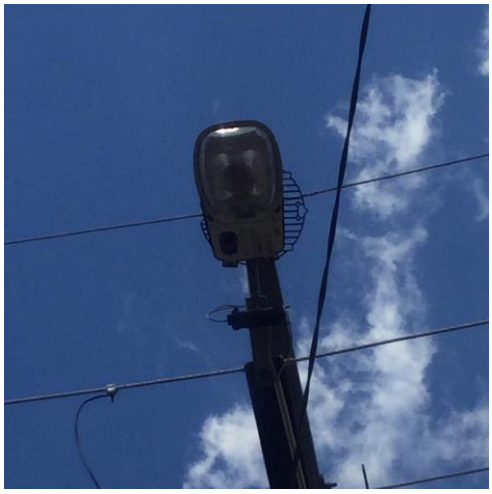
Inspection Date 6/12/2016 5:02:04 PM













Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 5:02:04 PM



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 2:23:18 PM

Insp ID: 941 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Direct
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	
Overhead Pole Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 2:23:18 PM











Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 2:18:00 PM

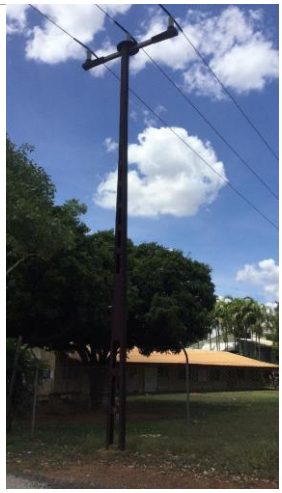
Insp ID: 942 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Direct
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	
Overhead Pole Comments:	No ID

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Electrical Infrastructure

Inspection Date 6/12/2016 2:18:00 PM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 2:13:32 PM

Insp ID: 943 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Steel
What is the condition of pole:	3
How is the pole planted:	Direct
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	3
Overhead Pole Comments:	

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Inspection Date 6/12/2016 2:13:32 PM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 2:07:37 PM

Insp ID: 945 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Direct
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	1
Overhead Pole Comments:	No ID

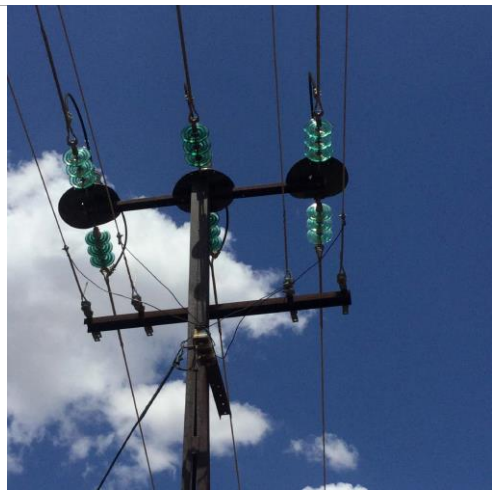
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 2:07:37 PM











Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 2:01:45 PM

Insp ID: 947 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	
Overhead Pole Comments:	No ID

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Inspection Date 6/12/2016 2:01:45 PM









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Electrical Infrastructure

Inspection Date 6/12/2016 1:58:16 PM

Insp ID: 948 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	2
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	1
Overhead Pole Comments:	No ID

Northern Territory Town Camps

Electrical Infrastructure

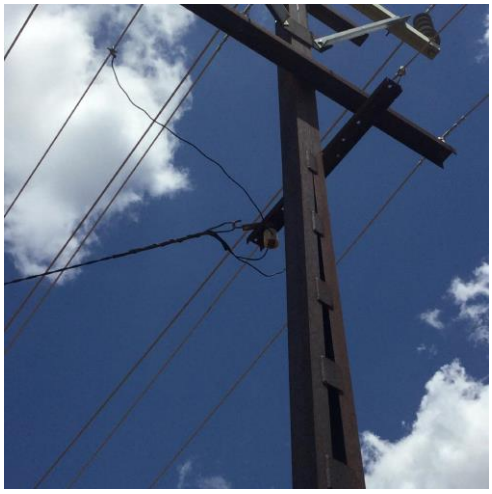
Inspection Date 6/12/2016 1:58:16 PM











Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 12:31:52 PM

Insp ID: 949 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Direct
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S50 D 11
Street Light Watts	
Street Light Condition	3
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	
Overhead Pole Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 12:31:52 PM













Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 12:15:15 PM

Insp ID: 951 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Steel
What is the condition of pole:	4
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	
Overhead Pole Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 12:15:15 PM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 12:11:52 PM

Insp ID: 952 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Direct
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M80 D 08
Street Light Watts	
Street Light Condition	3
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	
Overhead Pole Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 12:11:52 PM













Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 12:03:58 PM

Insp ID: 953 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Direct
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	1
Overhead Pole Comments:	No ID

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Electrical Infrastructure

Inspection Date 6/12/2016 12:03:58 PM









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Electrical Infrastructure

Inspection Date 6/12/2016 11:57:15 AM

Insp ID: 954 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	2
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M80 D 00
Street Light Watts	
Street Light Condition	3
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	1
Overhead Pole Comments:	

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Electrical Infrastructure

Inspection Date 6/12/2016 11:57:15 AM









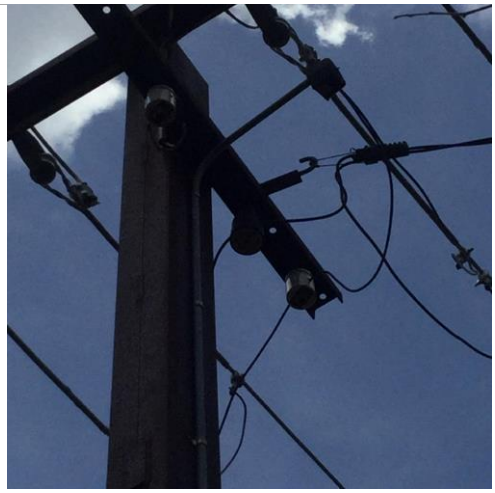




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Electrical Infrastructure

Inspection Date 6/12/2016 11:57:15 AM



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Electrical Infrastructure

Inspection Date 6/12/2016 11:35:48 AM

Insp ID: 957 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	1
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M80 D 00
Street Light Watts	
Street Light Condition	3
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	2
Overhead Pole Comments:	

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Electrical Infrastructure

Inspection Date 6/12/2016 11:35:48 AM













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Electrical Infrastructure

Inspection Date 6/12/2016 11:30:46 AM

Insp ID: 958 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Direct
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	1
Overhead Pole Comments:	No ID

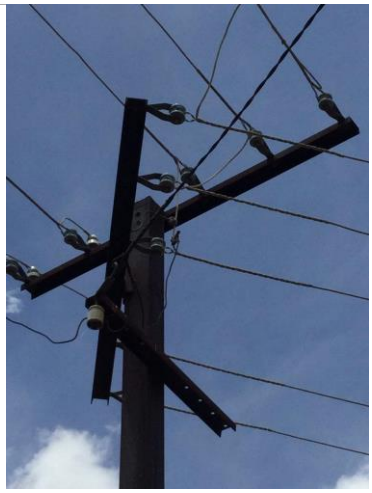
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Electrical Infrastructure

Inspection Date 6/12/2016 11:30:46 AM









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Electrical Infrastructure

Inspection Date 6/12/2016 11:27:53 AM

Insp ID: 959 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Direct
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M80 D 00
Street Light Watts	
Street Light Condition	3
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	
Overhead Pole Comments:	

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Electrical Infrastructure

Inspection Date 6/12/2016 11:27:53 AM













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Electrical Infrastructure

Inspection Date 6/12/2016 11:23:58 AM

Insp ID: 960 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Direct
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	Unknown
Street Light Watts	
Street Light Condition	3
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	
Overhead Pole Comments:	Street light fitting M80 D 00, good condition

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 11:23:58 AM













Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 11:18:49 AM

Insp ID: 961 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Steel
What is the condition of pole:	3
How is the pole planted:	
What is the Condition of plant:	
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Single
What is the HV voltage level:	
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	
What is the Condition:	
How many Lots are connected to this pole:	
Overhead Pole Comments:	

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Inspection Date 6/12/2016 11:18:49 AM





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Electrical Infrastructure

Inspection Date 6/12/2016 11:17:16 AM

Insp ID: 962 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Steel
What is the condition of pole:	2
How is the pole planted:	
What is the Condition of plant:	
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	
How many Lots are connected to this pole:	
Overhead Pole Comments:	

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Inspection Date 6/12/2016 11:17:16 AM







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Electrical Infrastructure

Inspection Date 6/12/2016 11:15:41 AM

Insp ID: 963 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Direct
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M80 D 05
Street Light Watts	
Street Light Condition	2
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	
Overhead Pole Comments:	

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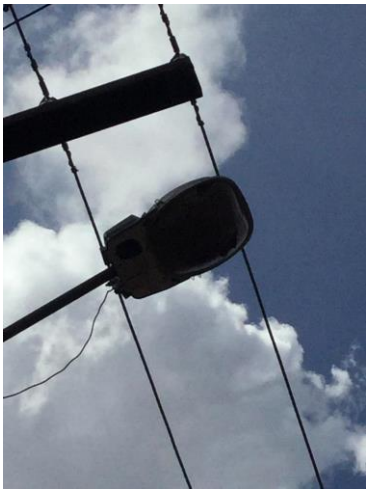
Inspection Date 6/12/2016 11:15:41 AM













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Electrical Infrastructure

Inspection Date 6/12/2016 11:10:14 AM

Insp ID: 964 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Direct
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	
Overhead Pole Comments:	No ID

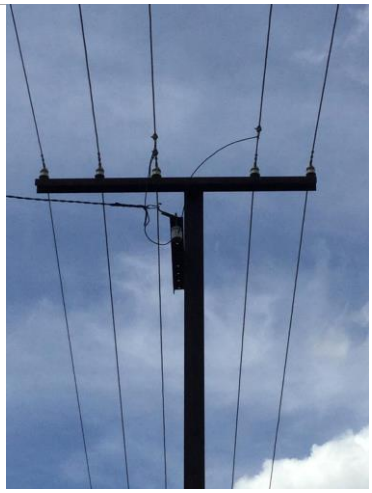
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Inspection Date 6/12/2016 11:10:14 AM









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Electrical Infrastructure

Inspection Date 6/12/2016 11:06:01 AM

Insp ID: 965 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Steel
What is the condition of pole:	4
How is the pole planted:	Concrete
What is the Condition of plant:	4
Is street light fitted:	
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	
How many Lots are connected to this pole:	
Overhead Pole Comments:	

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Inspection Date 6/12/2016 11:06:01 AM







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Electrical Infrastructure

Inspection Date 6/12/2016 11:03:32 AM

Insp ID: 966 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Direct
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M80 D 08
Street Light Watts	
Street Light Condition	2
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	
Overhead Pole Comments:	No pole ID

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Inspection Date 6/12/2016 11:03:32 AM













Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 11:03:32 AM



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 7/12/2016 11:15:18 AM

Insp ID: 984 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	2
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	
Overhead Pole Comments:	

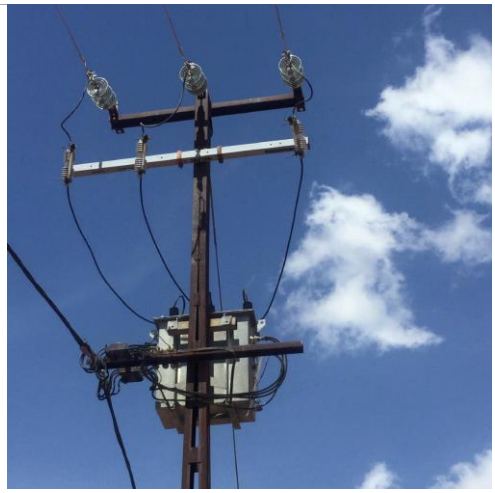
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Inspection Date 7/12/2016 11:15:18 AM













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Inspection Date 6/12/2016 11:50:41 AM

Insp ID: 991 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	1
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	
How many Lots are connected to this pole:	1
Overhead Pole Comments:	No ID

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Inspection Date 6/12/2016 11:50:41 AM











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Inspection Date 6/12/2016 10:19:38 AM

Insp ID: 909 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M80
Street Light Watts	
Street Light Condition	3
Street Light Height	





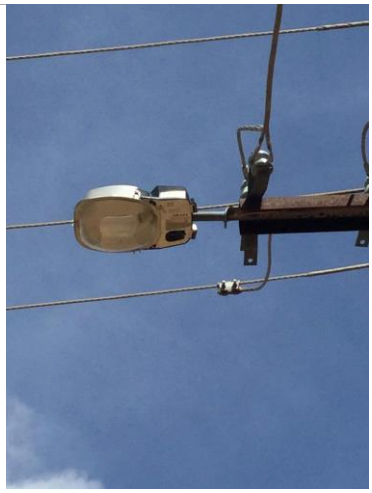




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Inspection Date 6/12/2016 10:19:38 AM



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Inspection Date 6/12/2016 10:14:29 AM

Insp ID: 910 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	Unknown
Street Light Watts	
Street Light Condition	2
Street Light Height	









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Inspection Date 6/12/2016 10:14:29 AM



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Electrical Infrastructure

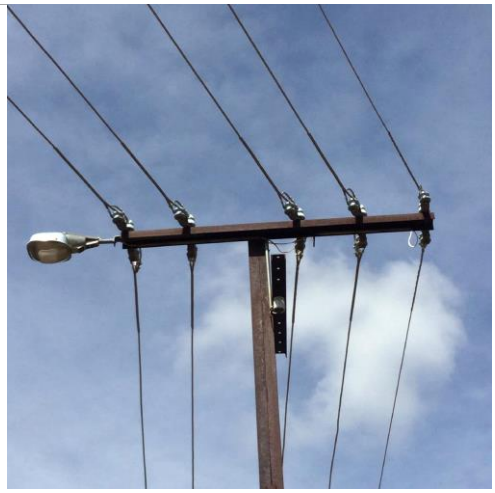
Inspection Date 6/12/2016 10:09:14 AM

Insp ID: 911 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	Unknown
Street Light Watts	
Street Light Condition	2
Street Light Height	









Northern Territory Town Camps

Electrical Infrastructure

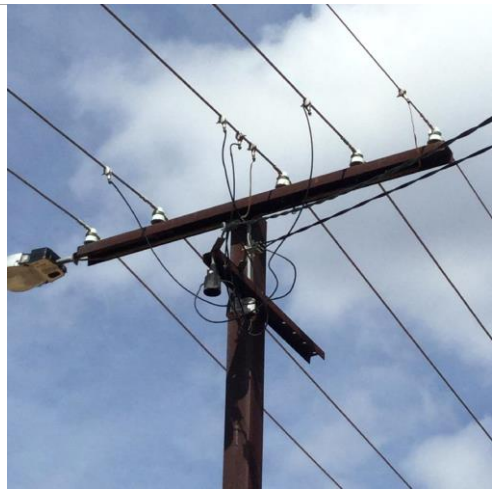
Inspection Date 6/12/2016 10:01:23 AM

Insp ID: 913 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M80 D 01
Street Light Watts	
Street Light Condition	3
Street Light Height	









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 10:01:23 AM



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 9:16:39 AM

Insp ID: 924 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M80 D 01
Street Light Watts	
Street Light Condition	2
Street Light Height	





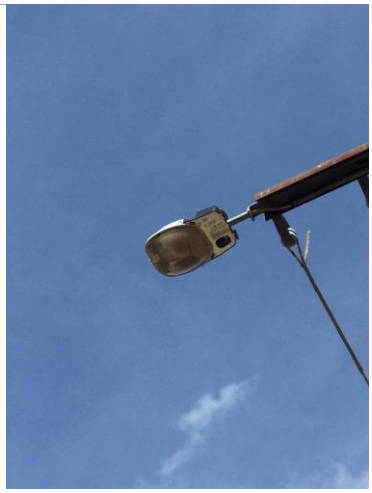




Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 9:16:39 AM





Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 5:38:52 PM

Insp ID: 925 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M80 D00
Street Light Watts	
Street Light Condition	3
Street Light Height	









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 5:38:52 PM





Northern Territory Town Camps

Electrical Infrastructure

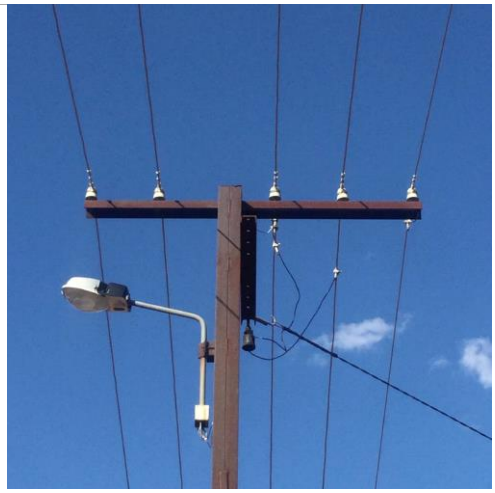
Inspection Date 6/12/2016 5:29:15 PM

Insp ID: 927 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M 80 D 00
Street Light Watts	
Street Light Condition	3
Street Light Height	





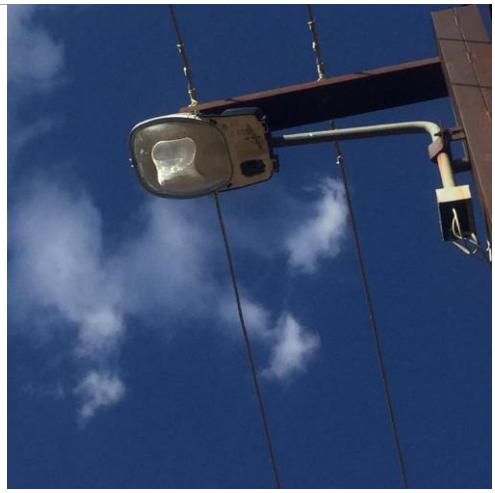




Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 5:29:15 PM





Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 5:22:20 PM

Insp ID: 929 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M80 D 01
Street Light Watts	
Street Light Condition	2
Street Light Height	









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 5:22:20 PM







Northern Territory Town Camps

Electrical Infrastructure

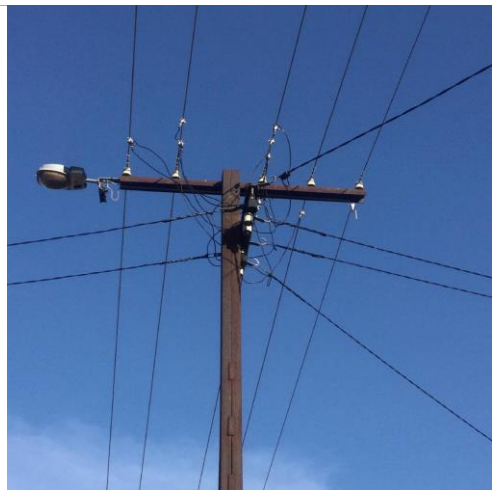
Inspection Date 7/12/2016 8:08:42 AM

Insp ID: 936 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M80 D 07
Street Light Watts	
Street Light Condition	2
Street Light Height	









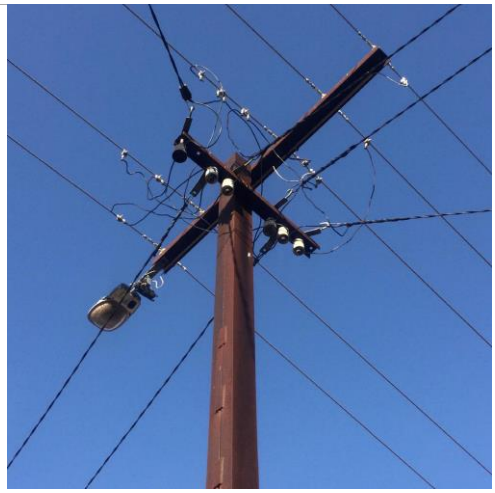
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 7/12/2016 8:08:42 AM







Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 7/12/2016 7:59:54 AM

Insp ID: 939 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M80 D 08
Street Light Watts	
Street Light Condition	2
Street Light Height	









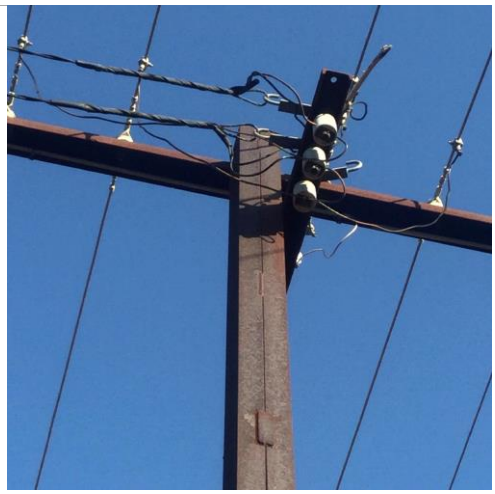
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 7/12/2016 7:59:54 AM







Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 5:02:04 PM

Insp ID: 940 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M80 D 08
Street Light Watts	
Street Light Condition	3
Street Light Height	





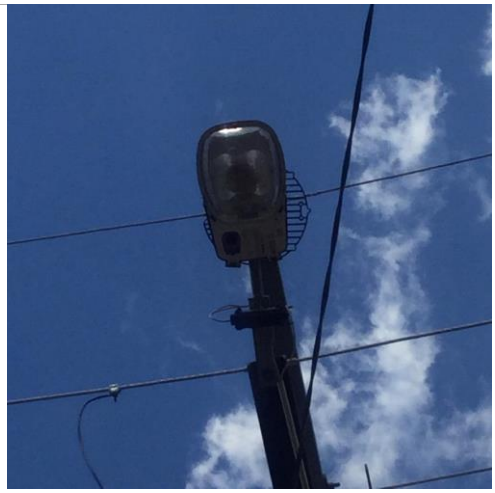




Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 5:02:04 PM







Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 12:31:52 PM

Insp ID: 949 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S50 D 11
Street Light Watts	
Street Light Condition	3
Street Light Height	





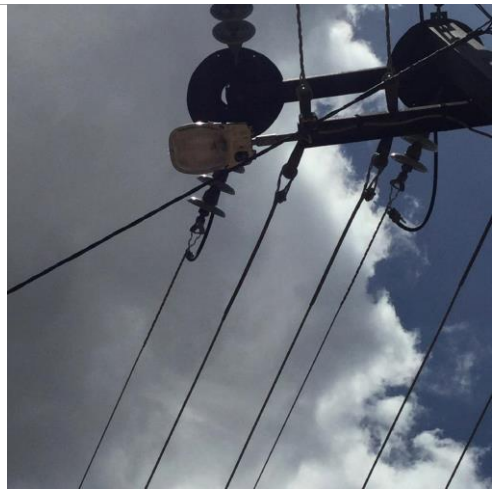




Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 12:31:52 PM





Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 12:11:52 PM

Insp ID: 952 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M80 D 08
Street Light Watts	
Street Light Condition	3
Street Light Height	









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 12:11:52 PM





Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 11:57:15 AM

Insp ID: 954 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M80 D 00
Street Light Watts	
Street Light Condition	3
Street Light Height	









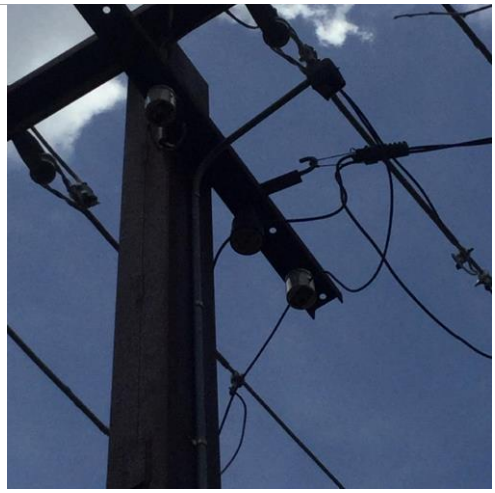
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 11:57:15 AM







Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 11:35:48 AM

Insp ID: 957 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M80 D 00
Street Light Watts	
Street Light Condition	3
Street Light Height	









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 11:35:48 AM





Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 11:27:53 AM

Insp ID: 959 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M80 D 00
Street Light Watts	
Street Light Condition	3
Street Light Height	





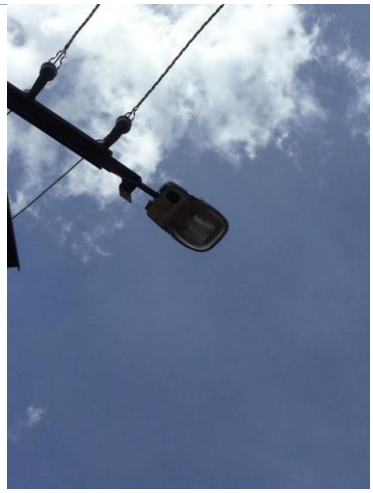




Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 11:27:53 AM





Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 11:23:58 AM

Insp ID: 960 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	Unknown
Street Light Watts	
Street Light Condition	3
Street Light Height	









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 11:23:58 AM





Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 11:15:41 AM

Insp ID: 963 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M80 D 05
Street Light Watts	
Street Light Condition	2
Street Light Height	





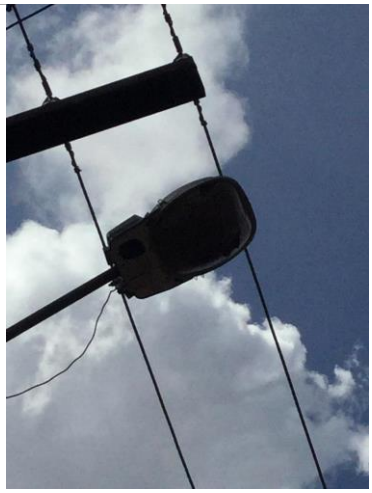




Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 11:15:41 AM





Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 11:03:32 AM

Insp ID: 966 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M80 D 08
Street Light Watts	
Street Light Condition	2
Street Light Height	









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 11:03:32 AM







Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 9:51:16 AM

Insp ID: 915 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Street Light
What is power supply method:	Underground
What is the lamp type:	Flood light , SH
What Wattage is the lamp:	
What is the condition of street lights:	2
What is Street Lighting pole installation height (approximate):	10





Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 9:42:35 AM

Insp ID: 917 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Street Light
What is power supply method:	Underground
What is the lamp type:	Flood lights ,SH
What Wattage is the lamp:	
What is the condition of street lights:	3
What is Street Lighting pole installation height (approximate):	10





Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 9:27:25 AM

Insp ID: 921 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Street Light
What is power supply method:	Underground
What is the lamp type:	LED
What Wattage is the lamp:	
What is the condition of street lights:	3
What is Street Lighting pole installation height (approximate):	10





Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 9:19:57 AM

Insp ID: 923 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing:	Street Light
What is power supply method:	Underground
What is the lamp type:	LED
What Wattage is the lamp:	
What is the condition of street lights:	3
What is Street Lighting pole installation height (approximate):	10





Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 5:16:51 PM

Insp ID: 930 Group 2 - Katherine, Pine Creek, Mataranka Miali Brumby (Kalano)

What Category are you capturing: Transformers

What is Transformer installation method:	Pole
If method know:	11SS1P
What is the condition of the mounting:	3
What is Transformer Rating:	22kV 315 kVA
Is there access to transformers name plate to take a photo:	No Access
What is the condition of transformer:	3
What is cable type to transformer:	Black single insulated
What is cable size to transformer:	
Is there switch gear or fusing associated with the transformer:	Drop out and surge protectors
Transformer Comment:	









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 6/12/2016 5:16:51 PM





Road map



Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Roads_DDP2.mxd 11/02/2017 17:17 Imagery: copyright DigitalGlobe WV 2

A3 scale: 1:4,000

0 20 40 60 80 100 m

Date: 11/02/2017 Version: 1

Coordinate system: GDA 1994

NT Town Camp Road Assessments

621 - Miali Brumby (Katherine)

4072

Existing drawings

TOWN OF KATHERINE

EMUNGALAN

KATHERINE

COSSACK

Katherine River

Town Boundary

Aged Care Hostel

Future Recreation

Oval

Recreation Hall

Child Care Centre

Community Patrol

Basketball Court

Womens Resource Centre

Training Centre

Council

Shop

Aged Care Flats

Caretakers House

Pump Station

Katherine Town Council Civic Centre

EMUNGALAN ROAD

STUART HIGHWAY

MCDONALD STREET

RAPIDE STREET

GILES STREET

AUSTER STREET

COX CRESCENT

CLARKE CRESCENT

SMYTH COURT

CLOUGH COURT

FINCH COURT

PARK COURT

OSHEA TERRACE

FOURTH STREET

THIRD STREET

DRIVE

NT Por 4745

NT Por 6354

NT Por 5437

NT Por 4250

NT Por 3980

NT Por 6438

NT Por 3648

NT Por 1820

NT Por 2308

NT Por 4709

NT Por 4706

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203 500 E

203 750 E

204 000 E

204 250 E

204 500 E

204 750 E

205 000 E

205 250 E

205 500 E

8 401 000 N

8 400 750 N

8 400 500 N

8 400 250 N

8 400 000 N

8 399 750 N

-14°26'48"

-14°27'36"

132°16'12"

132°15'24"

LEGEND

LAND USE PLANNING:
- APPROX. POSITION OF BUILDING constructed since date of photography

LAND EXCLUDED FROM DEVELOPMENT
- GENERAL EXCLUSION/BUFFERS
- CULTURAL EXCLUSION AREAS:

Unauthorised entry, works on or use of land where there is a sacred site is an offence under the Northern Territory Aboriginal Sacred Sites Act. For conditions on use or works within a Sacred Site or Restricted Work Area contact the Aboriginal Areas Protection Authority (AAPA): email enquiries.aapa@nt.gov.au or phone 8999 4332.

This advice does not negate the need for consent for entry, works, or use which may be required under the Aboriginal Land Rights(NT) Act (in the case of Aboriginal land), or another statute.

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CADASTRE
- Current — 123
- Proposed — 123
- Locality — LOCALITY

UTILITY SERVICES
- ELECTRICITY
- LOW VOLTAGE — LV
- HIGH VOLTAGE — HV
- WATER RETICULATION
- WATER MAIN
- WATER RISING MAIN
- SEWER
- SEWER MAIN — S
- SEWER RISING MAIN — S S

DIAL BEFORE YOU DIG www.1100.com.au

TOPOGRAPHY
- Road Sealed, Bridge
- Road Unsealed, Track
- Footpath, Drain, Culvert
- Wall, Gate, Fence, Cattle Grid
- Railway, Disused Railway
- Aerodrome Tarmac, Landing Strip
- Taxiway, Apron
- Pipeline: Oil, Water, Undetermined Gas, Sewage
- Building, Building-Shape unconfirmed
- Shade Structure, Incomplete Building
- Sewage Ponds, Tailings Pond
- Oval, Arena, Swimming Pool
- High Water Mark, Low Water Mark
- Mine; Quarry, Surface Excavation — 75
- Contour; Index, Intermediate
- Contour; Depression
- Top of Bank, Bottom of Bank, Cliff
- Watercourse; Perennial, Intermittent, Channel or Canal
- WaterBodies; Perennial, Intermittent
- WaterBodies; Reservoir, Water Hole
- Swamp; Swamp Perennial, Swamp Intermittent
- Flat; Mud Flat, Clay/Saltpan, STI
- Pole; Power, General, Light
- Tank; Water, Elevated, Non-Water, Silo
- Manhole, Pylon, Communication Tower, Bore.

AVAILABLE FROM AND PRODUCED BY:

Northern Territory Government

NOTES:
POWER POLES, MANHOLES, SEPTIC TANKS, POWER POINTS and Lot Boundary Information are captured from Aerial Photography and have their locations confirmed from aerial survey techniques.
These features are indicative as LOCAL SURVEY CONTROL, Their ground positions may be within +/-0.3m of their mapped location.

DIAL BEFORE YOU DIG phone 1100 (freecall) or visit www.1100.com.au
For water, sewer, and power information and connection requirements for Power and Water Corporation, and Water Corporation, Indigenous Community Development on 1800 245 092, and visit http://www.powerwater.com.au/business

General enquiries, corrections, updates, errors and omissions:
Indigenous Community Land Use Planning, NT Dept of Lands and Planning
TEL: (08) 8999 1300, FAX: (08) 8999 7189, Email: planning@nt.gov.au

This product is a compilation of data holdings from (but not restricted to) NT Dept of Lands and Planning, NT Dept of Housing, Local Government and Regional Services, Power and Water Corporation and Aboriginal Areas Protection Authority.
Whilst every effort has been made to ensure the accuracy of this map, errors and omissions may occur.
No Warranty is given concerning the accuracy of the information herein. Users should refer to the originating bodies or departments regarding the accuracy and currency of the data.

Topographic Information:
Land Information Division
Dept of Lands and Planning
TEL: (08) 8999 5331, FAX: (08) 8999 5386
Email: landinfo.dlp@nt.gov.au

Aboriginal Areas Protection Authority:
The Registrar
Aboriginal Areas Protection Authority
TEL: (08) 8999 4332
Email: enquiries.aapa@nt.gov.au

Cadastral Information:
Office of the Surveyor-General
Dept of Lands and Planning
TEL: (08) 8999 5353, FAX: (08) 8999 5366
Email: landinfo.dlp@nt.gov.au

Planning Information:
Indigenous Community Land Use Planning
Dept of Lands and Planning
TEL: (08) 8999 1300, FAX: (08) 8999 7189
Email: planning@nt.gov.au

Power, Water or Sewer Information:
Remote Operations Planning Branch
Power and Water Corporation
TEL: (08) 8924 6364, FAX: (08) 8924 5360

Housing Infrastructure Information:
Infrastructure Delivery Branch
Dept of Housing, Local Government, and Regional Services
TEL: (08) 8995 5013, FAX: (08) 8995 5110
Email: tw.dlhlg@nt.gov.au

SOURCE INFORMATION

CONTOUR INTERVAL :		CURRENCY OF TOPOGRAPHY :	6 June 2010
HORIZONTAL DATUM :		SOURCE MAP SCALE :	2500
VERTICAL DATUM :		ZONE UTM :	53
PROJECTION :	Transverse Mercator	DATE GENERATED :	20 June 2012

N

GDA

0 40 80 120 160 200

Locality Diagram



SERVICED LAND AVAILABILITY PROGRAM

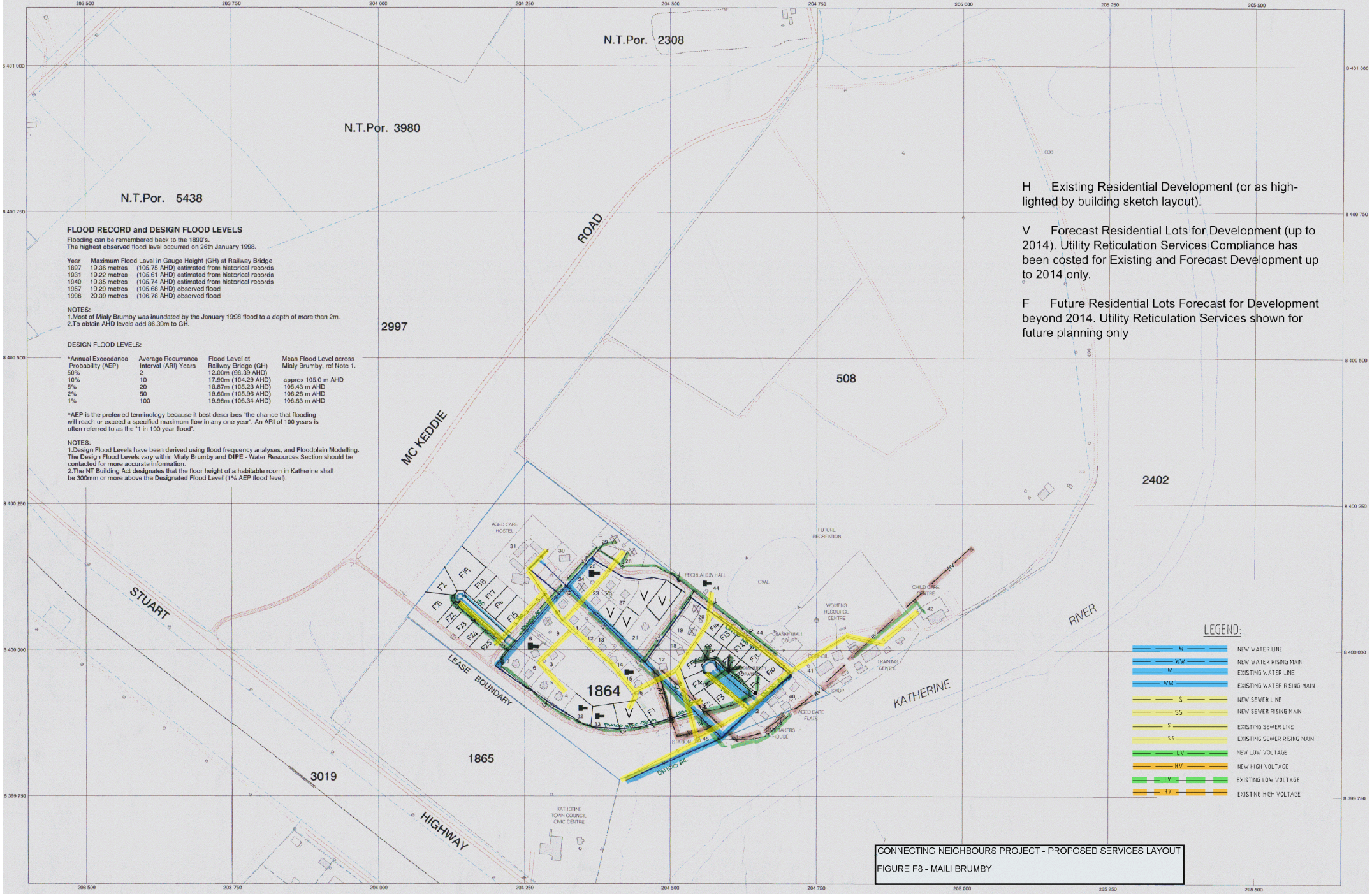
SLAP Map

Miali Brumby (Katherine Town Camp)

Kalamo

Katherine Town Council

Community ID: 621



FLOOD RECORD and DESIGN FLOOD LEVELS

Flooding can be remembered back to the 1890's.
The highest observed flood level occurred on 26th January 1998.

Year	Maximum Flood Level in Gauge Height (GH) at Railway Bridge	
1897	19.36 metres	(105.75 AHD) estimated from historical records
1921	19.22 metres	(105.61 AHD) estimated from historical records
1940	19.35 metres	(105.74 AHD) estimated from historical records
1957	19.29 metres	(105.68 AHD) observed flood
1998	20.39 metres	(106.78 AHD) observed flood

NOTES:
1.Most of Mialy Brumby was inundated by the January 1998 flood to a depth of more than 2m.
2.To obtain AHD levels add 86.39m to GH.

DESIGN FLOOD LEVELS:

*Annual Exceedance Probability (AEP)	Average Recurrence Interval (ARI) Years	Flood Level at Railway Bridge (GH)	Mean Flood Level across Mialy Brumby, ref Note 1.
50%	2	12.00m (86.39 AHD)	
10%	10	17.90m (104.29 AHD)	approx 105.0 m AHD
5%	20	18.87m (105.23 AHD)	105.43 m AHD
2%	50	19.60m (105.96 AHD)	106.26 m AHD
1%	100	19.98m (106.34 AHD)	106.63 m AHD

*AEP is the preferred terminology because it best describes "the chance that flooding will reach or exceed a specified maximum flow in any one year". An ARI of 100 years is often referred to as the "1 in 100 year flood".

NOTES:
1.Design Flood Levels have been derived using flood frequency analyses, and Floodplain Modelling. The Design Flood Levels vary within Mialy Brumby and DIPE - Water Resources Section should be contacted for more accurate information.
2.The NT Building Act designates that the floor height of a habitable room in Katherine shall be 300mm or more above the Designated Flood Level (1% AEP flood level).

H Existing Residential Development (or as high-lighted by building sketch layout).

V Forecast Residential Lots for Development (up to 2014). Utility Reticulation Services Compliance has been costed for Existing and Forecast Development up to 2014 only.

F Future Residential Lots Forecast for Development beyond 2014. Utility Reticulation Services shown for future planning only

CONNECTING NEIGHBOURS PROJECT - PROPOSED SERVICES LAYOUT
FIGURE F8 - MAILI BRUMBY

Northern Territory Government
Department of Community Development, Sport & Cultural Affairs

HORIZONTAL DATUM : GDA94 (ZONE 53)
VERTICAL DATUM : AUSTRALIAN HEIGHT DATUM (metres)

SCALE 1:2500

PRODUCED BY DEPARTMENT OF INFRASTRUCTURE, PLANNING AND ENVIRONMENT
DATE OF PHOTOGRAPHY
© NORTHERN TERRITORY OF AUSTRALIA

REFERENCE DRAWINGS
DEPARTMENT OF LANDS, PLANNING & ENVIRONMENT
TOPO PLAN REFERENCE:
POWER AND WATER AUTHORITY
WATER RETICULATION
SEWERAGE
ELECTRICAL
COUNCIL
ROADS AND CHARAGE

AMENDMENTS

No.	Date	Description	Authorized
1	OCT 01	PLAN CREATED	DIPE
2	NOV 01	LOT NUMBERS AND PLAN AMENDMENTS ADDED	COUNCIL
3	AUG 02	50/100/200 KATHERINE FLOOD MAPPING CONTOURS ADDED TO REPLACE PREVIOUS CONTOUR INFORMATION	DIPE
4	AUG 02	FLOOD RECORD AND DESIGN FLOOD LEVELS NOTATION ADDED	DIPE

PLAN LAST UPDATED BY SOU ON THE 22/08/2002

KALANO COMMUNITY ASSOCIATION

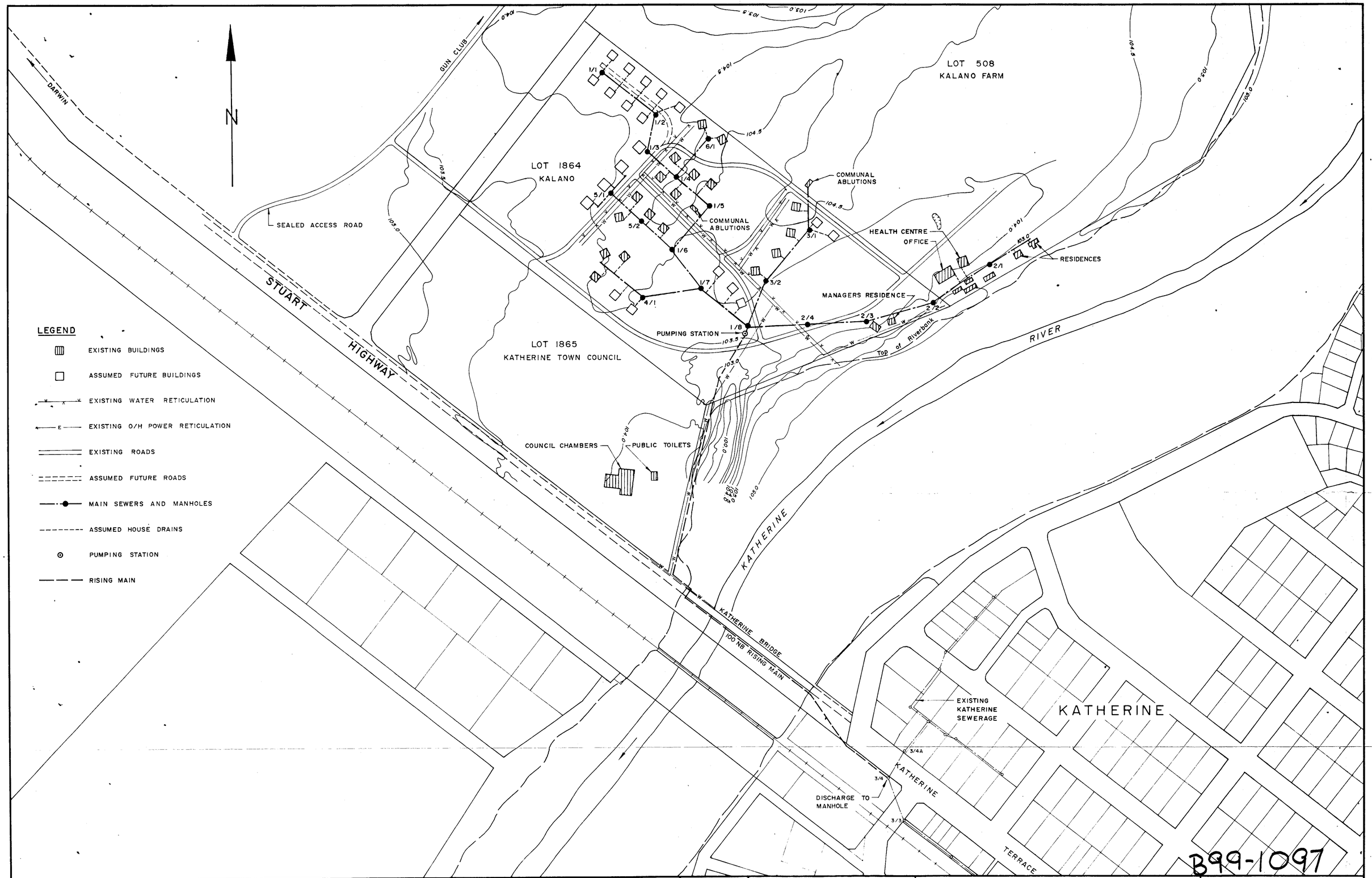
The Serviced Land Availability Program (SLAP) map system contains planning, engineering and topographical information. This map, called the SLAP map, contains information used for land use planning purposes.

COMMUNITY MAP

MIALI BRUMBY

KALAMO, KALAMO-MALI BRUMBY
KALANO, KALANO FARM, MIALLI
621

4075



B99-1097

DRAWING No.	SUBJECT	AMDT.	DESCRIPTION	DATE	INIT
ASSOCIATED DRAWINGS		AMENDMENTS			

WILLING & PARTNERS PTY. LTD. CONSULTING ENGINEERS
INCORPORATED IN THE A.C.T.
FEMCO HOUSE, 5 DOWNERS STREET, DARWIN 5790
BP HOUSE, LANE, TODD MALL, ALICE SPRINGS 5750

DESIGNED N.R.H.
DRAWN U.J.J.
TRACED
CHECKED M.J.B.
DATE

CLIENT
DEPARTMENT OF COMMUNITY DEVELOPMENT

KALANO-MIAILLI BRUMBY COMMUNITY SEWERAGE SCHEME INVESTIGATION
GRAVITY SEWERAGE LAYOUT

SCALE IN METRES 25 0 25 50 75 100 1:2500

COPYRIGHT RESERVED

DATUM A.H.D.

SHEET No. 1 OF 2

FIGURE 1

AMEND.

0 10 20 30 40 50
SCALE FOR MICROFILM REDUCTION

4076

N

DARWIN

GUN CLUB

SEALED ACCESS ROAD

STUART HIGHWAY

LOT 1864
KALANO

LOT 1865
KATHERINE TOWN COUNCIL

LOT 508
KALANO FARM

COMMUNAL ABLUTIONS

COMMUNAL ABLUTIONS

HEALTH CENTRE

OFFICE

RESIDENCES

MANAGERS RESIDENCE

Top of Riverbank

RIVER

GOOSENECK AND GAS RELIEF VALVE

COUNCIL CHAMBERS

PUBLIC TOILETS

KATHERINE

KATHERINE BRIDGE

EXISTING KATHERINE SEWERAGE

KATHERINE

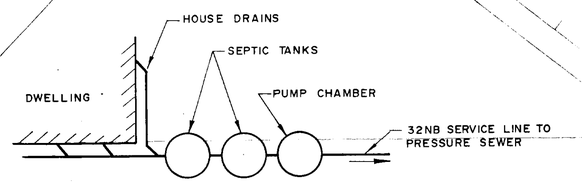
KATHERINE

TERRACE

DISCHARGE TO MANHOLE

LEGEND

- EXISTING BUILDINGS
- ASSUMED FUTURE BUILDINGS
- EXISTING WATER RETICULATION
- EXISTING O/H POWER RETICULATION
- EXISTING ROADS
- ASSUMED FUTURE ROADS
- 40 PRESSURE SEWERS WITH NOMINAL SIZE IN mm
- CLEANOUTS



SCHEMATIC PLAN OF STEP SYSTEM LAYOUT

NOT TO SCALE

B99-1098

DRAWING No.	SUBJECT	AMDT.	DESCRIPTION	DATE	INI.
ASSOCIATED DRAWINGS		AMENDMENTS			

WILLING & PARTNERS PTY LTD CONSULTING ENGINEERS

INCORPORATING THE FIRM OF [illegible]
DARWIN: [illegible] STREET, DARWIN 5790
REGISTERED OFFICE: [illegible] MAIL: ALICE SPRINGS 5750

DESIGNED N.R.H.
DRAWN U.J.J.
TRACED
CHECKED M.J.B.
DATE

CLIENT
DEPARTMENT OF COMMUNITY DEVELOPMENT

KALANO-MIAILLI BRUMBY COMMUNITY
SEWERAGE SCHEME INVESTIGATION
STEP SYSTEM LAYOUT

SCALE IN METRES 25 0 25 50 75 100 1:2500

COPYRIGHT RESERVED | DATUM A.H.D. | SHEET No. 2 OF 2

FIGURE 2 | AMEND. -

0 10 20 30 40 50
SCALE FOR MICROFILM REDUCTION

4077

DN100 PVC, SRM

STUART HIGHWAY
GWENDOLINE DRIVE
FOGARTY STREET
ARNDT ROAD
*UNNAMED
Eugene Beth Bridge
*BOAT RAMP
Emungalun
Ryan Park
Kintore Street School
Katherine Ambulance Station
Katherine South Pre School
RIVERBANK DRIVE
KINTORE STREET
RAILWAY TERRACE
KATHERINE TERRACE
WARBURTON STREET
FIRST STREET
SECOND STREET
MANNION STREET
O'SHEA TERRACE
GILES STREET
*MIALI BRUMBY

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PowerWater

0 55 110 220 Meters

Scale: 1:3,695

Original Sheet Size: A3

02/11/2016

4078

DN100 water meter located approximately here that services Kalano

STUART HIGHWAY
KATHERINE TERRACE
O'SHEA TERRACE
GILES STREET
SMITH COURT
NARBURTON STREET
FIRST STREET
SECOND STREET
THIRD STREET
FOURTH STREET
LINDSAY STREET
ARNDT ROAD
HOGARTY STREET
*MIALI BRUMBY
*TRACK
*UNNAMED
*BOATRAMP
Miali Brumby
Eugene Bridge
Emungalun
Kintore Street School
Ryan Park

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PowerWater

0 62.5 125 250 Meters

Scale: 1:4,346

Original Sheet Size: A3

02/11/2016

4079

Transformer data

Group	Com Id	Location	Community Name	Dwellings No. (Funded Dwellings)	Dwellings No. (Bennett Design)	New Houses ** (Future Demand)	Primary Volatge Level (KV)	PWC Substation ID	PWC Test Number	Transformer size (KVA)	KVA Total dwellings @ 4.5KVA	KVA Total dwellings @ 7KVA	Comments
1	290	Darwin	Bagot	55	55		11	1924	1735	300	247.5	385	
	344	Darwin	Knuckey Lagoons	18	19	2	11	1771	2163	100	85.5	133	
	347	Darwin	Kulaluk	19	19		11	1092	10607	50	85.5	133	
	403	Darwin	Palmerston Town Camp	20	16		22	10196	10245	100	90	140	Two transformers for this Town Camp. Transformers are not in boundary of Town Camp [The nearest transformers data to Town Camp are highlighted in yellow].
							22	265	11645	25			
	412	Darwin	Railway Dam (One Mile Dam)	5	6	2	11	1041	4378	200	27	42	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	427	Adelaide River	Amangal	9	9		22	216	12187	100	40.5	63	Two transformers for this Town Camp.
							22	184	5646	63			
	687	Jabiru	Manabadurma	10	12		11	5050	11107	200	54	84	
	825	Darwin	Minmarama Park	24	24		11	2147	11372	100	108	168	
2	606	Katherine	Warlpiri Transient Camp	9	9		22	6416	4886	100	40.5	63	Two transformers for this Town Camp.
							22	6074	4695	25			
	621	Katherine	Miali Brumby (Kalano)	47	31		22	6133	12247	315	211.5	329	
	640	Pine Creek	Pine Creek Compound	4	4		22	6666	3147	25	18	28	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	971	Mataranka	Mulggan	12	9	4	22	6819	5296	16	54	84	
							22	6818	5297	16			
							22	6384	11028	25			
3	215	Tennant Creek	Blueberry Hill (Munji-Marla)	2	2		22	7079	1868	200	9	14	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	223	Tennant Creek	Dump Camp (Marla-Marla)	7	7		22	7181	11088	200	31.5	49	
	224	Elliott	Elliott South Camp	12	12		11	7504	4718	200	54	84	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	225	Elliott	Elliott North Camp	36	25		11	7505	4715	100	162	252	
	238	Tennant Creek	Kargaru (East Side Camp)	12	12	1	22	7572		200	54	84	
	246	Tennant Creek	Ngalpa Ngalpa	18	21		22	7179		200	94.5	147	Two transformers for this Town Camp.
							22	7033	10904	315			
	271	Tennant Creek	Village Camp	12	12	1	22	7183	11107	200	54	84	
	681	Tennant Creek	Tingkarli	12	12		22	7180		200	54	84	
	684	Tennant Creek	Wuppa	15	15	1	22	7141	11092	100	67.5	105	Two transformers for this Town Camp.
							22	7182	11095	200			
4	3	Alice Springs	Akngwertnarre (Morris Soak)	11	15		11	8596	11336	300	67.5	105	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	16	Alice Springs	Anthelk Ewlpaye (Charles Creek)	17	10		11	8569		315	76.5	119	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	17	Alice Springs	Anthepe	15	15		22	8598	5874	200	67.5	105	Data extracted from PWC asset information. There was not access to this Town Camp due to ceremony on inspection day.
							22	8597	11244	315			
	19	Alice Springs	Aper Alwerrknge (Palmers)	7	6		11	8405	2939	200	31.5	49	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	35	Alice Springs	Ewyenper Atwatye (Hidden Valley)	47	47		11	8622	11202	100	211.5	329	
							11	8623	11203	100			
							22	8625	11205	63			
							11	8626	11204	100			
	47	Alice Springs	Ilparpa	13	13		22	8611	11702	200	58.5	91	
	48	Alice Springs	Ilperle Tyathe (Walpiri)	10	9		11	8001	11209	315	45	70	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	50	Alice Springs	Ilyperenye (Old Timers)	10	10		22	8145	3323	100	45	70	
	64	Alice Springs	Bassos	2	2		11	8002	10946	50	9	14	
	69	Alice Springs	Karnte	19	19		22	8282	2345	100	85.5	133	
	87	Alice Springs	Yarrenty Altere (Larapinta Valley)	34	34		11	8617	11334	100	153	238	
							11	8618	11200	63			
							11	8619	11335	100			
							11	8620	11201	100			
	90	Alice Springs	Inarlenge (Little Sisters)	16	22		22	8137	2925	100	99	154	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	108	Alice Springs	Mpwetyerre (Abbotts)	6	6		11	8093	11703	315	27	42	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	113	Alice Springs	Mount Nancy (Nyewente)	11	12		11	8405	2939	200	54	84	
	129	Alice Springs	Nyewente (Trucking Yards)	26	26		11	8629	11312	300	117	182	
	675	Alice Springs	Hoppys	15	19						85.5	133	There is not any Transformer in boundary of Town Camp. Also it's not shown in PWC asset information.
	676	Alice Springs	Ilpiye Ilpiye (Golders Camp)	15	14		11	8314	369	50	67.5	105	
	1029	Alice Springs	Kunoth	4	4		11	8569		315	18	28	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
5	222	Borroloola	Mara	28	29	2	11	6187	12610	100	130.5	203	Two transformers for this Town Camp.
							11	6545	10203				
	229	Borroloola	Garawa 1	16	14		11	6546	10166	100	72	112	Two transformers for this Town Camp.
							11	6332	4890	100			
	278	Borroloola	Yanyula	29	29		11	6162	10496	200	130.5	203	Data extracted from PWC asset information. It's outside of Twon Camp, shown only Transformer to this Town Camp.
							11		10167				This transformer is not shown in PWC asset information. It's installed in Boat Ramp Road near to Town Camp and connected to Electrical reticulation of Town Camp.
	992	Borroloola	Garawa 2	11	11		11	6189	2669	25	49.5	77	

** For New house's demand calculation see section 13.4 "Future Demand".

Mara

Mara

1 Design

The infrastructure reviews have been undertaken against current relevant standards for typical sub-divisions. The following standards have been used in undertaking the reviews.

Sewerage and water supply

- Water Services Association of Australia – Sewerage Code – WSA 02 Part 1: Planning and Design
- Power and Water Corporation supplement to WSA 02
- Water Services Association of Australia – Sewerage Pumping Station Code – WSA 04 -2005 Part 1: Planning and Design
- Power and Water Corporation supplement to WSA 04
- Water Services Association of Australia – Water Supply Code – WSA 03 2002 Part 1: Planning and Design
- Power and Water Corporation supplement to WSA 03
- Power and Water Corporation Indigenous Community Engineering Guidelines (2008)
- Department of Housing and Community Development Indigenous Community Engineering Guidelines (ICEG 2014, updated September 2016)
- Power and Water Corporation Essential Services Infrastructure Assessment and Upgrade Guidelines (for Town Camps in Urban Communities, 2009)
- Power and Water Corporation Standard Drawings
- Australian Standards

Electrical services

Electrical infrastructure has been assessed against AS/NZS3000 Wiring Rules and against PWC Service, Installation and Metering Rules and Urban Residential Development (URD) Design Standards where possible.

With one exception, town camps are each a single lot and compliance with AS/NZS3000 is sufficient to address potential safety concerns.

As such application of PWC URD Design Standards will mainly apply to the incoming supply and bulk or initial multi-metering panels if provided.

URD Design Standards for internal reticulation and street lighting appear to have been applied in many cases for convenience rather than compliance.

For the purposes of this report, the demand per dwelling allowances of URD Design Standards have been used to estimate incoming supply and overall distribution capacity requirements.

The following standards apply:

- Australian Standards
- Power Networks Design and Construction Guidelines, Power and Water Corporation
  - NP001.1_Design and Construction of Network Assets – General Requirements
  - NP001.3_General Specification for Overhead Electrical Reticulation
  - NP001.6_General Specification for URD Subdivisions
  - NP003_Installation Rules_V3
  - NP007_Service Rules
  - NP027_Capture of Newly Installed Street Lighting Information

- NP041_Guidelines for Electrical Design Consultants

Further referral to the guidelines in this report will be designated by the guidelines number, NP001.1.

Communications

- National Broadband Network Website viewed 21 January 2017 (http://www.nbnco.com.au/) – NBN rollout maps

General

It should be noted that if the town camps are proposed to be subdivided and services assets gifted to Power and Water Corporation (PWC) for operation and maintenance, all of these services will need to fully meet PWC standards. With the exception of a few town camps that have recently been upgraded, this will require the full replacement and/or realignment of most services.

2 Condition assessment

2.1 Rating assessment matrix

A condition rating matrix was developed and used to assess all municipal infrastructure. The same rating was used for all services to maintain consistency in assessments. Table 1 Below shows the condition rating and operability.

Table 1 Condition rating

Condition rating		Operability
1	Very Poor	Not operational
2	Poor	Not fully operational or requires immediate maintenance to keep operational
3	Good	Fully operational, may require routine maintenance
4	Very Good	Fully operational, may require maintenance in the next six months
5	Excellent	New, fully operational

2.2 Civil assessment limitations

The civil infrastructure condition investigations were subject to a number of limitations. These include:

- Only accessible services have been investigated. This includes inspecting the top of sewer manholes, side entry pits, etc., however, does not include opening pits to inspect infrastructure below ground.
- No physical testing of the sewer, water or stormwater network was undertaken.
- No survey or service locating was undertaken.

As there was no survey, potholing or CCTV undertaken on the underground infrastructure there is insufficient information to make determinations on the asset condition. The condition assessments discussed in this report are only for the accessible services and do not necessarily represent the condition of the underground infrastructure. For the majority of the town camps, other than a few that have recently been upgraded it was found that the underground services are generally undersized and it is likely, due to their age, that the these services are in poor condition. Either factor would trigger the need for a complete replacement to meet current relevant standards.

2.3 Electrical assessment limitations

The electrical infrastructure condition investigations were subject to a number of limitations. These include:

- Inspections were carried out without the assistance of an electrical tradesman.
- Only accessible services were investigated. Assessments were of a visual nature and no pit covers were removed.
- Overhead equipment was assessed from ground level.
- Switchboards were not opened and no assessment of the internal connections or bus ratings was made.
- Electrical infrastructure was assessed down to the meter for multi-meter panels and down to the termination, overhead pole or distribution pillar, of the supply cable to a meter located at a dwelling.

3 Current infrastructure issues

Power and Water Corporation (PWC) have advised of the following concerns and issues in regard to the sewerage, water and electrical infrastructure at all town camps.

3.1 Ownership and maintenance

PWC stated there has always been confusion regarding the ownership and responsibilities of the internal sewer, water and electrical infrastructure. PWC have advised that they have no legal tenure on the majority of assets in any town camps and that the owner is essentially that of the land owner or leaseholder. This is further discussed for each type of infrastructure for each town camp.

The ownership and who is responsible for the maintenance of the sewage pump stations and street lighting is a major concern. In most town camps it was found that PWC have been maintaining the assets on an in-kind basis, although there are no maintenance or access agreements in place and the infrastructure is generally not compliant to PWC standards.

3.2 Access to infrastructure

PWC advised that due to the uncertainty surrounding ownership and responsibility of the sewerage, water and electrical infrastructure, each town camp is seen as a single lot with multiple houses on it. There are no formal road reserves or easements where the municipal infrastructure should be located. PWC therefore have no legal right to enter the town camps to work on the infrastructure, nor can PWC stop others from working on the infrastructure. There is a risk that the maintenance undertaken by others may be to a lower standard than PWC.

It should be noted that there are currently no legal services easements within the town camps, except for a few cases where a town service passes through the town camp. Therefore it is recommended that easements are created over any infrastructure owned by PWC and any future assets to be gifted to PWC, to allow the service providers access to the infrastructure.

3.3 Existing infrastructure

PWC have stated that although the existing sewerage and water infrastructure appears to comply with relevant standards in some locations, the capacity cannot be assumed to meet PWC requirements due to the potential for underground substandard condition and/or grading of pipework. It is likely that these assets will need to be fully replaced to PWC standards to ensure sufficient capacity.

The planning process currently allows construction within the town camps on Commonwealth land without requiring service authority (PWC) approvals. This means that there has been no opportunity for PWC to recover contributions towards required upgrades to headworks servicing the developments and these upgrades have been paid for by PWC in the past. This inconsistency needs to be addressed for future developments within the town camps to ensure PWC are able to continue to provide adequate services.

3.4 Safety concerns

PWC have expressed concerns with safety of PWC staff and contractors working within the camps. PWC have employed procedures such as multiple people / vehicles to attend the site, with police or housing safety officers as required. This

generally leads to a delayed response time and increased cost to respond to and remediate emergency situations.

PWC have also raised the concern that if others work on water infrastructure within the town camps and do not apply the correct sanitation procedures they not only risk contaminating the entire water supply network within the town camp, at some town camps with direct connections to the town supply, they risk contaminating the entire town's water supply.

4 Available information

As the site investigations were limited to accessible / visible services, information on below ground services (such as electrical cables, sewer pipes, water supply pipes, etc.) were determined from available information. This information included:

- Serviced Land Availability Program (SLAP) maps,
- Department of Family & Community Services - Connecting Neighbours Program – Essential Services Scoping Study Report Volume 1 April 2005,
- Connecting Neighbours Project – Infrastructure Assessment and Recommendation Report - Arup Pty Ltd, April 2005,
- Connecting Neighbours Program – Borroloola – Design Report and Option Summary, Volume 3, Arup Pty Ltd, April 2005,
- Drawings supplied by NT Department of Infrastructure - Technical Records,
- Drawings supplied by Power and Water Corporation,
- Bennett Design inspection reports and population data.

Aurecon undertook a site investigation of the Mara community on 12 December 2016 to inspect roads, stormwater drainage, electrical services, sewerage and water supply, and community structures. The following sections detail the outcomes of this investigation and the assessments of the infrastructure.

The civil and electrical inspection reports can be found in the Appendicies.

5 Sewerage

5.1 Ownership and boundaries

The sewerage infrastructure within Mara community is the property of Narwinbi Aboriginal Land Trust, but is the responsibility of Mabunji Aboriginal Resource Association Incorporated to maintain.

Drawings provided by PWC show that the sewer network was updated in 2006 and the new pipework appears to comply with PWC standards.

5.1.1 Connection methods and billing

It is not confirmed who receives the sewerage bills for Mara, however bills are expected to be charged to the owner of the town camp, in this case Akngwertnarre Association Incorporated. The bill is based on number of dwellings within the town camp.

It is not known what contribution the residents make towards the sewerage bills.

5.2 Existing infrastructure condition assessment

The sewer infrastructure inspection was limited to inspecting the condition of manhole covers, as all other sewerage infrastructure is below ground. A total of nine manholes were inspected, with condition ratings as follows:

Table 2 Sewer condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Manhole		1	8			9



Figure 1 Sewer manhole, condition: *poor*, due to drainage issue



Figure 2 Sewer manhole, condition: *good*

The sewer manholes inspected were generally in good condition. There was one manhole rated in poor condition due to a drainage issue next to the manhole, however the actual manhole was in good structural condition. It was rated as poor to highlight that the drainage issue may result in future damage to the manhole. The drainage issue is expected to be mitigated when kerbs and gutters and side entry pits are installed on the road, as recommended in Section 8.4

5.3 Current performance and risks

The current capacity of the sewer network was calculated based on the following design assumptions:

- The adopted minimum grade for the pipework is 1.0%, as advised by Power and Water Corporation.
- The Equivalent Population (EP) has been calculated assuming one household equates to 9 EP, based on discussions with Power and Water Corporation.
- The capacity has been assessed by calculating the current flow rate, and the maximum flow rate when the sewer pipe flows full. The result is then a percentage of how much of the pipe is currently being used.
- Manning's roughness coefficient of the pipework is 0.012, as recommended by PWC for PVC pipes.
- Where the sewer pipe grade, size or material is not known, it is assumed to be non-compliant to PWC standards.

The current number of houses in Mara community is 31, however not all of these houses are connected to the sewer. For the purpose of assessing the existing sewer network, it was assumed that 31 houses could be connected. This number of houses multiplied by 9 EP per house gives a total current EP of 279. The capacity of the existing sewer was then calculated. The percentage shows how much of the pipe capacity is currently being used.

The pipe size is DN150 PVC based on drawings provided by PWC. The grade was assumed 1.0%.

Table 3 Existing sewer capacity

Catchment	Current total EP	Diameter of connection (mm)	Adopted PWC minimum slope (%)	Qfull (L/s)	Current Q (L/s)	Current capacity (%)
Catchment 1	279	150	1.0	16.50	2.96	18

Table 3 above shows that the capacity of the existing sewer network is adequate for the current peak population.

It was noted during the inspection that a number of older shelters which had residents living in them were not serviced by the sewer network. Instead, there was a communal toilet behind the shelters. It did not appear that this toilet was connected to the sewer network. The residents were not happy with the arrangement as the path to the toilet was a dirt track that gets muddy in the wet season, and there was no lighting to or at the toilet.

PWC advised that the sewer system in Mara had been upgraded as part of the Connecting Neighbours program and should be up to PWC standard.

5.4 Future demands

The future demand analysis showed that two additional houses are required to provide permanent accommodation for residents that are currently living in non-house dwellings. The type and location of house, number of bedrooms, etc. will need to be determined by the Department of Housing and Community Development when this work is undertaken.

An allowance of 9 EP has already been provided for each temporary house (caravans, structures, etc) in the current demand calculations, so the future EP will not increase since the residents from the temporary housing will be living in the new accommodation and the number of tenants will not be increased.

The location of the new houses is assumed to be close to the existing houses such that significant extension of the existing sewerage infrastructure would not be required. This means that no additional sewerage infrastructure upgrades would be required to cater for the new houses, other than what has already been recommended for the current demand, and not including a new house drain and connections to the existing network. The cost estimates for these works have been allowed for the in the upgrades for current demand.

5.5 Recommended works

5.5.1 Works required to existing infrastructure for current demand

The infrastructure that was assessed as very poor or poor is recommended to be upgraded to prevent failure in the future. In this case, only one sewer manhole was in poor condition due to a drainage issue. Mitigation works are recommended in the stormwater drainage section of this report.

5.5.2 Works required to existing infrastructure for future demand

The upgrades required for the two new houses include a new house drain and new connections to the existing network.

6 Water supply

6.1 Ownership and boundaries

The water reticulation servicing the community incorporates a looped water main with two supply points, refer Appendicies. The engineering drawings, dated 2006, indicate that the majority of the water mains were upgraded to DN150 PVC pipes. However, some of the DN100 water mains from the previous network were retained.

The water supply assets within Mara are believed to be owned by Narwinbi Aboriginal Land Trust, but are the responsibility of Mabunji Aboriginal Resource Association Incorporated to maintain. The water is supplied from PWC pipes outside of the community.

6.1.1 Connection methods and bills

PWC advised that they currently charge a single water bill to Narwinbi Aboriginal Land Trust (Northern Land Council). It is not known what contribution the residents make towards the water bills. It is understood that the water usage is measured at the bulk water meter located on the community boundary.

It is proposed that PWC measure the water supply to the entire community, as opposed to individual lots within the community. This requires the installation of a bulk water meter on the water main located at the community boundary. Under this scheme, the water bill for the entire community is the responsibility of the governing body, being Narwinbi Aboriginal Land Trust for Mara. It will be up to governing body to assign bills to residents accordingly.

It is recommended that the individual lot meters are maintained in addition to the proposed use of the bulk water meter. This will assist the governing body with distributing bills to residents, the identification of any leaks in the network, and meeting PWC standards should the town camp be subdivided in the future.

A total of 25 residential lot water meters were assessed during the inspection. Bennet Design reported 31 dwellings at Mara. Therefore, up to an additional six water meters are required to be installed to cover the properties without an existing water meters. Note, some water meters may have been present, however not visible due to overgrown flora or restricted property access. Consequently water meters may have not been discovered during the inspection.

6.2 Existing infrastructure assessment

The site investigation for the water infrastructure included assessing the condition of any air valves, fire hydrants, tanks, taps, and water meters. The assessment was limited to services that could be accessed above ground; no excavation of below ground services was undertaken.

The condition of each asset is as follows:

Table 4 Water supply condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Fire hydrants		1	10			11
Taps			1			1
Water meter (residential lots)	2	21	2			25



Figure 3 Fire hydrant, condition: *poor*



Figure 4 Tap, condition: *good*



Figure 5 Water meter (lot), condition: very poor

The majority of the residential lot water meters were in poor condition due to handles being broken off. It is recommended that the handles are replaced.

6.3 Current demands

It is understood that Borroloola has historically had issues with available supply for fire flow demands and that the NT Fire and Rescue Services had formally notified acceptance of a lower supply rate of 10 l/s for Borroloola. It is unclear if the water supply to the Borroloola Township has improved in recent years and if a supply rate of 25 l/s (as per PWC fire flow) is currently achievable.

The current demand of the community was calculated based on the following design assumptions:

- The nominal peak day flow is 1100 L/capita/day, based on PWC's supplement to WSA 03 2002. This value is for the northern region of NT. It was assumed that the nominal peak day flow of 1100 L/capita/day also

applies to water usage within the community, although it is possible that this value could be higher in real life due to a lack of controls to reduce water usage.

- The Equivalent Population (EP) has been calculated assuming one household equates to 9 EP, based on discussions with Power and Water Corporation.
- The peak hour factors are listed in PWC's Supplement to WSA 03-2002, and they depend on the population range of the community. The peak hour factor of 3.0 has been adopted, for populations less than 500.

Table 5 shows the calculated demand.

Table 5 Current water demand

Total dwellings	EP	Demand (l/s)	Peak hour demand (l/s)
31	279	3.55	10.66

The water reticulation is expected to have sufficient capacity for PWC flow requirements including peak hour and fire flow.

The assessment of water supply for firefighting has been based on the size of the water mains and the condition of the accessible fire hydrants. Additional hydrants have been recommended where it appears the existing number of hydrants are insufficient. In the case of Mara no additional fire hydrants are expected to be required to increase coverage throughout the community.

The existing network is not compliant with PWC standards due the DN100 PVC pipes. Given the network looping and small lengths of the DN100 pipe it is not expected to significantly impact the capacity of the network.

6.4 Future demands

The future demand analysis showed that two additional houses are required to provide permanent accommodation for residents that are currently living in non-house dwellings. The type and location of house, number of bedrooms, etc. will need to be determined by the Department of Housing and Community Development when this work is undertaken.

An allowance of 9 EP has already been provided for each temporary house (caravans, structures, etc) in the current demand calculations, so the future EP will not increase since the residents from the temporary housing will be living in the new accommodation and the number of tenants will not be increased.

The location of the new houses is assumed to be close to the existing houses such that significant extension of the existing water supply infrastructure would not be required. This means that no additional water supply infrastructure upgrades would be required to cater for the new houses, other than what has already been recommended for the current demand, and not including new residential water meters. The cost estimates for these works have been allowed for the in the upgrades for current demand.

6.5 Recommended works

6.5.1 Works required to existing infrastructure for current demand

The infrastructure that was assessed as very poor or poor is recommended to be upgraded to prevent failure in the future. The following maintenance works are recommended;

- Repaint two fire hydrants
- Replace 23 residential lot meter handles

The community is viewed overall as a large single lot and as previously detailed proposed have the water usage measured accordingly. In order to measure the water usages as a single lot, a bulk water meter should be installed. As the network is ring main, one of the supply points should be disconnected and reconnected to the internal network creating a looped main. This allows the single remaining point to be metered. The cost estimates for the upgrades at Trucking Yards include:

- Install new bulk water meter at community boundary
- Install up to six additional residential lot meters

6.5.2 Works required to existing infrastructure for future demand

The upgrades required to supply and monitor water to the new houses include new residential lot meters and connections to the network.

7 Roadworks

7.1 Ownership and boundaries

It is the current understanding that roads within Mara community are the property of Narwinbi Aboriginal Land Trust, but are the responsibility of Mabunji Aboriginal Resource Association Incorporated to maintain.

7.2 Existing infrastructure condition assessment

The road network within Mara community consists of a mix of sealed and unsealed roads. There are also numerous informal tracks which appear to be used frequently but are not covered in this inspection and report.

There was no road furniture, such as signs, footpaths or carparks at Mara. As there are no kerbs along the road, the driveways have no layover kerbs and are informal, therefore were not assessed.



Figure 6 Mara community road network

Table 6 below details the condition of the roads within Mara community for specific segments. Figure 6 shows a map of the community's road network with the condition ratings, road name, and chainage direction.

Table 6 Road network condition assessment

Road name	Chainage start (km)	Chainage end (km)	Condition	Road name
Mara Road	0.3	0.5	1	-100% of road has edge breaks (1) -40% of road has surface cracks (2) -30% of road has potholes (2)
	0.5	0.7	1	-100% of road has edge breaks (2)
	0.7	0.9	1	-100% of road has edge breaks (2) -30% of road has surface cracks (2)
222_1	0.0	0.15	2	-80% of road has edge breaks (2) -Flooding and drainage issues (2) -5% of road has potholes (2)
222_10	0.0	0.50	1	-70% of road has edge breaks (1) -40% of road has stone loss (2)
222_11	0.0	0.1	1	-100% of road has edge breaks (2) -50% of road has stone loss (2) -30% of road has surface cracks (2)



Figure 7 Mara Road, condition: *very poor*



Figure 8 Road 222_1, condition: *poor*

7.3 Current performance and risks

The road network is sufficient for the current number of houses although the condition was generally very poor.

The current road network has significant edge breaks for majority of the road, potholes, surface cracks and loose stones. It is recommended that the roads are resealed and the shoulders reformed. The installation of kerbs and gutters, as recommended in the stormwater drainage section should resolve a number of the drainage issues, however a stormwater model should be developed to investigate where culverts are required, particularly for the road outside the Mabunji offices.

7.4 Future demands

The addition of two new house will not require any upgrades to the road network. The additional houses will require minor upgrades to the kerb to provide a layover kerb for a driveway.

7.5 Recommended works

7.5.1 Works required to existing infrastructure for current demand

The infrastructure that was assessed as very poor or poor is recommended to be upgraded to prevent failure in the future. The following works are recommended to upgrade the current infrastructure;

- Reseal roads, including reforming shoulders and edges – approximately 950 m, 7.2 m wide
- Investigate stormwater drainage and where culverts are required, under the roads.

In order to allow for a longer term sustainable road network a significant upgrade would be required. It is recommended that a long term design which incorporates a full two lane road network, with all appropriate road furniture, line-marking, kerbs and gutters is constructed. A cost estimate to reinstate the base and subbase material, reseal with a two coat spray seal surface, construct subsoil drainage, line marking and signage has been included. Note that these works will need to be fully designed, the cost estimate is for budgetary purposes only and only indicates the construction phase. A footpath next to the road is also recommended to provide a safe trail for pedestrians.

As the maximum road width within the Mara community is 5 m, this means that all 1350 m of the road network will need to be upgraded to a 7.2 m wide road. The stormwater drainage infrastructure upgrades that are closely associated with the road upgrade i.e. kerb and gutters, side entry pits and underground drainage pipes are included in the stormwater section of this report.

7.5.2 Works required to existing infrastructure for future demand

Works required to provide for the two additional houses include upgrading the existing kerb to a layover kerb.

8 Stormwater drainage

8.1 Ownership and boundaries

There were no stormwater drainage assets at Mara town camp.

8.2 Current performance and risks

The detailed performance of the stormwater network cannot be fully analysed without significant hydraulic and hydrodynamic modelling, which is outside the scope of this project.

It was noted during the inspection that there were a number of areas prone to ponding and/or flooding.

The general design philosophy for stormwater drainage is that the design is based on a system of sealed roads, kerb and gutter, entry pits and underground drainage. This infrastructure currently does not exist at Mara and there would be major headworks required if stormwater drainage is to be incorporated. It is recommended that stormwater drainage infrastructure is constructed at Mara to reduce flooding and ponding within the community. A cost estimate to provide kerbs and gutters, side entry pits and underground pipes has been included. The location or size of culverts, swales, etc will need to be further investigated.

8.3 Future demands

The addition of two new house in the community will not have an impact on the stormwater drainage infrastructure, and no upgrades are required as a result.

8.4 Recommended works

The following works are recommended to upgrade or improve the current infrastructure:

- Install stormwater infrastructure, including kerbs and gutters, side entry pits and underground pipes.

9 Community structures

9.1 Ownership and boundaries

The community structures within Mara community are owned by Narwinbi Aboriginal Land Trust, but are the responsibility of Mabunji Aboriginal Resource Indigenous Corporation to maintain.

9.2 Existing infrastructure condition assessment

The site investigation for the community structures included assessing the condition and features of a playground. The following table shows the condition rating given to the community structures.

Table 7 Community structures condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Playground	1					1



Figure 9 Playground, in good condition

9.3 Current performance and risks

The playground at Mara community was in good condition and good appearance. The sand flooring had some vegetation growing in it, and the shadecloth had some dirt and mould, but overall the playground was in good condition.

No immediate maintenance works are recommended.

9.4 Future demands

The population of Mara is not expected to increase with the addition of two new houses, as the houses will provide permanent accommodation for residents that currently live in temporary housing. No additional community structures are required.

9.5 Recommended works

9.5.1 Works required to existing infrastructure for current demand

No upgrades required.

9.5.2 Works required to existing infrastructure for future demand

No upgrades required.

10 Electrical services

10.1 Ownership and boundaries

The following points, from Network Policy NP003 Installation Rules Section3, define the typical shared ownership of electrical infrastructure by Power and Water Corporation (PWC) and customers.

- The point of supply is defined as the point where PWC makes the electrical supply available. For domestic supply, this is normally one of the following:
- A point of attachment of an overhead service on to a building or pole on which a metering panel is fitted.
- A point of attachment of an overhead service on to a pole forming part of unmetered aerial consumer's mains.
- A nominated point on a distribution substation located on the customer's lot.
- A point of connection of an underground service in a metering panel, including underground services originating at an overhead line.
- A point of connection of an underground service in a pillar or junction box forming part of unmetered consumer's mains, located on the customer's lot.
- A point on a Power and Water pillar located on the customer's lot.

Typically, distribution infrastructure upstream of the Point Of Supply is owned and maintained by PWC and infrastructure below the point of supply is owned and maintained by the customer.

In many cases PWC have defined a Point Of Supply to ensure that they retain responsibility for aerial high voltage infrastructure, and aerial low voltage infrastructure where installed with aerial high voltage infrastructure, to minimise the possibility of the community or it's contractors coming into contact, either deliberately or inadvertently, with aerial high voltage infrastructure.

In other cases isolation facilities are present or desired by PWC to define the Point of Supply at or near the boundary of the town camp.

The Mara community electrical reticulation system is supplied by a transformer to an overhead reticulation scheme to prepaid meters individual houses.

PWC advise that the Point Of Supply is the LV terminals of the substation and that they own and are responsible for the first pole mount substation and upstream infrastructure.

PWC recommend that a GBS (Gas Break Switch) be provided upstream of the first transformer to establish a demarcation point.

PWC advise that street lighting is supplied from unmetered LV infrastructure and is the responsibility of the lot holder and not PWC.

All meters, whether pre- or post-paid are the property of PWC.

Mara community are responsible for maintain all unmetered and metered LV infrastructure including the main switchboard, metering panel (excluding meter), LV distribution feeders, distribution pillars, consumers' mains and consumer switchboards and street lights.

10.2 Existing infrastructure condition assessment

Table 8 shows the condition rating given to the street lights. The street lights were of a low voltage overhead feeder design, general height of eight (8) metres,

mercury lamp M80D, with lamp covers protected by cages. The street lights have 50% operational rating, from the visual inspection in the day.

Table 8 Street light condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Street light	1		1			2

Table 9 shows the condition rating given to the street lights. The street lights on the electrical poles were of a low voltage overhead feeder design, sodium lamp S150C or unknown lamp type and the lamp covers protected by cages. The street lights have 40 % operational rating and 60% inoperable.

Table 9 Street light on O/H pole condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Street light on O/H pole		6	4			10

Table 10 shows the condition rating given to the transformer. The transformers were of pole mount substation design. One assumed to supply the housing and the other transformer feed the industrial/commercial section. The transformer was visually accessed to be in good condition.

Table 10 Transformer condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Transformer			2			2

Table 11 shows the condition rating given to the Overhead poles. The overhead poles are of Weld Construction (Universal Pole construction) and steel LV distribution poles.

Table 11 Overhead pole condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Overhead pole			26			26

Table 12 shows the condition rating given to the metering panels.

Table 12 Meter panel condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Switchboard		3				3

Table 13 shows the condition rating given to the switchboards associated to dwellings.

Table 13 Switchboard condition assessment (Housing footprint)

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Switchboard			2			2

The details of the individual inspections and photographs of each piece of infrastructure are in Appendicies.

10.3 Current performance and risks

The electrical infrastructure evaluation was conducted against the following criteria

- Number of dwellings on tenure, the higher value of the funded dwelling and as quoted in the population report was utilised.
- Urban area, NP001.1, 4. Definitions.
- General Specification for URD Subdivisions, NP001.6, 4.3 Substation Size.
- Normal ADMD (After Diversity Maximum Demand) of 4.5 kVA and high cost subdivisions at 7 kVA.
- Transformer ratings were assumed to be correct in Dekho (PWC asset information system) and compared against photographs of test or transformer numbers collected.
- Substation loads were compared against transformer sizes only. No load flow analysis was conducted.
- No load calculations were performed or assessment conducted on overhead or underground cable, visual inspection from the ground only.
- Streetlighting loads were ignored as they are not significant.

The calculated maximum demand of the Mara community transformer is 130.5% of rated capacity based on 4.5kVA/dwelling.

PWC advise that no damage has occurred to this infrastructure.

Table 14 Mara current demand load vs transformer ratings

Com Id	Community name	Dwellings	Transformer (kVA)	kVA Total @ 4.5kVA	kVA Total @ 7kVA
222	Mara	29	100	130.5	203

A tabulated summary of all community transformers is included in Appendicies.

There is a risk of equipment not being maintained associated with the non-standard division of responsibilities between the customer and PWC.

The following points from the PWC Metering Rules should be noted:

- The routine maintenance of metering installations and the replacement of any faulty meters is the responsibility of PWC.
- The property owners are responsible for the maintenance and upkeep of meter rooms, boxes and panels (including lids, doors and locking mechanisms).
- The installation of pre-paid metering is a cost to the customer, refer NP010 Meter Manual-Maintenance of Metering Installations, Power and Water Corporation.

10.4 Future demands

There are two new developments currently planned for Mara community. Calculated future maximum demand of the Mara community transformer is 139.5% of rated capacity based on 4.5kVA/dwelling.

The calculated future maximum demand exceeds the total capacity of the substation on site. Load monitoring must be carried out to confirm the actual existing load.

Table 15 Mara future demand load vs transformer ratings

Com Id	Community name	Dwellings	Transformer (kVA)	kVA Total @ 4.5kVA	kVA Total @ 7kVA	Comments
222	Mara	31	100	139.5	217	

10.5 Recommended works

The Mara community transformer is owned by PWC who are aware of the loading of this transformer and have assessed the load does not require that this transformer be upgraded or replaced.

The following maintenance works and upgrades are recommended:

- Replace one street lights 80W
- Replace six street lights 150W
- Replace three switchboards inside the metering panel
- Install new street lighting - approximately 68 poles
- Since the load on the transformer exceeds 85% it is recommended that power monitoring be undertaken to allow PWC to determine, by assessment, whether the transformer needs to be upgraded or not.

11 Communications

11.1 Ownership and boundaries

Details of Telstra pit and conduit infrastructure within the town camp boundaries were sought but were not forthcoming.

11.2 Existing infrastructure condition assessment

The telecommunications infrastructure assessed included pits and telephone booths. The individual inspection reports can be found in Appendicies.

Table 16 Telecommunication pit condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Telecommunication Pit		1	3			4

Table 17 Phone booth condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Phone booth						1 (status unknown)

11.3 Current performance and risks

No details of the performance of communications infrastructure were obtained.

11.4 Future demands

The current availability of broadband services at Mara is displayed in the Figure 10 below.

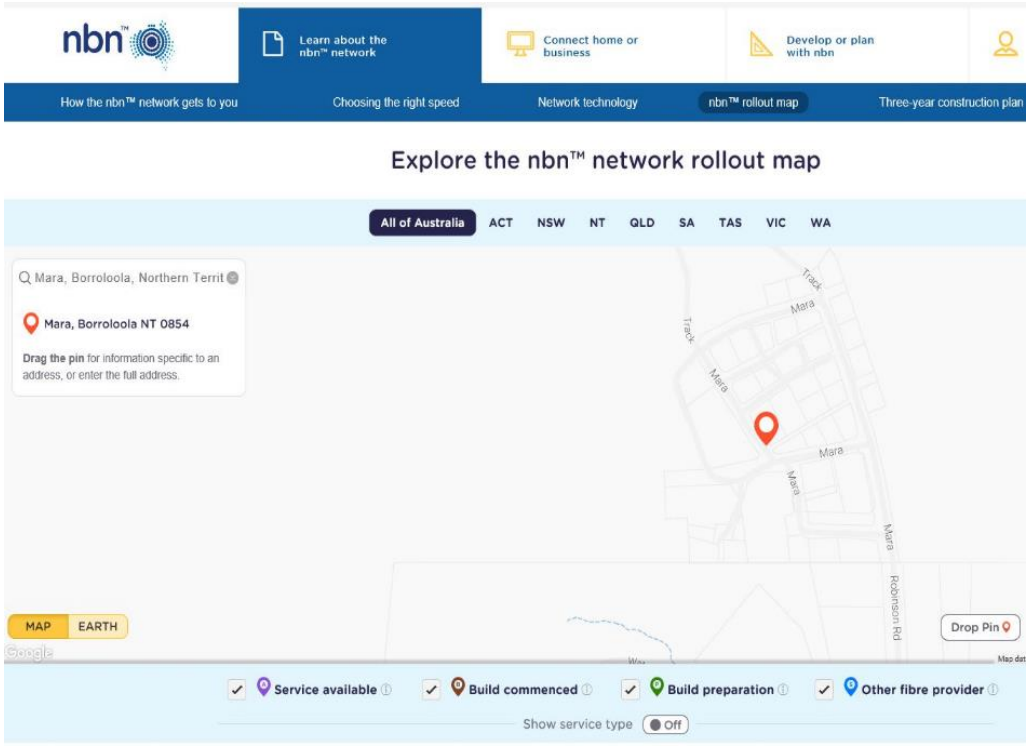


Figure 10 NBN network availability map

NBN is available to residents via satellite on application to an appropriate NBN access provider.

11.5 Recommended works

No works are required at Mara because NBN is available to residents via satellite on application to an appropriate NBN access provider.

12 Cost estimates

Table 18 below shows a summary of the cost estimates to undertake the maintenance required to fix the existing infrastructure, to upgrade the existing network to meet current design standards, and to upgrade the existing network to cater for the future design (included in current upgrades). The estimates take into account a 30% contingency, are inclusive of GST. A location factor has been applied to town camps outside of Darwin.

Table 18 Cost estimates

Infrastructure	Maintenance of existing infrastructure	Upgrades to meet current design
Sewerage	$ 0	$ 0
Water supply	$ 7,000	$ 1,822,000
Roadworks	$ 1,834,000	$ 2,948,000
Stormwater drainage	$ 0	$ 3,140,000
Community structures	$ 0	$ 0
Electrical	$ 110,000	$ 1,980,000
Communications	$ 0	$ 0
Miscellaneous provisions	$ 251,000	$ 1,204,000
Total (including GST)	**$ 2,202,000**	**$ 11,094,000**
Grand total	**$ 13,296,000**	

The cost estimates are a preliminary estimate only. Since Aurecon has no control over the cost of labour, materials, equipment or services furnished by others, or over contractors' methods of determining prices, or over competitive bidding or market conditions, Aurecon cannot guarantee actual costs will not vary from these estimates.

13 Summary

The following works are recommended for Mara community:

Sewerage

- No immediate upgrades or maintenance works required

Water supply

- Repaint two fire hydrants
- Replace 23 residential lot meter handles
- Install new bulk water meter at community boundary
- Install up to six additional residential lot meters

Roadworks

- It is recommended that the road is upgraded to a two lane network with all appropriate road furniture, line marking, kerbs, footpaths, etc.

Stormwater drainage

- Install stormwater infrastructure, including kerbs and gutters, side entry pits and underground pipes.

Community structures

- No immediate maintenance works required

Electrical services

- Replace one street lights 80W
- Replace six street lights 150W
- Replace three switchboards inside the metering panel
- Install new street lighting - approximately 68 poles
- Since the load on the transformer exceeds 85% it is recommended that power monitoring be undertaken to allow PWC to determine, by assessment, whether the transformer needs to be upgraded or not.

Communications

- No works are required because NBN is available to residents via satellite on application to an appropriate NBN access provider.

Civil inspection reports



Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 12:02 Imagery: Digital Globe WV2 2013-2016

A3 scale: 1:2,000

0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 2
Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Sewerage

222 - Mara (Borroloola)

4111



Legend

Town Camp boundary

Water

- Fire Hydrants (10)
- Water Meter (26)
- Taps (1)

Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 12:02 Imagery: Digital Globe WV2 2013-2016

A3 scale: 1:2,000

0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 2

Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Water

222 - Mara (Borroloola)

4112



Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 12:02 Imagery: Digital Globe WV2 2013-2016

A3 scale: 1:2,000

0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 2
Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments
Road furniture, stormwater drainage & community structures
222 - Mara (Borroloola)

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 10:43:00 AM

Insp ID: 1866 Group 5 - Borroloola Mara

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	Yes
FH Condition:	2 - Poor
FH Comment:	Graffiti , bent bollard

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 10:30:06 AM

Insp ID: 1872 Group 5 - Borroloola Mara

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 9:46:13 AM

Insp ID: 1877 Group 5 - Borroloola Mara

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	No red paint



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 9:23:44 AM

Insp ID: 1880 Group 5 - Borroloola Mara

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 9:16:24 AM

Insp ID: 1885 Group 5 - Borroloola Mara

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 8:50:07 AM

Insp ID: 1896 Group 5 - Borroloola Mara

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 8:47:54 AM

Insp ID: 1898 Group 5 - Borroloola Mara

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	Not painted red



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 8:41:03 AM

Insp ID: 1904 Group 5 - Borroloola Mara

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	Lid sitting above ground



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 8:35:56 AM

Insp ID: 1909	Group 5 - Borroloola	Mara

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	



Northern Territory Town Camps

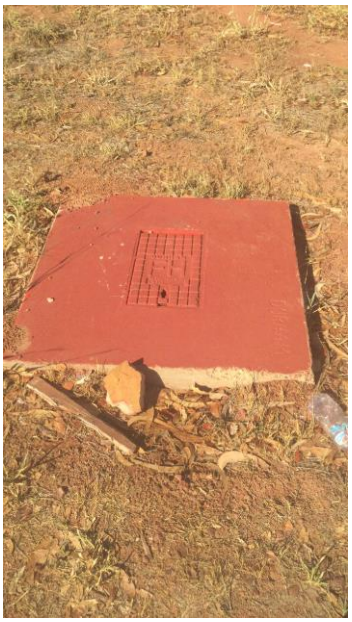
Civil Infrastructure

Inspection Date 13/12/2016 8:25:35 AM

Insp ID: 1915	Group 5 - Borroloola	Mara

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	





Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 10:32:01 AM

Insp ID: 1869 Group 5 - Borroloola Mara

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	
Comments:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 9:17:15 AM

Insp ID: 1884 Group 5 - Borroloola Mara

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	2/2
Comments:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 9:09:37 AM

Insp ID: 1887 Group 5 - Borroloola Mara

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	1/25
Comments:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 8:57:39 AM

Insp ID: 1893 Group 5 - Borroloola Mara

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	1/23
Comments:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 8:46:48 AM

Insp ID: 1899 Group 5 - Borroloola Mara

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	2/1
Comments:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 8:44:32 AM

Insp ID: 1902	Group 5 - Borroloola	Mara

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	
Comments:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 8:37:50 AM

Insp ID: 1907 Group 5 - Borroloola Mara

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	
Comments:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 8:30:32 AM

Insp ID: 1912 Group 5 - Borroloola Mara

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	1/20
Comments:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 8:27:34 AM

Insp ID: 1914 Group 5 - Borroloola Mara

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Round
Manhole Cover Diam (mm):	300
Manhole Length (mm):	
Manhole Width (mm):	
Manhole Condition:	3 - Good
Notes on Lid:	
Comments:	Approx dimensions could not Measure



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 8:23:37 AM

Insp ID: 1916 Group 5 - Borroloola Mara

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	2 - Poor
Notes on Lid:	1/18 (or 1/19)
Comments:	Drainage issue between manhole and road , starting to erode around manhole





Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 10:44:10 AM

Insp ID: 1865 Group 5 - Borroloola Mara

Road Name:	222_10
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.5
Road Type:	Sealed - spray seal
Section Width (m):	5
Road Condition:	1 - Very Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Edge Breaks	70	1 - Very Poor	70% of road
Stone Loss	40	2 - Poor	

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
No kerb		

Shoulders Section

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 10:44:10 AM





Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 10:44:10 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 10:01:23 AM

Insp ID: 1873 Group 5 - Borroloola Mara

Road Name:	222_11
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.1
Road Type:	Sealed - spray seal
Section Width (m):	5
Road Condition:	1 - Very Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Edge Breaks	100	2 - Poor	All of road has edge breaks
Stone Loss	50	2 - Poor	
Surfacing Cracks	30	2 - Poor	30% of road

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
No kerb		

Shoulders Section

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 10:01:23 AM





Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 10:01:23 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 9:11:02 AM

Insp ID: 1874 Group 5 - Borroloola Mara

Road Name:	Mara
What are you inspecting:	Pavements
Ch From (km):	0.7
Ch To (km):	0.9
Road Type:	Sealed - spray seal
Section Width (m):	5
Road Condition:	1 - Very Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Edge Breaks	100	2 - Poor	
Surfacing Cracks	30	2 - Poor	30% of road has cracks

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
No kerb		

Shoulders Section

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 9:11:02 AM









Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 9:11:02 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 9:27:12 AM

Insp ID: 1879 Group 5 - Borroloola Mara

Road Name:	222_1
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.15
Road Type:	Sealed - spray seal
Section Width (m):	5
Road Condition:	2 - Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Edge Breaks	80	2 - Poor	80% of road
Drainage	5	2 - Poor	Flooding
Potholes	5	2 - Poor	5% of road has potholes

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
No kerb		

Shoulders Section

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 9:27:12 AM







Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 9:27:12 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 8:53:10 AM

Insp ID: 1894 Group 5 - Borroloola Mara

Road Name:	Mara
What are you inspecting:	Pavements
Ch From (km):	0.5
Ch To (km):	0.7
Road Type:	Sealed - spray seal
Section Width (m):	5
Road Condition:	1 - Very Poor
General Comment:	Speed bumps not painted

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Edge Breaks	100	2 - Poor	Whole road has edge breaks

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
No kerb		

Shoulders Section

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 8:53:10 AM







Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 8:53:10 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 7:15:12 AM

Insp ID: 1901 Group 5 - Borroloola Mara

Road Name:	Mara
What are you inspecting:	Pavements
Ch From (km):	0.3
Ch To (km):	0.5
Road Type:	Sealed - spray seal
Section Width (m):	5
Road Condition:	1 - Very Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Edge Breaks	100	1 - Very Poor	Whole road has edge breaks
Surfacing Cracks	40	2 - Poor	40% of road has cracks
Potholes	30	2 - Poor	30% of road has potholes

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
No kerb		

Shoulders Section

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 7:15:12 AM









Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 7:15:12 AM





Northern Territory Camps

Civil Infrastructure

Inspection Date 13/12/2016 9:19:56 AM

Insp ID: 1882	Group 5 - Borroloola	Mara

Inspection Type:	Shade Structure
Shade Structure Type:	Play ground
Shade Floor Type:	Sand
Roof Type:	Shadecloth
Width (mm):	
Length (mm):	
Appearance:	3
Appearance Comment:	
Condition:	3 - Good
Comment:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 9:32:22 AM

Insp ID: 1878 Group 5 - Borroloola Mara

What Water Asset Are you Capturing: Taps

Diameter(mm): 30

Tap Leakage: Yes

Tap Condition: 3 - Good

Tap Comment:



Northern Territory Town Camps

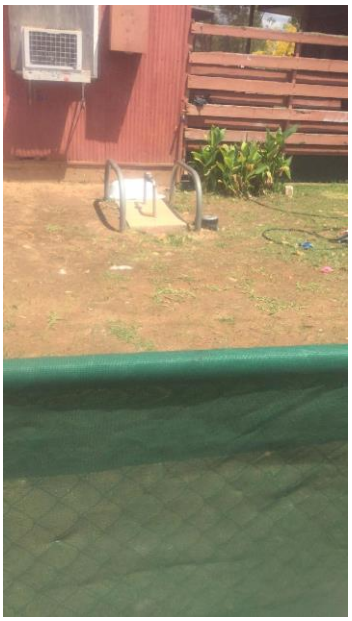
Civil Infrastructure

Inspection Date 13/12/2016 10:52:53 AM

Insp ID: 1862	Group 5 - Borroloola	Mara

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles



Northern Territory Town Camps

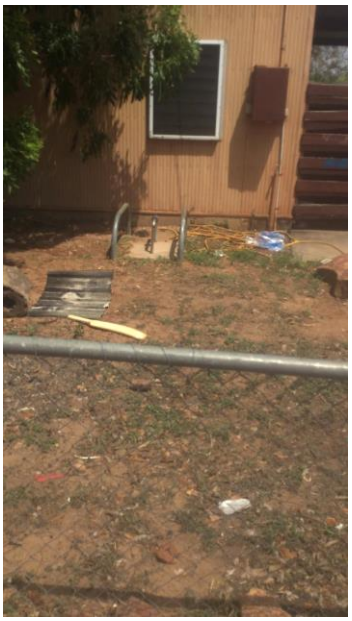
Civil Infrastructure

Inspection Date 13/12/2016 10:49:08 AM

Insp ID: 1863	Group 5 - Borroloola	Mara

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 10:46:08 AM

Insp ID: 1864 Group 5 - Borroloola Mara

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 10:35:51 AM

Insp ID: 1867	Group 5 - Borroloola	Mara

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	1 - Very Poor
Lot Water Meter Comment:	Connected to hose, not connected to main to house



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 10:34:35 AM

Insp ID: 1868	Group 5 - Borroloola	Mara

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 10:32:15 AM

Insp ID: 1870	Group 5 - Borroloola	Mara

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handle



Northern Territory Town Camps

Civil Infrastructure

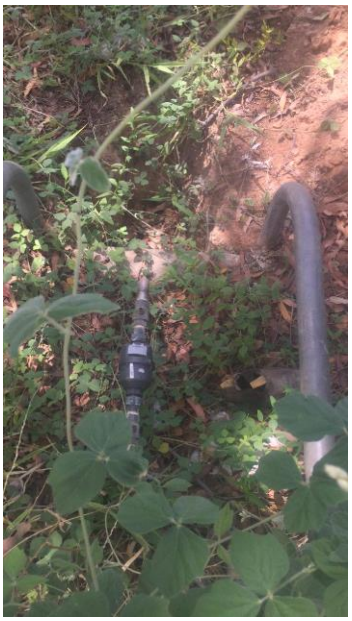
Inspection Date 13/12/2016 10:30:42 AM

Insp ID: 1871 Group 5 - Borroloola Mara

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	1 - Very Poor
Lot Water Meter Comment:	No tap handles and lot of scouring around slab





Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 9:59:40 AM

Insp ID: 1876	Group 5 - Borroloola	Mara

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap does

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 9:21:23 AM

Insp ID: 1881	Group 5 - Borroloola	Mara

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 9:13:00 AM

Insp ID: 1883	Group 5 - Borroloola	Mara

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles





Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 9:14:06 AM

Insp ID: 1886	Group 5 - Borroloola	Mara

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 9:08:39 AM

Insp ID: 1888 Group 5 - Borroloola Mara

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 9:07:26 AM

Insp ID: 1889	Group 5 - Borroloola	Mara

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles



Northern Territory Town Camps

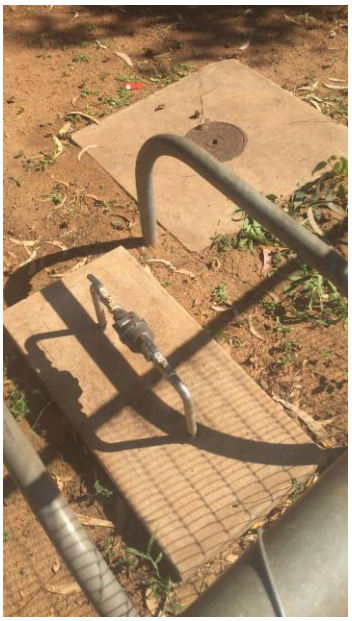
Civil Infrastructure

Inspection Date 13/12/2016 8:55:57 AM

Insp ID: 1890	Group 5 - Borroloola	Mara

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	3 - Good
Lot Water Meter Comment:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 9:04:55 AM

Insp ID: 1891	Group 5 - Borroloola	Mara

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	In lot. No tap handles



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 9:02:50 AM

Insp ID: 1892	Group 5 - Borroloola	Mara

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 8:51:39 AM

Insp ID: 1895	Group 5 - Borroloola	Mara

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 8:49:03 AM

Insp ID: 1897	Group 5 - Borroloola	Mara

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 8:46:00 AM

Insp ID: 1900	Group 5 - Borroloola	Mara

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 8:43:47 AM

Insp ID: 1903	Group 5 - Borroloola	Mara

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 8:39:46 AM

Insp ID: 1905	Group 5 - Borroloola	Mara

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	3 - Good
Lot Water Meter Comment:	Erosion around slab



Northern Territory Town Camps

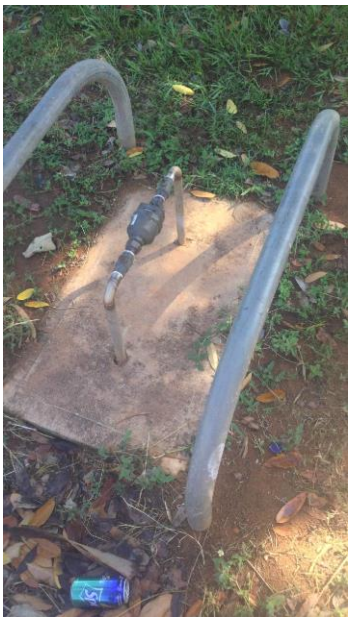
Civil Infrastructure

Inspection Date 13/12/2016 8:37:37 AM

Insp ID: 1906	Group 5 - Borroloola	Mara

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles



Northern Territory Town Camps

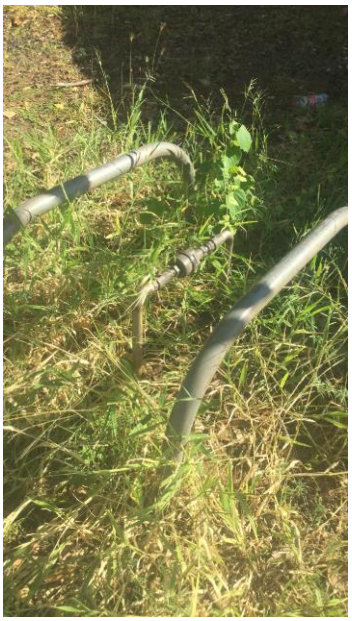
Civil Infrastructure

Inspection Date 13/12/2016 8:36:44 AM

Insp ID: 1908	Group 5 - Borroloola	Mara

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No handles



Northern Territory Town Camps

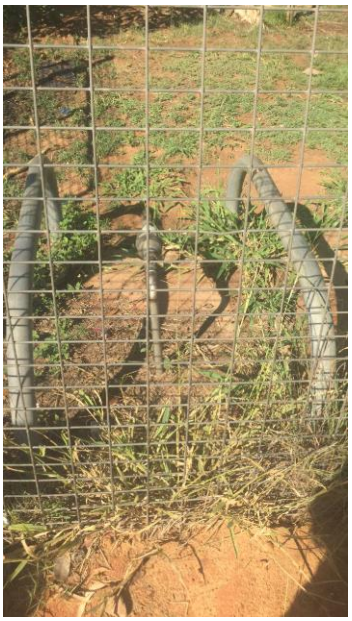
Civil Infrastructure

Inspection Date 13/12/2016 8:34:21 AM

Insp ID: 1910 Group 5 - Borroloola Mara

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No handles





Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 8:32:37 AM

Insp ID: 1911	Group 5 - Borroloola	Mara

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No handle



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 8:28:50 AM

Insp ID: 1913	Group 5 - Borroloola	Mara

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	30
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handle



Electrical inspection report



Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_004_Elec_DDP_report.mxd 23/02/2017 12:22

A3 scale: 1:2,000

0 20 40 60 80 100 m

Date: 23/02/2017 Version: 3

Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Electrical

222 - Mara (Borroloola)

4181

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 10:56:56 AM

Insp ID: 1073 Group 5 - Borroloola Mara

What Comms Category are you capturing:	Distribution
What is distribution method to households:	Underground
Is it Shared with PWC:	
Is there Anti-climb barrier provided for this pole:	
What is Pole construction type:	
Is street light fitted:	
Is there concrete collar around the base of pole:	
What is the condition of tap off to house:	
What is the condition of pole:	
How many Lots are connected to this pole:	
Is there access to Pits to take a photo:	No
What is Pit Condition:	3
Underground Comments:	





Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:29:32 AM

Insp ID: 1092	Group 5 - Borroloola	Mara

What Comms Category are you capturing:	Distribution
What is distribution method to households:	Underground
Is it Shared with PWC:	
Is there Anti-climb barrier provided for this pole:	
What is Pole construction type:	
Is street light fitted:	
Is there concrete collar around the base of pole:	
What is the condition of tap off to house:	
What is the condition of pole:	
How many Lots are connected to this pole:	
Is there access to Pits to take a photo:	No
What is Pit Condition:	2
Underground Comments:	Cover broken





Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:20:05 AM

Insp ID: 1094 Group 5 - Borroloola Mara

What Comms Category are you capturing:	Distribution
What is distribution method to households:	Underground
Is it Shared with PWC:	
Is there Anti-climb barrier provided for this pole:	
What is Pole construction type:	
Is street light fitted:	
Is there concrete collar around the base of pole:	
What is the condition of tap off to house:	
What is the condition of pole:	
How many Lots are connected to this pole:	
Is there access to Pits to take a photo:	No
What is Pit Condition:	3
Underground Comments:	





Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:18:51 AM

Insp ID: 1095 Group 5 - Borroloola Mara

What Comms Category are you capturing:	Distribution
What is distribution method to households:	Underground
Is it Shared with PWC:	
Is there Anti-climb barrier provided for this pole:	
What is Pole construction type:	
Is street light fitted:	
Is there concrete collar around the base of pole:	
What is the condition of tap off to house:	
What is the condition of pole:	
How many Lots are connected to this pole:	
Is there access to Pits to take a photo:	No
What is Pit Condition:	3
Underground Comments:	





Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 24/01/2017 1:36:20 PM

Insp ID: 3678	Group 5 - Borroloola	Mara

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond: 2

Meter Condition:

Meter Comment: Type & Condition of meter to be confirmed as meter photo not captured. Blank plates a

Comments:



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 24/01/2017 12:08:22 PM

Insp ID: 3679	Group 5 - Borroloola	Mara

What Category are you capturing: Electrical Meters

Meter Type: Electrical

Meter Switchboard Cond:

Meter Condition:

Meter Comment: Indoor SB, Cond 3

Comments:



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 24/01/2017 3:20:49 PM

Insp ID: 3688 Group 5 - Borroloola Mara

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond: 2

Meter Condition:

Meter Comment: Type & Condition of meter to be confirmed as meter photo not captured. Blank plates a

Comments:



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 25/01/2017 10:03:00 AM

Insp ID: 3692 Group 5 - Borroloola Mara

What Category are you capturing: Electrical Meters

Meter Type: Prepaid

Meter Switchboard Cond: 2

Meter Condition:

Meter Comment: Type & Condition of meter to be confirmed as meter photo not captured. Blank plates a

Comments:



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 11:15:17 AM

Insp ID: 1070 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	1
Overhead Pole Comments:	Surface rusted

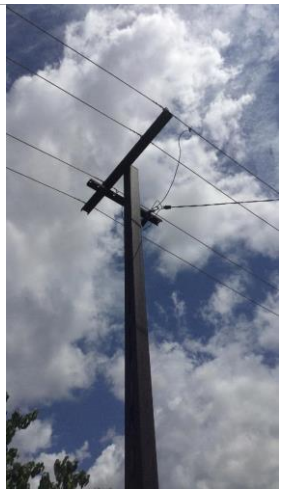
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 11:15:17 AM











Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 11:12:48 AM

Insp ID: 1071 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	Unknown
Street Light Watts	
Street Light Condition	2
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	2
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 11:12:48 AM











Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 11:07:10 AM

Insp ID: 1072 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	3
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 11:07:10 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 10:55:47 AM

Insp ID: 1074 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	1
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 10:55:47 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 10:53:04 AM

Insp ID: 1075 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	1
Overhead Pole Comments:	Surface rusted

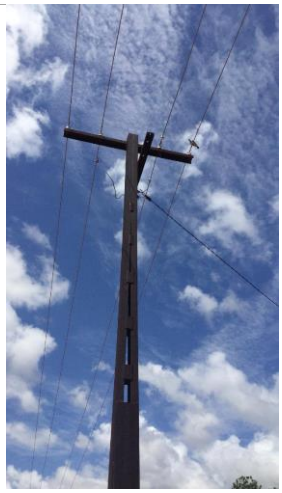
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 10:53:04 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 10:36:55 AM

Insp ID: 1076 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

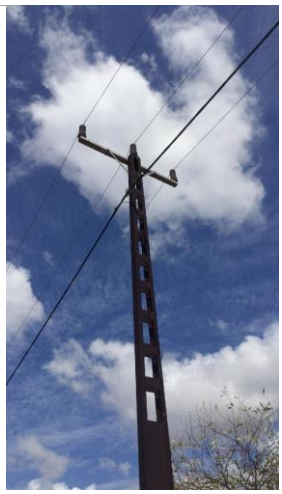
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 10:36:55 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 10:30:27 AM

Insp ID: 1078 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	1
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 10:30:27 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 10:12:26 AM

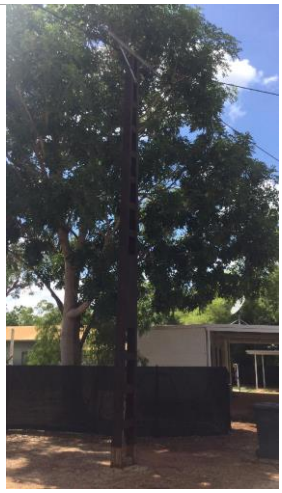
Insp ID: 1081 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	2
Overhead Pole Comments:	Surface rusted

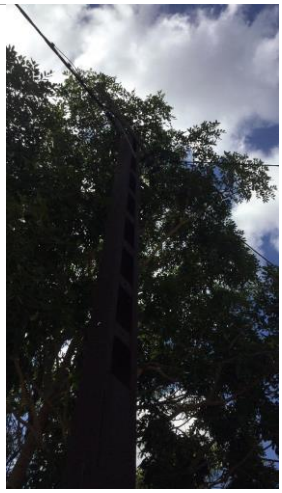
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 10:12:26 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 10:09:18 AM

Insp ID: 1082 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	
What is the Condition:	3
How many Lots are connected to this pole:	1
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 10:09:18 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 10:05:56 AM

Insp ID: 1083 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	3
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 10:05:56 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 10:03:28 AM

Insp ID: 1084 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	1
Overhead Pole Comments:	Surface rusted

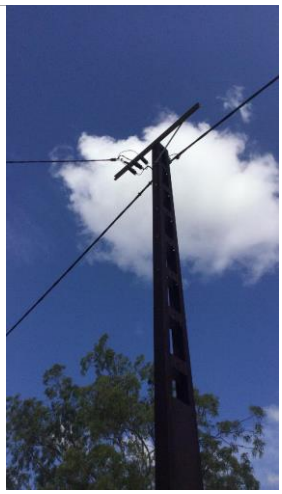
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 10:03:28 AM











Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 10:00:41 AM

Insp ID: 1085 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M80D 06
Street Light Watts	
Street Light Condition	2
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 10:00:41 AM











Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:54:00 AM

Insp ID: 1086 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

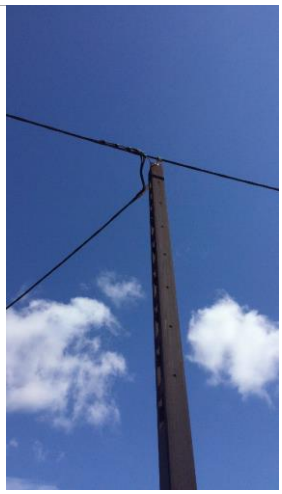
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:54:00 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:51:25 AM

Insp ID: 1087 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	Unknown
Street Light Watts	
Street Light Condition	3
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:51:25 AM











Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:48:37 AM

Insp ID: 1088 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	1
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:48:37 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:44:26 AM

Insp ID: 1089 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Steel
What is the condition of pole:	3
How is the pole planted:	Direct
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	Unknown
Street Light Watts	
Street Light Condition	3
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	2
Overhead Pole Comments:	

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:44:26 AM











Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:39:19 AM

Insp ID: 1090 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	1
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:39:19 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:37:00 AM

Insp ID: 1091 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	Unknown
Street Light Watts	
Street Light Condition	2
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	3
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:37:00 AM











Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:25:11 AM

Insp ID: 1093 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	Unknown
Street Light Watts	
Street Light Condition	3
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	2
Overhead Pole Comments:	Surface rusted . Connection cable to left lot (over t

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:25:11 AM













Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:14:04 AM

Insp ID: 1097 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:14:04 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:11:33 AM

Insp ID: 1098 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S150C 11
Street Light Watts	
Street Light Condition	2
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	3
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

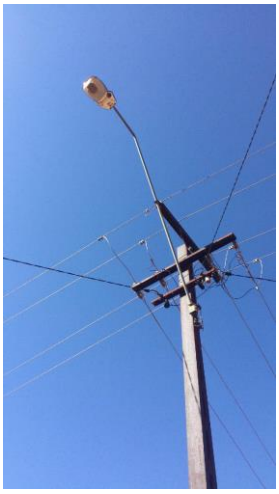
Inspection Date 13/12/2016 9:11:33 AM











Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 8:59:17 AM

Insp ID: 1100 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	2
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 8:59:17 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 8:55:04 AM

Insp ID: 1101 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S150C 11
Street Light Watts	
Street Light Condition	2
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	2
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

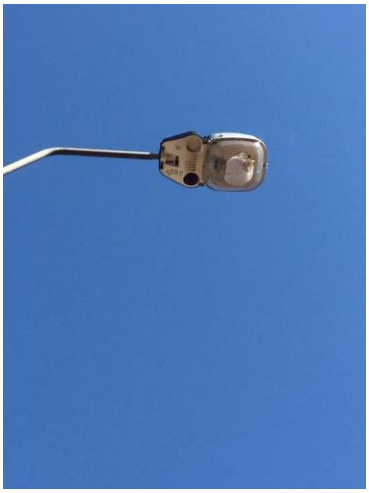
Inspection Date 13/12/2016 8:55:04 AM











Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 8:51:16 AM

Insp ID: 1102 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 8:51:16 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 8:48:59 AM

Insp ID: 1103 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S150C 11
Street Light Watts	
Street Light Condition	2
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	1
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 8:48:59 AM











Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:17:09 AM

Insp ID: 1104 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	Unknown
Street Light Watts	
Street Light Condition	3
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	3
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

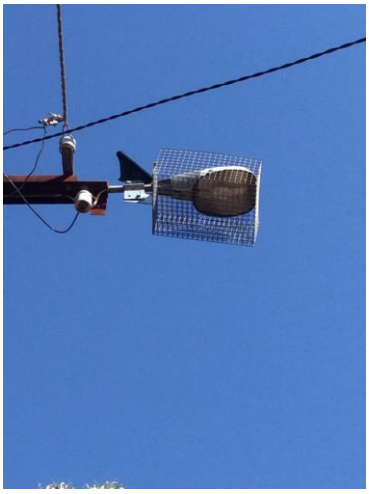
Inspection Date 13/12/2016 9:17:09 AM











Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 11:12:48 AM

Insp ID: 1071	Group 5 - Borroloola	Mara

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	Unknown
Street Light Watts	
Street Light Condition	2
Street Light Height	





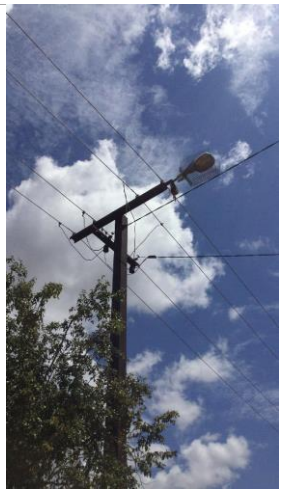




Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 11:12:48 AM



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 10:00:41 AM

Insp ID: 1085 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M80D 06
Street Light Watts	
Street Light Condition	2
Street Light Height	









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 10:00:41 AM



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:51:25 AM

Insp ID: 1087 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	Unknown
Street Light Watts	
Street Light Condition	3
Street Light Height	









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:51:25 AM



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:44:26 AM

Insp ID: 1089 Group 5 - Borroloola Mara

What Category are you capturing: Overhead Poles

Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	Unknown
Street Light Watts	
Street Light Condition	3
Street Light Height	









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:44:26 AM



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:37:00 AM

Insp ID: 1091 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	Unknown
Street Light Watts	
Street Light Condition	2
Street Light Height	









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:37:00 AM



Northern Territory Town Camps

Electrical Infrastructure

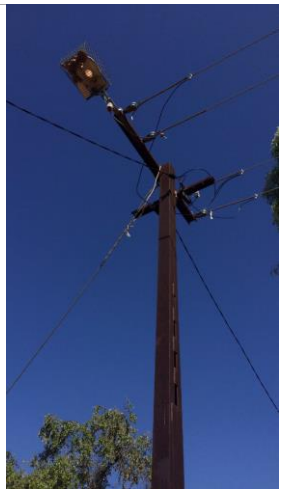
Inspection Date 13/12/2016 9:25:11 AM

Insp ID: 1093 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	Unknown
Street Light Watts	
Street Light Condition	3
Street Light Height	









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:25:11 AM





Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:11:33 AM

Insp ID: 1098 Group 5 - Borroloola Mara

What Category are you capturing: Overhead Poles

Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S150C 11
Street Light Watts	
Street Light Condition	2
Street Light Height	





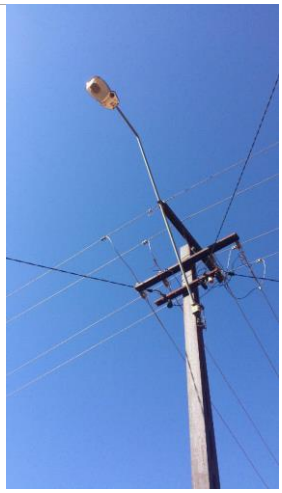




Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:11:33 AM



Northern Territory Town Camps

Electrical Infrastructure

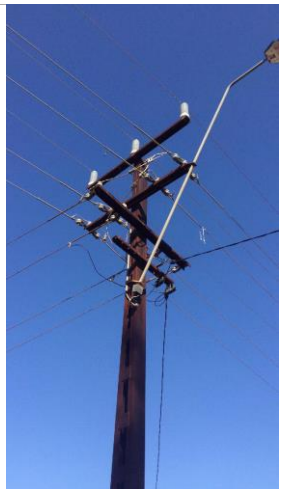
Inspection Date 13/12/2016 8:55:04 AM

Insp ID: 1101 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S150C 11
Street Light Watts	
Street Light Condition	2
Street Light Height	





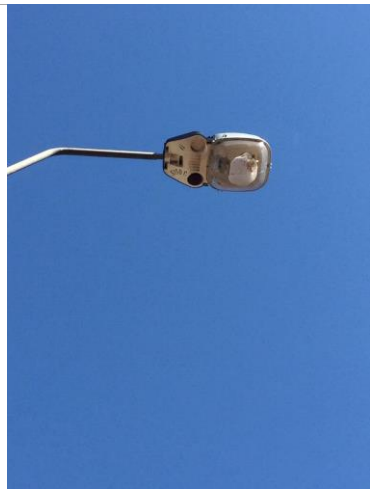




Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 8:55:04 AM



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 8:48:59 AM

Insp ID: 1103 Group 5 - Borroloola Mara

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	S150C 11
Street Light Watts	
Street Light Condition	2
Street Light Height	









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 8:48:59 AM



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:17:09 AM

Insp ID: 1104 Group 5 - Borroloola Mara

What Category are you capturing: Overhead Poles

Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	Unknown
Street Light Watts	
Street Light Condition	3
Street Light Height	





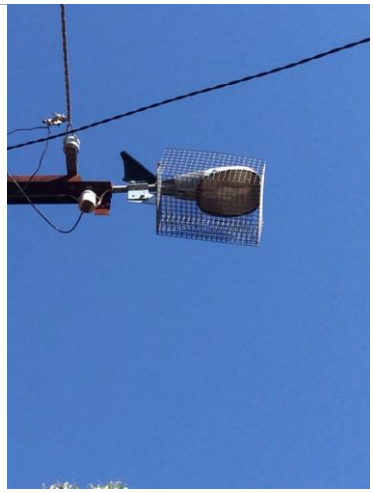




Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:17:09 AM



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 10:23:42 AM

Insp ID: 1079 Group 5 - Borroloola Mara

What Category are you capturing:	Street Light
What is power supply method:	Overhead
What is the lamp type:	Lamp type not clear
What Wattage is the lamp:	
What is the condition of street lights:	1
What is Street Lighting pole installation height (approximate):	7









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 10:23:42 AM



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 10:18:10 AM

Insp ID: 1080 Group 5 - Borroloola Mara

What Category are you capturing:	Street Light
What is power supply method:	Overhead
What is the lamp type:	M80D 09
What Wattage is the lamp:	80
What is the condition of street lights:	3
What is Street Lighting pole installation height (approximate):	7









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 10:34:27 AM

Insp ID: 1077 Group 5 - Borroloola Mara

What Category are you capturing:	Transformers
What is Transformer installation method:	Pole
If method know:	11SS1P
What is the condition of the mounting:	3
What is Transformer Rating:	Unknown
Is there access to transformers name plate to take a photo:	No
What is the condition of transformer:	3
What is cable type to transformer:	PVC insulated black
What is cable size to transformer:	
Is there switch gear or fusing associated with the transformer:	Cut out fuse
Transformer Comment:	









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 10:34:27 AM



Northern Territory Town Camps

Electrical Infrastructure

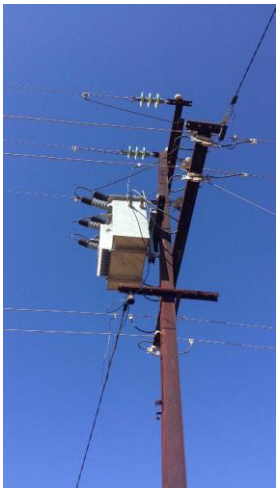
Inspection Date 13/12/2016 9:02:26 AM

Insp ID: 1099 Group 5 - Borroloola Mara

What Category are you capturing:	Transformers
What is Transformer installation method:	Pole
If method know:	11SS1P
What is the condition of the mounting:	3
What is Transformer Rating:	Unknown
Is there access to transformers name plate to take a photo:	No
What is the condition of transformer:	3
What is cable type to transformer:	PVC insulated black
What is cable size to transformer:	
Is there switch gear or fusing associated with the transformer:	Cut out fuse
Transformer Comment:	





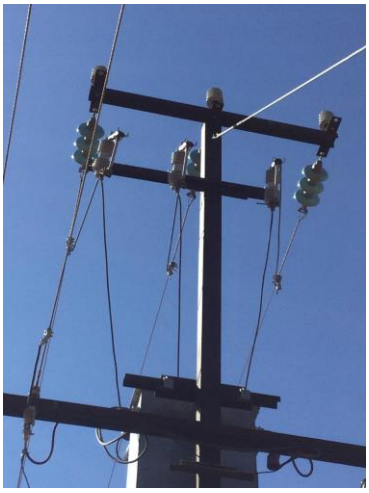




Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 13/12/2016 9:02:26 AM



Road map



Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Roads_DDP2.mxd 11/02/2017 17:17 Imagery: copyright DigitalGlobe WV 2

Legend

- Start of road

Road_Condition

- 1-Very poor
- 2-Poor
- 3-Good
- 4-Very good
- 5-Excellent
- Town Camp boundary

A3 scale: 1:2,000

0 20 40 60 80 100 m

Date: 11/02/2017 Version: 1

Coordinate system: GDA 1994

NT Town Camp Road Assessments

222 - Mara (Borroloola)

4270

Existing drawings

-16°02'51" 639 275 E 639 340 E 639 405 E 639 470 E 639 535 E 639 600 E 639 665 E -16°02'51"
138°18'06" 138°18'22"

8 225 360 N
8 225 295 N
8 225 230 N
8 225 165 N
8 225 100 N
8 225 035 N
8 224 970 N
8 224 905 N
8 224 840 N
8 224 775 N

Mara Camp

Excluded from Development (Cultural Reasons)

BORROLOOLA

NT Por 2087
NT Por 4714
NT Por 4715
NT Por 4716

Town Boundary

TOWN OF BORROLOOLA

ROBINSON ROAD

Power

Buffer

1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 44 46 47 48
595 797 815 820 825 527

-16°03'12" 639 275 E 639 340 E 639 405 E 639 470 E 639 535 E 639 600 E 639 665 E -16°03'12"
138°18'06" 138°18'22"

LEGEND

LAND USE PLANNING:

APPROX. POSITION OF BUILDING constructed since date of photography

LAND EXCLUDED FROM DEVELOPMENT

GENERAL EXCLUSION BUFFERS

CULTURAL EXCLUSION AREAS:

Unauthorised entry, works on or use of land where there is a sacred site is an offence under the Northern Territory Aboriginal Sacred Sites Act. For conditions relating to works on or use of land within a Cultural Exclusion Area contact the Aboriginal Areas Protection Authority (AAPA): email enquiries.aapa@nt.gov.au or Phone 8999 4332.

This advice does not negate the need for entry, works, or use which may be required under the Aboriginal land Rights (NT) Act (In the case of Aboriginal Land), or another statute.

CADASTRE

Current 123
Proposed 123
Locality LOCALITY

TOPOGRAPHY

Road Sealed, Bridge
Road Unsealed, Track
Footpath, Drain, Culvert
Wall, Gate, Fence, Cattle Grid
Railway, Disused Railway
Aerodrome Tarmac, Landing Strip
Taxiway, Apron
Pipeline: Oil, Water, Undetermined Gas, Sewage
Building, Building-Shape unconfirmed
Shade Structure, Incomplete Building
Sewage Ponds, Tailings Pond
Oval, Arena, Swimming Pool
High Water Mark, Low Water Mark
Mine; Quarry, Surface Excavation
Contour; Index, Intermediate 75
Contour; Depression

Top of Bank, Bottom of Bank, Cliff
Watercourse; Perennial, Intermittent, Channel or Canal
Water Body; Perennial, Intermittent
Water Body; Reservoir, Water Hole
Swamp; Swamp Perennial, Swamp Intermittent
Flat; Mud Flat, Clay/Saltpan, STI
Pole; Power, General, Light,
Tank; Water, Elevated, Non-Water, Silo
Manhole, Pylon, Communication Tower, Bore.

UTILITY SERVICES

ELECTRICITY
LOW VOLTAGE LV
HIGH VOLTAGE HV

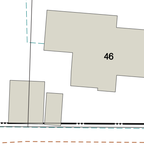
WATER RETICULATION
WATER MAIN W
WATER RISING MAIN W W

SEWER
SEWER MAIN S
SEWER RISING MAIN S S

DIAL BEFORE YOU DIG www.1100.com.au

© NORTHERN TERRITORY OF AUSTRALIA

Locality Diagram



AVAILABLE FROM AND PRODUCED BY:
Dept Lands, Planning and the Environment
Land Information Division
3rd Floor NAB House, Darwin
GPO Box 1680 Darwin NT 0801
http://www.nt.gov.au/dlpe
Northern Territory Government

This product is a compilation of data holdings from (but not restricted to) NT Dept of Lands, Planning and the Environment, NT Dept of Housing, Local Government and Regional Services, Power and Water Corporation and Aboriginal Areas Protection Authority.
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General enquiries, corrections, updates, errors and omissions:
Indigenous Community Land Use Planning, Dept of Lands, Planning and the Environment
TEL: (08) 8999 1300, FAX: (08) 8999 7189, Email: planning@nt.gov.au

Topographic Information:
Land Information Division
Dept of Lands, Planning and the Environment
TEL: (08) 8995 5331
FAX: (08) 8995 5386
Email: landinfo@nt.gov.au

Cadastral Information:
Office of the Surveyor-General
Dept of Lands, Planning and the Environment
TEL: (08) 8995 5353
FAX: (08) 8995 5365
Email: landinfo@nt.gov.au

Power, Water or Sewer Information:
Remote Operations Planning Branch
Power and Water Corporation
TEL: (08) 8924 5094
FAX: (08) 8924 5360

Planning Information:
Indigenous Community Land Use Planning
Dept of Lands, Planning and the Environment
TEL: (08) 8999 1300
FAX: (08) 8999 7189
Email: planning@nt.gov.au

Aboriginal Areas Protection Authority:
The Registrar
Aboriginal Areas Protection Authority
TEL: (08) 8999 4332
Email: enquiries.aapa@nt.gov.au

Housing Infrastructure Information:
Infrastructure Delivery Branch
Dept of Housing, Local Government & Regional Services
TEL: (08) 8999 5013
FAX: (08) 8999 5110
Email: ies.dhlgrs@nt.gov.au

NOTES: POWER POLES, MANHOLES, SEPTIC TANKS, TOWERS/POSTS and other similar shaped objects are captured from Aerial Photography and have locations confirmed from aerial survey techniques. These features are suitable as LOCAL SURVEY CONTROL. Their ground location is expected to be within +/-0.3m of their mapped location.

DIAL BEFORE YOU DIG phone 1100 (freecall) or visit www.1100.com.au For water, sewer and power information and connection requirements for developments contact Power and Water Corporation, Indigenous Community Development on 1800 245 092, and visit http://www.powerwater.com.au/business

SOURCE INFORMATION

CURRENCY OF TOPOGRAPHY :	26 Jun 2012
SOURCE MAP SCALE :	656
ZONE UTM :	53
CONTOUR INTERVAL :	
HORIZONTAL DATUM :	GDA94
VERTICAL DATUM :	AHD
PROJECTION :	Transverse Mercator
DATE GENERATED :	24 June 2013

N

GDA

0 10 20 30 40 50
metres

SERVICED LAND AVAILABILITY PROGRAM

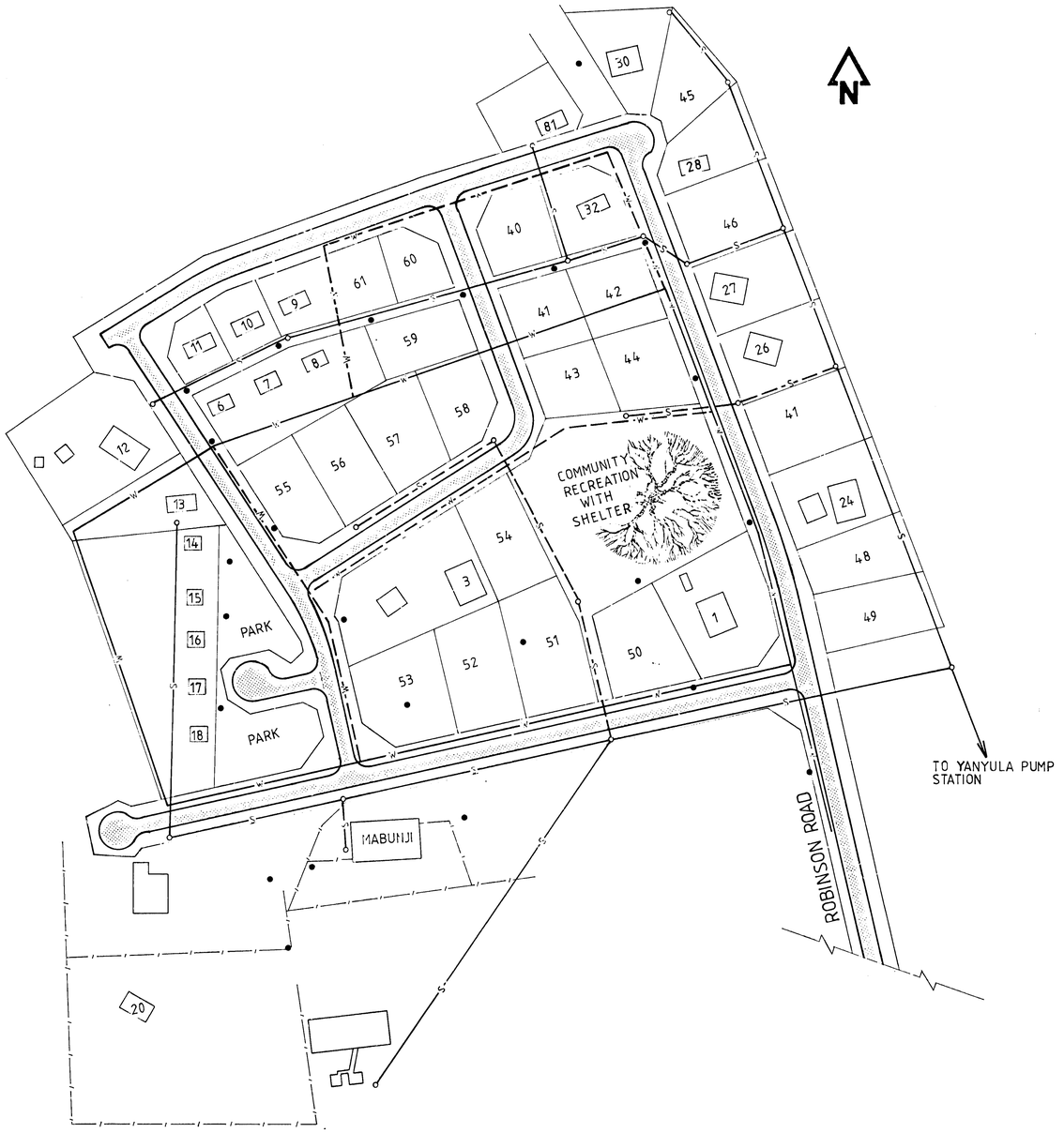
SLAP Map

Mara (Borroloola Town Camp)

Borroloola Town Camp

Roper Gulf Shire Council

Community ID : 222



SCALE 10 0 10 20 30 40 50 m 1:1000

LEGEND

- PROPOSED SEWER (FOR EXISTING BUILDINGS)
- SEWER EXTENSIONS FOR FUTURE DEVELOPMENT
- EXISTING WATER MAIN
- WATER EXTENSIONS FOR FUTURE DEVELOPMENT
- EXISTING RESIDENCE
- NOTIONAL ALLOTMENT BOUNDARIES
- PROPOSED ROAD RESERVE
- PROPOSED SEALED PAVEMENT
- POTENTIAL BUILDING SITE
- EXISTING POWER POLE

No.	DESCRIPTION	DATE	INIT
AMENDMENTS			

DRG No.	SUBJECT
ASSOCIATED DRAWINGS	

PAK-POY LANGE PTY. LTD.
CONSULTING ENGINEERS & PLANNERS
DARWIN, ALICE SPRINGS & PALMERSTON

APPROVED DATE

TITLE
BORROLOOLA
MARA TOWN CAMP
PROPOSED SUBDIVISON AND SERVICES LAYOUT

SCALE	1:1000
DATE	MAY 89
JOB No.	
DESIGNED	KWL
DRAWN	G.A
CHECKED	

SHEET No..... OF.....

DRAWING No. F2 FIG 5

B94-1697

MICROBOX

1 2 3 4 4 3 2 1

FOR LEGEND REFER TO
DRG. NO. 43-20867-C040

WARNING

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The locations of underground services are approximate only and their exact position should be proven on site. No guarantee is given that all existing services are shown.

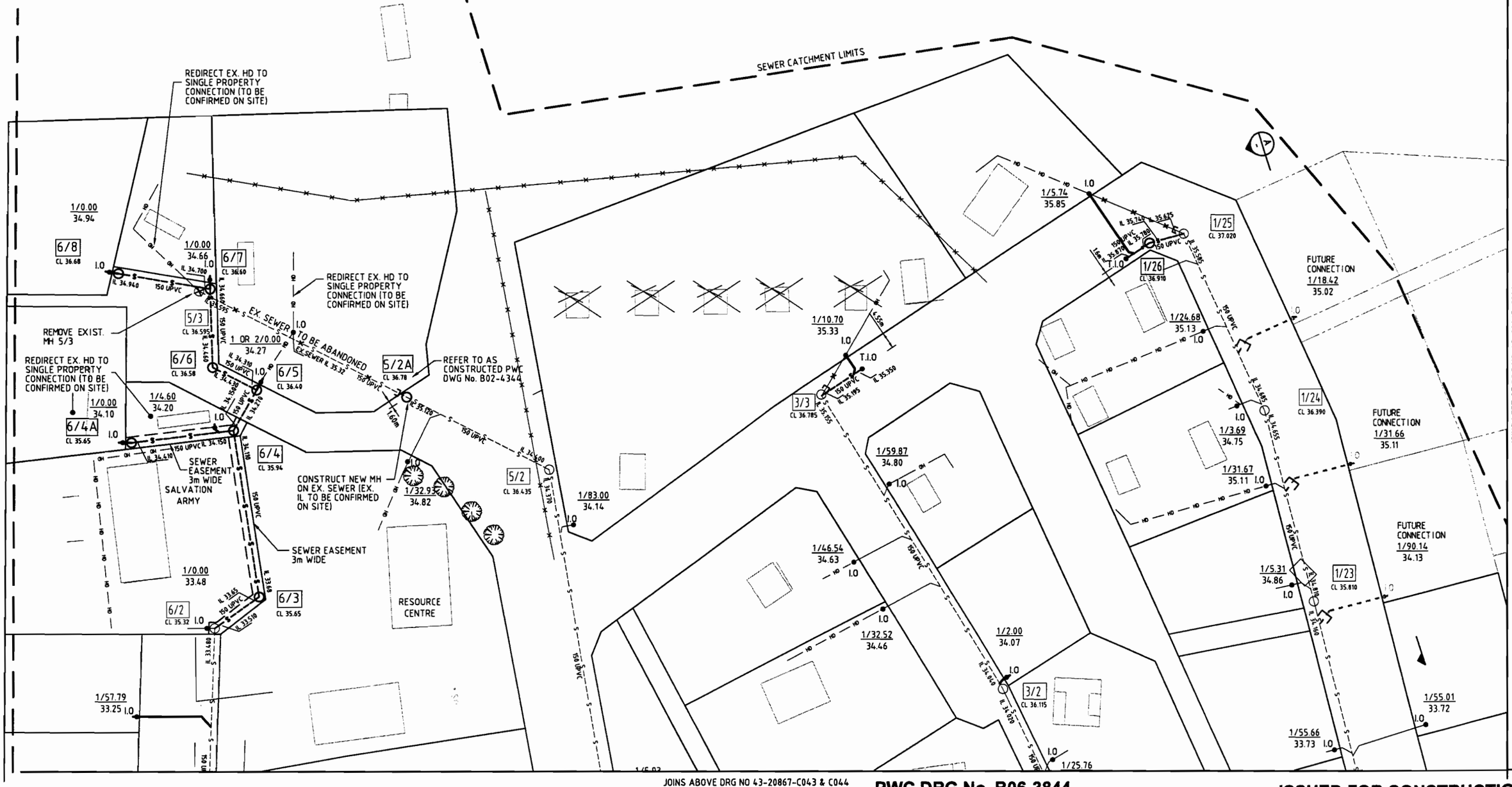
PERMISSION TO USE FOR CONSTRUCTION PURPOSES
SIGNED DATE 24/11/06
ON BEHALF OF LAND DEVELOPMENT FOR INCORPORATION INTO THE PWC NETWORK
THIS PERMISSION TO USE IS GIVEN ON THE BASIS THAT THE DEVELOPER AND/OR CONSULTANT IS NOT ABSOLVED FROM FULL RESPONSIBILITY FOR THE CORRECTNESS AND ACCURACY OF THE DESIGN AND/OR DOCUMENTS SO ASSOCIATED

NOTE

1. FOR LOT BOUNDARY SETOUT COORDINATES FOR MARA, REFER TO DRG. NO. 43-20867-C027

MANHOLE SET OUT COORDINATES

MH No.	EASTING	NORTHING
6/3	639369.822	8224765.372
6/4	639327.332	8224758.828
6/5	639317.018	8224764.651
6/6	639311.290	8224753.502
6/7	639291.313	8224752.849
6/8	639287.374	8224729.498
6/4A	639330.407	8224732.995
5/2A	639318.837	8224802.506



No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date
2	ISSUED FOR CONSTRUCTION		BK		BJ*	20-10-06
1	SEWER LINE 6 EXTENSION FOR PWC APPROVAL, SHEET 5 ADDED		HM	MG*	BJ*	17/10/06
0	ISSUED FOR TENDER		HM		BJ*	26/07/06

0 5 10 15 20 25m
SCALE 1:500 AT ORIGINAL SIZE

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Drawn	Z. VOGT	Designed	M.GLIDDON
Drafting Check	*M.GLIDDON	Design Check	*B. JONES
Approved	*P. TONKIN		
Date	20-10-06		
Scale	AS SHOWN	This Drawing must not be used for Construction unless signed as Approved	

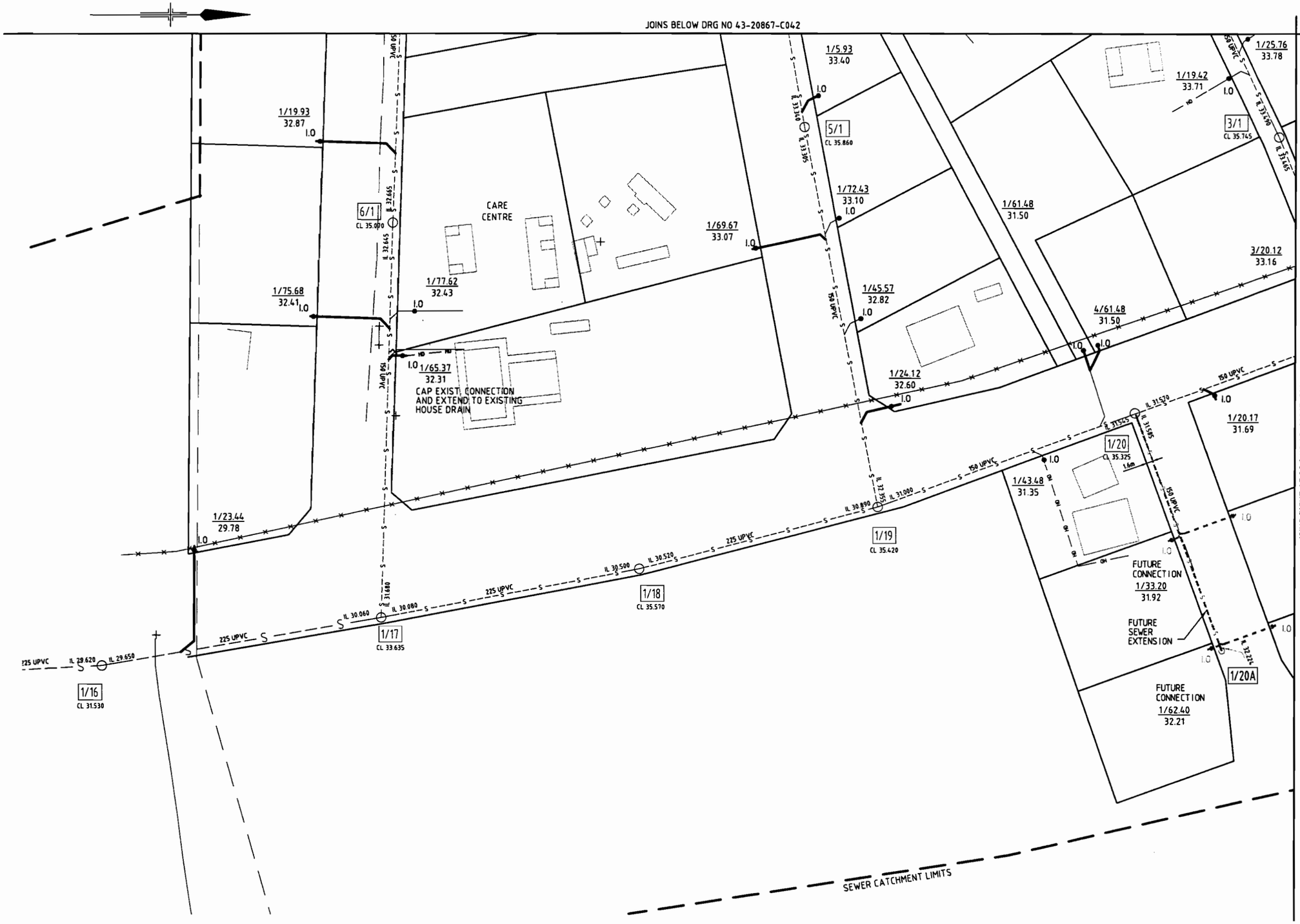
Client: AUSTRALIAN ARMY 19 CHIEF ENGINEER WORKS
Project: BORROLOOLA NAHS -MARA YANYULA & GARAWA 1
Title: SEWER RETICULATION PLAN FOR MARA SHEET 1 OF 5
Original Size: A1
Drawing No: 43-20867-C042
Rev: 2

Plot Date: 24 November 2006 - 9:22 AM Cad File No: G:\43\20867\CADD\Drawings\43-20867-C039_C046.dwg

JOINS BELOW DRG NO 43-20867-C042

JOINS RIGHT OF DRG NO 43-20867-C044

FOR LEGEND REFER TO
DRG. NO. 43-20867-C040



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The locations of underground services are approximate only and their exact position should be proven on site. No guarantee is given that all existing services are shown.

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DATE 24/11/06
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NOTE

1. FOR LOT BOUNDARY SETOUT COORDINATES FOR MARA, REFER TO DRG. NO. 43-20867-C027

PWC DRG No. B06-3845

ISSUED FOR CONSTRUCTION

No	Revision	Drawn	Checked	Approved	Date
3	REISSUED FOR CONSTRUCTION	HM			23/11/06
2	ISSUED FOR CONSTRUCTION	BK		BJ*	20-10-06
1	SHEET 5 ADDED	HM	MG*	BJ*	17/10/06
0	ISSUED FOR TENDER	HM		BJ*	26/07/06

Revision Notes: * indicates signatures on original issue of drawing or last revision of drawing

0 5 10 15 20 25m
SCALE 1:500 AT ORIGINAL SIZE

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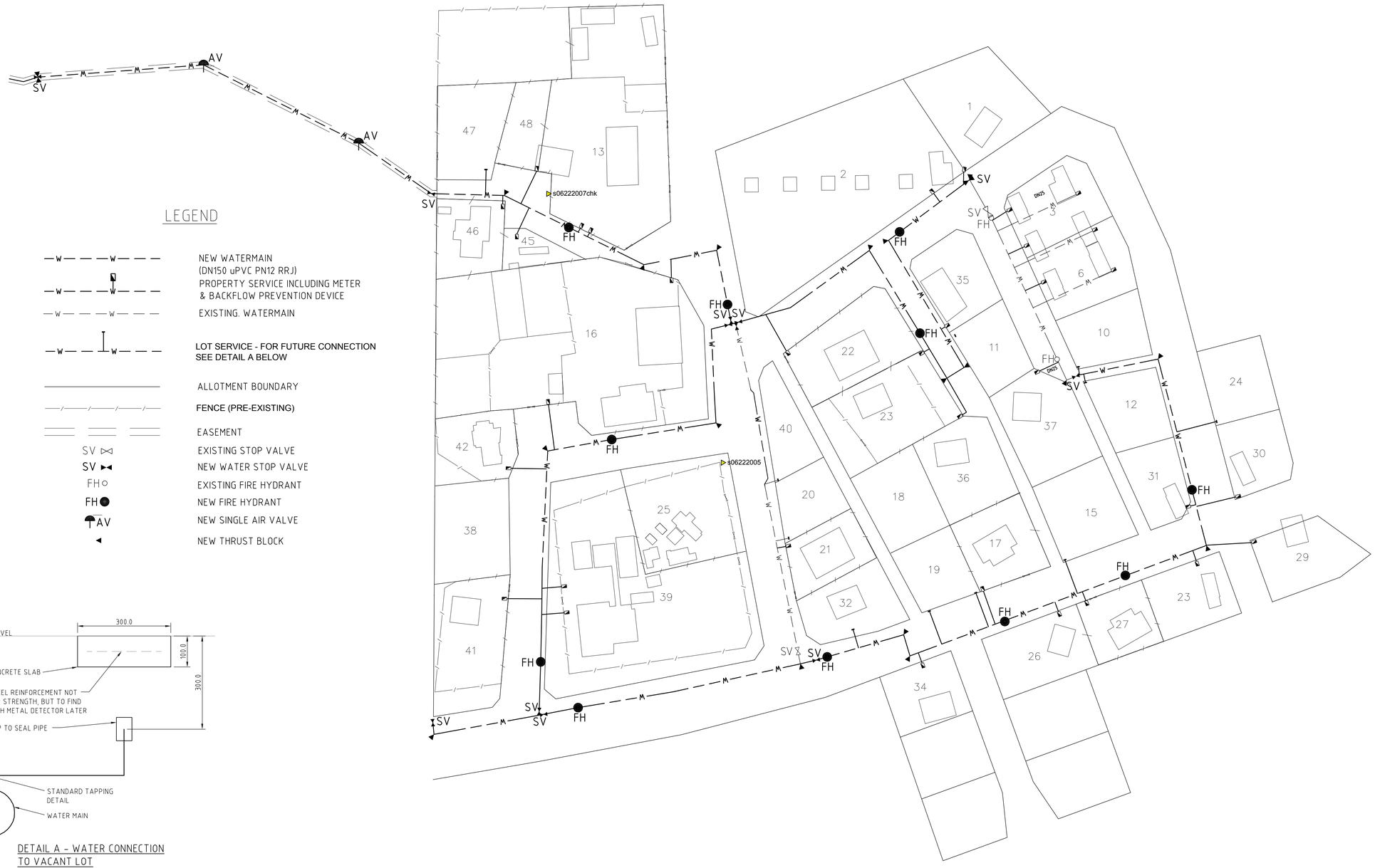
Drawn	Z. VOGT	Designed	M.GLIDDON
Drafting Check	*M.GLIDDON	Design Check	*B.JONES
Approved	*P TONKIN		
Date	20-10-06		
Scale	AS SHOWN	This Drawing must not be used for Construction unless signed as Approved	

Client: AUSTRALIAN ARMY 19 CHIEF ENGINEER WORKS
Project: BORROLOOLA NAHS -MARA YANYULA & GARAWA 1
Title: SEWER RETICULATION PLAN FOR MARA
SHEET 2 OF 5

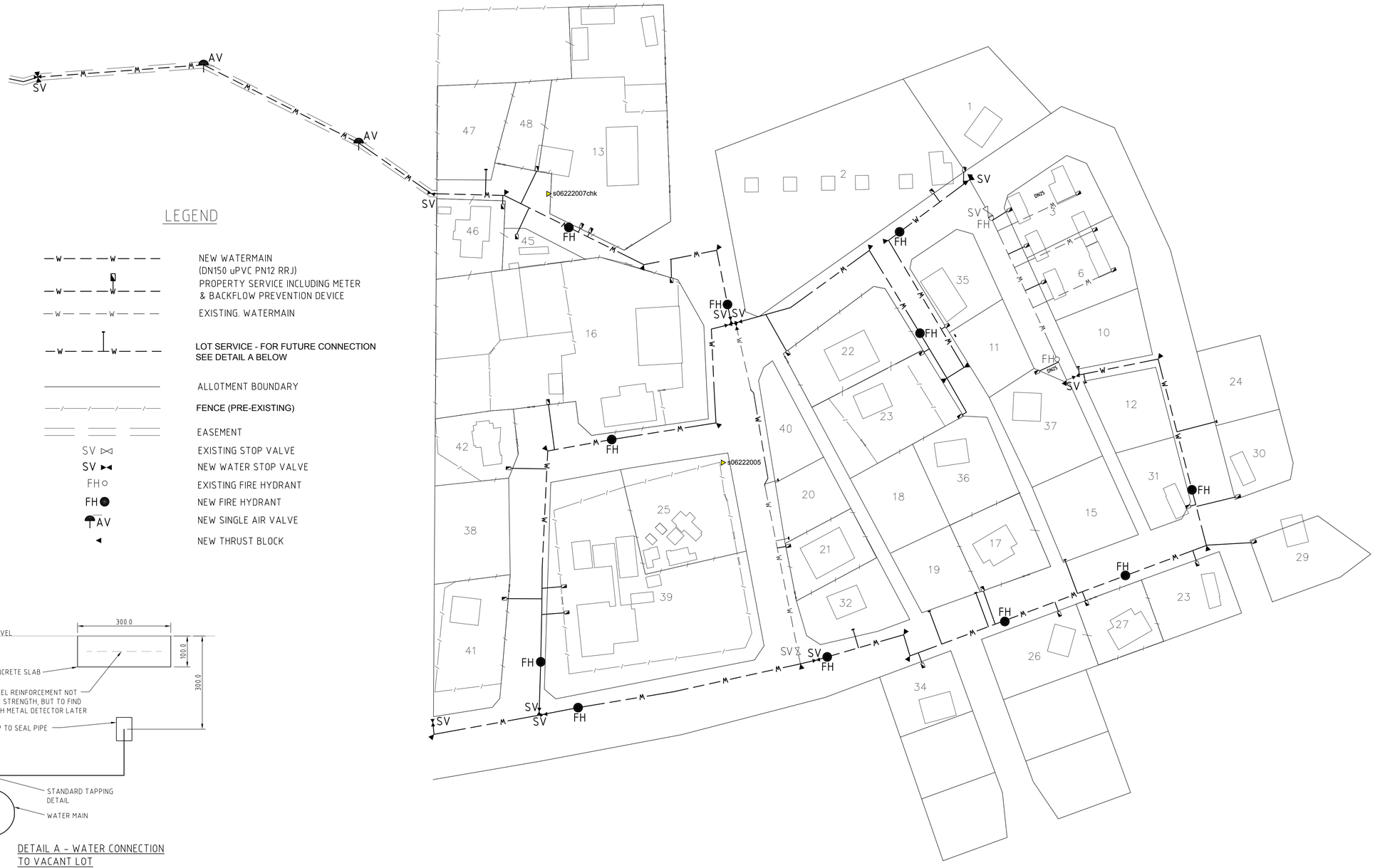
Original Size: A1
Drawing No: 43-20867-C043
Rev: 3

Plot Date: 24 November 2006 - 9:23 AM
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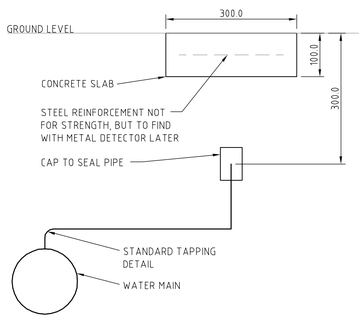

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LEGEND

- NEW WATERMAIN (DN150 uPVC PN12 RRJ)
- PROPERTY SERVICE INCLUDING METER & BACKFLOW PREVENTION DEVICE
- EXISTING. WATERMAIN
- LOT SERVICE - FOR FUTURE CONNECTION SEE DETAIL A BELOW
- ALLOTMENT BOUNDARY
- FENCE (PRE-EXISTING)
- EASEMENT
- SV EXISTING STOP VALVE
- SV NEW WATER STOP VALVE
- FH EXISTING FIRE HYDRANT
- FH NEW FIRE HYDRANT
- AV NEW SINGLE AIR VALVE
- NEW THRUST BLOCK



DETAIL A - WATER CONNECTION TO VACANT LOT

0 50 100 150 200 250mm
SCALE 1:5 AT ORIGINAL SIZE

0 20 40 60 80 100
metres

AS CONSTRUCTED

PWC DWG NO. B06-3834

ALPHA	DESCRIPTION	BY	CHKD	DATE

AMENDMENTS

19 CE WORKS
373a AVOCA STREET RANDWICK NSW 2031
Telephone (02) 93490242 Facsimile (02) 93490243

Designed and drawn by 19 Chief Engineer Works under a quality system certified as complying with ISO / AS 9001 by an accredited body.

SCALE: 1: 1000	DRAWN BY: SPR S.B CRAWFORD
DATE DRAWN: AUG 08	SURVEYOR: AUSURVEY
MANAGER (S):	
PROJECT ENGINEER: CAPT D. WALKER	
SENIOR PROJECT ENGINEER: MAJ J. TATE	
CHIEF ENGINEER: LTCOL D. COYLE	

PROJECT: AACAP 2006 BORROLOOLA, NT

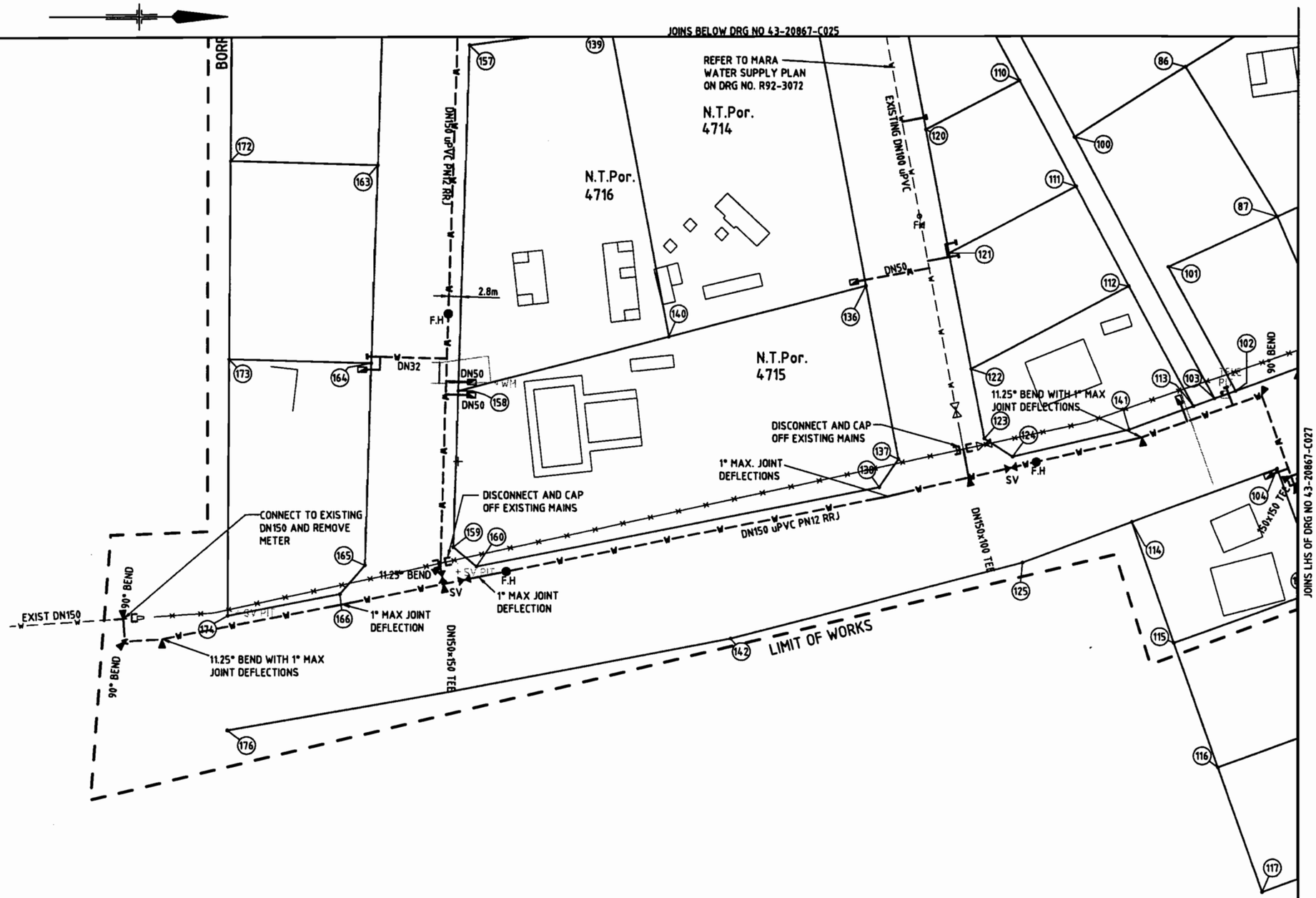
TITLE: MARA COMMUNITY WATER PLAN

SIZE: A1

DRAWING NUMBER: 985-148-X01

DRAWING STATUS: AS CONSTRUCTED

4277



WARNING

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SIGNED MP DATE 11/8/06

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0 5 10 15 20 25m
SCALE 1:500 AT ORIGINAL SIZE

PWC DRG No. B06-3835

NOTE

1. FOR LOT BOUNDARY SETOUT COORDINATES FOR MARA, REFER TO DRG. NO. 43-20867-C027
2. REFER DRG NO. 43-20867-C021 FOR NOTES AND PWC STANDARD DRAWINGS FOR WATER SERVICES.

ISSUED FOR TENDER

No	Revision	Drawn	Checked	Approved	Date
0	ISSUED FOR TENDER	ZV			26/07/06

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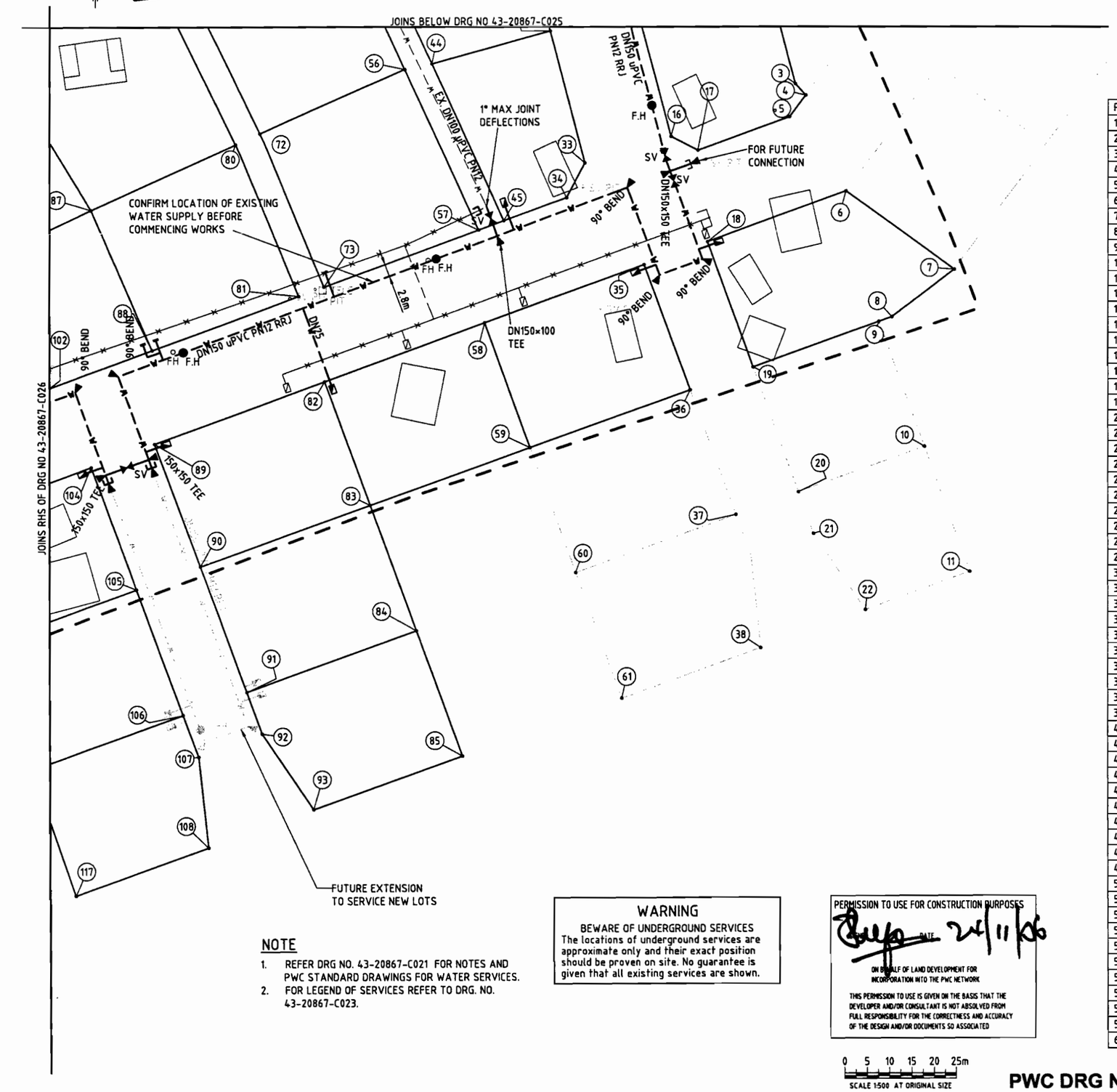
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Drawn Z. VOGT	Designed M.GLIDDON
Drafting Check	Design Check
Approved	
Date	
Scale AS SHOWN	This Drawing must not be used for Construction unless signed as Approved

Client: AUSTRALIAN ARMY 19 CHIEF ENGINEER WORKS
Project: BORROLOOLA NAHS -MARA YANYULA & GARAWA 1
Title: WATER RETICULATION PLAN FOR MARA - SHEET 3 OF 4

Original Size: A1 Drawing No: 43-20867-C026 Rev: 0

Plot Date: 27 July, 2006 - 8:28 AM Cad File No: G:\43\20867\CADD\Drawings\43-20867-C026_C031.dwg



NOTE

1. REFER DRG NO. 43-20867-C021 FOR NOTES AND PWC STANDARD DRAWINGS FOR WATER SERVICES.
2. FOR LEGEND OF SERVICES REFER TO DRG. NO. 43-20867-C023.

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0 5 10 15 20 25m
SCALE 1:500 AT ORIGINAL SIZE

MARA LOT BOUNDARY SETOUT POINTS

PT	EASTING	NORTHING
1	639364.067	8225079.428
2	639397.947	8225088.213
3	639422.635	8225094.610
4	639425.223	8225096.929
5	639430.114	8225093.345
6	639446.832	8225105.890
7	639464.368	8225130.232
8	639475.025	8225116.146
9	639476.082	8225113.243
10	639504.273	8225123.499
11	639532.465	8225133.756
12	639268.734	8225012.603
13	639324.830	8225038.262
14	639371.597	8225050.388
15	639405.477	8225059.173
16	639434.511	8225066.701
17	639437.641	8225072.655
18	639458.145	8225074.794
19	639486.338	8225085.051
20	639514.530	8225095.307
21	639523.927	8225098.726
22	639541.013	8225110.263
23	639259.024	8224988.346
24	639262.292	8224983.476
25	639231.555	8224954.606
26	639281.517	8224990.721
27	639284.328	8224997.743
28	639310.292	8225009.619
29	639331.551	8225019.343
30	639372.901	8225030.065
31	639378.721	8225031.574
32	639410.646	8225039.852
33	639440.412	8225047.570
34	639448.271	8225043.438
35	639463.274	8225060.698
36	639491.466	8225070.955
37	639519.659	8225081.212
38	639549.562	8225086.769
39	639299.683	8224963.653
40	639305.553	8224961.989
41	639328.585	8224972.472
42	639379.557	8224995.673
43	639385.174	8224998.229
44	639418.081	8225013.208
45	639453.418	8225029.292
46	639246.435	8224915.680
47	639288.739	8224944.072
48	639321.213	8224895.685
49	639247.486	8224736.870
50	639292.835	8224726.621
51	639315.423	8224940.201
52	639317.541	8224947.668
53	639347.380	8224961.250
54	639379.230	8224975.750
55	639386.407	8224992.198
56	639419.331	8225007.184
57	639455.475	8225023.636
58	639476.266	8225024.988
59	639504.458	8225035.245
60	639532.651	8225045.501

MARA LOT BOUNDARY SETOUT POINTS

PT	EASTING	NORTHING
61	639560.843	8225055.757
62	639332.110	8224731.384
63	639310.297	8224755.071
64	639322.851	8224779.506
65	639322.489	8224794.173
66	639332.910	8224777.204
67	639332.321	8224801.131
68	639329.268	8224919.571
69	639333.424	8224918.769
70	639362.763	8224936.824
71	639392.565	8224955.166
72	639433.789	8224974.873
73	639468.233	8224989.195
74	639341.990	8224901.260
75	639343.010	8224906.560
76	639371.160	8224923.790
77	639400.710	8224941.890
78	639403.426	8224948.721
79	639401.227	8224952.662
80	639436.257	8224969.434
81	639470.325	8224983.567
82	639489.507	8224989.369
83	639517.451	8224999.536
84	639545.643	8225009.792
85	639573.835	8225020.049
86	639416.780	8224916.770
87	639451.000	8224937.480
88	639482.403	8224951.083
89	639503.541	8224951.618
90	639531.219	8224961.688
91	639559.411	8224971.945
92	639568.809	8224975.364
93	639585.895	8224986.901
94	639279.371	8224829.517
95	NOT	USED
96	639353.277	8224843.432
97	639355.589	8224849.379
98	639372.746	8224859.816
99	639397.484	8224872.950
98	639372.746	8224859.816
99	639397.510	8224872.900
100	639432.840	8224891.660
101	639462.481	8224913.121
102	639490.905	8224928.212
103	639492.663	8224923.484
104	639508.768	8224937.558
105	639536.348	8224947.592
106	639564.540	8224957.849
107	639573.937	8224961.268
108	639594.442	8224963.407
109	639375.761	8224855.756
110	639419.923	8224879.203
111	639444.103	8224892.041
112	639466.873	8224904.130
113	639494.420	8224918.756
114	639520.911	8224904.893
115	639548.421	8224914.406
116	639576.779	8224924.209
117	639605.137	8224934.013

MARA LOT BOUNDARY SETOUT POINTS

PT	EASTING	NORTHING
118	639378.743	8224851.742
119	639384.810	8224849.368
120	639431.133	8224858.089
121	639459.304	8224863.393
122	639485.846	8224868.390
123	639501.835	8224871.400
124	639505.990	8224877.774
125	639530.148	8224880.044
126	NOT	USED
127	NOT	USED
128	639245.102	8224812.488
129	639271.298	8224814.969
130	639305.383	8224807.301
131	639313.166	8224808.100
132	639337.603	8224809.710
133	639359.576	8224824.266
134	639386.557	8224829.346
135	639401.320	8224832.125
136	639466.755	8224844.444
137	639506.523	8224851.932
138	639512.987	8224847.552
139	639407.373	8224786.442
140	639478.333	8224799.873
141	639499.808	8224904.262
142	639547.314	8224813.960
143	639246.977	8224753.000
144	639289.954	8224754.405
145	639292.684	8224701.622
146	639295.684	8224701.603
147	639295.865	8224731.603
148	639314.951	8224731.488
149	639315.017	8224742.375
150	NOT	USED
151	639325.232	8224762.259
152	639328.643	8224760.507
153	639370.464	8224766.989
154	NOT	USED
155	639379.311	8224755.624
156	639396.395	8224755.102
157	639411.588	8224754.637
158	639490.712	8224752.216
159	639526.443	8224751.123
160	639530.881	8224756.352
161	639379.289	8224735.615
162	639404.289	8224734.851
163	639439.039	8224733.788
164	639484.265	8224732.404
165	639530.523	8224730.989
166	639537.056	8224725.420
167	639248.589	8224701.887
168	639285.526	8224728.273
169	639335.684	8224701.362
170	639379.253	8224701.107
171	639404.253	8224700.949
172	639438.028	8224700.746
173	639483.288	8224700.483
174	639541.903	8224700.143
175	NOT	USED
176	639567.968	8224699.992

PWC DRG No. B06-3836

ISSUED FOR CONSTRUCTION

No	Revision (Note: * indicates signatures on original issue of drawing or last revision of drawing)	Drawn	Checked	Approved	Date
2	ISSUED FOR CONSTRUCTION	BK		BJ*	20-10-06
1	COORDINATE SETOUT POINTS REVISED	ZV		BJ*	4/10/06
0	ISSUED FOR TENDER	ZV		BJ*	26/07/06

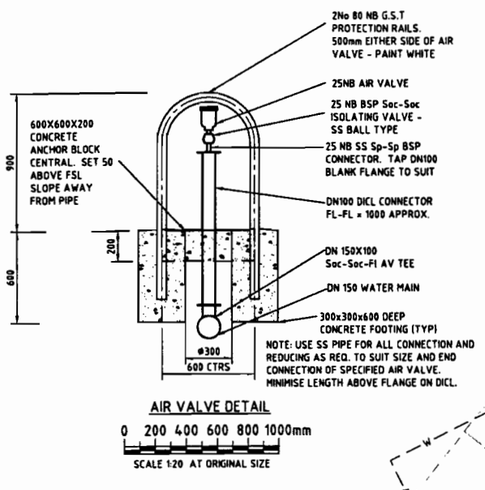
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Approved *P TONKIN
Date 20-10-06
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Client AUSTRALIAN ARMY 19 CHIEF ENGINEER WORKS
Project BORROLOOLA NAHS -MARA YANYULA & GARAWA 1
Title WATER RETICULATION PLAN FOR MARA - SHEET 4 OF 4
Original Size A1 | Drawing No: 43-20867-C027 | Rev: 2

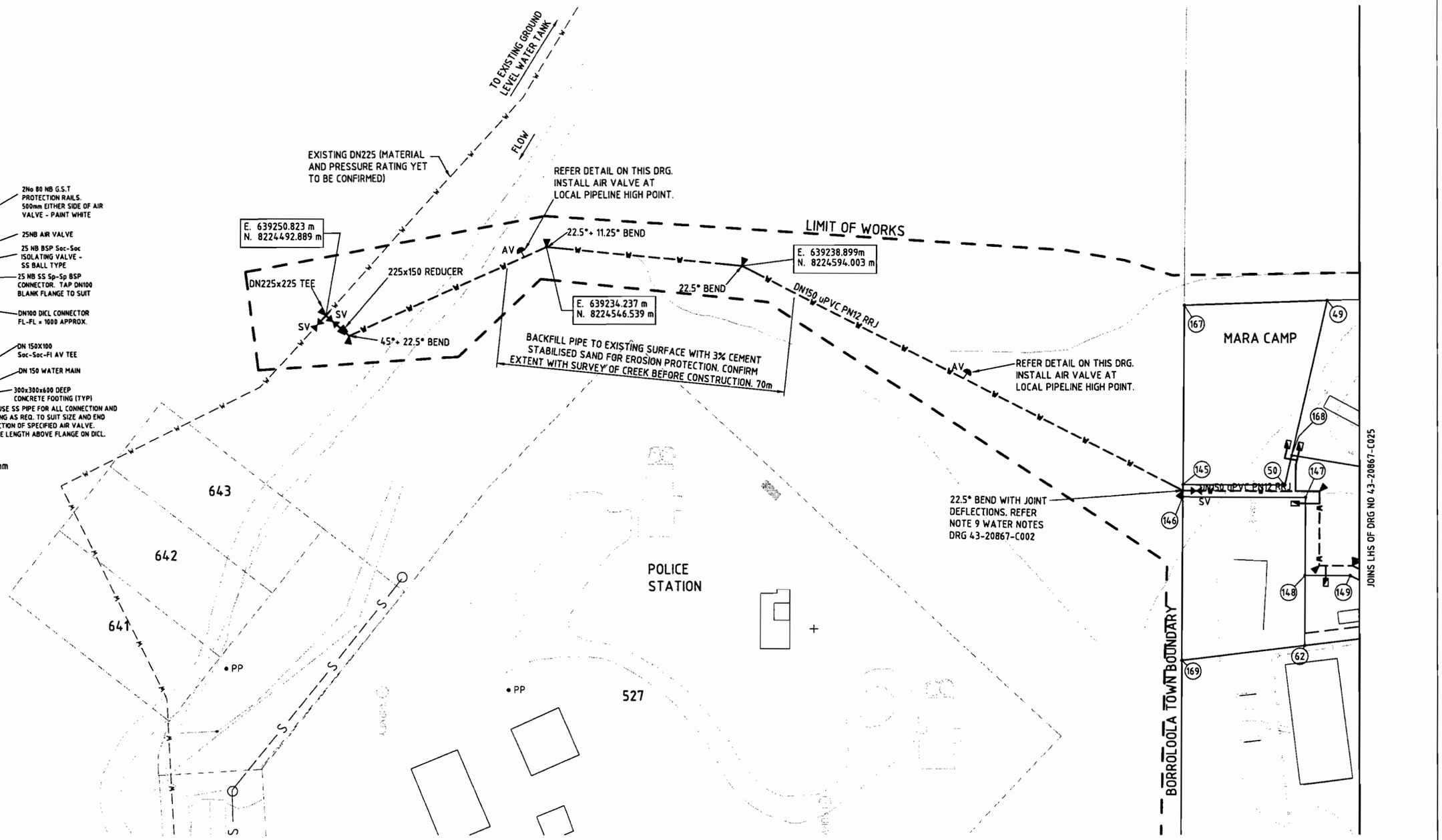
Plot Date: 24 November 2006 - 8:54 AM Cad File No: G:\43\20867\CADD\Drawings\43-20867-C022_C031.dwg



AIR VALVE DETAIL

0 200 400 600 800 1000mm

SCALE 1:20 AT ORIGINAL SIZE



WARNING

BEWARE OF UNDERGROUND SERVICES
The locations of underground services are approximate only and their exact position should be proven on site. No guarantee is given that all existing services are shown.

PERMISSION TO USE FOR CONSTRUCTION PURPOSES
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ON BEHALF OF LAND DEVELOPMENT FOR INCORPORATION INTO THE PWC NETWORK
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0 5 10 15 20 25m

SCALE 1:500 AT ORIGINAL SIZE

NOTE

1. FOR LOT BOUNDARY SETOUT COORDINATES FOR MARA, REFER TO DRG. NO. 43-20867-C027
2. FOR LEGEND REFER DRG NO. 43-20867-C023
3. MARKERS (CONCRETE DIAMONDS AND POSTS) INSTALLED AS PER PWC STD DRG W1-2-03H FOR WATER MAIN OUTSIDE MARA BOUNDARY

PWC DRG No. B06-3837

ISSUED FOR CONSTRUCTION

No	Revision		Drawn	Checked	Approved	Date
2	ISSUED FOR CONSTRUCTION	BK		BJ*	20-10-06
1	REALIGNMENT FOR LOT BOUNDARIES	ZV		BJ*	18.10.06
0	ISSUED FOR TENDER	ZV			26/07/06

Note: * indicates signatures on original issue of drawing or last revision of drawing

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Drafting Check	*M.GLIDDON	Design Check	*B. JONES
Approved	*P. TONKIN		
Date	20-10-06		
Scale	AS SHOWN	This Drawing must not be used for Construction unless signed as Approved	

Client	AUSTRALIAN ARMY 19 CHIEF ENGINEER WORKS
Project	BORROLOOLA NAHS -MARA YANYULA & GARAWA 1
Title	WATER RETICULATION PLAN FOR MARA - SHEET 1 OF 4
Original Size	A1
Drawing No:	43-20867-C036
Rev:	2

Plot Date: 24 November 2006 - 8:55 AM Cad File No: G:\43\20867\CADD\Drawings\43-20867-C036.dwg

Transformer data

Group	Com Id	Location	Community Name	Dwellings No. (Funded Dwellings)	Dwellings No. (Bennett Design)	New Houses ** (Future Demand)	Primary Volatge Level (KV)	PWC Substation ID	PWC Test Number	Transformer size (KVA)	KVA Total dwellings @ 4.5KVA	KVA Total dwellings @ 7KVA	Comments
1	290	Darwin	Bagot	55	55		11	1924	1735	300	247.5	385	
	344	Darwin	Knuckey Lagoons	18	19	2	11	1771	2163	100	85.5	133	
	347	Darwin	Kulaluk	19	19		11	1092	10607	50	85.5	133	
	403	Darwin	Palmerston Town Camp	20	16		22	10196	10245	100	90	140	Two transformers for this Town Camp. Transformers are not in boundary of Town Camp [The nearest transformers data to Town Camp are highlighted in yellow].
							22	265	11645	25			
	412	Darwin	Railway Dam (One Mile Dam)	5	6	2	11	1041	4378	200	27	42	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	427	Adelaide River	Amangal	9	9		22	216	12187	100	40.5	63	Two transformers for this Town Camp.
							22	184	5646	63			
	687	Jabiru	Manabadurma	10	12		11	5050	11107	200	54	84	
	825	Darwin	Minmarama Park	24	24		11	2147	11372	100	108	168	
2	606	Katherine	Warlpiri Transient Camp	9	9		22	6416	4886	100	40.5	63	Two transformers for this Town Camp.
							22	6074	4695	25			
	621	Katherine	Miali Brumby (Kalano)	47	31		22	6133	12247	315	211.5	329	
	640	Pine Creek	Pine Creek Compound	4	4		22	6666	3147	25	18	28	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	971	Mataranka	Mulggan	12	9	4	22	6819	5296	16	54	84	
							22	6818	5297	16			
							22	6384	11028	25			
3	215	Tennant Creek	Blueberry Hill (Munji-Marla)	2	2		22	7079	1868	200	9	14	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	223	Tennant Creek	Dump Camp (Marla-Marla)	7	7		22	7181	11088	200	31.5	49	
	224	Elliott	Elliott South Camp	12	12		11	7504	4718	200	54	84	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	225	Elliott	Elliott North Camp	36	25		11	7505	4715	100	162	252	
	238	Tennant Creek	Kargaru (East Side Camp)	12	12	1	22	7572		200	54	84	
	246	Tennant Creek	Ngalpa Ngalpa	18	21		22	7179		200	94.5	147	Two transformers for this Town Camp.
							22	7033	10904	315			
	271	Tennant Creek	Village Camp	12	12	1	22	7183	11107	200	54	84	
	681	Tennant Creek	Tingkarli	12	12		22	7180		200	54	84	
	684	Tennant Creek	Wuppa	15	15	1	22	7141	11092	100	67.5	105	Two transformers for this Town Camp.
							22	7182	11095	200			
4	3	Alice Springs	Akngwertnarre (Morris Soak)	11	15		11	8596	11336	300	67.5	105	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	16	Alice Springs	Anthelk Ewlpaye (Charles Creek)	17	10		11	8569		315	76.5	119	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	17	Alice Springs	Anthepe	15	15		22	8598	5874	200	67.5	105	Data extracted from PWC asset information. There was not access to this Town Camp due to ceremony on inspection day.
							22	8597	11244	315			
	19	Alice Springs	Aper Alwerrknge (Palmers)	7	6		11	8405	2939	200	31.5	49	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	35	Alice Springs	Ewyenper Atwatye (Hidden Valley)	47	47		11	8622	11202	100	211.5	329	
							11	8623	11203	100			
							22	8625	11205	63			
							11	8626	11204	100			
	47	Alice Springs	Ilparpa	13	13		22	8611	11702	200	58.5	91	
	48	Alice Springs	Ilperle Tyathe (Walpiri)	10	9		11	8001	11209	315	45	70	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	50	Alice Springs	Ilyperenye (Old Timers)	10	10		22	8145	3323	100	45	70	
	64	Alice Springs	Bassos	2	2		11	8002	10946	50	9	14	
	69	Alice Springs	Karnte	19	19		22	8282	2345	100	85.5	133	
	87	Alice Springs	Yarrenty Altere (Larapinta Valley)	34	34		11	8617	11334	100	153	238	
							11	8618	11200	63			
							11	8619	11335	100			
							11	8620	11201	100			
	90	Alice Springs	Inarlenge (Little Sisters)	16	22		22	8137	2925	100	99	154	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	108	Alice Springs	Mpwetyerre (Abbotts)	6	6		11	8093	11703	315	27	42	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	113	Alice Springs	Mount Nancy (Nyewente)	11	12		11	8405	2939	200	54	84	
	129	Alice Springs	Nyewente (Trucking Yards)	26	26		11	8629	11312	300	117	182	
	675	Alice Springs	Hoppys	15	19						85.5	133	There is not any Transformer in boundary of Town Camp. Also it's not shown in PWC asset information.
	676	Alice Springs	Ilpiye Ilpiye (Golders Camp)	15	14		11	8314	369	50	67.5	105	
	1029	Alice Springs	Kunoth	4	4		11	8569		315	18	28	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
5	222	Borroloola	Mara	28	29	2	11	6187	12610	100	130.5	203	Two transformers for this Town Camp.
							11	6545	10203				
	229	Borroloola	Garawa 1	16	14		11	6546	10166	100	72	112	Two transformers for this Town Camp.
							11	6332	4890	100			
	278	Borroloola	Yanyula	29	29		11	6162	10496	200	130.5	203	Data extracted from PWC asset information. It's outside of Twon Camp, shown only Transformer to this Town Camp.
							11		10167				This transformer is not shown in PWC asset information. It's installed in Boat Ramp Road near to Town Camp and connected to Electrical reticulation of Town Camp.
	992	Borroloola	Garawa 2	11	11		11	6189	2669	25	49.5	77	

** For New house's demand calculation see section 13.4 "Future Demand".

Garawa 1

Garawa 1

1 Design

The infrastructure reviews have been undertaken against current relevant standards for typical sub-divisions. The following standards have been used in undertaking the reviews.

Sewerage and water supply

- Water Services Association of Australia – Sewerage Code – WSA 02 Part 1: Planning and Design
- Power and Water Corporation supplement to WSA 02
- Water Services Association of Australia – Sewerage Pumping Station Code – WSA 04 -2005 Part 1: Planning and Design
- Power and Water Corporation supplement to WSA 04
- Water Services Association of Australia – Water Supply Code – WSA 03 2002 Part 1: Planning and Design
- Power and Water Corporation supplement to WSA 03
- Power and Water Corporation Indigenous Community Engineering Guidelines (2008)
- Department of Housing and Community Development Indigenous Community Engineering Guidelines (ICEG 2014, updated September 2016)
- Power and Water Corporation Essential Services Infrastructure Assessment and Upgrade Guidelines (for Town Camps in Urban Communities, 2009)
- Power and Water Corporation Standard Drawings
- Australian Standards

Electrical services

Electrical infrastructure has been assessed against AS/NZS3000 Wiring Rules and against PWC Service, Installation and Metering Rules and Urban Residential Development (URD) Design Standards where possible.

With one exception, town camps are each a single lot and compliance with AS/NZS3000 is sufficient to address potential safety concerns.

As such application of PWC URD Design Standards will mainly apply to the incoming supply and bulk or initial multi-metering panels if provided.

URD Design Standards for internal reticulation and street lighting appear to have been applied in many cases for convenience rather than compliance.

For the purposes of this report, the demand per dwelling allowances of URD Design Standards have been used to estimate incoming supply and overall distribution capacity requirements.

The following standards apply:

- Australian Standards
- Power Networks Design and Construction Guidelines, Power and Water Corporation
  - NP001.1_Design and Construction of Network Assets – General Requirements
  - NP001.3_General Specification for Overhead Electrical Reticulation
  - NP001.6_General Specification for URD Subdivisions
  - NP003_Installation Rules_V3
  - NP007_Service Rules
  - NP027_Capture of Newly Installed Street Lighting Information
  - NP041_Guidelines for Electrical Design Consultants

Further referral to the guidelines in this report will be designated by the guidelines number, NP001.1.

Communications

- National Broadband Network Website viewed 21 January 2017 (http://www.nbnco.com.au/) – NBN rollout maps

General

It should be noted that if the town camps are proposed to be subdivided and services assets gifted to Power and Water Corporation (PWC) for operation and maintenance, all of these services will need to fully meet PWC standards. With the exception of a few town camps that have recently been upgraded, this will require the full replacement and/or realignment of most services.

2 Condition assessment

2.1 Rating assessment matrix

A condition rating matrix was developed and used to assess all municipal infrastructure. The same rating was used for all services to maintain consistency in assessments. Table 1 Below shows the condition rating and operability.

Table 1 Condition rating

Condition rating		Operability
1	Very Poor	Not operational
2	Poor	Not fully operational or requires immediate maintenance to keep operational
3	Good	Fully operational, may require routine maintenance
4	Very Good	Fully operational, may require maintenance in the next six months
5	Excellent	New, fully operational

2.2 Civil assessment limitations

The civil infrastructure condition investigations were subject to a number of limitations. These include:

- Only accessible services have been investigated. This includes inspecting the top of sewer manholes, side entry pits, etc., however, does not include opening pits to inspect infrastructure below ground.
- No physical testing of the sewer, water or stormwater network was undertaken.
- No survey or service locating was undertaken.

As there was no survey, potholing or CCTV undertaken on the underground infrastructure there is insufficient information to make determinations on the asset condition. The condition assessments discussed in this report are only for the accessible services and do not necessarily represent the condition of the underground infrastructure. For the majority of the town camps, other than a few that have recently been upgraded it was found that the underground services are generally undersized and it is likely, due to their age, that the these services are in poor condition. Either factor would trigger the need for a complete replacement to meet current relevant standards.

2.3 Electrical assessment limitations

The electrical infrastructure condition investigations were subject to a number of limitations. These include:

- Inspections were carried out without the assistance of an electrical tradesman.
- Only accessible services were investigated. Assessments were of a visual nature and no pit covers were removed.
- Overhead equipment was assessed from ground level.
- Switchboards were not opened and no assessment of the internal connections or bus ratings was made.
- Electrical infrastructure was assessed down to the meter for multi-meter panels and down to the termination, overhead pole or distribution pillar, of the supply cable to a meter located at a dwelling.

3 Current infrastructure issues

Power and Water Corporation (PWC) have advised of the following concerns and issues in regard to the sewerage, water and electrical infrastructure at all town camps.

3.1 Ownership and maintenance

PWC stated there has always been confusion regarding the ownership and responsibilities of the internal sewer, water and electrical infrastructure. PWC have advised that they have no legal tenure on the majority of assets in any town camps and that the owner is essentially that of the land owner or leaseholder. This is further discussed for each type of infrastructure for each town camp.

The ownership and who is responsible for the maintenance of the sewage pump stations and street lighting is a major concern. In most town camps it was found that PWC have been maintaining the assets on an in-kind basis, although there are no maintenance or access agreements in place and the infrastructure is generally not compliant to PWC standards.

3.2 Access to infrastructure

PWC advised that due to the uncertainty surrounding ownership and responsibility of the sewerage, water and electrical infrastructure, each town camp is seen as a single lot with multiple houses on it. There are no formal road reserves or easements where the municipal infrastructure should be located. PWC therefore have no legal right to enter the town camps to work on the infrastructure, nor can PWC stop others from working on the infrastructure. There is a risk that the maintenance undertaken by others may be to a lower standard than PWC.

It should be noted that there are currently no legal services easements within the town camps, except for a few cases where a town service passes through the town camp. Therefore it is recommended that easements are created over any infrastructure owned by PWC and any future assets to be gifted to PWC, to allow the service providers access to the infrastructure.

3.3 Existing infrastructure

PWC have stated that although the existing sewerage and water infrastructure appears to comply with relevant standards in some locations, the capacity cannot be assumed to meet PWC requirements due to the potential for underground substandard condition and/or grading of pipework. It is likely that these assets will need to be fully replaced to PWC standards to ensure sufficient capacity.

The planning process currently allows construction within the town camps on Commonwealth land without requiring service authority (PWC) approvals. This means that there has been no opportunity for PWC to recover contributions towards required upgrades to headworks servicing the developments and these upgrades have been paid for by PWC in the past. This inconsistency needs to be addressed for future developments within the town camps to ensure PWC are able to continue to provide adequate services.

3.4 Safety concerns

PWC have expressed concerns with safety of PWC staff and contractors working within the camps. PWC have employed procedures such as multiple people / vehicles to attend the site, with police or housing safety officers as required. This generally leads to a delayed response time and increased cost to respond to and remediate emergency situations.

PWC have also raised the concern that if others work on water infrastructure within the town camps and do not apply the correct sanitation procedures they not only risk contaminating the entire water supply network within the town camp, at some town camps with direct connections to the town supply, they risk contaminating the entire town's water supply.

4 Available information

As the site investigations were limited to accessible / visible services, information on below ground services (such as electrical cables, sewer pipes, water supply pipes, etc.) were determined from available information. This information included:

- Serviced Land Availability Program (SLAP) maps,
- Department of Family & Community Services - Connecting Neighbours Program – Essential Services Scoping Study Report Volume 1 April 2005,
- Connecting Neighbours Project – Infrastructure Assessment and Recommendation Report - Arup Pty Ltd, April 2005,
- Connecting Neighbours Program – Borroloola – Design Report and Option Summary, Volume 3, Arup Pty Ltd, April 2005,
- Drawings supplied by NT Department of Infrastructure - Technical Records,
- Drawings supplied by Power and Water Corporation,
- Bennett Design inspection reports and population data.

Aurecon undertook a site investigation of the Garawa 1 on 14 December 2016 to inspect roads, stormwater drainage, electrical services, sewerage and water supply, and community structures. The following sections detail the outcomes of this investigation and the assessments of the infrastructure.

The civil and electrical inspection reports can be found in the Appendicies.

5 Sewerage

5.1 Ownership and boundaries

The sewer infrastructure within Garawa 1 community is owned by Garawa No 1 Camp Aboriginal Corporation, but is the responsibility of Mabunji Aboriginal Resource Indigenous Corporation to maintain.

In the past, PWC have undertaken basic maintenance of the wastewater infrastructure in response to requests from the community, in the absence of support from others. PWC have advised they do not own any of the infrastructure in Garawa 1, including the sewage pump station.

PWC advised that the on lot sewage pump station and reticulation has yet to be completed to PWC standards and has not been handed over. The sewer rising main was upgraded through the Connecting Neighbours Program but has not been handed over. PWC advised that the rising main is likely to require upgrading if additional loads are expected for Garawa 1.

5.1.1 Connection methods and billing

The current payment arrangement for sewerage usage is not known as PWC have advised they are currently not involved as a service provider for Garawa 1.

It is not known what contribution the residents make towards the any sewerage bills.

5.2 Existing infrastructure condition assessment

The sewer infrastructure inspection was limited to inspecting the condition of manhole covers, as all other sewerage infrastructure is below ground. A total of four manholes and one pump station were inspected, with condition ratings as follows:

Table 2 Sewer condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Manhole			4			4
Pump station			1			1



Figure 1 Sewage pump station, condition: *good*

The manholes were all in good condition, although one was located within a property boundary.

5.3 Current performance and risks

5.3.1 Current sewer network performance

The current capacity of the sewer network was calculated based on the following design assumptions:

- The adopted minimum grade for the pipework is 1.0%, as advised by Power and Water Corporation.
- The Equivalent Population (EP) has been calculated assuming one household equates to 9 EP, based on discussions with Power and Water Corporation.
- The capacity has been assessed by calculating the current flow rate, and the maximum flow rate when the sewer pipe flows full. The result is then a percentage of how much of the pipe is currently being used.
- Manning's roughness coefficient of the pipework is 0.012, as recommended by PWC for PVC pipes.
- Where the sewer pipe grade, size or material is not known, it is assumed to be non-compliant to PWC standards.
- As Garawa 1 disposes to a pump station, the capacity of the pump station has also been assessed.

The current number of houses in Garawa 1 is 18, this multiplied by 9 EP per house gives a total current EP of 162. Tender drawings from 2006, refer Appendicies, were available however PWC advised that the pipework was not upgraded. A pipe size of 100 mm was therefore assumed which is non-compliant with PWC standards.

The capacity of the existing sewer was then calculated. The percentage shows how much of the pipe capacity is currently being used.

Table 3 Existing sewer capacity

Catchment	Current total EP	Diameter of connection (mm)	Adopted PWC minimum slope (%)	Q_{full} (L/s)	Current Q (L/s)	Current capacity (%)
Catchment 1	162	100	1.0	5.60	1.95	35%

Error! Reference source not found. above shows that the capacity of the existing sewer network is adequate for the current peak population. It is recommended that the network is upgraded to a DN150 PVC to be in accordance with PWC standards.

5.3.2 Current sewage pump station performance

The capacity of the pump station was checked against the following criteria, based on PWC guidelines:

- Less than 12 pump starts per hour (for pumps less than 15kW),
- Minimum velocity 0.9 m/s,
- Maximum velocity 2.5 m/s,
- Overflow storage equal to three hours of peak dry weather flow.

Using the current EP of 162, it was found that the minimum velocity for self-cleansing is not achieved in the rising main. The minimum velocity is 0.7 m/s, when it should be 0.9 m/s. It is recommended that the pump type is upgraded to increase the velocity in the rising main. Available drawings did not show any emergency overflow storage. The pump station should have overflow storage equal to three hours of peak dry weather flow.

5.4 Future demands

As no new developments are currently planned for Garawa 1, there are no additional upgrades required to cater for future demand.

5.5 Recommended works

The following works are recommended for Garawa 1 pump station:

- Upgrade pumps (two) to increase velocity in rising main
- Construct emergency overflow storage
- Install new DN150 PVC reticulation main, including housing connections, manholes, and connection to existing sewage pump station.

6 Water supply

6.1 Ownership and boundaries

The engineering drawings for Garawa 1 show the water main network has a DN150 PVC looped main with a single supply point coming from the elevated storage tank located north of the community (refer Appendicies). Currently, bore water is pumped to the elevated storage tank and a ground level tank, which supplies Garawa 1 and Garawa 2.

The water supply assets within Garawa 1 are believed to be owned by Garawa No. 1 Camp Aboriginal Corporation, but are the responsibility of Mabunji Aboriginal Resource Indigenous Corporation to maintain. The ownership of the bore water supply arrangement (bores, pipes and tanks) is unclear. PWC have stated they do not own the assets.

6.1.1 Connection methods and bills

The current payment arrangement for water usage is not known as PWC have advised they are currently not involved as a service provider for Garawa 1.

A total of 16 residential lot water meters were assessed during the inspection. Bennett Design reported 18 dwellings in the community, Therefore, two additional water meters are required to cover the properties without an existing water meter. Note, some water meters may have been present however, not visible due to overgrown flora or restricted property access. Consequently, water meters may not have been discovered during the inspection.

6.2 Existing infrastructure assessment

The site investigation for the water infrastructure included assessing the condition of any air valves, fire hydrants, tanks, taps, and water meters. The assessment was limited to services that could be accessed above ground; no below ground services were inspected.

The condition of each asset is as follows:

Table 4 Water supply condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Air valves		1				1
Fire hydrants			5	2		7
Scour valve			1			1
Water meter (residential lots)		15	1			16



Figure 2 Air valve, condition: *poor*



Figure 3 Scour valve, condition: *good* (buried in sand)



Figure 4 Fire hydrant, condition: *good*



Figure 5 Residential lot water meter, condition: *poor*

6.3 Current demands

The following statement has been provided by PWC regarding Garawa 1 and Garawa 2 water supply. Note, this statement has been provided in an undated word document and is unclear if it was made before or after water infrastructure upgrades believed to be conducted in 2008.

"*PWC has concerns about the infrastructure's ability to continue to meet demand, and to provide an acceptable level of service for the community at Garawa. Currently Garawa town camps 1 and 2 are supplied by a single, low yielding bore on a separate system from the Borroloola town water supply. The water supply infrastructure is in very poor condition, and faces a range of challenges including highly corrosive source water which impacts on water delivery, storage and treatment infrastructure. This also makes the provision of a safe drinking water supply a high risk.*"

The current demand of the community was calculated based on the following design assumptions:

- The nominal peak day flow is 1100 L/capita/day, based on PWC's supplement to WSA 03 2002. This value is for the northern region of NT. It was assumed that the nominal peak day flow of 1100 L/capita/day also applies to water usage within the community, although it is possible that this value could be higher in real life due to a lack of controls to reduce water usage.
- The Equivalent Population (EP) has been calculated assuming one household equates to 9 EP, based on discussions with Power and Water Corporation.
- The peak hour factors are listed in PWC's Supplement to WSA 03-2002, and they depend on the population range of the community. The peak hour factor of 3.0 has been adopted, for populations less than 500.

Table 5 shows the calculated demand.

Table 5 Current water demand

Total dwellings	EP	Demand (l/s)	Peak hour demand (l/s)
18	162	2.06	6.19

More information is required to determine if the existing network has sufficient capacity to meet peak hour demands. It is expected that the network itself has sufficient capacity, however there are concerns about the supply to the network from the storage tanks.

The assessment of water supply for firefighting has been based on the size of the water mains and the condition of the accessible fire hydrants. Additional hydrants have been recommended where it appears the existing number of hydrants are insufficient. In the case of Garawa1 no additional fire hydrants are expected to be necessary. However, the limited supply into the water reticulation system is deemed a problem for firefighting.

The existing network is not compliant with PWC standards as there is a section of DN100 PVC which is undersized by PWC standards, as well as a dead end in the network. The non-compliant items are not expected to have a significant impact on the capacity of the network.

6.4 Future demands

As no new developments are currently planned for Garawa 1, there are no additional upgrades required to cater for future demand.

6.5 Recommended works

The infrastructure that was assessed as very poor or poor is recommended to be upgraded to prevent failure in the future. The following maintenance works are recommended;

- Restore handles to 15 residential lot meters
- Replace rusted air valve
- Clear buried scour valve
- Clear sand and other debris from two fire hydrants
- Repaint three fire hydrants

It is proposed that the existing water supply to Garawa 1 and Garawa 2 is abandoned and a new water main is constructed, connecting the two communities to the Borroloola network. It is intended that the water main follows the road and crosses the river at the existing bridge. The required length to service both communities is expected to be approximately 7 km. For cost estimates, the length of the pipeline has been split over the two communities. It is also proposed that the water usage is measured for each of the communities using bulk water meters, rather than at individual lot meters, however individual lot water meters should be located on the connection to each dwelling. The cost estimated for the upgrades at Garawa 1 include;

- Install new water main servicing Garawa 1 and Garawa 2 approximately 3500 m (half the total length allocated to Garawa 1 for cost estimates)
- Install up to two new additional residential lot water meters
- Install new bulk water meter

7 Roadworks

7.1 Ownership and boundaries

It is the current understanding that the roads and road furniture within Garawa 1 are owned by Garawa No. 1 Camp Aboriginal Corporation, but are the responsibility of Mabunji Aboriginal Resource Indigenous Corporation to maintain.

7.2 Existing infrastructure condition assessment

The road network within Garawa 1 community consists of a mix of sealed road and unsealed roads, all of which are in poor condition. There was no road furniture, such as signs, footpaths or carparks at Garawa 1. As there are no kerbs along the road, the driveways have no layover kerbs and are informal.



Figure 6 Garawa 1 community road network

Table 6 below details the condition of the roads within Garawa 1 community for specific segments. Figure 6 Garawa 1 community road network shows a map of the community's road network with the condition ratings, road name, and chainage direction.

Table 6 Road network condition assessment

Road name	Chainage start (km)	Chainage end (km)	Condition	Road name
Water tank access	0.0	0.1	2	-unsealed road -deformation (3)
Garawa One Access	0.0	*end*	2	-two floodways in poor condition, potholes (2) -80% of road has edge breaks (2)
Garawa One (229_1)	0.0	*end*	2	-unsealed road -corrugations, potholes -deformation (2) -drainage issues (2)



Figure 7 Water tank access road, condition: *poor*



Figure 8 Garawa One access road, condition: *poor*



Figure 9 Garawa One road, condition: *poor*

7.3 Current performance and risks

The road network is sufficient for the current number of houses. It was noted during the site inspections that a number of unsealed 'short-cuts' had been created and were regularly used. It is not recommended that these paths are formalised.

It is recommended that the Garawa One unsealed road is sealed, with culverts installed to remove drainage issues.

It is also recommended that a road safety audit is undertaken to determine where signage, line marking, etc. are required.

7.4 Future demands

As no new developments are currently planned for the community, there are no additional upgrades required to cater for future demand.

7.5 Recommended works

The infrastructure that was assessed as very poor or poor is recommended to be upgraded to prevent failure in the future. The following works are recommended to upgrade the current infrastructure;

- Seal road that is currently unsealed, including installing culverts to remove drainage issue – approximately 350 m
- Repair edge breaks – approximately 1000 m
- Repair two floodways, or install culverts – this should be further investigated.

In order to allow for a longer term sustainable road network a significant upgrade would be required. It is recommended that a long term design which incorporates a full two lane road network, with all appropriate road furniture, line-marking, kerbs and gutters is constructed. A cost estimate to reinstate the base and subbase material, reseal with a two coat spray seal surface, construct subsoil drainage, line marking and signage has been included. Note that these works will need to be fully designed, the cost estimate is for budgetary purposes only and only indicates the construction phase. A footpath next to the road is also recommended to provide a safe trail for pedestrians.

As the maximum road width within the Garawa 1 community is 5 m, this means that all ≈1000 m of the road network will need to be upgraded to a 7.2 m wide road. The stormwater drainage infrastructure upgrades that are closely associated with the road upgrade i.e. kerb and gutters, side entry pits and underground drainage pipes are included in the stormwater section of this report.

8 Stormwater drainage

8.1 Ownership and boundaries

The stormwater drainage assets within Garawa 1 community are owned by Garawa No 1 Camp Aboriginal Corporation, but is the responsibility of Mabunji Aboriginal Resource Indigenous Corporation to maintain.

There was one culvert beneath the access road to the water tanks that was inspected during the site investigation.

8.2 Existing infrastructure condition assessment

The site investigation for the stormwater infrastructure included assessing the condition of swales, culverts, headwalls, and side entry pits (SEP). Only the above ground infrastructure was assessed. As the inspection was undertaken outside of a storm event and no CCTV of the pipes was undertaken, flooding due to blockages or damage to the underground infrastructure could not be assessed. Table 7 below summarises the condition of the stormwater assets as assessed during the inspection.

Table 7 Stormwater condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Culvert			1			1



Figure 10 Culvert headwall, condition: *good*



Figure 11 Culvert endwall, condition: *good*

The culvert was generally in good condition, however there was debris at both the upstream and downstream culverts that should be cleaned up.

Along the Garawa One Access road, there are two existing floodways which are not working effectively as there is ponding, sand on the road, and potholes in the road. It is recommended that the stormwater runoff is further investigated to see if culverts should be constructed instead of repairing the floodways.

8.3 Current performance and risks

The detailed performance of the stormwater network cannot be fully analysed without significant hydraulic and hydrodynamic modelling, which is outside the scope of this project.

The general design philosophy for stormwater drainage is that the design is based on a system of sealed roads, kerb and gutter, entry pits and underground drainage. This infrastructure currently does not exist at Garawa 1 and there would be major headworks required if stormwater drainage is to be incorporated. It is recommended that stormwater drainage infrastructure is constructed at Garawa 1 to reduce flooding and ponding within the community. A cost estimate to provide kerbs and gutters, side entry pits and underground pipes has been included. The location or size of culverts, swales, etc. need to be further investigated.

8.4 Future demands

As no new developments are currently planned for the community, there are no additional upgrades required to cater for future demand.

8.5 Recommended works

The following works are recommended to upgrade or improve the current infrastructure:

- Clean out culvert, headwall and endwall.
- Install stormwater infrastructure, including kerbs and gutters, side entry pits and underground pipes.

9 Community structures

9.1 Ownership and boundaries

The community structures within Garawa 1 community are owned by Garawa No 1 Camp Aboriginal Corporation, but is the responsibility of Mabunji Aboriginal Resource Indigenous Corporation to maintain.

9.2 Existing infrastructure condition assessment

The site investigation for the community structures included assessing the condition and features of a playground. The following table shows the condition rating given to the community structures.

Table 8 Community structures condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Playground		1				1



Figure 12 Playground, condition: poor

The playground was given a poor condition due to having no shadecloth. The infrastructure is in place for a shadecloth so it is recommended that a new shadecloth is installed. The playground itself was in good condition.

9.3 Future demands

As no new developments are currently planned for the community, there are no additional upgrades required to cater for future demand.

9.4 Recommended works

The following works are recommended to upgrade the community structures:

- Replace shadecloth

10 Electrical services

10.1 Ownership and boundaries

The following points, from Network Policy NP003 Installation Rules Section3, define the typical shared ownership of electrical infrastructure by Power and Water Corporation (PWC) and customers.

- The point of supply is defined as the point where PWC makes the electrical supply available. For domestic supply, this is normally one of the following:
- A point of attachment of an overhead service on to a building or pole on which a metering panel is fitted.
- A point of attachment of an overhead service on to a pole forming part of unmetered aerial consumer's mains.
- A nominated point on a distribution substation located on the customer's lot.
- A point of connection of an underground service in a metering panel, including underground services originating at an overhead line.
- A point of connection of an underground service in a pillar or junction box forming part of unmetered consumer's mains, located on the customer's lot.
- A point on a Power and Water pillar located on the customer's lot.

Typically, distribution infrastructure upstream of the Point Of Supply is owned and maintained by PWC and infrastructure below the point of supply is owned and maintained by the customer.

In many cases PWC have defined a Point Of Supply to ensure that they retain responsibility for aerial high voltage infrastructure, and aerial low voltage infrastructure where installed with aerial high voltage infrastructure, to minimise the possibility of the community or it's contractors coming into contact, either deliberately or inadvertently, with aerial high voltage infrastructure.

In other cases isolation facilities are present or desired by PWC to define the Point of Supply at or near the boundary of the town camp.

The Garawa 1 community electrical reticulation systems is supplied by a transformer to an overhead reticulation scheme to meters of individual house.

PWC advise that the Point Of Supply is the LV terminals of the substation and that they own and are responsible for the first pole mount substation and upstream infrastructure.

PWC recommend that a GBS (Gas Break Switch) be provided upstream of the first transformer to establish a demarcation point.

PWC advise that street lighting is supplied from unmetered LV infrastructure and is the responsibility of the lot holder and not PWC.

All meters, whether pre- or post-paid are the property of PWC.

Garawa 1 community are responsible for maintain all unmetered and metered LV infrastructure including the main switchboard, metering panel (excluding meter), LV distribution feeders, distribution pillars, consumers' mains and consumer switchboards and street lights.

10.2 Existing infrastructure condition assessment

Table 9 shows the condition rating given to the distribution panels-metering and switchboard in sewage station. The distribution panels had 100% operational rating.

Table 9 Distribution panel condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Distribution panels			1			1

Table 10 shows the condition rating given to the street lights. The street lights were of a low voltage overhead feeder design, mercury lamp type M80 or unknown lamps, with lamp covers protected by cages. The street lights have 66.67% operational rating and 33.33% inoperable.

Table 10 Street light on O/H pole condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Street light on O/H pole		1	2			3

Table 11 shows the condition rating given to the transformer. The transformers were of pole mount substation design. The transformer was visually accessed to be in good condition.

Table 11 Transformer condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Transformer			2			2

Table 12 shows the condition rating given to the overhead poles. The overhead poles are of weld construction (universal pole construction). The overhead poles have 100% operational rating from the visual inspection.

Table 12 Overhead pole condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Overhead pole			17			17

The meters in Garawa 1 community were not inspected by Bennett Design or Aurecon.

The details of the individual inspections and photographs of each piece of infrastructure are in Appendicies.

10.3 Current performance and risks

The electrical infrastructure evaluation was conducted against the following criteria

- Number of dwellings on tenure, the higher value of the funded dwelling and as quoted in the population report was utilised.
- Urban area, NP001.1, 4. Definitions.
- General Specification for URD Subdivisions, NP001.6, 4.3 Substation Size.
- Normal ADMD (After Diversity Maximum Demand) of 4.5 kVA and high cost subdivisions at 7 kVA.
- Transformer ratings were assumed to be correct in Dekho (PWC asset information system) and compared against photographs of test or transformer numbers collected.
- Substation loads were compared against transformer sizes only. No load flow analysis was conducted.
- No load calculations were performed or assessment conducted on overhead or underground cable, visual inspection from the ground only.
- Streetlighting loads were ignored as they are not significant.

The calculated maximum demand of the Garawa 1 community transformer is 36% of rated capacity based on 4.5kVA/dwelling.

Table 13 Garawa 1 current demand load vs transformer ratings

Com Id	Community name	Dwellings	Transformer (kVA)	kVA Total @ 4.5kVA	kVA Total @ 7kVA	Comments
229	Garawa 1	16	100 100	72	112	Two transformers on main feed into for this Town Camp. Suggesting smaller is T off for lighting and should be checked.

A tabulated summary of all community transformers is included in Appendicies.

There is a risk of equipment not being maintained associated with the non-standard division of responsibilities between the customer and PWC.

The following points from the PWC Metering Rules should be noted:

- The routine maintenance of metering installations and the replacement of any faulty meters is the responsibility of PWC.
- The property owners are responsible for the maintenance and upkeep of meter rooms, boxes and panels (including lids, doors and locking mechanisms).
- The installation of pre-paid metering is a cost to the customer, refer NP010 Meter Manual-Maintenance of Metering Installations, Power and Water Corporation.

10.4 Future demands

As no new developments are currently planned for the community, there are no additional upgrades required to cater for future demand.

10.5 Recommended works

The following maintenance works and upgrades are recommended:

- Replace one street light 80W (immediate action).
- Install new street lighting with road upgrade - approximately 25 poles

11 Communications

11.1 Ownership and boundaries

Details of Telstra pit and conduit infrastructure within the town camp boundaries were sought but were not forthcoming.

11.2 Existing infrastructure condition assessment

The telecommunications infrastructure assessed included pits and telephone booths. There were no telephone booths found at Garawa 1.

Appendicies contains the individual reports.

Table 14 Telecommunication pit condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Telecommunication Pit		1	3			4

11.3 Current performance and risks

No details of the performance of communications infrastructure were obtained.

11.4 Future demands

The current availability of broadband services at Garawa 1 is displayed in the Figure 13 below. NBN is available to residents via satellite on application to an appropriate NBN access provider.

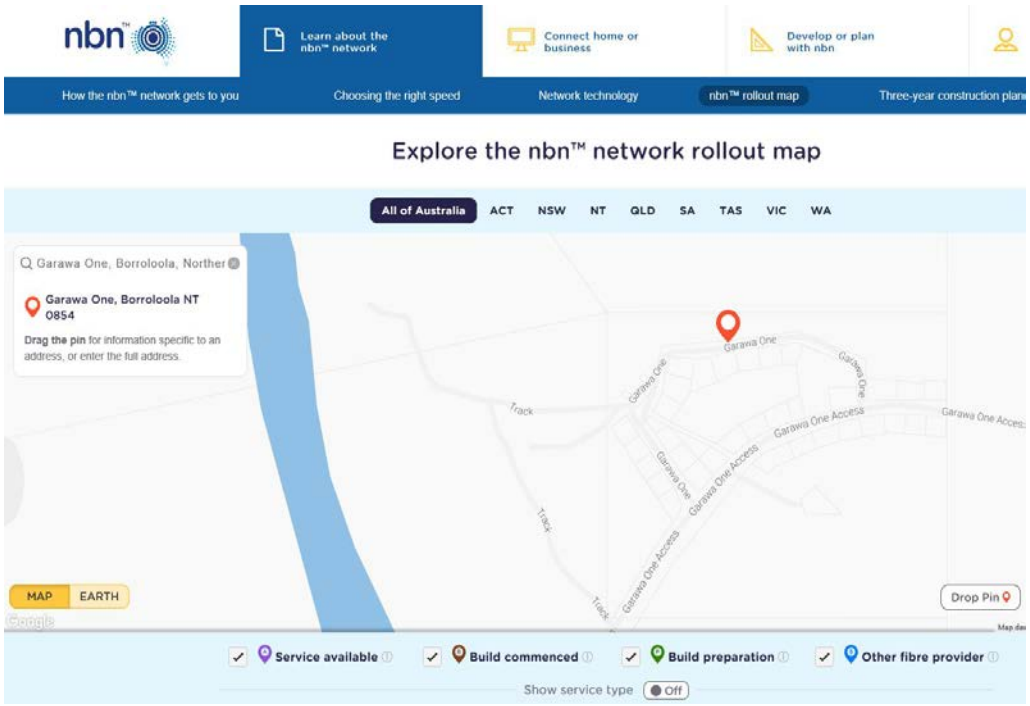


Figure 13 NBN network availability map

NBN is available to residents via satellite on application.

11.5 Recommended works

Representatives from NBN's Land Access and Stake Holder management teams are currently engaged with and NT Housing to look at how camps will be serviced. It is expected that any existing premises in these camps will have some type of NBN service via the NBN brownfields rollout in the future.

No works are required at Garawa 1 because NBN is available to residents via satellite on application to an appropriate NBN access provider.

12 Cost estimates

Table 15 below shows a summary of the cost estimates to undertake the maintenance required to fix the existing infrastructure, to upgrade the existing network to meet current design standards, and to upgrade the existing network to cater for the future design (included in current upgrades). The estimates take into account a 30% contingency, are inclusive of GST. A location factor has been applied to town camps outside of Darwin.

Table 15 Cost estimates

Infrastructure	Maintenance of existing infrastructure	Upgrades to meet current design
Sewerage	$ 0	$ 1,187,000
Water supply	$ 14,000	$ 3,748,000
Roadworks	$ 960,000	$ 1,089,000
Stormwater drainage	$ 3,000	$ 1,596,000
Community structures	$ 26,000	$ 0
Electrical	$ 44,000	$ 644,000
Communications	$ 0	$ 0
Miscellaneous provisions	$ 143,000	$ 1,009,000
Total (including GST)	**$ 1,190,000**	**$ 9,273,000**
Grand total	**$ 10,463,000**	

The cost estimates are a preliminary estimate only. Since Aurecon has no control over the cost of labour, materials, equipment or services furnished by others, or over contractors' methods of determining prices, or over competitive bidding or market conditions, Aurecon cannot guarantee actual costs will not vary from these estimates.

13 Summary

The following works are recommended for Garawa 1 community:

Sewerage

- Upgrade pumps (two) to increase velocity in rising main
- Construct emergency overflow storage
- Install new DN150 PVC reticulation main, including housing connections, manholes and connection to existing sewage pump station

Water supply

- Restore handles to 15 residential lot meters
- Replace rusted air valve
- Clear buried scour valve
- Clear sand and other debris from two fire hydrants
- Repaint three fire hydrants
- Install new water main servicing Garawa 1 and Garawa 2 approximately 3500 m (half the total length allocated to Garawa 1 for cost estimates)
- Install up to two new additional residential lot water meters
- Install new bulk water meter

Roadworks

- Seal road that is currently unsealed, including installing culverts to remove drainage issue – approximately 350 m
- Repair edge breaks – approximately 1000 m
- Repair two floodways, or install culverts (requires further engineer design)
- It is recommended that the road is upgraded to a two lane network with all appropriate road furniture, line marking, kerbs, footpaths, etc.

Stormwater drainage

- Clean out culvert, headwall and endwall.
- Install stormwater infrastructure, including kerbs and gutters, side entry pits and underground pipes.

Community structuresTowncamps - Part B

- Install new shadecloth

Electrical services

- Replace one street light 80W.
- Install new street lighting - approximately 25 poles

Communications

- No works are required because NBN is available to residents via satellite on application to an appropriate NBN access provider.

Civil inspection reports



Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 12:02 Imagery: Digital Globe WV2 2013-2016

A3 scale: 1:2,000

0 20 40 60 80 100 m

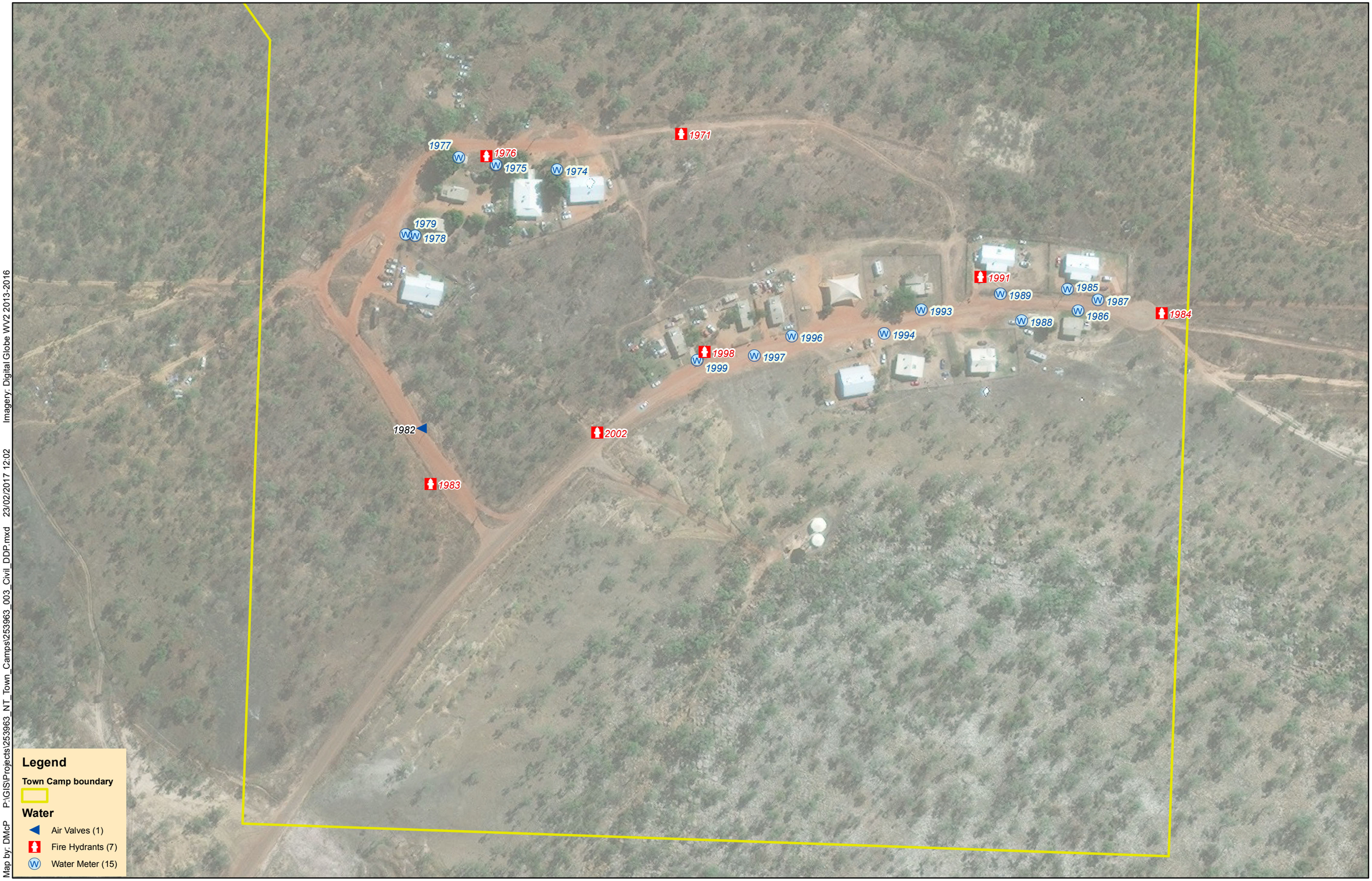
Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 2
Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Sewerage

229 - Garawa 1 (Borroloola)

4311



Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 12:02 Imagery: Digital Globe WV2 2013-2016

A3 scale: 1:2,000

0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 2
Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Water

229 - Garawa 1 (Borroloola)

4312



Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 12:02 Imagery: Digital Globe WV2 2013-2016

A3 scale: 1:2,000

0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 2
Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments
Road furniture, stormwater drainage & community structures
229 - Garawa 1 (Borroloola)

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:58:54 AM

Insp ID: 1982	Group 5 - Borroloola	Garawa 1

What Water Asset Are you Capturing: Air Valves

Air Valve Diameter (mm):

Air Valve Make:

Air Valve Leak:

Air Valve Condition: 2 - Poor

Air Valve Comments: Rusted



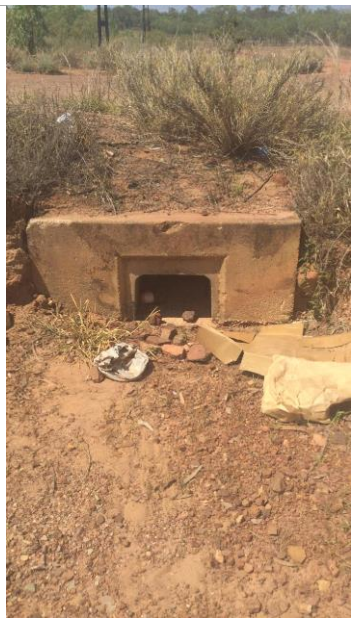
Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:18:54 AM

Insp ID: 2001 Group 5 - Borroloola Garawa 1

Stormwater Infrastructure:	Culverts
Culvert Type:	RCBC
Diameter (mm):	
Width (mm):	450
Culvert Depth (mm):	300
Culvert Length (m):	13
Culvert Condition:	3 - Good
Culvert Blockage (%):	10
Culvert Comments:	
Culvert Head Wall:	Yes
Safety Grate:	No
Headwall Blockage:	
Headwall Condition:	
Headwall Comment:	
End Wall:	Yes
End Wall condition:	3 - Good
EW Comment:	





Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:18:54 AM



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 11:25:22 AM

Insp ID: 1971 Group 5 - Borroloola Garawa 1

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 11:15:00 AM

Insp ID: 1976 Group 5 - Borroloola Garawa 1

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	Covered in dirt, rubbish



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:55:34 AM

Insp ID: 1983 Group 5 - Borroloola Garawa 1

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:52:16 AM

Insp ID: 1984 Group 5 - Borroloola Garawa 1

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	No
FH Condition:	4 - Very Good
FH Comment:	Looks new. Has PWC written on top



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:43:36 AM

Insp ID: 1991 Group 5 - Borroloola Garawa 1

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	Yes
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	No red paint





Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:30:08 AM

Insp ID: 1998 Group 5 - Borroloola Garawa 1

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	No red paint



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:17:54 AM

Insp ID: 2002 Group 5 - Borroloola Garawa 1

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	Yes
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	No
FH Condition:	4 - Very Good
FH Comment:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 11:27:13 AM

Insp ID: 1970 Group 5 - Borroloola Garawa 1

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	M1/3
Comments:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 11:22:54 AM

Insp ID: 1972 Group 5 - Borroloola Garawa 1

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	5/C
Comments:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 11:02:44 AM

Insp ID: 1981 Group 5 - Borroloola Garawa 1

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	
Comments:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:42:39 AM

Insp ID: 1992 Group 5 - Borroloola Garawa 1

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	
Comments:	In property



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:56:13 AM

Insp ID: 1973 Group 5 - Borroloola Garawa 1

Road Name:	Garawa One
What are you inspecting:	Pavements
Ch From (km):	
Ch To (km):	
Road Type:	Unsealed
Section Width (m):	5
Road Condition:	2 - Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Deformation		2 - Poor	Corrugations, potholes
Drainage		2 - Poor	

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
No kerb		

Shoulders Section

Linemarking Section

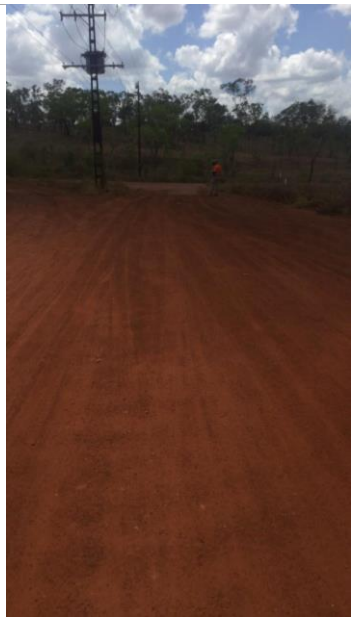
Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:56:13 AM









Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:56:13 AM





Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:56:13 AM

Insp ID: 1973 Group 5 - Borroloola Garawa 1

Road Name:	229_1
What are you inspecting:	Pavements
Ch From (km):	
Ch To (km):	
Road Type:	Unsealed
Section Width (m):	5
Road Condition:	2 - Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Deformation		2 - Poor	Corrugations, potholes
Drainage		2 - Poor	

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
No kerb		

Shoulders Section

Linemarking Section

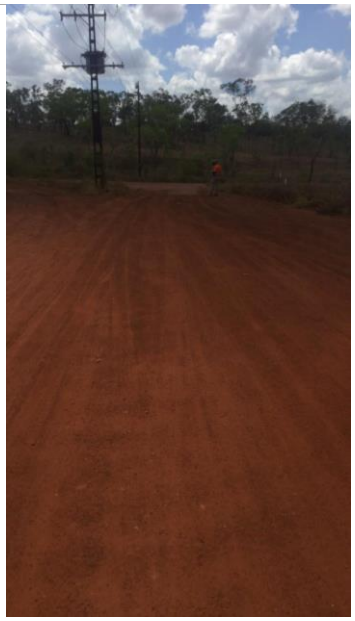
Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:56:13 AM









Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:56:13 AM





Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 9:52:20 AM

Insp ID: 1990 Group 5 - Borroloola Garawa 1

Road Name:	Garawa One Access
What are you inspecting:	Pavements
Ch From (km):	
Ch To (km):	
Road Type:	Sealed - spray seal
Section Width (m):	5
Road Condition:	2 - Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Drainage	2	2 - Poor	2 flood ways
Edge Breaks	80	2 - Poor	80% of road

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
No kerb		

Shoulders Section

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 9:52:20 AM









Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 9:52:20 AM









Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 9:52:20 AM





Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:21:38 AM

Insp ID: 2000 Group 5 - Borroloola Garawa 1

Road Name:	Water tank access
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.1
Road Type:	Unsealed
Section Width (m):	4
Road Condition:	2 - Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Deformation		3 - Good	

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
No kerb		

Shoulders Section

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:21:38 AM



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:21:38 AM

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 11:04:13 AM

Insp ID: 1980 Group 5 - Borroloola Garawa 1

What Sewerage Asset are you capturing:	Pump Station
No of Pumps in Pump Station:	2
Cabinet Condition:	3 - Good
Cabinet Comment:	
Alarm Light:	Yes
Alarm Light Condition:	3 - Good
Overhead Light:	Yes
Overhead Light Condition:	2 - Poor
Light Comments:	
Davit Crane Present:	Yes
Davit Crane Capacity (kg):	
Davit Crane Condition:	3 - Good
Davit Crane Comments:	
Fence TYPE:	Standard Security Fence (3 Strands barbed)
PS Fence Height (m):	1.8
PS Gates Locked:	Yes
PS Fence Condition:	4 - Very Good
Fence Comment:	
Flow meter type:	
Flow meter condition:	
Flow meter comments:	
Macerator Pump Make/Model:	
Manufacturers Date:	
Macerator Pump:	
Macerator Pump Condition:	
Macerator Pump Comments:	
Outgoing Pipe Diameter (mm):	
Valves:	
Outgoing Pipe Comments:	
Water Supply to pump station:	Yes
Fire hose reel:	No
Access cover locked:	Yes
Safety grid beneath access cover:	No Access

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 11:04:13 AM

Condition:	
Cabinet Locked:	Yes
Cabinet Lock Condition:	
Hand rails around entrance:	No
Fixed or removable:	
Rail Condition:	
Safety Comments:	

Pump Station Pumps section





Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 11:04:13 AM





Northern Territory Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:34:28 AM

Insp ID: 1995 Group 5 - Borroloola Garawa 1

Inspection Type:	Shade Structure
Shade Structure Type:	Play ground
Shade Floor Type:	Sand
Roof Type:	Shadecloth
Width (mm):	
Length (mm):	
Appearance:	3
Appearance Comment:	
Condition:	2 - Poor
Comment:	No Shadecloth



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 9:58:02 AM

Insp ID: 2003	Group 5 - Borroloola	Garawa 1

What Water Asset Are you Capturing: Scour Valves

Size:

SV Leakage: No

SV Condition: 3 - Good

SV Comment: Buried in sand



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 11:19:47 AM

Insp ID: 1974 Group 5 - Borroloola Garawa 1

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 11:18:41 AM

Insp ID: 1975 Group 5 - Borroloola Garawa 1

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 11:10:18 AM

Insp ID: 1977 Group 5 - Borroloola Garawa 1

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	NO tap handles



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 11:09:37 AM

Insp ID: 1978 Group 5 - Borroloola Garawa 1

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 11:07:28 AM

Insp ID: 1979 Group 5 - Borroloola Garawa 1

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	3 - Good
Lot Water Meter Comment:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:50:54 AM

Insp ID: 1985 Group 5 - Borroloola Garawa 1

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:49:26 AM

Insp ID: 1986 Group 5 - Borroloola Garawa 1

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles. Next to road, not within lot



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:47:56 AM

Insp ID: 1987 Group 5 - Borroloola Garawa 1

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles. Meter next to road, not within lot



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:46:46 AM

Insp ID: 1988 Group 5 - Borroloola Garawa 1

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles, scouring around slab



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:45:47 AM

Insp ID: 1989 Group 5 - Borroloola Garawa 1

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:39:55 AM

Insp ID: 1993 Group 5 - Borroloola Garawa 1

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:35:47 AM

Insp ID: 1994 Group 5 - Borroloola Garawa 1

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:32:55 AM

Insp ID: 1996 Group 5 - Borroloola Garawa 1

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:31:57 AM

Insp ID: 1997 Group 5 - Borroloola Garawa 1

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 14/12/2016 10:25:21 AM

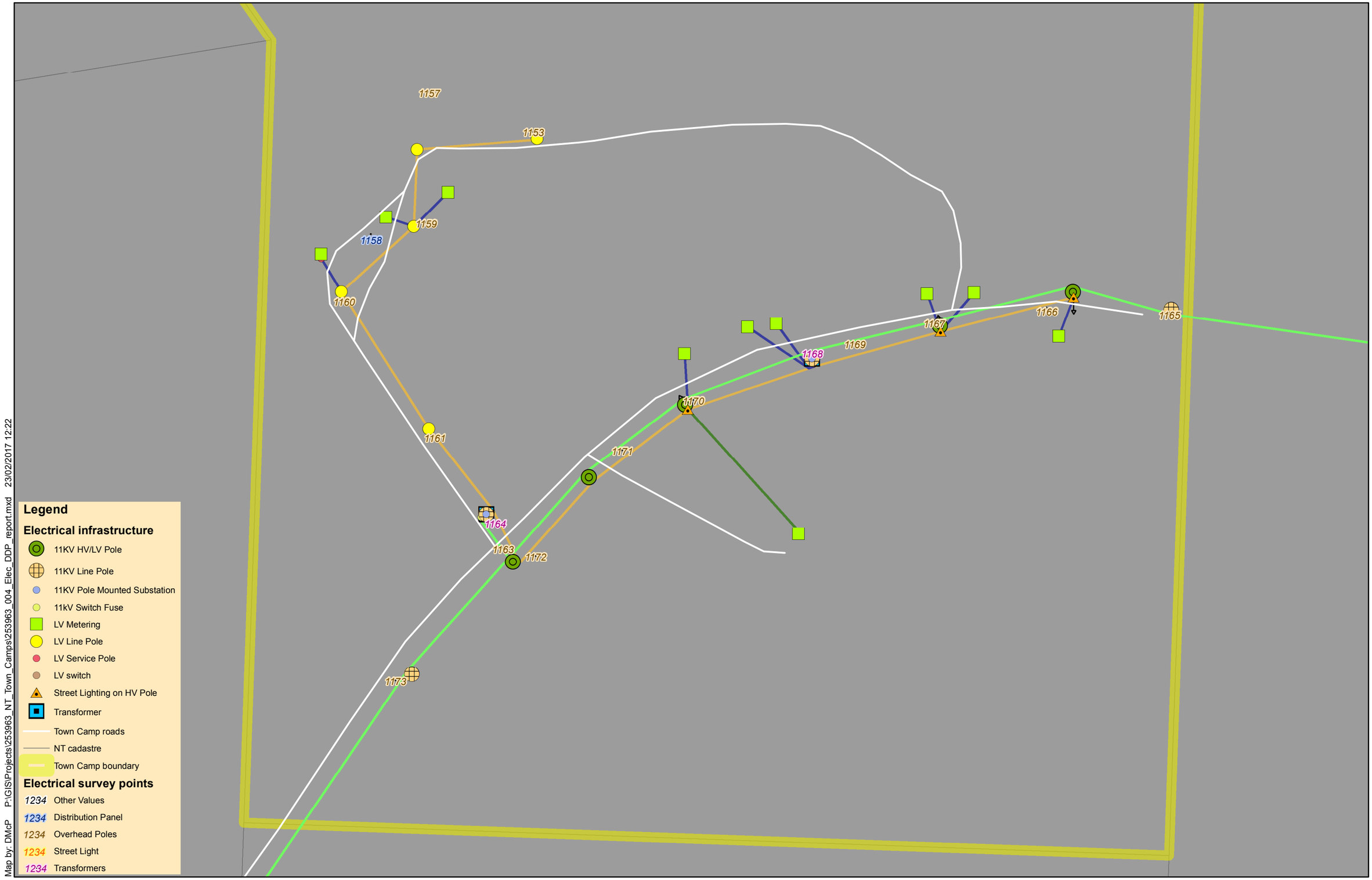
Insp ID: 1999 Group 5 - Borroloola Garawa 1

What Water Asset Are you Capturing: Water Meter

Water Meter Type:	Lot
Bulk Water Meter Size (mm):	
Bulk Water Meter Condition:	
Bulk Water Meter Comment:	
Lot Number:	
Lot Water Meter Size:	25
Lot Water Meter Condition:	2 - Poor
Lot Water Meter Comment:	No tap handles



Electrical inspection report



Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_004_Elec_DDP_report.mxd 23/02/2017 12:22

A3 scale: 1:2,000

0 20 40 60 80 100 m

Date: 23/02/2017 Version: 3

Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Electrical

229 - Garawa 1 (Borroloola)

4362

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:50:38 AM

Insp ID: 1151 Group 5 - Borroloola Garawa 1

What Comms Category are you capturing:	Distribution
What is distribution method to households:	Underground
Is it Shared with PWC:	
Is there Anti-climb barrier provided for this pole:	
What is Pole construction type:	
Is street light fitted:	
Is there concrete collar around the base of pole:	
What is the condition of tap off to house:	
What is the condition of pole:	
How many Lots are connected to this pole:	
Is there access to Pits to take a photo:	No
What is Pit Condition:	3
Underground Comments:	





Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:47:08 AM

Insp ID: 1155 Group 5 - Borroloola Garawa 1

What Comms Category are you capturing:	Distribution
What is distribution method to households:	Underground
Is it Shared with PWC:	
Is there Anti-climb barrier provided for this pole:	
What is Pole construction type:	
Is street light fitted:	
Is there concrete collar around the base of pole:	
What is the condition of tap off to house:	
What is the condition of pole:	
How many Lots are connected to this pole:	
Is there access to Pits to take a photo:	No
What is Pit Condition:	3
Underground Comments:	





Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:43:15 AM

Insp ID: 1158 Group 5 - Borroloola Garawa 1

What Category are you capturing:	Distribution Panel
What is Main Distribution Panel installation method:	Outdoor
Is the distribution panel labelled:	No
What is Distribution Panel main CB Rating:	Unknown
What is the main incoming cable type/Size to Distribution Panel:	Unknown
What is the condition of switchboard:	3
Condition Comments:	
What is the condition of cables/glands into switchboard:	3
Cable/Gland Condition Comments:	
Distribution Panels name plate access:	No









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:43:15 AM



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:33:14 AM

Insp ID: 1162	Group 5 - Borroloola	Garawa 1

What Comms Category are you capturing:	Distribution
What is distribution method to households:	Underground
Is it Shared with PWC:	
Is there Anti-climb barrier provided for this pole:	
What is Pole construction type:	
Is street light fitted:	
Is there concrete collar around the base of pole:	
What is the condition of tap off to house:	
What is the condition of pole:	
How many Lots are connected to this pole:	
Is there access to Pits to take a photo:	No
What is Pit Condition:	2
Underground Comments:	





Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 10:31:13 AM

Insp ID: 1176	Group 5 - Borroloola	Garawa 1

What Comms Category are you capturing:	Distribution
What is distribution method to households:	Underground
Is it Shared with PWC:	
Is there Anti-climb barrier provided for this pole:	
What is Pole construction type:	
Is street light fitted:	
Is there concrete collar around the base of pole:	
What is the condition of tap off to house:	
What is the condition of pole:	
How many Lots are connected to this pole:	
Is there access to Pits to take a photo:	No
What is Pit Condition:	3
Underground Comments:	





Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:49:37 AM

Insp ID: 1153 Group 5 - Borroloola Garawa 1

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	2
Overhead Pole Comments:	Surface rusted

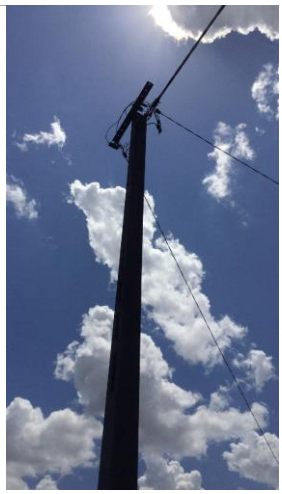
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:49:37 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:46:04 AM

Insp ID: 1157 Group 5 - Borroloola Garawa 1

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Twisted
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	
Overhead Pole Comments:	Surface rusted

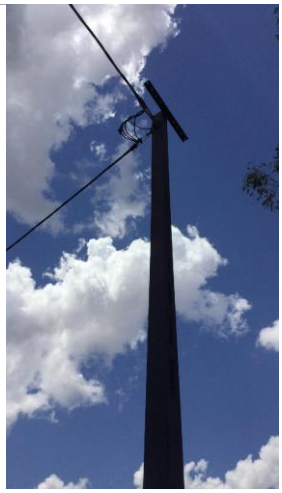
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:46:04 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:40:41 AM

Insp ID: 1159 Group 5 - Borroloola Garawa 1

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	2
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:40:41 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:37:54 AM

Insp ID: 1160 Group 5 - Borroloola Garawa 1

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	2
Overhead Pole Comments:	Surface rusted

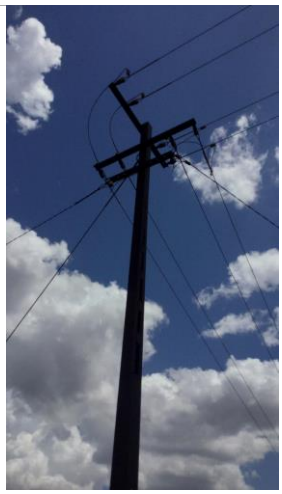
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:37:54 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:35:24 AM

Insp ID: 1161 Group 5 - Borroloola Garawa 1

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	
What is the Condition of plant:	
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Three
What is the HV voltage level:	400
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

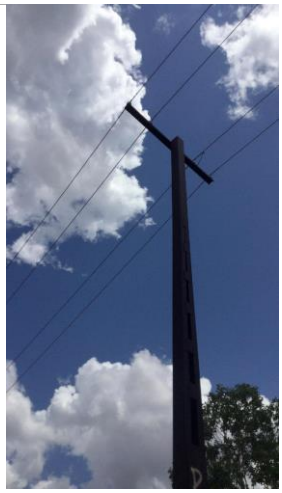
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:35:24 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:31:56 AM

Insp ID: 1163 Group 5 - Borroloola Garawa 1

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

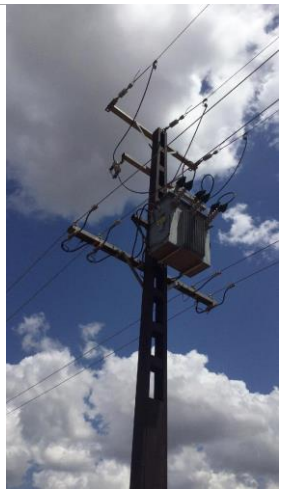
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:31:56 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:23:02 AM

Insp ID: 1165 Group 5 - Borroloola Garawa 1

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

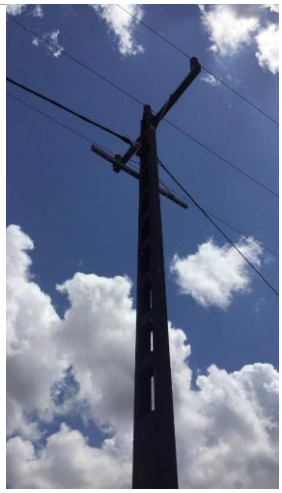
Northern Territory Town Camps

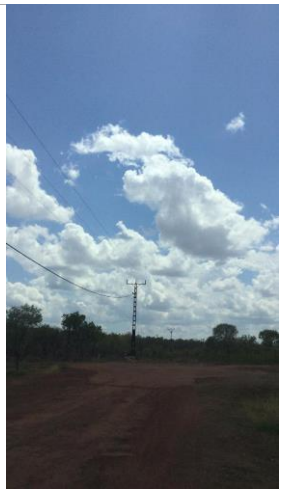
Electrical Infrastructure

Inspection Date 14/12/2016 11:23:02 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:19:09 AM

Insp ID: 1166 Group 5 - Borroloola Garawa 1

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	Unknown
Street Light Watts	
Street Light Condition	3
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	3
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:19:09 AM







Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:13:52 AM

Insp ID: 1167 Group 5 - Borroloola Garawa 1

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M80d 05
Street Light Watts	80
Street Light Condition	3
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	4
Overhead Pole Comments:	Surface rusted

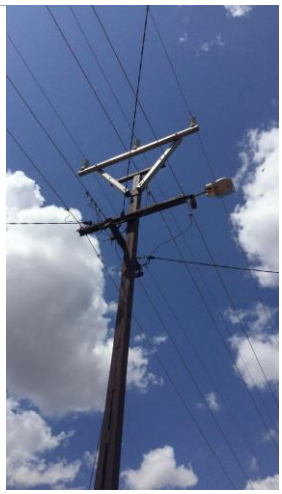
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:13:52 AM











Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:04:25 AM

Insp ID: 1169 Group 5 - Borroloola Garawa 1

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	Yes
What is the Condition:	3
How many Lots are connected to this pole:	3
Overhead Pole Comments:	Surface rusted

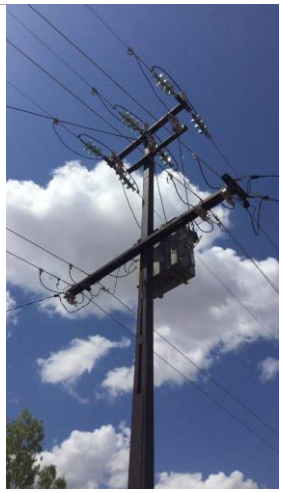
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:04:25 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 10:56:46 AM

Insp ID: 1170 Group 5 - Borroloola Garawa 1

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	Unknown
Street Light Watts	
Street Light Condition	2
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	1
Overhead Pole Comments:	Surface rusted

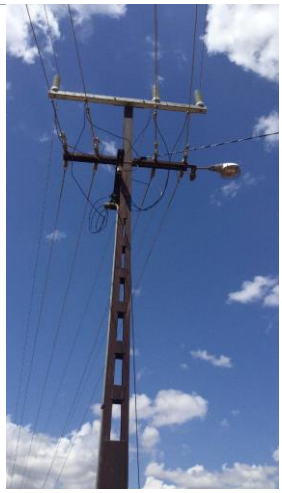
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 10:56:46 AM











Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 10:48:30 AM

Insp ID: 1171 Group 5 - Borroloola Garawa 1

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

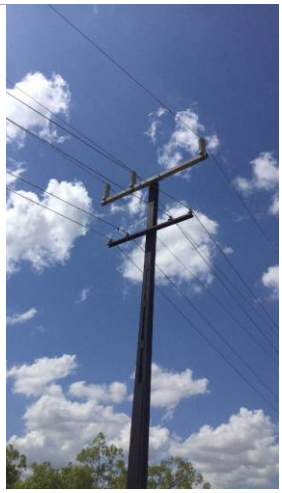
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 10:48:30 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 10:46:11 AM

Insp ID: 1172 Group 5 - Borroloola Garawa 1

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 10:46:11 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 10:43:09 AM

Insp ID: 1173 Group 5 - Borroloola Garawa 1

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	2
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

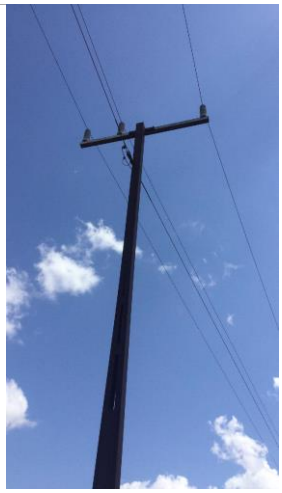
Northern Territory Town Camps

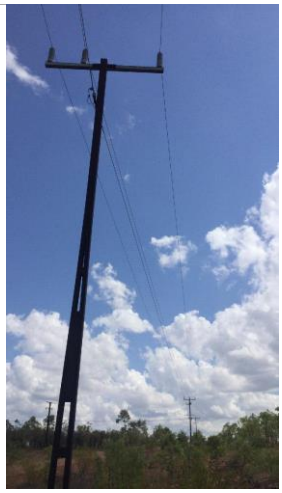
Electrical Infrastructure

Inspection Date 14/12/2016 10:43:09 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 10:38:58 AM

Insp ID: 1174 Group 5 - Borroloola Garawa 1

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

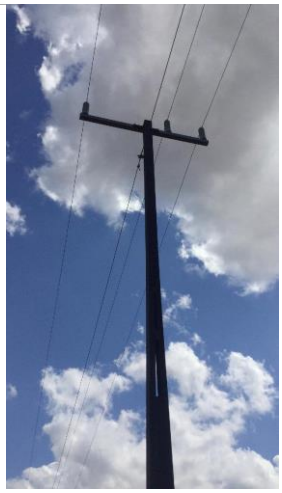
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 10:38:58 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 10:35:48 AM

Insp ID: 1175 Group 5 - Borroloola Garawa 1

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

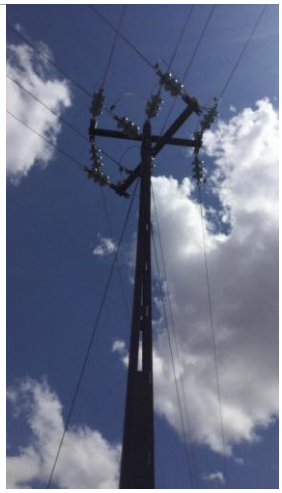
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 10:35:48 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 10:30:05 AM

Insp ID: 1177 Group 5 - Borroloola Garawa 1

What Category are you capturing:	Overhead Poles
What is Pole Material type:	Welded
What is the condition of pole:	3
How is the pole planted:	Concrete
What is the Condition of plant:	3
Is street light fitted:	No
Street Light Power Supply:	
Street Light Type	
Street Light Watts	
Street Light Condition	
Street Light Height	
What is the type of service:	Combined
What is the HV voltage level:	11000
What is the arrangement of connected cables:	Parallel
Are there isolators on the pole:	No
What is the Condition:	3
How many Lots are connected to this pole:	0
Overhead Pole Comments:	Surface rusted

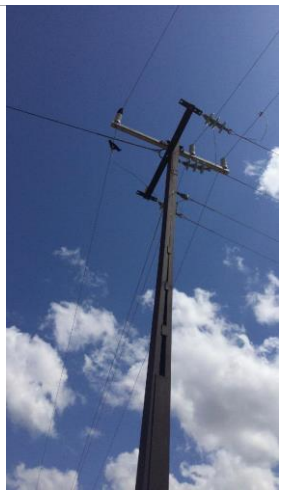
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 10:30:05 AM









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:19:09 AM

Insp ID: 1166 Group 5 - Borroloola Garawa 1

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	Unknown
Street Light Watts	
Street Light Condition	3
Street Light Height	







Northern Territory Town Camps

Electrical Infrastructure

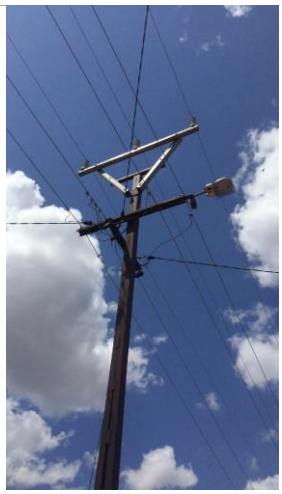
Inspection Date 14/12/2016 11:13:52 AM

Insp ID: 1167 Group 5 - Borroloola Garawa 1

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	M80d 05
Street Light Watts	80
Street Light Condition	3
Street Light Height	





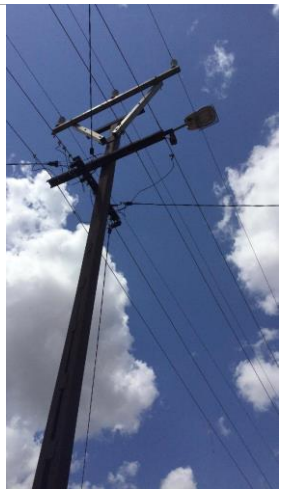




Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:13:52 AM



Northern Territory Town Camps

Electrical Infrastructure

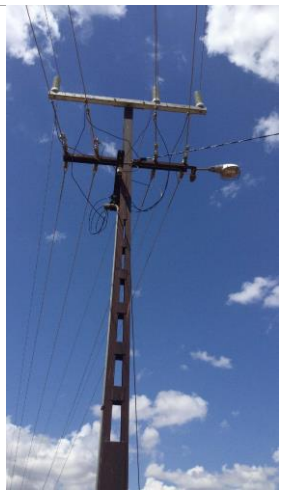
Inspection Date 14/12/2016 10:56:46 AM

Insp ID: 1170 Group 5 - Borroloola Garawa 1

What Category are you capturing:	Overhead Poles
Is street light fitted:	Yes
Street Light Power Supply:	
Street Light Type	Unknown
Street Light Watts	
Street Light Condition	2
Street Light Height	









Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 10:56:46 AM



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:28:27 AM

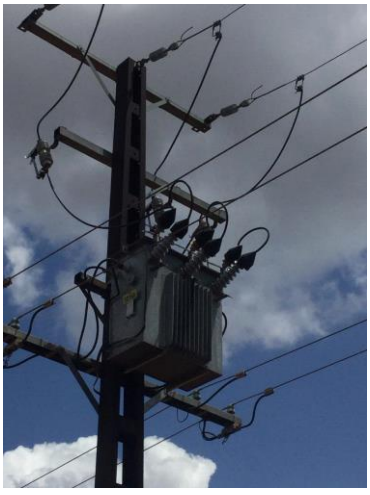
Insp ID: 1164 Group 5 - Borroloola Garawa 1

What Category are you capturing:	Transformers
What is Transformer installation method:	Pole
If method know:	11SS1P
What is the condition of the mounting:	3
What is Transformer Rating:	Unknown
Is there access to transformers name plate to take a photo:	No
What is the condition of transformer:	3
What is cable type to transformer:	PVC insulated black
What is cable size to transformer:	
Is there switch gear or fusing associated with the transformer:	Cut out fuse
Transformer Comment:	





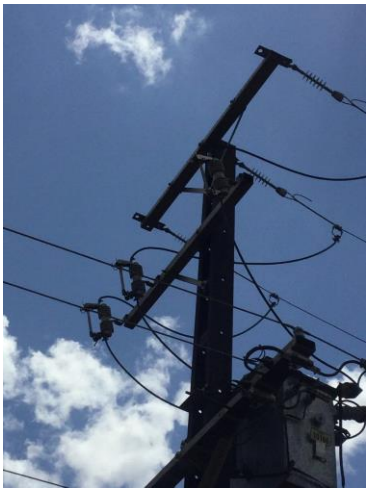




Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:28:27 AM



Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:07:22 AM

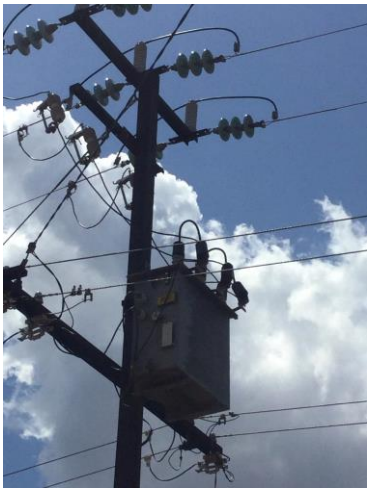
Insp ID: 1168 Group 5 - Borroloola Garawa 1

What Category are you capturing:	Transformers
What is Transformer installation method:	Pole
If method know:	11SS1P
What is the condition of the mounting:	3
What is Transformer Rating:	Unknown
Is there access to transformers name plate to take a photo:	No
What is the condition of transformer:	3
What is cable type to transformer:	PVC insulated black
What is cable size to transformer:	
Is there switch gear or fusing associated with the transformer:	Cut out fuse
Transformer Comment:	









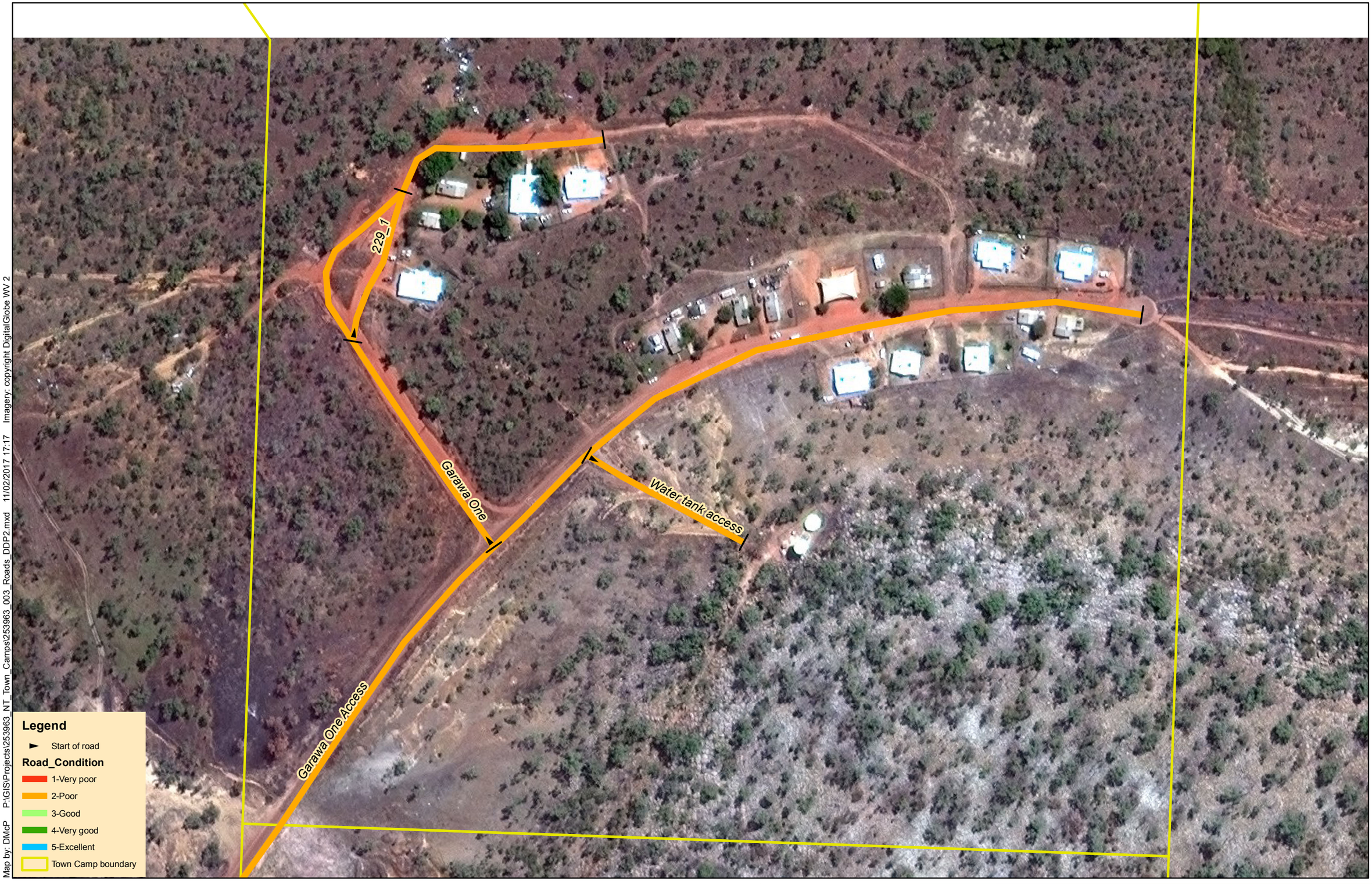
Northern Territory Town Camps

Electrical Infrastructure

Inspection Date 14/12/2016 11:07:22 AM



Road map



Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Roads_DDP2.mxd 11/02/2017 17:17 Imagery: copyright DigitalGlobe WV 2

A3 scale: 1:2,000

0 20 40 60 80 100 m

Date: 11/02/2017 Version: 1

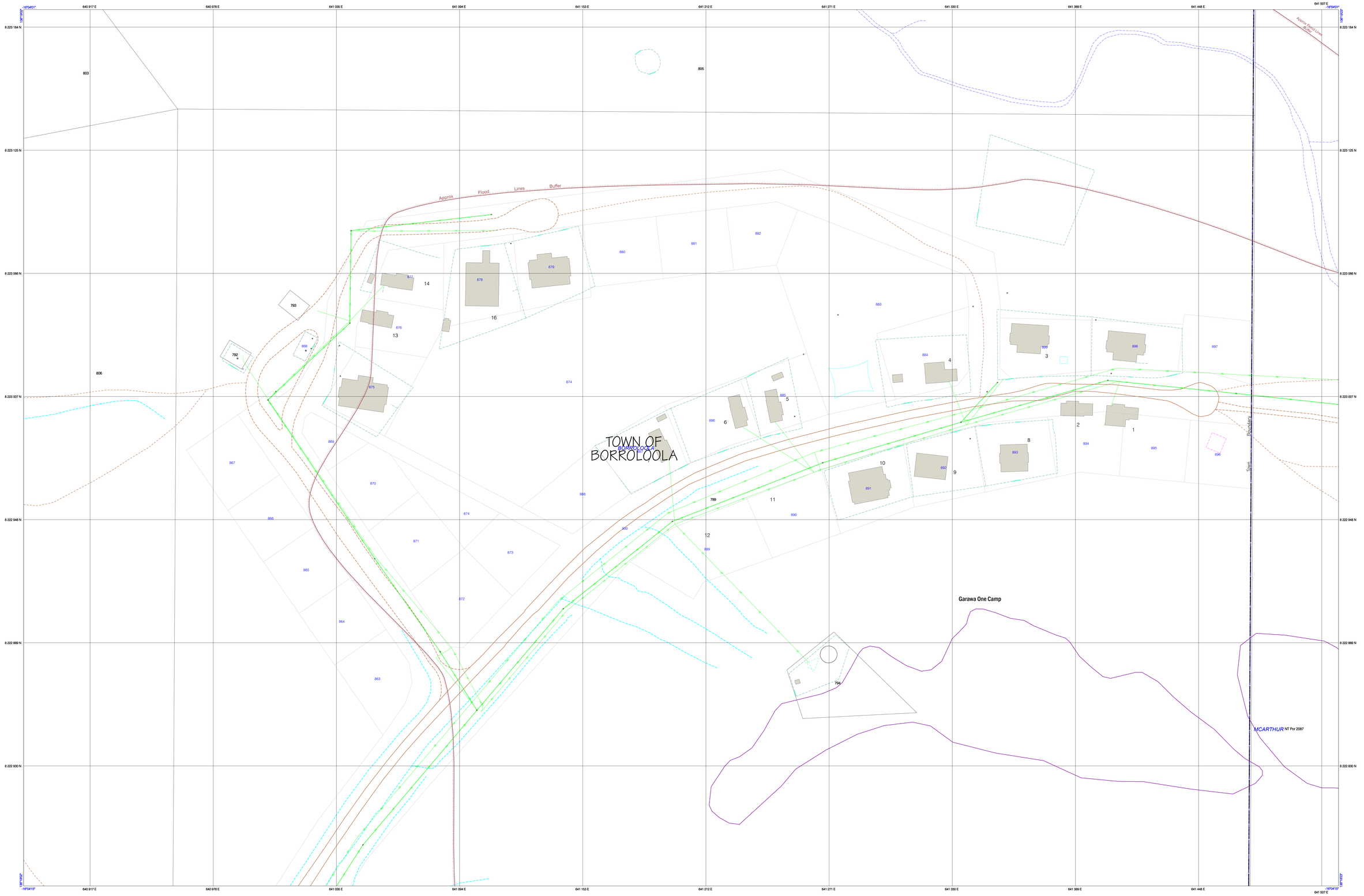
Coordinate system: GDA 1994

NT Town Camp Road Assessments

229 - Garawa 1 (Borroloola)

4413

Existing drawings



LAND USE PLANNING:

APPROX. POSITION OF BUILDING constructed since date of photography

LAND EXCLUDED FROM DEVELOPMENT:

GENERAL EXCLUSION/BUFFERS

CULTURAL EXCLUSION AREAS:

Unauthorised entry, works on or use of land where there is a sacred site is an offence under the Northern Territory Aboriginal Sacred Sites Act. For conditions relating to works on or use of land within a Cultural Exclusion Area contact the Aboriginal Areas Protection Authority (AAPA): email enquiries.aapa@nt.gov.au or phone 8999 4300.

This advice does not negate the need for consent for entry, works, or use which may be required under the Aboriginal Land Rights(NT) Act (in the case of Aboriginal land), or another statute.

© NORTHERN TERRITORY OF AUSTRALIA

CADASTRE

Current 123

Proposed 123

Locality LOCALITY

UTILITY SERVICES

ELECTRICITY LV

LOW VOLTAGE

HIGH VOLTAGE HV

WATER RETICULATION W

WATER MAIN

WATER RISING MAIN

SEWER S

SEWER MAIN

SEWER RISING MAIN

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LEGEND

TOPOGRAPHY

Road Sealed, Bridge

Road Unsealed, Track

Footpath, Drain, Culvert

Wall, Gate, Fence, Cattle Grid

Railway, Disused Railway

Aerodrome Tarmac, Landing Strip

Taxiway, Apron

Pipeline: Oil, Water, Undetermined Gas, Sewage

Building, Building-Shape unconfirmed

Shade Structure, Incomplete Building

Sewage Ponds, Tailings Pond

Oval, Arena, Swimming Pool

High Water Mark, Low Water Mark

Mine, Quarry, Surface Excavation

Contour, Index, Intermediate

Contour, Depression

Top of Bank, Bottom of Bank, Cliff

Watercourse; Perennial, Intermittent, Channel or Canal

WaterBodies; Perennial, Intermittent

WaterBodies; Reservoir, Water Hole

Swamp; Swamp Perennial, Swamp Intermittent

Flat, Mud Flat, Clay/Saltpan, STI

Pole; Power, General, Light

Tank, Water, Elevated, Non-Water, Silo

Manhole, Pylon, Communication Tower, Bore.

AVAILABLE FROM AND PRODUCED BY:
Dept Lands, Planning and the Environment
Land Information Division, Darwin
GPO Box 1680 Darwin NT 0801
http://www.nt.gov.au/dlpe

Northern Territory Government

NOTES:
POWER POLES, MANHOLES, SEPTIC TANKS, TOWERS/POSTS and other similar shaped objects are shown in their true geographic entity and have their locations confirmed from aerial survey techniques.
These features are suitable as LOCAL SURVEY CONTROL. Their ground location is expected to be within +/-0.3m of their mapped location.

DIAL BEFORE YOU DIG phone 1100 (freecall) or visit www.1100.com.au
For water, sewer, and power information and connection requirements for Indigenous Community Water and Wastewater, Indigenous Community Development on 1800 245 092, and visit: http://www.powerwater.com.au/business

General enquiries, corrections, updates, errors and omissions:
Indigenous Community Land Use Planning
NT Dept of Lands, Planning and the Environment
TEL: (08) 8999 1300, FAX: (08) 8999 7189, Email: planning@nt.gov.au

This product is a compilation of data holdings from (but not restricted to) NT Dept of Lands, Planning and the Environment, NT Dept of Housing, Local Government and Regional Services, Power and Water Corporation and Aboriginal Areas Protection Authority.
Whilst every effort has been made to ensure the accuracy of this map, errors and omissions may occur.
No Warranty is given concerning the accuracy of the information herein. Users should refer to the originating bodies or departments regarding the accuracy and currency of the data.

Topographic Information:
Land Information Division
Dept of Lands, Planning and the Environment
TEL: (08) 8995 5331, FAX: (08) 8995 5386
Email: landinfo@nt.gov.au

Cadastral Information:
Office of the Surveyor-General
Dept of Lands, Planning and the Environment
TEL: (08) 8995 5353, FAX: (08) 8995 5386
Email: landinfo@nt.gov.au

Power, Water or Sewer Information:
Remote Operations Planning Branch
Power and Water Corporation
TEL: (08) 8924 5384, FAX: (08) 8924 5360

Aboriginal Areas Protection Authority:
The Registrar
Aboriginal Areas Protection Authority
TEL: (08) 8999 4332
Email: enquiries.aapa@nt.gov.au

Planning Information:
Indigenous Community Land Use Planning
Dept of Lands, Planning and the Environment
TEL: (08) 8999 1300, FAX: (08) 8999 7189
Email: planning@nt.gov.au

Housing Infrastructure Information:
Infrastructure Delivery Branch
Dept of Housing, Local Government, and Regional Services
TEL: (08) 8995 5015, FAX: (08) 8995 5110
Email: tex.lithgow@nt.gov.au

SOURCE INFORMATION

CONTOUR INTERVAL :		CURRENCY OF TOPOGRAPHY :	26 Jun 2012
HORIZONTAL DATUM :	GDA94	SOURCE MAP SCALE :	598
VERTICAL DATUM :	AHD	ZONE UTM :	53
PROJECTION :	Transverse Mercator	DATE GENERATED :	24 June 2013

N

GDA

0 10 20 30 40 50

Locality Diagram



SERVICED LAND AVAILABILITY PROGRAM
SLAP Map
Garawa 1 (Borroloola Town Camp)

Borroloola Town Camp

Roper Gulf Shire Council

Community ID: 229

FOR LEGEND REFER TO
DRG. NO. 43-20867-C090

NOTE

1. FOR LOT BOUNDARY SETOUT COORDINATES FOR GARAWA 1, REFER TO DRG. NO. 43-20867-C029

FUTURE LOTS OUTSIDE EXISTING CATCHMENT. AUGMENTATION TO SEWER SYSTEM REQUIRED IF LOTS TO BE SERVICED IN THE FUTURE.

PERMISSION TO USE FOR CONSTRUCTION PURPOSES

SIGNED MC DATE 11/8/06

ON BEHALF OF LAND DEVELOPMENT FOR INCORPORATION INTO THE PWC NETWORK

THIS PERMISSION TO USE IS GIVEN ON THE BASIS THAT THE DEVELOPER AND/OR CONSULTANT IS NOT ABSOLVED FROM FULL RESPONSIBILITY FOR THE CORRECTNESS AND ACCURACY OF THE DESIGN AND/OR DOCUMENTS SO ASSOCIATED

WARNING

BEWARE OF UNDERGROUND SERVICES
The locations of underground services are approximate only and their exact position should be proven on site. No guarantee is given that all existing services are shown.

PWC DRG No. B06-3856

ISSUED FOR TENDER

No	Revision	Note * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date
0	ISSUED FOR TENDER		ZV			25/07/06

0 5 10 15 20 25m
SCALE 1:500 AT ORIGINAL SIZE

GHD CLIENTS | PEOPLE | PERFORMANCE
Level 5, 65 Smith Street Darwin NT 0800 Australia
PO Box 351 Darwin NT 0801
T 61 8 8982 0100 F 61 8 8981 1075
E drwmail@ghd.com.au W www.ghd.com.au

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Drawn	Z. VOGT	Designed	M.GLIDDON
Drafting Check		Design Check	
Approved			
Date			
Scale	AS SHOWN	This Drawing must not be used for Construction unless signed as Approved	

Client: AUSTRALIAN ARMY 19 CHIEF ENGINEER WORKS
Project: BORROLOOLA NAHS -MARA YANYULA & GARAWA 1
Title: MASTER PLAN FOR GARAWA 1
SHEET 1 OF 2

Original size: A1 Drawing No: 43-20867-C096 Rev: 0

Plot Date: 01 August, 2006 - 9:58 AM Cad File No: G:\43\20867\CADD\Drawings\43-20867-C096_C097.dwg

FUTURE LOTS OUTSIDE EXISTING CATCHMENT.
AUGMENTATION TO SEWER SYSTEM REQUIRED
IF LOTS TO BE SERVICED IN THE FUTURE.

JOINS RIGHT OF DRG NO. 43-20867-C096

ABANDONED SEWER

ABANDONED SEWER

COMMUNITY USE

PARK

BUILDING DEMOLISHED

FUTURE SEWER EXTENSION

FUTURE CONNECTION
LOT CONTROL TO BE CONFIRMED ON SITE

FUTURE CONNECTION
LOT CONTROL TO BE CONFIRMED ON SITE

EXISTING HD LOCATION TO BE CONFIRMED ON SITE

EXISTING HD LOCATION TO BE CONFIRMED ON SITE

EXISTING HD LOCATION TO BE CONFIRMED ON SITE

CONNECTION ORIENTATION TO BE CONFIRMED ON SITE

FUTURE CONNECTION

FUTURE CONNECTION ORIENTATION TO BE CONFIRMED ON SITE

ABANDON EXIST.MH REFER NOTE 2

ABANDON EXIST.MH REFER NOTE 2

ABANDON EXIST.MH REFER NOTE 2

FOR LEGEND REFER TO
DRG. NO. 43-20867-C090

NOTE

1. FOR LOT BOUNDARY SETOUT COORDINATES FOR GARAWA 1, REFER TO DRG. NO. 43-20867-C029

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SIGNED [signature] DATE 11/8/06

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WARNING

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The locations of underground services are approximate only and their exact position should be proven on site. No guarantee is given that all existing services are shown.

PWC DRG No. B06-3857

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No	Revision	Note: * Indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date
0	ISSUED FOR TENDER		ZV			28/07/06

SCALE 1:500 AT ORIGINAL SIZE
VERTICAL 1:100 AT ORIGINAL SIZE
HORIZONTAL 1:1000 AT ORIGINAL SIZE

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Drawn Z. VOGT	Designed M.GLIDDON	
Drafting Check	Design Check	
Approved		
Date		
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Client AUSTRALIAN ARMY 19 CHIEF ENGINEER WORKS
Project BORROLOOLA NAHS -MARA YANYULA & GARAWA 1
Title MASTER PLAN FOR GARAWA 1
SHEET 2 OF 2

Original Size A1 Drawing No: 43-20867-C097 Rev: 0

Plot Date: 01 August, 2006 - 8:03 AM Cad File No: G:\43\20867\CADD\Drawings\43-20867-C098_C097.dwg

FOR LEGEND REFER TO
DRG. NO. 43-20867-C040

SEWER OVERFLOW
150 UPVC

SB
CL 18.350

SC
CL 18.720

SD
CL 18.470

1B
CL 23.535

1C
CL 23.255

2A
CL 24.290

2A
CL 24.540

10
CL 23.320

10
CL 24.170

5A
CL 17.600

PS1
GARAWA 1
WASTEWATER
PUMP
STATION

WATER
BORE

WATER
BORE

OPEN
SPACE

OPEN
SPACE

OPEN
SPACE

COMMUNI
USE

PAR

1/36.47
15.24

1/36.47
15.24

1/0.00
15.86

1/0.00
15.86

1/70.12
16.98

1/70.12
16.98

1/12.53
14.48

1/12.53
14.48

1/10.46
21.69

1/34.71
21.93

1/12.36
22.41

1/11.26
23.38

1/0.00
22.72

FUTURE
CONNECTION

FUTURE CONNECTION
ORIENTATION TO BE
CONFIRMED ON SITE

ABANDON EXIST.MH
REFER NOTE 2

ABAND
REFER

WATER
TANKS

JOINS LEFT OF DRG NO. 43-20867-C046

NOTE

1. FOR LOT BOUNDARY SETOUT COORDINATES FOR GARAWA 1, REFER TO DRG. NO. 43-20867-C029
2. ABANDONED MANHOLE:
   CUT TOP 300mm OFF MANHOLE, FILL WITH 3% CEMENT STABILISED SAND AND REINSTATE SURFACE.

FUTURE LOTS OUTSIDE EXISTING CATCHMENT.
AUGMENTATION TO SEWER SYSTEM REQUIRED
IF LOTS TO BE SERVICED IN THE FUTURE.

PERMISSION TO USE FOR CONSTRUCTION PURPOSES

SIGNED mc k DATE 11/8/06

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PWC DRG No. B06-3848

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0	ISSUED FOR TENDER	ZV			26/07/06

0 5 10 15 20 25m
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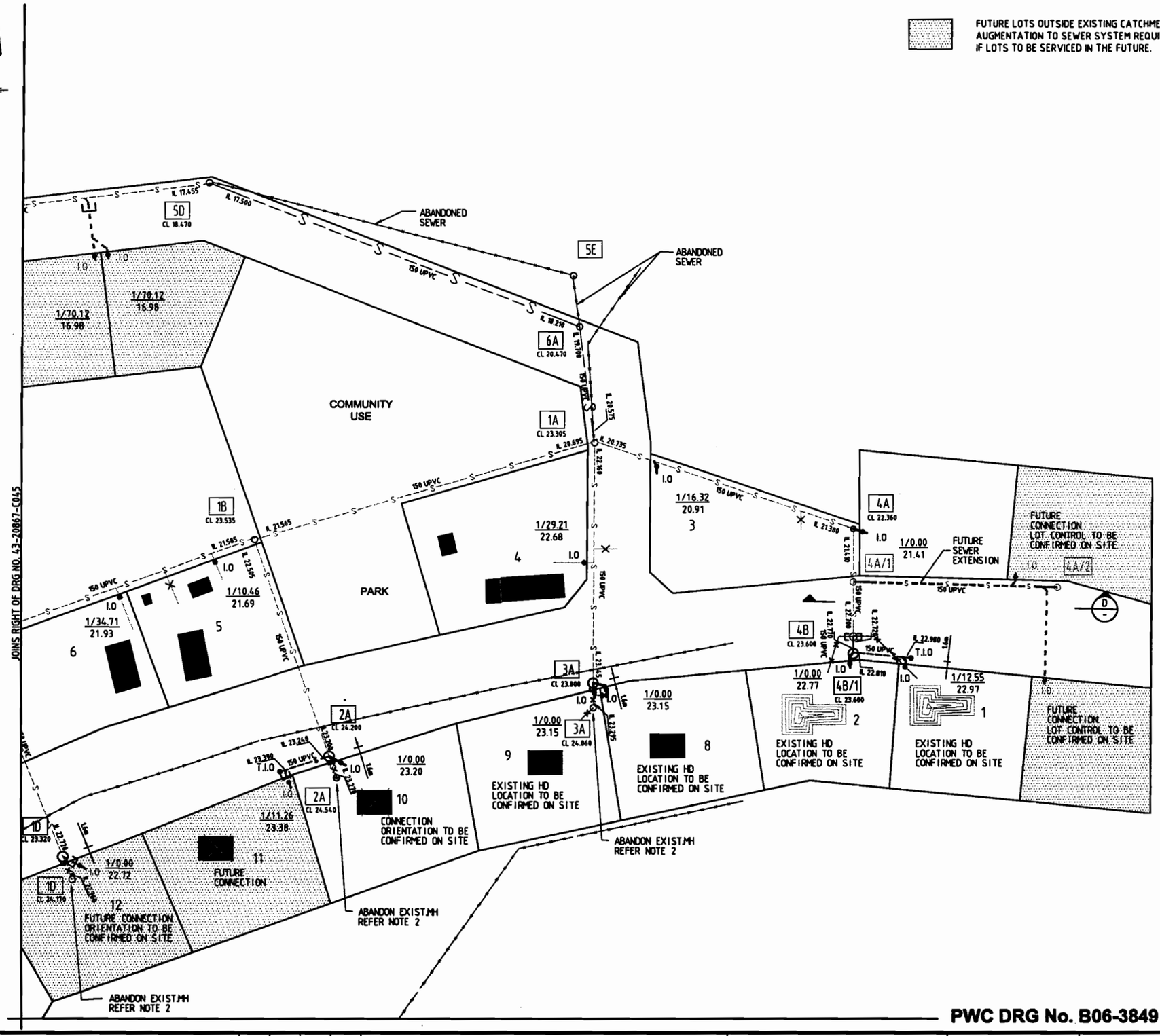
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Drafting Check	Design Check
Approved	
Date	
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Project BORROLOOLA NAHS -MARA YANYULA & GARAWA 1
Title SEWER RETICULATION PLAN FOR GARAWA 1
SHEET 1 OF 2

Original Size A1 Drawing No: 43-20867-C045 Rev: 0

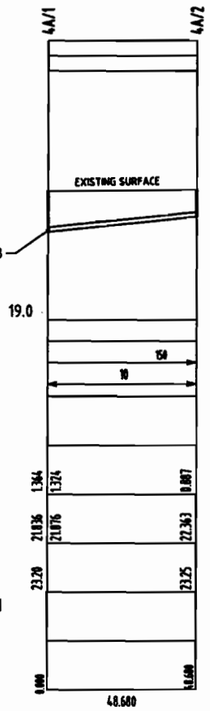
Plot Date: 08 August, 2006 - 10:41 AM Cad File No: C:\CADITEMP\AcPublish_3216\R 43-20867-C045_C045.dwg



MANHOLE NO. 4A/1 4A/2

MANHOLE/COVER TYPE

MANHOLE DROP TYPE



LOCATION

DIAMETER (mm)

GRADE (mm/m)

DEPTH TO INVERT

INVERT LEVEL

SURFACE LEVEL ALONG SEWER

SURFACE LEVEL ALONG NTH ALLOTMENTS BOUNDARY

CHAINAGE

DISTANCE

D SECTION
FUTURE SEWER EXTENSION

FOR LEGEND REFER TO DRG. NO. 43-20867-C040

NOTE

1. FOR LOT BOUNDARY SETOUT COORDINATES FOR GARAWA 1, REFER TO DRG. NO. 43-20867-C029
2. ABANDONED MANHOLE: CUT TOP 300mm OFF MANHOLE, FILL WITH 3% CEMENT STABILISED SAND AND REINSTATE SURFACE.

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SIGNED MCB DATE 11/8/06

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PWC DRG No. B06-3849

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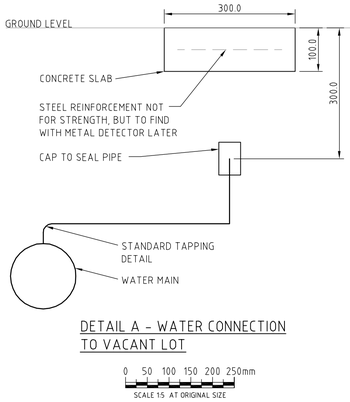
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Drafting Check	Design Check	Project	BORROLOOLA NAHS -MARA YANYULA & GARAWA 1
Approved		Title	SEWER RETICULATION PLAN FOR GARAWA 1 SHEET 2 OF 2
Date			
Scale AS SHOWN	This Drawing must not be used for Construction unless signed as Approved	Original Size A1	Drawing No: 43-20867-C046 Rev: 0

Plot Date: 08 August, 2006 - 10:41 AM Cad File No: C:\CADXTEMP\AsPublish_5316\43-20867-C030_C046.dwg

LEGEND

- NEW WATER MAIN - DN 150
- EXISTING WATER MAIN
- PROPERTY SERVICE INCLUDING METER & BACKFLOW PREVENTION DEVICE
- WATER CONNECTION TO VACANT LOT (SEE DETAIL A)
- THRUST BLOCK AT DIRECTIONAL CHANGE
- LOT BOUNDARY
- FENCE
- GATE
- SV — EXISTING STOP VALVE
- SV — NEW STOP VALVE
- FH — FIRE HYDRANT
- AV — AIR VALVE
- STRUCTURE



DETAIL A - WATER CONNECTION TO VACANT LOT

0 50 100 150 200 250mm
SCALE 15 AT ORIGINAL SIZE



0 20 40 60 80 100
SCALE 1 : 1000

PWC Dwg No. B06-3839

AS CONSTRUCTED

ALPHA	DESCRIPTION	BY	CHKD	DATE
	AMENDMENTS			

19 CE WORKS
373a AVOCA STREET RANDWICK NSW 2031
Telephone (02) 93490242 Facsimile (02) 93490243

Designed and drawn by 19 Chief Engineer Works under a quality system certified as complying with ISO / AS 9001 by an accredited body.

SCALE: 1: 1000	DRAWN BY: CAPT D. WALKER
DATE DRAWN: 02 SEP 08	SURVEYOR: AUSURV
MANAGER (S):	
PROJECT ENGINEER: CAPT D. WALKER	
SENIOR PROJECT ENGINEER: MAJ J. TATE	
CHIEF ENGINEER: LTCOL D. COYLE	

PROJECT: AACAP 2006 BORROLOOLA, NT

TITLE: GARAWA 1 COMMUNITY WATER PLAN

SIZE: A1 | DRAWING NUMBER: 985-148-X05 | DRAWING STATUS: AS CONSTRUCTED

4420

Transformer data

Group	Com Id	Location	Community Name	Dwellings No. (Funded Dwellings)	Dwellings No. (Bennett Design)	New Houses ** (Future Demand)	Primary Volatge Level (KV)	PWC Substation ID	PWC Test Number	Transformer size (KVA)	KVA Total dwellings @ 4.5KVA	KVA Total dwellings @ 7KVA	Comments
1	290	Darwin	Bagot	55	55		11	1924	1735	300	247.5	385	
	344	Darwin	Knuckey Lagoons	18	19	2	11	1771	2163	100	85.5	133	
	347	Darwin	Kulaluk	19	19		11	1092	10607	50	85.5	133	
	403	Darwin	Palmerston Town Camp	20	16		22	10196	10245	100	90	140	Two transformers for this Town Camp. Transformers are not in boundary of Town Camp [The nearest transformers data to Town Camp are highlighted in yellow].
							22	265	11645	25			
	412	Darwin	Railway Dam (One Mile Dam)	5	6	2	11	1041	4378	200	27	42	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	427	Adelaide River	Amangal	9	9		22	216	12187	100	40.5	63	Two transformers for this Town Camp.
							22	184	5646	63			
	687	Jabiru	Manabadurma	10	12		11	5050	11107	200	54	84	
	825	Darwin	Minmarama Park	24	24		11	2147	11372	100	108	168	
2	606	Katherine	Warlpiri Transient Camp	9	9		22	6416	4886	100	40.5	63	Two transformers for this Town Camp.
							22	6074	4695	25			
	621	Katherine	Miali Brumby (Kalano)	47	31		22	6133	12247	315	211.5	329	
	640	Pine Creek	Pine Creek Compound	4	4		22	6666	3147	25	18	28	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	971	Mataranka	Mulggan	12	9	4	22	6819	5296	16	54	84	
							22	6818	5297	16			
							22	6384	11028	25			
3	215	Tennant Creek	Blueberry Hill (Munji-Marla)	2	2		22	7079	1868	200	9	14	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	223	Tennant Creek	Dump Camp (Marla-Marla)	7	7		22	7181	11088	200	31.5	49	
	224	Elliott	Elliott South Camp	12	12		11	7504	4718	200	54	84	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	225	Elliott	Elliott North Camp	36	25		11	7505	4715	100	162	252	
	238	Tennant Creek	Kargaru (East Side Camp)	12	12	1	22	7572		200	54	84	
	246	Tennant Creek	Ngalpa Ngalpa	18	21		22	7179		200	94.5	147	Two transformers for this Town Camp.
							22	7033	10904	315			
	271	Tennant Creek	Village Camp	12	12	1	22	7183	11107	200	54	84	
	681	Tennant Creek	Tingkarli	12	12		22	7180		200	54	84	
	684	Tennant Creek	Wuppa	15	15	1	22	7141	11092	100	67.5	105	Two transformers for this Town Camp.
							22	7182	11095	200			
4	3	Alice Springs	Akngwertnarre (Morris Soak)	11	15		11	8596	11336	300	67.5	105	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	16	Alice Springs	Anthelk Ewlpaye (Charles Creek)	17	10		11	8569		315	76.5	119	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	17	Alice Springs	Anthepe	15	15		22	8598	5874	200	67.5	105	Data extracted from PWC asset information. There was not access to this Town Camp due to ceremony on inspection day.
							22	8597	11244	315			
	19	Alice Springs	Aper Alwerrknge (Palmers)	7	6		11	8405	2939	200	31.5	49	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	35	Alice Springs	Ewyenper Atwatye (Hidden Valley)	47	47		11	8622	11202	100	211.5	329	
							11	8623	11203	100			
							22	8625	11205	63			
							11	8626	11204	100			
	47	Alice Springs	Ilparpa	13	13		22	8611	11702	200	58.5	91	
	48	Alice Springs	Ilperle Tyathe (Walpiri)	10	9		11	8001	11209	315	45	70	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	50	Alice Springs	Ilyperenye (Old Timers)	10	10		22	8145	3323	100	45	70	
	64	Alice Springs	Bassos	2	2		11	8002	10946	50	9	14	
	69	Alice Springs	Karnte	19	19		22	8282	2345	100	85.5	133	
	87	Alice Springs	Yarrenty Altere (Larapinta Valley)	34	34		11	8617	11334	100	153	238	
							11	8618	11200	63			
							11	8619	11335	100			
							11	8620	11201	100			
	90	Alice Springs	Inarlenge (Little Sisters)	16	22		22	8137	2925	100	99	154	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	108	Alice Springs	Mpwetyerre (Abbotts)	6	6		11	8093	11703	315	27	42	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
	113	Alice Springs	Mount Nancy (Nyewente)	11	12		11	8405	2939	200	54	84	
	129	Alice Springs	Nyewente (Trucking Yards)	26	26		11	8629	11312	300	117	182	
	675	Alice Springs	Hoppys	15	19						85.5	133	There is not any Transformer in boundary of Town Camp. Also it's not shown in PWC asset information.
	676	Alice Springs	Ilpiye Ilpiye (Golders Camp)	15	14		11	8314	369	50	67.5	105	
	1029	Alice Springs	Kunoth	4	4		11	8569		315	18	28	Transformer is not in boundary of Town Camp [The nearest transformer data to Town Camp is highlighted in yellow].
5	222	Borroloola	Mara	28	29	2	11	6187	12610	100	130.5	203	Two transformers for this Town Camp.
							11	6545	10203				
	229	Borroloola	Garawa 1	16	14		11	6546	10166	100	72	112	Two transformers for this Town Camp.
							11	6332	4890	100			
	278	Borroloola	Yanyula	29	29		11	6162	10496	200	130.5	203	Data extracted from PWC asset information. It's outside of Twon Camp, shown only Transformer to this Town Camp.
							11		10167				This transformer is not shown in PWC asset information. It's installed in Boat Ramp Road near to Town Camp and connected to Electrical reticulation of Town Camp.
	992	Borroloola	Garawa 2	11	11		11	6189	2669	25	49.5	77	

** For New house's demand calculation see section 13.4 "Future Demand".

Yanyula

Yanyula

1 Design

The infrastructure reviews have been undertaken against current relevant standards for typical sub-divisions. The following standards have been used in undertaking the reviews.

Sewerage and water supply

- Water Services Association of Australia – Sewerage Code – WSA 02 Part 1: Planning and Design
- Power and Water Corporation supplement to WSA 02
- Water Services Association of Australia – Sewerage Pumping Station Code – WSA 04 -2005 Part 1: Planning and Design
- Power and Water Corporation supplement to WSA 04
- Water Services Association of Australia – Water Supply Code – WSA 03 2002 Part 1: Planning and Design
- Power and Water Corporation supplement to WSA 03
- Power and Water Corporation Indigenous Community Engineering Guidelines (2008)
- Department of Housing and Community Development Indigenous Community Engineering Guidelines (ICEG 2014, updated September 2016)
- Power and Water Corporation Essential Services Infrastructure Assessment and Upgrade Guidelines (for Town Camps in Urban Communities, 2009)
- Power and Water Corporation Standard Drawings
- Australian Standards

Electrical services

Electrical infrastructure has been assessed against AS/NZS3000 Wiring Rules and against PWC Service, Installation and Metering Rules and Urban Residential Development (URD) Design Standards where possible.

With one exception, town camps are each a single lot and compliance with AS/NZS3000 is sufficient to address potential safety concerns.

As such application of PWC URD Design Standards will mainly apply to the incoming supply and bulk or initial multi-metering panels if provided.

URD Design Standards for internal reticulation and street lighting appear to have been applied in many cases for convenience rather than compliance.

For the purposes of this report, the demand per dwelling allowances of URD Design Standards have been used to estimate incoming supply and overall distribution capacity requirements.

The following standards apply:

- Australian Standards
- Power Networks Design and Construction Guidelines, Power and Water Corporation
  - NP001.1_Design and Construction of Network Assets – General Requirements
  - NP001.3_General Specification for Overhead Electrical Reticulation
  - NP001.6_General Specification for URD Subdivisions
  - NP003_Installation Rules_V3
  - NP007_Service Rules
  - NP027_Capture of Newly Installed Street Lighting Information
  - NP041_Guidelines for Electrical Design Consultants

Further referral to the guidelines in this report will be designated by the guidelines number, NP001.1.

Communications

- National Broadband Network Website viewed 21 January 2017 (http://www.nbnco.com.au/) – NBN rollout maps

General

It should be noted that if the town camps are proposed to be subdivided and services assets gifted to Power and Water Corporation (PWC) for operation and maintenance, all of these services will need to fully meet PWC standards. With the exception of a few town camps that have recently been upgraded, this will require the full replacement and/or realignment of most services.

2 Condition assessment

2.1 Rating assessment matrix

A condition rating matrix was developed and used to assess all municipal infrastructure. The same rating was used for all services to maintain consistency in assessments. Table 1 Below shows the condition rating and operability.

Table 1 Condition rating

Condition rating		Operability
1	Very Poor	Not operational
2	Poor	Not fully operational or requires immediate maintenance to keep operational
3	Good	Fully operational, may require routine maintenance
4	Very Good	Fully operational, may require maintenance in the next six months
5	Excellent	New, fully operational

2.2 Civil assessment limitations

The civil infrastructure condition investigations were subject to a number of limitations. These include:

- Only accessible services have been investigated. This includes inspecting the top of sewer manholes, side entry pits, etc., however, does not include opening pits to inspect infrastructure below ground.
- No physical testing of the sewer, water or stormwater network was undertaken.
- No survey or service locating was undertaken.

As there was no survey, potholing or CCTV undertaken on the underground infrastructure there is insufficient information to make determinations on the asset condition. The condition assessments discussed in this report are only for the accessible services and do not necessarily represent the condition of the underground infrastructure. For the majority of the town camps, other than a few that have recently been upgraded it was found that the underground services are generally undersized and it is likely, due to their age, that the these services are in poor condition. Either factor would trigger the need for a complete replacement to meet current relevant standards.

2.3 Electrical assessment limitations

The electrical infrastructure condition investigations were subject to a number of limitations. These include:

- Inspections were carried out without the assistance of an electrical tradesman.
- Only accessible services were investigated. Assessments were of a visual nature and no pit covers were removed.
- Overhead equipment was assessed from ground level.
- Switchboards were not opened and no assessment of the internal connections or bus ratings was made.
- Electrical infrastructure was assessed down to the meter for multi-meter panels and down to the termination, overhead pole or distribution pillar, of the supply cable to a meter located at a dwelling.

3 Current infrastructure issues

Power and Water Corporation (PWC) have advised of the following concerns and issues in regard to the sewerage, water and electrical infrastructure at all town camps.

3.1 Ownership and maintenance

PWC stated there has always been confusion regarding the ownership and responsibilities of the internal sewer, water and electrical infrastructure. PWC have advised that they have no legal tenure on the majority of assets in any town camps and that the owner is essentially that of the land owner or leaseholder. This is further discussed for each type of infrastructure for each town camp.

The ownership and who is responsible for the maintenance of the sewage pump stations and street lighting is a major concern. In most town camps it was found that PWC have been maintaining the assets on an in-kind basis, although there are no maintenance or access agreements in place and the infrastructure is generally not compliant to PWC standards.

3.2 Access to infrastructure

PWC advised that due to the uncertainty surrounding ownership and responsibility of the sewerage, water and electrical infrastructure, each town camp is seen as a single lot with multiple houses on it. There are no formal road reserves or easements where the municipal infrastructure should be located. PWC therefore have no legal right to enter the town camps to work on the infrastructure, nor can PWC stop others from working on the infrastructure. There is a risk that the maintenance undertaken by others may be to a lower standard than PWC.

It should be noted that there are currently no legal services easements within the town camps, except for a few cases where a town service passes through the town camp. Therefore it is recommended that easements are created over any infrastructure owned by PWC and any future assets to be gifted to PWC, to allow the service providers access to the infrastructure.

3.3 Existing infrastructure

PWC have stated that although the existing sewerage and water infrastructure appears to comply with relevant standards in some locations, the capacity cannot be assumed to meet PWC requirements due to the potential for underground substandard condition and/or grading of pipework. It is likely that these assets will need to be fully replaced to PWC standards to ensure sufficient capacity.

The planning process currently allows construction within the town camps on Commonwealth land without requiring service authority (PWC) approvals. This means that there has been no opportunity for PWC to recover contributions towards required upgrades to headworks servicing the developments and these upgrades have been paid for by PWC in the past. This inconsistency needs to be addressed for future developments within the town camps to ensure PWC are able to continue to provide adequate services.

3.4 Safety concerns

PWC have expressed concerns with safety of PWC staff and contractors working within the camps. PWC have employed procedures such as multiple people / vehicles to attend the site, with police or housing safety officers as required. This

generally leads to a delayed response time and increased cost to respond to and remediate emergency situations.

PWC have also raised the concern that if others work on water infrastructure within the town camps and do not apply the correct sanitation procedures they not only risk contaminating the entire water supply network within the town camp, at some town camps with direct connections to the town supply, they risk contaminating the entire town's water supply.

4 Available information

As the site investigations were limited to accessible/visible services, information on below ground services (such as electrical cables, sewer pipes, water supply pipes, etc.) were determined from available information. This information included:

- Serviced Land Availability Program (SLAP) maps,
- Department of Family & Community Services - Connecting Neighbours Program – Essential Services Scoping Study Report Volume 1 April 2005,
- Connecting Neighbours Project – Infrastructure Assessment and Recommendation Report - Arup Pty Ltd, April 2005,
- Connecting Neighbours Program – Borroloola – Design Report and Option Summary, Volume 3, Arup Pty Ltd, April 2005,
- Drawings supplied by NT Department of Infrastructure - Technical Records,
- Drawings supplied by Power and Water Corporation,
- Bennett Design inspection reports and population data.

Aurecon undertook a site investigation of the Yanyula community on 13 December 2016 to inspect roads, stormwater drainage, electrical services, sewerage and water supply, and community structures. The following sections detail the outcomes of this investigation and the assessments of the infrastructure.

The civil and electrical inspection reports can be found in the Appendicies.

5 Sewerage

5.1 Ownership and boundaries

The sewerage infrastructure within Yanyula community is the property of Rrumburriya Malandari Housing Association, but is the responsibility of Mabunji Aboriginal Resource Association Incorporated to maintain.

Power and Water Corporation own a DN225 gravity main that runs to the east of Yanyula Camp. Some manholes on this line were investigated during the site inspection. PWC advised that the sewer network has been upgraded as part of the Connecting Neighbours program and that the new infrastructure should comply with PWC standards. PWC noted that the sewerage infrastructure has not been handed over to PWC, however they provide emergency maintenance on an in-kind basis as there is no formal maintenance agreement in place.

5.1.1 Connection methods and billing

It is understood that the sewerage bills are charged by PWC to the owner of the town camp, in this case Akngwertnarre Association Incorporated. PWC have advised the usage is current charged for 32 sanitary fittings.

It is not known what contribution the residents make towards the sewerage bills.

5.2 Existing infrastructure condition assessment

The sewer infrastructure inspection was limited to inspecting the condition of manhole covers, as all other sewerage infrastructure is below ground. A total of nine manholes and one pump station were inspected, with condition ratings as follows:

Table 2 Sewer condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Manhole		1	8			9
Pump station			1			1



Figure 1 Pump station, condition: good

The sewer manholes and pump station were generally in good condition. The pump station was not accessible so was only inspected from outside the fence. Detailed drawings of the pump station were available so an assessment could be undertaken.

5.3 Current performance and risks

5.3.1 Current sewer network performance

The current capacity of the sewer network was calculated based on the following design assumptions:

- The adopted minimum grade for the pipework is 1.0%, as advised by Power and Water Corporation.
- The Equivalent Population (EP) has been calculated assuming one household equates to 9 EP, based on discussions with Power and Water Corporation.
- The capacity has been assessed by calculating the current flow rate, and the maximum flow rate when the sewer pipe flows full. The result is then a percentage of how much of the pipe is currently being used.
- Manning's roughness coefficient of the pipework is 0.012, as recommended by PWC for PVC pipes.
- Where the sewer pipe grade, size or material is not known, it is assumed to be non-compliant to PWC standards.
- As Yanyula camp disposes to a pump station and absorption trench, the capacity of the pump station has also been assessed.

The current number of houses in Yanyula Town Camp is 29, this multiplied by 9 EP per house gives a total current EP of 261. The capacity of the existing sewer was then calculated. The percentage shows how much of the pipe capacity is currently being used.

PWC provided as-constructed drawings which showed that the pipe is DN150 PVC.

Table 3 Existing sewer capacity

Catchment	Current total EP	Diameter of connection (mm)	Adopted PWC minimum slope (%)	Q_{full} (L/s)	Current Q (L/s)	Current capacity (%)
Catchment 1	261	150	1.0	16.50	2.80	17%

Table 3 above shows that the capacity of the existing sewer network is adequate for the current peak population. PWC advised that they believe the network is up to PWC standards.

5.3.2 Current sewage pump station performance

The capacity of the pump station was checked against the following criteria, based on PWC guidelines:

- Less than 12 pump starts per hour (for pumps less than 15kW),
- Minimum velocity 0.9 m/s,
- Maximum velocity 2.5 m/s,
- Overflow storage equal to three hours of peak dry weather flow.

Using the current EP of 261 and the information provided on the detailed drawings, the pump station appears to have sufficient capacity for the Yanyula community. It is noted that the pump station is not a dedicated pump station for Yanyula community, and that it also receives flows from north of the community. The flows from outside of the Yanyula community were not known so a full review of the pump station could not be undertaken.

5.4 Future demands

As no new developments are currently planned for the community, there are no additional upgrades required to cater for future demand.

5.5 Recommended works

As the current internal sewer network is assumed to be undersized and non-compliant, it is recommended that the pipe is upgraded to a DN150 PVC, and installed within the road reserve or easements as required. The cost estimates include 900 m of DN150 PVC, new sewer manholes, and 29 housing connections.

6 Water supply

6.1 Ownership and boundaries

The water reticulation at Yanyula is a DN150 PVC main with two supply points and no dead ends, refer Appendicies.

The water supply assets within Yanyula are believed to be owned by Rrumburriya Malandari Housing Association, but are the responsibility of Mabunji Aboriginal Resource Association Incorporated to maintain. The water is supplied from the water main outside of the community, which is owned by PWC. Figure 2 shows the extent of water services.

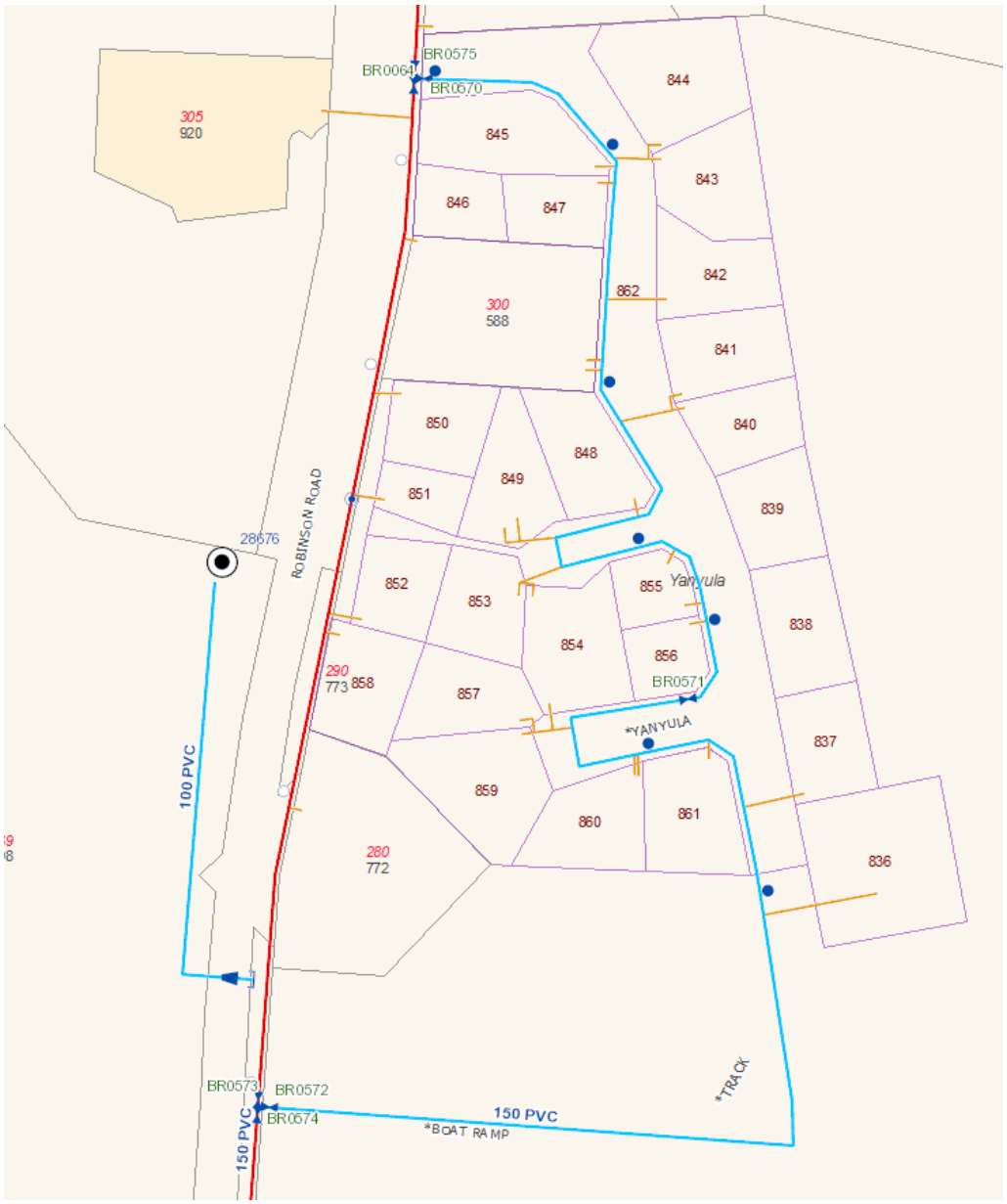


Figure 2 Yanyula water supply

6.1.1 Connection methods and bills

PWC advised that they currently charge water bills are to the Rrumburriya Malandari Housing Association. It is not known what contribution the residents make towards the water bills. The water usage is measured at the lot water meters and billed individually.

It is proposed that PWC measure the water supply to the entire community, as opposed to individual lots within the community. This requires the installation of a bulk water meter on the water main located at the community boundary and looping the internal main. Under this scheme, the water bill for the entire community is the responsibility of the governing body, being Narwinbi Aboriginal Land Trust for Yanyula. It will be up to governing body to assign bills to residents accordingly.

It is recommended that the individual lot meters are maintained in addition to the proposed continuation of using a bulk water meter. This will assist with the governing body distributing bills to residents, the identification of any leaks in the network, and meeting PWC standards should the town camp be subdivided in the future.

A total of 23 residential lot water meters were assessed and Bennett Design reported 29 dwelling at Yanyula. Therefore, up to an additional six water meters are required to be installed to cover the properties without an existing water meter. Note, some water meters may have been present however not visible due to overgrown flora or restricted property access. Consequently water meters may have not been discovered during the inspection.

6.2 Existing infrastructure assessment

The site investigation for the water infrastructure included assessing the condition of any air valves, fire hydrants, tanks, taps, and water meters. The assessment was limited to services that could be accessed above ground; no below ground services were inspected.

The condition of each asset is as follows:

Table 4 Water asset condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Fire hydrants	1	2	5			8
Water meter (residential lots)		21	2			23



Figure 3 Fire hydrant, condition: *poor*



Figure 4 Residential lot water meter, condition: *poor*

In general the fire hydrants at Yanyula were assessed as being in good condition. Figure 3 above shows a fire hydrant which is almost completely covered by dirt and leaves. The debris covering the hydrant should be cleared to ensure clear visibility. Another fire hydrant was assessed as very poor as there was no concrete cover. A new concrete pad around the pit lid is required and should be painted red.

Most of the residential water meters were missing the tap handles and consequently rated as poor. In total 21 residential lot water meters require replacement tap handles.

6.3 Current demands

It is understood that Borroloola has historically had issues with available supply for fire flow demands and that the NT Fire and Rescue Services had formally notified acceptance of a lower supply rate of 10 l/s for Borroloola. It is unclear if the water supply to the Borroloola Township has improved in recent years and if a supply rate of 25 l/s (as per PWC fire flow) is currently achievable.

The current demand of the community was calculated based on the following design assumptions:

- The nominal peak day flow is 1100 L/capita/day, based on PWC's supplement to WSA 03 2002. This value is for the northern region of NT. It was assumed that the nominal peak day flow of 1100 L/capita/day also applies to water usage within the community, although it is possible that this value could be higher in real life due to a lack of controls to reduce water usage.

- The Equivalent Population (EP) has been calculated assuming one household equates to 9 EP, based on discussions with Power and Water Corporation.
- The peak hour factors are listed in PWC's Supplement to WSA 03-2002, and they depend on the population range of the community. The peak hour factor of 3.0 has been adopted, for populations less than 500.

Table 5 shows the calculated demand.

Table 5 Current water demand

Total dwellings	EP	Demand (l/s)	Peak hour demand (l/s)
29	261	3.32	9.97

The water reticulation is expected to have sufficient capacity for PWC flow requirements including peak hour and fire flow.

The assessment of water supply for firefighting has been based on the size of the water mains and the condition of the accessible fire hydrants. Additional hydrants have been recommended where it appears the existing number of hydrants are insufficient. In the case of Yanyula no additional fire hydrants are expected to be required.

PWC have advised that with the upgrades in recent years the existing water reticulation network in Yanyula should be up to PWC standards.

6.4 Future demands

As no new developments are currently planned for the community, there are no additional upgrades required to cater for future demand.

6.5 Recommended works

The infrastructure that was assessed as very poor or poor is recommended to be upgraded to prevent failure in the future. The following maintenance works are recommended;

- Clear debris away from four fire hydrants
- Install and paint concrete slab around hydrant pit lid
- Replace 21 residential lot meter handles

The community is viewed overall as a large single lot and as previously detailed proposed have the water usage measured accordingly. In order to measure the water usages as a single lot, a bulk water meter should be installed. As the network is ring main, one of the supply points should be disconnected and reconnected to the internal network creating a looped main. This allows the single remaining point to be metered. The cost estimates for the upgrades at Yanula include:

- Disconnect secondary supply point and reconnect to water main creating a looped
- Install new bulk water meter at community boundaries
- Install up to six additional residential lot meters

7 Roadworks

7.1 Ownership and boundaries

It is the current understanding that the roads within Yanyula community are the property of Rrumburriya Malandari Housing Association, but are the responsibility of Mabunji Aboriginal Resource Association Incorporated.

7.2 Existing infrastructure condition assessment

The road network within Yanyula community consists of sealed roads. Table 6 below summarise the condition of a single sign inspected. There were no footpaths or carparks at Yanyula. As there are no kerbs along the road, the driveways have no layover kerbs and are informal.

Table 6 Roadworks condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Sign		1				1



Figure 5 Sign, condition: *poor*

The sign was in poor condition due to not being clearly visible from the road. It is recommended that the tree is cut back so the sign can be seen. It was noted during inspections that speed humps were not painted and no warning signage was installed, it is recommended that these changes are made.

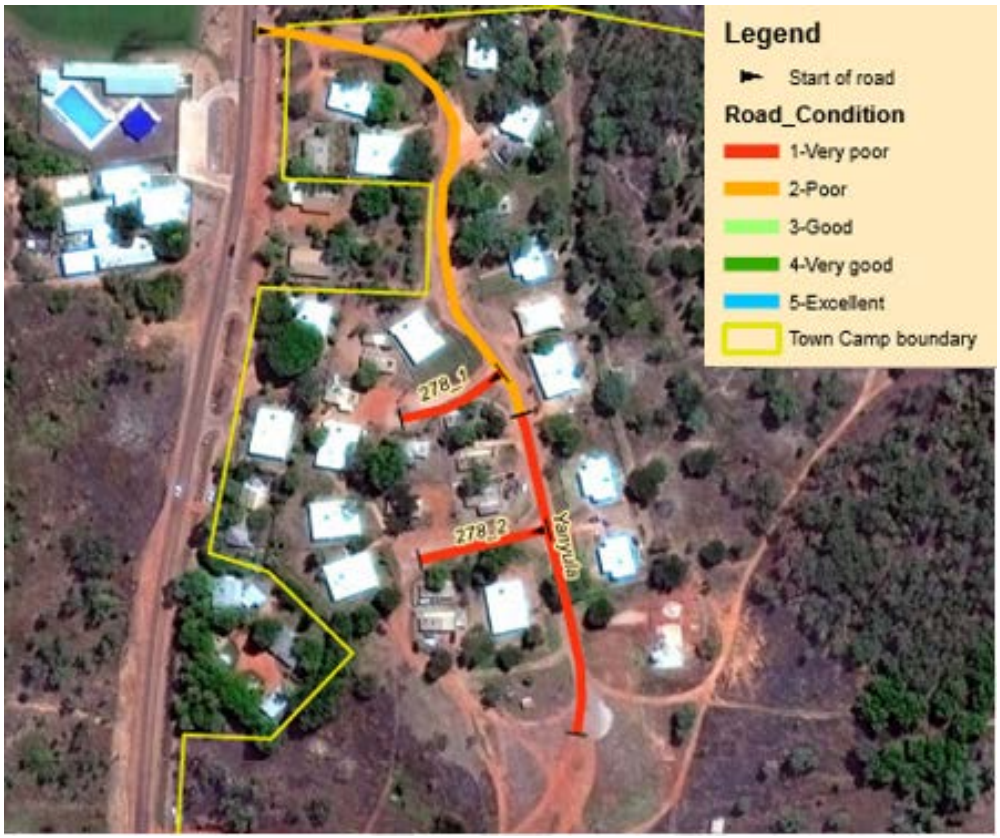


Figure 6 Yanyula community road network

Table 7 below details the condition of the roads within Yanyula community for specific segments.Figure 6 Table 7shows a map of the community's road network with the condition ratings, road name, and chainage direction. Note, the percentage refers to the percentage of that particular road segment which experiences the defect.

Table 7 Road network condition assessment

Road name	Chainage start (km)	Chainage end (km)	Condition (1 to 5)	Defects and associated condition
Yanyula Road (53032)	0.0	0.25	2	-edge breaks (2) -two potholes (2)
	0.25	0.40	1	-50% of road has edge breaks (2) -30% of road has potholes (2)
278_1	0.0	0.05	1	-5% of road has potholes (2)`
278_2	0.0	0.06	1	-5% of road has potholes (1) -40% of road has edge breaks (2)



Figure 7 Yanyula Road, condition: *very poor*



Figure 8 Road 278_1, condition: *very poor*

7.3 Current performance and risks

The road was in very poor condition and requires significant upgrades to bring it back to a good standard.

The road network is sufficient for the current number of houses.

It was noted during the site inspections that a number of unsealed 'short-cuts' had been created and were regularly used. It is not recommended that these paths are formalised.

7.4 Future demands

As no new developments are currently planned for the community, there are no additional upgrades required to cater for future demand.

7.5 Recommended works

The infrastructure that was assessed as very poor or poor is recommended to be upgraded to prevent failure in the future. The following works are recommended to upgrade the current infrastructure;

- Reseal road, including repairing edge breaks and shoulders – 500 m, 7.2 m wide
- Appropriate road signage such as speed limitations, speed hump warnings and give way signs installed.

In order to allow for a longer term sustainable road network a significant upgrade would be required. It is recommended that a long term design which incorporates a full two lane road network, with all appropriate road furniture, line-marking, kerbs and gutters is constructed. A cost estimate to reinstate the base and subbase material, reseal with a two coat spray seal surface, construct subsoil drainage, line marking and signage has been included. Note that these works will need to be fully designed, the cost estimate is for budgetary purposes only and only indicates the

construction phase. A footpath next to the road is also recommended to provide a safe trail for pedestrians.

As the maximum road width within the Yanyula community is 5 m, this means that all 510 m of the road network will need to be upgraded to a 7.2 m wide road. The stormwater drainage infrastructure upgrades that are closely associated with the road upgrade i.e. kerb and gutters, side entry pits and underground drainage pipes are included in the stormwater section of this report.

8 Stormwater drainage

8.1 Ownership and boundaries

There were no stormwater drainage assets at Yanyula town camp.

8.2 Current performance and risks

The detailed performance of the stormwater network cannot be fully analysed without significant hydraulic and hydrodynamic modelling, which is outside the scope of this project.

The general design philosophy for stormwater drainage is that the design is based on a system of sealed roads, kerb and gutter, entry pits and underground drainage. This infrastructure currently does not exist at Yanyula and there would be major headworks required if stormwater drainage is to be incorporated. It is recommended that stormwater drainage infrastructure is constructed at Yanyula to reduce flooding and ponding within the community. A cost estimate to provide kerbs and gutters, side entry pits and underground pipes has been included. The location or size of culverts, swales, etc. have not been investigated.

8.3 Future demands

As no new developments are currently planned for the community, there are no additional upgrades required to cater for future demand.

8.4 Recommended works

The following works are recommended to upgrade or improve the current infrastructure:

- Install stormwater infrastructure, including kerbs and gutters, side entry pits and underground pipes.

9 Community structures

9.1 Ownership and boundaries

The community structures within Yanyula community is the property of Rrumburriya Malandari Housing Association, but is the responsibility of Mabunji Aboriginal Resource Association Incorporated.

9.2 Existing infrastructure condition assessment

The site investigation for the community structures included assessing the condition and features of a playground. The following table shows the condition rating given to the community structures.

Table 8 Community structures condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Playground			1			1



Figure 9 Basketball court, condition: good

The playground was in good condition, and in good appearance. No immediate maintenance works are recommended.

9.3 Future demands

As no new developments are currently planned for the community, there are no additional upgrades required to cater for future demand.

9.4 Recommended works

No works required.

10 Electrical services

10.1 Ownership and boundaries

The following points, from Network Policy NP003 Installation Rules Section3, define the typical shared ownership of electrical infrastructure by Power and Water Corporation (PWC) and customers.

- The point of supply is defined as the point where PWC makes the electrical supply available. For domestic supply, this is normally one of the following:
- A point of attachment of an overhead service on to a building or pole on which a metering panel is fitted.
- A point of attachment of an overhead service on to a pole forming part of unmetered aerial consumer's mains.
- A nominated point on a distribution substation located on the customer's lot.
- A point of connection of an underground service in a metering panel, including underground services originating at an overhead line.
- A point of connection of an underground service in a pillar or junction box forming part of unmetered consumer's mains, located on the customer's lot.
- A point on a Power and Water pillar located on the customer's lot.

Typically, distribution infrastructure upstream of the Point Of Supply is owned and maintained by PWC and infrastructure below the point of supply is owned and maintained by the customer.

In many cases PWC have defined a Point Of Supply to ensure that they retain responsibility for aerial high voltage infrastructure, and aerial low voltage infrastructure where installed with aerial high voltage infrastructure, to minimise the possibility of the community or it's contractors coming into contact, either deliberately or inadvertently, with aerial high voltage infrastructure.

In other cases isolation facilities are present or desired by PWC to define the Point of Supply at or near the boundary of the town camp.

The Yanyula community electrical reticulation systems is supplied by a transformer to an overhead reticulation scheme to meters of individual house.

PWC advise that the Point Of Supply is the LV terminals of the substation and that they own and are responsible for the first pole mount substation and upstream infrastructure.

PWC recommend that a GBS (Gas Break Switch) be provided upstream of the first transformer to establish a demarcation point.

PWC advise that street lighting is supplied from unmetered LV infrastructure and is the responsibility of the lot holder and not PWC.

All meters, whether pre- or post-paid are the property of PWC.

Yanyula community are responsible for maintain all unmetered and metered LV infrastructure including the main switchboard, metering panel (excluding meter), LV distribution feeders, distribution pillars, consumers' mains and consumer switchboards and street lights.

10.2 Existing infrastructure condition assessment

The Table 9 shows the condition rating given to the distribution panels- switchboard in sewage station.

Table 9 Distribution panel condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Distribution panels						1 (status unknown)

Table 10 shows the condition rating given to the street lights. The street lights were of a low voltage overhead feeder design, mercury lamp, M80, with lamp covers protected by cages. The street lights have 33.33% operational rating and 66.67% inoperable.

Table 10 Street light on O/H pole condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Street light on O/H pole		8	4			12

Two transformers are connected to LV reticulation of this town camp, only one identified in PWC database and is not located in the boundary of town camp. The transformers were of pole mount substation design. Table 11 shows the condition rating given to the transformer inside the boundary of town camp. The transformer was visually accessed to be in good condition.

Table 11 Transformer condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Transformer			1			1

Table 12 shows the condition rating given to the Overhead poles. The overhead poles are of Weld Construction (Universal Pole construction) and steel LV distribution poles. The overhead poles have 100% operational rating from the visual inspection.

Table 12 Overhead pole condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Overhead pole			17			17

Table 13 shows the condition rating given to the Metering panels. All assessed meters in this community are prepaid digital meters.

Table 13 Meter Panel condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Pre-paid Meter			5			5
Switchboard		4	3			7

Table 14 shows the condition rating given to the switchboards associated to dwellings.

Table 14 Switchboard condition assessment (Housing footprint)

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Switchboard						0

The details of the individual inspections and photographs of each piece of infrastructure are in Appendicies.

10.3 Current performance and risks

The electrical infrastructure evaluation was conducted against the following criteria

- Number of dwellings on tenure, the higher value of the funded dwelling and as quoted in the population report was utilised.
- Urban area, NP001.1, 4. Definitions.
- General Specification for URD Subdivisions, NP001.6, 4.3 Substation Size.
- Normal ADMD (After Diversity Maximum Demand) of 4.5 kVA and high cost subdivisions at 7 kVA.
- Transformer ratings were assumed to be correct in Dekho (PWC asset information system) and compared against photographs of test or transformer numbers collected.
- Substation loads were compared against transformer sizes only. No load flow analysis was conducted.
- No load calculations were performed or assessment conducted on overhead or underground cable, visual inspection from the ground only.
- Streetlighting loads were ignored as they are not significant.

The calculated maximum demand of the Yanyula community transformer is 65% of rated capacity based on 4.5kVA/dwelling.

Table 15 Yanyula current demand load vs transformer ratings

Com Id	Community name	Dwellings	Transformer (kVA)	kVA Total @ 4.5kVA	kVA Total @ 7kVA	Comments
278	Yanyula	29	200	130.5	203	Data extracted from PWC asset info. It's outside of town Camp boundary, shown only transformer to this town Camp. [PWC Test No: 10496]
278	Yanyula	29	?			This transformer is not shown in PWC asset info. It's installed in Boat Ramp Road near to town camp and connected to electrical reticulation of Town Camp. [PWC Test No: 10167]

A tabulated summary of all community transformers is included in Appendicies.

There is a risk of equipment not being maintained associated with the non-standard division of responsibilities between the customer and PWC.

The following points from the PWC Metering Rules should be noted:

- The routine maintenance of metering installations and the replacement of any faulty meters is the responsibility of PWC.
- The property owners are responsible for the maintenance and upkeep of meter rooms, boxes and panels (including lids, doors and locking mechanisms).
- The installation of pre-paid metering is a cost to the customer, refer NP010 Meter Manual-Maintenance of Metering Installations, Power and Water Corporation.

10.4 Future demands

As no new developments are currently planned for the community, there are no additional upgrades required to cater for future demand.

10.5 Recommended works

The following maintenance works and upgrades are recommended:

- Replace eight street lights 80W.
- Replace four switchboards inside the metering panel
- Install new street lighting - approximately 26 poles

11 Communications

11.1 Ownership and boundaries

Details of Telstra pit and conduit infrastructure within the town camp boundaries were sought but were not forthcoming.

11.2 Existing infrastructure condition assessment

The telecommunications infrastructure assessed included pits. No telephone booths were found at Yanyula.

The individual inspection reports can be found in Appendicies.

Table 16 Telecommunication pit condition assessment

Asset	1 Very Poor	2 Poor	3 Good	4 Very Good	5 Excellent	Total
Telecommunication Pit		1				1

11.3 Current performance and risks

No details of the performance of communications infrastructure were obtained.

11.4 Future demands

The current availability of broadband services at Yanyula is displayed in the Figure 10 below.

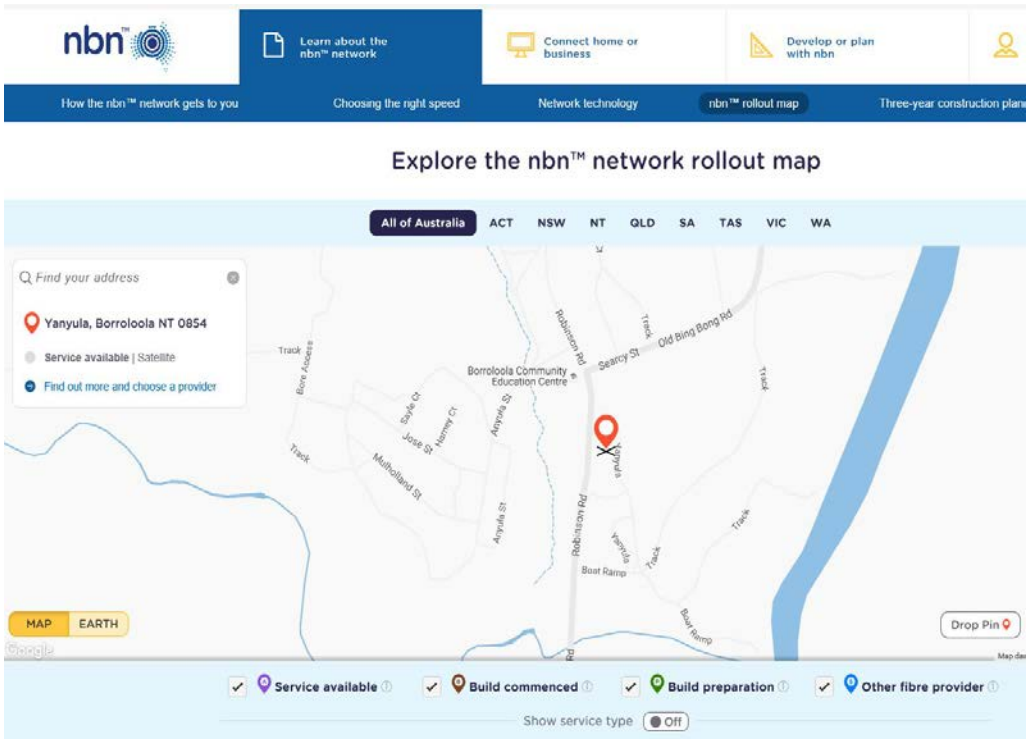


Figure 10 NBN network availability map

NBN is available to residents via satellite on application to an appropriate NBN access provider.

11.5 Recommended works

Representatives from NBN's Land Access and Stake Holder management teams are currently engaged with NT Housing to look at how camps will be serviced. It is expected that any existing premises in these camps will have some type of NBN service via the NBN brownfields rollout in the future.

No works are required at Yanyula because NBN is available to residents via satellite on application to an appropriate NBN access provider.

12 Cost estimates

Table 17 below shows a summary of the cost estimates to undertake the maintenance required to fix the existing infrastructure, to upgrade the existing network to meet current design standards, and to upgrade the existing network to cater for the future design (included in current upgrades). The estimates take into account a 30% contingency, are inclusive of GST. A location factor has been applied to town camps outside of Darwin.

Table 17 Cost estimates

Infrastructure	Maintenance of existing infrastructure	Upgrades to meet current design
Sewerage	$ 0	$ 0
Water supply	$ 8,000	$ 175,000
Roadworks	$ 1,000	$ 1,116,000
Stormwater drainage	$ 0	$ 1,081,000
Community structures	$ 0	$ 0
Electrical	$ 108,000	$ 669,000
Communications	$ 0	$ 0
Miscellaneous provisions	$ 32,000	$ 382,000
Total (including GST)	**$ 149,000**	**$ 3,423,000**
Grand total	**$ 3,572,000**	

The cost estimates are a preliminary estimate only. Since Aurecon has no control over the cost of labour, materials, equipment or services furnished by others, or over contractors' methods of determining prices, or over competitive bidding or market conditions, Aurecon cannot guarantee actual costs will not vary from these estimates.

13 Summary

The following works are recommended for Yanyula community:

Sewerage

- No upgrades required

Water supply

- Clear debris away from four fire hydrants
- Install and paint concrete slab around hydrant pit lid
- Replace 21 residential lot meter handles
- Disconnect secondary supply point and reconnect to water main creating a looped
- Install new bulk water meter at community boundaries
- Install six additional residential lot meters

Roadworks

- It is recommended that the road is upgraded to a two lane network with all appropriate road furniture, line marking, kerbs, footpaths, etc.

Stormwater drainage

- Install stormwater infrastructure, including kerbs and gutters, side entry pits and underground pipes.

Community structures

- No works required.

Electrical services

- Replace eight street lights 80W.
- Replace four switchboards inside the metering panel
- Install new street lighting - approximately 26 poles

Communications

- No works are required because NBN is available to residents via satellite on application to an appropriate NBN access provider.

Civil inspection reports



Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 12:02 Imagery: Digital Globe WV2 2013-2016

A3 scale: 1:2,500

0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 2
Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Sewerage

278 - Yanyula (Borroloola)

4452



Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 12:02 Imagery: Digital Globe WV2 2013-2016

A3 scale: 1:2,500

0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 2
Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments: Water

278 - Yanyula (Borroloola)

4453



Map by: DMcP P:\GIS\Projects\253963_NT_Town_Camps\253963_003_Civil_DDP.mxd 23/02/2017 12:02 Imagery: Digital Globe WV2 2013-2016

A3 scale: 1:2,500

0 20 40 60 80 100 m

Note:
Label numbers refer to survey IDs

Date: 23/02/2017 Version: 2
Coordinate system: MGA94 Zone 52

NT Town Camp Infrastructure Assessments
Road furniture, stormwater drainage & community structures
278 - Yanyula (Borroloola)

4454

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 1:17:39 PM

Insp ID: 1921	Group 5 - Borroloola	Yanyula

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	Cracked slab



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 1:14:59 PM

Insp ID: 1922	Group 5 - Borroloola	Yanyula

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	No
FH Condition:	2 - Poor
FH Comment:	Lid cracked, been driven over



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 1:03:34 PM

Insp ID: 1929	Group 5 - Borroloola	Yanyula

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 12:54:02 PM

Insp ID: 1934	Group 5 - Borroloola	Yanyula

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 12:45:28 PM

Insp ID: 1941	Group 5 - Borroloola	Yanyula

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	No
FH Condition:	1 - Very Poor
FH Comment:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 12:37:00 PM

Insp ID: 1943	Group 5 - Borroloola	Yanyula

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	Covered in grass , no bollard



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 12:02:28 PM

Insp ID: 1957	Group 5 - Borroloola	Yanyula

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 11:47:44 AM

Insp ID: 1965	Group 5 - Borroloola	Yanyula

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	No
FH Condition:	3 - Good
FH Comment:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 11:46:33 AM

Insp ID: 1966 Group 5 - Borroloola Yanyula

What Water Asset Are you Capturing: Fire Hydrants

Single or Double:	
Sluice Valve:	No
Above or Below ground:	Below ground
FH Leakage:	No
Bollards around hydrant:	No
FH Condition:	2 - Poor
FH Comment:	Covered in dirt



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 1:05:01 PM

Insp ID: 1927	Group 5 - Borroloola	Yanyula

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	
Comments:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 1:04:17 PM

Insp ID: 1928	Group 5 - Borroloola	Yanyula

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	
Comments:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 12:54:19 PM

Insp ID: 1935	Group 5 - Borroloola	Yanyula

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	2/A
Comments:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 12:40:04 PM

Insp ID: 1942 Group 5 - Borroloola Yanyula

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	1/C
Comments:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 12:29:45 PM

Insp ID: 1944	Group 5 - Borroloola	Yanyula

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	1/B
Comments:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 12:28:44 PM

Insp ID: 1945 Group 5 - Borroloola Yanyula

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	
Comments:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 12:27:55 PM

Insp ID: 1946 Group 5 - Borroloola Yanyula

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	
Comments:	In property





Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 12:26:48 PM

Insp ID: 1947	Group 5 - Borroloola	Yanyula

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	3 - Good
Notes on Lid:	
Comments:	Looks like it goes to pump station



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 11:35:40 AM

Insp ID: 1959 Group 5 - Borroloola Yanyula

What Sewerage Asset are you capturing:	Manholes
MH Cover Shape:	Rectangular
Manhole Cover Diam (mm):	
Manhole Length (mm):	1000
Manhole Width (mm):	700
Manhole Condition:	2 - Poor
Notes on Lid:	
Comments:	



Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 12:57:47 PM

Insp ID: 1932 Group 5 - Borroloola Yanyula

Road Name:	278_1
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.05
Road Type:	Sealed - spray seal
Section Width (m):	5
Road Condition:	1 - Very Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Potholes	5	1 - Very Poor	5% of road

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
No kerb		

Shoulders Section

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 12:57:47 PM





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Civil Infrastructure

Inspection Date 13/12/2016 12:57:47 PM

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Civil Infrastructure

Inspection Date 13/12/2016 12:51:03 PM

Insp ID: 1937 Group 5 - Borroloola Yanyula

Road Name:	278_2
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.06
Road Type:	Sealed - spray seal
Section Width (m):	5
Road Condition:	1 - Very Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Potholes	5	1 - Very Poor	5% road has potholes
Edge Breaks	40	2 - Poor	40% road has edge breaks

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
No kerb		

Shoulders Section

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 12:51:03 PM





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Inspection Date 13/12/2016 12:51:03 PM

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Civil Infrastructure

Inspection Date 13/12/2016 12:06:52 PM

Insp ID: 1954 Group 5 - Borroloola Yanyula

Road Name:	Yanyula
What are you inspecting:	Pavements
Ch From (km):	0.25
Ch To (km):	0.4
Road Type:	Sealed - spray seal
Section Width (m):	5
Road Condition:	1 - Very Poor
General Comment:	Speed bumps aren't painted

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Edge Breaks	50	2 - Poor	
Potholes	30	2 - Poor	30% of road has potholes

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
No kerb		

Shoulders Section

Linemarking Section

Obstruction Section

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Civil Infrastructure

Inspection Date 13/12/2016 12:06:52 PM







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Inspection Date 13/12/2016 12:06:52 PM

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Civil Infrastructure

Inspection Date 13/12/2016 11:41:42 AM

Insp ID: 1958 Group 5 - Borroloola Yanyula

Road Name:	Yanyula
What are you inspecting:	Pavements
Ch From (km):	0
Ch To (km):	0.25
Road Type:	Sealed - spray seal
Section Width (m):	5
Road Condition:	2 - Poor
General Comment:	

Road Defects Section

Defect Type	Defect QTY	Defect Condition	Defect Comments
Edge Breaks		2 - Poor	
Potholes	1	2 - Poor	
Potholes		2 - Poor	

Kerbs Section

Kerb Type	Kerb Cond	Kerb Comments
No kerb		

Shoulders Section

Linemarking Section

Obstruction Section

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 11:41:42 AM









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Civil Infrastructure

Inspection Date 13/12/2016 11:41:42 AM

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Civil Infrastructure

Inspection Date 13/12/2016 12:23:37 PM

Insp ID: 1948 Group 5 - Borroloola Yanyula

What Sewerage Asset are you capturing:	Pump Station
No of Pumps in Pump Station:	2
Cabinet Condition:	4 - Very Good
Cabinet Comment:	
Alarm Light:	No
Alarm Light Condition:	
Overhead Light:	Yes
Overhead Light Condition:	1 - Very Poor
Light Comments:	
Davit Crane Present:	Yes
Davit Crane Capacity (kg):	550
Davit Crane Condition:	3 - Good
Davit Crane Comments:	
Fence TYPE:	Standard Security Fence (3 Strands barbed)
PS Fence Height (m):	1.8
PS Gates Locked:	Yes
PS Fence Condition:	4 - Very Good
Fence Comment:	
Flow meter type:	
Flow meter condition:	
Flow meter comments:	
Macerator Pump Make/Model:	
Manufacturers Date:	
Macerator Pump:	No Access
Macerator Pump Condition:	
Macerator Pump Comments:	
Outgoing Pipe Diameter (mm):	
Valves:	
Outgoing Pipe Comments:	
Water Supply to pump station:	Yes
Fire hose reel:	No
Access cover locked:	Yes
Safety grid beneath access cover:	No Access

Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 12:23:37 PM

Condition:	
Cabinet Locked:	
Cabinet Lock Condition:	
Hand rails around entrance:	Yes
Fixed or removable:	
Rail Condition:	3
Safety Comments:	

Pump Station Pumps section





Northern Territory Town Camps

Civil Infrastructure

Inspection Date 13/12/2016 12:23:37 PM



