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Dear Keith,

Golden West Resources' (GWR) Wiluna West Project area consists of three banded ironstone ridges as a potential source of Iron Ore. Level 2 Flora surveys of the project area have been completed by the Department of Environment and Conservation (DEC) in August 2006, as well as Jim's, Seeds, Weeds and Trees Pty Ltd in June 2006 and Recon Environmental in March-June 2009.

All three reports revealed a number of Priority Flora known to exist in habitat provided by the banded ironstone ridges. These Priority Flora namely *Homalocalyx echinulatus* (P3), *Beyeria lapidicola* (P1), *Calytrix uncinata* (P3), *Sida picklesiana* (P3), *Prostanthera ferricola* (P3), *Eremophila congesta* (P1), *Eremophila arachnoides subsp arachnoides* (P3), *Maireana prosthocochaeta* (P3), *Olearia mucronata* (P3), *Ptilotus chrysocomus* (P1), *Ptilotus luteolus* (P3) and *Tribulus adelacanthus* (P3).

From the 28<sup>th</sup> of November to the 1<sup>st</sup> of December 2011, Native Vegetation Solutions (NVS) was commissioned by Keith Lindbeck and Associates (KLA) to complete a Targeted Priority Flora survey at the GWR Wiluna West Project. GWR is proposing to commence mining of three pits, with construction of their associated waste dumps within the Wiluna West Project area. A Targeted Priority Flora survey will form part of the Mining Proposal application. The targeted Priority Flora survey was completed within the C3, C4 and Bowerbird areas of the Wiluna West Project, where mining has been planned for years 1 to 10 of the mine life.

GPS locations of proposed pit and waste dump areas were provided to NVS by KLA. A total area of approximately 287ha of pits and 928ha of waste landforms were traversed by Kawasaki Mule and on foot. All locations of Priority Flora species previously recorded (provided to NVS by KLA) were also visited. Efforts were concentrated in areas of suitable habitat for Priority Flora, particularly on ridges, whereas unsuitable habitat was surveyed less intensively.

Priority Flora encountered was marked with a GPS. The locations of Priority Flora are included in Appendices 1, 2, 3, 4 and 5 attached. Where Priority Flora was encountered within the inspected areas, a tally of these plants was conducted. This allowed the calculation of the percentage of plants potentially to be destroyed amongst the regional population, for those species of known population size. Results of these percentages can be seen in Table 1 below.

Table 1: Priority Flora encountered within the proposed pit and waste dump areas

Project	Waypoint number	Description	Conservation Code	Number of plants to potentially be disturbed	Regional Population	Percentage of Regional Population
C3	10	<i>Homalocalyx echinulatus</i>	P3	53	>2000*	2%
	11			83	>2000*	4%
	13			7	>2000*	<1%
	16			1	>2000*	<1%
	25			302	>2000*	15%
	27			443	>2000*	22%
	28			8	>2000*	<1%
	29			68	>2000*	3%
	30			8	>2000*	<1%
	12	Previous record of <i>Homalocalyx echinulatus</i>	P3	0	n/a	n/a
	14	<i>Prostanthera ferricola</i>	P3	5	400*	1%
	17			7	400*	2%
	18			1	400*	<1%
	19			2	400*	<1%
	20			4	400*	1%
	21			2	400*	<1%
22	2			400*	<1%	
23	3			400*	<1%	
24	3			400*	<1%	
C4	1			<i>Eremophila congesta</i>	P1	1
	2	2	>2000*			<1%
	3	1	>2000*			<1%
	4	1	>2000*			<1%
	5	1	>2000*			<1%
	7	1	>2000*			<1%
	8	1	>2000*			<1%
	9	1	>2000*			<1%
Bowerbird	44	<i>Calytrix uncinata</i>	P3	6	>2000*	<1%
	48			4	>2000*	<1%
	50			3	>2000*	<1%
	39	<i>Eremophila congesta</i>	P1	1	>2000*	<1%
	45			4	>2000*	<1%
	66			2	>2000*	<1%
	67	19	>2000*	1%		
	32	<i>Homalocalyx echinulatus</i>	P3	32	>2000*	1.60%
	34			3	>2000*	<1%
	35			46	>2000*	2.30%
	36			29	>2000*	1%
	37			29	>2000*	1%
	38			350	>2000*	17.50%
	43			4	>2000*	<1%
	64			14	>2000*	<1%
65	16			>2000*	<1%	

Project	Waypoint number	Description	Conservation Code	Number of plants to potentially be disturbed	Regional Population	Percentage of Regional Population
Bowerbird	77	<i>Homalocalyx echinulatus</i>	P3	25	>2000*	1%
	74	<i>Maireana prosthocochaeta</i>	P3	0	n/a	n/a
	52	Previous record of <i>Ptilotus chrysocomus</i>	P1	0	n/a	n/a
	72	<i>Ptilotus chrysocomus</i>	P1	48	782**	6.1%
	73			500	782**	63.9%
	75			42	782**	5.3%
	76			67	782**	8.5%
	6			<i>Sida picklesiana</i>	P3	10
	31	20	4419***			<1%
	46	1	4419***			<1%
	47	24	4419***			<1%
	49	39	4419***			<1%
	51	500	4419***			11.3%
	55	30	4419***			<1%
	56	100	4419***			2.3%
	58	60	4419***			1%
	59	30	4419***			<1%
	60	100	4419***			2.3%
	62	50	4419***			1%
	63	2	4419***			<1%
	68	50	4419***			1%
	69	60	4419***			1%
	70	1	4419***			<1%

\* WAHERB (2010)

\*\* Eren Reid 2011, pers. comm. 5<sup>th</sup> Dec, based on knowledge of local population

\*\*\* Total Population from regional work completed by KLA (2010)

Where it was impractical to count actual population numbers, estimations were made using a GPS to record the perimeter of a population and counting plants within a 10m<sup>2</sup> quadrat of that population as a representation of that area. The number of plants were multiplied by the measured area to give the estimated population. This method was used for *Homalocalyx echinulatus* and *Sida picklesiana*.

Impact upon populations of *Calytrix uncinata* (P3) and *Eremophila congesta* (P1) were calculated for populations of >2000 plants. Therefore, <1% of each of these populations will be destroyed if all plants are removed from the proposed footprints.

No plants of *Maireana prosthocochaeta* (P3) were found where this species was previously recorded at Waypoint 74. Samples of similar plants were taken from this area and sent to Frank Obbens at the WAHERB for identification confirming it was not a positive ID of this species, rather *Maireana georgei*.

*Prostanthera ferricola* (P3) is found in other locations approximately 300km's north and east of Wiluna showing a wider distribution than this survey area. It has a relatively small known population of 400 (WAHERB, 2010), and 7.5% of the population inhabit the proposed footprint area, suggesting only a small impact on the population.

A total of 657 plants of *Ptilotus chrysocomus* (P1) were recorded in the survey area. Within the wider Wiluna West Project it is estimated that a total population of 782 plants exists. This wider population estimate was observed by Eren Reid in his experience and knowledge of the local area as well as information provided on FloraBase. There are only 2 locations recorded for this species on FloraBase. One of these forms part of the wider population estimate, the other is recorded approximately 250km's NE of Wiluna, in the Little Sandy Desert. One location historically recorded was inspected with no findings (Waypoint 52). Removal of 84% of this species will have a large impact on the local

population of this species. As this species occurs in quite specific habitat, which is difficult to discover both in the field and via aerial photography, it is considered impractical to conduct further regional surveys for this species. It is therefore recommended to avoid the location of these species via altering the formation of the waste landform, so that it either extends further south or north to compensate for the avoidance area.

Twenty four percent (1077 of 4419) of *Sida picklesiana* (P3) will be impacted in the proposed area. This is calculated on a regional population based on a survey of the region by KLA (2010) in conjunction with the Western Australian Herbarium (WAHERB). Removal of these plants in the survey area is likely to have a moderate impact on this species.

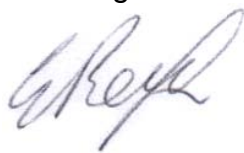
More information is required to determine a percentage impact on *Homalocalyx echinulatus* (P3) as there is no known definitive population size of this species. A total of 1521 plants were recorded in this survey. At Waypoint 12 a historically recorded location was extensively surveyed with no plants found. This species also occurs in surrounding areas within 400km radius of Wiluna, and FloraBase lists 28 records in more than 13 localities. Based on the number of populations recorded in the surrounding area, there is likely to be no significant impact to the conservation status of this species, however it is recommended to conduct a population count of the known locations recorded on Florabase in order to define a regional impact percentage.

There will not be a significant impact on Priority Flora *Calytrix uncinata* (P3), *Eremophila congesta* (P1), and *Prostanthera ferricola* (P3).

Priority Flora known to exist in habitat provided by the banded ironstone ridges that was not sighted in the survey area include: *Beyeria lapidicola* (P1), *Maireana prosthocochaeta* (P3), *Olearia mucronata* (P3), *Ptilotus luteolus* (P3) and *Tribulus adelacanthus* (P3).

If you have any queries regarding this work completed, please do not hesitate to contact me on the above mentioned contact details.

Kind Regards



**Eren Reid**  
Botanist/Proprietor

## References

DEC (2007). *Banded Ironstone Formation Ranges in the Midwest and Goldfields - Interim Status Report Biodiversity Values and Conservation Requirement*. Unpublished report; September, 2007.

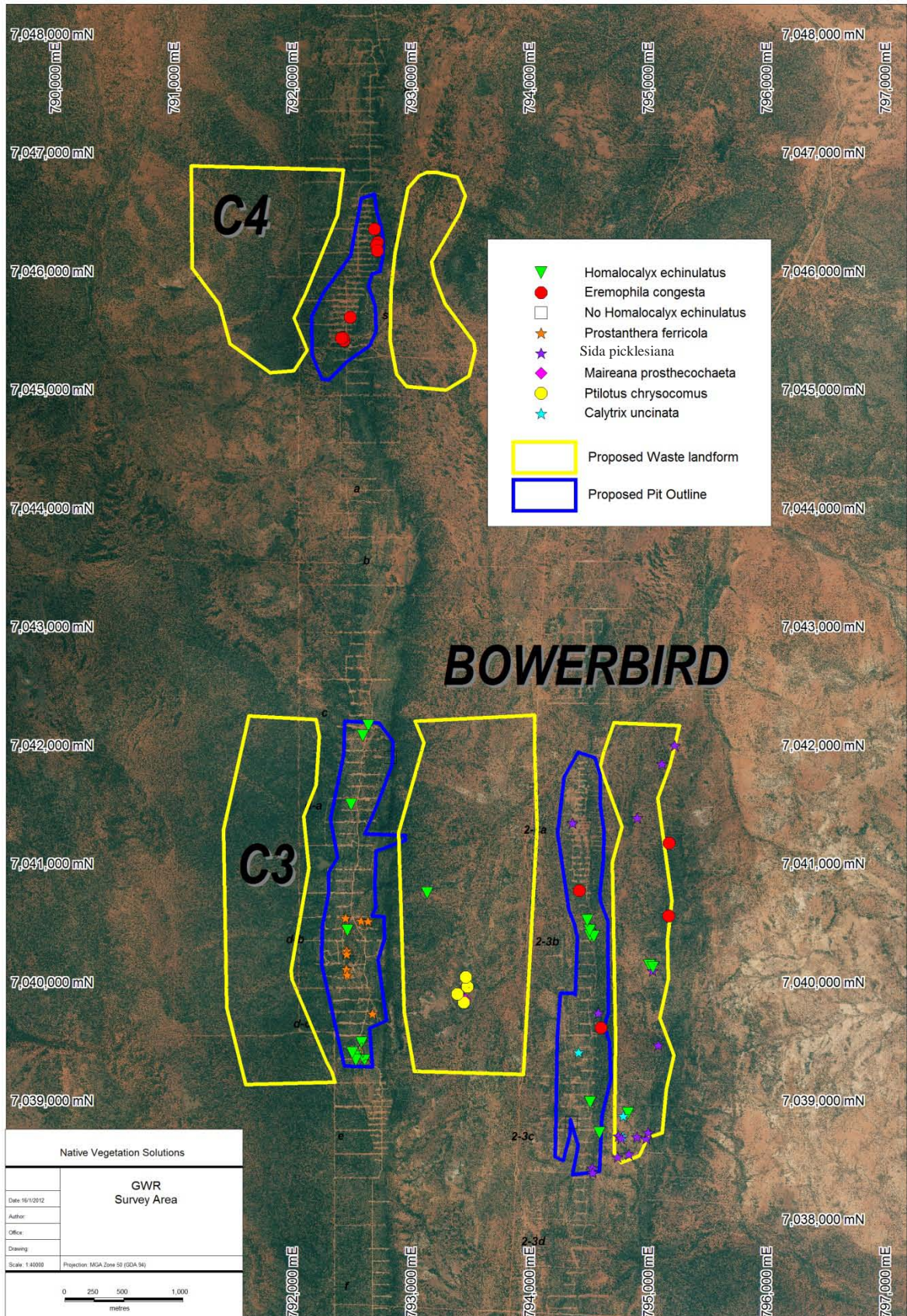
Jim's Seeds, Weeds & Trees (2006). *Flora and Vegetation of the Wiluna West Banded Ironstone Formations*. Unpublished report prepared for Golden West Resources Ltd, September 2006.

KLA (2010), *Sida picklesiana* (A. Markey and S. Dillon 4126) P1- REGIONAL FLORA SURVEY, Unpublished report by Keith Lindbeck and Associates produced for Golden West Resources Ltd.

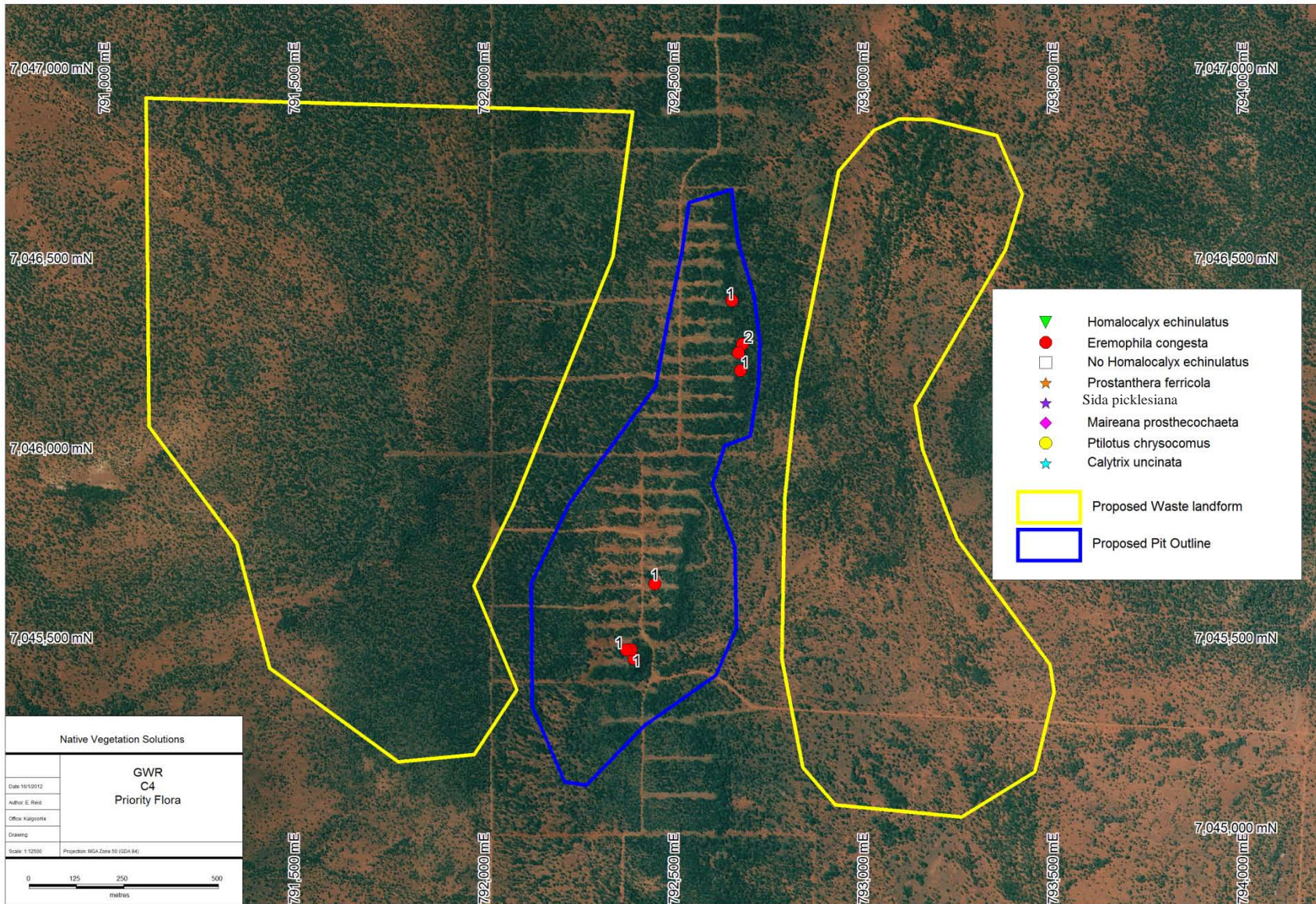
Read, T.J. (2010). *Herbert Lukin Ridge & Surrounds Vegetation Survey*. Unpublished Report prepared for Golden West Resources Ltd by Recon Environmental, May 2010. Report No. GWR01.

WAHERB, (2009 & 2010). *Florabase – The Western Australian Flora*. Department of Environment & Conservation.  
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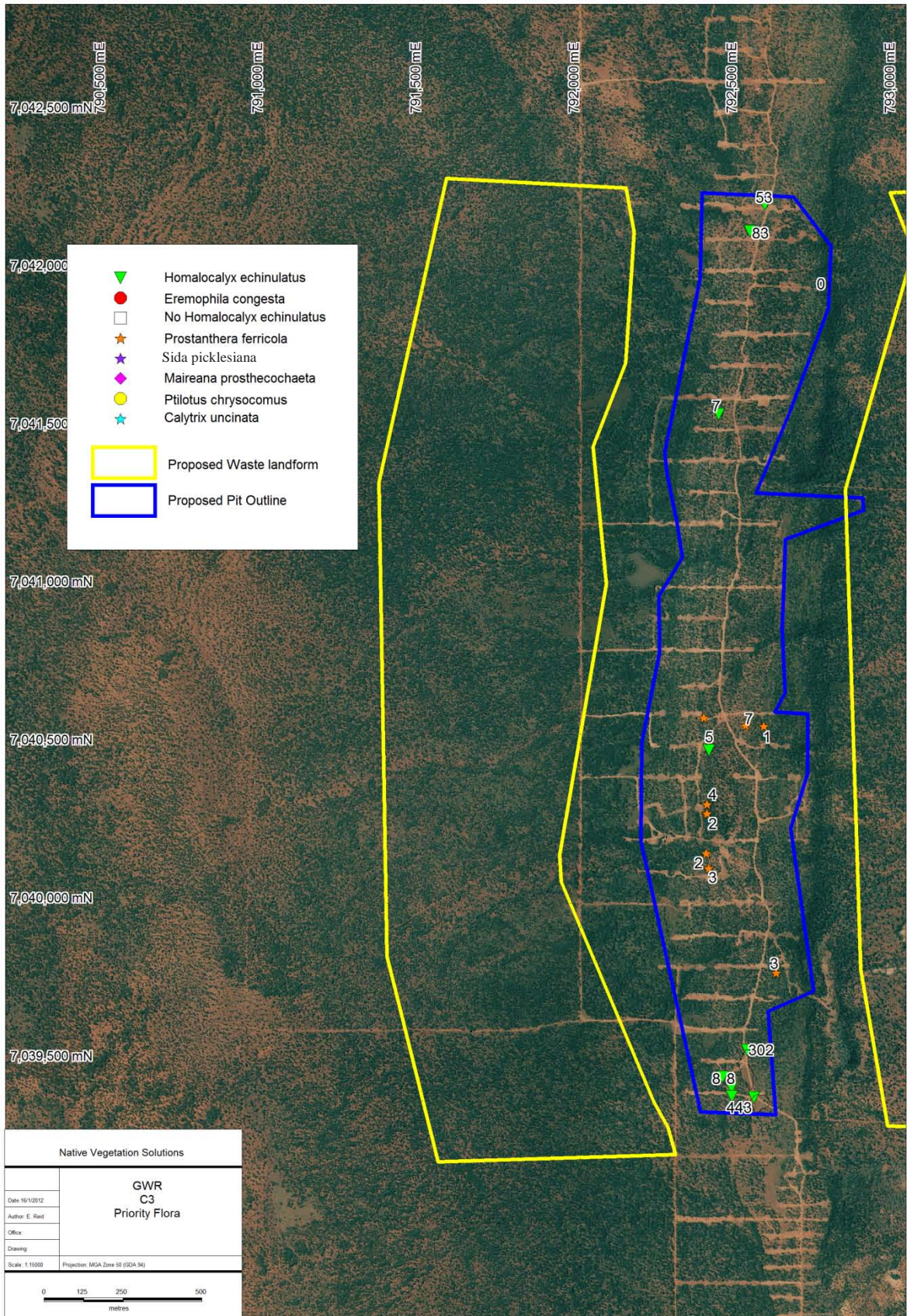
# Appendix 1



## Appendix 2

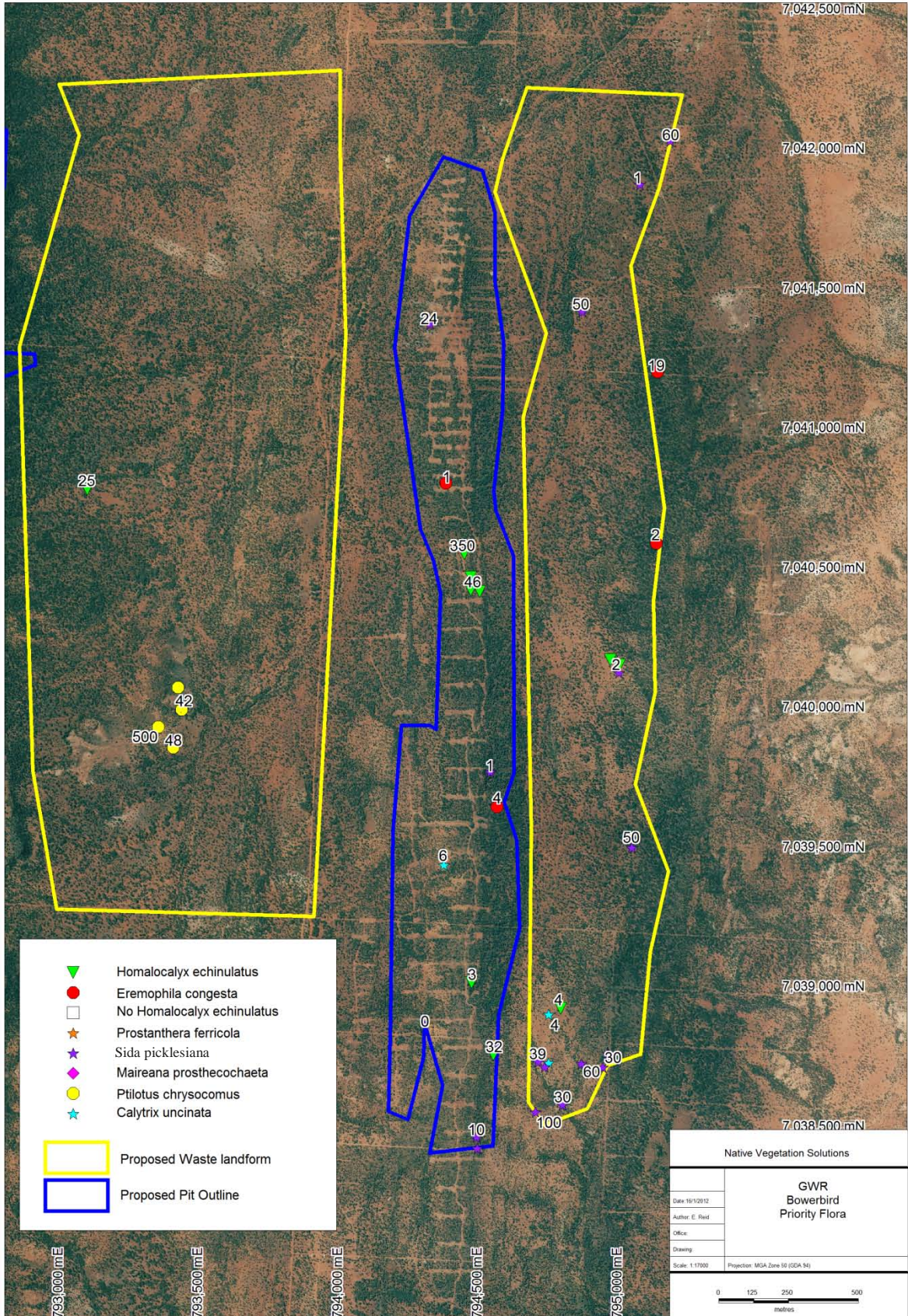


# Appendix 3





# Appendix 4



## Appendix 5: GPS coordinates of Priority Flora encountered

Waypoint Number	Priority Flora	Conservation Code	Zone	EASTING	NORTHING
1	<i>Eremophila congesta</i>	P1	50 J	792637	7046402
2	<i>Eremophila congesta</i>	P1	50 J	792664	7046288
3	<i>Eremophila congesta</i>	P1	50 J	792653	7046265
4	<i>Eremophila congesta</i>	P1	50 J	792658	7046218
5	<i>Eremophila congesta</i>	P1	50 J	792433	7045657
6	<i>Sida picklesiana</i>	P3	50 J	794474	7038480
7	<i>Eremophila congesta</i>	P1	50 J	792378	7045460
8	<i>Eremophila congesta</i>	P1	50 J	792370	7045484
9	<i>Eremophila congesta</i>	P1	50 J	792358	7045483
10	<i>Homalocalyx echinulatus</i>	P3	50 J	792585	7042210
11	<i>Homalocalyx echinulatus</i>	P3	50 J	792538	7042126
12	Previous record of <i>Homalocalyx echinulatus</i>	P3	50 J	792770	7041943
13	<i>Homalocalyx echinulatus</i>	P3	50 J	792438	7041547
14	<i>Prostanthera ferricola</i>	P3	50 J	792406	7040497
16	<i>Homalocalyx echinulatus</i>	P3	50 J	792407	7040485
17	<i>Prostanthera ferricola</i>	P3	50 J	792523	7040564
18	<i>Prostanthera ferricola</i>	P3	50 J	792580	7040561
19	<i>Prostanthera ferricola</i>	P3	50 J	792390	7040588
20	<i>Prostanthera ferricola</i>	P3	50 J	792401	7040313
21	<i>Prostanthera ferricola</i>	P3	50 J	792400	7040284
22	<i>Prostanthera ferricola</i>	P3	50 J	792399	7040158
23	<i>Prostanthera ferricola</i>	P3	50 J	792406	7040111
24	<i>Prostanthera ferricola</i>	P3	50 J	792620	7039780
25	<i>Homalocalyx echinulatus</i>	P3	50 J	792528	7039536
27	<i>Homalocalyx echinulatus</i>	P3	50 J	792550	7039386
28	<i>Homalocalyx echinulatus</i>	P3	50 J	792479	7039417
29	<i>Homalocalyx echinulatus</i>	P3	50 J	792480	7039389
30	<i>Homalocalyx echinulatus</i>	P3	50 J	792451	7039451
31	<i>Sida picklesiana</i>	P3	50 J	794478	7038440
32	<i>Homalocalyx echinulatus</i>	P3	50 J	794535	7038774
34	<i>Homalocalyx echinulatus</i>	P3	50 J	794457	7039032
35	<i>Homalocalyx echinulatus</i>	P3	50 J	794455	7040438
36	<i>Homalocalyx echinulatus</i>	P3	50 J	794485	7040432
37	<i>Homalocalyx echinulatus</i>	P3	50 J	794454	7040484
38	<i>Homalocalyx echinulatus</i>	P3	50 J	794431	7040568
39	<i>Eremophila congesta</i>	P1	50 J	794365	7040820
43	<i>Homalocalyx echinulatus</i>	P3	50 J	794776	7038940
44	<i>Calytrix uncinata</i>	P3	50 J	794357	7039455
45	<i>Eremophila congesta</i>	P1	50 J	794548	7039661
46	<i>Sida picklesiana</i>	P3	50 J	794524	7039787
47	<i>Sida picklesiana</i>	P3	50 J	794308	7041391
48	<i>Calytrix uncinata</i>	P3	50 J	794734	7038919
49	<i>Sida picklesiana</i>	P3	50 J	794695	7038749
50	<i>Calytrix uncinata</i>	P3	50 J	794732	7038745
51	<i>Sida picklesiana</i>	P3	50 J	794718	7038731
52	Previous record of <i>Ptilotus chrysocomus</i>	P1	50 J	794298	7038865
55	<i>Sida picklesiana</i>	P3	50 J	794782	7038595
56	<i>Sida picklesiana</i>	P3	50 J	794686	7038570
58	<i>Sida picklesiana</i>	P3	50 J	794850	7038743

Waypoint Number	Priority Flora	Conservation Code	Zone	EASTING	NORTHING
59	<i>Sida picklesiana</i>	P3	50 J	794927	7038729
60	<i>Sida picklesiana</i>	P3	50 J	794946	7038779
62	<i>Sida picklesiana</i>	P3	50 J	795030	7039517
63	<i>Sida picklesiana</i>	P3	50 J	794983	7040143
64	<i>Homalocalyx echinulatus</i>	P3	50 J	794987	7040170
65	<i>Homalocalyx echinulatus</i>	P3	50 J	794954	7040189
66	<i>Eremophila congesta</i>	P1	50 J	795118	7040606
67	<i>Eremophila congesta</i>	P1	50 J	795122	7041219
68	<i>Sida picklesiana</i>	P3	50 J	794852	7041435
69	<i>Sida picklesiana</i>	P3	50 J	795168	7042046
70	<i>Sida picklesiana</i>	P3	50 J	795059	7041891
72	<i>Ptilotus chrysocomus</i>	P1	50 J	793390	7039874
73	<i>Ptilotus chrysocomus</i>	P1	50 J	793336	7039947
74	<i>Previous record of Maireana prosthocochaeta</i>	P3	50 J	793400	7039900
75	<i>Ptilotus chrysocomus</i>	P1	50 J	793420	7040009
76	<i>Ptilotus chrysocomus</i>	P1	50 J	793407	7040090
77	<i>Homalocalyx echinulatus</i>	P3	50 J	793083	7040799