

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.

WRSB
 A = 1.3m
 WA = 70m
 WL = 372m
 WT = 442m
 DEF = 2.645m
 P.S. = 2.5m
 APP = FL2

WRSB
 A = 3.3m
 WA = 87m
 WL = 733m
 WT = 820m
 DEF = 3.24m
 P.S. = 3.5m
 APP = ST

GENERAL NOTES

1. SURVEY DATUMS: LEVEL-AHD, GRID-MGA ZONE 54
2. FOR WRSB DETAILS REFER TO GUARD FENCE AND WIRE ROPE SAFETY BARRIER SETTING OUT TERMINOLOGY DRAWING.
3. REFER LANDSCAPE DRAWINGS FOR TREES TO BE REMOVED.

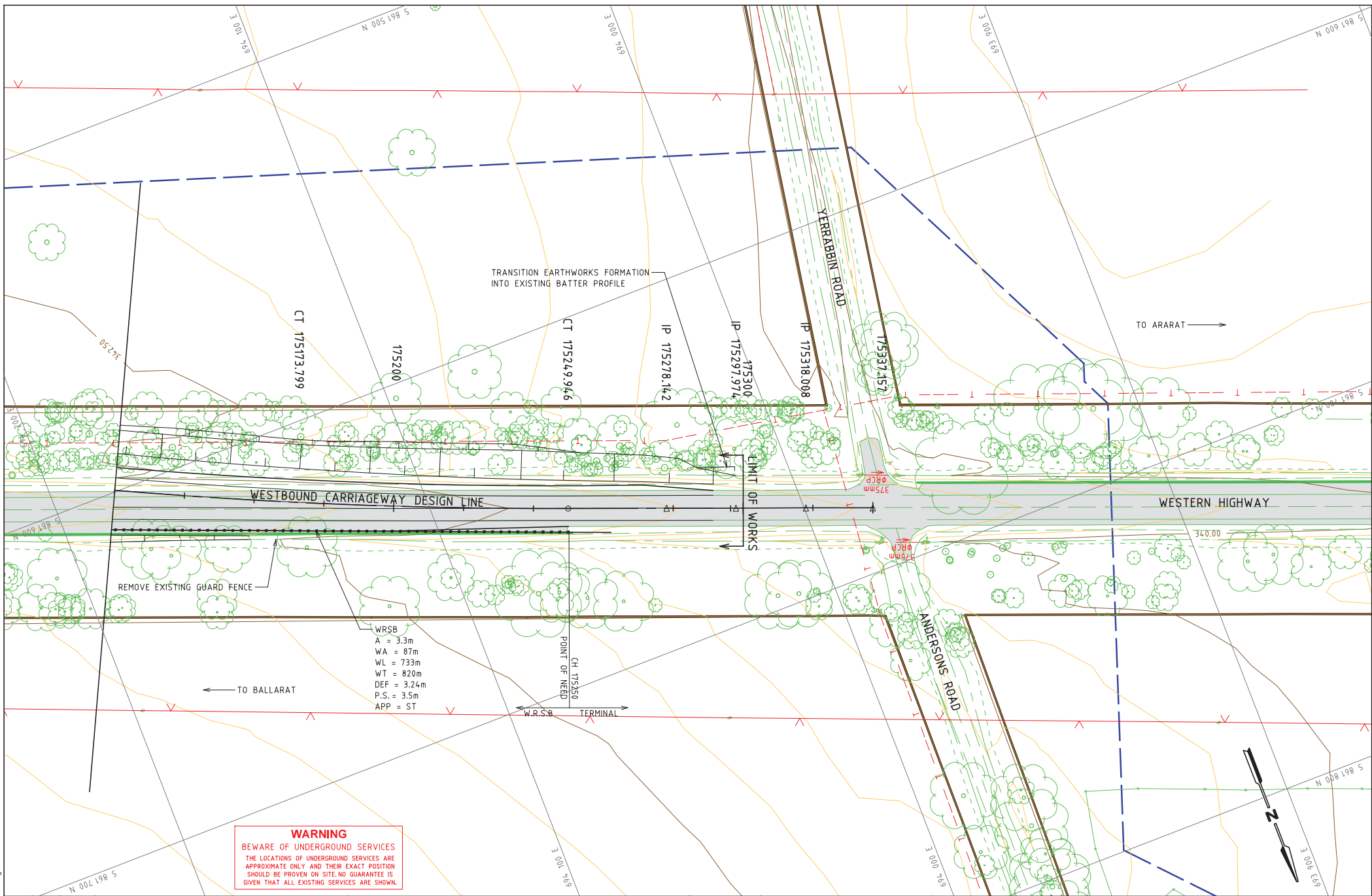
	PROPOSED ROW BOUNDARY
	EXISTING FENCE
	PROPOSED POWER LINE RELOCATION
	EXISTING SAFETY BARRIER
	NO GO ZONES

TECHNICAL CONSULTING	DESIGNED PROJECT DESIGN
3 PROSPECT HILL ROAD, CAMBERWELL, VICTORIA, 3124 PHONE (03) 9811 8355 FAX (03) 9811 8329	APPROVED J. MIKITCZUK 18/10/13 CAT: Road_Design PROJ: (a) Section 2A FILE: 716-pd-a-ap-45.dgn

SCALE OF METRES
 HOR 0 10 20
 VER

WESTERN HWY/FWY			
WESTERN HIGHWAY - BEAUFORT TO ARARAT MCKINNON LANE TO ANDERSONS ROAD CH 174780 - CH 175120			
ALIGNMENT PLAN			
FILE NO. 716	CONTRACT NO. 8612	SHEET NO. 172	DRAWING NO. 728673
			ISSUE A

14/11/2013 Default
 716-pd-a-ap-45.dgn



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.

E			
D			
C			
B			
A	J.M.	29/10/2013	WRSB OFFSETS INCREASED
ISSUE	APP'D	DATE	AMENDMENT

GENERAL NOTES
 1. SURVEY DATUMS: LEVEL-AHD, GRID-MGA ZONE 54
 2. FOR WRSB DETAILS REFER TO GUARD FENCE AND WIRE ROPE SAFETY BARRIER SETTING OUT TERMINOLOGY DRAWING.
 3. REFER LANDSCAPE DRAWINGS FOR TREES TO BE REMOVED.

PROPOSED ROW BOUNDARY
 EXISTING FENCE
 PROPOSED POWER LINE RELOCATION
 EXISTING SAFETY BARRIER
 NO GO ZONES

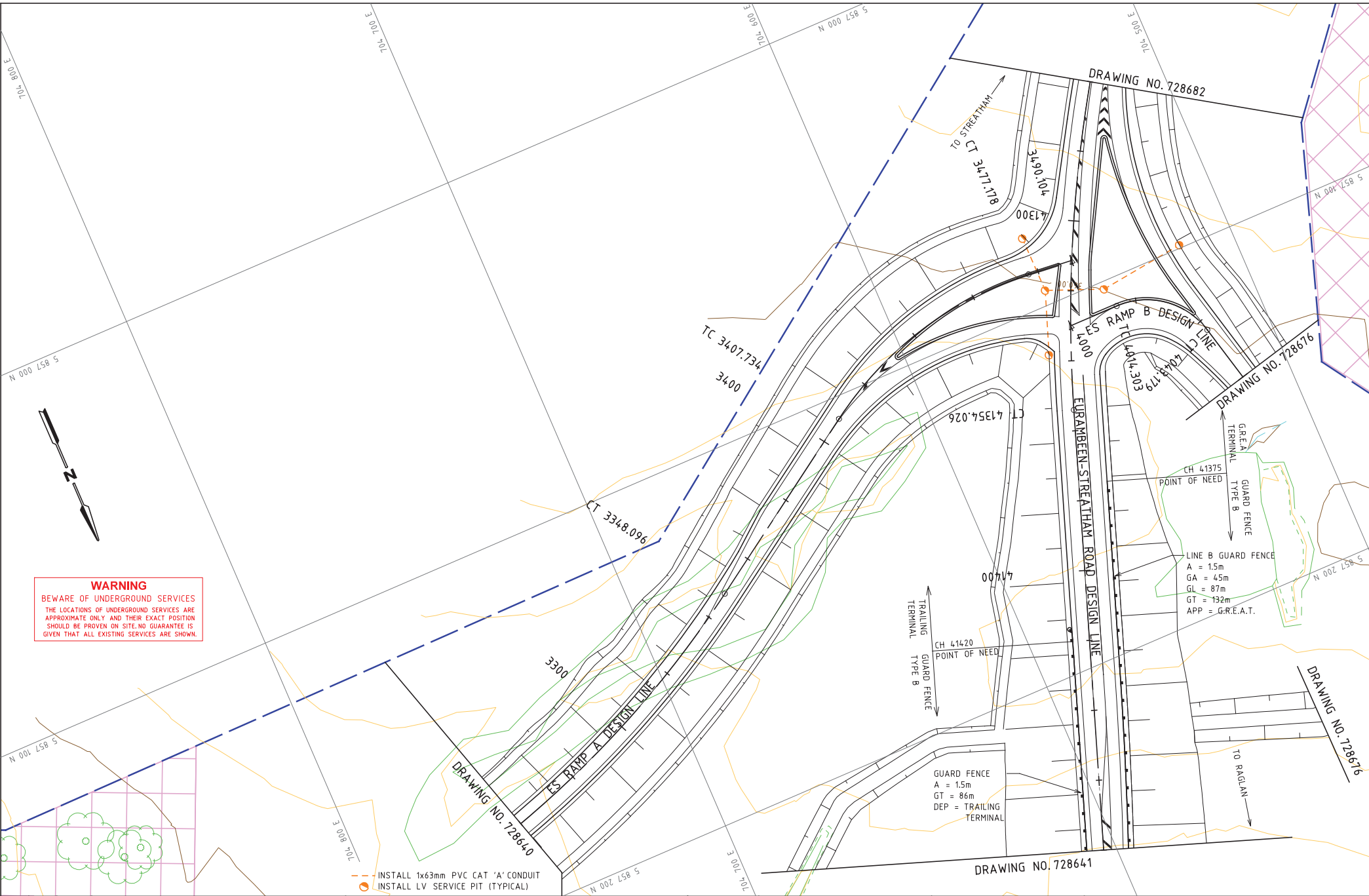
TECHNICAL CONSULTING
 3 PROSPECT HILL ROAD,
 CAMBERWELL,
 VICTORIA, 3124
 PHONE (03) 9811 8355
 FAX (03) 9811 8329

DESIGNED PROJECT DESIGN
 APPROVED
 J. MIKITCZUK
 18/10/13
 CAT: Road_Design
 PRO: (a) Section 2A
 FILE: 716-pd-a-ap-46.dgn

SCALE OF METRES
 HOR 0 10 20
 VER

WESTERN HWY/FWY WESTERN HIGHWAY - BEAUFORT TO ARARAT MCKINNON LANE TO ANDERSONS ROAD CH 175120 - CH 175337.157 ALIGNMENT PLAN			
FILE NO.	CONTRACT NO.	SHEET NO.	DRAWING NO.
716	8612	173	728674
			ISSUE
			A

14/11/2013 Default
 11:46:16 PM 716-pd-a-ap-46.dgn



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.

- INSTALL 1x63mm PVC CAT 'A' CONDUIT
- INSTALL LV SERVICE PIT (TYPICAL)

GENERAL NOTES	
1.	SURVEY DATUMS: LEVEL-AHD, GRID-MGA ZONE 54
2.	FOR WRSB DETAILS REFER TO GUARD FENCE AND WIRE ROPE SAFETY BARRIER SETTING OUT TERMINOLOGY DRAWING.
3.	REFER LANDSCAPE DRAWINGS FOR TREES TO BE REMOVED.
---	PROPOSED ROW BOUNDARY
---	EXISTING FENCE
---	PROPOSED POWER LINE RELOCATION
---	EXISTING SAFETY BARRIER
---	NO GO ZONES

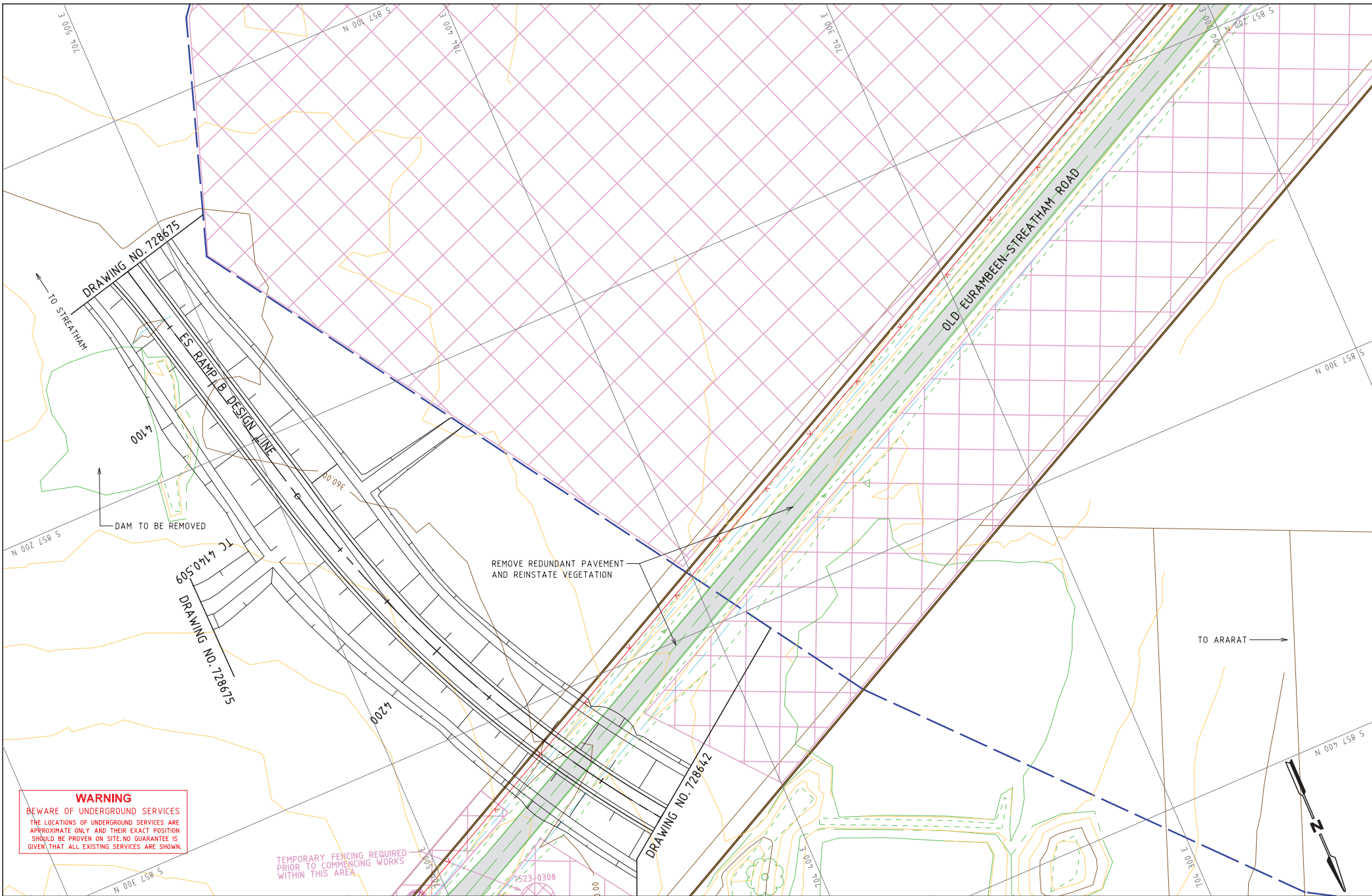
TECHNICAL CONSULTING	
3 PROSPECT HILL ROAD, CARBISWELL, VICTORIA, 3124 PHONE (03) 9811 8355 FAX (03) 9811 8329	
DESIGNED	PROJECT DESIGN
APPROVED	
CAT: Road_Design PROJ: (a) Section 2A FILE: 716-pd-a-ap-47.dgn	

SCALE OF METRES
 HOR 0 10 20
 VER

WESTERN HWY/FWY WESTERN HIGHWAY - BEAUFORT TO ARARAT MCKINNON LANE TO ANDERSONS ROAD EURAMBEN-STREATHAM RD CH 41260 - CH 41480 ALIGNMENT PLAN					
FILE NO.	CONTRACT NO.	SHEET NO.	DRAWING NO.	ISSUE	
716	8612	174	728675		

ISSUE	APP'D	DATE	AMENDMENT
E			
D			
C			
B			
A			

14/11/2013 Default
 11:45:16 PM 716-pd-a-ap-47.dgn



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.

TEMPORARY FENCING REQUIRED PRIOR TO COMMENCING WORKS WITHIN THIS AREA

REMOVE REDUNDANT PAVEMENT AND REINSTATE VEGETATION

14/11/2013 Default
 14:42:00 PM 716-pd-a-ap-48.dgn

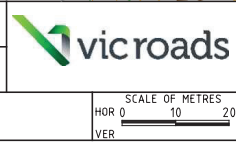
E				
D				
C				
B				
A				
ISSUE	APP'D	DATE	AMENDMENT	

GENERAL NOTES
 1. SURVEY DATUMS: LEVEL-AHD, GRID-MGA ZONE 54
 2. FOR WRSB DETAILS REFER TO GUARD FENCE AND WIRE ROPE SAFETY BARRIER SETTING OUT TERMINOLOGY DRAWING.
 3. REFER LANDSCAPE DRAWINGS FOR TREES TO BE REMOVED.

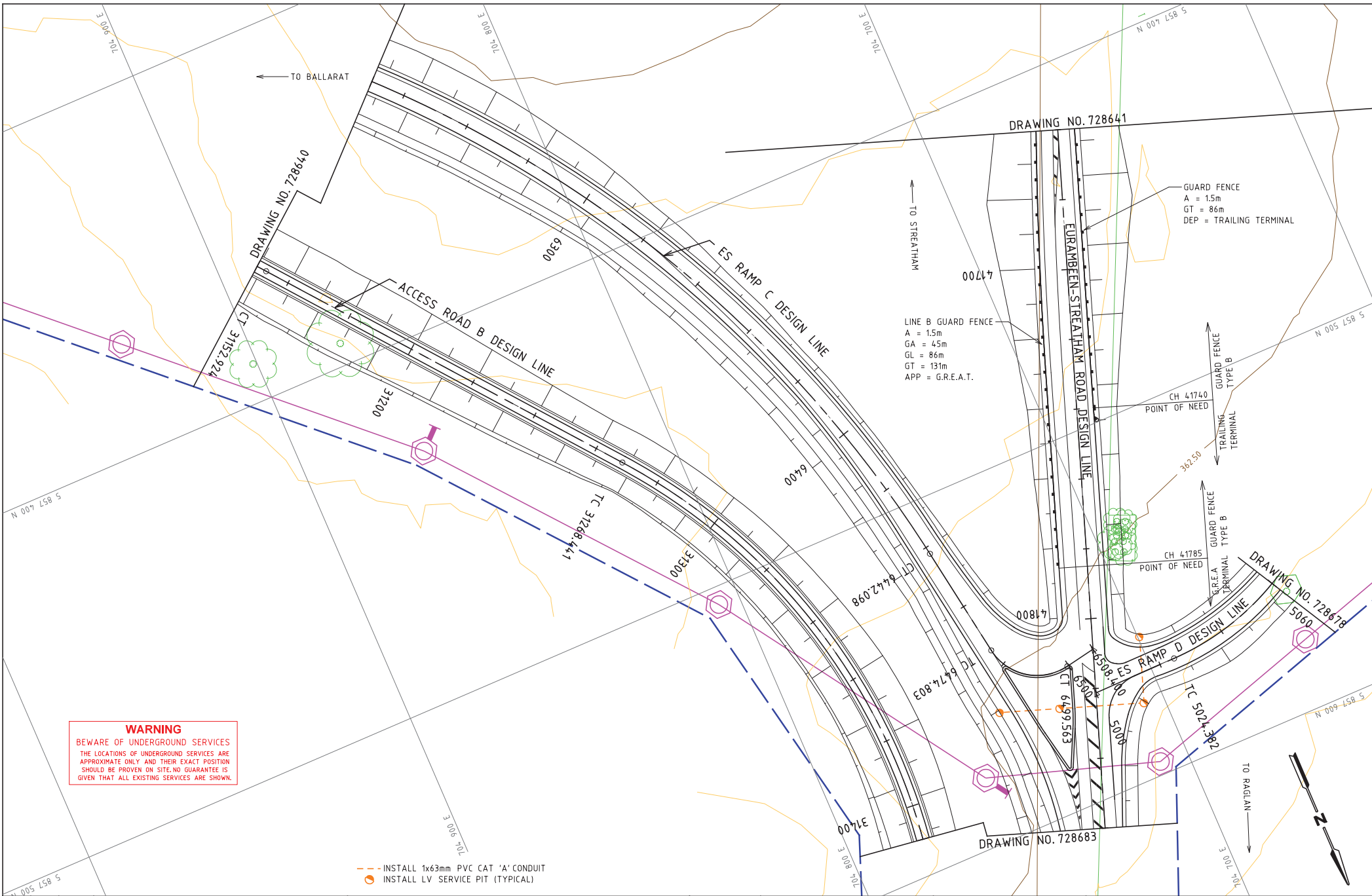
— PROPOSED ROW BOUNDARY
— EXISTING FENCE
— EXISTING SAFETY BARRIER
— PROPOSED POWER LINE RELOCATION
 NO GO ZONES

TECHNICAL CONSULTING
 3 PROSPECT HILL ROAD,
 CARBISWELL,
 VICTORIA, 3124
 PHONE (03) 9811 8355
 FAX (03) 9811 8329

DESIGNED PROJECT DESIGN
 APPROVED
 J. MIKITCZUK
 18/10/13
 CAT: Road_Design
 PRO: (a) Section 2A
 FILE: 716-pd-a-ap-48.dgn



WESTERN HWY/FWY			
WESTERN HIGHWAY - BEAUFORT TO ARARAT MCKINNON LANE TO ANDERSONS ROAD ES RAMP B CH 4060 - CH 4280 ALIGNMENT PLAN			
FILE NO.	CONTRACT NO.	SHEET NO.	DRAWING NO.
716	8612	175	728676



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.

- INSTALL 1x63mm PVC CAT 'A' CONDUIT
- INSTALL LV SERVICE PIT (TYPICAL)

GENERAL NOTES

1. SURVEY DATUMS: LEVEL-AHD, GRID-MGA ZONE 54
2. FOR WRSB DETAILS REFER TO GUARD FENCE AND WIRE ROPE SAFETY BARRIER SETTING OUT TERMINOLOGY DRAWING.
3. REFER LANDSCAPE DRAWINGS FOR TREES TO BE REMOVED.

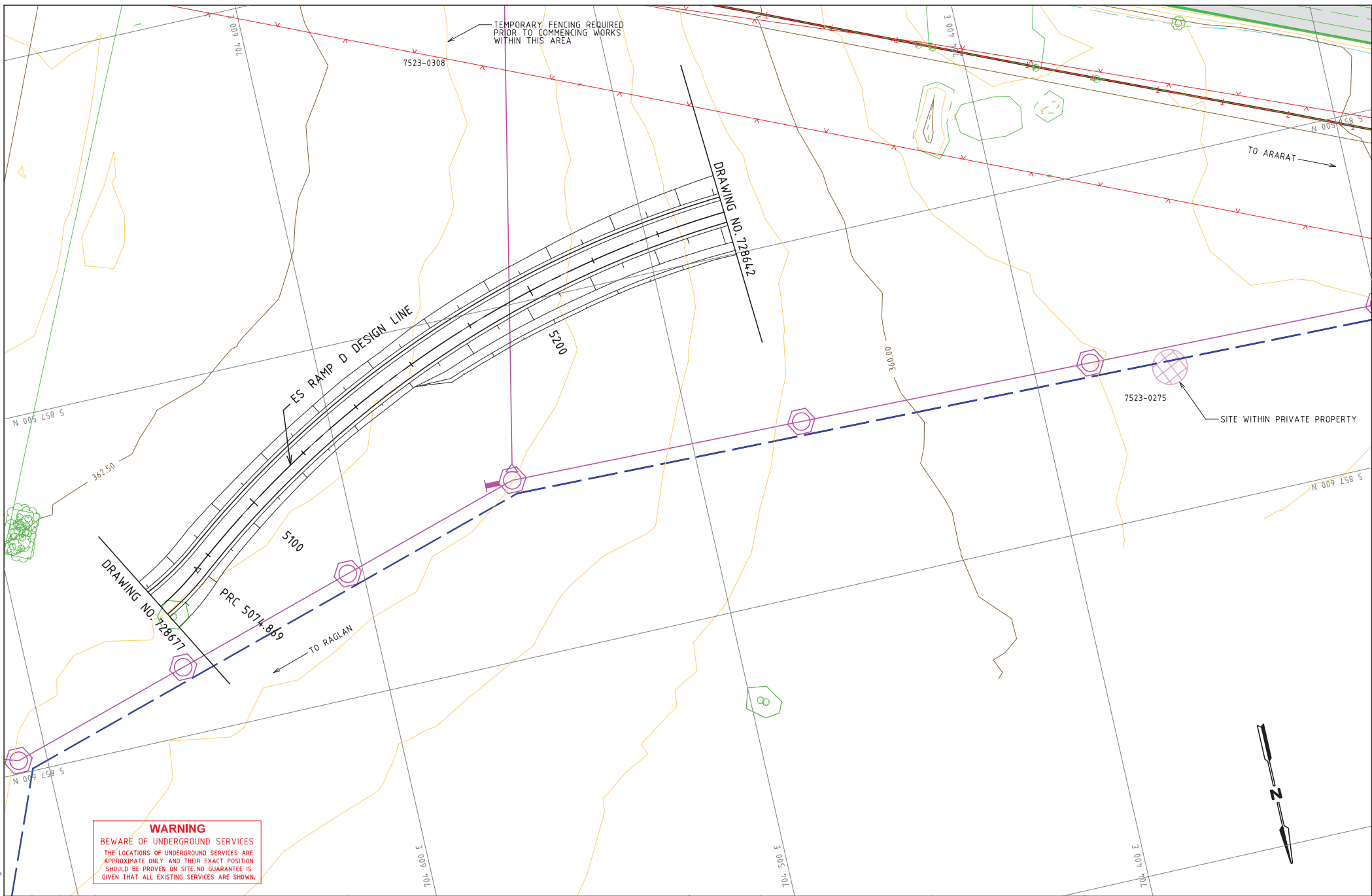
	PROPOSED ROW BOUNDARY
	EXISTING FENCE
	PROPOSED POWER LINE RELOCATION
	EXISTING SAFETY BARRIER
	NO GO ZONES

TECHNICAL CONSULTING 3 PROSPECT HILL ROAD, CAMBERWELL, VICTORIA, 3124 PHONE (03) 9811 8355 FAX (03) 9811 8329	DESIGNED PROJECT DESIGN
	APPROVED

SCALE OF METRES
 HOR 0 10 20
 VER

WESTERN HWY/FWY WESTERN HIGHWAY - BEAUFORT TO ARARAT MCKINNON LANE TO ANDERSONS ROAD EURAMBEEN-STREATHAM RD CH 41660 - CH 41860 ALIGNMENT PLAN				
FILE NO.	CONTRACT NO.	SHEET NO.	DRAWING NO.	ISSUE
716	8612	176	728677	

14/11/2013 Default
 716-pd-a-ap-49.dgn



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.

E				
D				
C				
B				
A				
ISSUE	APP'D	DATE	AMENDMENT	

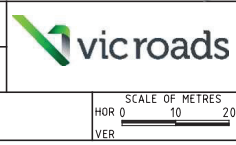
GENERAL NOTES
 1. SURVEY DATUMS: LEVEL-AHD, GRID-MGA ZONE 54
 2. FOR WRSB DETAILS REFER TO GUARD FENCE AND WIRE ROPE SAFETY BARRIER SETTING OUT TERMINOLOGY DRAWING.
 3. REFER LANDSCAPE DRAWINGS FOR TREES TO BE REMOVED.

— PROPOSED ROW BOUNDARY
— EXISTING FENCE
— PROPOSED POWER LINE RELOCATION
— EXISTING SAFETY BARRIER
X NO GO ZONES

TECHNICAL CONSULTING
 3 PROSPECT HILL ROAD,
 CAMBERWELL,
 VICTORIA, 3124
 PHONE (03) 9811 8355
 FAX (03) 9811 8329

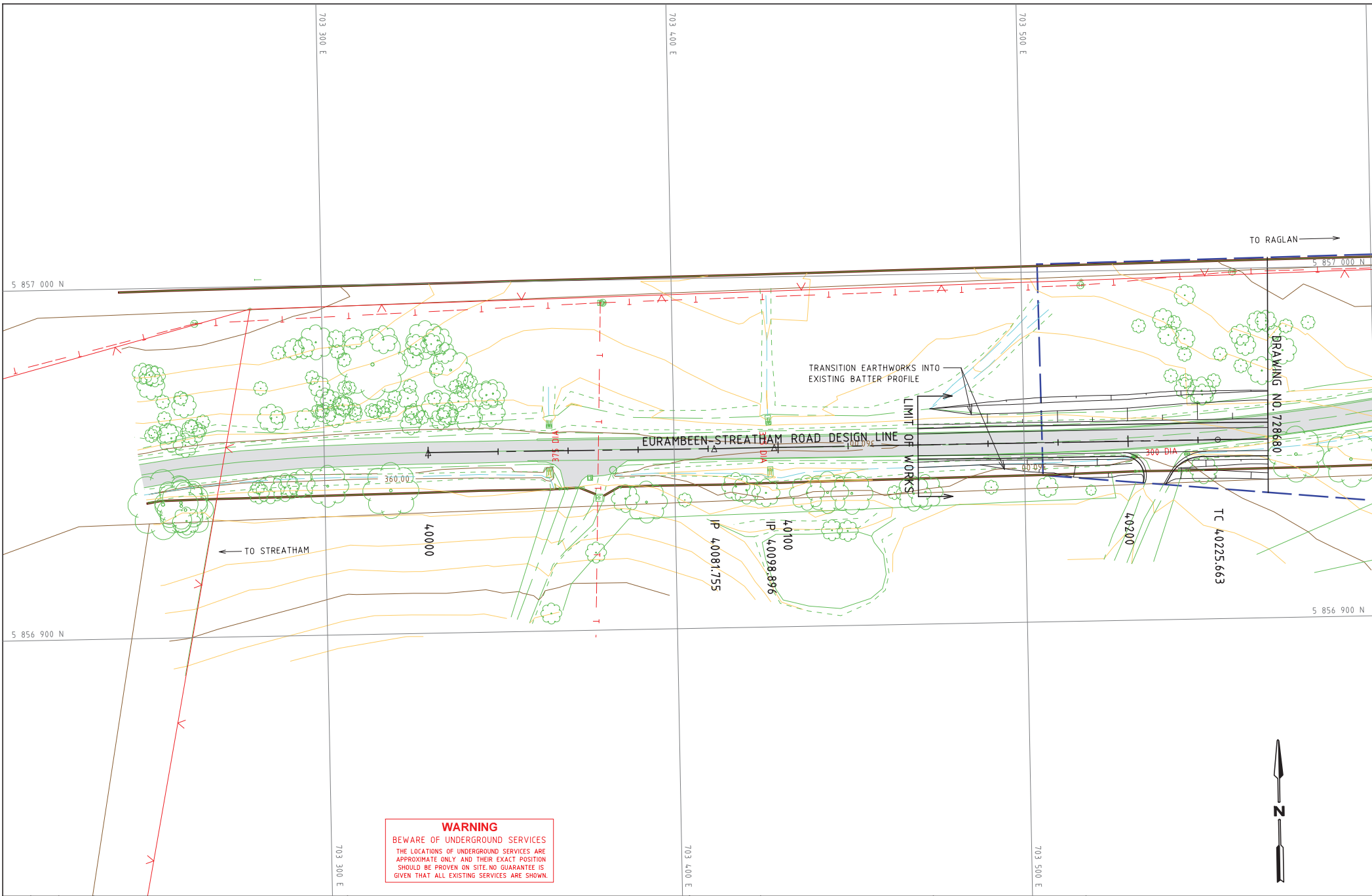
DESIGNED PROJECT DESIGN
 APPROVED

CAT: Road_Design
 PROJ: (a) Section 2A
 FILE: 716-pd-a-ap-50.dgn



WESTERN HWY/FWY				
WESTERN HIGHWAY - BEAUFORT TO ARARAT MCKINNON LANE TO ANDERSONS ROAD				
ES RAMP D CH 5060 - CH 5260				
ALIGNMENT PLAN				
FILE NO.	CONTRACT NO.	SHEET NO.	DRAWING NO.	ISSUE
716	8612	177	728678	

14/11/2013 Default
 716-pd-a-ap-50.dgn



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.

E				
D				
C				
B				
A				
ISSUE	APP'D	DATE	AMENDMENT	

GENERAL NOTES
 1. SURVEY DATUMS: LEVEL-AHD, GRID-MGA ZONE 54
 2. FOR WRSB DETAILS REFER TO GUARD FENCE AND WIRE ROPE SAFETY BARRIER SETTING OUT TERMINOLOGY DRAWING.
 3. REFER LANDSCAPE DRAWINGS FOR TREES TO BE REMOVED.

— PROPOSED ROW BOUNDARY
— EXISTING FENCE
— PROPOSED POWER LINE RELOCATION
— EXISTING SAFETY BARRIER
 NO GO ZONES

TECHNICAL CONSULTING
 3 PROSPECT HILL ROAD,
 CARBISWELL,
 VICTORIA, 3124
 PHONE (03) 9811 8355
 FAX (03) 9811 8329

DESIGNED PROJECT DESIGN
 APPROVED

CAT: Road_Design
 PROJ: (a) Section 2A
 FILE: 716-pd-a-ap-51.dgn

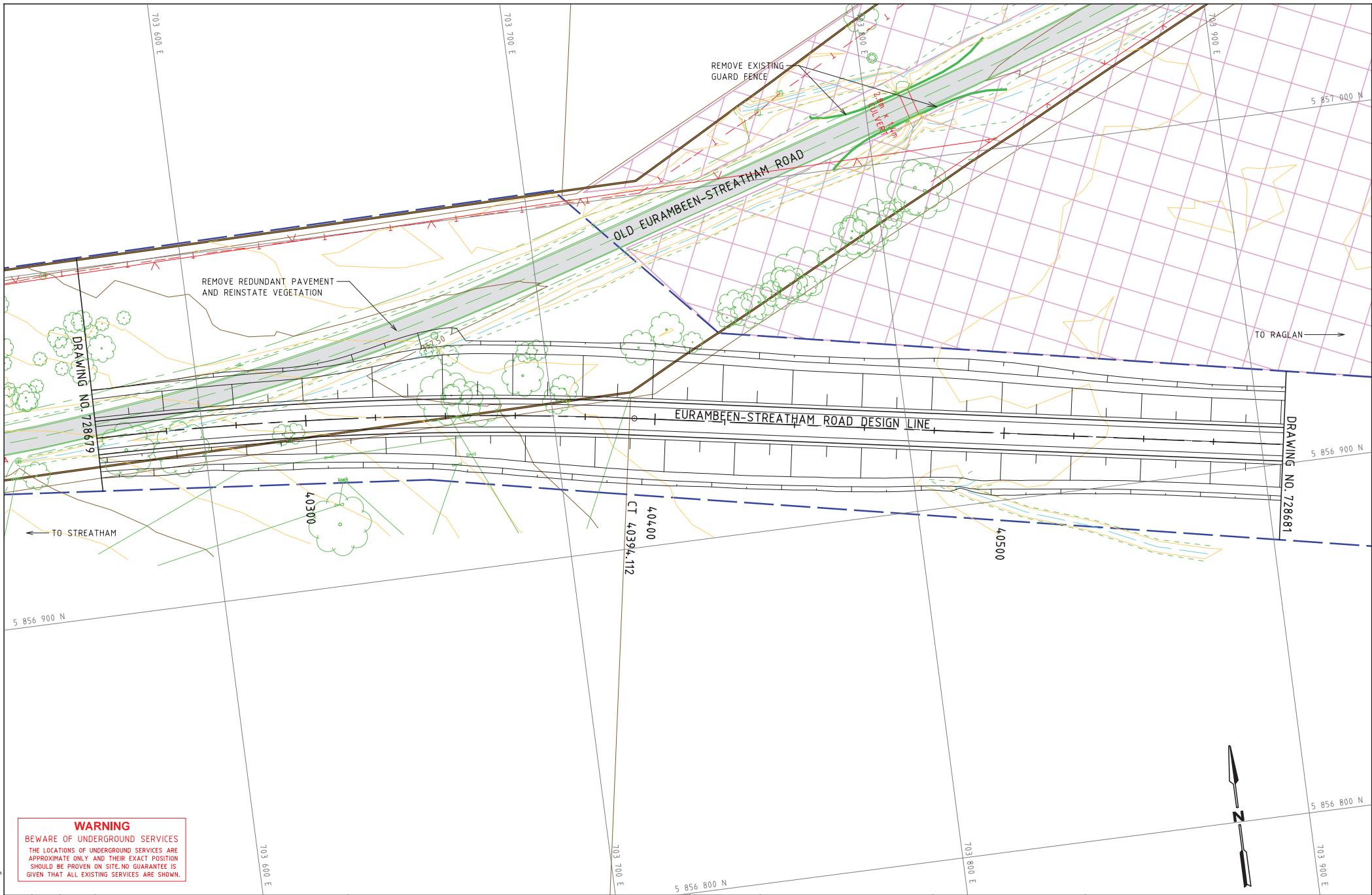
SCALE OF METRES
 HOR 0 10 20
 VER

WESTERN HWY/FWY
 WESTERN HIGHWAY - BEAUFORT TO ARARAT
 MCKINNON LANE TO ANDERSONS ROAD
EURAMBIEN-STREATHAM RD CH 40000 - CH 40240
ALIGNMENT PLAN

FILE NO.	CONTRACT NO.	SHEET NO.	DRAWING NO.	ISSUE
716	8612	178	728679	

14/11/2013 Default
 716-pd-a-ap-51.dgn





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.

E				
D				
C				
B				
A				
ISSUE	APP'D	DATE	AMENDMENT	

GENERAL NOTES
 1. SURVEY DATUMS: LEVEL-AHD, GRID-MGA ZONE 54
 2. FOR WRSB DETAILS REFER TO GUARD FENCE AND WIRE ROPE SAFETY BARRIER SETTING OUT TERMINOLOGY DRAWING.
 3. REFER LANDSCAPE DRAWINGS FOR TREES TO BE REMOVED.

— PROPOSED ROW BOUNDARY
— EXISTING FENCE
— EXISTING SAFETY BARRIER
— PROPOSED POWER LINE RELOCATION
 NO GO ZONES

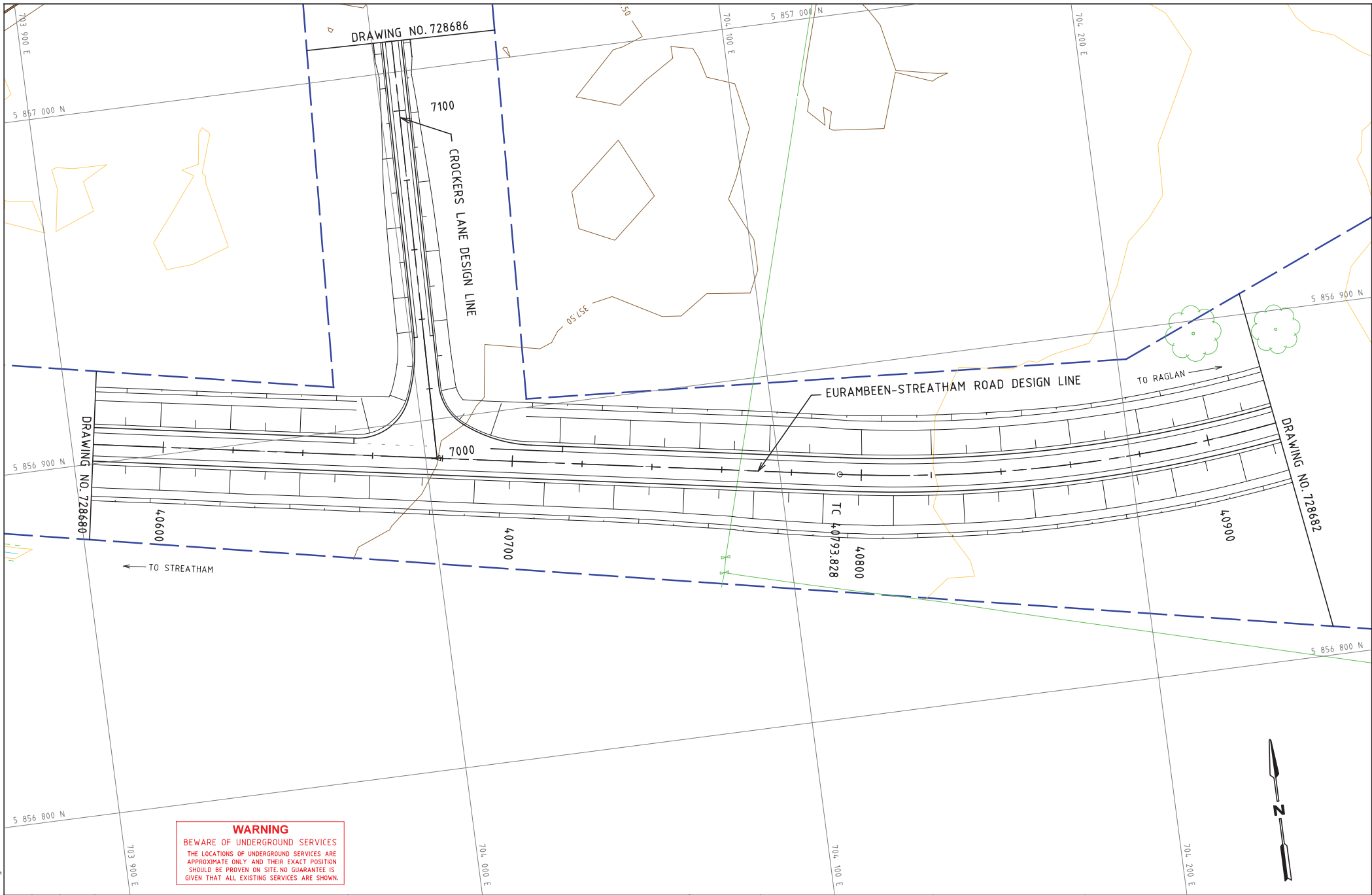
TECHNICAL CONSULTING
 3 PROSPECT HILL ROAD,
 CAMBERWELL,
 VICTORIA, 3124
 PHONE (03) 9811 8355
 FAX (03) 9811 8329

DESIGNED PROJECT DESIGN
 APPROVED

CAT: Road_Design
 PROJ: (a) Section 2A
 FILE: 716-pd-a-ap-52.dgn

SCALE OF METRES
 HOR 0 10 20
 VER

WESTERN HWY/FWY WESTERN HIGHWAY - BEAUFORT TO ARARAT MCKINNON LANE TO ANDERSONS ROAD EURAMBEEN-STREATHAM RD CH 40240 - CH 40580 ALIGNMENT PLAN				
FILE NO.	CONTRACT NO.	SHEET NO.	DRAWING NO.	ISSUE
716	8612	179	728680	



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.



14/11/2013 Default
 716-pd-a-op-53.dgn

E				
D				
C				
B				
A				
ISSUE	APP'D	DATE	AMENDMENT	

GENERAL NOTES
 1. SURVEY DATUMS: LEVEL-AHD, GRID-MGA ZONE 54
 2. FOR WRSB DETAILS REFER TO GUARD FENCE AND WIRE ROPE SAFETY BARRIER SETTING OUT TERMINOLOGY DRAWING.
 3. REFER LANDSCAPE DRAWINGS FOR TREES TO BE REMOVED.

— PROPOSED ROW BOUNDARY
— EXISTING FENCE
— PROPOSED POWER LINE RELOCATION
 NO GO ZONES
— EXISTING SAFETY BARRIER

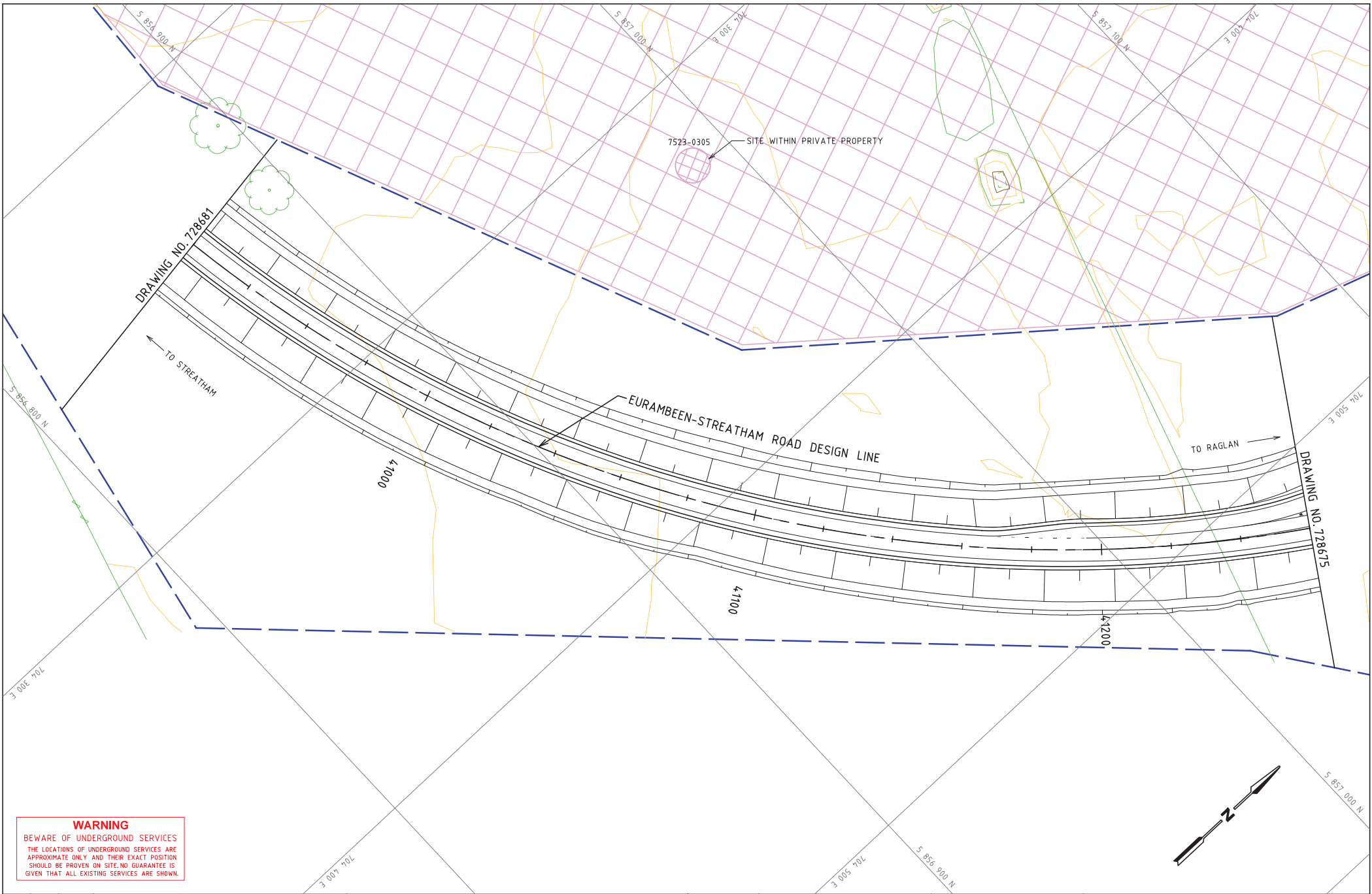
TECHNICAL CONSULTING
 3 PROSPECT HILL ROAD,
 CAMBERWELL,
 VICTORIA, 3124
 PHONE (03) 9811 8355
 FAX (03) 9811 8329

DESIGNED PROJECT DESIGN
 APPROVED

CAT: Road_Design
 PRO: (a) Section 2A
 FILE: 716-pd-a-op-53.dgn

SCALE OF METRES
 HOR 0 10 20
 VER

WESTERN HWY/FWY				
WESTERN HIGHWAY - BEAUFORT TO ARARAT MCKINNON LANE TO ANDERSONS ROAD				
EURAMBEEN-STREATHAM RD CH 40580 - CH 40920				
ALIGNMENT PLAN				
FILE NO.	CONTRACT NO.	SHEET NO.	DRAWING NO.	ISSUE
716	8612	180	728681	



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.



E				
D				
C				
B				
A				
ISSUE	APP'D	DATE	AMENDMENT	

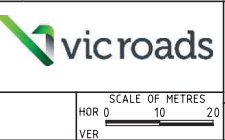
GENERAL NOTES
 1. SURVEY DATUMS: LEVEL-AHD, GRID-MGA ZONE 54
 2. FOR WRSB DETAILS REFER TO GUARD FENCE AND WIRE ROPE SAFETY BARRIER SETTING OUT TERMINOLOGY DRAWING.
 3. REFER LANDSCAPE DRAWINGS FOR TREES TO BE REMOVED.

PROPOSED ROW BOUNDARY
 EXISTING FENCE
 PROPOSED POWER LINE RELOCATION
 EXISTING SAFETY BARRIER
 NO GO ZONES

TECHNICAL CONSULTING
 3 PROSPECT HILL ROAD,
 CAMBERWELL,
 VICTORIA, 3124
 PHONE (03) 9811 8355
 FAX (03) 9811 8329

DESIGNED PROJECT DESIGN
 APPROVED

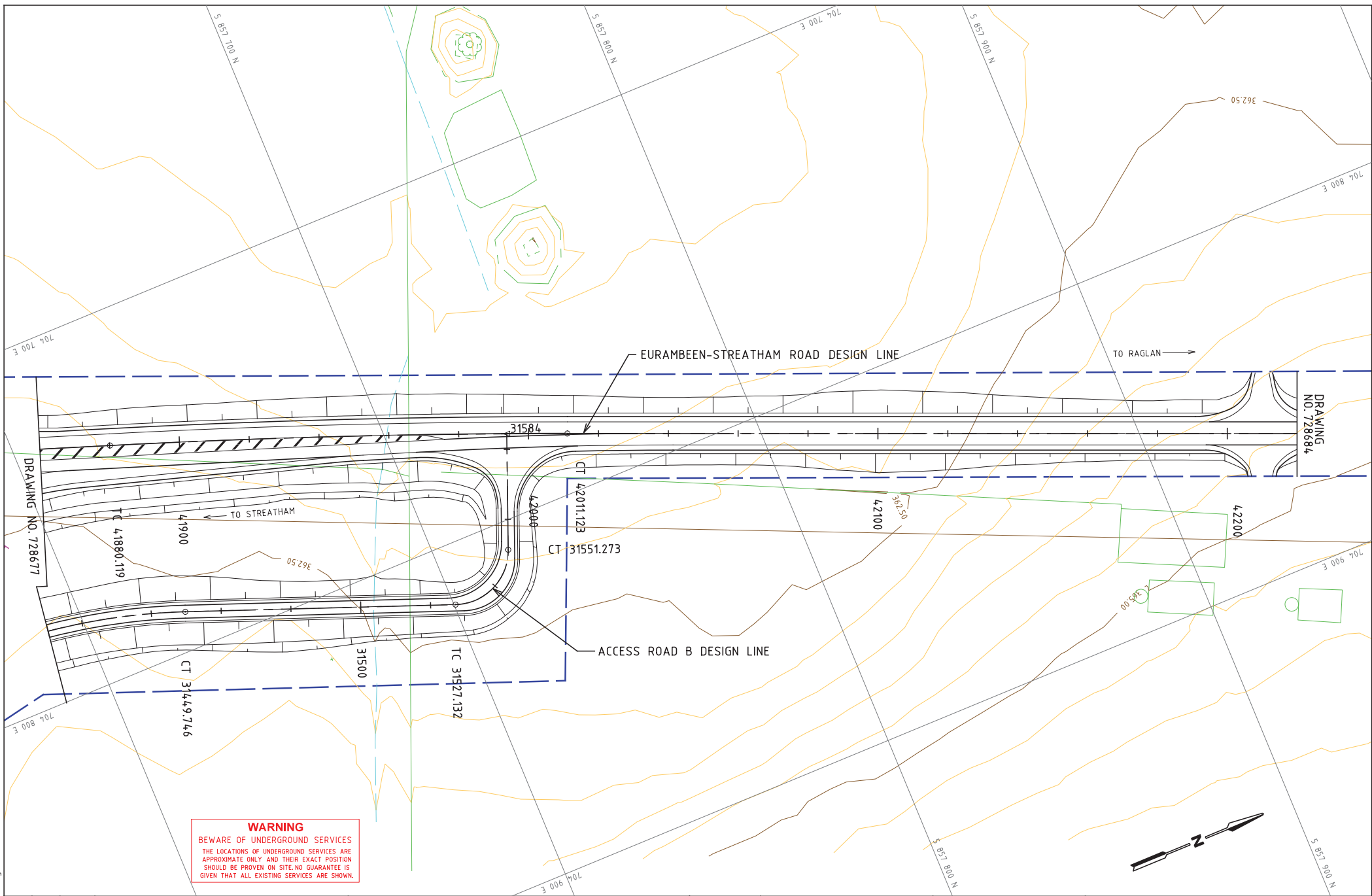
CAT: Road_Design
 PRO: (a) Section 2A
 FILE: 716-pd-a-ap-54.dgn



WESTERN HWY/FWY
 WESTERN HIGHWAY - BEAUFORT TO ARARAT
 MCKINNON LANE TO ANDERSONS ROAD
 EURAMBEEN-STREATHAM RD CH 40920 - CH 41260
 ALIGNMENT PLAN

FILE NO.	CONTRACT NO.	SHEET NO.	DRAWING NO.	ISSUE
716	8612	181	728682	

14/11/2013 Default
 14:46:32 PM 716-pd-a-ap-54.dgn



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.

F				
D				
C				
B				
A				
ISSUE	APP'D	DATE	AMENDMENT	

GENERAL NOTES
 1. SURVEY DATUMS: LEVEL-AHD, GRID-MGA ZONE 54
 2. FOR WRSB DETAILS REFER TO GUARD FENCE AND WIRE ROPE SAFETY BARRIER SETTING OUT TERMINOLOGY DRAWING.
 3. REFER LANDSCAPE DRAWINGS FOR TREES TO BE REMOVED.

— PROPOSED ROW BOUNDARY
— EXISTING FENCE
— EXISTING SAFETY BARRIER
 NO GO ZONES
— PROPOSED POWER LINE RELOCATION
— EXISTING SAFETY BARRIER

TECHNICAL CONSULTING
 3 PROSPECT HILL ROAD,
 CARBISWELL,
 VICTORIA, 3124
 PHONE (03) 9811 8355
 FAX (03) 9811 8329

DESIGNED PROJECT DESIGN
 APPROVED

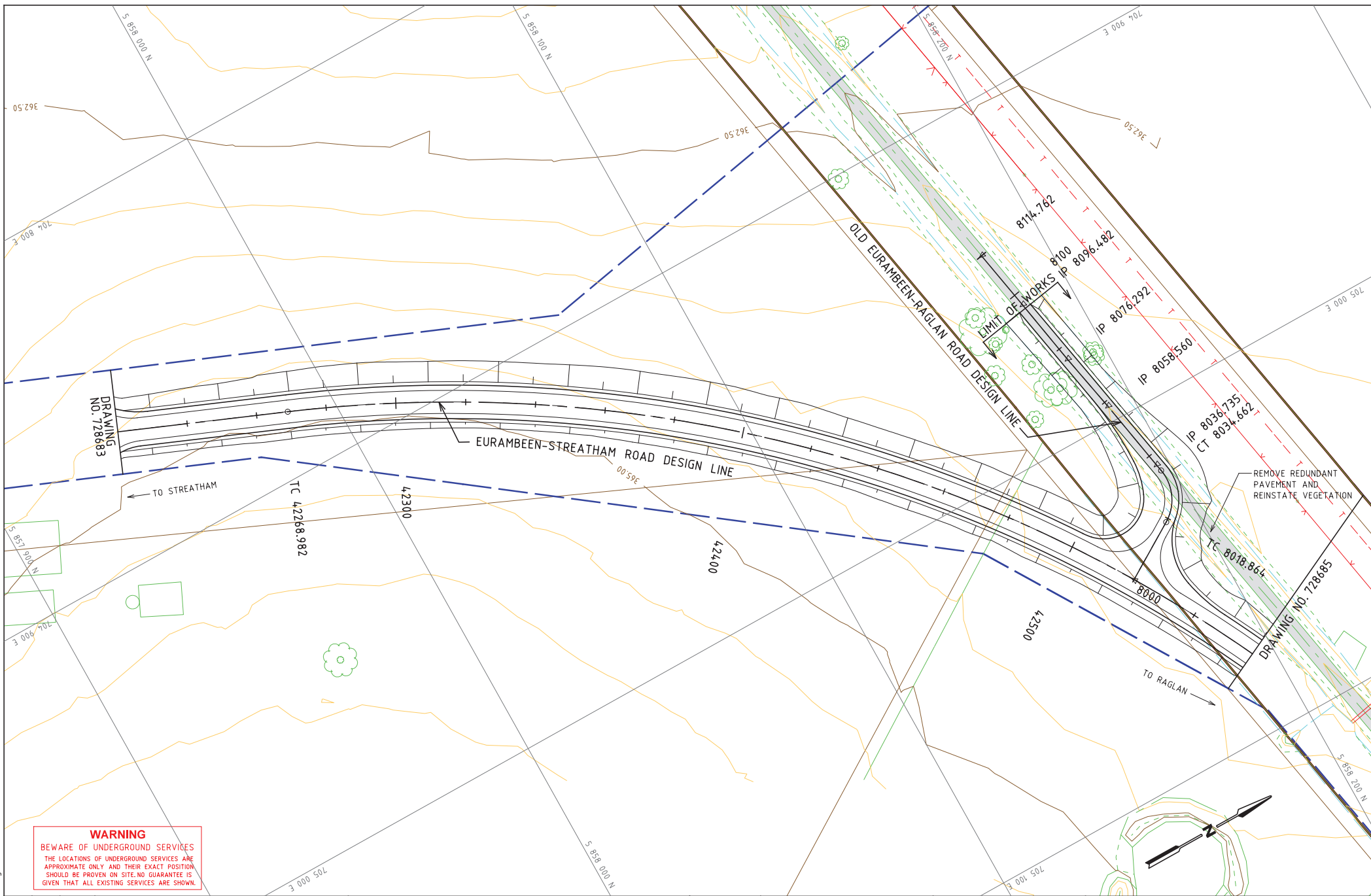
CAT: Road_Design
 PRO: (a) Section 2A
 FILE: 716-pd-a-ap-55.dgn

SCALE OF METRES
 HOR 0 10 20
 VER

WESTERN HWY/FWY
 WESTERN HIGHWAY - BEAUFORT TO ARARAT
 MCKINNON LANE TO ANDERSONS ROAD
EURAMBEEN-STREATHAM RD CH 41860 - CH 42220
ALIGNMENT PLAN

FILE NO.	CONTRACT NO.	SHEET NO.	DRAWING NO.	ISSUE
716	8612	182	728683	

14/11/2013 Default
 716-pd-a-ap-55.dgn



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.

E				
D				
C				
B				
A				
ISSUE	APP'D	DATE	AMENDMENT	

GENERAL NOTES

1. SURVEY DATUMS: LEVEL-AHD, GRID-MGA ZONE 54
2. FOR WRSB DETAILS REFER TO GUARD FENCE AND WIRE ROPE SAFETY BARRIER SETTING OUT TERMINOLOGY DRAWING.
3. REFER LANDSCAPE DRAWINGS FOR TREES TO BE REMOVED.

— PROPOSED ROW BOUNDARY
— EXISTING FENCE
— EXISTING SAFETY BARRIER
— PROPOSED POWER LINE RELOCATION
 NO GO ZONES

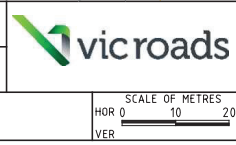
TECHNICAL CONSULTING

3 PROSPECT HILL ROAD,
 CARBISWELL,
 VICTORIA, 3124
 PHONE (03) 9811 8355
 FAX (03) 9811 8329

DESIGNED PROJECT DESIGN

APPROVED

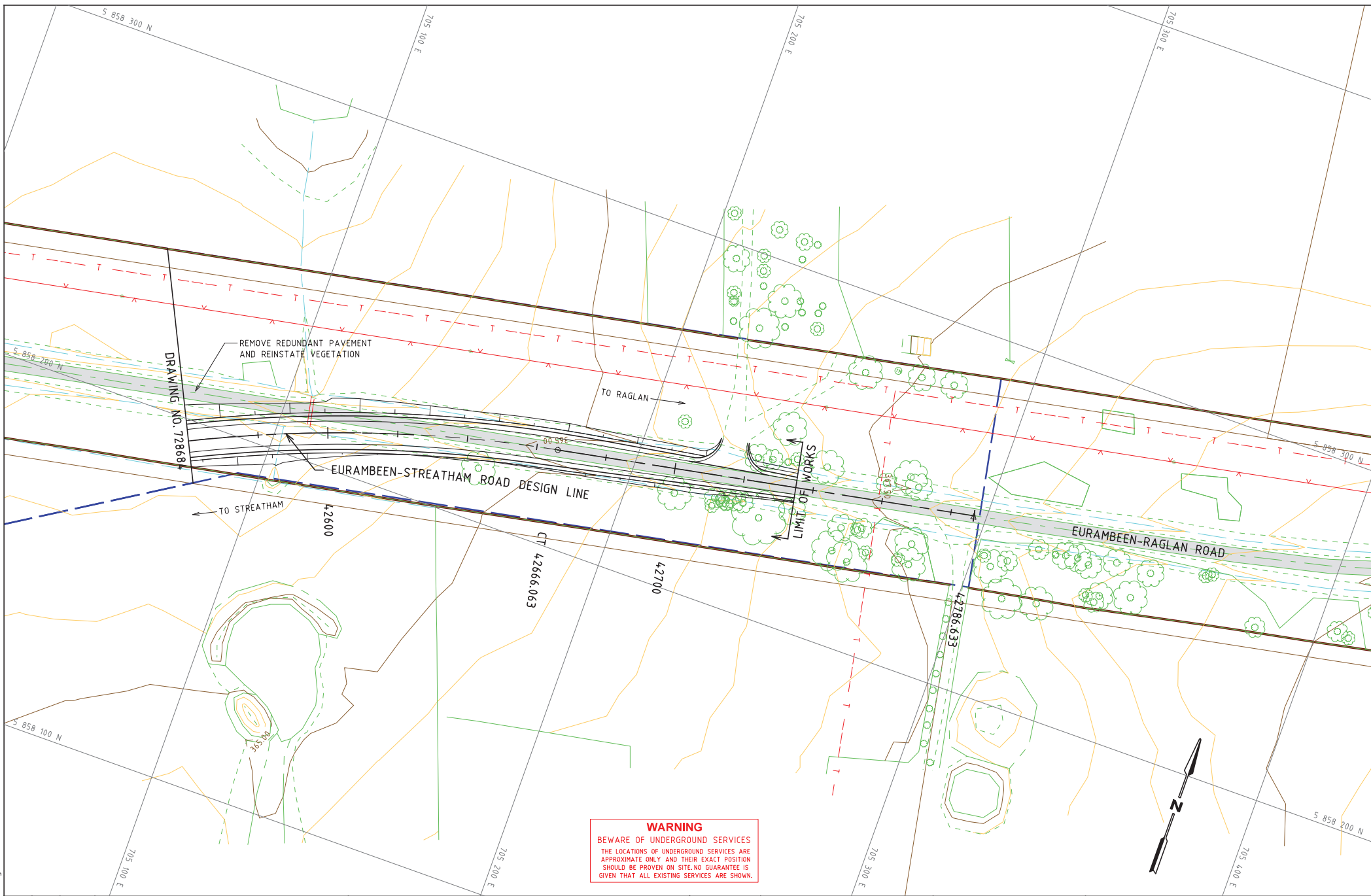
CAT: Road_Design
 PRO: (a) Section 2A
 FILE: 716-pd-a-ap-56.dgn



WESTERN HWY/FWY
 WESTERN HIGHWAY - BEAUFORT TO ARARAT
 MCKINNON LANE TO ANDERSONS ROAD
EURAMBIEN-STREATHAM RD CH 42220 - CH 42560
ALIGNMENT PLAN

FILE NO.	CONTRACT NO.	SHEET NO.	DRAWING NO.	ISSUE
716	8612	183	728684	

14/11/2013 Default
 716-pd-a-ap-56.dgn



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.

14/11/2013 Default
 11:46:38 PM 716-pd-a-ap-57.dgn

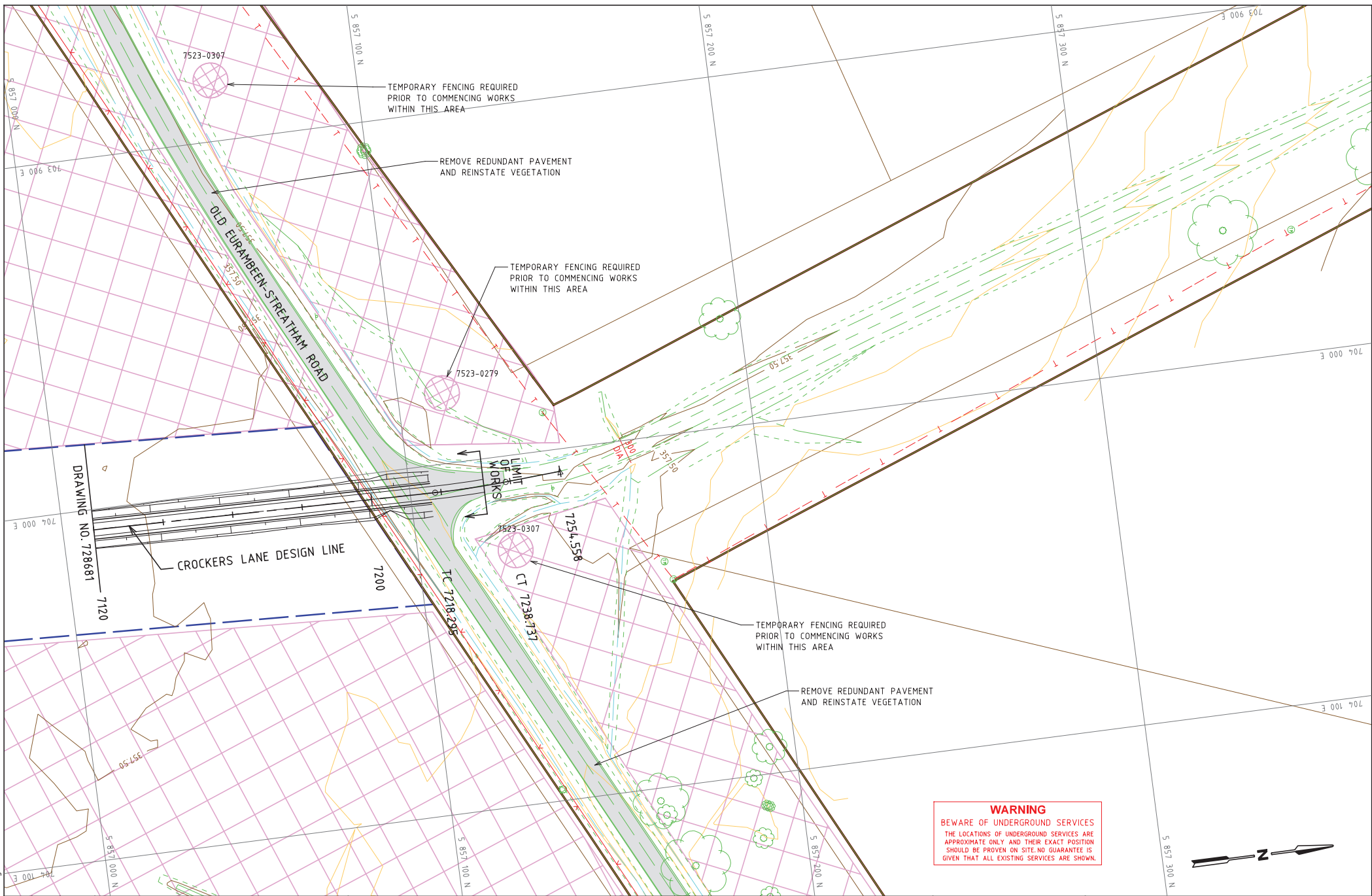
E			
D			
C			
B			
A			
ISSUE	APP'D	DATE	AMENDMENT

GENERAL NOTES	
1. SURVEY DATUMS: LEVEL-AHD, GRID-MGA ZONE 54	
2. FOR WRSB DETAILS REFER TO GUARD FENCE AND WIRE ROPE SAFETY BARRIER SETTING OUT TERMINOLOGY DRAWING.	
3. REFER LANDSCAPE DRAWINGS FOR TREES TO BE REMOVED.	
	PROPOSED ROW BOUNDARY
	EXISTING FENCE
	PROPOSED POWER LINE RELOCATION
	EXISTING SAFETY BARRIER
	NO GO ZONES

TECHNICAL CONSULTING	DESIGNED PROJECT DESIGN
APPROVED	
3 PROSPECT HILL ROAD, CARBISWELL, VICTORIA, 3124 PHONE (03) 9811 8355 FAX (03) 9811 8329	CAT: Road_Design PROJ: (a) Section 2A FILE: 716-pd-a-ap-57.dgn

SCALE OF METRES
 HOR 0 10 20
 VER

WESTERN HWY/FWY			
WESTERN HIGHWAY - BEAUFORT TO ARARAT MCKINNON LANE TO ANDERSONS ROAD			
EURAMBEEN-STREATHAM RD CH 42560 - CH 42786.633			
ALIGNMENT PLAN			
FILE NO.	CONTRACT NO.	SHEET NO.	DRAWING NO.
716	8612	184	728685



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.



F				
D				
C				
B				
A				
ISSUE	APP'D	DATE	AMENDMENT	

GENERAL NOTES
 1. SURVEY DATUMS: LEVEL-AHD, GRID-MGA ZONE 54
 2. FOR WRSB DETAILS REFER TO GUARD FENCE AND WIRE ROPE SAFETY BARRIER SETTING OUT TERMINOLOGY DRAWING.
 3. REFER LANDSCAPE DRAWINGS FOR TREES TO BE REMOVED.

— PROPOSED ROW BOUNDARY
— EXISTING FENCE
— PROPOSED POWER LINE RELOCATION
— EXISTING SAFETY BARRIER
 NO GO ZONES

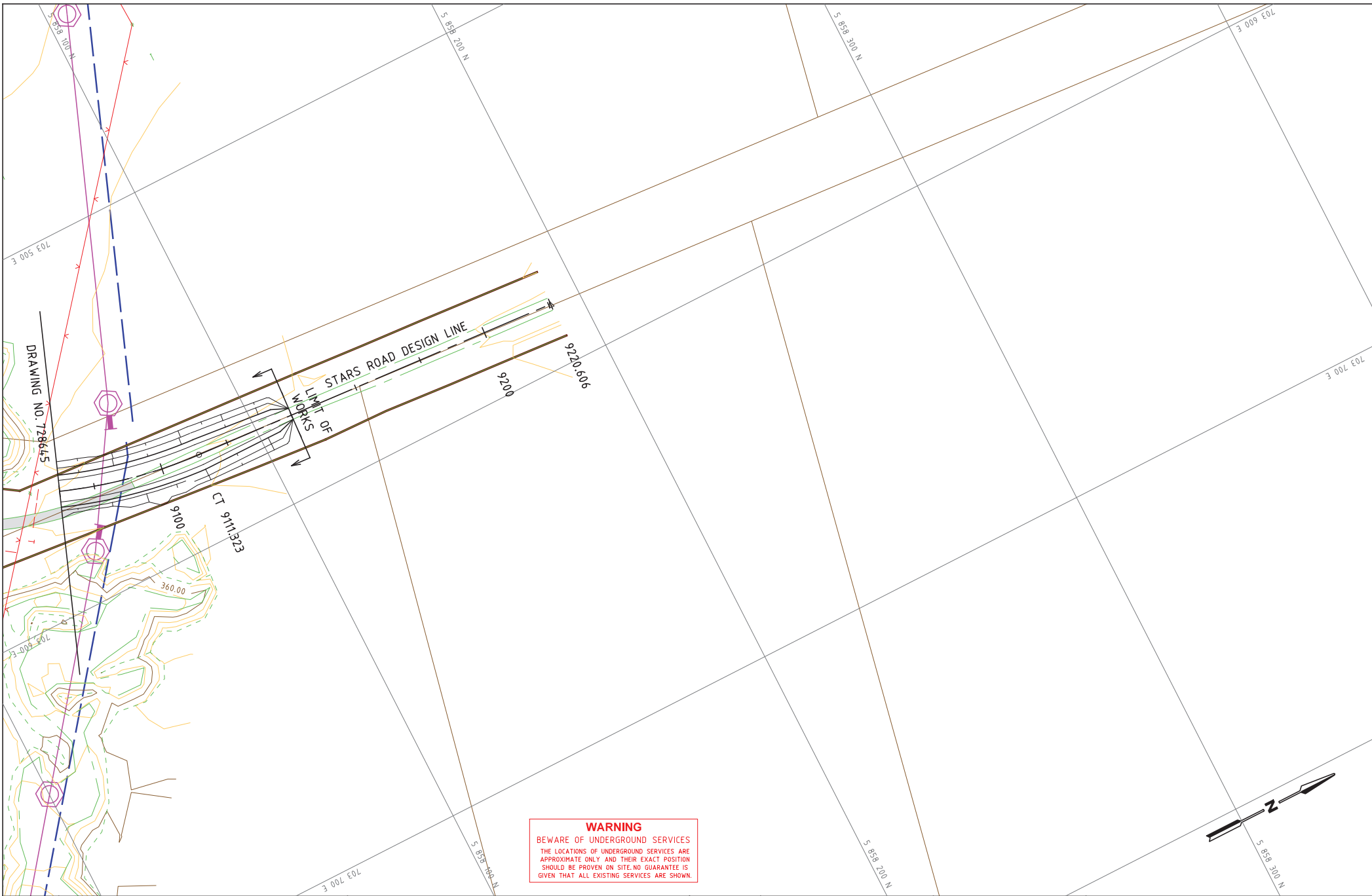
TECHNICAL CONSULTING
 3 PROSPECT HILL ROAD,
 CARBISWELL,
 VICTORIA, 3124
 PHONE (03) 9811 8355
 FAX (03) 9811 8329

DESIGNED PROJECT DESIGN
 APPROVED

CAT: Road_Design
 PRO: (a) Section 2A
 FILE: 716-pd-a-ap-58.dgn

SCALE OF METRES
 HOR 0 10 20
 VER

WESTERN HWY/FWY				
WESTERN HIGHWAY - BEAUFORT TO ARARAT MCKINNON LANE TO ANDERSONS ROAD				
CROCKERS LANE CH 7120 - CH 7218.295				
ALIGNMENT PLAN				
FILE NO.	CONTRACT NO.	SHEET NO.	DRAWING NO.	ISSUE
716	8612	185	728686	



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.

14/11/2013 Default
 716-pd-a-ap-59.dgn

E			
D			
C			
B			
A			
ISSUE	APP'D	DATE	AMENDMENT

GENERAL NOTES
 1. SURVEY DATUMS: LEVEL-AHD, GRID-MGA ZONE 54
 2. FOR WRSB DETAILS REFER TO GUARD FENCE AND WIRE ROPE SAFETY BARRIER SETTING OUT TERMINOLOGY DRAWING.
 3. REFER LANDSCAPE DRAWINGS FOR TREES TO BE REMOVED.

— PROPOSED ROW BOUNDARY
— EXISTING FENCE
— PROPOSED POWER LINE RELOCATION
— EXISTING SAFETY BARRIER
 NO GO ZONES

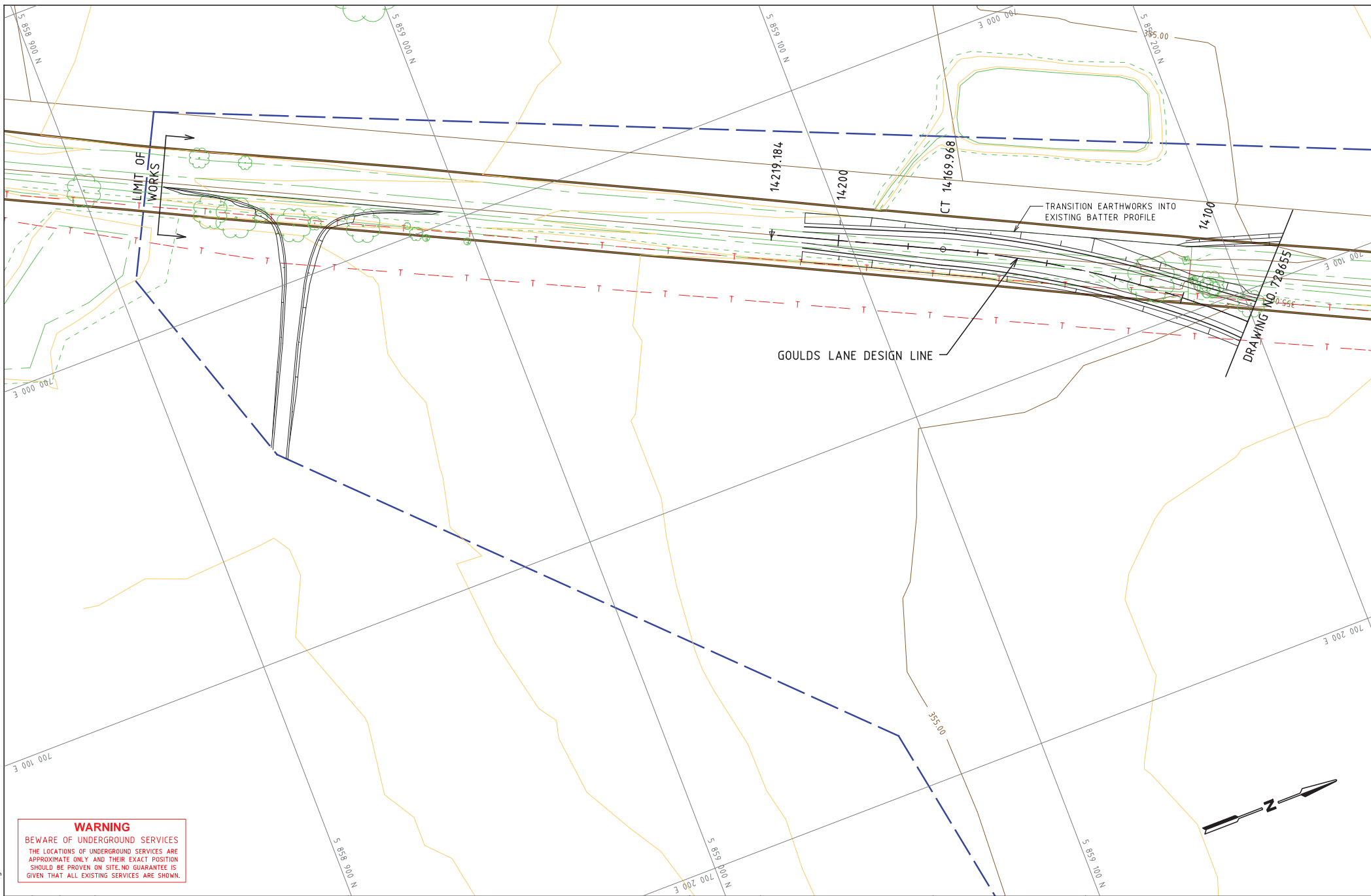
TECHNICAL CONSULTING
 3 PROSPECT HILL ROAD,
 CAMBERWELL,
 VICTORIA, 3124
 PHONE (03) 9811 8355
 FAX (03) 9811 8329

DESIGNED PROJECT DESIGN
 APPROVED

CAT: Road_Design
 PRO: (a) Section 2A
 FILE: 716-pd-a-ap-59.dgn

SCALE OF METRES
 HOR 0 10 20
 VER

WESTERN HWY/FWY WESTERN HIGHWAY - BEAUFORT TO ARARAT MCKINNON LANE TO ANDERSONS ROAD STARS ROAD CH 9070 - CH 9220.606 ALIGNMENT PLAN				
FILE NO.	CONTRACT NO.	SHEET NO.	DRAWING NO.	ISSUE
716	8612	186	728687	



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.

E				
D				
C				
B				
A				
ISSUE	APP'D	DATE	AMENDMENT	

GENERAL NOTES
 1. SURVEY DATUMS: LEVEL-AHD, GRID-MGA ZONE 54
 2. FOR WRSB DETAILS REFER TO GUARD FENCE AND WIRE ROPE SAFETY BARRIER SETTING OUT TERMINOLOGY DRAWING.
 3. REFER LANDSCAPE DRAWINGS FOR TREES TO BE REMOVED.

— PROPOSED ROW BOUNDARY
— EXISTING FENCE
— PROPOSED POWER LINE RELOCATION
— EXISTING SAFETY BARRIER
 NO GO ZONES

TECHNICAL CONSULTING
 3 PROSPECT HILL ROAD,
 CAMBERWELL,
 VICTORIA, 3124
 PHONE (03) 9811 8355
 FAX (03) 9811 8329

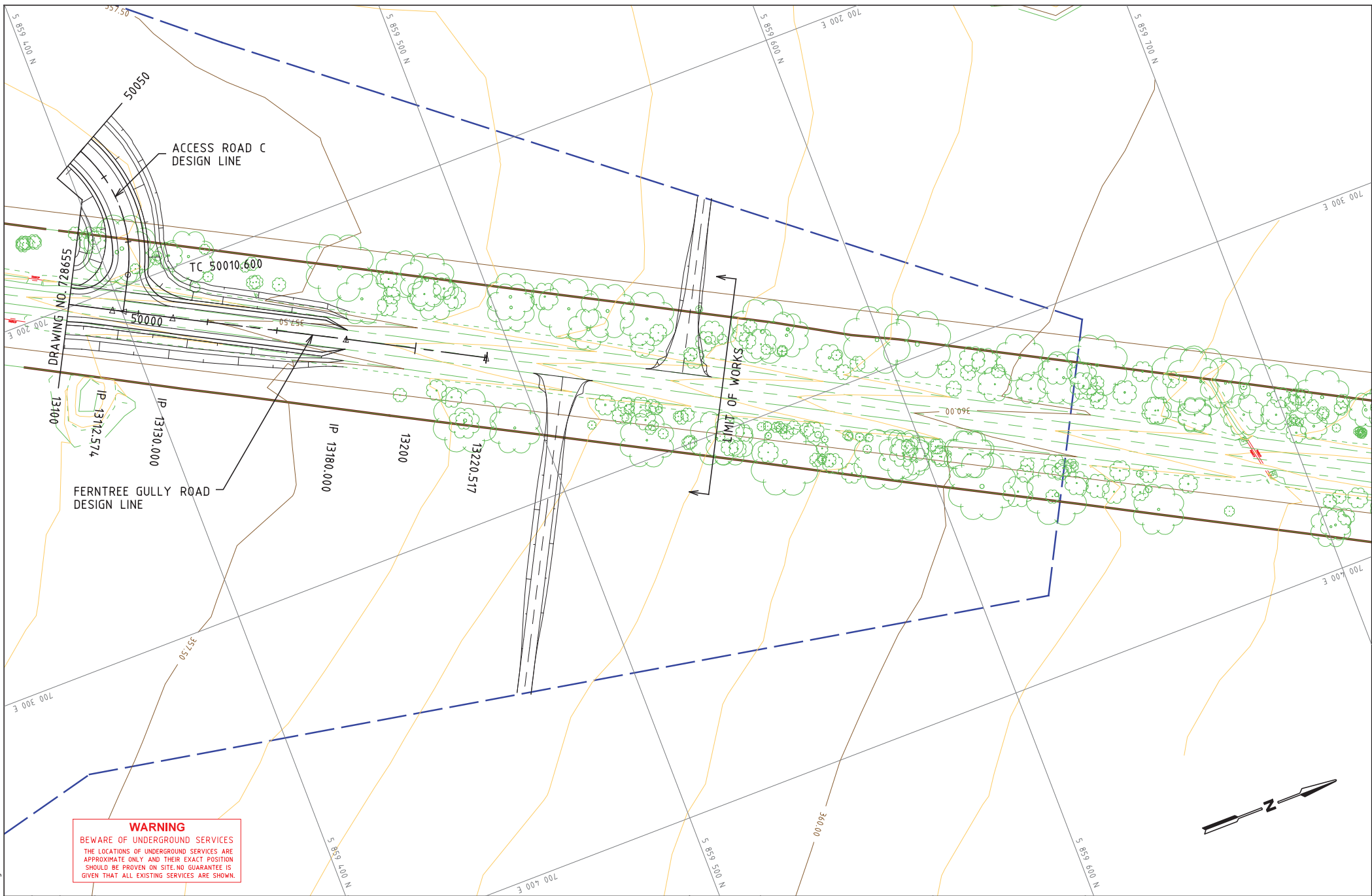
DESIGNED PROJECT DESIGN
APPROVED

CAT: Road_Design
 PRO: (a) Section 2A
 FILE: 716-pd-a-ap-60.dgn

SCALE OF METRES
 HOR 0 10 20
 VER

WESTERN HWY/FWY				
WESTERN HIGHWAY - BEAUFORT TO ARARAT MCKINNON LANE TO ANDERSONS ROAD				
GOULDS LANE CH 14080 - CH 14219.184				
ALIGNMENT PLAN				
FILE NO.	CONTRACT NO.	SHEET NO.	DRAWING NO.	ISSUE
716	8612	187	728688	

14/11/2013 Default
716-pd-a-ap-60.dgn



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.

E				
D				
C				
B				
A	J.M.	29/10/13	SHEET NUMBER CORRECTED FROM 189 TO 188	
ISSUE	APP'D	DATE	AMENDMENT	

GENERAL NOTES
 1. SURVEY DATUMS: LEVEL-AHD, GRID-MGA ZONE 54
 2. FOR WRSB DETAILS REFER TO GUARD FENCE AND WIRE ROPE SAFETY BARRIER SETTING OUT TERMINOLOGY DRAWING.
 3. REFER LANDSCAPE DRAWINGS FOR TREES TO BE REMOVED.

— PROPOSED ROW BOUNDARY
— EXISTING FENCE
— PROPOSED POWER LINE RELOCATION
— EXISTING SAFETY BARRIER
 NO GO ZONES

TECHNICAL CONSULTING
 3 PROSPECT HILL ROAD,
 CARBISWELL,
 VICTORIA, 3124
 PHONE (03) 9811 8355
 FAX (03) 9811 8329

DESIGNED PROJECT DESIGN
 APPROVED
 J. MIKITCZUK
 18/10/13
 CAT: Road_Design
 PRO: (a) Section 2A
 FILE: 716-pd-a-ap-61.dgn

SCALE OF METRES
 HOR 0 10 20
 VER

WESTERN HWY/FWY				
WESTERN HIGHWAY - BEAUFORT TO ARARAT MCKINNON LANE TO ANDERSONS ROAD				
FERNTREE GULLY ROAD CH 13100 - 13220.517				
ALIGNMENT PLAN				
FILE NO.	CONTRACT NO.	SHEET NO.	DRAWING NO.	ISSUE
716	8612	188	728689	A

14/11/2013 Default
 14:46:45 PM 716-pd-a-ap-61.dgn

From: s22
To: s22
Cc: s22
Subject: FW: Western Highway Project - Beaufort to Ararat [SEC=UNCLASSIFIED]
Date: Tuesday, 3 December 2013 5:38:48 PM
Attachments: [DSEWPac Offset response to request for additional information EPBC 2010_5741.pdf](#)
[Attachment 1- Proposed sites for EPBC Offsets Creswick Road Campbelltown and Firey Flat Rd Kinypanial.pdf](#)
[Attachment 2- EPBC assessment spreadsheets.pdf](#)
[~WRD000.jpg](#)

s22
Director - Victoria Section
South Eastern Australia Branch
Environment Assessments and Compliance Division
Department of the Environment
✉ GPO Box 787 Canberra ACT 2601
☎ 02 6274 s22 📧 s22 @environment.gov.au

From: s22 @roads.vic.gov.au [mailto:s22 @roads.vic.gov.au]
Sent: Tuesday, 3 December 2013 5:00 PM
To: s22
Subject: Western Highway Project - Beaufort to Ararat

Hi s22

Further to discussions we had a couple of months ago regarding obtaining offsets for Section 2, I am pleased to advise that we are now in a position where we feel that we have identified all that are required for Beaufort to Ararat. We will obviously need some confirmation from your department that the offset quantities and type are suitable which we will work through with you.

Subject to resolving the above detail, the only issue we will still have is in relation to when the offsets will actually be secured. The issues related to this are in relation to the timing of when we can do final surveys and the timeframes required to actually gain "security" over the offsets.

Given we are so far down the track towards obtaining the offsets and the funding for the Project is coming from the Government and is therefore secure, I was hoping that you could consider a proposal for us to commence works in advance of actually having the offsets "in the bank". We are very keen to make the best use of the current summer period for construction and your assistance through considering some flexibility in the timing of completion of securing the offsets would help a great deal in this matter.

The attached letter outlines our proposal in more detail and the attachments will hopefully assist you in your discussions.

When you have had a chance to have a look through the attached, I would really appreciate the opportunity to discuss further with you as we would like to meet all of your interests and potential concerns to assist us in getting to a mutually comfortable outcome. If you can please advise when I should call you to discuss or perhaps set up a meeting that would be great.

Thanks again for your assistance on this s22 and if you need any further information please give me a call.

s22
Project Director - Western Highway Project

VicRoads

PO Box 148, Wendouree, VIC 3355
237 Ring Road, Wendouree, VIC 3355

T 03 5309 1s22

M s22

E s22 @roads.vic.gov.au

VICROADS CENTENARY
CONNECTING VICTORIANS FOR 100 YEARS
1913-2013



DISCLAIMER

The following conditions apply to this communication and any attachments: VicRoads reserves all of its copyright; the information is intended for the addressees only and may be confidential and/or privileged - it must not be passed on by any other recipients; any expressed opinions are those of the sender and not necessarily VicRoads; VicRoads accepts no liability for any consequences arising from the recipient's use of this means of communication and/or the information contained in and/or attached to this communication. If this communication has been received in error, please contact the person who sent this communication and delete all copies.

Western Highway Project
237 Ring Road
Wendouree Victoria 3355
PO Box 148 Wendouree Victoria 3355

Telephone 1300 779 642
Fax (03) 5309 1099
Email whp@roads.vic.gov.au

vicroads.vic.gov.au

Victoria Section
Environment Assessment Branch
Department of Sustainability, Environment, Water, Population
and Communities
GPO Box 787
CANBERRA ACT 2601

2 December 2013
Our Ref: n2289252
File No: AO925-009-006
Your Ref: EPBC 2010/5741

Dear Mr Tregurtha

**REQUEST FOR ADDITIONAL INFORMATION
WESTERN HIGHWAY PROJECT- BEAUFORT TO ARARAT, VICTORIA
(EPBC 2010/5741)**

I refer to your letter dated 21 June 2013 requesting additional information in relation to proposed offset sites.

VicRoads has been diligently taking steps to source all required offsets to meet the obligations under the *EPBC Act*. Ecology and Heritage Partners has been engaged to undertake an assessment of required offsets in accordance with *EPBC Act environmental offsets policy (DSEWPaC, October 2012)*. Each of these assessment guides are attached to this letter. The below table summarises the offsets that VicRoads is proposing to obtain. The proposed offsets to be removed are based on the Section 2 construction footprint which assumes a total loss. These numbers will be further reduced as detailed design is progressively finalised and patches of native vegetation will be marked as no-go zones to the contractor.

MNES	Proposed removal (ha)	Proposed offset (ha)
GSM	31.56	73.0
NTGVVP	5.25	21.1
GEWVVP	11.14	25.8

The proposed offsets are accounted for across two sites. Site 1 is located on the Creswick-Newstead Rd at Campbelltown. The property is approximately 111 hectares with a mixture of volcanic and sedimentary soils, the site is privately owned, and is zoned farming. Site 2 is located on Kurting-Boort Rd in Kinypanial. The property is approximately 85 hectares with a mixture of granitic and alluvial soils. Further information regarding these properties including location, maps and tenure arrangements can be found in the attached document *Proposed Sites for EPBC Offsets: Creswick Rd Campbelltown and Firey Flat Rd Kinypanial*.

VicRoads has engaged a consultant to undertake survey of Golden Sun Moth on the Kinypanial site in early December 2013 as the timing for this survey is restricted to between December and January due to the species fly period.

Given the type and quantities of offsets, it has taken VicRoads a number of months to source the quantity and quality of offsets required and to now be at the point where there



is a high level of confidence that offsets available for the Project are now somewhat secured.

However, given the timing of the surveys that remain and the purchasing steps required to obtain title over the offsets, the final formal transfer of offsets to VicRoads and the implementation of the Native Vegetation Offset Management plan may not be absolutely final by the end of January 2014.

With all other planning approvals in place, I would expect that VicRoads is in a position to award a contract for construction of the first phase of this section by late January 2014.

In order to progress the purchase of offsets, I am seeking your in principle agreement to the quantity of the proposed offsets as indicated in the above table and, subject to the outcomes of the surveys, the suitability of the two sites identified in this letter.

Given the significant progress that has been made on this matter and the steps taken towards securing the offsets, I would also seek your agreement to commence construction works on this critical project in advance of finalising securing the offsets.

Your agreement to this proposal will provide substantial benefits in allowing construction works this summer which will shorten the overall project duration and deliver project benefits earlier. Subject to your agreement to this approach, VicRoads will undertake to use absolute best endeavours to finalise the procurement of the offsets and will produce a Native Vegetation Offset Management plan for the two sites as soon as possible. VicRoads will provide all other required information upon the completion of this plan.

I thank you for considering this request and would appreciate the opportunity for further discussion with you on this matter to try and progress to an outcome that meets the interests of both parties.

Should you require further information, s22 [REDACTED] from this office (Tel: 1300 779 642) would be pleased to assist.

Yours sincerely

s22 [REDACTED]

PROJECT DIRECTOR - WESTERN HIGHWAY

VICROADS

PROPOSED SITES FOR EPBC OFFSETS

CRESWICK RD CAMPBELLTOWN AND FIREY FLAT RD KINYPANIAL



www.cassinia.com

PO Box 481 Kyneton Victoria 3444

P.0423 944526 ABN 81 065 571 244

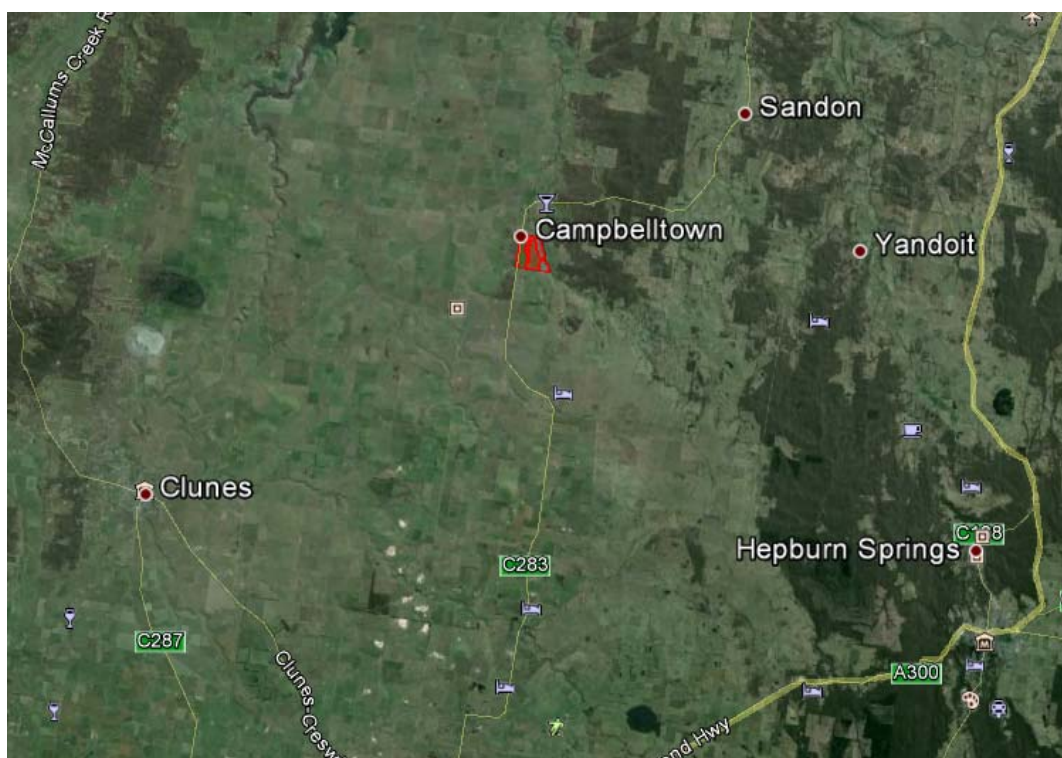
1. INTRODUCTION

Cassinia Environmental has been requested by Vicroads to identify offsets for three EPBC requirements including Golden Sun Moth, Natural Temperate Grasslands of the VVP and Grassy Eucalypt Woodlands of the VVP. Paul Dettmann from Cassinia has identified two properties which appear to accommodate the required offsets. This document summaries the two properties.

2. SITE 1 CAMPBELLTOWN

Site Description

The property is located on the Creswick-Newstead Rd at Campbelltown. The property is approximately 111 hectares (276 acres) with a mixture of volcanic and sedimentary soils, the site is privately owned, and is zoned farming. A map demonstrating the location of the property is shown in map 1, and a report on the property is given in Annex 1.



Map 1 demonstrates the location of the site

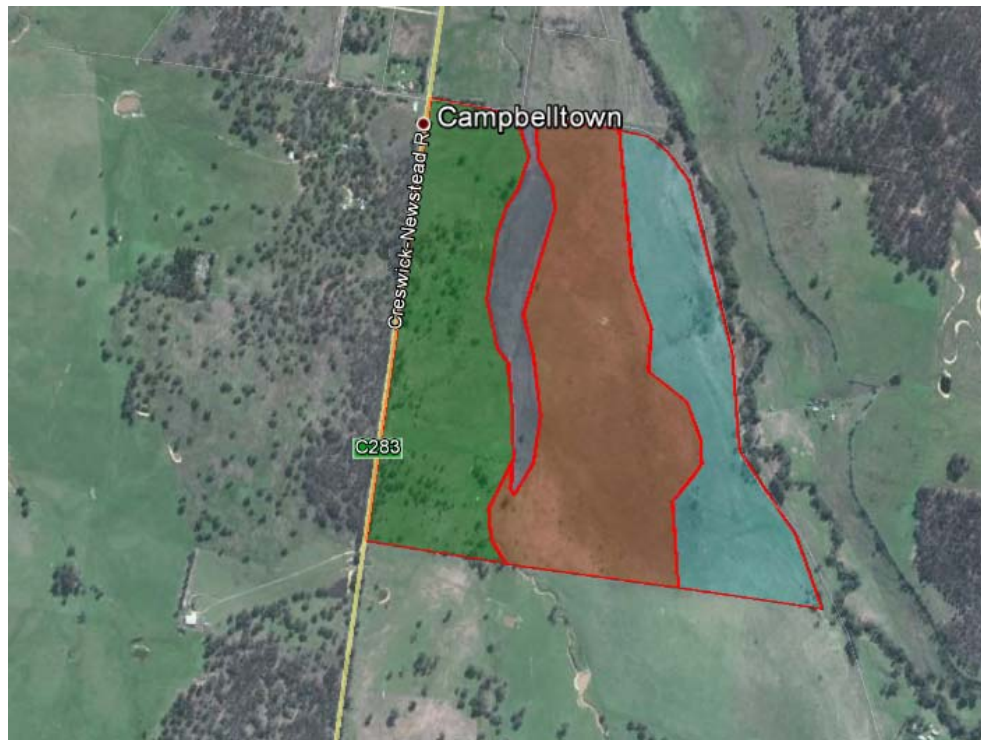
Ecological Description

The site has been assessed by Dr. Nathan Wong from Trust for Nature. Nathan indicated that when assessed according to the Victorian Government's vegetation types the property appears to be a mixture of four different ecological vegetation classes (EVCs) including Plains Grassy Woodland, Plains Grassy Wetland, Plains Grassland, and Grassy Woodland.

When considered according to EPBC ecological communities, the property appears to be consistent with the EPBC definitions of Natural Temperate Grasslands of the VVP, Grassy Eucalypt Woodlands of the VVP and White box - yellow box - Blakely's red gum grassy woodlands and derived native grasslands.

Nathan identified that most of the eucalypts which were present in the Grassy Eucalypt Woodlands of the VVP had been removed, but a diverse understory persists including *calocephalus sitriuis*, *themda triandra*, *dianella amoena*, *dianella admixta*, *Solenogyne dominii*, and *ptilotus macrocephalus* and remnants of the original *Eucalyptus camaldulansis* overstorey. Nathan estimated that the split of grassy woodland to grassland is likely to have been around 50% given the nature and extent of understory species present. Reestablishment of the canopy in this grassy woodland is likely to result in the protection of a highly significant site and given the lack of success of Vanessa Craigie (DEPI) in finding diverse grassy woodland sites in the VVP this presents one of the few opportunities to protect a diverse example of this ecological community on private land.

The Natural Temperate Grasslands of the VVP maintained a diverse understory species including *Pimelea spinescens subsp. spinescens*, *Eryngium ovinum*, and *Dianella amoena*, and included the section of plans Grassy Wetland. An approximate map of the ecological communities is given in Map 2 below.



- Natural Temperate Grasslands of the VVP
- Grassy Eucalypt Woodlands of the VVP
- Natural Temperate Grasslands of the VVP / Grassy Eucalypt Woodlands of the VVP Mosaic
- White box - yellow box - Blakely's red gum grassy woodlands and derived native grasslands

Proposed future management

A detailed map of the site and management plan will be developed if the site is deemed a possible offset. The site will be purchased and will have a Trust for Nature covenant placed on title to protect the site and avert any future degradation.

SITE PHOTOS – CAMPBELLTOWN

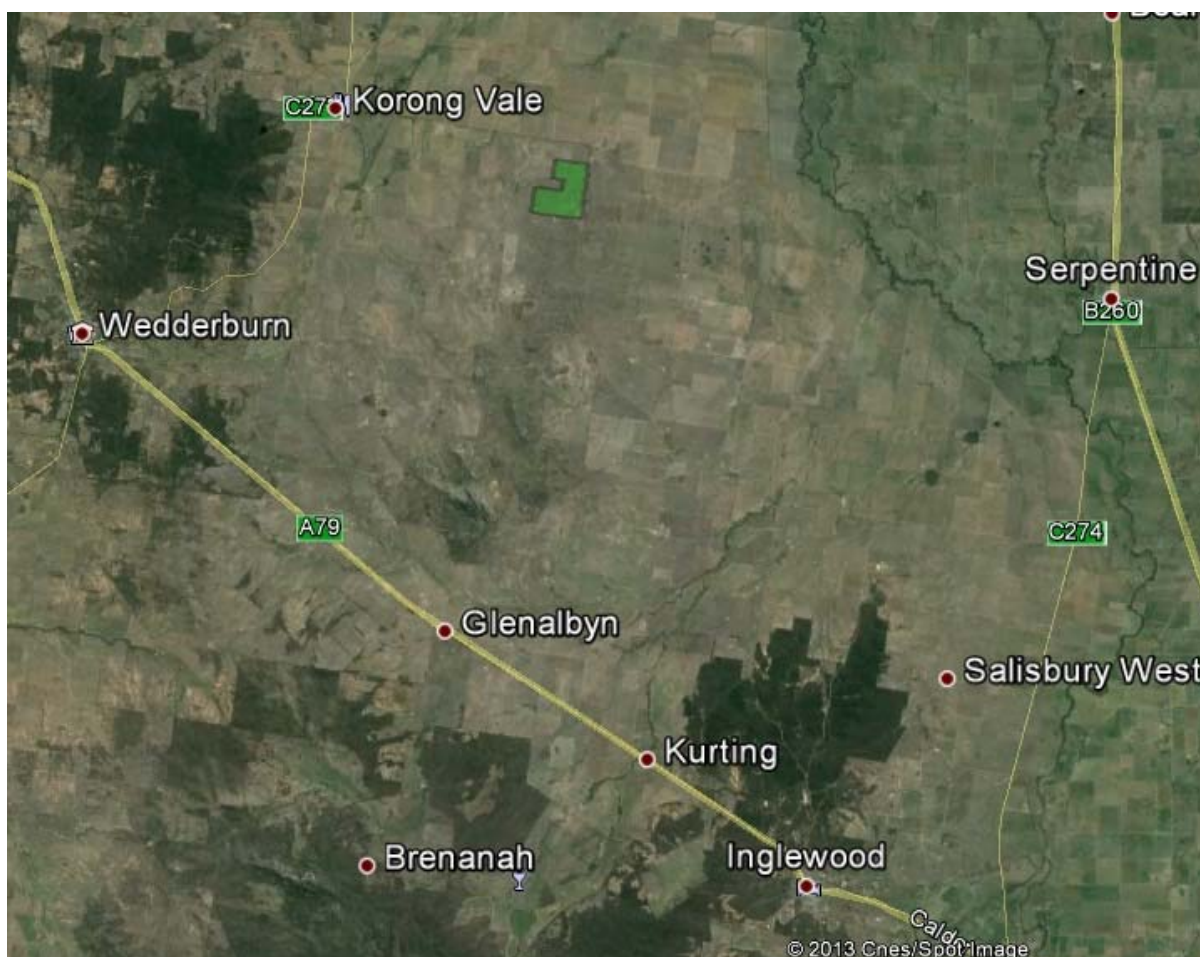


3. SITE 2 KINYPANIAL

Site Description

The property is located on Kurting-Boort Rd in Kinypanial. The property is approximately 85 hectares (210 acres) with a mixture of granitic and alluvial soils. The property is privately owned, and is zoned farming. A map demonstrating the location of the property is shown in map 3, and a report on the property is given in Annex 2.

Map 3 below demonstrates the location of the site.



Ecological Description

The site has been assessed by Dr. Nathan Wong from Trust for Nature. Nathan indicated that when assessed according to the Victorian Government's vegetation types the property is a mixture of two different ecological vegetation classes (EVCs). These are Grassy Woodland and Plains Woodland.

The site has never been ploughed and maintains an intact cover of native grasses including several danthonia species. The site is located approximately 5km south of the Kinypanial Grassland reserve, a reference site for Golden Sun Moth. No GSM surveys have been undertaken on the site, but Nathan Wong and Deanna Marshall have both indicated that the site is very likely to contain GSM. A site assessment is being undertaken for GSM in December 2013.



Proposed future management

A detailed map of the site and management plan will be developed if the site is deemed a possible offset. The site will be purchased and will have a Trust for Nature covenant placed on title to protect the site and avert any future degradation.

SITE PHOTOS – KINYPANIAL



4. ANNEXURES

ANNEX 1 – PROPERTY REPORT CAMPBELLTOWN



Property Report from www.land.vic.gov.au on 25 November 2013 01:05 PM

Address: 2169 CRESWICK-NEWSTEAD ROAD CAMPBELLTOWN 3364

Lot and Plan Number: This site has 9 parcels. See table below.

Standard Parcel Identifier (SPI): See table below.

Local Government (Council): HEPBURN Council Property Number: 202170

Directory Reference: VicRoads 58 H5

This property is in a designated bushfire prone area.

Special bushfire construction requirements apply. Planning provisions may apply.

Further information about the building control system and building in bushfire prone areas can be found in the Building Commission section of the Victorian Building Authority website www.vba.vic.gov.au

Site Dimensions

All dimensions and areas are approximate. They may not agree with the values shown on a title or plan.



Area: 1124045 sq. m
(112.4 ha)

Perimeter: 7056 m

For this property:

— Site boundaries

— Road frontages

Dimensions for individual parcels require a separate search, but dimensions for individual units are generally not available.

6 dimensions shorter than 42m not displayed

Calculating the area from the dimensions shown may give a different value to the area shown above - which has been calculated using all the dimensions.

For more accurate dimensions get copy of plan at [Title and Property Certificates](#)

Copyright © - State Government of Victoria

Copyright © - State Government of Victoria

Disclaimer: This content is provided for information purposes only. No claim is made as to the accuracy or authenticity of the content. The Victorian Government does not accept any liability to any person for the information provided.

Read the full disclaimer at www.land.vic.gov.au/home/copyright-and-disclaimer

2169-CRESWICK-NEWSTEAD-ROAD-CAMPBELLTOWN-DETAILED-PROPERTY-REPORT



Parcel Details

Letter in first column identifies parcel in diagram above

	Lot/Plan or Crown Description	SPI		Lot/Plan or Crown Description	SPI
A	Lot 1 TP243419	1\TP243419	F	Lot 2 TP893627	2\TP893627
B	Lot 1 TP893624	1\TP893624	G	Lot 3 TP893627	3\TP893627
C	Lot 2 TP893624	2\TP893624	H	Lot 1 TP893638	1\TP893638
D	Lot 3 TP893624	3\TP893624	I	PARISH OF CAMPBELLTOWN Allot 9A4	9A4PP2326
E	Lot 1 TP893627	1\TP893627			

State Electorates

Legislative Council: NORTHERN VICTORIA, WESTERN VICTORIA (2005)

Legislative Assembly: BENDIGO WEST, RIPON (2001)

Utilities

Regional Urban Water Business: Central Highlands Water

Rural Water Business: Goulburn-Murray Water

Melbourne Water: outside drainage boundary

Power Distributor: POWERCOR ([Information about choosing an electricity retailer](#))

Planning Zone Summary

Planning Zone: [FARMING ZONE \(FZ\)](#)

[SCHEDULE TO THE FARMING ZONE](#)

Planning Overlay: [ENVIRONMENTAL SIGNIFICANCE OVERLAY \(ESO\)](#)

[ENVIRONMENTAL SIGNIFICANCE OVERLAY - SCHEDULE 1 \(ESO1\)](#)

Areas of Aboriginal Cultural Heritage Sensitivity:

This property is within, or affected by, one or more areas of cultural heritage sensitivity

Planning scheme data last updated on 21 November 2013.

A **planning scheme** sets out policies and requirements for the use, development and protection of land.

This report provides information about the zone and overlay provisions that apply to the selected land. Information about the State, local, particular and general provisions of the local planning scheme that may affect the use of this land can be obtained by contacting the local council or by visiting [Planning Schemes Online](#)

This report is NOT a **Planning Certificate** issued pursuant to Section 199 of the Planning & Environment Act 1987.

It does not include information about exhibited planning scheme amendments, or zonings that may affect the land.

To obtain a Planning Certificate go to [Titles and Property Certificates](#)

The Planning Property Report includes separate maps of zones and overlays

For details of surrounding properties, use this service to [get the Reports for properties of interest](#)

To view planning zones, overlay and heritage information in an interactive format visit [Planning Maps Online](#)

For other information about planning in Victoria visit www.dpcd.vic.gov.au/planning

Areas of Aboriginal Cultural Heritage Sensitivity

The data provides indicative information about the location and extent of areas of Aboriginal cultural heritage sensitivity and is provided to assist with the decisions about the potential need to prepare a Cultural Heritage Management Plan in relation to proposed activities on this property.

For further information about whether a Cultural Heritage Management Plan is required go to [Aboriginal Heritage Planning Tool](#)

To find out if your property has any recorded Aboriginal cultural heritage places, such as scarred trees, occupation sites or places of burial, you can request information from the Victorian Aboriginal Heritage Register.

Find out more about the [Victorian Aboriginal Heritage Register](#)

Copyright © - State Government of Victoria

Disclaimer: This content is provided for information purposes only. No claim is made as to the accuracy or authenticity of the content. The Victorian Government does not accept any liability to any person for the information provided.

Read the full disclaimer at www.land.vic.gov.au/home/copyright-and-disclaimer

299-CRESWICK-NEWTOWN-ROAD-CAMPBELLTOWN-DETAILED-PROPERTY-REPORT

Area Map



Copyright © - State Government of Victoria

Disclaimer: This content is provided for information purposes only. No claim is made as to the accuracy or authenticity of the content. The Victorian Government does not accept any liability to any person for the information provided.

Read the full disclaimer at www.land.vic.gov.au/home/copyright-and-disclaimer

2169-CRESWICK-NEWSTEAD-ROAD-CAMPBELLTOWN-DETAILED-PROPERTY-REPORT



Property Report from www.land.vic.gov.au on 25 November 2013 03:19 PM

Crown Description: Allot. 172 PARISH OF KINYPANIAL

Address: BOORT-KURTING ROAD FIERY FLAT 3518

Standard Parcel Identifier (SPI): 172\PP2885

Local Government (Council): LODDON Council **Property Number:** 63605300 (Part)

Directory Reference: VicRoads 29 E8

Note: This parcel is part of a property. For property details get the free Basic Property Report at [Property Reports](#)

This parcel is in a designated bushfire prone area.

Special bushfire construction requirements apply. Planning provisions may apply.

Further information about the building control system and building in bushfire prone areas can be found in the Building Commission section of the Victorian Building Authority website www.vba.vic.gov.au

Parcel Details

This is 1 parcel of 2 parcels comprising the property. The parcel searched for is marked with an * in the table below.

Lot/Plan or Crown Description	SPI
PARISH OF KINYPANIAL	
*Allot. 172	172\PP2885
Allot. 183	183\PP2885

State Electorates

Legislative Council: NORTHERN VICTORIA (2005)

Legislative Assembly: SWAN HILL (2001)

Utilities

Regional Urban Water Business: Coliban Region Water

Rural Water Business: Goulburn-Murray Water

Melbourne Water: outside drainage boundary

Power Distributor: POWERCOR (Information about [choosing an electricity retailer](#))

Planning Zone Summary

Planning Zone: [FARMING ZONE \(FZ\)](#)

[SCHEDULE TO THE FARMING ZONE](#)

Planning Overlay: [VEGETATION PROTECTION OVERLAY \(VPO\)](#)

[VEGETATION PROTECTION OVERLAY - SCHEDULE 2 \(VPO2\)](#)

Planning scheme data last updated on 21 November 2013.

A **planning scheme** sets out policies and requirements for the use, development and protection of land.

This report provides information about the zone and overlay provisions that apply to the selected land.

Information about the State, local, particular and general provisions of the local planning scheme that may affect the use of this land can be obtained by contacting the local council or by visiting [Planning Schemes Online](#)

This report is NOT a **Planning Certificate** issued pursuant to Section 199 of the Planning & Environment Act 1987.

It does not include information about exhibited planning scheme amendments, or zonings that may affect the land.

To obtain a Planning Certificate go to [Titles and Property Certificates](#)

The Planning Property Report includes separate maps of zones and overlays

For details of surrounding properties, use this service to get the Reports for properties of interest

To view planning zones, overlay and heritage information in an interactive format visit [Planning Maps Online](#)

For other information about planning in Victoria visit www.dpcd.vic.gov.au/planning

Copyright © - State Government of Victoria

Disclaimer: This content is provided for information purposes only. No claim is made as to the accuracy or authenticity of the content. The Victorian Government does not accept any liability to any person for the information provided.

Read the full disclaimer at www.land.vic.gov.au/home/copyright-and-disclaimer

Allot-172-BASIC-PROPERTY-REPORT



Area Map



Copyright © - State Government of Victoria

Disclaimer: This content is provided for information purposes only. No claim is made as to the accuracy or authenticity of the content. The Victorian Government does not accept any liability to any person for the information provided.

Read the full disclaimer at www.land.vic.gov.au/home/copyright-and-disclaimer

AL04-172-BASIC-PROPERTY-REPORT

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

FOI 181211
Document 3c

Matter of National Environmental Significance	
Name	Golden Sun Moth
EPBC Act status	Critically Endangered
Annual probability of extinction Based on IUCN category definitions	6.8%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator					
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact	Units	Information source
<i>Ecological communities</i>					
Area of community	No		Area		
			Quality		
			Total quantum of impact	0.00	
<i>Threatened species habitat</i>					
Area of habitat	Yes	31.56 hectares of Golden Sun Moth habitat	Area	31.56	Hectares
			Quality	5	Scale 0-10
			Total quantum of impact	15.78	Adjusted hectares
<i>Threatened species</i>					
Number of features e.g. Nest hollows, habitat trees	No				
Condition of habitat Change in habitat condition, but no change in extent	No				
Birth rate e.g. Change in nest success	No				
Mortality rate e.g. Change in number of road kills per year	No				
Number of individuals e.g. Individual plants/animals	No				

Offset calculator																												
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source												
<i>Ecological Communities</i>																												
Area of community	No				Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	Risk of loss (%) with offset																				
					Time until ecological benefit	Start quality (scale of 0-10)	Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0																		
							Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)																			
<i>Threatened species habitat</i>																												
Area of habitat	Yes	15.78	Adjusted hectares	73 hectares of confirmed GSM habitat	Time over which loss is averted (max. 20 years)	10	Start area (hectares)	73	Risk of loss (%) without offset	5%	Risk of loss (%) with offset	0%	Raw gain	3.65	Confidence in result (%)	80%	Adjusted gain	2.92	Net present value	1.51	% of impact offset	100.14%	Minimum (90%) direct offset requirement met?	Yes	Cost (\$ total)	\$3,650,000.00	Information source	Cost estimated at \$50,000 per hectare. Based on current market prices.
					Time until ecological benefit	2	Start quality (scale of 0-10)	5	Future area without offset (adjusted hectares)	69.4	Future area with offset (adjusted hectares)	73.0	Raw gain	3.00	Confidence in result (%)	80%	Adjusted gain	2.40	Net present value	2.10								
							Future quality without offset (scale of 0-10)	5	Future quality with offset (scale of 0-10)	8																		
<i>Threatened species</i>																												
Number of features e.g. Nest hollows, habitat trees	No																											
Condition of habitat Change in habitat condition, but no change in extent	No																											
Birth rate e.g. Change in nest success	No																											
Mortality rate e.g. Change in number of road kills per year	No																											
Number of individuals e.g. Individual plants/animals	No																											

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	15.78	15.80	100.14%	Yes	\$3,650,000.00	N/A	\$3,650,000.00
Area of community	0				\$0.00		\$0.00
					\$3,650,000.00	\$0.00	\$3,650,000.00

Offsets Assessment Guide

For use in determining offsets under the Environment Protection and Biodiversity Conservation Act 1999
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	GEWVVP
EPBC Act status	Critically Endangered
Annual probability of extinction Based on IUCN category definitions	6.8%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
<i>Ecological communities</i>						
Area of community	Yes	11.14 hectares of GEWVVP	Area	11.14	Hectares	Site assessments and EES report
			Quality	5	Scale 0-10	
			Total quantum of impact	5.57	Adjusted hectares	
<i>Threatened species habitat</i>						
Area of habitat	No		Area			
			Quality			
			Total quantum of impact	0.00		
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
<i>Threatened species</i>						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g. Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator																					
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source					
<i>Ecological Communities</i>																					
Area of community	Yes	5.57	Adjusted hectares	25.8 hectares GEWVVP	Risk-related time horizon (max. 20 years)	10	Start area (hectares)	25.8	Risk of loss (%) without offset	5%	Risk of loss (%) with offset	0%									
					Future area without offset (adjusted hectares)	24.5	Future area with offset (adjusted hectares)	25.8													
					Time until ecological benefit	2	Start quality (scale of 0-10)	5	Future quality without offset (scale of 0-10)	5	Future quality with offset (scale of 0-10)	8	3.00	80%	2.40	2.10	5.58	100.27%	Yes	\$1,290,000.00	Cost estimated at \$50,000 per hectare. Based on current market value
<i>Threatened species habitat</i>																					
Area of habitat	No				Time over which loss is averted (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset		Risk of loss (%) with offset										
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0													
					Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)										
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start value	Future value without offset	Future value with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source					
Number of features e.g. Nest hollows, habitat trees	No																				
Condition of habitat Change in habitat condition, but no change in extent	No																				
<i>Threatened species</i>																					
Birth rate e.g. Change in nest success	No																				
Mortality rate e.g. Change in number of road kills per year	No																				
Number of individuals e.g. Individual plants/animals	No																				

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
					Birth rate	0	
Mortality rate	0				\$0.00	\$0.00	
Number of individuals	0				\$0.00	\$0.00	
Number of features	0				\$0.00	\$0.00	
Condition of habitat	0				\$0.00	\$0.00	
Area of habitat	0				\$0.00	\$0.00	
Area of community	5.57	5.58	100.27%	Yes	\$1,290,000.00	N/A	\$1,290,000.00
					\$1,290,000.00	\$0.00	\$1,290,000.00

Offsets Assessment Guide

For use in determining offsets under the Environment Protection and Biodiversity Conservation Act 1999
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	NTGVVP
EPBC Act status	Critically Endangered
Annual probability of extinction Based on IUCN category definitions	6.8%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
<i>Ecological communities</i>						
Area of community	Yes	5.25 hectares of NTGVVP	Area	5.25	Hectares	Site assessments and EES report
			Quality	6	Scale 0-10	
			Total quantum of impact	3.15	Adjusted hectares	
<i>Threatened species habitat</i>						
Area of habitat	No		Area			
			Quality			
			Total quantum of impact	0.00		
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
<i>Threatened species</i>						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g. Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator																									
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source									
<i>Ecological Communities</i>																									
Area of community	Yes	3.15	Adjusted hectares	21.1 hectares NTGVVP	Risk-related time horizon (max. 20 years)	10	Start area (hectares)	21.1	Risk of loss (%) without offset	5%	Risk of loss (%) with offset	0%	Raw gain	1.06	Confidence in result (%)	80%	Adjusted gain	0.84	Net present value (adjusted hectares)	0.44	3.16	100.37%	Yes	\$1,055,000.00	Cost estimated at \$50,000 per hectare. Based on current market value
					Future area without offset (adjusted hectares)	20.0	Future area with offset (adjusted hectares)	21.1																	
					Time until ecological benefit	2	Start quality (scale of 0-10)	6	Future quality without offset (scale of 0-10)	6	Future quality with offset (scale of 0-10)	8	Raw gain	2.00	Confidence in result (%)	80%	Adjusted gain	1.60	Net present value (adjusted hectares)	1.40					
<i>Threatened species habitat</i>																									
Area of habitat	No				Time over which loss is averted (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset		Risk of loss (%) with offset		Raw gain		Confidence in result (%)		Adjusted gain		Net present value (adjusted hectares)						
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0																	
					Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)		Raw gain		Confidence in result (%)		Adjusted gain		Net present value (adjusted hectares)						
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start value	Future value without offset	Future value with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source									
Number of features e.g. Nest hollows, habitat trees	No																								
Condition of habitat Change in habitat condition, but no change in extent	No																								
<i>Threatened species</i>																									
Birth rate e.g. Change in nest success	No																								
Mortality rate e.g. Change in number of road kills per year	No																								
Number of individuals e.g. Individual plants/animals	No																								

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	0				\$0.00		\$0.00
Area of community	3.15	3.16	100.37%	Yes	\$1,055,000.00	N/A	\$1,055,000.00
					\$1,055,000.00	\$0.00	\$1,055,000.00

From: s22 [redacted]@roads.vic.gov.au
To: s22 [redacted]
Subject: Fw: Western Highway Project Section 2- Threatened Species Management Plan & Native Vegetation Management Plan
Date: Friday, 13 December 2013 5:51:21 PM
Attachments: [VICROADS_n2305353_v1_Native_Vegetation_Man_Plan_-_BM_Version.DOCX](#)

Hi s22 [redacted]

As per our discussions and as an outcome of the Western Highway Project Section 2 Environment Effects Statement we are required to produce a *Native Vegetation Management Plan* and a *Threatened Species Management Plan* in consultation with DSEWPC and DEPI. These conditions were outlined in the *Western Highway Project : Section 2- Beaufort to Ararat Incorporated Document* and are outlined below along with draft documents.

5.4 Native Vegetation Management Plan

A native vegetation management plan detailing additional measures to reduce the impacts on native vegetation and listed ecological communities, identified during the detailed design stage, be prepared to the satisfaction of DEPI and DSEWPC before construction commences.

5.6 Threatened Species Management Plan

Prior to the commencement of construction or carrying out of any buildings or works, Threatened Species Management Plans must be prepared in consultation with the DEPI and DSEWPC and then be submitted to, and endorsed by the Secretary of DSE (or delegate), including for the Spiny Rice-flower, Dwarf Galaxias and Golden Sun Moth.

(I have made several attempts to send this via email however due to size I will have to send it via post)

These documents have been prepared in accordance with EES recommendations and our consultants who helped prepare the EES documentation. The plans are DRAFT FINAL and next step is to obtain any input from DSEWPC. We are meeting with DEPI on 07/01/14 and I respectfully request that your comments are provide to VicRoads prior to that date.

Could you please advise on the suitability of this request. I will call to discuss early next week.

Regards,

s22 [redacted]

**Acting Team Leader Projects
VicRoads – Western Highway Project**

**Mail: PO Box 148 Wendouree, VIC, 3355
Office: 237 Ring Road, Wendouree, VIC, 3355**

T 5309 s22 [redacted]

F 5309 1099

W www.vicroads.vic.gov.au



DISCLAIMER

The following conditions apply to this communication and any attachments: VicRoads reserves all of its copyright; the information is intended for the addressees only and may be confidential and/or privileged - it must not be passed on by any other recipients; any expressed opinions are those of the sender and not necessarily VicRoads; VicRoads

accepts no liability for any consequences arising from the recipient's use of this means of communication and/or the information contained in and/or attached to this communication. If this communication has been received in error, please contact the person who sent this communication and delete all copies.

Native Vegetation Management Plan

Western Highway Project Section 2: Beaufort to Ararat
November 2013

Table of Contents

1. Introduction	3
1.1 Project Background	3
1.2 Project Scope	3
1.3 Project Objectives	4
1.4 Project Program and Staging	4
Figure 1 - Locality Plan	5
2. Scope of Management Plan	6
2.1 Environment Effects Statement (EES)	6
2.2 Removal of Native Vegetation	6
2.3 Environmental Management Measures	7
3. VicRoads Commitment to Biodiversity Management	8
4. Planning	9
4.1 Reducing Construction Footprint	9
4.2 Landscaping	9
4.3 Statuary Approvals and Consents	10
Table 1 – Summary of Key Statuary Approvals	10
5. Implementation	11
5.1 Roles and Responsibilities	11
Table 2 – Key Roles and Responsibilities	11
5.2 Biodiversity and Habitat Objectives and Indicators	12
5.3 Native Vegetation Management Actions	13
5.3.1 Spiny Rice Flower	13
5.3.2 Golden Cowslips	13
5.3.3 Emerald-lip Greenhood	13
5.3.4 No Go Zones	13
5.3.5 Site Inductions	14
5.3.6 Hollow-bearing Trees	14
5.3.7 Weed Management Plan	14
5.4 Native Vegetation Contingency Management Actions	14
6. Compliance	15
6.1 Monitoring	15
6.2 Reporting	15
6.3 Revisions to Environmental Documentation	15
Appendix A - Biodiversity and Habitat Management Measures	16
Appendix B – Section 2A Alignment Plans	21
Appendix C – Weed Management Plan, Western Highway Duplication Project- Section 2, Beaufort to Ararat, Victoria	22

1. Introduction

This Native Vegetation Management Plan relates to Section 2 of the Western Highway Project forming part of the Environment Effects Statement (EES) assessment approval.

This plan is independent of the Western Highway Project Section 2 Native Vegetation Offset Management Plan

1.1 Project Background

The Western Highway (A8) in Victoria is the principal road link between Melbourne and Adelaide. The highway serves interstate trade between Victoria and South Australia, and is the key transport corridor through Victoria's Western districts, which supports the farming industry, grain production, regional tourism, and a range of manufacturing and service activities in Victoria's Western districts.

The Western Highway between Ballarat and Stawell currently carries more than 5500 vehicles per day (vpd), including 1500 trucks, and as such is one of the busiest rural highways in the country with high freight movements with traffic expected to significantly increase by 2040.

The existing Western Highway between Beaufort and Ararat is undivided with a single lane in each direction and overtaking lanes at various locations. This section of the Western Highway has a crash history of 5.5 crashes per 100 million vehicle km travelled.

1.2 Project Scope

The Western Highway upgrade project includes the progressive upgrade of the Western Highway to a four lane divided highway between Ballarat and Stawell excluding bypasses of Beaufort and Ararat. The Project is funded by the Commonwealth and Victorian government under shared funding arrangement.

Section 2 of the Project involves the duplication of the existing carriageway between Beaufort to Ararat including one rail crossing, six creek crossings and a bypass of the township of Buangor. Refer to Figure 1 for locality details.

Section 2 of the Project also includes interchanges at Eurambeen-Streatham Road and Peacocks Road, new bridges/major culverts at Fiery Creek, Middle Creek, Charleycombe Creek, Billy Billy Creek and Hopkins River, minor diversion of Charleycombe Creek, service roads, intersection upgrades, other culverts, rest areas, utility/service relocation, drainage works, landscaping, realigned property access, earthworks and temporary access roads.

1.3 Project Objectives

The objectives of the Project are to:

1. Provide safer conditions for all road users by:
 - Reducing the incidence of head on and run off road crashes due to poor road geometry;
 - Improving safety at intersections;
 - Improving safety of access to adjoining properties
2. Improve the efficiency of freight by designing for High Productivity Freight Vehicles.
3. Provide adequate and improved rest areas especially relating to freight movements at night.
4. Locate the alignment to allow for possible future bypasses of Beaufort and Ararat.

1.4 Project Program and Staging

Construction of Section 2 of the Western Highway Project is to be further divided into 3 sections:

- Section 2A (Beaufort to Buangor)
- Section 2A+ (Buangor Bypass)
- Section 2B (Buangor to Ararat)

Construction of Section 2A is expected to commence early 2014 followed by Section 2A+ late in 2014. It is expected that both of these contracts will be completed by the end of 2015.

Section 2B is subject to future funding by the Commonwealth and Victorian governments. The current allocated funding allows for all Project planning to be completed and the construction from Ballarat to the west of Buangor township.

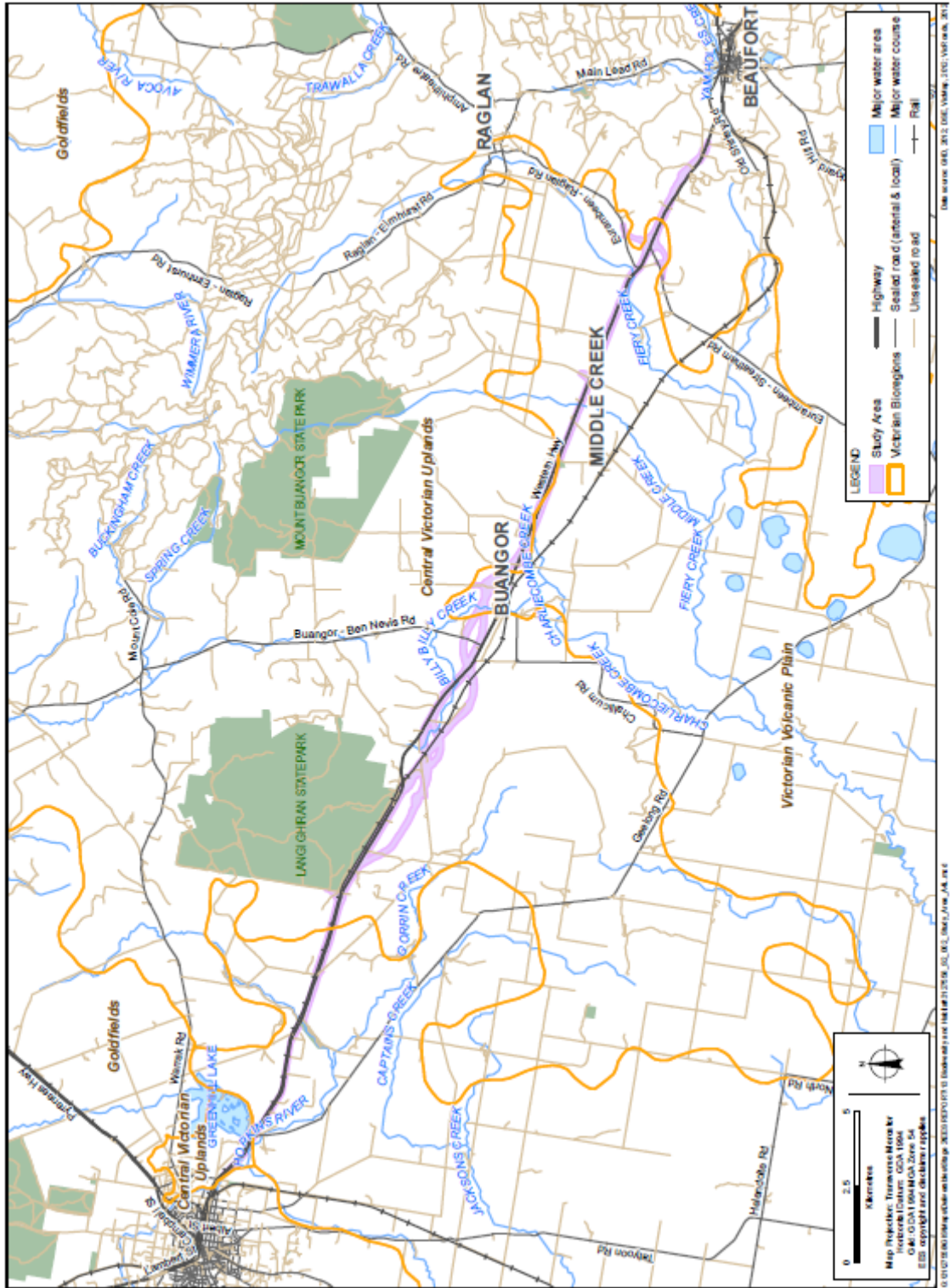


Figure 1 - Locality Plan

2. Scope of Management Plan

2.1 Environment Effects Statement (EES)

Section 2 of the Western Highway Project required a range of statutory approvals under State and Commonwealth legislation. The Victorian Minister for Planning determined that an Environment Effects Statement (EES) was required for the Project.

The Commonwealth Minister for Sustainability, Environment, Water, Population and Communities determined the Project to be a controlled action requiring assessment and approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The EES process was accredited as the assessment approach for the purposes of the EPBC Act. The Beaufort to Ararat EES was developed following extensive consultation with the community and stakeholders including the Pyrenees Shire Council and Ararat Rural City Council, as well as government agencies.

A Technical Reference Group convened by the Department of Planning and Community Development has worked closely with VicRoads and provided advice during the preparation of the EES.

The EES was approved by the Minister for Planning in May 2013.

2.2 Removal of Native Vegetation

Construction of the Project results in the removal of native vegetation including parts of Ecological Vegetation Classes (EVCs) of varying quality.

The native vegetation to be removed includes :

- Plains Grassland (endangered);
- Plains Grassy Woodland (endangered);
- Alluvial Terraces Herb-rich Woodland (endangered);
- Hills Herb-rich Woodland (vulnerable);
- Heathy Dry Forest (least concern);
- Creekline Grassy Woodland (endangered);
- Grassy Woodland (endangered);
- Plains Grassy Wetland (endangered);
- Grassy Dry Forest (depleted); and
- Heathy Woodland (depleted).

2.3 Environmental Management Measures

In order to minimise the extent of native vegetation removal alternative alignment options have been assessed and evaluated. The selected option has the minimal impact on Ecological Vegetation Classes (EVCs).

The impact to the native vegetation has been further reduced with the application of management measures including micro-alignment during the detailed design phase and revegetation with species appropriate to the local area. It is expected that this would be a moderate overall impact on EVCs based on the consequence guidelines developed in the EES as the loss is less than 0.1% of the total area of EVCs in the bioregion.

VicRoads standard construction contract specification for road and bridge works contains a comprehensive set of environmental protection measures. This construction contract specification is tailored for each project and site conditions and specific environmental management measures are included as outlined in Appendix 1.

Contract Specification “Hold points” are noted in the contract specification at key stages where the contractor(s) is required to seek VicRoads’ approval prior to proceeding with works.

Specific native vegetation management measures are outlined in Section 5.3 which comply with the environmental management measures as outlined in the EES as shown in Appendix A.

3. VicRoads Commitment to Biodiversity Management

Biodiversity protection and management is a high priority for VicRoads.

VicRoads has a legal obligation to manage the road network consistently with State and Commonwealth biodiversity policy and legislation, as well as an obligation to the community to ensure that issues arising throughout the planning, construction and management of the road network are avoided and minimised where possible.

VicRoads is committed to minimising the detrimental impact of its activities on the biological assets of the State and where possible enhancing and protecting the biodiversity values within its control.

The VicRoads Environmental Strategy 2005-2015 acknowledges the extensive clearing of private land for development and agriculture means that in some landscapes the vegetation on road reserves represents the last remaining remnants. VicRoads has an important role to play, therefore, as a manager of an extensive area of road reserve Across the State.

The Environmental Strategy sets three priorities for biodiversity management :

- To maintain and improve the biodiversity of roadside assets;
- To minimise threats to biological assets, while managing and developing the road network; and
- To maintain and sustain landscaping and revegetation.

The Environmental Strategy complements the Roadside Management Strategy (2002) which provides a framework for the consideration of all values and requirements of roadsides including environmental and cultural heritage values.

The Biodiversity Guidelines are intended to give effect to the biodiversity related priorities and objectives of each of these broader strategies.

4. Planning

4.1 Reducing Construction Footprint

The detailed design of Section 2A has been completed by VicRoads design with a main objective of reducing the construction footprint. This has been achieved by varying median widths, increasing the gradient of batter slopes and increasing the use of Wire Rope Safety Barrier to reduce clear zone requirements.

In particular, the detailed design for section 2A of the project includes additional No-Go Zones over and above the EES requirements. These include:

- Brown Toadlet habitat at Box's Cutting (Appendix B- Sheet 131-134)
- Protection of vegetation east of the Eurambeen interchange (Appendix B- Sheet 136-140)
- Working with DEPI and Parks Victoria to reduce the impact on Woodnaggerak Reserve (Appendix B- Sheet 163); and
- Protecting a other key areas along the alignment not required for construction purposes (i.e 5m from the toe of the batter slope).

By reducing the construction footprint and creating additional No-Go Zones it is possible to retain appropriate habitat features within the construction alignment. Shrubs and other understorey species would be retained within No-Go Zones. Only trees in the path of construction would be removed.

This process will be continued for Section 2A+ and Section 2B during the respective detailed design stages.

4.2 Landscaping

The landscape planting list for Section 2A has been reviewed by Ecology and Heritage Partners who completed Chapter 11- Biodiversity and Habitat of the Western Highway Project Section 2 EES and it was found to be consistent with the indigenous vegetation of the area.

Landscape planting lists for Section 2A+ and Section 2B will also be consistent with indigenous vegetation in the area.

4.3 Statutory Approvals and Consents

VicRoads is responsible for coordinating and obtaining statutory approvals for the Project and ensuring the requirements of these approvals are implemented.

VicRoads will require the construction contractor(s) to comply with the conditions of these approvals and obtain any additional licences or permits that may be required for construction.

A summary of the environmental management requirements arising from key regulatory approvals and the mechanisms for implementing these requirements is presented in Table 1.

Approval	Requirements	Responsibility	Implementation
Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>	Specific plans for EPBC-listed species would be prepared as required, including a salvage and translocation plan for any EPBC Act-listed flora requiring removal and a Dwarf Galaxias Management Plan.	VicRoads	VicRoads would arrange for an appropriately qualified ecologist to prepare the plans. Any conditions or requirements would be incorporated into the PEPS and addressed by either VicRoads or through the construction / maintenance contracts as appropriate.
Planning Scheme Amendment pursuant to the <i>Planning and Environment Act 1987</i>	A draft Planning Scheme Amendment has been placed on public exhibition concurrently with this EES.	VicRoads	Condition outlined in Sections 5.2 and 5.3 of the Incorporated Document forming part of the Planning Scheme Amendment would be incorporated into the VicRoads PEPS and addressed by either VicRoads or through the construction / maintenance contracts as appropriate.
Victoria's Native Vegetation Management: A Framework for Action	VicRoads would prepare an Offset Management Strategy to satisfy requirements under Victoria's Native Vegetation Management: A Framework for Action (DNRE 2002).	VicRoads	Conditions and requirements from the Offset Management Strategy would be incorporated into the VicRoads PEPS and addressed by VicRoads.
<i>Flora and Fauna Guarantee Act 1988</i> and <i>Wildlife Act 1975</i>	A Salvage and Translocation Plan, adhering to best practice protocols, would be prepared prior to commencement of works, including for the FFG-listed species Brown Toadlet, Brown Tree Creeper and the Victorian Temperate Woodland Bird Community. A <i>Flora and Fauna Guarantee Act</i> permit would be sought to remove listed flora species. A permit under the <i>Wildlife Act</i> would be sought to remove/translocate fauna species.	VicRoads	VicRoads would arrange for an appropriately qualified ecologist to prepare the plan. Any conditions or requirements of the plan or permits would be incorporated into the VicRoads PEPS and addressed by either VicRoads or through the construction / maintenance contracts as appropriate.

Table 1 – Summary of Key Statutory Approvals

5. Implementation

5.1 Roles and Responsibilities

The key roles and responsibilities for the construction and operational phases of the Project are listed in Table 2 below

Organisation	Responsibilities
VicRoads Project Director (Superintendent)	<p>VicRoads Project Director would:</p> <ul style="list-style-type: none"> • Check that VicRoads' Project Environment Protection Strategy (PEPS) is developed, approved and implemented in accordance with VicRoads requirements. • Check that VicRoads staff are appropriately trained in environmental awareness. • Sign off close-out of environmental incidents.
VicRoads Manager – Project Delivery	<p>VicRoads Manager – Project Delivery would:</p> <ul style="list-style-type: none"> • Check that the required actions identified in the PEPS are undertaken. • Check that the PEPS is regularly reviewed and updated as required. • Check that relevant stakeholders are consulted and provide input into the development of the PEPS where appropriate. • Check that non-contractual environmental commitments are actioned. • Obtain all necessary permits for VicRoads as identified.
VicRoads Project Engineers / Surveillance Officers	<p>VicRoads Project Engineers / Surveillance Officers would:</p> <ul style="list-style-type: none"> • Prepare the PEPS in accordance with VicRoads internal environmental management guidelines. • Check that the requirements in the PEPS are incorporated into the contract specification for construction. • Check that the requirements of the PEPS and contract specification are addressed by the construction contractor's Environmental Management Strategy (EM Strategy) and Construction Environmental Management Plan(s) (CEMPs) and that they include monitoring, surveillance and auditing. • Log environmental incidents in VicRoads incident reporting system. • Prepare surveillance plans for each construction contract and complete regular assessment/review of the environmental risks and amend the surveillance plan as necessary to reflect the risks. • Conduct surveillance and audits of works to check compliance with the contract specification and the contractor's EM Strategy and CEMP(s). • Record environmental surveillance in the VicRoads Surveillance and Management System (SuMS).
Construction contractor(s)	<p>The construction contractor(s) would:</p> <ul style="list-style-type: none"> • Develop an EM Strategy and CEMP(s) to the satisfaction of VicRoads Project Director. • Effectively implement and manage the EM Strategy and CEMP(s) to the satisfaction of VicRoads Project Director. • Monitor, audit and conduct surveillance of the implementation and effectiveness of the CEMP(s) and report their effectiveness to VicRoads Project Director. • Engage an independent, suitably qualified and experienced auditor to conduct audits of implementation of the contract specification. • Engage specialist environmental advice where required. • Engage a qualified ecologist to demarcate ecological 'No-go zones' on-site. • Check that all contractual commitments are honoured. • Report environmental incidents to VicRoads Project Director and relevant statutory authorities. Document actions taken to rectify the situation. • Check that all other requirements as described in the contract specification are met. • Inform VicRoads Project Director of any queries from statutory agencies and respond accordingly. • Check that Contractor's staff and subcontractors have been appropriately trained in environmental awareness.

Table 2 – Key Roles and Responsibilities

5.2 Biodiversity and Habitat Objectives and Indicators

The following biodiversity and habitat objectives and indicators have been developed as part of the EES process for this Project to guide environmental performance during construction.

Objectives

- Minimise loss of native vegetation
- Avoid and minimise impacts on significant flora, fauna and ecological communities
- Prevent introduction and spread of pest plants, weeds and disease.

These objectives have been developed with consideration to the EES Scoping Requirements, relevant environmental legislation and potential environmental impacts associated with the project.

Indicators

- No-go zones established to protect native vegetation that is to be retained
- Project activities conducted in accordance with specific measures and species management plans for EPBC and FFG listed threatened species and communities
- Development and implementation of a native vegetation Offset Management Strategy (report under development as at November 2013)
- Development and implementation of a weed management and control program (addressed in *Weed Management Plan, Western Highway Duplication Project- Section 2, Beaufort to Ararat, Victoria.*)
- Development and implementation of hygiene practices to alleviate pathogen/disease risk (addressed in contract specification).

Indicators have been developed to measure the effectiveness of proposed environmental management measures with respect to environmental objectives. Indicators may relate to one or more environmental objectives.

5.3 Native Vegetation Management Actions

5.3.1 Spiny Rice Flower

With the exception of one individual, all other Spiny Rice Flowers have been avoided. The single impacted spiny rice flower individual will be relocated in accordance with *Western Highway Project Section 2: Beaufort to Ararat, Victoria Threatened Species Management Plan*

5.3.2 Golden Cowslips

Section 2B detailed design will attempt to avoid the single Golden Cowslip that has been identified within the current alignment. If this is unachievable then the plant will be relocated. This plant is not currently endangered.

5.3.3 Emerald-lip Greenhood

Due to the cryptic and delicate nature of the Emerald-lip Greenhood, translocation of impacted individuals is not being considered. Seeds are to be salvaged during winter (July/August) prior to the affected area being disturbed. Seed are to be collected from as many populations as practically possible within the study area by a suitably qualified contractor. Recipient locations for Emerald-lip Greenhood may be determined by DEPI for conservation purposes.

Seeds can be collected in fruits and are found in a mix which is commonly called 'chaff'. There is no need to remove seeds from the 'chaff' as it can be simply be used as part of the propagating blend. Seeds will need to be labelled with a number to ensure that once they arrive at a suitable nursery they are easily identifiable as to which patch/location they were removed from.

5.3.4 No Go Zones

No work will occur outside the Public Acquisition overlay. As per the Western Highway Project Section 2 EES, additional areas of vegetation will be protected within the Public Acquisition Overlay (i.e some medians). Any area of vegetation contained within the Public Acquisition Overlay that is not required for construction purposes will be marked as a No-Go Zone. In general this will be 5m from the toe of the batter slope.

All fencing of 'No Go Zones' shall as a minimum be:

- erected 1 metre beyond the boundary of the habitat to be protected, or the drip line of the trees, or as agreed by the Superintendent;
- constructed of start picket, paraweb one wire support
- have a high visibility component
- communicated by signage installed on the temporary fencing at intervals no less than 20 metres apart stating 'Protected Area- No Unauthorised Access'; and,
- retained in place for the duration of the construction period (until Practical Completion).

5.3.5 Site Inductions

All site managers and supervisors to be initially inducted by a qualified botanist.

5.3.6 Hollow-bearing Trees

To reduce the likelihood of removing a hollow-bearing tree that contains fauna, a tree collar must be placed on the tree at a minimum height of 1m off the ground at least 24 hours prior to removal.

5.3.7 Weed Management Plan

This Management Action is covered within Appendix C: Weed Management Plan, *Western Highway Project- Section 2, Beaufort to Ararat, Victoria*.

5.4 Native Vegetation Contingency Management Actions

Management issues may arise during construction that is not foreseen such as the discovery of significant flora. Site cards identifying significant flora (as specified in the Section 2 Beaufort to Ararat EES) are to be on display at site compounds in the event previously unknown locations of significant species are identified.

Regular surveillance of No-Go Zones is to be undertaken by VicRoads staff. A 'stop-work' may be issued to the contractor depending on the nature of the breach.

6. Compliance

VicRoads would undertake environmental monitoring for the Project and surveillance of its construction contractor(s). The contract specification(s) would include compliance requirements for the construction contractor(s) including reporting to VicRoads and external environmental auditing.

6.1 Monitoring

Results of monitoring and studies would be forwarded to relevant government agencies (i.e DSEWPC, DEPI, Parks Victoria) to contribute to the improvement of environmental knowledge.

6.2 Reporting

A quarterly report would be provided to VicRoads by the construction contractor(s) outlining the performance and effectiveness of the EM Strategy as well as an other items specifically required by VicRoads. This report would include external and internal audit findings, monitoring results and incidents and non-compliances.

6.3 Revisions to Environmental Documentation

Revisions to the construction contractor(s) environmental documentation may be required as a result of changes in activities and work practices, legislation, aspects and impacts, or as a result of internal or external audit findings, incidents or complaints.

The construction contractor(s) would be required to submit all major revisions to environmental documentation to VicRoads for approval. Major revisions are defined as changes that affect work practices, roles and responsibilities, environmental risks and overall project delivery. Minor revisions are defined as addressing typographical errors, formatting and other administrative changes.

Appendix A - Biodiversity and Habitat Management Measures

Risk No.	Impact Pathway	Consequence Description	Environmental Management Measures	Status (as at November 2013)
FF1	Potential removal of individuals of a known population of the EPBC listed flora	Spiny Rice-flower are present at one location: • Between Warrayatkin Rd and Green Hill Lake Rd	Comply with section 1200.13 Flora and Fauna of the VicRoads contract specification. Further targeted survey to be completed on final alignment prior to construction to identify all existing individuals. Potential for detailed design or construction planning to avoid impact at known locations (e.g. micro alignment change to construction corridor). Prepare and implement a Conservation Management Plan (CMP), including a Salvage and Translocation Plan. Collect seed and implement salvage and translocation for any individuals to be removed. Translocation to be undertaken in accordance with a formal translocation plan approved by SEWPaC, which would include post-translocation monitoring. To protect populations during construction, protective fencing would be supplemented with a high-visibility component to indicate the sensitivity of the area.	<ol style="list-style-type: none"> Contractor must comply with section 1200.13 Flora and Fauna (Design and Construct Contract) OR section 177 Part 1 Flora and Fauna (Construct Only). CN8612 Section 2A Specification has been finalised and includes Section 177. Section 2 Design avoids impact on Spiny Rice Flower locations other than one individual plant which will be translocated in accordance with <i>Western Highway Project Section 2: Beaufort to Ararat, Victoria Threatened Species Management Plan</i>. See Management Action 4.1
FF2	Potential removal of individuals of a known population of the DSE advisory listed flora Golden Cowslip which are present within Options 1 and 2.	Golden Cowslip are present within Options 1 and 2. See targeted flora map for exact locations.	As per Risk FF1. Translocation to be in accordance with a formal translocation plan approved by DSE, which would include post-translocation monitoring.	<ol style="list-style-type: none"> CN8612 Section 2A Specification has been finalised and includes Section 177 (in lieu of Section 1200.13). A single Golden Cowslip has been identified (Section 2B). See Management Action 4.2
FF3a	Approved removal of individuals of a known population of the DSE advisory listed flora Emeraldlip Greenhood which are present within Option 1 and 2.	Emerald-lip Greenhood is present within Options 1 and 2. See targeted flora map for exact locations.	As per Risk FF1. Translocation to be in accordance with a formal translocation plan approved by DSE, which would include post-translocation monitoring.	<ol style="list-style-type: none"> CN8612 Section 2A Specification has been finalised and includes Section 177 (in lieu of Section 1200.13). Emerald-lip Greenhood has been identified (Section 2B). See Management Action 4.3
FF3b	Approved removal of individuals of a known population of the DSE advisory listed flora Yarra Gum which are present within Option 2.	Yarra Gum is present within Option 2. See targeted flora map for exact locations.	Comply with section 1200.13 Flora and Fauna of the VicRoads contract specification. Further targeted survey to be completed on final alignment prior to construction to identify all existing individuals. Potential for detailed design or construction planning to avoid impact at known locations (e.g. micro alignment change to construction corridor). Prepare and implement a CMP including collecting seed and implementing salvage program. To protect populations during construction, protective fencing would be supplemented with a high-visibility component to indicate the sensitivity of the area.	<ol style="list-style-type: none"> Yarra Gum has not been identified within Option 1. No further action required.

FF4	Construction encounters unexpected listed flora species (species not known to be present from targeted survey).	Removal of small number of unknown listed flora species during pre-clearance / clearance work	Comply with section 1200.13 Flora and Fauna of the VicRoads contract specification. Avoid impacts if possible, by altering the construction area. Otherwise where applicable, implement a translocation plan for these individuals.	<ol style="list-style-type: none"> 1. CN8612 Section 2A Specification has been finalised and includes Section 177 (in lieu of Section 1200.13). 2. Construction footprint has been further reduced during Section 2A detailed design where possible. All areas of vegetation not required for construction within the construction footprint have been noted as a No-Go Zone on the Section 2A alignment plans. This process will also occur for later Section 2 stages of work. See Pre-Construction Development 3.1 3. No-Go Zones to be fenced off during construction. See Management Action 4.4
	<i>Risk associated with Fauna only</i>			
FF6	<i>Risk associated with Fauna only</i>			
FF7	<i>Risk associated with Fauna only</i>			
FF8	<i>Risk associated with Fauna only</i>			
FF9	Construction encounters FFG listed Victorian Temperate Woodland Bird Community – located along entire alignment	Removal of fauna habitat, possible injury/death to listed fauna species individuals during construction.	Comply with section 1200.13 Flora and Fauna of the VicRoads contract specification. Potential for detailed design or construction planning to avoid impact at known locations/habitats (e.g. micro alignment change to construction corridor). Prepare and implement a CMP, including a salvage and translocation plan. Where potential habitat for listed fauna species is identified to be removed a qualified ecologist would need to conduct a pre-clearance survey and attempt relocation where necessary/possible.	<ol style="list-style-type: none"> 1. CN8612 Section 2A Specification has been finalised and includes Section 177 (in lieu of Section 1200.13). 2. Construction footprint has been further reduced during Section 2A detailed design where possible. All areas of vegetation not required for construction within the construction footprint have been noted as a No-Go Zone on the Section 2A alignment plans. This process will also occur for later Section 2 stages of work. See Pre-Construction Development 3.1
FF10	<i>Risk associated with Fauna only</i>			
FF11	<i>Risk associated with Fauna only</i>			
FF12	<i>Risk associated with Fauna only</i>			
FF13	Construction encounters Ecological Vegetation Communities (EVCs) (Native vegetation and fauna habitat) - located along entire alignment.	Removal of EVCs of high and very high conservation significance including: Alluvial Terraces Herb-rich Woodland, Grassy Dry Forest, Grassy Woodland, Plains Grassy Wetland, Creekline Grassy Woodland, Plains Grassy Woodland, Plains Grassland, Heathy Dry Forest, Hill Herb-rich Woodland, Heathy Woodland.	Comply with section 1200.13 Flora and Fauna of the VicRoads contract specification. Potential for detailed design or construction planning to avoid impact at known locations/habitats (e.g. micro alignment change to construction corridor). Revegetation or landscape plantings to include species appropriate to the local EVC. Where possible retain appropriate habitat features/structure within the construction alignment. Shrubs and other understorey species would be retained or re-established (to the allowable height limit) post-construction. Logs and any felled trees would be left in the area to provide additional fauna habitat. Trees would be lopped or trimmed rather than removed where possible. All contractors would be aware of areas of ecological value through a site induction by a qualified botanist (see figures attached for locations of remnant native vegetation) to minimise the likelihood for damage to	<ol style="list-style-type: none"> 1. CN8612 Section 2A Specification has been finalised and includes Section 177 (in lieu of Section 1200.13). 2. Construction footprint has been further reduced during Section 2A detailed design where possible. All areas of vegetation not required for construction within the construction footprint have been noted as a No-Go Zone on the Section 2A alignment plans. This process will also occur for later Section 2 stages of work. See Pre-Construction Development 3.1 3. CN8612 (Section 2A) includes Landscaping Plans that are appropriate to local EVCs. See Pre-Construction Development 3.2 4. Initial site induction to include site induction by a qualified botanist. See Management Action 4.5

			areas scheduled to be retained and include EVC polygons (areas of sensitivity) on detailed surveying drawings and check for accuracy. The study area would be rehabilitated and revegetated in accordance with Section 9 of Technical Appendix H.	
FF14a	Construction encounters the EPBC listed community, Grassy Eucalypt Woodland of the Victorian Volcanic plain, located along entire alignment.	Removal of the EPBC Act-listed community.	Comply with section 1200.13 Flora and Fauna of the VicRoads contract specification. Detailed design and construction planning to minimise native vegetation loss as far as possible.	<ol style="list-style-type: none"> 1. CN8612 Section 2A Specification has been finalised and includes Section 177 (in lieu of Section 1200.13). 2. Construction footprint has been further reduced during Section 2A detailed design where possible. All areas of vegetation not required for construction within the construction footprint have been noted as a No-Go Zone on the Section 2A alignment plans. This process will also occur for later Section 2 stages of work. See Pre-Construction Development 3.1
FF14b	Construction encounters the EPBC listed community, Natural Temperate Grassland of the Victorian Volcanic Plain.	Removal of the EPBC Act-listed community.	Comply with section 1200.13 Flora and Fauna of the VicRoads contract specification. Detailed design and construction planning to minimise native vegetation loss as far as possible.	<ol style="list-style-type: none"> 1. CN8612 Section 2A Specification has been finalised and includes Section 177 (in lieu of Section 1200.13). 2. Construction footprint has been further reduced during Section 2A detailed design where possible. All areas of vegetation not required for construction within the construction footprint have been noted as a No-Go Zone on the Section 2A alignment plans. This process will also occur for later Section 2 stages of work. See Pre-Construction Development 3.1
FF15	Construction encounters the following FFG listed community - Western (Basalt) Plains Grasslands - located along entire alignment	Removal of the FFG Act-listed community.	Comply with section 1200.13 Flora and Fauna of the VicRoads contract specification. Detailed design and construction planning to minimise native vegetation loss as far as possible.	<ol style="list-style-type: none"> 1. CN8612 Section 2A Specification has been finalised and includes Section 177 (in lieu of Section 1200.13). 2. Construction footprint has been further reduced during Section 2A detailed design where possible. All areas of vegetation not required for construction within the construction footprint have been noted as a No-Go Zone on the Section 2A alignment plans. This process will also occur for later Section 2 stages of work. See Pre-Construction Development 3.1
FF16	Construction encounters Large and Very Large Scattered Trees/Hollow-bearing trees/fauna habitat - located along entire alignment	Removal of scattered trees.	Comply with section 1200.13 Flora and Fauna of the VicRoads contract specification. Detailed design and construction planning to minimise loss of trees, particularly Medium Old Trees, Large Old Trees and Very Large Old Trees and those which are hollow bearing, with the advice of an arborist.	<ol style="list-style-type: none"> 1. CN8612 Section 2A Specification has been finalised and includes Section 177 (in lieu of Section 1200.13). 2. Construction footprint has been further reduced during Section 2A detailed design where possible. All areas of vegetation not required for construction within the construction footprint have been noted as a No-Go Zone on the Section 2A alignment plans. This process will also occur for later Section 2 stages of work. See Pre-Construction Development 3.1

				3. Tree collar to be placed on hollow-bearing trees a minimum of 24 hours prior to removal. See Management Action 4.6
FF17	<i>Risk associated with Fauna only</i>			
FF18	<i>Risk associated with Fauna only</i>			
FF19	<i>Risk associated with Fauna only</i>			
FF20	Construction activities occur outside of agreed construction zone.	Potential loss or modification of native vegetation and/or fauna habitat that was intended to be retained	Existing vegetation and native fauna habitat identified in the Contract to be retained, would be identified as 'No Go Zones' and protected by temporary fencing and signage erected outside the limit of the canopy of the vegetation or the habitat site. In areas of known, or possible, habitat for listed threatened flora and fauna species, protective fencing should be supplemented with a high-visibility component to indicate the sensitivity of the area. Plant, equipment, material or debris not to be placed or stored within the limit of the root zone of vegetation to be retained.	1. See Management Action 4.4
FF21	Weeds and/or pathogens introduced or spread through construction activities.	Displacement/invasion of native vegetation and/or fauna habitat and increased spread of weed species or pathogens. Potential pathogens include Cinnamon Fungus <i>Phytophthora cinnamomi</i> , Bovine Johne's Disease <i>Mycobacterium paratuberculosis</i> , Grape phylloxera <i>Daktulosphaira vitifoliae</i> , Potato Cyst Nematode <i>Globodera rostochiensis</i> and Amphibian Chytrid Fungus <i>Batrachochytrium dendrobatidis</i> .	The Contractor would develop a procedure to prevent the spread of declared weeds, pests and diseases within the Site and off-site. A weed management and control program would be prepared prior to construction and would be implemented for a period of no less than two years after the completion of the project. Weed management procedures are detailed in Section 9 of Technical Appendix H Pre-construction mapping of weeds and soil pathogens, as other soil pathogens (in addition to cinnamon fungus) may exist in the area. Pathogen management procedures as outlined in Section 9 of Technical Appendix H would be developed to prevent pathogen spread.	1. See Management Action 4.7
FF22	<i>Risk associated with Fauna only</i>			
FF23	Construction modifies hydrological/surface water flows	Impact to retained native vegetation and fauna habitats	Implementation of a Construction EMP detailing: <input type="checkbox"/> Erosion and sediment control measures. <input type="checkbox"/> Fuel and chemical management procedures. Installation of appropriate drainage systems. Schedule construction to no-flow or low-flow periods	1. Refer to Construction EMP (to be submitted by contractor post-award and endorsed by the secretary of DTPLI)
FF24	<i>Risk associated with Fauna only</i>			
FF25	<i>Risk associated with Fauna only</i>			
FF26	Construction creates dust impacting on native fauna, native flora and surface water ecosystems	Impact to retained native vegetation and fauna habitats.	Implementation of a Construction EMP detailing air quality control measures and strict monitoring procedures Implement methods and management systems consistent with EPA Best Practice Environmental Management: 'Environmental Guidelines for Major Construction Sites' (EPA, 1996). Minimise land disturbance by using phased approach, rehabilitate cleared areas promptly. Keep vehicles to well-defined haul roads, limit vehicle speed and seal haul roads and other	1. Refer to Construction EMP (to be submitted by contractor post-award and endorsed by the secretary of DTPLI)

			exposed areas by means of concrete or paving where necessary. Employ dust suppression methods such as watering down the ROW	
FF27	Creation of pollutants (including smoke, dust, petrochemicals, litter etc.) during construction and operation.	Impact to retained native vegetation and fauna habitats.	As per Risk FF25. Implementation of a Construction EMP detailing: <input type="checkbox"/> Erosion and sediment control measures. Fuel and chemical management procedures	1. Refer to Construction EMP (to be submitted by contractor post-award and endorsed by the secretary of DTPLI)

Appendix B – Section 2A Alignment Plans

See Digital files

**Appendix C – Weed Management Plan, Western Highway
Duplication Project- Section 2, Beaufort to Ararat, Victoria**

See Digital files



**Western Highway Project
Section 2: Beaufort to Ararat, Victoria**

Threatened Species Management Plan

for

Spiny Rice-flower (*Pimelea spinescens*), Golden Sun Moth (*Synemon plana*)

Dwarf Galaxias (*Glaxiella pusilla*), Brown Toadlet (*Pseudophryne bibronii*)

October 2013

keeping victorians connected



GLOSSARY OF TERMS

AVW	Atlas of Victorian Wildlife
CALP	Catchment and Land Protection
CEMP	Construction Environmental Management Plan
CVU	Central Victorian Uplands
DEPI	Department of Environment and Primary Industries
SEWPaC	Department of Sustainability, Environment, Water, Population and Communities
DTV	Degraded Treeless Vegetation
EPBC	Environment Protection and Biodiversity Conservation
EVC	Ecological Vegetation Class
FFG	Flora and Fauna Guarantee
FIS	Flora Information System
GEWVVP	Grassy Eucalypt Woodland of the Victorian Volcanic Plain
NAP	National Action Plan
NES	National Environmental Significance
PMST	Protected Matters Search Tool
VBA	Victorian Biodiversity Atlas
VROTS	Vulnerable Rare or Threatened Species
VVP	Victorian Volcanic Plain

Reference Document

Ecology and Heritage Partners Pty. Ltd.
Final Report: Western Highway Project: Section 2, Beaufort to Ararat, Victoria
Significant Flora and Fauna Species Conservation Management Plan
Prepared for VicRoads. June 2013.

1 INTRODUCTION

1.1 Project Background

The Western Highway (A8) is being progressively upgraded to a four-lane divided highway for approximately 110 kilometres (km) between Ballarat and Stawell, referred to as the Western Highway Project. As the principal road link between Melbourne and Adelaide, the Western Highway serves interstate trade between Victoria and South Australia and is the key corridor through Victoria's west, supporting farming, grain production, tourism and a range of manufacturing and service activities. Currently, more than 5500 vehicles travel on the highway west of Ballarat each day, including 1500 trucks.

Section 2 of the Western Highway Project consists of three sub-sections:

- Section 2A – Beaufort to Buangor
- Section 2A+ – Buangor Bypass
- Section 2B – Buangor to Ararat

Previous assessments have recorded one flora species listed under the Federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Spiny Rice-flower), two floristic communities listed under the EPBC Act (Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP) and Grassy Eucalypt Woodland of the Victorian Volcanic Plain (GEWVVP)) and three flora species listed under the Victorian Department of Sustainability and Environment (DSE) Advisory List (Yarra Gum, Emerald-lip Greenhood and Golden Cowslips) present within the proposed alignment footprint.

Also present within the study area are two fauna species listed under the EPBC Act (Dwarf Galaxias and Golden Sun Moth), one species listed under the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act) (Brown Toadlet), and one species listed under the DSE Advisory List (Brown Treecreeper).

Two alignment options for Section 2 were investigated. Each of these options follow different routes for part of the corridor, with each having varying amounts of native vegetation as well as other ecological features, including important habitat for flora and fauna.

Following assessment under the *Environmental Effects Act 1978*, Option 1 was recommended for implementation in accordance with the Inquiry Report dated May 2013.

A summary of significant flora and fauna species recorded within the study area is provided in Table 1 and shown in Figure 2.

Table 1. Summary of flora and fauna listed under the EPBC Act, FFG Act and DSE Advisory List that are present within each alignment option.

Alignment Option	Flora	Fauna	Communities
1	Spiny Rice-flower (x1) (EPBC Act) Golden Cowslip (x1) (DSE Advisory List) Emerald-lip Greenhood (x12) (DSE Advisory List)	Golden Sun Moth (31.56 ha) (EPBC Act) Dwarf Galaxias (2 intersections) (EPBC Act) Brown Toadlet (FFG Act) Brown Treecreeper (DSE Advisory List)	GEWVVP (11.14ha) (EPBC Act) NTGVVP (5.25ha) (EPBC Act) WPG (10.86ha) (FFG Act) VTWB (FFG Act)
2	Spiny Rice-flower (x1) (EPBC Act) Yarra Gum (x8) (DSE Advisory List)	Golden Sun Moth (23.80 ha) (EPBC Act) Dwarf Galaxias (2 intersections) (EPBC Act) Brown Toadlet (FFG Act) Brown Treecreeper (DSE Advisory List)	GEWVVP (8.65ha) (EPBC Act) NTGVVP (5.25ha) (EPBC Act) WPG (10.86ha) (FFG Act) VTWB (FFG Act)

Notes: Individual numbers for threatened fauna species not provided as assessment is based on habitat loss rather than species present. Impact to Dwarf Galaxias is represented by the number of times each option intersects with Billy Billy Creek. GEWVVP = Grassy Eucalypt Woodland of the Victorian Volcanic Plain, NTGVVP = Natural Temperate Grassland of the Victorian Volcanic Plain, WPG = Western (Basalt) Plains Grassland, VTWB = Victorian Temperate Woodland Bird Community.

1.2 Project Area

The project area (Figure 1) consists primarily of road reserve and private properties on either side of the Western Highway, between Beaufort and Ararat. It is situated approximately 170 kilometres west of Melbourne, Victoria and according to the DSE Biodiversity Interactive Map (DSE 2012), is located partly within the Central Victorian Uplands (CVU) bioregion and partly within the Victorian Volcanic Plains (VVP) bioregion.

The CVU bioregion extends from Stawell in the west to Bright in the east and from Glenrowan in the north-east to Meredith in the south. The VVP bioregion extends from Portland in the west to Craigieburn in the east and from Clunes in the north to Colac in the south. The western section of the project area is located within the City of Ararat and the eastern section within the Shire of Pyrenees. The entire project area is located within the Glenelg – Hopkins Catchment Management Authority area.

The project area is characterised by native and exotic grassland vegetation, with scattered areas of remnant indigenous vegetation consisting of forest, grassland and wetland communities. The existing highway intersects Cemetery Creek, Green Hill Creek, Hopkins River, Billy Billy Creek, Middle Creek, Fiery Creek and several smaller drainage lines along its length.

1.3 Purpose of this Document

The purpose of the Threatened Species Management Plan (the Management Plan) is to outline the mitigation and preservation measures which will be undertaken throughout the pre-construction, construction and post construction stages of the Project. It also provides guidelines for the removal and relocation of Threatened Flora and Fauna where required.

Implementation of the Management Plan will minimise the potential impact on Spiny Rice-flower, Golden Sun Moth, Dwarf Galaxias and Brown Toadlet individuals, and should be considered in conjunction with all other environmental requirements for the Project.

The Management Plan will be incorporated into the Construction Environmental Management Plan (CEMP) for the Project.

1.4 Background Information

VicRoads approach to environmental management is to avoid potential impacts, and where possible minimise potential impacts through appropriate design and construction techniques.

Ecology and Heritage Partners Pty. Ltd. were engaged by VicRoads to undertake surveys and prepare a Conservation Report for significant flora and fauna within the alignment footprint of the Western Highway Project, Section 2 (Beaufort to Ararat). The Conservation Report forms the basis of this Management Plan.

Descriptions of threatened flora and fauna species recorded within the project area and in the surrounding area are provided in Appendix 1. The 'Assessment Area' is defined as the broader area that was assessed for ecological values.

1.4.1 Nationally Significant Flora

Spiny Rice-flower

Approximately 575 Spiny Rice-flower plants were recorded within the Assessment Area during the targeted surveys (Figure 2). All plants were recorded within Plains Grassland (habitat zones PG1 and PG2) within the road reserve between the Ararat Airport entrance/Service Centre and Warrayatkin Road. All plants were recorded on the north side of the Western Highway between the road and rail reserve, except for one plant which was recorded on the south side of the Western Highway.

One Spiny Rice-flower plant will be impacted by the proposed alignment, located between Green Hill Lake Road and Warrayatkin Road.

1.4.2 Nationally Significant Fauna

Dwarf Galaxias

There is one previous record of Dwarf Galaxias from the local area in 1904 (DSE 2010). However, the species was recorded more recently in 2010 in Mount Emu Creek (Ecology and Heritage Partners Pty Ltd. There is suitable habitat for Dwarf Galaxias in Cemetery Creek, Green Hill Creek, Hopkins River, Billy Billy Creek, Middle Creek and Fiery Creek, as well as several smaller, unnamed drainage lines and dams.

One hundred and fifty-six Dwarf Galaxias were recorded during the targeted aquatic surveys. All of the records were made within Billy Billy Creek, at three sites: two yielding 96 and 57 individuals and a third yielding three (Figure 2).

Golden Sun Moth

There are six previous records of Golden Sun Moth from the local area, the most recent in 1906 (DSE 2010). Based on the current range of habitats and their relative condition, there is

the potential for Golden Sun Moth to occur within grassland remnants along several of the alignment options listed.

Golden Sun Moth was recorded during targeted surveys at several sites spread between Buangor-Ben Nevis Road and Langi Ghiran Picnic Ground Road, with numerous individuals recorded in paddocks to the east and west of Pope Road (Figure 2). Surveys were undertaken on 16, 22 and 29 December 2011 and 13 January 2012 with 40, 17, 86 and 2 Golden Sun Moth individuals recorded respectively.

1.4.2 State Significant Fauna

Brown Toadlet

There are five previous records of Brown Toadlet from the local area, the most recent in 1963. There is suitable habitat for this species in the Hopkins River, Billy Billy Creek, Charliecombe Creek, Middle Creek and Fiery Creek, as well as several smaller, unnamed drainage lines.

Over 28 records of Brown Toadlet were collected within the study area during targeted Brown Toadlet surveys and throughout the duration of the project. Individuals were detected during the targeted nocturnal surveys and incidentally whilst undertaking other surveys (e.g. whilst collecting hair tubes and infra-red cameras etc.). Records of Brown Toadlet collected during the targeted surveys and incidentally are presented in Figure 2 however this species is widespread throughout the study area in many of the drainage lines, seeps, road ditches and culverts located within or adjacent to woodland vegetation.

2 THREATENED SPECIES MANAGEMENT PLAN

2.1 Objectives

The objective of this Management Plan is to provide management protocols for the Project to protect and mitigate impacts to threatened species and their habitats which exist within the study area. Furthermore, the overall objective is to ensure minimal impact on threatened species populations and ensure ongoing survival into the future.

Construction within the study area is expected to occur in stages over several years, with multiple stages of construction likely to occur at any one time. The Management Plan outlines management actions for species listed below (Table 2 and 3).

Table 2. Flora species addressed under this Management Plan.

Common name	Scientific name	EPBC	VROTS	FFG
Spiny Rice-flower	<i>Pimelea spinescens subsp. spinescens</i>	CR	e	L

Table 3. Fauna species addressed under this Management Plan.

Common name	Scientific name	EPBC	FFG	DSE ADV	NAP
Golden Sun Moth	<i>Synemon plana</i>	CR	L	CR	
Dwarf Galaxias	<i>Galaxiella pusilla</i>	VU	L	VU	VU
Brown Toadlet	<i>Pseudophryne bibronii</i>		L	EN	DD

The Management Plan was prepared to satisfy the relevant regulatory authorities, the Federal Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) and the Victorian Department of Environment and Primary Industries (DEPI). The implementation of the plan will require the commitment of the public land manager (i.e. VicRoads), the collaboration of all relevant stakeholders and ongoing reviews by DEPI (and SEWPaC if required) to ensure intended management outcomes are being achieved.

2.2 Responsibilities and Timeframes

Responsibilities and timing for actions are outlined in the 'Management Plan Actions' and 'Ongoing Management and Monitoring Actions' tables provided in Sections 2.4 and 2.5.

Implementation of the Plan covers the following periods:

- *Pre-construction:* This is the period prior to the commencement of construction works and mobilisation of equipment on to site for the implementation of the Project.
- *Construction:* This is when works occur to implement the Project. It is characterised by the commencement of initial disturbance (i.e. earthworks, existing building demolition, vegetation removal), up until the completion of construction works.
- *On-going Management and Monitoring:* This occurs in some instances immediately following approval of the Management Plan, whilst other management and monitoring

actions occur post-construction (immediately following completion of construction works).

2.3 Post- construction Responsibilities

Post-construction actions will require the ongoing implementation of the following:

- Maintenance of waterway corridors by Glenelg Hopkins Catchment Management Authority and municipal councils in accordance with relevant Memorandum of Understanding between the organisations and reflecting each organisation's standard maintenance policies and programs.
- Any ongoing monitoring and/or management of Spiny Rice-flower by VicRoads.
- Any monitoring and/or management of the translocated Spiny Rice-flower specimen within the translocation site by VicRoads.
- Any monitoring and/or management of translocated fauna species by the identified owner of the translocation site (translocation of threatened flora may be to private or public land and management will occur in accordance with any translocation agreement).
- Any monitoring and/or management of weeds by VicRoads and Glenelg Hopkins Catchment Management Authority.

2.4 Management Plan Actions

A summary of actions required for the implementation of this Management Plan is provided in Table 4, below. Actions are described in detail within Appendix 2, 3 and 4.

Table 4. Summary of actions required for the implementation of the Management Plan.

Action	Timing	Responsibility	Measurable Outcome
<p>1. Construction Environment Management Plan (CEMP)</p> <p>Prepare and implement a CEMP for the project. The CEMP must include management actions relating (but not limited) to pathogen management, erosion, stockpiling, sedimentation, dust, noise and pollutants.</p>	To be developed and accepted in the pre- construction phase, and implemented in the construction phase.	VicRoads and/or its contractors or responsible agent.	Ensure that the approved CEMP follows all management actions that are recommended for threatened species, as outlined in this CMP.
<p>2. Weed Management Plan (WMP)</p> <p>Prepare and implement a Weed Management Plan for the project. This plan will follow the guidelines set out in the CALP Act 1994, and fulfill any obligations by the Project team in relation to minimising the spread of weeds as a result of construction.</p>	To be developed and accepted in the pre- construction phase, and implemented in the construction phase.	VicRoads and/or its responsible contractors.	WMP prepared and implemented
<p>3. Permits and authorisations</p> <p>Ensure all relevant permits relating to salvage and translocation of flora and fauna have been obtained. This will include:</p> <ul style="list-style-type: none"> • A permit under the FFG Act to remove or disturb native vegetation and listed flora species. • Management Authorisation under the Wildlife Act to undertake any inspection, removal or relocation of fauna species. • A permit under the FFG Act to remove, salvage, temporarily hold or translocate listed fish (Dwarf Galaxias) if required. • A permit under the Fisheries Act to remove, salvage or relocate any Dwarf Galaxias individuals (if required) • Approval under the EPBC Act to remove habitat/impact Golden Sun Moth, Spiny Rice Flower and Dwarf Galaxias. 	Pre-construction.	VicRoads and any organisation, contractor or individual responsible for the salvage and translocation of flora and fauna.	Permits are obtained and evidence as to their period of validity is provided prior to commencement of construction.

<p>4. Spiny Rice-flower translocation</p> <p>Translocation of the Spiny Rice-flower individual proposed for removal from the southern side of the Western Highway on Figure 3b: Chainage 36300 (Option 1) to the northern side of the Western Highway on Figure 3b (same Chainage location as the removal location).</p>	<p>Translocation of the Spiny Rice-flower should be undertaken during the winter or spring prior to construction commencing</p>	<p>VicRoads and any organization, contractor or individual responsible for the translocation of flora.</p>	<p>Translocation of Spiny Rice-flower are generally determined to be successful if they have a 70% survival rate, however, as there is only one plant, success should be determined based on all actions and protocols being completed.</p>
<p>5. 'No Go' zones</p> <p>Identification and fencing of 'No Go' zone areas identified as ecologically sensitive must be fenced off with appropriate signage prior to commencement of construction, and remain in place until the construction phase is complete. In areas of known or potential habitat for listed threatened flora and fauna species and ecological communities, protective fencing should be supplemented with a high-visibility component to indicate the sensitivity of the area.</p> <p>Areas of sensitivity that must be flagged as a 'No Go' zone including hi-visibility component have been identified in Figure 3</p>	<p>To be developed and accepted in the pre- construction phase, and implemented in the construction phase.</p>	<p>VicRoads and/or its responsible contractors.</p>	<p>All areas identified as ecologically sensitive are fenced off with appropriate signage prior to commencement of construction.</p>
<p>6. Water quality monitoring</p> <p>Water quality monitoring will be conducted to establish background conditions and appropriate trigger values at allocated upstream and downstream sites (to be determined).</p>	<p>Monthly for two months prior to commencement of construction.</p>	<p>VicRoads and/or its responsible contractors. Measurements to be taken by an appropriately qualified ecologist.</p>	<p>Water quality is measured as per requirements detailed in Appendix 4.2, Water Quality Monitoring and Management</p>
<p>7. Pre-construction environmental induction (site supervisors)</p> <p>All site environment officers / supervisors (or equivalent) must attend a pre-construction induction to ensure that they are aware of the ecological values present on-site; the protocols and procedures to avoid and reduce impacts to native flora and fauna; and the risk of penalty should compliance to aforementioned protocols and procedures not take place.</p> <p>The induction must be conducted by an appropriately qualified person who is familiar with the ecological values present within the study area and the associated management requirements. Specific induction requirements are listed in Appendix 3 and Appendix 4</p>	<p>Pre-construction</p>	<p>VicRoads and/or its responsible contractors.</p>	<p>Site ecological values, protocols and procedures are conveyed to contractors and workers during Toolbox meetings.</p>
<p>8. Pre-construction environmental induction (contractors)</p> <p>All construction contractors must attend a pre-construction induction for significant flora and fauna species and</p>	<p>Immediately before construction commencement</p>	<p>VicRoads and/or its responsible contractors.</p>	<p>Information regarding significant species, protocols and procedures are conveyed to contractors and workers.</p>

<p>communities. An ecological consultant or trained site environment officer / supervisor must conduct the induction immediately before commencement of work in ecologically sensitive areas. Ecologically sensitive areas are listed above under 'No Go' zones.</p>			
<p>9. Pre-clearance surveys and salvage for significant fauna</p> <p>A qualified zoologist or ecologist must be present for fauna salvage during vegetation or topsoil removal at the following locations:</p> <ul style="list-style-type: none"> • During the removal of any riparian or wetland habitat. This includes the following locations: • Drainage lines (Cemetery Creek, Green Hill Creek, Hopkins River, Billy Billy Creek, Middle Creek and Fiery Creek); and, • Wetland adjacent to the existing highway, between Mile Post Lane and Anderson Road. 	<p>During construction</p>	<p>VicRoads and/or its responsible contractors.</p>	<p>Salvage and translocation completed as per Appendix 4</p>
<p>10. Permanent fencing and signage of significant flora populations</p> <p>Permanent fencing (eg. 1.0m high metal post and wire fence) and appropriate signage to be constructed around the Spiny Rice-flower population retained in situ along the Western Highway road reserve (Figure 3b and 3c) and the Button Wrinklewort population retained in situ within the Woodnaggerak Reserve (Figure 3m) to help increase awareness and reduce disturbance.</p>	<p>During construction</p>	<p>VicRoads and/or its responsible contractors.</p>	<p>Signage and fencing installed</p>
<p>11. Population monitoring for Golden Sun Moth</p> <p>Monitoring of Golden Sun Moth populations is required to determine if the species has persisted in grassland areas within the roadside reserve or adjacent to construction activities.</p>	<p>Annually during construction activities. October to early January</p>	<p>VicRoads and/or its responsible contractors. Surveys to be conducted by qualified ecologist.</p>	<p>Surveys completed to specified requirements.</p>
<p>12. Water quality monitoring</p> <p>Water quality monitoring will be conducted to ensure that water quality is maintained within the pre-construction water quality parameters of the waterway whilst also satisfying SEPP (WoV) objectives (EPA 2003). However, if downstream trigger values are breached, then weekly water quality monitoring will be implemented until water quality conditions have returned to background conditions or within SEPP (WoV) objectives (EPA 2003).</p>	<p>During construction on a monthly basis, unless triggers are breached</p>	<p>VicRoads and/or its responsible contractors.</p>	<p>Water quality is measured as per requirements detailed in Appendix 4.2, Water Quality Monitoring and Management</p>



2.5 Ongoing Management and Monitoring Actions

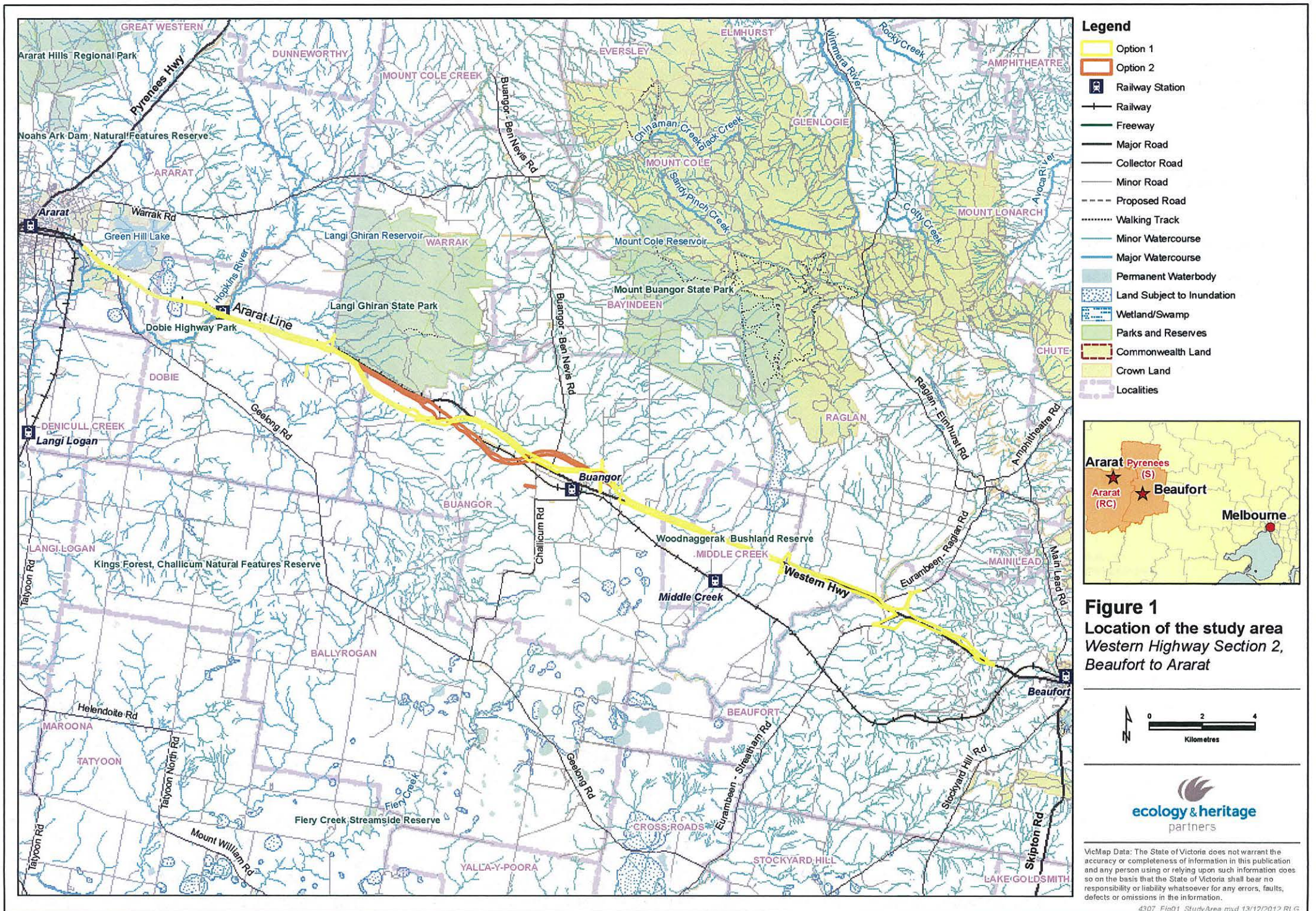
A summary of ongoing actions (i.e. Post Construction) required for the implementation of this Management Plan is provided in Table 5, below. Actions are described within Appendix 2, 3 and 4.

Table 5. Ongoing management and monitoring actions required for the implementation of the Management Plan.

Action	Timing	Responsible Agent	Funding Source	Measurable Outcome	Adaptive Management
Qualified personnel to document the health of Spiny Rice-flower populations retained in-situ within Road Reserves and undertake appropriate management techniques (i.e. weed control, burning, maintenance of fencing) to ensure survival. Monitoring of the effectiveness will be conducted concurrently with weed control program. See Appendix 4 for detailed information.	Annually for 3 years post-construction	VicRoads	VicRoads	Maintenance of current population numbers within retained areas and a reduction in exotic biomass to help reduce competition and create open space for Spiny Rice-flower and Button Winklewort populations to survive and reproduce.	If exotic biomass is not successfully reduced then a more rigorous and frequent regime is required. If additional plants/populations of these species are found, VicRoads should implement a contingency action with direction from DEPI.
Qualified personnel to document the health of the Spiny Rice-flower individual which is to be translocated to a pre-determined site and conduct appropriate management techniques (i.e. watering/weeding). See Appendix 4 for detailed information	Annually for 3 years post-construction	VicRoads	VicRoads	Translocation is undertaken based on actions and protocols outlined in this plan.	Appropriate protection and management of remaining Spiny Rice-flower population on the north side of the Western Highway should be undertaken regardless of success of the translocation.
Ensure rubbish or litter in and around retained Spiny Rice-flower populations is appropriately managed within Roadside Reserves	As needed	VicRoads	VicRoads	Rubbish and litter appropriately managed to ensure species survival	Clean up as required

Action	Timing	Responsible Agent	Funding Source	Measurable Outcome	Adaptive Management
A progress statement should be written on the implementation of the Management Plan for Spiny Rice-flower retained in situ in roadside and public reserves, documenting key issues and management responses.	Statement should be written annually.	VicRoads	VicRoads	All recommendations outlined in the Plan have been effectively followed.	Annual statement submitted to DEPI.
<i>Water quality monitoring</i> Water quality monitoring will be conducted to demonstrate if water quality has returned/remained at background conditions. The frequency of the water quality monitoring will be reviewed after the initial two-year period and a decision will be made on whether ongoing water chemistry monitoring is required.	As required to verify water quality conditions.	VicRoads	VicRoads	All recommendations outlined in the Plan have been effectively followed	Annual statement submitted to DEPI.
<i>Population monitoring for Golden Sun Moth</i> Monitoring of Golden Sun Moth populations is required to determine if the species has persisted in grassland areas within the roadside reserve or adjacent to construction activities.	Annually between October-January for three years post- construction	VicRoads	VicRoads	Ongoing monitoring completed as per Appendix 5.5, Management Procedures for Golden Sun Moth	Annual statement submitted to DEPI.
<i>Population monitoring for Dwarf Galaxias</i> Ongoing population monitoring for Dwarf Galaxias is required to determine whether the habitat availability and quality for Dwarf Galaxias has been adversely impacted during construction	Annually between December-May for three years post- construction	VicRoads	VicRoads	Ongoing monitoring completed as per Appendix 5.3, Management Procedures for Aquatic Fauna	Annual statement submitted to DEPI.

FIGURES





- Legend**
- Alignment Options**
- Option 1
 - Option 2
- Remnant Vegetation**
- EVCs
 - EPBC Vegetation Communities
 - Grassy Eucalypt
 - Woodland of the VVP
 - Natural Temperate Grassland of the VVP
- Threatened Fauna Species**
- Brown Toadlet
 - Brown Treecreeper
 - Dwarf Galaxias
 - Golden Sun Moth
- Threatened Flora Species**
- Button Winklewort
 - Emerald-lip Greenhood
 - Golden Cowslips
 - Spiny Rice-flower
 - Yarra Gum

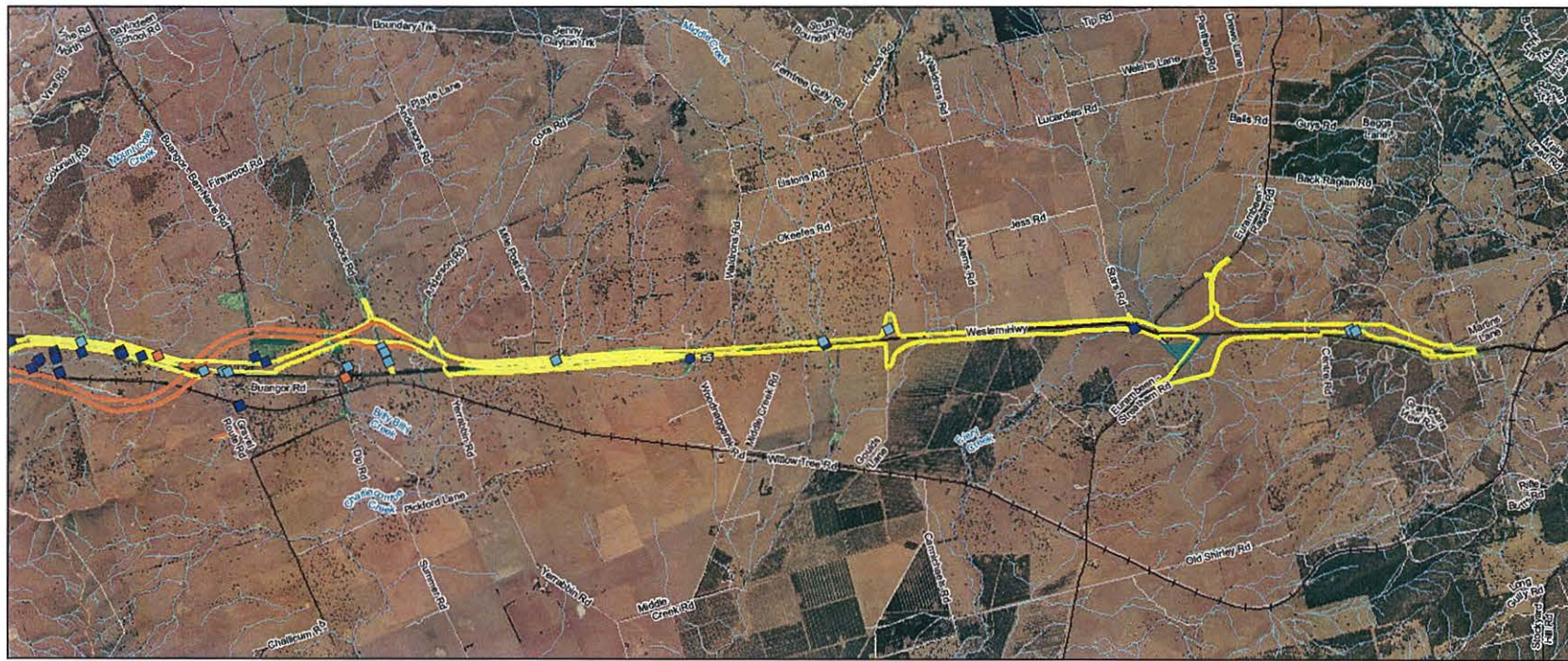
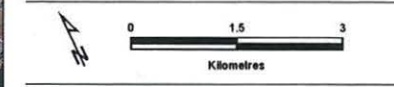


Figure 2
Ecological features and targeted surveys within the study area (Overview)
Western Highway Project Section 2, Beaufort to Ararat



Victoria Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication, and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, omissions, defects or inaccuracies in the information.

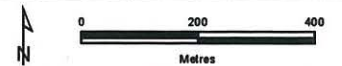


Legend

- Threatened Flora Species**
- Button Wrinklewort
 - Emerald-lip Greenhood
 - Golden Cowslips
 - Spiny Rice-flower
 - Yarra Gum
- Threatened Fauna Species**
- Brown Toadlet
 - Brown Treecreeper
 - Dwarf Galaxias
 - Golden Sun Moth
- Alignment Options**
- Option 1
 - Option 2
- Mitigation Actions**
- ▨ No Go Zone - Threatened Species
 - ▨ No Go Zone - Vegetation
 - ▨ Salvage
 - ▲ No Go Zone - Trees
 - ✚ Sediment Fencing
- EPBC Vegetation Communities**
- Grassy Eucalypt
 - Woodland of the VVP
 - Natural Temperate Grassland of the VVP
- Remnant Vegetation**
- ▲ Scattered Trees
 - EVCs

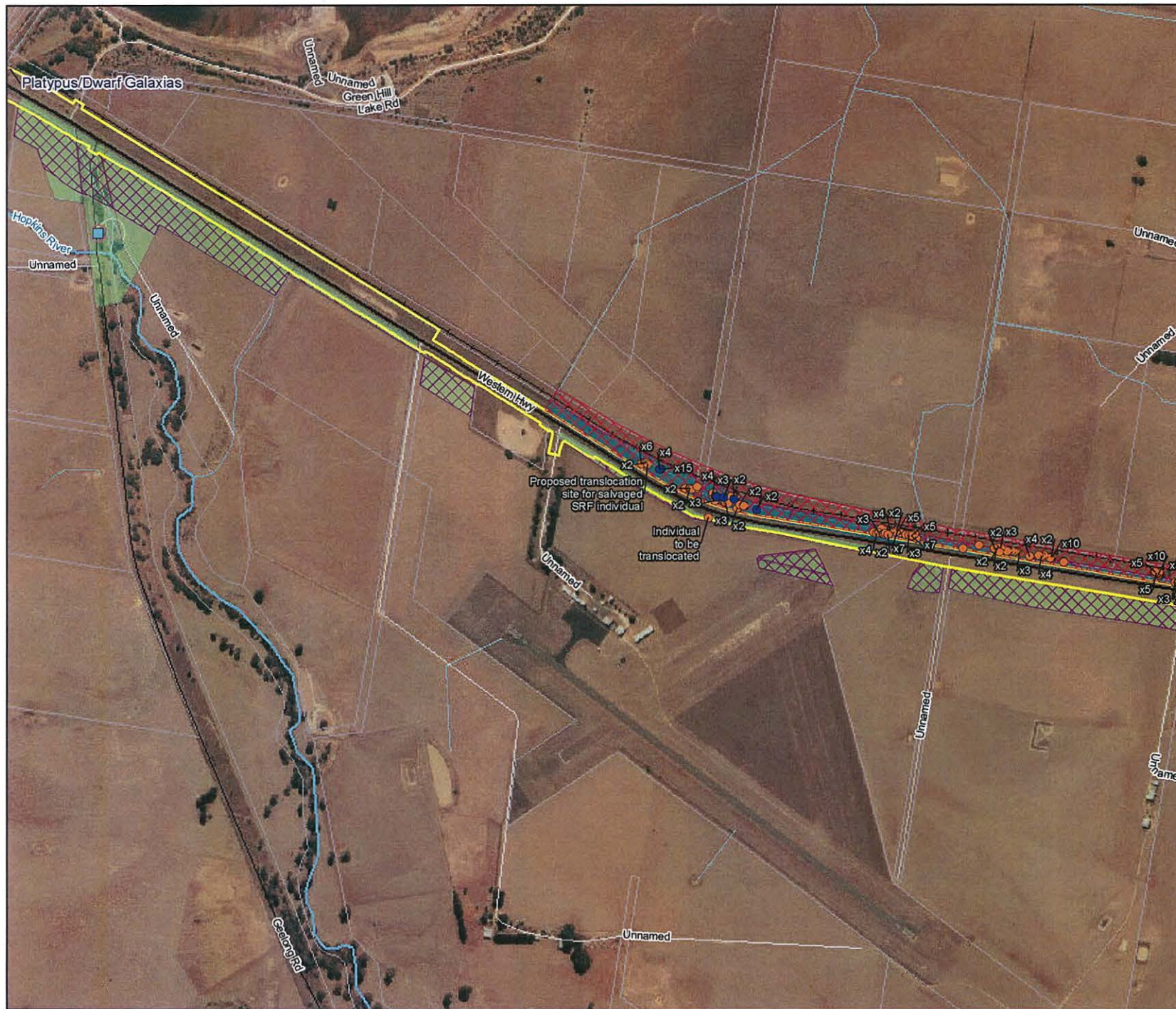


Figure 3A
 Mitigation actions for areas of sensitivity within the study area
 Western Highway,
 Beaufort to Ararat




 ecology & heritage
 partners

VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.



Legend

- Threatened Flora Species**
 - Button Wrinklewort
 - Emerald-lip Greenhood
 - Golden Cowslips
 - Spiny Rice-flower
 - Yarra Gum
- Threatened Fauna Species**
 - Brown Toadlet
 - Brown Treecreeper
 - Dwarf Galaxias
 - Golden Sun Moth
- Alignment Options**
 - Option 1
 - Option 2
- Mitigation Actions**
 - ⊠ No Go Zone - Threatened Species
 - ⊠ No Go Zone - Vegetation
 - ⊠ Salvage
 - ▲ No Go Zone - Trees
 - ⊕ Sediment Fencing
- EPBC Vegetation Communities**
 - Grassy Eucalypt Woodland of the VVP
 - Natural Temperate Grassland of the VVP
- Remnant Vegetation**
 - ▲ Scattered Trees
 - EVCs



Figure 3B
 Mitigation actions for areas of sensitivity within the study area
 Western Highway,
 Beaufort to Ararat



VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

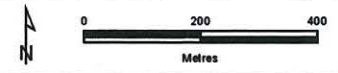


Legend

- Threatened Flora Species**
 - Button Wrinklewort
 - Emerald-lip Greenhood
 - Golden Cowslips
 - Spiny Rice-flower
 - Yarra Gum
- Threatened Fauna Species**
 - Brown Toadlet
 - Brown Treecreeper
 - Dwarf Galaxias
 - Golden Sun Moth
- Alignment Options**
 - ▭ Option 1
 - ▭ Option 2
- Mitigation Actions**
 - ⊠ No Go Zone - Threatened Species
 - ⊠ No Go Zone - Vegetation
 - ⊠ Salvage
 - ▲ No Go Zone - Trees
 - ⊕ Sediment Fencing
- EPBC Vegetation Communities**
 - Grassy Eucalypt
 - Woodland of the VVP
 - Natural Temperate Grassland of the VVP
- Remnant Vegetation**
 - ▲ Scattered Trees
 - EVCs



Figure 3C
Mitigation actions for areas of sensitivity within the study area
 Western Highway,
 Beaufort to Ararat



VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

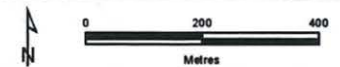


Legend

- | | |
|--|---|
| <p>Threatened Flora Species</p> <ul style="list-style-type: none"> ● Button Wrinklewort ● Emerald-lip Greenhood ● Golden Cowslips ● Spiny Rice-flower ● Yarra Gum <p>Threatened Fauna Species</p> <ul style="list-style-type: none"> ■ Brown Toadlet ■ Brown Treecreeper ■ Dwarf Galaxias ■ Golden Sun Moth <p>Alignment Options</p> <ul style="list-style-type: none"> ■ Option 1 ■ Option 2 <p>Mitigation Actions</p> <ul style="list-style-type: none"> ▨ No Go Zone - Threatened Species ▨ No Go Zone - Vegetation ▨ Salvage ▲ No Go Zone - Trees ⊕ Sediment Fencing | <p>EPBC Vegetation Communities</p> <ul style="list-style-type: none"> ■ Grassy Eucalypt ■ Woodland of the VVP ■ Natural Temperate Grassland of the VVP <p>Remnant Vegetation</p> <ul style="list-style-type: none"> ▲ Scattered Trees ■ EVCs |
|--|---|



Figure 3D
Mitigation actions for areas of sensitivity within the study area
Western Highway, Beaufort to Ararat




 ecology & heritage
 partners

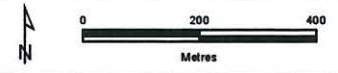
VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.



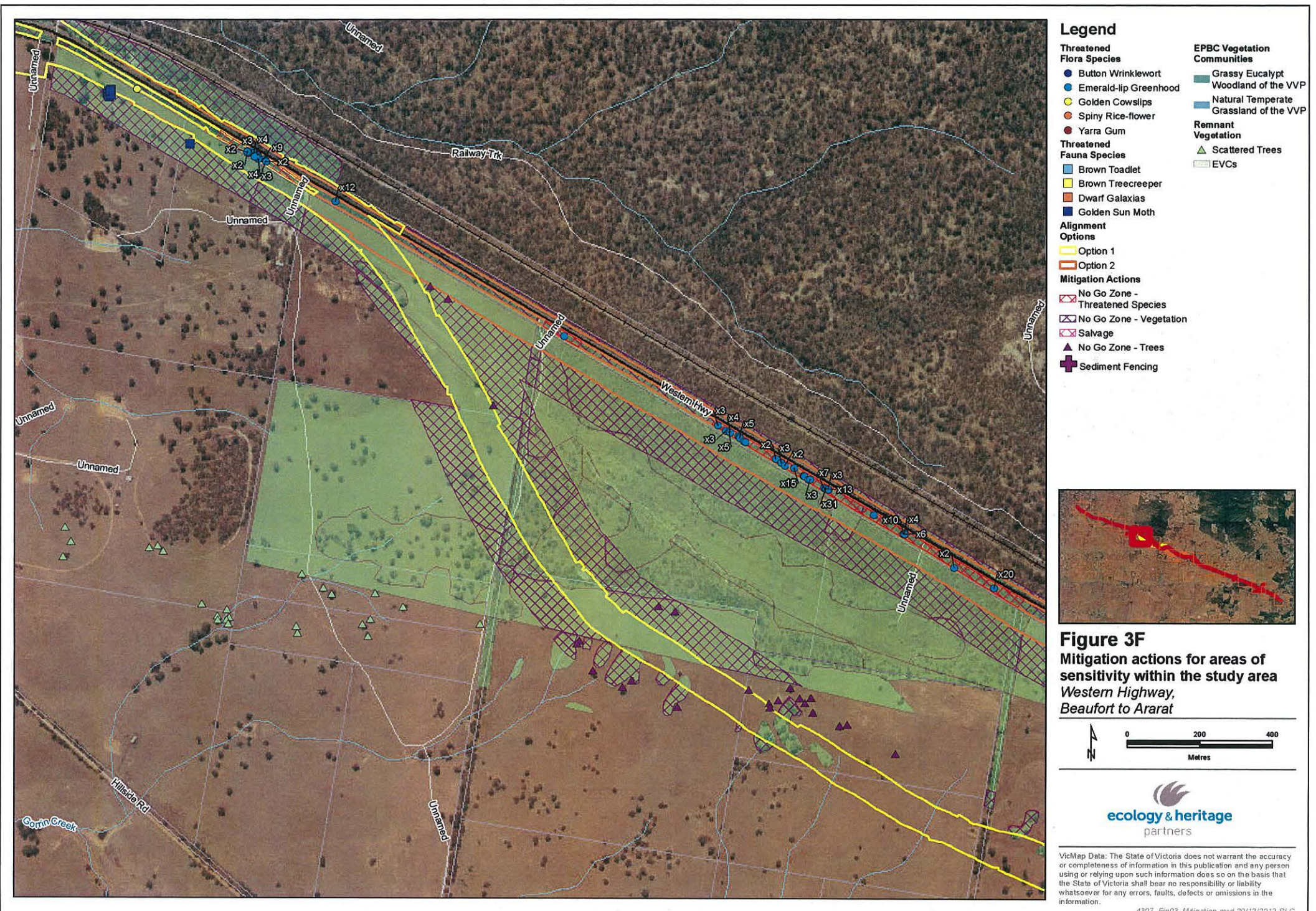
- ### Legend
- Threatened Flora Species**
 - Button Wrinklewort
 - Emerald-lip Greenhood
 - Golden Cowslips
 - Spiny Rice-flower
 - Yarra Gum
 - Threatened Fauna Species**
 - Brown Toadlet
 - Brown Treecreeper
 - Dwarf Galaxias
 - Golden Sun Moth
 - Alignment Options**
 - Option 1
 - Option 2
 - Mitigation Actions**
 - ▨ No Go Zone - Threatened Species
 - ▨ No Go Zone - Vegetation
 - ▨ Salvage
 - ▲ No Go Zone - Trees
 - Sediment Fencing
 - EPBC Vegetation Communities**
 - Grassy Eucalypt
 - Woodland of the VVP
 - Natural Temperate Grassland of the VVP
 - Remnant Vegetation**
 - ▲ Scattered Trees
 - EVCs



Figure 3E
 Mitigation actions for areas of sensitivity within the study area
 Western Highway,
 Beaufort to Ararat



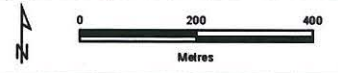
VecMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.



- ### Legend
- Threatened Flora Species**
 - Button Wrinklewort
 - Emerald-lip Greenhood
 - Golden Cowslips
 - Spiny Rice-flower
 - Yarra Gum
 - Threatened Fauna Species**
 - Brown Toadlet
 - Brown Treecreeper
 - Dwarf Galaxias
 - Golden Sun Moth
 - Alignment Options**
 - Option 1
 - Option 2
 - Mitigation Actions**
 - ⊠ No Go Zone - Threatened Species
 - ⊠ No Go Zone - Vegetation
 - ⊠ Salvage
 - ▲ No Go Zone - Trees
 - ⊕ Sediment Fencing
 - EPBC Vegetation Communities**
 - Grassy Eucalypt
 - Woodland of the VVP
 - Natural Temperate Grassland of the VVP
 - Remnant Vegetation**
 - △ Scattered Trees
 - EVCs



Figure 3F
 Mitigation actions for areas of sensitivity within the study area
 Western Highway,
 Beaufort to Ararat



VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

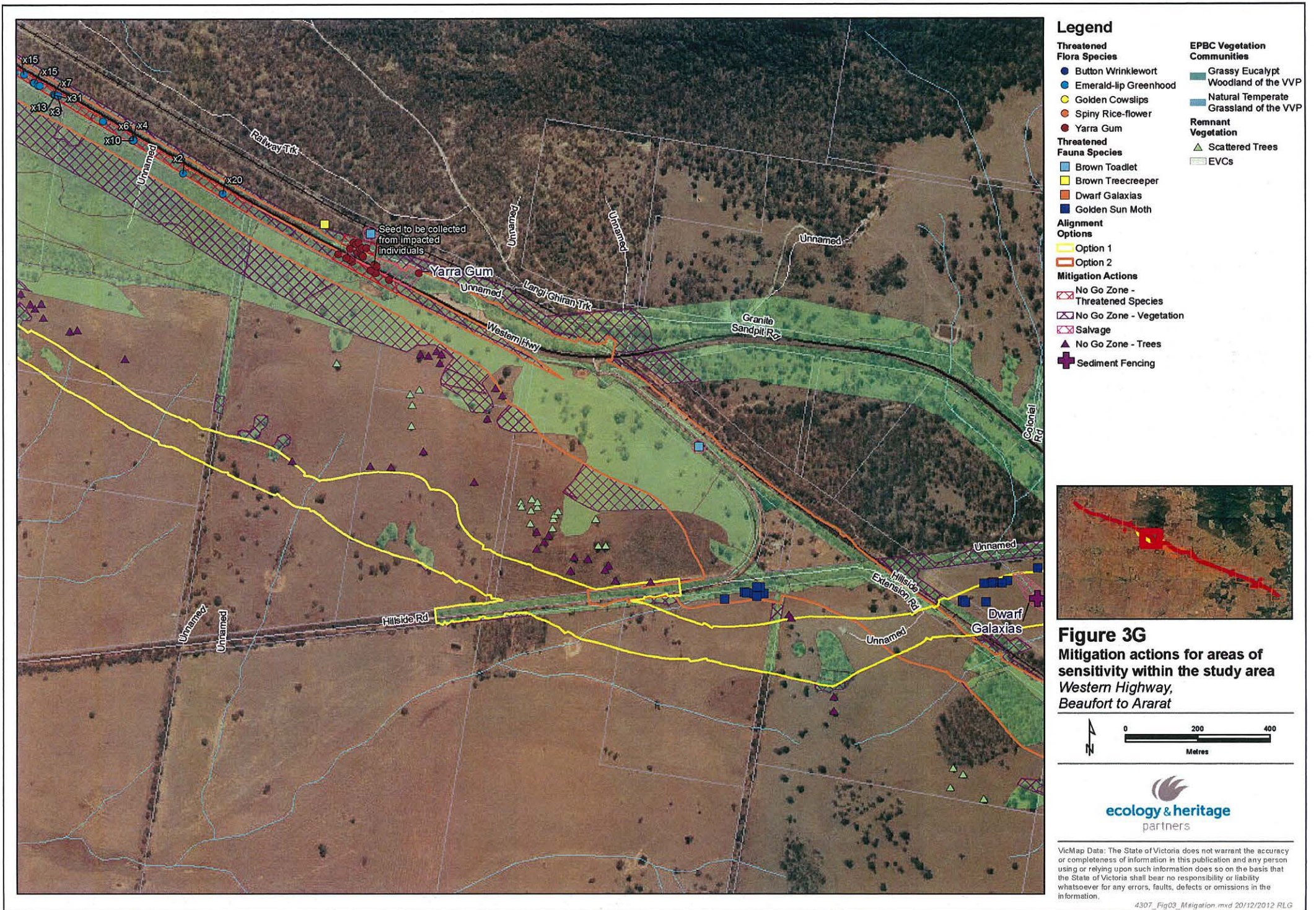
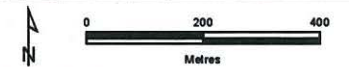


Figure 3G
 Mitigation actions for areas of sensitivity within the study area
 Western Highway,
 Beaufort to Ararat



VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

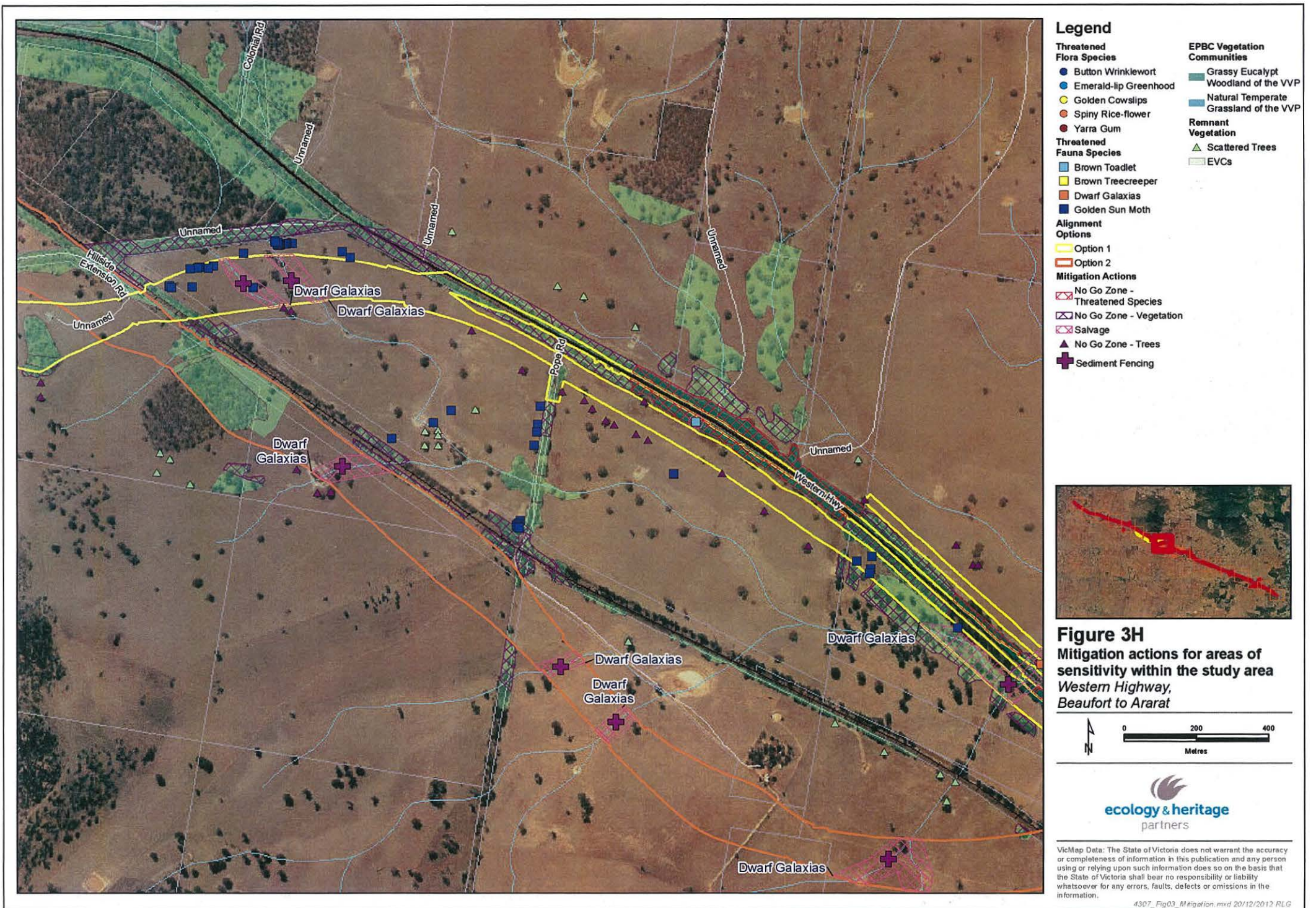
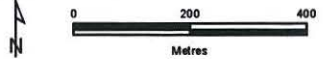
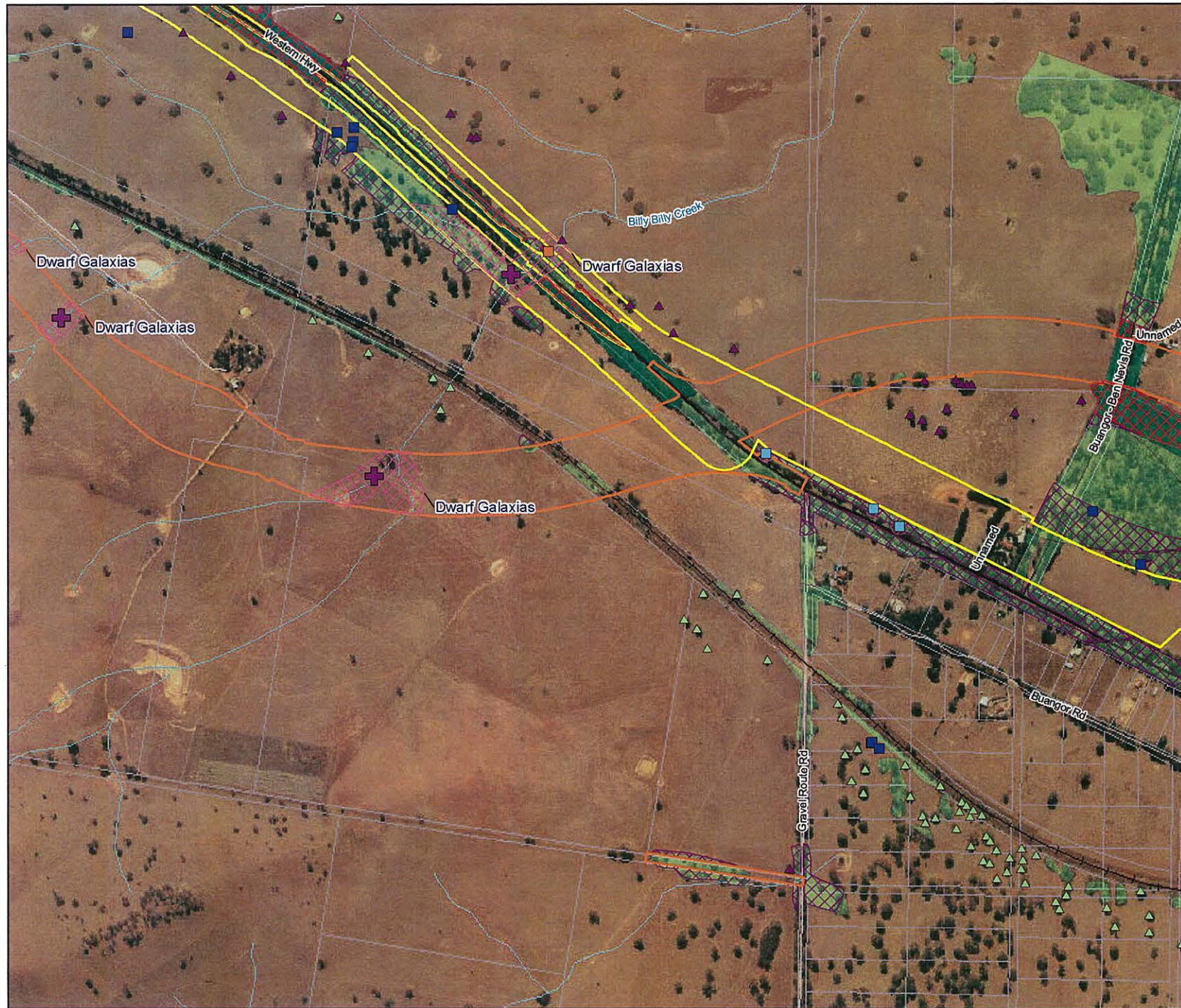


Figure 3H
 Mitigation actions for areas of sensitivity within the study area
 Western Highway, Beaufort to Ararat



VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.



Legend

- | | |
|--|---|
| <p>Threatened Flora Species</p> <ul style="list-style-type: none"> ● Button Wrinklewort ● Emerald-lip Greenhood ● Golden Cowslips ● Spiny Rice-flower ● Yarra Gum <p>Threatened Fauna Species</p> <ul style="list-style-type: none"> ■ Brown Toadlet ■ Brown Treecreeper ■ Dwarf Galaxias ■ Golden Sun Moth <p>Alignment Options</p> <ul style="list-style-type: none"> — Option 1 — Option 2 <p>Mitigation Actions</p> <ul style="list-style-type: none"> ▨ No Go Zone - Threatened Species ▨ No Go Zone - Vegetation ▨ Salvage ▲ No Go Zone - Trees ⊕ Sediment Fencing | <p>EPBC Vegetation Communities</p> <ul style="list-style-type: none"> ■ Grassy Eucalypt ■ Woodland of the VVP ■ Natural Temperate Grassland of the VVP <p>Remnant Vegetation</p> <ul style="list-style-type: none"> ▲ Scattered Trees ■ EVCs |
|--|---|



Figure 31
 Mitigation actions for areas of sensitivity within the study area
 Western Highway,
 Beaufort to Ararat



VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

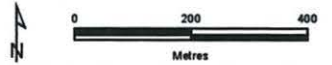


Legend

- Threatened Flora Species**
 - Button Wrinklewort
 - Emerald-lip Greenhood
 - Golden Cowslips
 - Spiny Rice-flower
 - Yarra Gum
- Threatened Fauna Species**
 - Brown Toadlet
 - Brown Treecreeper
 - Dwarf Galaxias
 - Golden Sun Moth
- Alignment Options**
 - Option 1
 - Option 2
- Mitigation Actions**
 - ▨ No Go Zone - Threatened Species
 - ▨ No Go Zone - Vegetation
 - ▨ Salvage
 - ▲ No Go Zone - Trees
 - ⊕ Sediment Fencing
- EPBC Vegetation Communities**
 - Grassy Eucalypt Woodland of the VVP
 - Natural Temperate Grassland of the VVP
- Remnant Vegetation**
 - ▲ Scattered Trees
 - EVCs



Figure 3J
 Mitigation actions for areas of sensitivity within the study area
 Western Highway, Beaufort to Ararat



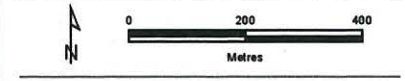
VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.



- ### Legend
- Threatened Flora Species**
 - Button Wrinklewort
 - Emerald-lip Greenhood
 - Golden Cowslips
 - Spiny Rice-flower
 - Yarra Gum
 - Threatened Fauna Species**
 - Brown Toadlet
 - Brown Treecreeper
 - Dwarf Galaxias
 - Golden Sun Moth
 - Alignment Options**
 - Option 1
 - Option 2
 - Mitigation Actions**
 - ⊠ No Go Zone - Threatened Species
 - ⊠ No Go Zone - Vegetation
 - ⊠ Salvage
 - ▲ No Go Zone - Trees
 - ⊕ Sediment Fencing
 - EPBC Vegetation Communities**
 - Grassy Eucalypt
 - Woodland of the VVP
 - Natural Temperate Grassland of the VVP
 - Remnant Vegetation**
 - ▲ Scattered Trees
 - EVCs



Figure 3K
Mitigation actions for areas of sensitivity within the study area
Western Highway, Beaufort to Ararat



VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.



Legend

- | | |
|-----------------------------------|--|
| Threatened Flora Species | EPBC Vegetation Communities |
| ● Button Winklewort | ■ Grassy Eucalypt |
| ● Emerald-lip Greenhood | ■ Woodland of the VVP |
| ● Golden Cowslips | ■ Natural Temperate Grassland of the VVP |
| ● Spiny Rice-flower | |
| ● Yarra Gum | Remnant Vegetation |
| Threatened Fauna Species | ▲ Scattered Trees |
| ■ Brown Toadlet | ■ EVCs |
| ■ Brown Treecreeper | |
| ■ Dwarf Galaxias | |
| ■ Golden Sun Moth | |
| Alignment Options | |
| — Option 1 | |
| — Option 2 | |
| Mitigation Actions | |
| ▨ No Go Zone - Threatened Species | |
| ▨ No Go Zone - Vegetation | |
| ▨ Salvage | |
| ▲ No Go Zone - Trees | |
| ✚ Sediment Fencing | |



Figure 3L
Mitigation actions for areas of sensitivity within the study area
Western Highway, Beaufort to Ararat




ecology & heritage
partners

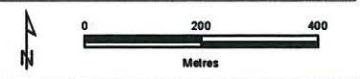
VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.



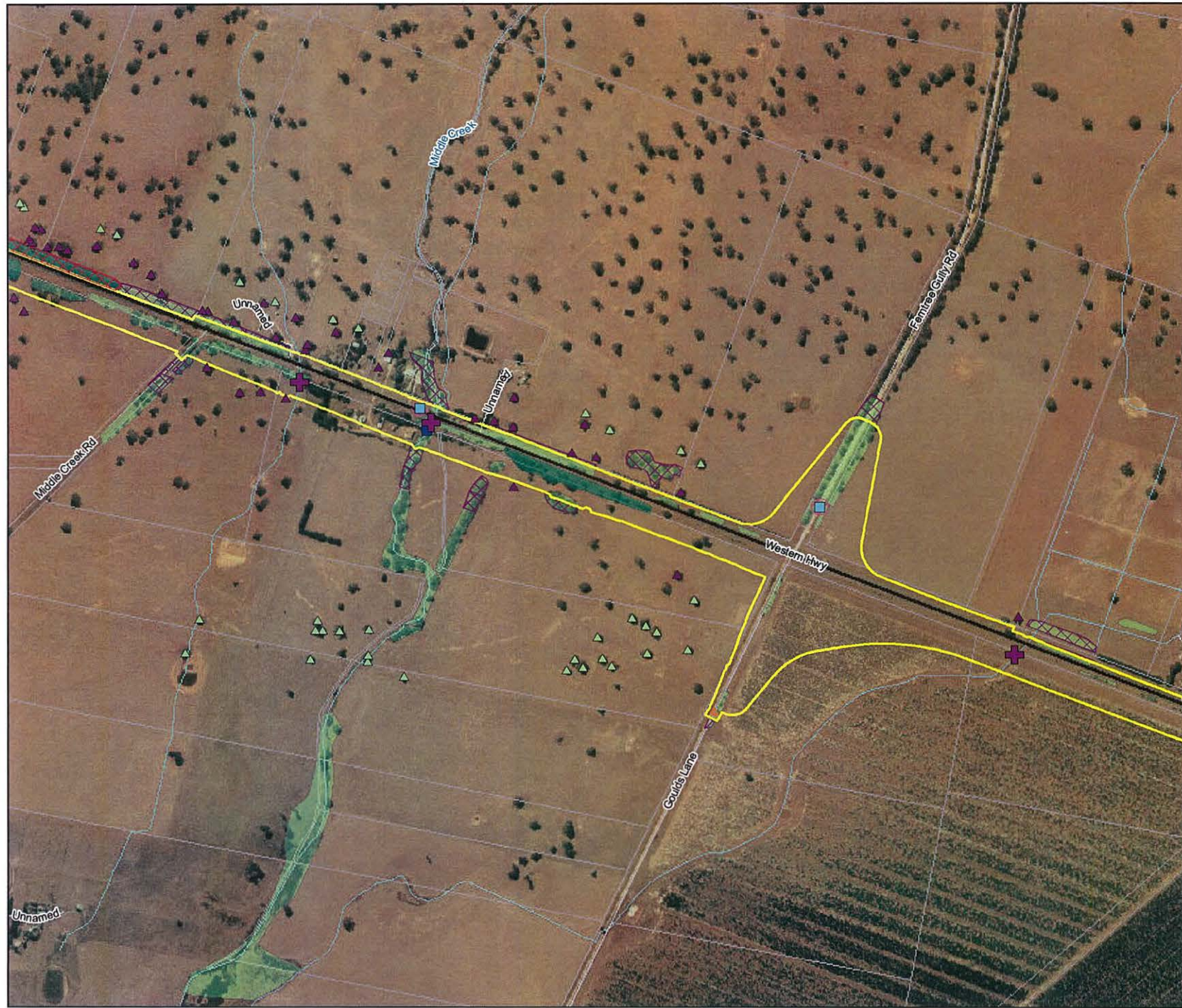
- ### Legend
- Threatened Flora Species**
 - Button Wrinklewort
 - Emerald-lip Greenhood
 - Golden Cowslips
 - Spiny Rice-flower
 - Yarra Gum
 - Threatened Fauna Species**
 - Brown Toadlet
 - Brown Treecreeper
 - Dwarf Galaxias
 - Golden Sun Moth
 - Alignment Options**
 - Option 1
 - Option 2
 - Mitigation Actions**
 - ▨ No Go Zone - Threatened Species
 - ▨ No Go Zone - Vegetation
 - ▨ No Go Zone - Salvage
 - ▲ No Go Zone - Trees
 - Sediment Fencing
 - EPBC Vegetation Communities**
 - Grassy Eucalypt
 - Woodland of the VVP
 - Natural Temperate Grassland of the VVP
 - Remnant Vegetation**
 - ▲ Scattered Trees
 - EVCs



Figure 3M
Mitigation actions for areas of sensitivity within the study area
Western Highway, Beaufort to Ararat



VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

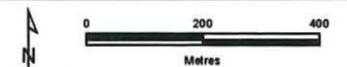


Legend

- | | |
|--|--|
| <p>Threatened Flora Species</p> <ul style="list-style-type: none"> ● Button Wrinklewort ● Emerald-lip Greenhood ● Golden Cowslips ● Spiny Rice-flower ● Yarra Gum <p>Threatened Fauna Species</p> <ul style="list-style-type: none"> ■ Brown Toadlet ■ Brown Treecreeper ■ Dwarf Galaxias ■ Golden Sun Moth <p>Alignment Options</p> <ul style="list-style-type: none"> — Option 1 — Option 2 <p>Mitigation Actions</p> <ul style="list-style-type: none"> ⊠ No Go Zone - Threatened Species ⊠ No Go Zone - Vegetation ⊠ Salvage ▲ No Go Zone - Trees ⊕ Sediment Fencing | <p>EPBC Vegetation Communities</p> <ul style="list-style-type: none"> ■ Grassy Eucalypt Woodland of the VVP ■ Natural Temperate Grassland of the VVP <p>Remnant Vegetation</p> <ul style="list-style-type: none"> ▲ Scattered Trees ■ EVCs |
|--|--|



Figure 3N
 Mitigation actions for areas of sensitivity within the study area
 Western Highway,
 Beaufort to Ararat



VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

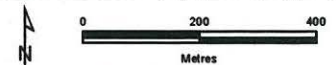


Legend

- | | |
|--|---|
| Threatened Flora Species
<ul style="list-style-type: none"> ● Button Wrinklewort ● Emerald-lip Greenhood ● Golden Cowslips ● Spiny Rice-flower ● Yarra Gum | EPBC Vegetation Communities
<ul style="list-style-type: none"> ■ Grassy Eucalypt Woodland of the VVP ■ Natural Temperate Grassland of the VVP |
| Threatened Fauna Species
<ul style="list-style-type: none"> ■ Brown Toadlet ■ Brown Treecreeper ■ Dwarf Galaxias ■ Golden Sun Moth | Remnant Vegetation
<ul style="list-style-type: none"> ▲ Scattered Trees ■ EVCs |
| Alignment Options
<ul style="list-style-type: none"> ■ Option 1 ■ Option 2 | |
| Mitigation Actions
<ul style="list-style-type: none"> ⊠ No Go Zone - Threatened Species ⊠ No Go Zone - Vegetation ⊠ Salvage ▲ No Go Zone - Trees ⊕ Sediment Fencing | |



Figure 30
Mitigation actions for areas of sensitivity within the study area
Western Highway, Beaufort to Ararat



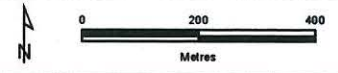
VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.



- ### Legend
- Threatened Flora Species**
 - Button Wrinklewort
 - Emerald-lip Greenhood
 - Golden Cowslips
 - Spiny Rice-flower
 - Yarra Gum
 - Threatened Fauna Species**
 - Brown Toadlet
 - Brown Treecreeper
 - Dwarf Galaxias
 - Golden Sun Moth
 - Alignment Options**
 - Option 1
 - Option 2
 - Mitigation Actions**
 - ⊠ No Go Zone - Threatened Species
 - ⊠ No Go Zone - Vegetation
 - ⊠ Salvage
 - ▲ No Go Zone - Trees
 - ⊕ Sediment Fencing
 - EPBC Vegetation Communities**
 - Grassy Eucalypt
 - Woodland of the VVP
 - Natural Temperate Grassland of the VVP
 - Remnant Vegetation**
 - ▲ Scattered Trees
 - EVCs



Figure 3P
 Mitigation actions for areas of sensitivity within the study area
 Western Highway,
 Beaufort to Ararat



VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

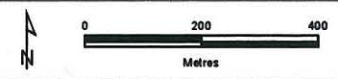


Legend

Threatened Flora Species ● Button Wrinklewort ● Emerald-lip Greenhood ● Golden Cowslips ● Spiny Rice-flower ● Yarra Gum	EPBC Vegetation Communities ■ Grassy Eucalypt ■ Woodland of the VVP ■ Natural Temperate ■ Grassland of the VVP
Threatened Fauna Species ■ Brown Toadlet ■ Brown Treecreeper ■ Dwarf Galaxias ■ Golden Sun Moth	Remnant Vegetation ▲ Scattered Trees ■ EVCs
Alignment Options — Option 1 — Option 2	
Mitigation Actions ▨ No Go Zone - Threatened Species ▨ No Go Zone - Vegetation ▨ Salvage ▲ No Go Zone - Trees + Sediment Fencing	



Figure 3Q
 Mitigation actions for areas of sensitivity within the study area
 Western Highway,
 Beaufort to Ararat



VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.



Legend

- | | |
|--|--|
| Threatened Flora Species
<ul style="list-style-type: none"> ● Button Wrinklewort ● Emerald-lip Greenhood ● Golden Cowslips ● Spiny Rice-flower ● Yarra Gum | EPBC Vegetation Communities
<ul style="list-style-type: none"> ■ Grassy Eucalypt ■ Woodland of the VVP ■ Natural Temperate Grassland of the VVP |
| Threatened Fauna Species
<ul style="list-style-type: none"> ■ Brown Toadlet ■ Brown Treecreeper ■ Dwarf Galaxias ■ Golden Sun Moth | Remnant Vegetation
<ul style="list-style-type: none"> ▲ Scattered Trees ■ EVCs |
| Alignment Options
<ul style="list-style-type: none"> — Option 1 — Option 2 | |
| Mitigation Actions
<ul style="list-style-type: none"> ■ No Go Zone - Threatened Species ■ No Go Zone - Vegetation ■ Salvage ▲ No Go Zone - Trees ■ Sediment Fencing | |



Figure 3R
 Mitigation actions for areas of sensitivity within the study area
 Western Highway,
 Beaufort to Ararat



VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

APPENDICES

APPENDIX 1 FLORA AND FAUNA SPECIES OF CONSERVATION SIGNIFICANCE

Nationally Significant Species

Spiny Rice-flower Pimelea spinescens subsp. spinescens

Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens* is listed as critically endangered under the EPBC Act, is listed under the FFG Act, and is considered endangered in Victoria (DSE 2005; FIS 2011). Spiny Rice-flower occurs in Plains Grassland in Victoria, with most populations occurring within the EPBC Act listed Natural Temperate Grassland of the Victorian Volcanic Plain vegetation community. There are at least 831 documented records of Spiny Rice-flower in Victoria, with the nearest and most recent record (2003) located within the study area along the road reserve south of Ararat (FIS 2011).

Dwarf Galaxias Galaxiella pusilla

EPBC Act: Endangered; FFG Act: Listed; National Action Plan: Near Threatened; DSE Advisory List: Near Threatened.

Dwarf Galaxias is a very small Galaxiid, with females reaching up to 40mm and males only 35mm (DPIW 2006). It is a slightly stocky fish, with a deepened trunk at the belly and small head with a blunt snout (McDowall, R. 1996). The fins are small and membranous (McDowall, R 1996) with large flanges on the caudal (tail) fin that cause it to almost reach the dorsal and anal fin (McDowall, R 1996; DPIW 2006). The colour of Dwarf Galaxias is generally transparent olive-amber on the dorsal surface, with three longitudinal black stripes (laterally) and a silvery, white underside. Males also have a vivid orange stripe between the middle and lower black lateral stripe; females lack this orange colouration (McDowall, R 1996; DPIW 2006).

Breeding occurs in spring, where pairs will spawn eggs one by one on aquatic plants (likely less than 100 eggs), each approximately 1mm in diameter. Larvae hatch in 2-3 weeks, with an estimated life expectancy of one year, only allowing for one spawning event per individual (Humphries 1986). Dwarf Galaxias lives its entire life cycle in freshwater (McDowall 1996; DPIW 2006).

The species is mostly found in still (McDowall 1996) or slow-flowing waters (DPIW 2006), which are often overgrown with aquatic and/ or emergent plants. They can occur within permanent waterbodies, though are commonly located within ephemeral pools (connected to permanent waterways) and are thought to be able to aestivate when waterbodies dry up (McDowall 1996). Dwarf Galaxias occurs in southern Victoria from Gippsland east to Mount Gambier in SouthAustralia, also on Flinders Island and in the east of the north coast of Tasmania (Humphries1996; McDowall 1996) and is intermittent in occurrence, though often locally abundant (DPIW 2006).

Golden Sun Moth Synemon plana

EPBC Act: Critically Endangered; FFG Act: Listed; National Action Plan: not applicable; DSE Advisory List: Critically Endangered.

The Golden Sun Moth is a medium-sized, day-flying moth. The wingspan of females and males is about 3.1 cm and 3.4 cm respectively. The smaller wingspan of the female is unique

within the *Synemon* genus (Edwards 1991). The upper-side of the forewing is dark grey with patterns of paler grey scales on female moths, and the hindwing is golden yellow with black spots along the edges of the wings. The underside of both wings is white with small black spots along the edge of the wings. In the male, the upper-side of the forewing is dark brown with patterns of pale grey scales and the hindwing is bronze/brown with dark brown patches. The underside of both wings is pale grey with dark brown spots. Both males and females have clubbed antennae. The female has a long extensible ovipositor, which is an elongated organ extending from the posterior abdomen, used to lay eggs.

Adult moths survive between one and four days after pupal emergence and are unable to feed because they lack functional mouthparts (Clarke & O'Dwyer 2000; O'Dwyer & Attiwill 1999). Males spend their adult life patrolling approximately 1 m above the grass in search of females for breeding. Females have reduced hind wings and are reluctant to fly and will only do so when disturbed (Edwards 1991).

The Golden Sun Moth typically occurs in native grassland, grassy woodland, dominated by greater than 40% cover of wallaby-grass *Austrodanthonia* spp. (DSE 2004), but is also known to inhabit areas dominated by Kangaroo Grass (Endersby & Koehler 2006) and introduced species such as Chilean Needle-grass (A. Organ pers. obs.).

Prior to European settlement, the Golden Sun Moth was widespread and relatively continuous throughout its range, inhabiting grassy open woodlands and grassland (Dear 1996; DSE 2004). Habitat loss, disturbance and fragmentation due to preferential agricultural expansion and urbanization of open woodland and grasslands, means that many populations are now small, isolated and fragmented. As a result, it is difficult for this relatively immobile species to recolonise areas in the event of local extinctions (females are almost entirely immobile while males are usually found less than 100 m from suitable habitat). Furthermore, the small size typical of remaining habitat patches and the lack of genetic exchange between them, may result in an inability to maintain genetically viable populations and increase the risk of local extinctions.

Golden Sun Moths are known to exist in less than a dozen sites in each of New South Wales and the Australian Capital Territory and, until the last two–three years, only six active sites in Victoria. However, recent targeted surveys around Melbourne have detected the species from at least 60 additional sites (Biosis Research Pty Ltd 2008; Gilmore *et al.* 2008; Ecology and Heritage Partners Pty Ltd in prep.).

State Significant Species

Brown Toadlet Pseudophryn bibronii

The Brown Toadlet is a small brownish coloured toadlet endemic to south-eastern Australia including Tasmania and is found in a variety of habitats not necessarily associated with permanent water. The Brown Toadlet is brown to black on its back, with a scattering of darker flecks and red spots. Its underbelly is marbled black and red spots. Its underbelly is marbled black and white and there is a bright yellow patch around its cloaca. In Victoria, the Brown Toadlet is distributed from the north-east through to central and western Victoria with scattered records in Gippsland. In the South West region it is recorded from all bioregions except the Otway Ranges bioregions, although most records are grouped on the Volcanic Plains bioregion north of Werribee, the Greater Grampians bioregion and the Lowan Malle bioregion in the Little Desert.

APPENDIX 2. PROJECT SPECIFIC CONTROLS

In addition to the requirements listed in VicRoads Standard Specification Section 177 – Environmental Management for Major Road and Bridge Construction Projects, several project-specific controls are also proposed to reduce risks to flora, fauna and ecological communities, including:

1. Where possible, avoid impacts to significant species and communities as well as areas of key fauna habitat and wildlife corridors through construction and micro-siting techniques during the planning phase of the Project. This has been undertaken throughout the planning phase, through minor adjustments and modifications to the alignment location and design to avoid significant species and communities, and will continue through to finalisation of the alignment design. The most significant demonstration of this being the avoidance of a large population of Spiny Rice-flower within the road reserve at the northern end of Section 2; only one plant out of several hundred in the population is now likely to be impacted as a result of an adjustment to the alignment location;
2. Prepare and implement a Construction Environment Management Plan (CEMP) to introduce environmental controls with a view to protect ecological values during the construction process. The CEMP will include requirements to regularly inspect and maintain environmental controls that are implemented;
'No-go zones' will be clearly identified within the CEMP and demarcated on-site by a qualified ecologist prior to commencement of construction. All protective fencing should remain in place until the completion of all construction activities and should be fitted with signs to clearly indicate that the surrounding vegetation is a 'no-go zone' for construction vehicles, machinery, personnel, equipment, materials and waste. Any areas nominated as 'no-go zones' will remain in place unless removal is authorised by the Superintendent;
3. Revegetation of the disturbed areas and rehabilitation of redundant sections of the existing Western Highway with grassland species favoured as a food source by Golden Sun Moth (e.g. *Austrodanthonia* spp.) where Golden Sun Moth populations are known to be present;
4. Construction of all waterway crossings should proceed with the following considerations:
 - a. Bridge to span waterway (no structures in-stream), no structures to be installed in low-flow channels;
 - b. Bridge structures to be set at least 5m from the regular flow bank to allow for fauna movement under the bridge;
 - c. Establish a water quality monitoring regime to assess and limit any construction impacts. This should include a before/after sampling design, including several upstream and downstream sites;
 - d. Establish a set of site specific criteria that would trigger intervention of works in the event of a noticeable deterioration of water quality or observed direct death or injury of aquatic fauna. Establish appropriate response actions in case of such an

event based on these site specific criteria;

- f. Ensure that best practice sedimentation and pollution control measures are undertaken at all times, in accordance with EPA guidelines, to prevent impacts to waterways and wetlands;
 - g. All waterways disturbed during project construction are to be revegetated and restored (to a condition equal to or better than pre-construction) after completion of construction;
 - h. Any snags and/or logs that are removed from any waterways to be replaced in similar locations after completion of construction (particularly Billy Billy Creek as these features provide habitat for Dwarf Galaxias);
 - i. The storage of fuel and chemicals (including the refuelling of vehicles and machinery) at a minimum of 20 metres away from all waterways;
 - j. Site toilets to be a minimum of 50 metres away from all waterways; and,
 - k. Schedule construction to no-flow or low-flow periods.
5. Protection and management measures for the Dwarf Galaxias population in Billy Billy Creek. Such measures should include but are not limited to:
- b. Monitor weather for rainfall events within the catchment and postpone work near Billy Billy Creek during expected elevated flows; and,
 - c. Construction around and in Billy Billy Creek to avoid breeding period/dispersal period (May to October).
6. The realignment of Charliecombe Creek should proceed with the following considerations:
- a. Undertake creek realignment during the dry season (summer-autumn) to reduce the likelihood of large water flows through the waterway when the soils are most unstable;
 - b. Protect realigned creek banks with rock material or Geofab to increase bank stability and reduce erosion;
 - c. Revegetate disturbed creek banks as soon as possible after realignment to increase bank stability (using plant species consistent with the local creekline EVC);
 - d. Replace any disturbed in-stream habitats (e.g. rocks, branches, other snags, etc.);
 - e. Charliecombe Creek is an ephemeral waterway, however sitting water pools are likely to provide habitat to locally common aquatic fauna species. An assessment of the water table should be completed to ensure that sitting pools are retained;
 - f. Pool, riffle, run morphological features should be retained to their current lengths and depths;

- g. Pre, during and post ecological monitoring (including water quality and macroinvertebrates) should be implemented; and,
 - h. Soil testing should be conducted to ensure the soil type is appropriate for the new creek alignment.
7. Pathogen management procedures developed to prevent the spread of Cinnamon Fungus and Amphibian Chytrid Fungus.

Construction planning procedures would identify vehicle, plant equipment, personal hygiene regime required to prevent spread of fungus between waterways during the works, including at a minimum the following:

- a. Cinnamon Fungus is not currently known to occur between Beaufort and Ararat; however a key risk will be their introduction through the transportation of materials (e.g. gravel, soil) during the construction process. The following procedures will be followed to reduce the risk of introduction:
 - i. All vehicles, equipment and footwear are to be clean of any organic material (soil, water and plant material) prior to commencement of construction and prior to entering the construction zone. Vehicles, equipment or footwear suspected to have been in areas which support Cinnamon Fungus will be washed down with Phyto-clean (diluted according to labelled ratio, generally 1:10). Boots should be immersed in a bath for minimum 30 seconds;
 - ii. Avoid the use of infected gravel and soils in construction works, by attempting to use certified pathogen-free materials; and,
 - b. Follow a "Clean on Entry and Exit" policy to assist in the control of BJD at properties which have supported cattle in the last 12 months (BJD bacteria can survive in the environment for up to 12 months (DPI 2011)). All vehicles and equipment are to be clean of any organic material prior to entering identified at-risk properties (DPI 2008). Vehicles will also be confined to formed tracks where possible if driving onto site is necessary. The wash-down of vehicles will be recorded in the respective vehicles log book and the landholder notified of control procedures employed.
 - c. All measures and survey techniques involving the handling of frogs or personnel moving into areas known to support frogs will be conducted in accordance with the hygiene protocol for the control of disease in frogs to prevent the spread of Amphibian Chytrid Fungus (NPWS 2001).
8. Installation of sediment fencing adjacent to waterways to limit sediment discharge from soil erosion or spoil earthworks;

Implement methods and management systems consistent with EPA Best Practice Environmental Management: 'Environmental Guidelines for Major Construction Sites' (EPA, 1996); and,

9. Reduce impacts to flora and fauna from dust by implementing the following:

- a. Minimise land disturbance by using phased approach and rehabilitate cleared areas promptly; and
- b. Employ dust suppression methods such as watering down the haul roads, unvegetated stockpiles and key movement areas.

APPENDIX 3 STANDARD PROCEDURES FOR THE SALVAGE AND TRANSLOCATION OF SIGNIFICANT FLORA

The following section lists the various salvage and translocation protocols for significant flora which may arise during the development of the Project.

3.1 Permits and Approval

There are no further approvals required to translocate Spiny Rice-flower or propagate Yarra Gum and Emerald-lip Greenhood after this document is approved. However, if an additional recipient site is required, a management arrangement will need to be negotiated with the managing authority.

3.2 Timing

Spiny Rice-flower

Spiny Rice-flower was recorded within the proposed road alignment (Option 1), therefore, the standard procedures outlined in this plan will be required.

The proposed removal of the plant is intended to occur prior to construction. If the removal is undertaken during winter or spring, the translocated plants will be placed into the recipient site immediately after salvage, as the timing should allow sufficient rains to provide adequate soil moisture leading into summer. If the removal is undertaken outside of this period, the plant will need to be held by an indigenous nursery until such time as rainfall increases to water in the plant at the recipient site. Weed control of all high threat/high impact weeds will have been undertaken at the recipient site. Given that the plant will be placed directly into the recipient site, if sufficient rainfall or soil moisture are not present supplementary watering of the plant will occur (Table A4.1).

3.3 Proposed End Use of Salvaged Material

It is proposed that all salvaged material of the Spiny Rice-flower individual will be placed into the recipient site and no additional material is likely to be removed.

3.4 Removal Technique

Spiny Rice-flower

The removal will be supervised by a qualified botanist. All vegetative material from patches proposed to be disturbed will be removed from the impact site.

The procedure for removal will be:

1. The patch to be removed will be identified with marker paint, and the plant will be recorded against the monitoring sheet;
2. The plant will be watered the day before the proposed removal to loosen the soil and to

ensure the plants are not drought stressed during salvage and movement;

3. Material will be dug from the ground by hand using spades clean of dirt; and,
4. During excavation, soil will be maintained around the root system, however plants will survive if exposed to air for short periods.

The plant will be marked and uniquely labelled before excavation. During removal, the plant will be labelled according to the patch number and segment to ensure once it arrives at the recipient site and/or nursery it is easily identifiable as to which patch it was removed from.

Once the plant is lifted from the ground and placed into the polystyrene boxes, it will be immediately taken to the recipient site and placed into a pre-excavated hole. If part of the plant is to be taken to an experienced nursery for propagation then desired amounts (i.e. one third, two thirds etc) will need to be decided.

3.5 Direct Translocation

Spiny Rice-flower

The direct translocation from the impact site to the recipient site will take place on the same day as the material is removed from the impact site, to minimise stress on the material. The translocation site is directly adjacent to the impact site on the north side of Western Highway. Material will be removed as discussed in the removal technique section and transported directly to the recipient site.

1. Soil from around the salvaged material will be kept in place as a sod, to help the plants establish within the recipient site, this also helps with moisture retention around the root zone;
2. Holes at the recipient site will be prepared before the salvage of plants at the impact site, to minimise the time out of the ground for the salvaged material;
3. Holes will be dug deeper than the clod of soil from the impact site, soil will also be broken up at the base of the hole to allow quick penetration of the soil by the roots of the salvaged material;
4. Holes will be filled with water before the translocation to soften and loosen the surrounding soil, also helping to remove air pockets in the soil;
5. A weed free medium will be placed in the hole to allow an easy fit and manoeuvrability for the clod of soil;
6. The sod containing the material will be placed into the medium in the hole, ensuring the medium is tightly packed around the sod, removing air pockets and binding the medium together to prevent erosion of the medium;
7. The area around the plant will be mulched with certified weed free mulch, consisting of either wood chips or pea straw; and,
8. The plant will then be watered by hand until the sod containing the material is wet enough for water to no longer penetrate the soil.

The placement of the salvaged material will be recorded with a GPS. It is proposed the holes will be systematically lined up to allow for ease of monitoring, and the recipient sites pre existing vegetation will also be considered when choosing sites to dig holes.

3.6 Delayed Translocation

Spiny Rice-flower

If translocation is delayed, plants will need to be established within a nursery until site conditions at the recipient site are favourable e.g. soil moisture, climatic conditions, weed control, and fencing, as required.

The ideal time to plant the salvaged material into the recipient site is during late autumn or winter, when rainfall is highest and conditions are cool. Adequate rainfall will reduce the potential requirement for supplementary watering of replanted material. Planting the material at the earliest stage before summer will also maximise the allowance for growth of the material, and allow for a higher rate of establishment, therefore maximising the potential for long-term survival within the recipient site.

The delayed translocation planting is similar to that of the direct translocation:

1. Holes need to be pre dug systematically and filled with water the day before material from the pots is removed;
2. Holes need to be dug approximately 100 millimetres wider and 50 millimetres deeper than the pot in which the material is grown in, this allows the soil to be loosened and increases the soils permeability and allows moisture to penetrate the soil to a deeper level;
3. Pots containing material will be well watered before planting into the hole;
4. Plants from the nursery will be ‘hardened’ and trimmed before they are planted;
5. Care will be taken when removing the material from the pot to keep the medium intact around the root system before placing into the hole.
6. Extra medium may need to be placed into the hole to ensure the material is tightly packed into the hole;
7. The material and medium will then be covered in certified weed free mulch, consisting of either wood chips or pea straw.
8. Watering by hand will then be undertaken; care will be undertaken not to wash medium away.

The plant will be labelled according to the nursery number and a waypoint taken with a GPS.

3.7 Management of Salvaged Material within the Recipient Site

The main management issues that arise from translocation usually are drought, grazing, competition from weeds and accidental disturbances. Management of these issues is discussed in greater detail below.

Spiny Rice-flower

3.7.1 Watering

Supplementary watering at the recipient site will be dependant primarily on rainfall, although mulching, site aspect and soil type will also be considered when determining if

supplementary watering is required. Monitoring of the plant will be undertaken regularly to assist plant establishment and long-term survival. A basic watering guide is provided in Table A4.1.

Table A.4.1. Suggested watering regime for replanted salvaged material Spiny Rice-flower

Months after planting	Period between significant rainfall events that will trigger watering	Watering Required
0 - 3	1 weeks	Weekly
3 - 9	2 weeks	Weekly
9 - 21	1 – 2 Months	Monthly
21 - 36	1 – 2 Months	Only if plants display signs of stress

3.7.2 Grazing

The grazing potential by pest and native animals needs to be monitored before the recipient site is chosen and measures such as fencing may need to be undertaken to reduce grazing pressure upon replanted salvaged material. Caging or using tree guards is the most economically efficient option to protect individual plants because of the small number of plants being translocated.

Fencing of the entire recipient site would be the best outcome to protect the areas biodiversity. If the entire recipient site is fenced, this will protect existing Spiny Rice-flower populations as well. Fencing, along with signage, will also protect the site from accidental and potentially intentional disturbances. Care should be taken when fencing to avoid any other Spiny Rice-flower plants.

3.7.3 Pest Plant Management

As part of the management plan for the recipient site, weed control will be undertaken before and after the replanting of the salvaged material. The use of herbicides to control weeds at the recipient site will be applied with great care as Spiny Rice-flower plants are sensitive to herbicide (DSE 2003). Skilled contractors familiar with Spiny Rice-flower plants should always be used to conduct weed control around the recipient site. Spot-spraying will be undertaken using a fine nozzle, and in low wind conditions to ensure only weeds are targeted. Initially the focus of weed management should apply to high threat/high impact exotic species, then as the number of high threat weed species reduce over time, the focus should shift to species that are considered less threatening but may still compete with the replanted salvaged material. Hand weeding around the plant should also occur on a regular basis.

3.7.4 Biomass Reduction

As Spiny Rice-flower are generally found in grassy habitats, it can be self maintaining in areas of high ground storey biomass e.g. dense grassy swards. However, the closure of inter-tussock space from a lack of fire or grazing may reduce the areas of available occupancy within the recipient site. The grass length will be monitored around replanted salvaged material to ensure both native and exotic grass species are not limiting the growth of the salvaged material.

If required, measures such as hand weeding, slashing, crash grazing, mosaic burning or weed

control may be employed to lower the levels of the recipient site biomass. All measures to lower biomass must be done in consultation with an expert familiar with the growth of Spiny Rice-flower and also the management of native vegetation, to limit potential impacts on replanted salvaged material. Slashing, burning or grazing may also be used as forms of weed control.

3.7.5 Monitoring

Monitoring of the translocated plant within the recipient site is crucial to ensuring ongoing survival (Vallee *et al.* 2004). Monitoring should be conducted by a qualified botanist familiar with the ecology and growth habits of Spiny Rice-flower and regular reports should be made to the relevant approval authorities. Along with direct measurements of the translocated plants, monitoring will assess drought stress, pest plant and animal impacts, biomass accumulation and site disturbance. Monitoring will be undertaken weekly for the month and then monthly for the next six months and then on a six month basis for up to three years from translocation. After the requirements for watering has ceased, then monitoring should be undertaken biannually for a 3 year period.

A report will be prepared 12 months after replanting the salvaged material, then ongoing at each 12 month stages after the planting. The reporting will detail the growth level of the plants and include information on disturbances, deaths, further plantings and conditions at the recipient site.

Although only one plant is to be translocated as part of this project, the data obtained from the long-term monitoring of the plant should be incorporated with findings from other translocation sites. Information from a range of projects will aid adaptive management decisions for current and future translocation efforts.

3.7.6 Performance Targets

The ultimate aim of translocation is to ensure the conservation of the genetic diversity of a species. The conservation of genetics is especially critical for endangered species and the loss of genetics from even a single plant can be seen as a failure of the translocation process.

The translocation of any species can be inherently difficult and may put excessive stress on material which is disturbed, resulting in the death of plants in extreme cases. This is especially true for Spiny Rice-flower plants due their habit of producing a large tap root that may grow greater than a metre into the soil. If this tap root is damaged during salvage, plants may have little chance of surviving the translocation process.

Vallee *et al.* (2004) detailed stringent criteria for determining the success of translocated plant species. The outlined criteria are broken into segments for short and long term success, and also the success of management of material in an *ex-situ* situation.

In the short term biological success can be determined through:

- Survival of greater than 70% of transplants, with representatives from the range of genetic individuals planted (a benchmark which is less relevant in this circumstance);
- The new or enhanced populations have similar characteristics to the natural population(s), such as the survival and growth of translocated individuals;

- Survival of transplants to reproductive stage (producing flowers and fruit); and,
- The reproduction of translocated individuals, including the production of flowers and fruit at levels consistent with naturally occurring plants; and seed viability is consistent with naturally occurring plants.

Long Term Criteria includes:

- New seedlings are established;
- The number of individuals within the population is being sustained or increased by natural recruitment; and,
- Adequate levels of biodiversity, particularly genetic variation, are maintained through generations.

Criteria for determining successful establishment and maintenance of the *ex situ* collection:

- The required number of transplants were available for the translocation proposal (which may not be relevant in this circumstance);
- Correct labelling and documentation maintained through cultivation;
- Techniques for successful propagation of the taxon are understood; and,
- A genetically representative collection was maintained.

As recruitment of Spiny Rice-flowers in natural settings is currently poorly known, the measurement of success through recruitment is not possible. Conserving the genetics of all individual plants should therefore be kept as a higher goal in determining translocation success.

The ideal goal is to preserve the genetics of the plant proposed to be translocation through the successful establishment of the plant in the recipient site. However, the difficulty and inherent dangers of translocation means that it is likely that the plant may die as a result of disturbance, especially given the plant is likely to have to travel a significant distance to be re-established with an existing viable population. Following the criteria outlined by Vallee *et al.* (2004), the survival of the single plant is crucial for the translocation to be judged as successful in the short-term.

Spiny Rice-flower plants have been translocated as a result of several development projects within the greater Melbourne region, where the possibility of avoidance on the plants was not feasible.

APPENDIX 4 STANDARD PROCEDURES FOR THE SALVAGE AND TRANSLOCATION OF FAUNA

Salvage and translocation within the study area should only be undertaken as a last resort.

4.1 Site Shed Requirements and Staff Inductions

Tool box meetings will be designed to inform all management and construction staff of the mitigation, salvage and translocation protocols outlined in this document. This will include the following:

- All site environmental officers and/or supervisors will attend a pre-construction induction detailing the ecological values of the study area. The induction will be conducted by a qualified ecologist who is familiar with the ecological values present;
- All construction managers and supervisors will attend a pre-construction induction to ensure that they are aware of the ecological values present on-site, the protocols and procedures to avoid and reduce impacts to native fauna and the risk of penalty should compliance to aforementioned protocols and procedures not take place. The induction may be conducted by a site environment officer or site supervisor who has been inducted by a qualified ecologist (see above), and may take place prior to commencement of construction (i.e. during a Toolbox meeting or equivalent). Inductions will include a description of the appearance and typical habitat attributes for each threatened fauna species considered likely to occur within potential habitat;
- It will be mandatory for each site shed to contain a relevant 'Species Fact Sheet', these should include; a picture and physical description, habitat requirements, potential distribution within the study area and the times of year it is most likely to be active within the study area;
- The 'Species Fact Sheet' will also contain the relevant contact details of the ecological consultant, local veterinarian clinic and nearest DSE office;
- A range of suitable salvage bags (i.e. calico or cotton) or containers will be provided by the ecological consultant and must be kept on site at all times in case of an emergency in which injured or salvaged fauna is located during construction. This will allow a relevant site supervisor or designated staff member from the construction team to keep the animal safe until the ecological consultant is contacted and/or arrives on site (if required);
- At no point should the animal be released unless confirmed to be a non-threatened species. All released animals should be returned within 200 metres of their sourced location within a similar habitat to which it was found; and,
- Ecological consultants or inducted site supervisors will conduct specific inductions for new staff who have not been informed about threatened fauna which may occur on site prior to working on site or during morning Toolbox meetings.

4.2 Management Procedures for Aquatic Fauna

4.2.1 Planning and pre-construction

Some of the most effective measures to avoid or reduce the extent of impact on native fauna residing in, relying upon or regularly using waterbodies or waterways can be achieved at the planning and pre-construction phases. Such measures are presented below.

- Bridge to span waterway where practical (no structures in-stream);
- Bridge abutments to be set at least 5m from the regular flow bank (where practical) to allow for fauna movement under the bridge;
- Establish a water quality monitoring regime to assess and limit any construction impacts. This should include a before/after sampling design, including several upstream and downstream sites (see below);
- Establish a set of site-specific criteria that would trigger intervention of works in the event of a noticeable deterioration in habitat, water quality or observed direct death or injury of aquatic fauna (particularly Dwarf Galaxias in Billy Billy Creek). Establish appropriate response actions in case of such an event based on these site specific criteria (see below);
- Ensure that best practice sedimentation and pollution control measures are undertaken at all times, in accordance with EPA guidelines, to prevent impacts to waterways and wetland. Sediment fencing must be installed such that any runoff from the construction zone in to the waterway is prevented. This is particularly important for construction within 30 metres of all tributaries of Billy Billy Creek where Dwarf Galaxias is known to occur. Sediment fences must be inspected on a weekly basis to ensure that they are functioning as intended;
- Schedule construction to no-flow or low-flow periods. The removal/modification of waterbodies and waterways should occur in mid-late January through to early February (before commencement of Autumn rains), avoiding the time when most waterbirds (and to a lesser extent frogs) are breeding and/or have dependent young and when water flows are at their lowest. This is particularly important for Billy Billy Creek where Dwarf Galaxias is known to occur, and Charliecombe Creek which is proposed to be realigned. Construction should also avoid impacts during the breeding or dispersal period for Dwarf Galaxias (breeding occurs from late winter to October).
- Ensure that the contractors engaged to remove or modify waterbodies and wetlands have demonstrated experience doing so in ecologically sensitive areas. When tendering for these works, provision of this Management Plan to the potential tenders will ensure they are aware of the requirements of the site;
- Signage and protective fencing should be installed in the vicinity of Billy Billy Creek to exclude construction machinery or unauthorised access so that inadvertent damage does not occur; and,

- Site toilets and the storage of fuel and chemicals (including the refuelling of vehicles and machinery) to be a minimum of 50 metres away from all waterways.

4.2.2 Ongoing Monitoring Procedures

4.2.2.1 Water Quality Monitoring and Management

Two upstream and four downstream water quality monitoring sites will be established prior to construction. Water quality sampling will adhere to the EPA's reference document: *A guide to the sampling and analysis of waters, wastewaters, soils and wastes* (EPA 2000), which can be found on the web at www.epa.vic.gov.au. Water quality results will be compared to the State Environment Protection Policy (SEPP) Waters of Victoria (WoV) objectives (EPA 2003).

Water quality monitoring will be conducted at specified intervals during the construction phase to ensure that water quality is maintained with pre-construction water quality parameters of the waterway.

Post-construction water quality monitoring will be conducted to demonstrate if water quality has returned/remained at background conditions. The frequency of the water quality monitoring will be reviewed after the initial two-year period and a decision will be made on whether ongoing water chemistry monitoring is required.

4.2.2.2 Population and habitat monitoring

Threatened fauna populations are known to vary on spatial and temporal scales depending upon habitat conditions at a particular site. It is therefore important that monitoring is undertaken for Dwarf Galaxias annually between December–May for at least three years post construction. Monitoring of Billy Billy Creek is required to determine whether the habitat availability and quality for Dwarf Galaxias has been adversely impacted during construction. Specific survey procedures for Dwarf Galaxias will follow the *Biodiversity Precinct Structure Planning Kit* (DSE 2010).

In-situ water quality monitoring and habitat assessments will be conducted concurrently with fauna surveys. Site-specific water quality and habitat variables will be assessed to ensure habitat availability and quality within Billy Billy Creek remains intact.

In-situ water quality parameters will be compared with SEPP (WoV) guidelines and include:

- Temperature;
- pH;
- Electrical conductivity;
- Dissolved Oxygen; and
- Turbidity.

Habitat variables will include:

- Depth, flow and water quality;

- Vegetation diversity, structure, composition and percentage of cover;
- Presence of introduced fish, particularly Eastern Gambusia;
- Presence of pollutants, rubbish and other threatening processes; and,
- A photographic reference will be taken at the same time of water quality monitoring, so that comparisons of habitat conditions can be made over time.

4.3 Management Procedures for Brown Toadlet

Habitat for Brown Toadlet is widespread throughout the study area in many of the wetlands, drainage lines, seeps, road ditches and culverts located within or adjacent to woodland vegetation.

Salvage and translocation (Pre-construction)

Active season (late March – June)

- Pre-construction salvage will take place prior to site disturbance, but as close as possible to proposed construction periods, i.e. one to three days (a longer intervening period may mean frogs have moved back into the area);
- Two observers will spend a minimum two nights surveying, by spotlighting and call playback, in identified areas of habitat (to be identified during targeted surveys prior to commencement of construction) within the study area prior to the commencement of works in their vicinity. Any individuals detected will be relocated to the nearest suitable habitat at least 200 metres, but no greater than 500 metres, from the construction zone;
- Frog and tadpole salvage will be undertaken during the drainage/pumping of any dams identified as known habitat by the species within the study area, in accordance with requirements outlined in Appendix 4.2, Management Procedures for Aquatic Fauna;
- Footwear will be washed in disinfectant at the beginning and end of each salvage period to prevent the introduction and/or spread of any diseases. All salvage procedures will be conducted in accordance with the hygiene protocol for the control of disease in frogs (NPWS 2001).

Inactive season (July – February)

As any Brown Toadlet that may be present will be inactive during these months, nocturnal surveys prior to construction activities will not be required.

Salvage and translocation (During construction)

- After completion of pre-construction surveys and salvage, the draining of wetlands, dams and drainage lines will proceed as detailed above (Salvage and Translocation of Aquatic Fauna);
- For the removal of any vegetation or refuge in and around the waterbody, zoologists are to communicate how to best undertake removal to avoid injury to native fauna.

4.4 Management Procedures for Golden Sun Moth

Salvage and translocation

As outlined in the Golden Sun Moth EPBC Act Policy Statement (DEWHA 2009a) and Background Paper to the EPBC Act Policy Statement 3.12 (significant impact guidelines) (DEWHA 2009b), salvage and translocation does not reduce the impact of an action below the significance threshold. Furthermore, 'Salvage translocation may be tried as an experiment in addition to mitigating measures in circumstances where damage to the habitat of the species is unavoidable' (DEWHA 2009a, 2009b). 'Any translocation experiment of the species should be undertaken in association with a fully costed and funded monitoring and adaptive management strategy with clearly stated criteria for identifying success' (DEWHA 2009a, 2009b). Furthermore, translocation of the species is not considered a mitigation measure to offset the impact of an action, as it is unlikely to result in a positive conservation outcome for the species (DEWHA 2009b).

In light of the above, salvage and translocation of Golden Sun Moth is not proposed for the project.

Population and Habitat Monitoring

Golden Sun Moth populations are known to vary on spatial and temporal scales depending upon habitat conditions at a particular site. It is therefore important that monitoring is undertaken prior to commencement of construction, during construction activities and for at least three years after completion of construction.

Monitoring is required to determine if Golden Sun Moth has persisted in grassland areas within the roadside reserve or adjacent to construction activities to determine reproductive success and to ensure that management actions and habitats are suitable for a viable Golden Sun Moth population in the future. Specific survey procedures will follow those used to monitor the species elsewhere (i.e. timed surveys, generally along transect). Monitoring for at least three years after the road is operational will be used to guide decisions upon the success of habitat reservation and management within the roadside reserve. There is a high likelihood the species will persist in this area in the future (the species has been recorded along other linear corridors such as railway reserves north of Melbourne), particularly given that the roadside reserve will be contiguous with larger area of suitable grassland habitat on private properties which are also known to contain the species.

At least four days of survey over the flight season (i.e. typically between October and early January) of Golden Sun Moth will be conducted to collect data on habitat variables, and to ensure that the grassland areas along the roadside remain suitable for the species. This is particularly pertinent given that the roadside reserve will experience high levels of disturbance from traffic and other threats such as increased water, nutrient and gross pollutant run-off, accumulation of rubbish, and inappropriate slashing or mowing regimes (i.e. season and frequency).

The following will be undertaken as part of population monitoring and habitat monitoring of suitable grassland habitats proposed to be retained for Golden Sun Moth:

- Survey will be carried out by qualified zoologists in areas of suitable habitat within the study area. The survey will focus in areas of indigenous grassland (namely those areas dominated by wallaby-grass *Austrodanthonia* spp., but also in areas of Needle Grass *Nassella* spp. which is a known food source for the species) and areas where the species has previously been recorded;
- The surveys will be undertaken during optimal conditions suitable for detecting species. The male of this species generally flies between 11am and 3pm on calm, warm (over 20°C), sunny days, emerging between October and early January; and,
- All transects and Golden Sun Moths observed during the surveys will be marked with a hand held GPS (accuracy of +/- 5 meters).

Several site-specific habitat variables will also be assessed during the monitoring period, specifically:

- Vegetation diversity, structure, composition and percentage of cover (percentage cover of particular grassland species such as wallaby grass and/or Kangaroo Grass);
- Density of grass and height (providing an indication of when it was last slashed or potentially grazed);
- Presence of other natural features such exposed rock;
- The suitability of adjoining grassland habitats which are also known to support Golden Sun Moth; and,
- Presence of pollutants, rubbish and other threatening processes as outlined above.

Habitat Management and Maintenance

In areas proposed for retention, ongoing maintenance of weeds will be essential to ensure that habitat becomes established and remains as tussocky grassland for Golden Sun Moth and associated species. The control of pest plants is a major requirement for management, as the study area is under continual pressure from weeds invasion (e.g. Chilean Needle-grass and Serrated Tussock). Pest plant control should proceed in accordance with an approved Weed Management Plan.

In areas proposed for revegetation and rehabilitation, landscape plantings should include:

- Flora species appropriate to the local grassland EVC including a suite of understorey and ground cover species, to be used in all revegetation and landscape plantings; and,
- Grassland species favoured as a food source by Golden Sun Moth (e.g. *Austrodanthonia* spp.) where Golden Sun Moth populations are known to be present.



Spiny Rice-flower



Golden Sun Moth



Dwarf Galaxias



Brown Toadlet

Photographs

Western Highway Project Section 2: Beaufort to Ararat, Victoria

Threatened Species Management Plan

April 2014

for

- Spiny Rice Flower (*Pimelea spinescens*)
- Dwarf Galaxias (*Galaxiella pusilla*)
- Button Wrinklewort (*Rutidosia leptorrhynchoides*)
- Golden Sun Moth (*Synemon plana*)

Table of Contents

1.	INTRODUCTION	6
1.1	Project Background	6
1.2	Project Area.....	7
1.3	Purpose of Document	7
2.	SPINY RICE-FLOWER	8
2.1	Description.....	8
2.2	Impacts	9
2.3	Mitigation measures.....	9
2.3.1	No-go Zones.....	9
2.3.2	Salvage and translocation procedures.....	9
2.4	Revegetation	11
2.5	Corrective Action	12
2.6	Monitoring	12
2.7	Reporting.....	15
3.	DWARF GALAXIAS.....	17
3.1	Description.....	17
3.2	Impacts	18
3.3	Mitigation measures.....	18
3.3.1	Timing.....	18
3.3.2	Survey	18
3.3.3	No-go Zones.....	18
3.3.4	Removal of vegetation or habitat	19
3.3.5	Salvage and translocation.....	19
3.3.5.1	Capture and handling	20
3.3.5.2	Holding	20
3.3.5.3	Releasing	21
3.3.5.4	Injured and exotic fish	21
3.3.6	Revegetation	21
3.4	Corrective Action	22
3.5	Monitoring	22
3.5.1	Water Quality Monitoring and Management	23
3.5.1.1	Sampling frequency.....	23

3.5.2	Population and habitat monitoring	24
3.6	Reporting	25
4.	BUTTON WRINKLEWORT	26
4.1	Description	26
4.2	Impacts	27
4.3	Mitigation measures	27
4.3.1	No-go Zones	27
4.3.2	Salvage and translocation	27
4.3.3	Revegetation	27
4.4	Corrective Action	28
4.5	Monitoring	28
4.6	Reporting	28
5.	GOLDEN SUN MOTH	29
5.1	Description	29
5.2	Impacts	30
5.3	Mitigation measures	30
5.3.1	No-go Zones	30
5.3.2	Salvage and translocation	30
5.3.3	Revegetation	31
5.4	Corrective Action	31
5.5	Monitoring	31
5.6	Reporting	33
6.	BROWN TOADLET	34
6.1	Description	34
6.2	Impact	34
6.3	Mitigation measures	35
6.3.1	No-go Zones	35
6.3.2	Salvage and translocation	35
7.	EROSION AND SEDIMENT CONTROL	36
7.1	General	36
7.2	Works in/near Waters	36
7.3	Sedimentation Basins	36
7.4	Stokepiles	37

7.5	Monitoring	37
8.	FUELS AND CHEMICALS	38
8.1	General.....	38
8.2	Monitoring	38
9.	NO-GO ZONES.....	39
	APPENDIX A- PROJECT AREA.....	40
	APPENDIX B- MATTERS OF NES MAPS.....	41

1. INTRODUCTION

1.1 Project Background

The Western Highway (A8) is being progressively upgraded to a four-lane divided highway for approximately 110 kilometres (km) between Ballarat and Stawell, referred to as the Western Highway Project. As the principal road link between Melbourne and Adelaide, the Western Highway serves interstate trade between Victoria and South Australia and is the key corridor through Victoria's west, supporting farming, grain production, tourism and a range of manufacturing and service activities. Currently, more than 5500 vehicles travel on the highway west of Ballarat each day, including 1500 trucks.

As shown in Appendix 1, Section 2 of the Western Highway Project consists of up to four sub-sections:

- Beaufort to Buangor
- Buangor Bypass
- Buangor to Warryatkin Road
- Warryatkin Road to Ararat

Previous assessments have recorded one flora species listed under the Federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Spiny Rice-flower), two floristic communities listed under the EPBC Act (Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP) and Grassy Eucalypt Woodland of the Victorian Volcanic Plain (GEWVVP)) and two flora species listed under the Victorian Department of Sustainability and Environment (DSE) Advisory List (Emerald-lip Greenhood and Golden Cowslips) present within the construction footprint.

Also present within the study area are two fauna species listed under the EPBC Act (Dwarf Galaxias and Golden Sun Moth), one species listed under the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act) (Brown Toadlet).

Two alignment options for Section 2 were investigated. Each of these options follow different routes for part of the corridor, with each having varying amounts of native vegetation as well as other ecological features, including important habitat for flora and fauna.

Following assessment under the *Environmental Effects Act 1978*, Option 1 was recommended for implementation in accordance with the Inquiry Report dated May 2013.

A summary of significant flora and fauna species recorded within the study area is provided below in Table 1.

1.2 Project Area

The project area Appendix 1 consists primarily of road reserve and private properties on either side of the Western Highway, between Beaufort and Ararat. It is situated approximately 170 kilometres west of Melbourne, Victoria and according to the DSE Biodiversity Interactive Map (DSE 2012), is located partly within the Central Victorian Uplands (CVU) bioregion and partly within the Victorian Volcanic Plains (VVP) bioregion.

The CVU bioregion extends from Stawell in the west to Bright in the east and from Glenrowan in the north-east to Meredith in the south. The VVP bioregion extends from Portland in the west to Craigieburn in the east and from Clunes in the north to Colac in the south. The western section of the project area is located within the City of Ararat and the eastern section within the Shire of Pyrenees. The entire project area is located within the Glenelg – Hopkins Catchment Management Authority area.

The project area is characterised by native and exotic grassland vegetation, with scattered areas of remnant indigenous vegetation consisting of forest, grassland and wetland communities. The existing highway intersects Cemetery Creek, Green Hill Creek, Hopkins River, Billy Billy Creek, Middle Creek, Fiery Creek and several smaller drainage lines along its length.

1.3 Purpose of Document

The purpose of the Threatened Species Management Plan is to outline the mitigation and preservation measures which will be undertaken throughout the Project. It also provides guidelines for the removal and relocation of Threatened Flora and Fauna where required.

Implementation of the Management Plan will minimise the potential impact on Spiny Rice-flower, Dwarf Galaxias, Button Wrinklewort and Brown Toadlet individuals, and should be considered in conjunction with all other environmental requirements for the Project.

This Threatened Species Management Plan forms part of the approvals issued by Department of Environment on **XX April 2014**.

This plan must be considered in conjunction with the following documents:

- VicRoads Contract 8612 (specifically Section 177)
- WHP Section 2 PEPS document
- WHP Section 2 Construction Environmental Management Plan
- WHP Section 2 Weed Management Plan

2. SPINY RICE-FLOWER



Critically Endangered (EPBC Act)
Listed (FFG Act)
Endangered (DSE Advisory List)

2.1 Description

Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens* is listed as critically endangered under the EPBC Act. In Victoria, Spiny Rice-flower is listed under the FFG Act and is considered endangered on the DSE Advisory List (DSE 2005; FIS 2011).

Spiny Rice-flower is a small spreading shrub growing to 30cm in height, with partly herbaceous stems. It has narrow, green, hairless, oval-shaped leaves 2-10mm long and 1-3mm wide, that grow from spine-tipped stems. Up to 12 small, unisexual, hairless pale yellow flowers form the inflorescences. Flowering occurs from April to August (Oberon & Walsh 2006).

Spiny Rice-flower is endemic to Victoria where it occurs in grassland or open shrubland on basalt-derived soils in the central west of the State., Most populations occur within the EPBC Act listed Natural Temperate Grassland of the Victorian Volcanic Plain vegetation community.

Threats

According to the National Recovery Plan for Spiny Rice-flower (Oberon & Walsh 2006), the main threats to the Spiny Rice-flower are:

- Weed Invasion – particularly perennial introduced grasses and most at risk are small, heavily disturbed sites.
- Road and rail maintenance – many population occur around these reserves and can be impacted by maintenance activities.
- Grazing – particularly feral herbivores including rabbits and hares as well as additional pressure from domestic stock.
- Inappropriate fire regimes – lack of fire or similar biomass reduction strategy may lead to plants being crowded out.
- Changing land use – changes from grazing to cropping or from farming to industrial or residential uses.

Distribution

There are at least 831 documented records of Spiny Rice-flower in Victoria, with the nearest and most recent record (2003) located within the study

area along the road reserve south of Ararat (FIS 2011).

Approximately 575 Spiny Rice-flower plants were recorded within the Assessment Area during the targeted surveys (Appendix 2- Map 2-3). All plants were recorded within Plains Grassland within the road reserve between the Ararat Airport entrance/Service Centre and Warrayatkin Road. All plants were recorded on the north side of the Western Highway between the road and rail reserve, except for one plant which was recorded on the south side of the Western Highway.

2.2 Impacts

During the planning phase the road alignment was been modified to largely avoid the Spiny Rice-flower population located between Ararat and Warrayatkin Road. Only a single Spiny Rice-flower plant will be impacted by the proposed alignment, located between Green Hill Lake Road and Warrayatkin Road.

2.3 Mitigation measures

2.3.1 No-go Zones

Prior to undertaking construction activities within 500m of the Spiny Rice-flower patch, the person taking the action must Establish no-go zone(s) as per Section 9 around the Spiny Rice-flower plants identified Appendix 2, Maps 2-3.

2.3.2 Salvage and translocation procedures

Timing

The proposed removal of the single impacted plant is to occur prior to construction. If the removal is undertaken during winter or spring, the translocated plants will be placed into the recipient site immediately after salvage, as the timing should allow sufficient rains to provide adequate soil moisture leading into summer. If the removal is undertaken outside of this period, the plant will need to be held by an indigenous nursery until such time as rainfall increases to water in the plant at the recipient site. Weed control of all high threat/high impact weeds will have been undertaken at the recipient site. Given that the plant will be placed directly into the recipient site, if sufficient rainfall or soil moisture are not present supplementary watering of the plant will occur.

Removal Technique

The removal will be supervised by a qualified botanist. All vegetative material from patches proposed to be disturbed will be removed from the impact site.

The procedure for removal will be:

1. The patch to be removed will be identified with marker paint, and the plant will be recorded against the monitoring sheet
2. The plant will be watered the day before the proposed removal to loosen the soil and to ensure the plants are not drought stressed during salvage and movement

3. Material will be dug from the ground by hand using spades clean of dirt
4. During excavation, soil will be maintained around the root system, however plants will survive if exposed to air for short periods.

The plant will be marked and uniquely labelled before excavation. During removal, the plant will be labelled according to the patch number and segment to ensure once it arrives at the recipient site and/or nursery it is easily identifiable as to which patch it was removed from.

Once the plant is lifted from the ground and placed into the polystyrene boxes, it will be immediately taken to the recipient site and placed into a pre-excavated hole. If part of the plant is to be taken to an experienced nursery for propagation then desired amounts (i.e. one third, two thirds etc) will need to be decided.

Direct Translocation

The direct translocation from the impact site to the recipient site will take place on the same day as the material is removed from the impact site, to minimise stress on the material. The translocation site is directly adjacent to the impact site on the north side of Western Highway. Material will be removed as discussed in the removal technique section and transported directly to the recipient site.

1. Soil from around the salvaged material will be kept in place as a sod, to help the plants establish within the recipient site, this also helps with moisture retention around the root zone;
2. Holes at the recipient site will be prepared before the salvage of plants at the impact site, to minimise the time out of the ground for the salvaged material;
3. Holes will be dug deeper than the clod of soil from the impact site, soil will also be broken up at the base of the hole to allow quick penetration of the soil by the roots of the salvaged material;
4. Holes will be filled with water before the translocation to soften and loosen the surrounding soil, also helping to remove air pockets in the soil;
5. A weed free medium will be placed in the hole to allow an easy fit and manoeuvrability for the clod of soil;
6. The sod containing the material will be placed into the medium in the hole, ensuring the medium is tightly packed around the sod, removing air pockets and binding the medium together to prevent erosion of the medium;
7. The area around the plant will be mulched with certified weed free mulch, consisting of either wood chips or pea straw; and,
8. The plant will then be watered by hand until the sod containing the material is wet enough for water to no longer penetrate the soil.

The placement of the salvaged material will be recorded with a GPS. It is

proposed the holes will be systematically lined up to allow for ease of monitoring, and the recipient sites pre existing vegetation will also be considered when choosing sites to dig holes.

Delayed Translocation

If translocation is delayed, plants will need to be established within a nursery until site conditions at the recipient site are favourable e.g. soil moisture, climatic conditions, weed control, and fencing, as required.

The ideal time to plant the salvaged material into the recipient site is during late autumn or winter, when rainfall is highest and conditions are cool. Adequate rainfall will reduce the potential requirement for supplementary watering of replanted material. Planting the material at the earliest stage before summer will also maximise the allowance for growth of the material, and allow for a higher rate of establishment, therefore maximising the potential for long-term survival within the recipient site.

The delayed translocation planting is similar to that of the direct translocation:

1. Holes need to be pre dug systematically and filled with water the day before material from the pots is removed;
2. Holes need to be dug approximately 100 millimetres wider and 50 millimetres deeper than the pot in which the material is grown in, this allows the soil to be loosened and increases the soils permeability and allows moisture to penetrate the soil to a deeper level;
3. Pots containing material will be well watered before planting into the hole;
4. Plants from the nursery will be 'hardened' and trimmed before they are planted;
5. Care will be taken when removing the material from the pot to keep the medium intact around the root system before placing into the hole.
6. Extra medium may need to be placed into the hole to ensure the material is tightly packed into the hole;
7. The material and medium will then be covered in certified weed free mulch, consisting of either wood chips or pea straw.
8. Watering by hand will then be undertaken; care will be undertaken not to wash medium away.

The plant will be labelled according to the nursery number and a waypoint taken with a GPS.

2.4 Revegetation

Due to extensive protection of the Spiny Rice-Flower population (Section 2.2) and salvage and translocation procedures (Section 2.3.3) no revegetation is required.

2.5 Corrective Action

Due to extensive protection of the Spiny Rice-Flower population (Section 2.2) and salvage and translocation procedures (Section 2.3.3) no further action is required.

The Spiny Rice-Flower population is located in an existing rail and road reserve which is not required for construction. A large portion of the area have been previously fenced and a No-Go Zone will be installed prior to construction, ensuring the risk of impact is negligible.

2.6 Monitoring

No-go Zones must be regularly monitored to ensure compliance with this plan.

Table 1. Ongoing management and monitoring actions required for the relocated Spiny Rice-flower.

Action	Timing	Responsible Agent	Funding Source	Measurable Outcome	Adaptive Management
Qualified personnel to document the health of Spiny Rice-flower populations retained in-situ within Road Reserves and undertake appropriate management techniques (i.e. weed control, burning, maintenance of fencing) to ensure survival. Monitoring of the effectiveness will be conducted concurrently with weed control program. See Appendix 4 for detailed information.	Annually for the first ten years of this Plan	VicRoads	VicRoads	Maintenance of current population numbers within retained areas and a reduction in exotic biomass to help reduce competition and create open space for Spiny Rice-flower populations to survive and reproduce.	If exotic biomass is not successfully reduced then a more rigorous and frequent regime is required. If additional plants/populations of these species are found, VicRoads should implement a contingency action with direction from DEPI.
Qualified personnel to document the health of the Spiny Rice-flower individual which is to be translocated to a pre-determined site and conduct appropriate management techniques (i.e. watering/weeding). See Appendix 4 for detailed information	For first 10 years of this Plan	VicRoads	VicRoads	Translocation is undertaken based on actions and protocols outlined in this plan.	Appropriate protection and management of remaining Spiny Rice-flower population on the north side of the Western Highway should be undertaken regardless of success of the translocation.
Ensure rubbish or litter in and around retained Spiny Rice-flower populations is appropriately managed within Roadside Reserves	As needed for the first ten years of the CMP	VicRoads	VicRoads	Rubbish and litter appropriately managed to ensure species survival	Clean up as required

Action	Timing	Responsible Agent	Funding Source	Measurable Outcome	Adaptive Management
A progress statement should be written on the implementation of this Plan for Spiny Rice-flower retained in situ in roadside and public reserves, documenting key issues and management responses.	Statement should be written at the end of Phase One	VicRoads	VicRoads	All recommendations outlined in the CMP have been effectively followed.	Annual statement submitted to DEPI and DoE.

The main management issues that arise from translocation usually are drought, grazing, competition from weeds and accidental disturbances. Management of these issues is discussed in greater detail below.

Watering

Supplementary watering at the recipient site will be dependant primarily on rainfall, although mulching, site aspect and soil type will also be considered when determining if supplementary watering is required. Monitoring of the plant will be undertaken regularly to assist plant establishment and long-term survival. A basic watering guide is provided in Table A4.1.

Table A.4.1. Suggested watering regime for replanted salvaged material Spiny Rice-flower

Months after planting	Period between significant rainfall events that will trigger watering	Watering Required
0 - 3	1 weeks	Weekly
3 - 9	2 weeks	Weekly
9 - 21	1 - 2 Months	Monthly
21 - 36	1 - 2 Months	Only if plants display signs of stress

Grazing

The grazing potential by pest and native animals needs to be monitored before the recipient site is chosen and measures such as fencing may need to be undertaken to reduce grazing pressure upon replanted salvaged material. Caging or using tree guards is the most economically efficient option to protect individual plants because of the small number of plants being translocated.

Fencing of the entire recipient site would be the best outcome to protect the areas biodiversity. If the entire recipient site is fenced, this will protect existing Spiny Rice-flower populations as well. Fencing, along with signage, will also protect the site from accidental and potentially intentional disturbances. Care should be taken when fencing to avoid any other Spiny Rice-flower plants.

Pest Plant Management

As part of the management plan for the recipient site, weed control will be undertaken in accordance with the Weed Management Plan (refer to Final Report prepared by Ecology and Heritage Partners dated June 2013) before and after the replanting of the salvaged material. The use of herbicides to control

weeds at the recipient site will be applied with great care as Spiny Rice-flower plants are sensitive to herbicide (DSE 2003). Skilled contractors familiar with Spiny Rice-flower plants should always be used to conduct weed control around the recipient site. Spot-spraying will be undertaken using a fine nozzle, and in low wind conditions to ensure only weeds are targeted. Initially the focus of weed management should apply to high threat/high impact exotic species, then as the number of high threat weed species reduce over time, the focus should shift to species that are considered less threatening but may still compete with the replanted salvaged material. Hand weeding around the plant should also occur on a regular basis.

Biomass Reduction

As Spiny Rice-flower are generally found in grassy habitats, it can be self maintaining in areas of high ground storey biomass e.g. dense grassy swards. However, the closure of inter-tussock space from a lack of fire or grazing may reduce the areas of available occupancy within the recipient site. The grass length will be monitored around replanted salvaged material to ensure both native and exotic grass species are not limiting the growth of the salvaged material.

If required, measures such as hand weeding, slashing, crash grazing, mosaic burning or weed control may be employed to lower the levels of the recipient site biomass. All measures to lower biomass must be done in consultation with an expert familiar with the growth of Spiny Rice-flower and also the management of native vegetation, to limit potential impacts on replanted salvaged material. Slashing, burning or grazing may also be used as forms of weed control.

Monitoring

Monitoring of the translocated plant within the recipient site is crucial to ensuring ongoing survival (Vallee *et al.* 2004). Monitoring should be conducted by a qualified botanist familiar with the ecology and growth habits of Spiny Rice-flower and regular reports should be made to the relevant approval authorities. Along with direct measurements of the translocated plants, monitoring will assess drought stress, pest plant and animal impacts, biomass accumulation and site disturbance. Monitoring will be undertaken weekly for the month and then monthly for the next six months and then on a six month basis for up to three years from translocation. After the requirements for watering has ceased, then monitoring should be undertaken biannually for a 3 year period.

Performance Targets

The ultimate aim of translocation is to ensure the conservation of the genetic diversity of a species. The conservation of genetics is especially critical for endangered species and the loss of genetics from even a single plant can be seen as a failure of the translocation process.

The translocation of any species can be inherently difficult and may put excessive stress on material which is disturbed, resulting in the death of plants in extreme cases. This is especially true for Spiny Rice-flower plants due their habit of producing a large tap root that may grow greater than a metre into the soil. If this tap root is damaged during salvage, plants may have little chance of surviving the translocation process.

Vallee *et al.* (2004) detailed stringent criteria for determining the success of translocated plant species. The outlined criteria are broken into segments for short and long term success, and also the success of management of

material in an *ex-situ* situation.

In the short term biological success can be determined through:

- Survival of greater than 70% of transplants, with representatives from the range of genetic individuals planted (a benchmark which is less relevant in this circumstance);
- The new or enhanced populations have similar characteristics to the natural population(s), such as the survival and growth of translocated individuals;
- Survival of transplants to reproductive stage (producing flowers and fruit); and,
- The reproduction of translocated individuals, including the production of flowers and fruit at levels consistent with naturally occurring plants; and seed viability is consistent with naturally occurring plants.

Long Term Criteria includes:

- New seedlings are established;
- The number of individuals within the population is being sustained or increased by natural recruitment; and,
- Adequate levels of biodiversity, particularly genetic variation, are maintained through generations.

Criteria for determining successful establishment and maintenance of the *ex situ* collection:

- The required number of transplants were available for the translocation proposal (which may not be relevant in this circumstance);
- Correct labelling and documentation maintained through cultivation;
- Techniques for successful propagation of the taxon are understood; and,
- A genetically representative collection was maintained.

As recruitment of Spiny Rice-flowers in natural settings is currently poorly known, the measurement of success through recruitment is not possible. Conserving the genetics of all individual plants should therefore be kept as a higher goal in determining translocation success.

The ideal goal is to preserve the genetics of the plant proposed to be translocated through the successful establishment of the plant in the recipient site. However, the difficulty and inherent dangers of translocation means that it is likely that the plant may die as a result of disturbance, especially given the plant is likely to have to travel a significant distance to be re-established with an existing viable population. Following the criteria outlined by Vallee *et al.* (2004), the survival of the single plant is crucial for the translocation to be judged as successful in the short-term.

Spiny Rice-flower plants have been translocated as a result of several development projects within the greater Melbourne region, where the possibility of avoidance on the plants was not feasible.

2.7 Reporting

An annual summary statement or report will be prepared to inform DEPI and DoE of relevant ecological issues, milestones and threats. This statement/report will include:

- The progress of development;
- Any measures implemented in accordance with this Plan
- Any incidents which may have impacted any matters of NES or other listed species
- Any mitigation measures implemented
- Progress of management actions (e.g. weed removal, salvage and translocation works)
- Any significant findings resulting from monitoring activities

3. DWARF GALAXIAS



Endangered (EPBC Act)

Listed (FFG Act)

Near threatened (DSE Advisory List)

3.1 Description

Dwarf Galaxias is a very small Galaxiid, with females reaching up to 40mm and males only 35mm (DPIW 2006). It is a slightly stocky fish, with a deepened trunk at the belly and small head with a blunt snout (McDowall, R. 1996). The fins are small and membranous (McDowall, R 1996) with large flanges on the caudal (tail) fin that cause it to almost reach the dorsal and anal fin (McDowall, R 1996; DPIW 2006). The colour of Dwarf Galaxias is generally transparent olive-amber on the dorsal surface, with three longitudinal black stripes (laterally) and a silvery, white underside. Males also have a vivid orange stripe between the middle and lower black lateral stripe; females lack this orange colouration (McDowall, R1996; DPIW 2006).

Breeding occurs in spring, where pairs will spawn eggs one by one on aquatic plants (likely less than 100 eggs), each approximately 1mm in diameter. Larvae hatch in 2-3 weeks, with an estimated life expectancy of one year, only allowing for one spawning event per individual (Humphries 1986). Dwarf Galaxias lives its entire life cycle in freshwater (McDowall 1996; DPIW 2006).

The species is mostly found in still (McDowall 1996) or slow-flowing waters (DPIW 2006), which are often overgrown with aquatic and/ or emergent plants. They can occur within permanent waterbodies, though are commonly located within ephemeral pools (connected to permanent waterways) and are thought to be able to aestivate when waterbodies dry up (McDowall 1996). Dwarf Galaxias occurs in southern Victoria from Gippsland east to Mount Gambier in South_Australia, also on Flinders Island and in the east of the north coast of Tasmania (Humphries1996; McDowall 1996) and is intermittent in occurrence, though often locally abundant (DPIW 2006).

Threats

The Dwarf Galaxias National Recovery Plan details the following key threats to the species:

- Degradation and loss of habitat;
- Alteration to flow regime;
- Climate change;
- Introduced aquatic species; and,

- Illegal collection.

Distribution

There is one previous record of Dwarf Galaxias from the local area in 1904 (DSE 2010). However, the species was recorded more recently in Billy Billy Creek (Ecology and Heritage Partners Pty Ltd). There is suitable habitat for Dwarf Galaxias in Green Hill Creek, Hopkins River and Billy Billy Creek, as well as several smaller, unnamed drainage lines and dams.

3.2 Impacts

One hundred and fifty-six Dwarf Galaxias were recorded during the targeted aquatic surveys. All of the records were made within Billy Billy Creek, at three sites: two yielding 96 and 57 individuals and a third yielding three.

It is expected that up to a 70m portion of Billy Billy Creek will be realigned. Construction will not occur within any Billy Billy Creek tributary or the Hopkins River between 1 April and 30 November in any year.

Where practical, design of these waterways will proceed with the following considerations:

- Where practical, Bridge to span waterway (no structures in-stream), no structures to be installed in low-flow channels
- Where practical, bridge structures to be set at least 5m from the regular flow bank to allow for fauna movement under the bridge

In the event that it is not practical for the structure to span over Dwarf Galaxias habitat then a specialist Dwarf Galaxias consultant will be engaged to assist VicRoads (or the contractor) in designing a culvert(s) or pipe(s) that do not restrict connectivity or hinder the dispersal of Dwarf Galaxias.

3.3 Mitigation measures

3.3.1 Timing

To minimise disruption to the Dwarf Galaxias breeding cycle, construction activities that directly impact any Billy Billy Creek tributary or the Hopkins River will not be undertaken from 1 April May to 30 November in any year.

3.3.2 Survey

Prior to any construction activities within Dwarf Galaxias habitat, the section of the Dwarf Galaxias habitat must be isolated and searched by a suitably qualified ecologist. All Dwarf Galaxias salvaged and translocated to an alternative section of the Dwarf Galaxias habitat, in accordance with Section 3.3.5.

3.3.3 No-go Zones

For the duration of construction within 100m of waterways, a temporary barrier must be erected around sites of native vegetation and a no-go zone established in accordance with Appendix 2. Further No-Go Zones will be established around Billy-Billy Creek and Hopkins River upon the completion of detailed design.

3.3.4 Removal of vegetation or habitat

The contractors engaged to remove or modify waterbodies and wetlands must have an experience in doing so in ecologically sensitive areas. When tendering for these works, provision of this plan to the potential tenders will ensure they are aware of the requirements of the site

- All waterways disturbed during project construction are to be revegetated and restored (to a condition equal to or better than pre-construction) after completion of construction
- Any snags and/or logs that are removed from any waterways to be replaced in similar locations after completion of construction (particularly Billy Billy Creek as these features provide habitat for Dwarf Galaxias).

3.3.5 Salvage and translocation

The following procedure must be followed when undertaking Salvage and translocation of Dwarf Galaxias. The following does not apply if access into the creek/river is not required or the creek/river is dry:

- Drain the waterbody or bunded waterway to a depth of one metre. The point of water extraction should be within 30 cm of the water surface at all times with an effective filter installed to prevent aquatic fauna from being taken up into the pump
- The following applies only in the event of Billy Billy Creek realignment: When the waterway is at a depth of one metre, two zoologists/aquatic ecologists are to carry out one night of intensive fish trapping. The waterbody is to be saturated with bait traps and fyke nets to capture as many fish (and tadpoles) as possible. The traps and nets are to be cleared the following morning and all native fish (and tadpoles) relocated to other waterbodies on site
- When the waterbody or bunded waterway is at one metre depth, two zoologists/aquatic ecologists are to undertake seine netting through the waterbody to capture any native fish (and tadpoles) and relocate;
- Two zoologists/aquatic ecologists are to be on site whilst the remainder of the water is drained. Any fish, frogs, tadpoles to be salvaged and relocated to other waterbodies on site;
- Where possible, the waterbody is to remain drained and allowed to dry out for at least two weeks prior to the commencement of any earthworks. This is to encourage any remaining frogs and waterbirds to relocate themselves to more suitable habitats. Construction/deconstruction can then commence, with the presence of the zoologists;

- At any time during the removal of the waterbody, the zoologists/aquatic ecologists can request work to pause if:
 - an animal is at risk of direct injury or mortality;
 - an animal requires capture and relocation;
 - an animal is injured and requires medical attention.
- In the event that an animal is injured during the construction, the zoologists/aquatic ecologists will act in accordance with the Capture and Release Standard Procedures.

3.3.5.1 Capture and handling

- Fish are only to be handled by an experienced zoologist or aquatic ecologist. When fish are required to be handled, hands and surfaces are to be wet with the water from which the fish is captured. Fish capture techniques are described as follows:
 - Fyke Nets: large fish traps set in the deeper margins of a waterbody and good for catching all sized fish including eels. The traps have a “D” shaped entrance and two wings, all of which are held upright in the water by a series of hoops. The trap is secured into the substrate with star pickets (or similar). Fish enter the trap and accumulate in the wings. Upon retrieval of the trap, the fish can be collected quickly from these points of accumulation.
 - Bait Traps: small, rectangular traps set with glow sticks that lure small fish and tadpoles through a small opening. Traps are set in various micro habitats at various depths.
 - All fyke nets and bait traps that are deployed overnight, unattended, are set so that a part of the trap is elevated above the water’s surface in the event that a frog, turtle or waterbird (which will need to surface to breathe) is accidentally trapped.
 - All fyke nets and bait traps are to be set in the evening and collected at first light, or the earliest practicable time the following morning so that fauna are not trapped for prolonged periods.
 - Seine Nets: a large net dragged through the waterbody by two zoologists/aquatic ecologists who then bring the ends together to actively trap any fish present. This method is effective in capturing large fish including eels.
 - Dip Nets: hand held nets used to sweep through micro habitats and capture small fish and tadpoles.

3.3.5.2 Holding

- Fish are to be held in a large esky or bucket, filled with the water from which the fish was captured.

- Fish are not to be held for greater than 10 minutes before relocation into suitable habitat on site.
- The number of fish held in the one esky or bucket is to be relative to the fish's size and nature so as to not make the holding container inhospitable (e.g. significantly reduce oxygen, increase temperature, cause fighting or predation etc.)

3.3.5.3 Releasing

- The recipient site of fish captured is to be assessed and pre-determined by the zoologist/aquatic ecologist prior to salvage commencing.
- Fish are to be released as soon as possible upon capture.
- Fish are to be released into suitable micro-habitats that protect them from predation.

3.3.5.4 Injured and exotic fish

Any significantly injured or diseased native fish and any exotic fish encountered during the salvage are to be euthanized quickly and humanely by a suitably experienced zoologist/aquatic ecologist, in accordance with their Animal Ethics Permit.

3.3.6 Revegetation

Revegetation, rehabilitation and weed removal works must be undertaken within 10m of drainage lines, including establishment of in-stream habitat with suitable features such as woody debris and native riparian and aquatic species. These works must be undertaken every year for a period of 10 years following completion of construction,

- All waterways disturbed during project construction are to be revegetated and restored (to a condition equal to or better than pre-construction) after completion of construction;
- Any snags and/or logs that are removed from any waterways to be replaced in similar locations after completion of construction (particularly Billy Billy);
- The realignment of Billy Billy Creek should proceed with the following considerations:
 - Undertake creek realignment during 1 December and 31 March to reduce the likelihood of large water flows through the waterway when the soils are most unstable
 - Line creek banks with rock material or Geofab to increase bank stability and reduce erosion
 - Revegetate creek banks as soon as possible after realignment to increase bank stability (using plant species consistent with the local creekline EVC)
 - Replace any in-stream habitats (e.g. rocks, branches, other snags, etc.)

- Sitting water pools are likely to provide habitat to locally common aquatic fauna species. An assessment of the water table should be completed to ensure that sitting pools are retained
- Pool, riffle and run morphological features should be retained to their current lengths and depths
- Pre, during and post ecological monitoring (including water quality and macroinvertebrates) should be implemented
- Soil testing should be conducted to ensure the soil type is appropriate for the new creek alignment.
- Suitably qualified persons (e.g. zoologist, aquatic ecologist) should monitor the water and habitat quality of the new creekline once a year for three years to document: fauna use, habitat quality, threats and any necessary management actions (e.g. pest control, complimentary planting, weed control, etc.);
- In response to each monitoring event, suitably qualified persons (e.g. Bush Crew contractors) to undertake the aforementioned management actions; and,
- Prepare and implement a Weed Management Plan for the new wetlands with a focus on regular monitoring utilising early detection and physical methods of weed removal (rather than the use of chemicals).

3.4 Corrective Action

In the event of a noticeable deterioration of water quality or observed direct death or injury of aquatic fauna, works within 100 metres of affected waterways will cease immediately (see below for environmental trigger values).

If the cause of deterioration is not immediately evident (e.g. a waterway chemical spill), a water quality or ecology specialist must be contacted to determine the cause of deterioration. Appropriate corrective actions must be determined in liaison with specialists and the Victorian Department of Environment and Primary Industries (DEPI). Corrective actions will vary depending on the cause of deterioration. Only after corrective actions have been implemented, and with approval from DEPI, may construction activities recommence.

3.5 Monitoring

Ensure that best practice sedimentation and pollution control measures are undertaken at all times, in accordance with EPA guidelines and Section 7 to prevent impacts to waterways and wetland. Sediment fencing must be installed such that any runoff from the construction zone in to the waterway is prevented. This is particularly important for construction within 30 metres of all tributaries of Billy Billy Creek where Dwarf Galaxias is known to occur. Sediment fences must be inspected on a weekly basis to ensure that they are functioning as intended.

3.5.1 Water Quality Monitoring and Management

Two upstream and four downstream water quality monitoring sites will be established prior to construction. Water quality sampling will adhere to the EPA's reference document: *A guide to the sampling and analysis of waters, wastewaters, soils and wastes* (EPA 2000), which can be found on the web at www.epa.vic.gov.au. Water quality results will be compared to the State Environment Protection Policy (SEPP) Waters of Victoria (WoV) objectives (EPA 2003).

A monitoring program will be designed in order to determine any potential risks to water quality as soon as conditions deteriorate from the background (pre-construction) water quality concentrations and from upstream sites (during construction). Management actions will be implemented if chemical spills are detected or if there is a noticeable deterioration in water quality. Several 'Spill Response Kits' will be provided if an oil or fuel spill occurs, appropriate training will be provided on how to use the kits if a spillage occurs on site.

Trigger values will be established and based on pre-construction water quality conditions at both upstream and downstream sites. Given that there is no long-term water quality data for waterways within the study area, the following trigger values should be used;

- Turbidity >20% background condition;
- Electrical Conductivity > 1% background condition;
- Dissolved Oxygen Concentration <1% background condition;
- pH ± 0.5 pH unit from background condition; and,
- All other water quality parameters (including any nutrients or heavy metals) have not substantially exceeded background conditions (i.e. no statistically significant difference ($\alpha > 0.05$)).

If water quality results *upstream* of the construction zone exceed trigger values or are outside SEPP (WoV) objectives (EPA 2003), then water quality is likely to have been affected by unrelated catchment issues. If water quality results *downstream* of the construction zone exceed trigger values or are outside SEPP objectives, works will be ceased and appropriate mitigation measures implemented, until the cause of the problem is determined.

If any downstream trigger values are breached (and upstream values are not), weekly water quality monitoring will also be implemented. Weekly monitoring will be undertaken until the water quality conditions return to background conditions or within SEPP (WoV) objectives (EPA 2003).

3.5.1.1 Sampling frequency

Pre-construction

Water quality monitoring will be conducted monthly for two months prior to commencement of construction to establish background conditions and appropriate trigger values at allocated upstream and downstream sites (to be determined).

During Construction

Water quality monitoring will be conducted monthly during the construction phase to ensure that water quality is maintained within the pre-construction water quality parameters of the waterway whilst also satisfying SEPP (WoV) objectives (EPA 2003). However, if downstream trigger values are breached, then weekly water quality monitoring will be implemented until water quality conditions have returned to background conditions or within SEPP (WoV) objectives (EPA 2003).

Post-construction

Water quality monitoring will be conducted every four months for two years post-construction to demonstrate if water quality has returned/remained at background conditions. The frequency of the water quality monitoring will be reviewed after the initial two-year period and a decision will be made on whether ongoing water chemistry monitoring is required.

3.5.2 Population and habitat monitoring

Threatened fauna populations are known to vary on spatial and temporal scales depending upon habitat conditions at a particular site. It is therefore important that monitoring is undertaken for Dwarf Galaxias annually between December–May for at least three years post construction. Monitoring of Billy Billy Creek is required to determine whether the habitat availability and quality for Dwarf Galaxias has been adversely impacted during construction. Specific survey procedures for Dwarf Galaxias will follow the *Biodiversity Precinct Structure Planning Kit* (DSE 2010).

In-situ water quality monitoring and habitat assessments will be conducted concurrently with fauna surveys. Site-specific water quality and habitat variables will be assessed to ensure habitat availability and quality within Billy Billy Creek remains intact.

In-situ water quality parameters will be compared with SEPP (WoV) guidelines and include:

- Temperature;
- pH;
- Electrical conductivity;
- Dissolved Oxygen;
- Turbidity; and,
- Total Dissolved Solids.

Habitat variables will include:

- Depth, flow and water quality;
- Vegetation diversity, structure, composition and percentage of cover;
- Presence of introduced fish, particularly Eastern Gambusia;
- Presence of pollutants, rubbish and other threatening processes; and,

A photographic reference will be taken at the same time of water quality monitoring, so that comparisons of habitat conditions can be made over time.

3.6 Reporting

An annual summary statement or report will be prepared to inform DEPI and DoE of relevant ecological issues, milestones and threats.

This statement/report will include:

- The progress of development;
- Any measures implemented in accordance with this plan
- Any incidents which may have impacted any matters of NES or other listed species
- Any mitigation measures implemented
- Progress of management actions (e.g. weed removal, salvage and translocation works)
- Any significant findings resulting from monitoring activities.

4. BUTTON WRINKLEWORT



Endangered (EPBC Act)
Listed (FFG Act)
Endangered (DSE Advisory List)

4.1 Description

Button Wrinklewort *Rutidosia leptorhynchoides* is listed as endangered under the EPBC Act. In Victoria, it is listed under the FFG Act, and is considered endangered on the DSE Advisory List (DSE 2005; FIS 2011).

Button Wrinklewort is a perennial forb which produces multiple flowering stems 15 to 30cm high during spring and summer. Stems are hairless in the upper part, becoming woolly towards the base. Leaves are mostly stem-clasping at their base, linear, usually 1.5-3.5cm long, 0.5-1.5mm wide, hairless and have their edges slightly rolled under. In Victorian the species flowers from October to February (NSW Office of Environment and Heritage 2012)

Button Wrinklewort occurs in south-eastern Australia, from Goulburn in the Southern Tablelands of NSW to Wickliffe on the plains west of Melbourne. In Victoria the species occurred across the Victorian Volcanic Plain but is now restricted to tiny populations in the south-west and is generally growing in in Plains Grassland and Grassy Woodland vegetation (Walsh and Entwistle 1994).

Threats

The National Recovery Plan for Button Wrinklewort (NSW Office of Environment and Heritage 2012) lists the following key threats to the species:

- Urban Development
- Physical disturbance
- Climate Change
- Weed Invasion
- Completion from other native vegetation
- Grazing
- Lack of Genetic Diversity in Small Populations
- Genetic Incompatibility

- Inappropriate fire regimes
- Poor Reservation Status

Management Strategies

The National Recovery Plan for the Button Wrinklewort (NSW Office of Environment and Heritage 2012) summarises appropriate management strategies to avoid threatening processes. These include:

- Protect known populations from changes to land use.
- Do not undertake road works, pasture modification or other changes in land use that may affect populations.
- Limit grazing on sites where populations occur.
- Do not increase domestic stock grazing pressures on sites where populations persist.
- Undertake weed control in and adjacent to populations.
- Mark sites and potential habitat on to maps used for planning road works, residential and infrastructure projects.
- Maintain or install on-site signs to alert maintenance staff to the habitat.
- Search for new populations in potential habitat.
- Avoid physical alteration to Button Wrinklewort habitat
- Restore and protect damaged or depleted habitat through revegetation and habitat maintenance.
- Undertake appropriate management of proposed translocation and cultivation programs involving Button Wrinklewort.
- Control use of nutrients, biocides and other chemicals for any vegetation clearing adjacent to Button Wrinklewort habitat.

Distribution

There are 233 documented records of Button Wrinklewort in Victoria, with several records located close to the alignment around the Hopkins River at Dobie and within the Woodnaggerak Reserve at Middle Creek

4.2 Impacts

During the Environment Effects Statement development process the carriageway that impacted the Button Wrinklewort was moved south to avoid the species. The Project does not impact on the Button Wrinklewort however the species remains adjacent to the carriageway in at least two locations.

4.3 Mitigation measures

4.3.1 No-go Zones

Prior to undertaking construction activities within 500m of the Button Wrinklewort patches, the person taking the action must Establish no-go zone(s) as per Section 9 around the Spiny Rice-flower plants identified Appendix 2, Maps 2-3, 13.

4.3.2 Salvage and translocation

Not required due to species avoidance.

4.3.3 Revegetation

Not required due to species avoidance.

4.4 Corrective Action

Not required due to species avoidance.

4.5 Monitoring

No-go Zones must be regularly monitored to ensure compliance with this plan.

4.6 Reporting

Not required due to species avoidance.

5. GOLDEN SUN MOTH



Critically Endangered (EPBC Act)
Listed (FFG Act)
Critically Endangered (DSE Advisory List)

5.1 Description

The Golden Sun Moth is a medium-sized, day-flying moth. The wingspan of females and males is about 3.1 cm and 3.4 cm respectively. The smaller wingspan of the female is unique within the *Synemon* genus (Edwards 1991). The upper-side of the forewing is dark grey with patterns of paler grey scales on female moths, and the hindwing is golden yellow with black spots along the edges of the wings. The underside of both wings is white with small black spots along the edge of the wings. In the male, the upper-side of the forewing is dark brown with patterns of pale grey scales and the hindwing is bronze/brown with dark brown patches. The underside of both wings is pale grey with dark brown spots. Both males and females have clubbed antennae. The female has a long extensible ovipositor, which is an elongated organ extending from the posterior abdomen, used to lay eggs.

Adult moths survive between one and four days after pupal emergence and are unable to feed because they lack functional mouthparts (Clarke & O'Dwyer 2000; O'Dwyer & Attiwill 1999). Males spend their adult life patrolling approximately 1 m above the grass in search of females for breeding. Females have reduced hind wings and are reluctant to fly and will only do so when disturbed (Edwards 1991).

The Golden Sun Moth typically occurs in native grassland, grassy woodland, dominated by greater than 40% cover of wallaby-grass *Austrodanthonia* spp. (DSE 2004), but is also known to inhabit areas dominated by Kangaroo Grass (Endersby & Koehler 2006) and introduced species such as Chilean Needle-grass (A. Organ pers. obs.).

Threats

The Department of Environment Species Profile and Threats Database (http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=25234) lists the key threats to the Golden Sun Moth as:

- the loss and degradation of Wallaby Grass-dominated native temperate grasslands within the species historical range
- the loss and degradation of open grassy woodlands where the

- ground layer is dominated by Wallaby Grass
- soil disturbance at extant Golden Sun Moth sites.

Distribution

Prior to European settlement, the Golden Sun Moth was widespread and relatively continuous throughout its range, inhabiting grassy open woodlands and grassland (Dear 1996; DSE 2004). Habitat loss, disturbance and fragmentation due to preferential agricultural expansion and urbanization of open woodland and grasslands, means that many populations are now small, isolated and fragmented. As a result, it is difficult for this relatively immobile species to recolonise areas in the event of local extinctions (females are almost entirely immobile while males are usually found less than 100 m from suitable habitat). Furthermore, the small size typical of remaining habitat patches and the lack of genetic exchange between them, may result in an inability to maintain genetically viable populations and increase the risk of local extinctions.

Golden Sun Moths are known to exist in less than a dozen sites in each of New South Wales and the Australian Capital Territory and, until the last two–three years, only six active sites in Victoria. However, recent targeted surveys around Melbourne have detected the species from at least 60 additional sites (Biosis Research Pty Ltd 2008; Gilmore *et al.* 2008; Ecology and Heritage Partners Pty Ltd in prep.).

There are six previous records of Golden Sun Moth from the local area, the most recent in 1906 (DSE 2010). Based on the current range of habitats and their relative condition, there is the potential for Golden Sun Moth to occur within grassland remnants along several of the alignment options listed.

5.2 Impacts

Golden Sun Moth was recorded during targeted surveys at several sites spread between Buangor-Ben Nevis Road and Langi Ghiran Picnic Ground Road, with numerous individuals recorded in paddocks to the east and west of Pope Road (Figure 2). Surveys were undertaken on 16, 22 and 29 December 2011 and 13 January 2012 with 40, 17, 86 and 2 Golden Sun Moth individuals recorded respectively.

5.3 Mitigation measures

5.3.1 No-go Zones

Prior to undertaking construction activities within 100m of Golden Sun-Moth habitat, the person taking the action must Establish no-go zone(s) as per Section 9 around the Golden Sun-Moth habitat identified Appendix 2, Maps 2-3. Further No-Go Zones will be established around Golden Sun-Moth habitat upon the completion of detailed design.

5.3.2 Salvage and translocation

As outlined in the Golden Sun Moth EPBC Act Policy Statement (DEWHA 2009a) and Background Paper to the EPBC Act Policy Statement 3.12 (significant impact guidelines) (DEWHA 2009b), salvage and translocation does not reduce the impact of an action below the significance threshold.

In light of the above, salvage and translocation of Golden Sun Moth is not proposed for the project.

5.3.3 Revegetation

The Golden Sun-Moth revegetation area is marked on Appendix 2, Map 8.

Topsoil excavated during construction should be replaced over the disturbed zone after construction, in accordance with the relevant Environmental Management Program. This should be undertaken throughout the construction area.

If native vegetation recolonisation is not successful by returning the retained topsoil, revegetation will be undertaken using a suite of flora species appropriate to the cleared EVC. Revegetation of the disturbed areas and rehabilitation of redundant sections of the existing Western Highway with grassland species favoured as a food source by Golden Sun Moth (e.g. *Austrodanthonia* spp.) where Golden Sun Moth populations are known to be present.

Areas of retained remnant native vegetation following construction will face increased pressures from weed invasion, increased disturbance and edge effects from the newly constructed areas. Consequently, a management procedure must be implemented in order to ensure the long-term survival of these remnants. A Weed Management Plan will be implemented prior to commencement of construction within the Project area. Weed management procedures and monitoring will continue for at least three years after completion of construction.

In areas proposed for revegetation and rehabilitation, landscape plantings should include:

- Flora species appropriate to the local grassland EVC including a suite of understorey and ground cover species, to be used in all revegetation and landscape plantings; and,
- Grassland species favoured as a food source by Golden Sun Moth (e.g. *Austrodanthonia* spp.) where Golden Sun Moth populations are known to be present.

5.4 Corrective Action

Golden Sun Moth populations are known to vary on spatial and temporal scales depending upon habitat and environmental conditions at a particular site. It is therefore important that monitoring is undertaken prior to commencement of construction, during construction activities and for at least three years after completion of construction (see below).

Any reduction in Golden Sun Moth population is likely to be related to deteriorating habitat conditions. As such, corrective actions will be associated with ongoing weed management, informed by the project Weed Management Plan.

5.5 Monitoring

Monitoring is required to determine if Golden Sun Moth has persisted in grassland areas within the roadside reserve or adjacent to construction activities to determine reproductive success and to ensure that management actions and habitats are suitable for a viable Golden Sun Moth population in the future. Specific survey procedures will follow those used to monitor the species elsewhere (i.e. timed surveys, generally along transect). Monitoring for at least three years after the road is operational will be used to guide decisions upon the success of habitat reservation and management within the roadside reserve. There is a high likelihood the species will persist in this area in the future (the species has been recorded along other linear corridors such as railway reserves north of Melbourne), particularly given that the roadside reserve will be contiguous with larger area of suitable grassland habitat on private properties which are also known to contain the species.

At least four days of survey over the flight season (i.e. typically between October and early January) of Golden Sun Moth will be conducted to collect data on habitat variables, and to ensure that the grassland areas along the roadside remain suitable for the species. This is particularly pertinent given that the roadside reserve will experience high levels of disturbance from traffic and other threats such as increased water, nutrient and gross pollutant run-off, accumulation of rubbish, and inappropriate slashing or mowing regimes (i.e. season and frequency).

The following will be undertaken as part of population monitoring and habitat monitoring of suitable grassland habitats proposed to be retained for Golden Sun Moth:

- Survey will be carried out by qualified zoologists in areas of suitable habitat within the study area. The survey will focus in areas of indigenous grassland (namely those areas dominated by wallaby-grass *Austrodanthonia* spp., but also in areas of Needle Grass *Nassella* spp. which is a known food source for the species) and areas where the species has previously been recorded;
- The surveys will be undertaken during optimal conditions suitable for detecting species. The male of this species generally flies between 11am and 3pm on calm, warm (over 20°C), sunny days, emerging between October and early January; and,
- All transects and Golden Sun Moths observed during the surveys will be marked with a hand held GPS (accuracy of +/- 5 meters).

Several site-specific habitat variables will also be assessed during the monitoring period, specifically:

- Vegetation diversity, structure, composition and percentage of cover (percentage cover of particular grassland species such as wallaby grass and/or Kangaroo Grass);
- Density of grass and height (providing an indication of when it was last slashed or potentially grazed);
- Presence of other natural features such exposed rock;
- The suitability of adjoining grassland habitats which are also known to support Golden Sun Moth; and

- Presence of pollutants, rubbish and other threatening processes as outlined above.

5.6 Reporting

An annual summary statement or report will be prepared to inform DEPI and DoE of relevant ecological issues, milestones and threats.

This statement/report will include:

- The progress of development;
- Any measures implemented in accordance with this plan
- Any incidents which may have impacted any matters of NES or other listed species
- Any mitigation measures implemented
- Progress of management actions (e.g. weed removal, salvage and translocation works)
- Any significant findings resulting from monitoring activities.

6. BROWN TOADLET



Listed (FFG Act)
Endangered (DSE Advisory List)

6.1 Description

The Brown Toadlet is a small brownish coloured toadlet endemic to south-eastern Australia including Tasmania and is found in a variety of habitats not necessarily associated with permanent water. The Brown Toadlet is brown to black on its back, with a scattering of darker flecks and red spots. Its underbelly is marbled black and red spots. Its underbelly is marbled black and white and there is a bright yellow patch around its cloaca. In Victoria, the Brown Toadlet is distributed from the north-east through to central and western Victoria with scattered records in Gippsland. In the South West region it is recorded from all bioregions except the Otway Ranges bioregions, although most records are grouped on the Volcanic Plains bioregion north of Werribee, the Greater Grampians bioregion and the Lowan Malle bioregion in the Little Desert.

There are five previous records of Brown Toadlet from the local area, the most recent in 1963. There is suitable habitat for this species in the Hopkins River, Billy Billy Creek, Charliecombe Creek, Middle Creek and Fiery Creek, as well as several smaller, unnamed drainage lines.

Over 28 records of Brown Toadlet were collected within the study area during targeted Brown Toadlet surveys and throughout the duration of the project. Individuals were detected during the targeted nocturnal surveys and incidentally whilst undertaking other surveys (e.g. whilst collecting hair tubes and infra-red cameras etc.). Records of Brown Toadlet collected during the targeted surveys and incidentally are presented in Figure 2 however this species is widespread throughout the study area in many of the drainage lines, seeps, road ditches and culverts located within or adjacent to woodland vegetation.

6.2 Impact

Habitat for Brown Toadlet is widespread throughout the study area in many of the wetlands, drainage lines, seeps, road ditches

and culverts located within or adjacent to woodland vegetation.

6.3 Mitigation measures

6.3.1 No-go Zones

There are no No-Go Zones specifically for the Brown Toadlet. However all areas of vegetation that can be protected through refined detailed design will form part of additional No-Go Zones not outlined in this plan.

6.3.2 Salvage and translocation

Salvage and translocation (Pre-construction)

Active season (late March – June)

- Pre-construction salvage will take place prior to site disturbance, but as close as possible to proposed construction periods, i.e. one to three days (a longer intervening period may mean frogs have moved back into the area);
- Two observers will spend a minimum two nights surveying, by spotlighting and call playback, in identified areas of habitat (to be identified during targeted surveys prior to commencement of construction) within the study area prior to the commencement of works in their vicinity. Any individuals detected will be relocated to the nearest suitable habitat at least 200 metres, but no greater than 500 metres, from the construction zone;
- Frog and tadpole salvage will be undertaken during the drainage/pumping of any dams identified as known habitat by the species within the study area, in accordance with requirements outlined in Appendix 4.2, Management Procedures for Aquatic Fauna;
- Footwear will be washed in disinfectant at the beginning and end of each salvage period to prevent the introduction and/or spread of any diseases. All salvage procedures will be conducted in accordance with the hygiene protocol for the control of disease in frogs (NPWS 2001).

Inactive season (July – February)

As any Brown Toadlet that may be present will be inactive during these months, nocturnal surveys prior to construction activities will not be required.

Salvage and translocation (During construction)

- After completion of pre-construction surveys and salvage, the draining of wetlands, dams and drainage lines will proceed as detailed above (Salvage and Translocation of Aquatic Fauna);
- For the removal of any vegetation or refuge in and around the waterbody, zoologists are to communicate how to best undertake removal to avoid injury to native fauna.

7. EROSION AND SEDIMENT CONTROL

7.1 General

All sediment erosion and pollution control protocols are implemented, in accordance with *Construction Techniques for Sediment Pollution Control (EPA Publication No. 275, 1991)*; and *Environmental Guidelines for Major Construction Sites (EPA Publication No. 480, February 1996)*.

All exposed surfaces shall be free of or treated to minimise erosion.

Erosion and sediment controls shall include but are not limited to:

- minimising the amount of exposed erodible surfaces during construction including the staging of works;
- prompt temporary and/or permanent progressive revegetation of the site as work proceeds;
- prompt covering of exposed surfaces (including batters and stockpiles) that would otherwise remain bare for more than 28: days. Cover may include mulch, erosion control mat or seeding with sterile grass;
- installation, stabilisation and maintenance of catch and diversion drains that segregate water runoff from catchments outside of the construction site from water exposed to the construction site;
- installation and maintenance of erosion and sedimentation controls, established in accordance with EPA best practice guidelines for the treatment of sediment laden run-off resulting from construction activities;
- adequately control and route runoff within the construction site to the appropriate sedimentation controls; and
- where trees are required to be removed more than two months in advance of any construction works, remove only that part of the tree that is above ground level and where possible allow the roots to remain intact beneath the ground surface to assist with erosion control.

7.2 Works in/near Waters

Works shall be programmed and managed to avoid work in waters. Where work in waters is unavoidable, procedures shall be developed and implemented to satisfy the requirements of the specification and as required by any permits from the responsible authority(s).

Where construction activities are undertaken in, near or over waters, EMPs shall be prepared to protect beneficial uses in accordance with any permit, the *State Environmental Planning Policy (Waters of Victoria)* its schedules and best practice guidelines.

7.3 Sedimentation Basins

Sedimentation basins shall be utilised as the primary sediment control for the works unless the Contractor can demonstrate to the Superintendent's satisfaction that the implementation of a sedimentation basin is not technically feasible for the works.

Where sedimentation basins are proposed as control measures, basins shall be designed to contain flows from a rainfall event having an Average Recurrence Interval of not less than two years and six hour duration when allowing for a 30% reduction in capacity as a result of sediment accumulation.

Sedimentation basins shall be modelled and sized to manage rainfall intensities and soil characteristics specific to the region. The sizing and modelling of sedimentation basin(s) shall consider the expected works and associated area of disturbance within catchment area(s) within the site.

The sizing and modelling of temporary sedimentation basins shall be undertaken using recognised 'best practice' modelling techniques or '*VicRoads Temporary Sedimentation Basin Sizing Tool*'.

Spillways or bypass systems (installations that divert all clean surface flows around a works site) shall be designed for an event having an Average Recurrence Interval of five years.

An independent hydraulic consultant who has demonstrated competence and suitable experience in the design of temporary sedimentation basins shall complete and sign a declaration. The declaration shall accompany submission of the sedimentation basin designs to the Superintendent.

The Contractor shall submit to the Superintendent the sedimentation designs and the associated independent verification declarations not less than two weeks prior to the commencement of construction of the temporary sedimentation basin.

Sedimentation basins shall be cleaned out whenever the accumulated sediment has reduced the capacity of the basin by 30% or more, or whenever the sediment has built up to a point where it is less than 500 mm below the spillway crest, whichever occurs earlier.

7.4 Stokepiles

Where soil is stockpiled on site, such stockpiles shall be located, where possible, to provide a clearance of not less than 10 m from waterways. Where it is not possible to provide a clearance of 10 m, the stockpile shall be above the normal high water level of the waterways and additional protection shall be provided to prevent the stockpiled material entering the waterways.

7.5 Monitoring

The Contractor shall inspect the whole site for instances of soil erosion or scour and the effectiveness of erosion and sedimentation controls in accordance with the following:

- at intervals not more than seven days;
- within one hour of the commencement of any runoff resulting from rain events during working hours;
- every four hours during periods of continuous rain during working hours;
- within 12 hours of a rain event outside working hours.

Any defects and/or deficiencies in control measures identified by monitoring undertaken shall be rectified immediately and these control measures shall be cleaned, repaired and augmented as required to ensure effective control.

8. FUELS AND CHEMICALS

8.1 General

Any leakage or spillage of any fuels or chemicals shall not have a detrimental environmental impact.

EMPs shall include specific procedures to mitigate the effect on the environment from fuels and chemicals, including herbicides and pesticides. Such procedures shall include but not be limited to:

- nominated fuel and chemical storage areas that comply with Dangerous Goods (Storage and Handling) Regulations 2000 and EPA Bunding Guidelines (EPA Publication 347) including the placarding of compounds and bulk storage containers;
- nominated points for the refuelling and fluid top up of vehicles and plant which shall be undertaken in a designated area at least 100 m from any drainage point or waterways;
- provision of readily accessible and maintained spill kits for the purpose of cleaning up chemical, oil and fuel spillages on the site at all times;
- ensuring that personnel trained in the efficient deployment of the spill kits are readily available in the event of spillages; and
- a contingency plan that shall address the containment, treatment and disposal of any spill.

8.2 Monitoring

Fuel and chemical storages and equipment fill areas shall be monitored for compliance at intervals of not more than 7 days.

9. NO-GO ZONES

No work will occur outside the Project Area. As per the Western Highway Project Section 2 EES, additional areas of vegetation will be protected within the Project Area to protect Threatened Species as described in this plan and shown in Appendix 2. In addition to No-Go Zones identified in the plan, No-Go Zones will be implemented where vegetation can be protected through refined detailed design.

All fencing of 'No Go Zones' shall as a minimum be:

- erected 1 metre beyond the boundary of the habitat to be protected (unless otherwise stated in this plan), or the drip line of trees
- constructed of star picket, paraweb one wire support
- have a high visibility component
- communicated by signage installed on the temporary fencing at intervals no less than 20 metres apart stating 'Protected Area- No Unauthorised Access'; and,
- retained in place for the duration of the construction period (until Practical Completion).

Note: Where No-Go Zones compromise Road Safety (i.e appear in a clear zone) then star pickets will be replaced with sand bagged bollards and monitored daily. This will be at the discretion of VicRoads.

APPENDIX A- PROJECT AREA

APPENDIX B- MATTERS OF NES MAPS

Western Highway Project
 237 Ring Road
 Wendouree Victoria 3355
 PO Box 148 Wendouree Victoria 3355

 Telephone 1300 779 642
 Fax (03) 5309 1099
 Email whp@roads.vic.gov.au

 vicroads.vic.gov.au

Victoria Section
 Environment Assessment Branch
 Department of Sustainability, Environment, Water, Population
 and Communities
 GPO Box 787
CANBERRA ACT 2601

4 February 2014
 Our Ref: n2367224
 File No: AO925-009-006
 Your Ref: EPBC 2010/5741

Dear S22

**REQUEST FOR ADDITIONAL INFORMATION
 WESTERN HIGHWAY PROJECT- BEAUFORT TO ARARAT, VICTORIA
 (EPBC 2010/5741)**

I refer to your email on 17 January 2014 and our previous letter dated 2 December 2013 (Our Ref: n2289252).

After careful consideration VicRoads is no longer pursuing offset sites at Campbelltown and Kinypanial. This is primarily due to an unsuccessful Golden Sun Moth survey undertaken in December 2013.

VicRoads has now engaged the services of Vegetation Link (ESLink Services) who has provided two alternative properties which we believe satisfy the requirements of Department of Environment (DoE). These properties are located in Darlington and Dunkeld.

ESLink has sourced these properties on the basis of the proposed offsets previously discussed with DoE and provided in the below table.

MNES	Proposed removal (ha)	Proposed offset (ha)
GSM	31.56	73.0
NTGVVP	5.25	21.1
GEVVVP	11.14	25.8

All additional information requested in DSEWPac's original letter dated 21 June 2013 has been provided in Appendix 1.

Please note that the landowners have given VicRoads permission to supply this information to DoE however they specify that the information provided shall not be made public until suitable commercial agreements have been reached covering matters of disclosure etc.

VicRoads has committed to purchasing both offset sites on the basis that DoE makes a decision on the referral accepting this proposal. In addition to the information provided in this letter VicRoads has also engaged Ecology and Heritage Partners to produce a Native Vegetation Offset Management Plan for the sites at Darlington and Dunkeld. It is expected that a draft plan will be provided within 4 weeks.



With all other planning approvals in place, VicRoads has completed the tender evaluation and is now in a position to award a contract for construction for the first phase of this section between Beaufort and Buangor.

Given the significant progress that has been made on this matter and the steps taken towards securing the offsets, I would also seek your agreement to commence construction works on this critical project.

Your agreement to this proposal will provide substantial benefits in allowing construction works to commence this summer which will shorten the overall project duration and deliver project benefits earlier.

I thank you for considering this request and would appreciate the opportunity for further discussion with you on this matter to achieve an outcome that meets the interests of both parties.

Should you require further information, s22 [REDACTED] from this office (Tel: 5309 1075) would be pleased to assist.

Yours sincerely

s22 [REDACTED]

PROJECT DIRECTOR - WESTERN HIGHWAY

APPENDIX 1: FURTHER INFORMATION

	Property 1	Property 2
Location	Darlington	Dunkeld
Size (Ha)	73	25.8
Context	<p>The proposed area is located within a large remnant (200 hectares approx. within same "patch") representing a mosaic of quality plains grassland, stony-knoll shrubland and wetland formations typical of the volcanic plains. In addition to representing NTGVVP and confirmed GSM habitat, a large number of other threatened species have been recorded on the property (Refer Attachments).</p> <p>DEPI modelling and mapping has identified the site of high strategic biodiversity significance.</p> <p>The exact 73 acres within the remnant patch will be confirmed by the landowner as part of the commercial agreement and Offset Management Plan.</p>	<p>The proposed area is located within a landscape comprising extensive tracts of large scattered old trees (Red Gums) with understorey's of differing quality depending on the grazing history. The proposed site has been assessed as being very high conservation significance, as is thus likely to be one of the best patches through the Dunkeld area. The site is also relatively close to the Grampians National Park.</p> <p>DEPI modelling and mapping has identified the site of high to very high strategic biodiversity significance.</p> <p>The exact 25.8 hectares within the remnant patch will be confirmed by the landowner as part of the commercial agreement and Offset Management Plan.</p>
Maps	Refer Appendix 2	n/a
Tenure Arrangements	Privately owned, zoned farming, no overlays	Privately owned, zoned farming, no overlays
Confirmed Records of presence	The landowners engaged ecological consultants Brett Lane & Associates who undertook a detailed flora assessment of a 120 hectare (approx.) area of the patch. This assessment confirmed over 80 hectares of very high conservation significance Plains Grassland (Habitat Hectare Scores 47-65) that also met the definition of NTGVVP. (Refer	A qualified habitat hectare assessor (Plume Ecology) was engaged to undertake a habitat assessment in October 2013. The assessor confirmed the presence of very high conservation significance plains grassy woodland as well as approximately 30 hectares that are defined as GEWVP (Refer Appendix 4)

	<p>Appendix 2). Additional areas yet to be formally assessed will also meet the definition of NTGVVP.</p> <p>Independent surveys undertaken by Enics Solutions in December 2012 confirmed the presence of Golden Sun Moth (Males & Females recorded). (Refer Appendix 3)</p>	
<p>Detailed information regarding the presence of GSM, NTGVVP or GEVWVP</p>	<p>Refer Appendix 3. To be expanded upon in the Offset Management Plan</p>	<p>Refer Appendix 4. To be expanded upon in the Offset Management Plan</p>
<p>Management Actions</p>	<p>To be developed as part of the Offset Management Plan, but broadly:</p> <ul style="list-style-type: none"> - Extensive weed and pest animal management; - Grazing Management; - Biomass Management 	<p>To be developed as part of the Offset Management Plan, but broadly:</p> <ul style="list-style-type: none"> - Extensive weed and pest animal management; - Grazing Management; - Biomass Management
<p>Time over which management actions take place</p>	<p>Consistent with State requirements, a 10-year detailed, audited management plan would be implemented with in-perpetuity protection to ensure the habitat improvements are maintained</p>	<p>Consistent with State requirements, a 10-year detailed, audited management plan would be implemented with in-perpetuity protection to ensure the habitat improvements are maintained</p>
<p>Risk of damage</p>	<p>To be elaborated on as part of the Offset Management Plan, but broadly: The offset site is farm zoned, with no further planning overlays or or-title agreements to provide habitat protection. Permitted business as usual farming activity (grazing) could realistically lead to a loss of species diversity, inappropriate biomass levels, weediness and vegetation loss through erosion/pest animal activity.</p> <p>Wind farm development in the area could also</p>	<p>To be elaborated on as part of the Offset Management Plan, but broadly: The offset site is farm zoned, with no further planning overlays or or-title agreements to provide habitat protection. Permitted business as usual farming activity (grazing) could realistically lead to a loss of species diversity, inappropriate biomass levels, weediness and vegetation loss through erosion/pest animal activity.</p>

	lead to a request to clear part of the vegetation.	
Legal Mechanism of protection	A Section 173 Agreement under the <i>Planning & Environment Act 1987</i>	A Section 173 Agreement under the <i>Planning & Environment Act 1987</i>
How the offset package is additional to what is already required	The land is farm zoned with no environmental protection overlays or on-title protections. The offset package will provide in perpetuity protection (removing the right to apply to clear the vegetation/habitat) as well as control land use (e.g. grazing restrictions, pest plant and animal control) to maintain and improve the condition over time. Without the offset, permitted as-of-right land uses could significantly degrade the proposed areas.	The land is farm zoned with no environmental protection overlays or on-title protections. The offset package will provide in perpetuity protection (removing the right to apply to clear the vegetation/habitat) as well as control land use (e.g. grazing restrictions, pest plant and animal control) to maintain and improve the condition over time. Without the offset, permitted as-of-right land uses could significantly degrade the proposed areas.
Overall Cost	\$3.3 million (estimated)	\$1.0 million (estimated)

APPENDIX 2: BRETT LANE NATIVE VEGETATION AND THREATENED SPECIES ASSESSMENT

s47F

NATIVE VEGETATION AND THREATENED SPECIES ASSESSMENT

s47F



Brett Lane & Associates Pty. Ltd.
Ecological Research & Management

Suite 5 61 - 63 Camberwell Road, Hawthorn, VIC 3123

P.O. Box 337, Camberwell, VIC 3124

Ph. (03) 9815 2111

Fax. (03) 9815 2685

June 2013

Report No. 12155 (1.1)

CONTENTS

1. EXECUTIVE SUMMARY	1
2. INTRODUCTION.....	5
3. SOURCES OF INFORMATION	6
3.1. Existing information	6
3.1.1. Flora	6
3.1.2. Ecological Vegetation Classes.....	6
3.1.3. Threatened ecological communities.....	6
3.2. Field methodology.....	7
3.2.1. Flora	7
3.2.2. Native vegetation	7
3.2.3. Threatened ecological communities.....	8
3.3. Limitations of field assessment.....	8
4. SITE DESCRIPTION.....	10
5. ASSESSMENT RESULTS.....	12
5.1. Vegetation assessment	12
5.1.1. Flora species	12
5.1.2. Ecological Vegetation Classes.....	13
5.1.3. Listed threatened ecological communities	18
6. Threatened Fauna Likelihood of OccurRence.....	19
6.1.1. Fauna species	19
6.1.2. Listed threatened fauna species	19
7. OFFSET POTENTIAL.....	26
7.1. EPBC Act listed biological values	26
7.1.1. Listed threatened flora species	26
7.1.2. Golden Sun Moth habitat	26
7.1.3. Other EPBC Act listed threatened fauna	26
7.1.4. Protection of listed threatened ecological communities.....	27
7.2. Victorian statutory planning offsets.....	27
7.3. Recommendations.....	27
8. REFERENCES.....	29

TABLES

Table 1: Description of habitat zones in the study area 15
Table 2: Summary of habitat hectare assessment results 18
Table 3: Threatened fauna identified as occurring or potentially occurring in the study
area 20

FIGURES

Figure 1: Study area and native vegetation 11

APPENDICES

Appendix 1: Flora species recorded in the study area and threatened species known
(or with the potential) to occur in the search region 31
Appendix 2: Detailed habitat hectare assessment results 36
Appendix 3: EVC Benchmarks 37
Appendix 4: Best / Remaining 50% habitat assessment for rare and threatened species
..... 38

1. EXECUTIVE SUMMARY

s47F engaged Brett Lane & Associates Pty. Ltd. to conduct an assessment for native vegetation and threatened species of a 270 hectare area of land at s47F s47F. Native vegetation located at this property is proposed to be used as offsets to compensate for the approved loss of native vegetation elsewhere.

This investigation was commissioned to provide information on the type, extent and condition of native vegetation in the study area, assess the extent of threatened species habitat in the 270 hectare study area and determine the potential value of the study area as a third party offset site.

Native vegetation

The current investigation found that the study area currently supports approximately 200 hectares of native vegetation in the form of *Heavier-soils* Plains Grassland (EVC 132_61), Plains Grassy Wetland (EVC 125), Stony Knoll Shrubland (EVC 649), Creekline Tussock Grassland (654), and Brackish Wetland (EVC 656). Due to time constraints only 119.4 hectares of this vegetation was assessed for its quality.

The majority of the study area supported intact remnant native vegetation, much of which was of high quality. The remainder supported introduced pasture and common pastoral weeds.

All of the *Heavier-soils* Plains Grassland (EVC 132_61) recorded in the study area was found to be the EPBC Act listed threatened ecological community *Natural Temperate Grassland of the Victorian Volcanic Plain* (NTGVVP). This same vegetation was also found to be the FFG Act listed threatened ecological community *Western (Basalt) Plains Grasslands Community* (WBPGC). A total of 81.06 hectares of this vegetation was recorded in the study area.

All 81.06 hectares (or 45.67 Habitat hectares) of *Heavier-soils* Plains Grassland (EVC 132_61) recorded in the study area was found to be of very high conservation significance.

A total of 10.92 hectares (6.77 Habitat hectares) of Plains Grassy Wetland (EVC 125) was recorded in the study area, all of which was found to be of very high conservation significance.

A total of 27.45 hectares (15.66 Habitat hectares) of Brackish Wetland (EVC 656) was recorded in the study area, all of which was found to be of very high conservation significance.

Threatened flora

Three threatened flora species were recorded in the study area during the current survey. These were:

- Spiny Rice-flower (listed as *critically endangered* under the EPBC Act, *threatened* under the FFG Act and *endangered* on DEPI's advisory list) – at least 32 plants.
- Brackish Plains Buttercup (listed as *rare* on DEPI's advisory list), and
- Purple Blown Grass (listed as *rare* on DEPI's advisory list).

While not recorded during the current survey, previous surveying at the property by Damien Cook at Australian Ecosystems detected additional threatened flora species:

- Salt-lake Tussock-grass (listed as *vulnerable* under the EPBC Act, *threatened* under the FFG Act and *vulnerable* on DEPI's advisory list)
- Fragrant Leek-orchid (listed as *endangered* under the EPBC Act, *threatened* under the FFG Act and *endangered* on DEPI's advisory list)
- Annual Bitter-cress (*endangered* on DEPI Advisory list)
- Small Milkwort (*threatened* of FFG Act and *endangered* on DEPI Advisory list)
- Golden Cowslips (*vulnerable* on DEPI Advisory list)
- Pale Swamp Everlasting (*vulnerable* on DEPI Advisory list)
- Derrinallum Billy-buttons (*endangered* on DEPI Advisory list)
- Plains Yam-daisy (*vulnerable* on DEPI Advisory list)

Additional threatened flora species considered to potentially occur in the study area due to the presence of suitable habitat detected during the current survey include:

EPBC Act and FFG Act listed species

- Adamson's Blown-grass
- Basalt Greenhood
- Clover Glycine (landowner has previously identified this species on site)
- Curly Sedge

Listed on the Advisory List of Rare and Threatened Plants in Victoria (DEPI)

- Metallic Sun-orchid
- Southern Swainson-pea (landowner has previously identified this species on site)

Threatened fauna

No threatened fauna species were recorded during the current survey.

While not recorded during the current survey, previous surveying at the property detected additional threatened fauna species:

Recorded in previous survey by Damien Cook at Australian Ecosystems:

- Australian Shoveler (*vulnerable* on DEPI Advisory list)
- Whiskered Tern (*near threatened* on DEPI Advisory list)
- Spotted Harrier (*near threatened* on DEPI Advisory list)
- Brown Quail (*near threatened* on DEPI Advisory list)
- Latham's Snipe (*near threatened* on DEPI Advisory list)
- Brolga (*threatened* on FFG Act and *vulnerable* on DEPI Advisory list)
- Growling Grass Frog (*vulnerable* on EPBC Act, *threatened* on FFG Act and *endangered* on DEPI Advisory list)
- Caspian Tern (*threatened* on FFG Act and *near threatened* on DEPI Advisory list)

Recorded in previous survey (December 2012) by Enics Solutions:

- Golden Sun Moth (*critically endangered* on EPBC Act, *threatened* on FFG Act and *critically endangered* on DEPI Advisory list)

Additional listed fauna species considered to potentially occur in the study area due to the presence of suitable habitat detected during the current survey include:

- Black Falcon
- Corangamite Water Skink (landowner has previously identified this species on site)
- Curlew Sandpiper
- Eastern Great Egret
- Emu
- Fat-tailed Dunnart
- Fork-tailed Swift
- Gull-billed Tern
- Rainbow Bee-eater
- Red-necked Stint
- Royal Spoonbill
- Striped Legless Lizard
- Tussock Skink
- White-throated Needle-tail
- White-bellied Sea-Eagle

All of the native vegetation, Spiny Rice-flower plants and Golden Sun Moth habitat recorded within the study area have potential for use as third party offsets. Targeted surveying for Golden Sun Moth (GSM) is recommended to determine the extent/size of the population of GSM onsite. Considering the structure and health of the habitat observed during the investigation, the study area has the potential to contain 182.36 hectares of Golden Sun Moth habitat.

It is recommended that targeted surveys for all EPBC Act listed flora and fauna species likely to occur be undertaken at the appropriate times of year, to determine the status of these species in the study area, and hence, their potential for third party offsetting. The following species should be given particular attention, given the current and likely future demand for offsets for these species:

- Golden Sun Moth – repeat surveys during suitable weather conditions in November-December (up to the end of January in some years)
- Spiny Rice-flower – April to August during the flowering period
- Fragrant Leek-Orchid - October to January during the flowering period

Targeted surveys for Striped Legless Lizard and Corangamite Water Skink may be undertaken if a proponent requires confirmation of their presence.

It is recommended that the remaining unassessed native vegetation within the study area be assessed for habitat quality which will substantially increase the habitat hectares available to be offered as a third party offset.

It is also recommended that the landholder enter into discussion with DEPI's BushBroker team or Trust for Nature in relation to developing a management plan to improve the vegetation quality. Once a plan is determined the potential improvement gains can be calculated and the value of the offset quantified.

2. INTRODUCTION

s47F engaged Brett Lane & Associates Pty. Ltd. to conduct an assessment for native vegetation and threatened species of a 270 hectare area of land at s47F

s47F Native vegetation located at this property is proposed to be used as offsets to compensate for the approved loss of native vegetation elsewhere.

This investigation was commissioned to provide information on the type, extent and condition of native vegetation in the study area, assess the extent of threatened species habitat in the study area and determine the potential value of the study area as a third party offset site. This report outlines any implications under various national, state and local legislation and policy, including Victoria's Native Vegetation Management Framework (DNRE 2002), referred to herein as the 'Framework.'

Specifically, the scope of the investigation included:

- A review of existing reports;
- A database review of existing information (e.g. DEPI Flora Information System and Atlas of Victorian Wildlife; EPBC Act Protected Matters Search Tool).
- A site survey involving:
 - Characterisation and mapping of remnant native vegetation on the site.
 - Mapping of habitat zones and habitat scoring to ascertain vegetation condition in each habitat zone.
 - Assessment of the likelihood of occurrence of threatened flora and fauna in the area.
 - Compilation of flora species list for the site.
- Preparation of this report including a map of the site showing the results of the assessment.

This report is divided into the following sections:

Section 3 describes the sources of information, including the methods used for the field survey.

Section 4 provides an overview of the characteristics of the study area.

Section 5 presents the investigation results, describing the flora and fauna of the study area.

Section 6 presents the likelihood of occurrence of threatened fauna species

Section 7 discusses the potential of the study area as a third party offset site

Section 8 provides conclusions of the investigation and recommendations for future assessments.

This investigation was undertaken by a team from BL&A, comprising Davide Coppolino (Senior Botanist), Alan Brennan (Senior Ecologist & Project Manager) and Lachlan Marshall (Senior Ecologist & Project Manager).

3. SOURCES OF INFORMATION

3.1. Existing information

Existing information used for this investigation is described below. Note that 'study area' refers to a 270 hectare area of private land located at s47F

Additional up to date information was also sourced from a wider area, termed the 'search region' defined for this assessment as an area with radius ten kilometres from the approximate centre point of the study area of coordinates: latitude 37° 56' 27" S and longitude 143° 02' 05" E. This provided an indication of threatened species and communities in the wider region that have the potential to occur in the study area which could influence the conservation significance of the vegetation assessed.

3.1.1. Flora

A list of the flora species recorded in the search region was obtained from the Viridans Flora Information System (FIS), a database administered by the Department of Environment and Primary Industries (DEPI) (Viridans Biological Databases 2012a). This database search listed all plant species, including rare and threatened plants found in the search region. The Victorian Biodiversity Atlas Flora records were also reviewed. Plant taxonomy used throughout this report follows the FIS standards.

The likelihood of suitable habitat in the study area for nationally threatened flora species was ascertained through a search of the online *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool (DSEWPC 2013) using the same search region.

3.1.2. Ecological Vegetation Classes

Pre-1750 (pre-European settlement) vegetation mapping was reviewed to determine the type of native vegetation likely to occur in the study area. Information on Ecological Vegetation Classes was obtained from published EVC benchmarks. These sources included:

- Relevant EVC benchmarks for the Victorian Volcanic Plain bioregion¹ (DSE 2012a)
- Biodiversity Interactive Maps (DSE 2012b).

3.1.3. Threatened ecological communities

The likelihood of occurrence in the study area of nationally threatened ecological communities was ascertained through a search of the online *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool (DSEWPC 2013) using the abovementioned search region.

Communities of flora and fauna, listed under the FFG Act Threatened List (DSE 2010a) were reviewed to ascertain whether any Victorian threatened ecological communities were likely to occur in the study area.

¹ A bioregion is defined as "a geographic region that captures the patterns of ecological characteristics in the landscape, providing a natural framework for recognising and responding to biodiversity values". In general bioregions reflect underlying environmental features of the landscape (DNRE 1997).

3.2. Field methodology

Field assessments were conducted on the 22nd May and 23rd June 2013. During these assessments, the study area was inspected on foot and areas supporting remnant native vegetation were surveyed and assessed.

Sites in the study area found to support native vegetation and/or habitat for rare or threatened flora and fauna were mapped. Mapping was undertaken through a combination of aerial photograph interpretation and ground-truthing using a hand held GPS (accurate to approximately five metres).

Additional field surveys

Spiny Rice-flower targeted surveys

Based on the identification of 32 Spiny Rice-flower (BL&A, 2013), a targeted survey for Spiny Rice-flower was recommended to be undertaken. The private land manager (s47F) undertook this targeted survey during late May, thereby coinciding with the peak flowering period of the species. It is understood that during this survey transects spaced five metres apart were walked in all areas of land within habitat zones five, six and seven of the study area (s47F pers comm.). As such, the methods used for this survey were undertaken in accordance with the prescriptions for this species as outlined in the DSE Biodiversity Precinct Structure Planning Kit (DSE 2010).

3.2.1. Flora

Incidental records of flora species were made based on intuitive sampling methods within all vegetation types and landforms. Specimens requiring identification using laboratory techniques were collected.

3.2.2. Native vegetation

Native vegetation in Victoria has been defined as belonging to three categories (DNRE 2002):

- Remnant patch
- Scattered trees
- Degraded treeless vegetation
- A description of these is provided below with the prescribed DEPI methods to assess them.

Remnant patch

Remnant patches of native vegetation comprise indigenous plant species considered part of a clearly definable EVC and are defined by the DEPI as:

- An area of native vegetation, with or without trees, where at least 25% of the understorey cover is indigenous (excluding bare ground), and/or
- "A group (i.e. three or more) of trees where the tree canopy cover is at least 20%" (DSE 2007a).

Remnant patch vegetation is assessed using the habitat scoring or habitat hectare method (Parkes *et al.* 2003; DSE 2004) whereby components of native vegetation (e.g. tree canopy, understorey and ground cover) are assessed against a DEPI-issued EVC

benchmark (see appendices) that described the notional pre-European condition of that EVC. The score effectively measures the percentage resemblance of the vegetation to its original condition.

The habitat hectare score assists in defining the value of remnant native vegetation for assessing its conservation significance and for calculating offsets if removal of native vegetation is approved.

Scattered trees

DSE (2007a) define scattered trees as indigenous canopy trees with a diameter at breast height (1.3 metres) (DBH) greater than ten centimetres “within an area where at least 75% of the total understorey plant cover is introduced vegetation and the overall canopy cover for a group (i.e. three or more) of trees is less than 20%”.

Scattered trees are counted and their DBH measured. The size class of scattered trees is based on the large tree DBH in the relevant benchmark for the EVC to which it once belonged.

Degraded treeless vegetation

Degraded treeless vegetation comprises all other vegetation (DSE 2007a), either:

- “Minor treeless vegetation” which is vegetation that does not have more than 25% understorey cover that is native or does not contain any canopy trees, or
- “Modified treeless vegetation” which is vegetation that has more than 25% understorey cover that is native, but is now dominated by species that are unlikely to have originally dominated the site. This may include such situations as former grasslands that have had a history of cropping, and now have an extremely modified cover consisting of a few opportunistic, primary colonising native grass species generally amongst exotic species, with little other indigenous diversity.

Minor and modified treeless vegetation cannot be used for offsetting the removal of native vegetation.

3.2.3. Threatened ecological communities

The study area was assessed against identification criteria and condition thresholds for relevant listed ecological communities, found to potentially occur in the study area.

3.3. Limitations of field assessment

Where feasible, all efforts are made to schedule flora field surveys in optimal weather conditions and times of year. Nevertheless, field surveys usually fail to record all species present for various reasons, including the seasonal absence of some species and short survey duration. Rare or cryptic species are often missed in short surveys.

Surveying was carried out in late autumn, when many annual and spring-emergent plant species may have been absent or in the senescent stage of their life-cycle and lacking essential identification characteristics. Additionally, the study area is being grazed by livestock which may remove some of the identifying features of a plant or graze smaller individuals to an unidentifiable size. The timing of the survey and condition of vegetation was otherwise considered suitable to ascertain the extent and quality of native vegetation and the impacts of previous vegetation removal events.

Results of the surveying as undertaken by BL&A are provided in this report. Previous surveying at the site has been undertaken by various ecologists including Australian Ecosystems and Enics Solutions. Further records of flora and fauna have been made by the landowners. Results provided in this report from surveying, other than that carried out by BL&A are clearly noted as such.

Wherever appropriate, a precautionary approach has been adopted in the discussion of implications. That is, where insufficient evidence is available on the occurrence or likelihood of occurrence of a species, it is assumed that it could be in an area of suitable habitat. The implications under legislation and policy are considered accordingly.

4. SITE DESCRIPTION

The study area for this investigation (Figure 1) is 270 hectares of private land located at s47F located approximately 200 kilometres west of Melbourne's CBD. It is bordered by neighbouring private agricultural property to the south, east and west.

The current investigation found that the study area supported intact remnant native vegetation, much of which was of a relatively high quality. Approximately 200 hectares of native vegetation in the form of *Heavier-soils* Plains Grassland (EVC 132_61), Plains Grassy Wetland (EVC 125), Stony Knoll Shrubland (EVC 649), Creepline Tussock Grassland (654), and Brackish Wetland (EVC 656) was recorded. The remainder supported introduced pasture and weeds.

The study area supported soils of volcanic origin on a varied undulating landscape. Low rocky ridges, representing more recent volcanic flows (or 'barriers' as they are locally termed), occurred throughout the study area, though the vegetation on these landscape features was largely degraded by introduced pastoral species. Other prominent landscape features were the central drainage line which dissected the study area in a general north-south orientation as a shallow valley; and Martins Lake, a low lying brackish saline lake located in the east of the study area. The remainder of the study area, which was the vast majority in area, was relatively flat, or gently undulating, and it was here that the vast majority of intact remnant native vegetation occurred.

Observed vegetation in those parts of the study area dominated by intact remnant native vegetation consisted of a matrix of various indigenous grass species, which was interspersed with a number of indigenous forbs in the gaps between grass tussocks. Weed cover in these areas was low. The remainder of the study area was dominated by a variety of pasture grasses and typical agricultural and environmental weeds. Annual weed cover is high in the area mostly utilised by stock. A more detailed account of remnant native vegetation recorded in the study area is provided below in Section 5.1.2.

The landscape context of the study area was considered to be moderately connected at the site scale and poorly connected at the landscape scale in terms of habitat linkages and the proximity of nearby large areas of native vegetation. Although large areas of native grassland exist in the area they are generally fragmented, and interspersed with large areas of cropland or much degraded native vegetation.

The study area has been subject to sheep grazing for many decades. It is currently grazing on a seasonal basis with livestock rotated throughout the area to assist in conservation of the native vegetation. The surrounding land predominantly supports similar agricultural practises although cropping makes up a larger portion of the surrounding area where the topography is flatter and more suited to such activities.

Discussions with the land owners s47F indicate that the study area has never been cropped or subjected to pasture improvement actions. Importantly, biomass at the study area is currently being effectively managed through intermittent grazing by sheep and few cattle. It is understood that areas are only grazed for a 1-2 days with resting periods of 60 to 90 days without grazing.

The study area lies within the Victorian Volcanic Plain bioregion and falls within the Glenelg Hopkins catchment. It is currently zoned Farming Zone (FZ) in the Moyne Planning Scheme.



Legend

Study Area

Native Vegetation

- Creekline Tussock Grassland
- Plains Grassland
- Plains Grassy Wetland (EVC 125)
- Stony Knoll Shrubland
- Wetland Formation

Unassessed

Threatened Species

- Brackish Plains Buttercup
- Fragrant Leek Orchid Population
- Spiny Rice-flower

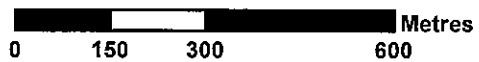


Figure 1: Study Area and Native Vegetation

Project: S47F

Client: S47F

Project No.: 12155 Date: 18/06/2013 Created By: M. Ghasemi / L. Marshall



Brett Lane & Associates Pty. Ltd.
Ecological Research & Management



● Experience 25 Burwood Rd, Hawthorn ph (03) 9615 2111 | fax (03) 9815 2686
● Knowledge PO Box 74, Richmond blane@ecologicalresearch.com.au
● SOLUTIONS VIC 3121 Australia www.ecologicalresearch.com.au

5. ASSESSMENT RESULTS

5.1. Vegetation assessment

5.1.1. Flora species

During the field assessment 86 plant species were recorded. Of these, 57 (66%) were indigenous and 29 (34%) were introduced or non-indigenous native in origin (Appendix 1).

FIS records (Viridans Biological Databases 2012a) and the EPBC Protected Matters Search Tool (DSEWPC 2013) indicates that within the search region there are records of, or there occurs potential suitable habitat for, 20 rare or threatened flora species. Of these, 11 species were listed under the federal EPBC Act, 10 on the state *Flora and Fauna Guarantee Act 1988* (FFG Act) and 20 on DEPI's Advisory List for Rare and Threatened Flora (DSE 2007b). Three rare or threatened flora species were detected during the field survey for this investigation. These were:

Spiny Rice-flower

- BL&A recorded 32 Spiny Rice-flower (BL&A, 2013) during surveying at the site. These are shown in Figure 1. As a result of this, targeted survey for Spiny Rice-flower was recommended to be undertaken.
- The private land manager (s47F) undertook a survey during late May, and recorded 152 Spiny Rice-flower plants, all of which were mapped using a handheld GPS. It is understood that the whole area has not been surveyed and additional Spiny Rice-flower plants are considered likely to occur.
- Listed as *critically endangered* under the EPBC Act, *threatened* under the FFG Act and *endangered* on DEPI's advisory list
- Recorded in Habitat Zones PG5 and PG6, it is likely that more occur in these zones and other high quality habitat zones
- The extent of this species in the study area should be determined through further targeted surveying in suitable habitat during its regular flowering period – between April and August.

Brackish Plains Buttercup

- Listed as rare on DEPI's advisory list
- Two individuals were recorded in Habitat Zone BW2, it is likely that more occur in this and higher quality habitat zone BW1

Purple Blown Grass

- Listed as rare on DEPI's advisory list
- Numerous individuals were recorded in Habitat Zone BW1. It is also likely that more occur in other higher quality habitat zones

Likelihood of occurrence in the study area of other threatened species listed under the FFG Act or the EPBC Act was assessed from the review of existing information and habitat suitability in the study area.