



HEPBURN SHIRE COUNCIL
ORDINARY MEETING OF COUNCIL
PUBLIC MINUTES

Tuesday 21 December 2021

Council Chamber
76 Vincent Street Daylesford VIC 3460

6:00PM

A LIVE STREAM OF THE MEETING CAN BE VIEWED
VIA [COUNCIL'S FACEBOOK PAGE](#)

Confirmed at the Ordinary Meeting of Council held 15 February 2022

A handwritten signature in black ink, appearing to read "Tim Drylie".

Chair, Cr Tim Drylie, Mayor

MINUTES

Tuesday 21 December 2021

Council Chamber

76 Vincent Street Daylesford VIC 3460

Commencing at 6:00PM

TABLE OF CONTENTS

1	ACKNOWLEDGEMENT OF TRADITIONAL OWNERS	5
2	OPENING OF MEETING	5
3	APOLOGIES	5
4	DECLARATIONS OF CONFLICTS OF INTEREST	6
5	CONFIRMATION OF MINUTES	6
6	NOTICES OF MOTION	6
6.1	NOTICE OF MOTION	6
7	ITEMS OF URGENT BUSINESS	9
8	COUNCILLOR AND CEO REPORTS	10
8.1	MAYOR'S REPORT	10
8.2	COUNCILLOR REPORTS	10
8.3	CHIEF EXECUTIVE OFFICER'S REPORT	14
9	PUBLIC PARTICIPATION TIME	19
9.1	PETITIONS	20
9.1.1	PUBLIC PETITION	20
9.2	PUBLIC QUESTIONS	20
9.3	REQUESTS TO ADDRESS COUNCIL	22
10	STATUTORY PLANNING	24
10.1	PA 3141 - USE AND DEVELOPMENT OF THE LAND FOR A MOUNTAIN BIKE TRAIL (INFORMAL OUTDOOR RECREATION) AND THE REMOVAL OF NATIVE VEGETATION - CRESWICK TRAILS	24

10.2 AMENDMENT C82HEPB OLD HEPBURN HOTEL INDEPENDENT PLANNING PANEL HEARING OUTCOMES AND NEXT STEPS	856
10.3 PA 3353 – 66 HIGH STREET TRENTHAM - ALTERATIONS AND EXTENSIONS TO AN EXISTING COMMUNITY FACILITY, INCLUDING PARTIAL DEMOLITION, REMOVAL OF TWO TREES, REDUCTION IN CAR PARKING REQUIREMENT, AND ALTERATION OF ACCESS TO ROAD ZONE CATEGORY	1003
11 STRATEGIC PLANNING	1051
12 A RESILIENT AND SUSTAINABLE ENVIRONMENT	1051
12.1 SUSTAINABLE HEPBURN - NOMINATIONS RECEIVED FOR SUSTAINABLE HEPBURN COMMUNITY REFERENCE GROUP	1051
13 A HEALTHY, SUPPORTED, AND EMPOWERED COMMUNITY	1063
13.1 COMMUNITY GRANTS PROGRAM 2021 2022 ROUND 2.....	1063
14 EMBRACING OUR PAST AND PLANNING FOR OUR FUTURE.....	1072
14.1 CONTRACT AWARD HEPBU.RFT2021.138 -TRENTHAM COMMUNITY HUB.....	1072
14.2 DAYLESFORD MACEDON RAIL TRAIL / DAYLESFORD SPA COUNTRY RAIL EXTENSION FEASIBILITY STUDY.....	1085
15 DIVERSE ECONOMY AND OPPORTUNITY.....	1154
15.1 AWARDDING OF CONTRACT - HEPBU.RFT2021.216 - BULLARTO RAILWAY STATION BUILDING.....	1154
16 A DYNAMIC AND RESPONSIVE COUNCIL	1163
16.1 INSTRUMENTS OF APPOINTMENTS TO AUTHORISED OFFICERS UNDER THE PLANNING AND ENVIRONMENT ACT 1987	1163
16.2 CHIEF EXECUTIVE OFFICER (CEO) EMPLOYMENT AND REMUNERATION POLICY.....	1167
16.3 PROCUREMENT POLICY 2021	1193
16.4 RISK MANAGEMENT FRAMEWORK	1222
16.5 RECORDS OF COUNCILLOR ATTENDANCE	1257
17 CONFIDENTIAL ITEMS.....	1308
17.1 CLOSURE OF MEETING TO MEMBERS OF THE PUBLIC.....	1308
18 CLOSE OF MEETING	1311

BRADLEY THOMAS

CHIEF EXECUTIVE OFFICER

Tuesday 21 December 2021

CONDUCTING COUNCIL MEETINGS VIRTUALLY

Council continues to be guided by government directives and wants to do the right thing for the health of our community during the COVID-19 pandemic. In line with these directives, the public are unable to attend this meeting in person. This meeting is being held virtually to protect the health and wellbeing of Councillors, Council Officers, and the community.

In the spirit of open, transparent and accountable governance, this Ordinary meeting will be live-streamed on Council's Facebook page. The meeting will also be recorded and made available on Council's website as soon as practicable after the meeting.

Pursuant to the Ministerial Guidelines, should technology problems be encountered and we are unable to broadcast this meeting, the meeting will be adjourned until resolution or postponed.

Council's Ordinary meeting will be conducted tonight in accordance with:

- The Local Government Act 2020
- The COVID-19 Omnibus (Emergency Measures) Act 2020
- The Minister's Good Practice Guideline MGPG-1: Virtual Meetings
- Council's Governance Rules; and
- The Hepburn Shire Council Councillor Code of Conduct.

1 ACKNOWLEDGEMENT OF TRADITIONAL OWNERS

Hepburn Shire Council acknowledges the Dja Dja Wurrung as the Traditional Owners of the lands and waters on which we live and work. On these lands, Djaara have performed age-old ceremonies of celebration, initiation and renewal. We recognise their resilience through dispossession and it is a testament to their continuing culture and tradition, which is strong and thriving.

We also acknowledge the neighbouring Traditional Owners, the Wurundjeri to our South East and the Wadawurrung to our South West and pay our respect to all Aboriginal peoples, their culture, and lore. We acknowledge their living culture and the unique role they play in the life of this region.

2 OPENING OF MEETING

COUNCILLORS PRESENT: Cr Brian Hood, Cr Don Henderson, Cr Jen Bray, Cr Juliet Simpson, Cr Lesley Hewitt, Cr Tessa Halliday, Cr Tim Drylie

OFFICERS PRESENT: Mr Bradley Thomas - Chief Executive Officer, Mr Andrew Burgess - Director Organisational Services, Mr Bruce Lucas - Director Infrastructure and Delivery, Ms Leigh McCallum - Director Community and Development, Mr Chris Whyte – Manager Information and Communication Technology, Ms Krysten Forte - Manager People and Governance, Ms Bronwyn Southee – Manager Planning and Development

The meeting opened at 6.01pm.

STATEMENT OF COMMITMENT

“WE THE COUNCILLORS OF HEPBURN SHIRE
DECLARE THAT WE WILL UNDERTAKE ON EVERY OCCASION
TO CARRY OUT OUR DUTIES IN THE BEST INTERESTS OF THE COMMUNITY
AND THAT OUR CONDUCT SHALL MAINTAIN THE STANDARDS OF THE CODE OF
GOOD GOVERNANCE
SO THAT WE MAY FAITHFULLY REPRESENT AND UPHOLD THE TRUST PLACED IN THIS
COUNCIL BY THE PEOPLE OF HEPBURN SHIRE”

3 APOLOGIES

Nil

4 DECLARATIONS OF CONFLICTS OF INTEREST

Cr Lesley Hewitt declared a general conflict of interest for Confidential item 2.3 Community Awards Nominations

Cr Tessa Halliday declared a general conflict of interest for Confidential item 2.3 Community Awards Nominations

Cr Juliet Simpson declared a general conflict of interest for Item 8 Leave of Absence

Cr Tim Drylie declared a general conflict of interest for Item 13.1 Community Grants Program 2021/2022 and item 8 Leave of Absence.

5 CONFIRMATION OF MINUTES

RECOMMENDATION

That the Minutes of:

- *The Ordinary Meeting of Council held on 23 November 2021 and;*
- *The Statutory Meeting of Council held on 16 November 2021*

(as previously circulated to Councillors) be confirmed.

MOTION

That the Minutes of:

- *The Ordinary Meeting of Council held on 23 November 2021 and;*
- *The Statutory Meeting of Council held on 16 November 2021*

(as previously circulated to Councillors) be confirmed.

Moved: Cr Tessa Halliday

Seconded: Cr Jen Bray

Carried

6 NOTICES OF MOTION

6.1 NOTICE OF MOTION

PROCEDURAL MOTION -RE ORDERING OF COUNCIL BUSINESS

That Council, Pursuant to Chapter 2, Division 3, part 19 of the Hepburn Shire Council Governance Rules, resolve to rearrange the order of business for the Ordinary Council meeting 21 December 2021 be changed to reflect that item 9 – Public Participation Time be brought forward and addressed prior to item 6 – Notice of motion.

Moved: Cr Jen Bray
Seconded: Cr Tessa Halliday
Lost

The following Notice of Motion was put forward by Cr Jen Bray on 13 December 2021.

BACKGROUND

At the Ordinary Council Meeting on 23 November 2021, a resolution of Council was determined that in part requested the Chief Executive Officer (CEO) to undertake a process to sell, through a public process, the Rex building.

A Notice of Motion has been proposed by Cr Bray as detailed below that seeks to request additional information gathering to assist in the future decision making of Council in relation to the sale of the Rex Building.

MOTION

That Council:

1. *Defers action on the sale of the Rex building until -
 - a) *Officers prepare a comprehensive report on current Council-owned facilities and other possible properties, and provide options to Council that consider staff accommodation needs, and access to community facilities.*
 - b) *Officers prepare a report outlining the options available to optimise Council's service delivery to the community through the strategic deployment of Council staff across the Shire.**
2. *Conducts a community, staff and stakeholder engagement process in accordance with council's Community Engagement Policy, to inform the*

reports noted in points 1(a) and 1(b). This consultation will necessitate the provision of clear and relevant background information to all stakeholders.

- 3. Requests officers to prepare the reports and conduct community input to Council as soon as practicable in 2022.*
- 4. Commits to a final decision on the Hepburn Hub project at a future council meeting in 2022 once the findings of the community engagement and the officer's reports have been evaluated.*
- 5. Adequately funds the project to undertake the detailed analysis and community engagement.*

Moved: Cr Jen Bray

Seconded: Cr Tessa Halliday

Lost

Division

For: Cr Tessa Halliday, Cr Jen Bray, Cr Tim Drylie

Against: Cr Don Henderson, Cr Brian Hood, Cr Lesley Hewitt, Cr Juliet Simpson

7 ITEMS OF URGENT BUSINESS

Nil

8 COUNCILLOR AND CEO REPORTS

8.1 MAYOR'S REPORT

Councillor Tim Drylie, Creswick Ward

Cr Tim Drylie declared a material conflict of interest in relation to item 8 leave of absence

MOTION:

That Councillor Bray be appointed as temporary chairperson.

Mover: Cr Don Henderson

Seconder: Cr Lesley Hewitt

Carried

Cr Tim Drylie left the meeting at 6:28pm

MOTION:

That Council resolve to grant a leave of absence to Councillor Tim Drylie to take a week's leave 15 January 2022 to 23 January 2022.

Moved: Cr Don Henderson

Seconded: Cr Lesley Hewitt

Carried

Cr Tim Drylie returned to the meeting at 6:29pm

Cr Juliet Simpson declared a material conflict of interest in relation to item 8 leave of absence.

Cr Juliet Simpson left the meeting at 6:30pm

MOTION:

That Council resolve to grant a leave of absence to Councillor Juliet Simpson for 22 December 2021 to 24 January 2022 inclusive.

Moved: Cr Tessa Halliday

Seconded: Cr Don Henderson

Carried

Cr Juliet Simpson returned to the meeting at 6:31pm

8.2 COUNCILLOR REPORTS

Councillor Brian Hood, Coliban Ward

Two important Council-sponsored events that I have participated in over the past month were the Walk Against Violence initiative and Dr Rob Gordon's presentation to the community on recovery from the traumatic storm event. Council should be proud of its support for such worthy causes. A few weeks ago the Project Advisory

Group for the Trentham Community Centre project conducted an open day for the community at the Mechanics Hall. This event was to reminisce and celebrate the hall's colourful history and was a fun day of entertainment of many kinds. I was also proud to present Council's Citizens awards to graduating grade six students at Bullarto and Trentham primary schools. It was delightful to see students, parents and teachers able to end the school year on a positive note...following numerous lockdowns and home schooling.

Councillor Juliet Simpson, Holcombe Ward

On 24th November I attended the Daylesford Child Care Centre AGM where Councilor Hewitt showed me how to chair an election of new Office bearers.

On the 25th November I did the Daylesford 16 Days of Activism walk around Daylesford demonstrating against violence towards women and children.

I also attended a storm recovery community session by Dr Rob Gordon at the Trentham mechanics Institute. Rob emphasized the importance of listening to a whole story from a person that has been traumatized by prompting them to speak about the whole event.

I attended a zoom Webinar for all council Staff and Councilor's called "Looking After your mental Health".

On the 29th November I chaired part of the Glenlyon Upper Loddon Landcare AGM for the election of new Office Bearers.

On the 2nd December I attended a Disability Information night which was hosted by Rotary Daylesford

On the 9th December I attended a Goulburn Murray Water Information Session at the Glenlyon Hall where Matt Pethybridge(the water and Streams manager) and Andrew(a senior Hydrologist) spoke to a full hall of about 40 people.

On 13th December I chaired the Mineral Springs Reserve Advisory Committee meeting.

Councillor Jen Bray, Birch Ward

Tabled her report

Councillor Lesley Hewitt, Birch Ward

This month has seen two significant days of acknowledgement – International Day of People with Disabilities on 3rd December and International Day of Volunteers on 5th December. Both those days have significance for me personally in my role as a coach and secretary of Daylesford Riding for Disabled, and this year, also in my responsibilities as the Chair of Council's Disability Advisory Committee and as a Birch ward Councillor. The theme this year for International Day of People with Disabilities was leadership for people with disabilities and I want to take this opportunity to put on the record my thanks for those members of the DAC who are demonstrating leadership and of course undertaking a voluntary role in giving up their time to serve on the DAC. Darren Manning, Andrew Brown, Graeme Downie, Kaylene Powell,

David Moten, Steve Kelly, John Condon and new members Lainey Curr, Peter Waters and Fiona Porter. All of whom are living this year's theme of leadership in our community. Our Council Plan talks about being inclusive to all and I would just like to make the point that we still have some way to go in the Shire towards making our public places, sport and recreational Clubs and employment opportunities truly inclusive.

Regarding International Day of Volunteers, you will see from my tabled list of activities that I have attended a number of AGM's this month. All bar one, run entirely by volunteers, and whose varied aims and activities make this a better place to live for all of us. What was clear from the financial statements at all of the AGM's that all have made a loss of varying sizes during the financial year 2020-2021, due to the impact of COVID and either the cancellation of events, activities and fund-raising opportunities. But each of these six local organizations and the volunteers who run them were all actively planning to continue and to press on. As a community, we are fortunate indeed to have these people who don't bemoan or blame others for the difficult circumstances that they find themselves in, but just get on with taking responsibility for their various organizations. I wish all of them and all residents and ratepayers of Hepburn Shire a safe and joyous Christmas and holiday period, however that is relevant for everyone to celebrate and look forward to continuing to work for and with residents and rate payers in 2022.

November/December

Councillor Briefings 30/11/21, 7/12/21, 14/12/21, 20/12/21

Daylesford Men's Shed 20/12/21

Hepburn Shire All Staff Meeting 17/12/21

Boundary walk Lake Daylesford with Cr Bray and Mr Lucas 16/12/21

Disability Advisory Committee Christmas Acknowledgement 16/12/21

Meeting with Catherine King MP re Daylesford Hospital Upgrade Committee 15/12/21

Daylesford Visitors Centre Volunteer Recognition 9/12/21

Central Highlands Rural Health AGM 9/12/21

Daylesford Agricultural Society AGM 8/12/21

Daylesford Horticultural Society AGM 7/12/21

Daylesford Hospital Upgrade Sub-Committee Meeting 6/12/21

Rural South-Central MAV Meeting 6/12/21

International Day of Volunteers 5/12/21

Sprung Circus Performance 4/12/21

Cresfest Launch 4/12/21

International Day of Disability Video 3/12/21

Artisan Agriculture Event 2/12/21

International Day of Disability Rotary Club of Daylesford Event 2/12/21

Hepburn U3A AGM 30/11/21

Daylesford Historical Society AGM 28/11/21

MAV Representative's Meeting 26/11/21

Daylesford Hospital Upgrade Committee Meeting 25/11/21

16 Days of Activism Walk 25/11/21

Daylesford Community Child Care AGM 24/11/21

Meeting and phone calls with residents on various matters including alleged breaches of planning permits and Council November decision to not award Hepburn Hub at the Rex tender.

Councillor Tessa Halliday, Cameron Ward

Presented a verbal report

Councillor Don Henderson, Creswick Ward

Presented a verbal report

RECOMMENDATION

That Council receives and notes the Mayor's and Councillors' reports.

MOTION

That Council receives and notes the Mayor's and Councillor Reports.

Moved: Cr Juliet Simpson

Seconded: Cr Don Henderson

Carried

8.3 CHIEF EXECUTIVE OFFICER'S REPORT

The Chief Executive Officer Report informs Council and the community of current issues, initiatives and projects undertaken across Council.

- Nil

CHIEF EXECUTIVE OFFICER UPDATE

With the end of the year and the office closure fast approaching, this is my last CEO report for 2021.

Reflecting on the past year I'm incredibly proud of what the organisation has achieved in what have been very trying times. We've dealt with multiple COVID-19 lockdowns and the Shire was significantly impacted by severe storm events which have anticipated recovery costs in the order of \$10-12M and a 2-year clean-up program.

A key highlight of the year for me was being appointed into the Interim CEO role and being appointed as the permanent CEO of Hepburn Shire Council. I'm incredibly proud of what we achieve as a small rural council - and our achievements are often acknowledged by our State and Local government colleagues complementing our achievements and commenting that we bat well above our weight for a small council.

Some of the significant milestones which Council has achieved over the past year include:

- Continued business operations throughout multiple lockdowns, promoting social distancing and COVID-19 restrictions for visitors to the Shire
- Awarded Coronavirus Community Support Grants
- Conducted Citizenship ceremonies
- Launched Hepburn Together
- Adopted a Community Engagement Policy to guide community input into Council decisions and projects and significantly improved our engagement with the community
- Opened a customer service desk at the Trentham Library to provide easier access to Council services for people living in and around the Coliban Ward
- Conducted and promoted several mental health and connectiveness initiatives during lockdown
- Launched Go Local initiative to encourage people to support local business
- Adopted the 2020/21 budget outlining investment in capital works and the delivery of more than 100 services for the community
- Adopted the 10-year Community Vision & 4-year Council Plan (including the Municipal Public Health and Wellbeing Plan) and the Financial Plan 2021-2031
- Promotion of the Central Goldfields world heritage bid
- Support and promotion of Artisan food producers and growers

- Adopted a Masterplan for the Trentham Sportsground and designs for the pavilion redevelopment
- Ongoing advocacy work for the Western Victorian Transmission network project to place the transmission lines underground
- Roadside slashing program of 600kms of road
- Completed construction of the Trentham Early Learning Centre extension
- Adopted the C80hepb Planning Scheme amendment and submitted the amendment to
- Held the Hepburn Together Community Panel, made up of 40 community members, to provide input into the development of the Council Plan and Community Vision.
- Adopted an Affordable Housing Policy.
- Awarded Community Grants Program funding committing funds for projects across several organisations.
- Signed a Memorandum of Understanding with Central Highlands Rural Health Services to work together to support and improve the health and wellbeing of the community.
- Hosted the ChillOut Youth Ball, for people aged 12 to 17 years. The event was free and held in partnership with Daylesford College Pride, Brigayed, Mount Alexander Shire and Macedon Ranges Shire youth teams.
- Offered free Youth Mental Health First Aid training for young people, along with sessions for parents, workers and volunteers.
- Announced SUEZ as the new kerbside collection provider from 1 July 2021.
- Adopted an Asset Management Plan and Road Upgrade Policy.
- Launched a monthly e-newsletter, Hepburn Life, to share Council information with the community.
- Victorian State Government announced it would fund a \$3.5M grant towards construction of the Trentham Community Hub as part of its Regional Infrastructure Fund.
- Received confirmation that Sport and Recreation Victoria will fund \$2.062 million towards the redevelopment of Trentham Sportsground Reserve Pavilion as part of the Community Sport Infrastructure Stimulus Program.
- Received a \$500,000 grant from the Victorian Government's Regional Infrastructure Fund to help create a working museum at Bullarto Station, in partnership with the Daylesford Spa Country Railway, \$500,000 to make a series of improvements to the Wombat Hill Botanic Gardens, in partnership with the Friends of Wombat Hill Botanic Garden and \$500,000 to undertake works at the Creswick Town Hall.
- Signed on to the Victorian Energy Collaboration (VECO), the largest ever emissions reduction project by local government in Australia.
- Held Hepburn Planning Scheme Amendment information sessions to explain the amendment and the impact on the Shire.

- Awarded more than \$25,000 in funding to 13 community groups for projects that build social connection and encourage physical activity as part of Council's Reactivate Hepburn grants.
- Hosted the Daylesford Skate Park Competition 2021, which included free tournaments for scooter, BMX and skateboard.
- Council reached an in-principle decision for the future of Aged and Disability services.
- Adopted a Hardship Policy.
- Completed remedial works to upgrade the Clunes Town Hall, including repairs to the Borough office, Court House, bio room (projector room), building façade, roof and more. The project was funded by Council (\$428,000) and a grant (\$317,000) from Regional Development Victoria's Living Regions Living Suburbs program.
- Held a farm walk for producers, growers and farmers on regenerative agriculture as part of Council's Artisan Agriculture Project.
- Began community engagement to develop the ten-year Aquatics Strategy.
- Invited people to apply to join a Gender Equity Advisory Committee, to provide advice on improving gender equity within Council and the community.
- Established a Relief Centre and led recovery support following the severe weather event, which impacted more than one-third of the Shire, primarily around Trentham and surrounds.
- Announced \$24,000 in support for seven community-led projects to improve biodiversity in the Shire through the 2020/2021 Biodiversity Grants.
- Finalised the concept design plans for the \$4.62 million Trentham Community Hub.
- Received a Highly Commended Award for the film series 'Peaks, Wetlands and Rivers' at the HART Awards (Helping to Achieve Reconciliation Together) in the Local Government category.
- Shortlisted for two LGPro Awards for Excellence - Peaks, Wetlands and Rivers in the First Nations Community Partnership Initiative category and Manna Gum Frontier Wars Memorial Avenue in the Outstanding Small Rural Council Initiative category.
- Invited community feedback on the management of dogs and cats as part of the development of the new Domestic Animal Management Plan.
- Council made the decision not to proceed with Hepburn Hub at the Rex within the Rex Building and instructed Officers to proceed with the sale of the building

Staff have returned to working in the office with formal work from home arrangements continuing as approved by Managers and subject to business requirements.

Some of the meetings I have attended this month include:

- Central Highlands Regional Partnership Transport Connectivity meeting
- Executive Team meetings

- Aged Care Reforms staff meeting
- Procurement Policy Review workshop
- Storm recovery community session with Dr Rob Gordon
- Storm advocacy meetings
- Meetings with my direct reports
- Meeting with the Mayor and Catherine King
- Mental health webinar with Wayne Schwass, PukaUp
- Creswick Trails meetings
- LGPro CEO Forum
- MAV CEO Forum
- MAV Regional Meeting – Rural South Central
- Executive Teams meeting between Hepburn Shire Council and City of Ballarat
- Media interviews
- Central Victorian Goldfields World Heritage Bid media event in Clunes
- MAV Representatives and CEO's forum
- Daylesford Macedon Rail Trail feasibility study meeting
- Catch up meeting between the CEO, Mayor and Deputy Mayor
- Quarterly catch up between Executive Team, Managers and Coordinators
- Central Highlands Regional Partnership Quarterly meeting
- Council briefings and meetings
- Quarterly Executive Team meeting to review progress on the Annual Plan
- Dept of Jobs, Precincts and Regions CEO's and MAV Forum
- Leadership Team (LT) meeting and Leading Teams Leadership workshop
- Western Vic Transmission Network Project (WVTNP) meetings
- Rural Councils Victoria (RCV) AGM
- Loddon Campaspe Councils CEO meeting
- Storm Advocacy Meeting between Hepburn, Maceon Ranges and Moorabool Shire Councils, Dept of Transport, DELWP, Bushfire Recovery Victoria
- CEO/Councillor one-on-one meeting
- Central Highlands Councils Integrated Water Management forum meeting
- Meeting with the Victorian Planning Authority to introduce our team and discuss Planning Activities we are undertaking.
- Audit & Risk Committee Meeting
- Hepburn Together Project Control Group debrief meetings with Projectura

In 2022 I look forward to working with Councillors and leading the organisation in continuing a program of change that we have been enacting the last couple of years, where we are improving our governance, community engagement and ensuring our community and customers are always forefront to our decision making and implementation of our Council Plan (incorporating the Municipal Health and Wellbeing Plan)

I wish you and your families a safe and happy festive season and I look forward to working with you in 2022.

RECOMMENDATION

That Council receives and notes the Chief Executive Officer's Report for December 2021.

MOTION

That Council receives and notes the Chief Executive Officer's Report for December 2021.

Moved: Cr Don Henderson

Seconded: Cr Lesley Hewitt

Carried

9 PUBLIC PARTICIPATION TIME

This part of the Ordinary Meeting of Council allows for the tabling of petitions by Councillors and Officers and 30 minutes for the purposes of:

- Tabling petitions
- Responding to questions from members of our community
- Members of the community to address Council

Community members are invited to be involved in public participation time in accordance with Council's Governance Rules.

Individuals may submit written questions or requests to address Council to the Chief Executive Officer by 10:00am the day before the Council Meeting.

Some questions of an operational nature may be responded to through usual administrative procedure. Separate forums and Council processes are provided for deputations or for making submissions to Council.

Questions received may be taken on notice but formal responses will be provided to the questioners directly. These responses will also be read out and included within the minutes of the next Ordinary Meeting of Council to make them publicly available to all.

BEHAVIOUR AT COUNCIL MEETINGS

Council supports a welcoming, respectful and safe environment for members of the community to participate at Council Meetings regarding issues that are important to them. Council's Governance Rules sets out guidelines for the Mayor, Councillors, and community members on public participation in meetings. It reinforces the value of diversity in thinking, while being respectful of differing views, and the rights and reputation of others.

Under the Governance Rules, members of the public present at a Council Meeting must not be disruptive during the meeting.

Respectful behaviour includes:

- Being courteous when addressing Council during public participation time and directing all comments through the Chair
- Being quiet during proceedings
- Being respectful towards others present and respecting their right to their own views

Inappropriate behaviour includes:

- Interjecting or taking part in the debate
- Verbal abuse or harassment of a Councillor, member of staff, ratepayer or member of the public
- Threats of violence

9.1 PETITIONS

9.1.1 PUBLIC PETITION

Public petition in relation to the Creswick Trails Project received from Bernadette Cheesman – this Petition has received 20 signatures thus far.

Petition details: Hepburn Shire Council's concept, development, planning and processing for the Creswick Trails Project (CTP) are significantly and demonstrably flawed and deficient. There is no public confidence in the CTP Planning Permit (PP) process. The development of the CTP will cause significant net detrimental and permanent impact and injury to public land, public values and the general public.

We submit that:

1. in the public interest, Hepburn Shire Council not approve the Creswick Trails Project planning permit application; and
2. move that the CTP Planning Permit not be approved and the CTP be abandoned. The impacts to public values will be too great and are objected to in the public interest.

(note 1: we refer to and generally agree with all CTP planning permit application public objection submissions).

(note 2: as the CTP planning permit application will be decided at council meeting on 21 December 2021, we submit that this petition be presented to and be urgently heard by council at the same council meeting.)

MOTION

That Council:

1. *Receive and note the petition in relation to item 10.1 PA 3141 - use and development of the land for a mountain bike trail (informal outdoor recreation) and the removal of native vegetation - Creswick Trails, containing 20 signatures thus far*
2. *Refers the Petition to the Director Community Development for response to the lead petition writer noting that the petition is in relation to PA3141 which will be considered at tonight's Ordinary Council Meeting - 21 December 2021.*

Moved: Cr Don Henderson

Seconded: Cr Lesley Hewitt

Carried

9.2 PUBLIC QUESTIONS

The Chair will read out responses to questions taken on notice from the last ordinary meeting, and then read and respond to new questions received in accordance with Council's Governance Rules.

Question 1 – Adam Fawcett

At last month's council meeting, Councillor's Hood, Simpson, Henderson and a Councillor from my own ward of Birch, Councillor Lesley Hewitt, voted on a motion to discontinue action on the Hepburn Hub project at The Rex. The primary concern given by all four of these Councillor's related to the financial viability of the project. Rather than simply expressing the view that "many people in the community will no doubt be disappointed by this decision", given the lack of public consultation made prior to this decision, can these four councillors please advise residents and ratepayers what other actions they took to consider the long-term ramifications of this decision from both community and cultural viewpoints, rather than just an economic one.

Response – Mayor Tim Drylie

We received a number of detailed briefings on the project and the implications of progressing or not progressing the project.

It is acknowledged that parts of our community support the decision and certainly parts of our community are disappointed with the decision.

Councillors did speak to the report at the November Council meeting and provided some explanation to their decision. This is available to be viewed via Councils website. In addition, you may wish to contact individual councillors to discuss any particular queries.

It is important to note that the decision from November meeting does now trigger a community engagement process, in accordance with Councils Community Engagement Policy for the sale of land. This community engagement will be coordinated in the new year.

Question 2 – Adam Fawcett

How can Councillors Hood, Simpson, Henderson and Hewitt be assured that their individual decision to vote on a motion to discontinue the Hepburn Hub Project at The Rex actually represents the majority view and wishes of residents and ratepayers? What evidence do they have to support this view?

Response – Mayor Tim Drylie

Councillors did speak to the report at the November Council meeting and which may provide some response to your question. This meeting was recorded and is available for viewing via Councils website.

Please also feel free to contact individual Councillors if you would like to discuss individual views and opinions with Councillors.

Councillors contact details are available on Councils website and we will include contact details for all Councillors in our written response to your question.

Question 3 – Gina Lyons

The space in the Rex was specifically designed to meet the needs of a cinema. Moving a cinema is not like moving a gift shop, there are specific needs in terms of height, length, width and soundproofing. With the Council's shock decision to abandon the Rex project, the cinema's future is bleak. Will the Council compensate Daylesford Community Theatre for the financial impact caused by the extended closure, and including the initial capital of \$140K raised by the community?

Response – Mayor Tim Drylie

We are not proposing to compensate for the financial impact or commercial loss whilst the building has been a construction site.

We have endeavoured to work with the Daylesford Community Theatre over many years to support the use of alternate venues and facilities and we are committed to continue working with the Daylesford Cinema group on potential temporary and permanent solutions for the community cinema;

Question 4 – Linda Caroll

Seeing that Council have voted to walk away from the Rex project, I'd like to ask if Council have done any cost estimates and considered any time-frames for the next phase.

Obviously Council will be engaging consultants, conducting new feasibility studies, possibly engaging with the community, looking for a new location and spending more money on a new project. This takes us back to 2016 when all this work was done previously.

In reality, I see this as another 4 year exercise. Four years of spending more money unnecessarily, more time searching for an "ideal location", more time and more money just wasted. Can someone explain what the next step in this process is going to look like, what it's likely to cost and what sort of time frame are we realistically looking at.

Given that you already have a building in the middle of the main street give you an advantage - if you just continue with the renovation. All the hard work has been done. It's a 7-8 month build. Don't councillors see a new building as a 50-60 year long term investment? If not, why not?

Response – Mayor Tim Drylie

The planning and costing to implement the November council decision is just commencing and will not be known until early next year. However it is likely that it will require the best part of twelve months to undertake the planning project and review possible solutions of staffing accommodation and community facilities.

9.3 REQUESTS TO ADDRESS COUNCIL

Members of our community who have submitted a request in accordance with Council's Governance Rules will be heard.

Ms Anna Irwin-Schutze addressed Council regarding the Rex Project and determination made by Council at the November Council Meeting.

Mr David Moore addressed Council regarding the Rex Project and determination made by Council at the November Council Meeting.

Ms Jenny Beacham addressed Council regarding the Rex Project and determination made by Council at the November Council Meeting.

Ms Gina Lyons addressed Council regarding the Rex Project and determination made by Council at the November Council Meeting.

10 STATUTORY PLANNING

10.1 PA 3141 - USE AND DEVELOPMENT OF THE LAND FOR A MOUNTAIN BIKE TRAIL (INFORMAL OUTDOOR RECREATION) AND THE REMOVAL OF NATIVE VEGETATION - CRESWICK TRAILS DIRECTOR COMMUNITY AND DEVELOPMENT

In providing this advice to Council as the Statutory Planner, I James McInnes have no interests to disclose in this report.

ATTACHMENTS

1. PA 3141 - Application and Planning Report - Creswick Trails [10.1.1 - 44 pages]
2. PA 3141 - Flora and Fauna, Arborist and Native Vegetation Removal Report - Creswick Trails [10.1.2 - 208 pages]
3. PA 3141 - Environmental management Plan - Creswick Trails [10.1.3 - 57 pages]
4. PA 3141 - Historic Survey Report & Historic Cultural Heritage Assessment Report [10.1.4 - 151 pages]
5. PA 3141 - Objections (redacted) [10.1.5 - 330 pages]
6. PA 3141 - Letter of Advice - Heritage Victoria - Creswick Trails [10.1.6 - 2 pages]
7. PA 3141 - Collated Referral Responses [10.1.7 - 15 pages]

EXECUTIVE SUMMARY

The purpose of this report is for Council to determine planning application PA 3141 for the use and development of land for a mountain bike trail (informal outdoor recreation) and the removal of native vegetation upon land within and surrounding St Georges Lake, Koala Park, and Cheney Street areas in the Creswick Regional Park, and within and surrounding the St Georges Lake Flora Reserve, Creswick (Attachment 1 – PA 3141 – Application and Planning Report – Creswick Trails).

OFFICER'S RECOMMENDATION

That Council makes a determination to issue a Notice of Decision to Grant a Planning Permit at land within and surrounding St Georges Lake, Koala Park, and Cheney Street areas in the Creswick Regional Park, and within and surrounding the St Georges Lake Flora Reserve, Creswick in accordance with the following recommendation and conditions, and with reference to the following Crown Allotments.

The legal description of the subject lots are as follows:

- *Crown Allotment 13 Section 21 Parish of Creswick*
- *Crown Allotment 14 Section 21 Parish of Creswick*
- *Crown Allotment 14A Section 21 Parish of Creswick*
- *Crown Allotment 16 Section B Parish of Creswick*
- *Crown Allotment 25 Section 51 Parish of Creswick*

- *Crown Allotment 26 Section 51 Parish of Creswick*
- *Crown Allotment 26 Section 72 Parish of Creswick*
- *Crown Allotment 27 Section 72 Parish of Creswick*
- *Crown Allotment Y29 Parish of Creswick*
- *Crown Allotment Y29D Parish of Creswick*
- *Crown Allotment Y29F Parish of Creswick*
- *Crown Allotment Y29H Parish of Creswick*
- *Crown Allotment Y31 Parish of Creswick*
- *Crown Allotment Y32 Parish of Creswick*
- *Crown Allotment 2015 Parish of Creswick*
- *Crown Allotment 2035 Parish of Creswick*

That Council, having caused notice of planning application PA 3141 to be given under Section 52 of the Planning and Environment Act 1987 (the Act) and having considered all the matters required under Section 60 of The Act, determines to issue a Notice of Decision to Grant a Planning Permit for the use and development of land for a mountain bike trail (informal outdoor recreation) and the removal of native vegetation upon land within and surrounding St Georges Lake, Koala Park, and Cheney Street areas in the Creswick Regional Park, and within and surrounding the St Georges Lake Flora Reserve, Creswick subject to the following conditions:

Amended plans

1. *Prior to the commencement of works (including those works for vegetation removal and lopping), amended plans and reports to the satisfaction of the responsible authority must be submitted to and approved by the responsible authority. When approved, the plans and reports will be endorsed and will then form part of the permit. The plans must be drawn to scale and fully dimensioned. The plans and reports must be generally in accordance with the advertised plans and reports, but detailed to include:*
 - a. *The plans referenced as ‘Appendix B Stage 1 Individual Trail Summaries’ (pages 34 to 153 of the ‘Creswick Trails – Trail Development Plan – Stage 1 Works’ plan), prepared by Common Ground, dated February 2021, and further detailed to include:*
 - i. *An existing site plan as per ‘Creswick Trails Stage 1 – Existing Trails’ submitted with the application;*
 - ii. *A proposed site plan as per ‘Creswick Trails Stage 1 – Overview’ as submitted with the application;*
 - iii. *Figures detailing profiles of typical sections, features, turns, and watercourse crossings to be used for each trail type;*
 - b. *A construction management plan in accordance with condition 4 of this permit.*
 - c. *A construction environmental management plan in accordance with condition 18 of this permit.*

All in accordance with conditions 27 and 28 of this permit, and to the satisfaction of the Responsible Authority.

2. *Prior to the commencement of use, amended plans and reports to the satisfaction of the Responsible Authority must be submitted to and approved by the Responsible Authority. When approved, the plans and reports will be endorsed and will then form part of the permit. The plans must be drawn to scale and fully dimensioned. The plans and reports must be generally in accordance with the advertised plans and reports, but detailed to include:*
 - a. *An emergency management plan in accordance with condition 14 of this permit.*

All to the satisfaction of the Responsible Authority.

Compliance with endorsed plans

3. *The use and development approved by this permit and as shown on the endorsed plans must not be altered or modified unless otherwise agreed in writing by the Responsible Authority.*

Construction management plan

4. *Before works (including vegetation removal and lopping) start, a construction management plan to the satisfaction of the responsible authority must be submitted to and approved by the responsible authority. When approved, the plan will be endorsed and will then form part of the permit. The plan must be generally in accordance with 'Section 9 and Section 10 of the Creswick Trails Environmental Management Plan Final Report' dated 8th April 2021 by Biosis Pty Ltd, but further detailed to show:*
 - a. *A survey of the existing condition of any infrastructure adjacent to trail;*
 - b. *Details for a liaison officer for contact by residents and the responsible authority in the event of relevant queries or problems experienced;*
 - c. *A 24 hour emergency contact number;*
 - d. *Traffic management measures for works on roads in accordance with relevant Australian Standards and Council requirements.*
5. *The construction management measures shown on the endorsed plan must be carried out and completed to the satisfaction of the Responsible Authority.*

Mandatory stormwater requirements

6. *All stormwater must be managed and discharged to the satisfaction of the Responsible Authority and generally in accordance with the principles described in 'Urban Stormwater: Best Practice Environmental Management Guidelines' (Victorian Stormwater Committee 1999).*

Council Engineering

Access

7. *Any trails or recreational facilities directly accessing/crossing road reserves must have professionally prepared plans prepared to the satisfaction of the Responsible Authority.*
8. *The developer shall prepare all documents required for obtaining approval from Dja Dja Wurrung Clans Aboriginal Corporation for road works and submitted to the Responsible Authority for forwarding them to the Dja Dja Wurrung Clans Aboriginal Corporation. All costs incurred in complying with the Dja Dja Wurrung Clans Aboriginal Corporation requirements shall be borne by the developer.*

Carparking

9. *Before construction works start associated with the provision of carparking, detailed layout plans demonstrating compliance with AustRoads Publication 'Guide to Traffic Engineering Practice: Part 11 Parking', Australian Standard 'AS2890: Parking Facilities' and to the satisfaction of the Responsible Authority must be submitted to and approved by the Responsible Authority. The plans must be drawn to scale with dimensions.*
10. *Before the use or occupation of the development starts, the area(s) set aside for parking of vehicles and access lanes as shown on the endorsed plans must be:

 - a. *surfaced with an all-weather surface and treated to prevent dust;*
 - b. *drained in accordance with an approved drainage plan;*
 - c. *provision for vehicles to pass on driveways and*
 - d. *constructed and completed to the satisfaction of the Responsible Authority.**
11. *Where the boundary of any car space, access lane or driveway adjoins a footpath or a garden area, a kerb or a similar barrier shall be constructed to the satisfaction of Responsible Authority*

Completion of works

12. *All works must construct and complete prior to commencement of use.*
13. *All costs incurred in complying with the above Council Engineering conditions shall be borne by the permit holder.*

Emergency management plan (as per Country Fire Authority's recommendations)

14. *Prior to the commencement of use as approved by this permit, an Emergency Management Plan (EMP) to the satisfaction of the Responsible Authority must be submitted to and endorsed by the Responsible Authority. The EMP must be prepared based on a comprehensive risk assessment which considers a range of emergencies including, but not limited to, medical emergency, inclement weather, and bushfire unless otherwise agreed in writing by the Responsible Authority.*
15. *Prior to the commencement of any large events associated with the use approved by this permit, a separate EMP to the satisfaction of the Responsible Authority must be prepared for each separate event, and must be submitted to*

and endorsed by the Responsible Authority. It must contain equivalent details as those required by condition 14, but further detailed to include:

- a. A clear statement of the plans' purpose and scope*
- b. Details on the event, its location and any emergency features/equipment.*
- c. A version control table and details on when and how the plan will be reviewed.*
- d. Detail the roles and responsibilities of the emergency planning committee (event management)*
- e. Details on the roles and responsibilities of the emergency control organisation (wardens)*
- f. Outline the training requirements for the emergency control organisation and how/if exercises will be conducted.*
- g. Details for onsite contacts, emergency services and neighbours.*
- h. Appropriate "action statements" for:*
 - i. Before the Fire Danger Period*
 - ii. During the Fire Danger Period – including details of how the bushfire threat will be monitored*
 - iii. When a Code Red or Extreme Fire Danger Rating is forecast*
 - iv. When a Total Fire Ban is forecast*
 - v. When any other lower trigger point for action is forecast (as determined by the sites emergency planning committee/event management)*
 - vi. When a bushfire threatens the event – including the trigger for evacuation (as appropriate).*
 - vii. After the bushfire threat passes*
- i. Details on evacuating staff, visitors and attendees (if required)*

Department of Environment, Land, Water and Planning

Notification of permit conditions

- 16. Before works start, the permit holder must advise all persons undertaking the vegetation removal or works on site of all relevant conditions of this permit.*

Native vegetation permitted to be removed, destroyed or lopped

- 17. The native vegetation permitted to be removed, destroyed or lopped under this permit must be in accordance with the submitted 'Native Vegetation Removal Report' (report ID: BIO_2021_012, dated: 01/03/2021), which is comprised of:*
 - a. 11.867 hectares of native vegetation,*
 - b. including one (1) large trees,*
 - c. with a strategic biodiversity value of 0.663.*

Protection of retained vegetation

- 18. Before works start, a plan (a Construction Environmental Management Plan) to the satisfaction of the responsible authority and DELWP identifying all native vegetation to be retained and describing the measures to be used to protect the*

identified vegetation during construction, must be prepared and submitted to and approved by DELWP and the responsible authority. When approved, the plan will be endorsed and will form part of this permit. All works constructed or carried out must be in accordance with the endorsed plan.

19. *Before works start, all patches of native vegetation to be retained and protected on site must be demarcated appropriately, i.e. flagging tape and signage specifying 'No-go Area'. The protective boundary must be erected along the perimeter of the impact area as defined in 'Creswick Trails: Environmental Management Plan Final Report' by Biosis Pty Ltd, prepared for Hepburn Shire Council dated 8 April 2021. The protective boundary must be constructed and remain in place until all works are completed, to the satisfaction of the responsible authority and DELWP.*
20. *Except with the written consent of the responsible authority, within the area of native vegetation to be retained and any tree or vegetation protection zone associated with the permitted use and/or development, the following is prohibited:*
 - a. *vehicular access*
 - b. *trenching or soil excavation*
 - c. *storage or dumping of any soils, materials, equipment, vehicles, machinery or waste products*
 - d. *entry and exit pits for the provision of underground services*
 - e. *any other actions or activities that may result in adverse impacts to retained native vegetation.*

Native vegetation offsets

21. *To offset the removal of 11.867 hectares of native vegetation, the permit holder must secure a native vegetation offset in accordance with 'Guidelines for the removal, destruction or lopping of native vegetation' (DELWP 2017), as specified below:*

A general offset of 6.858 general habitat units must meet the following criteria:

- a. *located within the North Central Catchment Management Authority boundary, or Hepburn Shire Council municipal area;*
- b. *with a minimum strategic biodiversity score of at least 0.530, and;*
- c. *The offset(s) secured must also protect one (1) large tree.*

Offset evidence

22. *Before the commencement of works approved by this permit, evidence that the required offset by this permit has been secured must be provided to the satisfaction of the responsible authority. This evidence must be one or both of the following:*
 - a. *an established first party offset site including a security agreement signed by both parties, and a management plan detailing the 10-year management actions and ongoing management of the site, and/or;*

- b. credit extract(s) allocated to the permit from the Native Vegetation Credit Register.*
- 23. A copy of the offset evidence will be endorsed by the responsible authority and form part of this permit. Within 30 days of endorsement of the offset evidence, a copy of the endorsed offset evidence must be provided to Planning Approvals at the Department of Environment, Land, Water and Planning - Grampians regional office via email: grampians.planning@delwp.vic.gov.au.*

Central Highlands Water

- 24. Construction and maintenance of the Creswick Trails must be in accordance with Section 9 of the 'Creswick Trails Environmental Management Plan Final Report' dated 8th April 2021 by Biosis Pty Ltd.*
- 25. Following completion of the trail, the manager must implement the following relevant trail management measures in accordance with the 'Creswick Trails Environmental Management Plan Final Report' dated 8th April 2021 by Biosis Pty Ltd:*
 - a. Erosion of batters and trail surface must be monitored during assessments. Remedial works must be undertaken in the form of surface hardening or supplementary planting to reduce erosion in unstable areas.*
 - b. Erosion and sediment controls for works near creeks and drainage lines to protect against any impacts to water quality must be inspected and maintained annually.*
 - c. Maintenance works in waterways must be avoided when the waterways are flowing. Works in these areas should be undertaken in summer/autumn months when they are dry.*

Goulburn Murray Water

- 26. All construction and ongoing activities must be in accordance with sediment control principles outlined in 'Construction Techniques for Sediment Pollution Control' (EPA, 1991).*

North Central Catchment Management Authority

- 27. The design of Section 1, 2 and the Skills zone area must not obstruct flood flows or reduce flood storage. Prior to the commencement of works, detailed engineering plans of any proposed boardwalks or earthworks to alter the topography of flood prone land must be provided to the North Central CMA for approval.*
- 28. Unless otherwise agreed in writing with North Central CMA, the trail must be setback a minimum of 15m from the top of bank of all waterways including Creswick Creek, Lincoln Creek, Slaty Creek and Jackass Gully.*

Department of Transport

- 29. Crossing to be located within the existing 60km/h speed zone.*
- 30. Safe sight distance for V60 to be available at crossing location.*
- 31. Plans of proposed crossing to be submitted to DOT for DOT approval.*

32. *Advanced pedestrian/cycling crossing point signs to be installed.*
33. *All works to be at no cost to DOT.*

Permit expiry

34. *This permit will expire if one of the following circumstances applies:*
 - a. *The development is not started within two years of the date of this permit.*
 - b. *The development is not completed within four years of the date of this permit.*
 - c. *The use is not started within four years of the date of this permit.*
 - d. *The use is discontinued for a period of two years.*

The Responsible Authority may extend the permit if a request is made in writing in accordance with Section 69 of Planning and Environment Act 1987.

PERMIT NOTES:

Note 1. Signage

Planning approvals for signage have not been considered nor approved by this permit. The signage examples as shown in the supporting documentation for the application appear to meet the applicable signage exemptions of the Hepburn Planning Scheme. If any future proposed signage does not meet the applicable signage exemptions of the Hepburn Planning Scheme, appropriate planning approvals will be required prior to their display.

Note 2. Goulburn Murray Water

The subject property is located within an area of Cultural Heritage Sensitivity. Should the activity associated with proposed development require a Cultural Heritage Management Plan (CHMP), planning permits, licences and work authorities cannot be issued unless a CHMP has been approved for the activity.

Note 3. Department of Environment, Land, Water and Planning

Before any works on public land start, a permit to take protected flora under the Flora and Fauna Guarantee (FFG) Act 1988 may be required. To obtain an FFG permit or further information, please contact a Natural Environment Program officer at the Grampians regional office of the Department of Environment, Land, Water and Planning on grampians.environment@delwp.vic.gov.au.

Please be mindful of the list of assessments and works that need to be undertaken to obtain the various Landowner Consents for the proposed works. The proposed works must not commence before these consents are provided.

Further consultation is required with DELWP, as the relevant fire authority, in the development and finalisation of a plan to address the risks to human life arising from bushfire.

Regarding offsets, within 12 months of the completion of the project, offset requirements can be reconciled with the written agreement of the Responsible Authority and the DELWP.

Before any works start, the applicant must comply with applicable Commonwealth, State and local legislation, regulations and permits.

Mr Joel Schmetzer addressed Council in support of the application.

Mr David Tannard the president of VOGA Cycle Club addressed Council in support of the application.

Ms Bernadette Cheesman addressed Council in objection to the application.

Mr Bill Elder addressed Council in objection to the application.

Ms Susan Kruss addressed Council in objection to the application.

MOTION

That Council makes a determination to issue a Notice of Decision to Grant a Planning Permit at land within and surrounding St Georges Lake, Koala Park, and Cheney Street areas in the Creswick Regional Park, and within and surrounding the St Georges Lake Flora Reserve, Creswick in accordance with the following recommendation and conditions, and with reference to the following Crown Allotments.

The legal description of the subject lots are as follows:

- *Crown Allotment 13 Section 21 Parish of Creswick*
- *Crown Allotment 14 Section 21 Parish of Creswick*
- *Crown Allotment 14A Section 21 Parish of Creswick*
- *Crown Allotment 16 Section B Parish of Creswick*
- *Crown Allotment 25 Section 51 Parish of Creswick*
- *Crown Allotment 26 Section 51 Parish of Creswick*
- *Crown Allotment 26 Section 72 Parish of Creswick*
- *Crown Allotment 27 Section 72 Parish of Creswick*
- *Crown Allotment Y29 Parish of Creswick*
- *Crown Allotment Y29D Parish of Creswick*
- *Crown Allotment Y29F Parish of Creswick*
- *Crown Allotment Y29H Parish of Creswick*
- *Crown Allotment Y31 Parish of Creswick*
- *Crown Allotment Y32 Parish of Creswick*

- Crown Allotment 2015 Parish of Creswick
- Crown Allotment 2035 Parish of Creswick

That Council, having caused notice of planning application PA 3141 to be given under Section 52 of the Planning and Environment Act 1987 (the Act) and having considered all the matters required under Section 60 of The Act, determines to issue a Notice of Decision to Grant a Planning Permit for the use and development of land for a mountain bike trail (informal outdoor recreation) and the removal of native vegetation upon land within and surrounding St Georges Lake, Koala Park, and Cheney Street areas in the Creswick Regional Park, and within and surrounding the St Georges Lake Flora Reserve, Creswick subject to the following conditions:

Amended plans

1. *Prior to the commencement of works (including those works for vegetation removal and lopping), amended plans and reports to the satisfaction of the responsible authority must be submitted to and approved by the responsible authority. When approved, the plans and reports will be endorsed and will then form part of the permit. The plans must be drawn to scale and fully dimensioned. The plans and reports must be generally in accordance with the advertised plans and reports, but detailed to include:*
 - a. *The plans referenced as ‘Appendix B Stage 1 Individual Trail Summaries’ (pages 34 to 153 of the ‘Creswick Trails – Trail Development Plan – Stage 1 Works’ plan), prepared by Common Ground, dated February 2021, and further detailed to include:*
 - i. *An existing site plan as per ‘Creswick Trails Stage 1 – Existing Trails’ submitted with the application;*
 - ii. *A proposed site plan as per ‘Creswick Trails Stage 1 – Overview’ as submitted with the application;*
 - iii. *Figures detailing profiles of typical sections, features, turns, and watercourse crossings to be used for each trail type;*
 - b. *A construction management plan in accordance with condition 4 of this permit.*
 - c. *A construction environmental management plan in accordance with condition 18 of this permit.*

All in accordance with conditions 27 and 28 of this permit, and to the satisfaction of the Responsible Authority.

2. *Prior to the commencement of use, amended plans and reports to the satisfaction of the Responsible Authority must be submitted to and approved by the Responsible Authority. When approved, the plans and reports will be endorsed and will then form part of the permit. The plans must be drawn to scale and fully dimensioned. The plans and reports must be generally in accordance with the advertised plans and reports, but detailed to include:*

- a. *An emergency management plan in accordance with condition 14 of this permit.*

All to the satisfaction of the Responsible Authority.

Compliance with endorsed plans

3. *The use and development approved by this permit and as shown on the endorsed plans must not be altered or modified unless otherwise agreed in writing by the Responsible Authority.*

Construction management plan

4. *Before works (including vegetation removal and lopping) start, a construction management plan to the satisfaction of the responsible authority must be submitted to and approved by the responsible authority. When approved, the plan will be endorsed and will then form part of the permit. The plan must be generally in accordance with 'Section 9 and Section 10 of the Creswick Trails Environmental Management Plan Final Report' dated 8th April 2021 by Biosis Pty Ltd, but further detailed to show:*
 - a. *A survey of the existing condition of any infrastructure adjacent to trail;*
 - b. *Details for a liaison officer for contact by residents and the responsible authority in the event of relevant queries or problems experienced;*
 - c. *A 24 hour emergency contact number;*
 - d. *Traffic management measures for works on roads in accordance with relevant Australian Standards and Council requirements.*
5. *The construction management measures shown on the endorsed plan must be carried out and completed to the satisfaction of the Responsible Authority.*

Mandatory stormwater requirements

6. *All stormwater must be managed and discharged to the satisfaction of the Responsible Authority and generally in accordance with the principles described in 'Urban Stormwater: Best Practice Environmental Management Guidelines' (Victorian Stormwater Committee 1999).*

Council Engineering

Access

7. *Any trails or recreational facilities directly accessing/crossing road reserves must have professionally prepared plans prepared to the satisfaction of the Responsible Authority.*
8. *The developer shall prepare all documents required for obtaining approval from Dja Dja Wurrung Clans Aboriginal Corporation for road works and submitted to the Responsible Authority for forwarding them to the Dja Dja Wurrung Clans Aboriginal Corporation. All costs incurred in complying with the Dja Dja Wurrung Clans Aboriginal Corporation requirements shall be borne by the developer.*

Carparking

9. *Before construction works start associated with the provision of carparking, detailed layout plans demonstrating compliance with AustRoads Publication 'Guide to Traffic Engineering Practice: Part 11 Parking', Australian Standard 'AS2890: Parking Facilities' and to the satisfaction of the Responsible Authority must be submitted to and approved by the Responsible Authority. The plans must be drawn to scale with dimensions.*
10. *Before the use or occupation of the development starts, the area(s) set aside for parking of vehicles and access lanes as shown on the endorsed plans must be:

 - a. *surfaced with an all-weather surface and treated to prevent dust;*
 - b. *drained in accordance with an approved drainage plan;*
 - c. *provision for vehicles to pass on driveways and*
 - d. *constructed and completed to the satisfaction of the Responsible Authority.**
11. *Where the boundary of any car space, access lane or driveway adjoins a footpath or a garden area, a kerb or a similar barrier shall be constructed to the satisfaction of Responsible Authority*

Completion of works

12. *All works must construct and complete prior to commencement of use.*
13. *All costs incurred in complying with the above Council Engineering conditions shall be borne by the permit holder.*

Emergency management plan (as per Country Fire Authority's recommendations)

14. *Prior to the commencement of use as approved by this permit, an Emergency Management Plan (EMP) to the satisfaction of the Responsible Authority must be submitted to and endorsed by the Responsible Authority. The EMP must be prepared based on a comprehensive risk assessment which considers a range of emergencies including, but not limited to, medical emergency, inclement weather, and bushfire unless otherwise agreed in writing by the Responsible Authority.*
15. *Prior to the commencement of any large events associated with the use approved by this permit, a separate EMP to the satisfaction of the Responsible Authority must be prepared for each separate event, and must be submitted to and endorsed by the Responsible Authority. It must contain equivalent details as those required by condition 14, but further detailed to include:

 - a. *A clear statement of the plans' purpose and scope*
 - b. *Details on the event, its location and any emergency features/equipment.*
 - c. *A version control table and details on when and how the plan will be reviewed.*
 - d. *Detail the roles and responsibilities of the emergency planning committee (event management)*
 - e. *Details on the roles and responsibilities of the emergency control organisation (wardens)**

- f. *Outline the training requirements for the emergency control organisation and how/if exercises will be conducted.*
- g. *Details for onsite contacts, emergency services and neighbours.*
- h. *Appropriate “action statements” for:*
 - i. *Before the Fire Danger Period*
 - ii. *During the Fire Danger Period – including details of how the bushfire threat will be monitored*
 - iii. *When a Code Red or Extreme Fire Danger Rating is forecast*
 - iv. *When a Total Fire Ban is forecast*
 - v. *When any other lower trigger point for action is forecast (as determined by the sites emergency planning committee/event management)*
 - vi. *When a bushfire threatens the event – including the trigger for evacuation (as appropriate).*
 - vii. *After the bushfire threat passes*
- i. *Details on evacuating staff, visitors and attendees (if required)*

Department of Environment, Land, Water and Planning

Notification of permit conditions

- 16. *Before works start, the permit holder must advise all persons undertaking the vegetation removal or works on site of all relevant conditions of this permit.*

Native vegetation permitted to be removed, destroyed or lopped

- 17. *The native vegetation permitted to be removed, destroyed or lopped under this permit must be in accordance with the submitted ‘Native Vegetation Removal Report’ (report ID: BIO_2021_012, dated: 01/03/2021), which is comprised of:*
 - a. *11.867 hectares of native vegetation,*
 - b. *including one (1) large trees,*
 - c. *with a strategic biodiversity value of 0.663.*

Protection of retained vegetation

- 18. *Before works start, a plan (a Construction Environmental Management Plan) to the satisfaction of the responsible authority and DELWP identifying all native vegetation to be retained and describing the measures to be used to protect the identified vegetation during construction, must be prepared and submitted to and approved by DELWP and the responsible authority. When approved, the plan will be endorsed and will form part of this permit. All works constructed or carried out must be in accordance with the endorsed plan.*
- 19. *Before works start, all patches of native vegetation to be retained and protected on site must be demarcated appropriately, i.e. flagging tape and signage specifying 'No-go Area'. The protective boundary must be erected along the perimeter of the impact area as defined in ‘Creswick Trails: Environmental Management Plan Final Report’ by Biosis Pty Ltd, prepared for*

Hepburn Shire Council dated 8 April 2021. The protective boundary must be constructed and remain in place until all works are completed, to the satisfaction of the responsible authority and DELWP.

20. *Except with the written consent of the responsible authority, within the area of native vegetation to be retained and any tree or vegetation protection zone associated with the permitted use and/or development, the following is prohibited:*
- a. *vehicular access*
 - b. *trenching or soil excavation*
 - c. *storage or dumping of any soils, materials, equipment, vehicles, machinery or waste products*
 - d. *entry and exit pits for the provision of underground services*
 - e. *any other actions or activities that may result in adverse impacts to retained native vegetation.*

Native vegetation offsets

21. *To offset the removal of 11.867 hectares of native vegetation, the permit holder must secure a native vegetation offset in accordance with 'Guidelines for the removal, destruction or lopping of native vegetation' (DELWP 2017), as specified below:*

A general offset of 6.858 general habitat units must meet the following criteria:

- a. *located within the North Central Catchment Management Authority boundary, or Hepburn Shire Council municipal area;*
- b. *with a minimum strategic biodiversity score of at least 0.530, and;*
- c. *The offset(s) secured must also protect one (1) large tree.*

Offset evidence

22. *Before the commencement of works approved by this permit, evidence that the required offset by this permit has been secured must be provided to the satisfaction of the responsible authority. This evidence must be one or both of the following:*
- a. *an established first party offset site including a security agreement signed by both parties, and a management plan detailing the 10-year management actions and ongoing management of the site, and/or;*
 - b. *credit extract(s) allocated to the permit from the Native Vegetation Credit Register.*
23. *A copy of the offset evidence will be endorsed by the responsible authority and form part of this permit. Within 30 days of endorsement of the offset evidence, a copy of the endorsed offset evidence must be provided to Planning Approvals at the Department of Environment, Land, Water and Planning - Grampians regional office via email: grampians.planning@delwp.vic.gov.au.*

Central Highlands Water

24. *Construction and maintenance of the Creswick Trails must be in accordance with Section 9 of the 'Creswick Trails Environmental Management Plan Final Report' dated 8th April 2021 by Biosis Pty Ltd.*
25. *Following completion of the trail, the manager must implement the following relevant trail management measures in accordance with the 'Creswick Trails Environmental Management Plan Final Report' dated 8th April 2021 by Biosis Pty Ltd:*
 - a. *Erosion of batters and trail surface must be monitored during assessments. Remedial works must be undertaken in the form of surface hardening or supplementary planting to reduce erosion in unstable areas.*
 - b. *Erosion and sediment controls for works near creeks and drainage lines to protect against any impacts to water quality must be inspected and maintained annually.*
 - c. *Maintenance works in waterways must be avoided when the waterways are flowing. Works in these areas should be undertaken in summer/autumn months when they are dry.*

Goulburn Murray Water

26. *All construction and ongoing activities must be in accordance with sediment control principles outlined in 'Construction Techniques for Sediment Pollution Control' (EPA, 1991).*

North Central Catchment Management Authority

27. *The design of Section 1, 2 and the Skills zone area must not obstruct flood flows or reduce flood storage. Prior to the commencement of works, detailed engineering plans of any proposed boardwalks or earthworks to alter the topography of flood prone land must be provided to the North Central CMA for approval.*
28. *Unless otherwise agreed in writing with North Central CMA, the trail must be setback a minimum of 15m from the top of bank of all waterways including Creswick Creek, Lincoln Creek, Slaty Creek and Jackass Gully.*

Department of Transport

29. *Crossing to be located within the existing 60km/h speed zone.*
30. *Safe sight distance for V60 to be available at crossing location.*
31. *Plans of proposed crossing to be submitted to DOT for DOT approval.*
32. *Advanced pedestrian/cycling crossing point signs to be installed.*
33. *All works to be at no cost to DOT.*

Permit expiry

34. *This permit will expire if one of the following circumstances applies:*
 - a. *The development is not started within two years of the date of this permit.*

- b. *The development is not completed within four years of the date of this permit.*
- c. *The use is not started within four years of the date of this permit.*
- d. *The use is discontinued for a period of two years.*

The Responsible Authority may extend the permit if a request is made in writing in accordance with Section 69 of Planning and Environment Act 1987.

PERMIT NOTES:

Note 1. Signage

Planning approvals for signage have not been considered nor approved by this permit. The signage examples as shown in the supporting documentation for the application appear to meet the applicable signage exemptions of the Hepburn Planning Scheme. If any future proposed signage does not meet the applicable signage exemptions of the Hepburn Planning Scheme, appropriate planning approvals will be required prior to their display.

Note 2. Goulburn Murray Water

The subject property is located within an area of Cultural Heritage Sensitivity. Should the activity associated with proposed development require a Cultural Heritage Management Plan (CHMP), planning permits, licences and work authorities cannot be issued unless a CHMP has been approved for the activity.

Note 3. Department of Environment, Land, Water and Planning

Before any works on public land start, a permit to take protected flora under the Flora and Fauna Guarantee (FFG) Act 1988 may be required. To obtain an FFG permit or further information, please contact a Natural Environment Program officer at the Grampians regional office of the Department of Environment, Land, Water and Planning on grampians.environment@delwp.vic.gov.au.

Please be mindful of the list of assessments and works that need to be undertaken to obtain the various Landowner Consents for the proposed works. The proposed works must not commence before these consents are provided.

Further consultation is required with DELWP, as the relevant fire authority, in the development and finalisation of a plan to address the risks to human life arising from bushfire.

Regarding offsets, within 12 months of the completion of the project, offset requirements can be reconciled with the written agreement of the Responsible Authority and the DELWP.

Before any works start, the applicant must comply with applicable Commonwealth, State and local legislation, regulations and permits.

Moved: Cr Don Henderson

Seconded: Cr Brian Hood

Carried

BACKGROUND

Site and Surrounds

The subject site is made up of 16 different Crown Allotments within and surrounding St Georges Lake, Koala Park and Cheney Street areas in the Creswick Regional Park and the St Georges Lake Flora Reserve. The total size of these allotments together is approximately 711.52 hectares, however the overall scope of the proposed works is much smaller than this given the width of the proposed trails. The site is under a mix of ownership/management between DELWP, Parks Victoria, HVP Plantations, and Hepburn Shire Council. The site is a mix of Public Conservation and Resource (PCRZ), Public Park and Recreation (PPRZ), Farming (FZ), Rural Living (RLZ), General Residential (GRZ1), and Road (RDZ1) Zone, with the Environmental Significance Overlay – Schedule 1 (ESO1) covering the entire site, and the Bushfire Management Overlay (BMO) and Heritage Overlay (HO 560) partially covering the site.

Much of the proposed trail alignment falls within dry eucalypt forest areas with a generally open understorey of native grasses. Those parts of the trail which are situated within riparian areas traverse terrain which has a thicker understorey of vegetation. Some areas are covered with invasive weeds (i.e. Gorse and Blackberry).

The commercial areas of Creswick are located at the north-western end of the subject site, with Melbourne Road running generally along the south to south-western boundaries of the subject site. A small part of the trail alignment traverses through the Melbourne Road, road reserve, and is situated to the south-west of the road. Part of the site contains an existing pine plantation, and Cosgrove Reservoir is located proximate to the south-eastern end of the site.

Proposal

The application proposes the use and development of land for a mountain bike trail (informal outdoor recreation) and the removal of native vegetation. This application is for the first of two stages of the Creswick Trails project, with this first stage comprising the construction of approximately 60 kilometres of purpose built mountain bike track through land within and surrounding St Georges Lake, Koala Park and Cheney Street areas in the Creswick Regional Park, and within the St Georges Lake Flora Reserve. The application proposes the use of some existing trails and road reserves of approximately 11.9 kilometres in length as a means to minimise the overall environmental and biodiversity impact of the proposal, and to minimise the amount of vegetation to be removed, as well as the construction of new trails of approximately 48.7 kilometres in length.

Works associated with the trails will include reasonably significant lengths of site cuts, generally being between 300mm and 1000mm in depth. Approximately 11.867 hectares of vegetation will be impacted, which includes impact upon 174 canopy trees (including 1 large tree).

Relevant Planning Ordinance applying to the site and proposal

Zoning:	<p>32.08 General Residential Zone – Schedule 1 (GRZ1)</p> <p>35.03 Rural Living Zone (RLZ)</p> <p>35.07 Farming Zone (FZ)</p> <p>36.02 Public Park and Recreation Zone (PPRZ)</p> <p>36.03 Public Conservation and Resource Zone (PCRZ)</p> <p>36.04 Road Zone, Category 1 (RDZ1)</p>
Overlays:	<p>42.01 Environmental Significance Overlay – Schedule 1 (ESO1)</p> <p>43.01 Heritage Overlay (HO 560)</p> <p>44.06 Bushfire Management Overlay (BMO)</p>
Particular/General Provisions	<p>52.06 Car Parking</p> <p>52.17 Native Vegetation</p> <p>52.29 Land Adjacent to a Road Zone, Category 1</p> <p>52.31 Local Government Projects</p> <p>62.02 Buildings and Works</p> <p>65 Decision Guidelines</p>
Relevant Provisions of the PPF	<p>12.01-1S Protection of biodiversity</p> <p>12.02-1S Native vegetation management</p> <p>12.03-1S River corridors, waterways, lakes and wetlands</p> <p>13.02-1S Bushfire planning</p> <p>14.01-1S Protection of agricultural land</p> <p>14.02-1S Catchment planning and management</p> <p>14.02-2S Water quality</p> <p>15.03-1S Heritage conservation</p> <p>15.03-2S Aboriginal cultural heritage</p> <p>17.01-1S Diversified economy</p> <p>17.01-1R Diversified economy – Central Highlands</p> <p>17.04-1S Facilitating tourism</p> <p>18.02-1S Sustainable personal transport</p> <p>18.02-4S Car parking</p>

	19.02-3S Cultural facilities 19.02-4S Social and cultural infrastructure 21.01 Municipal Profile 21.07 Economic Development 21.09 Environment and Heritage 22.01 Catchment and Land Protection	
Under what clause(s) is a permit required?	36.03-1 (PCRZ)	A permit is required to use the land for informal outdoor recreation (where the Section 1 use conditions are not met)
	36.04-1 (RDZ1)	A permit is required for the Section 2 use of informal outdoor recreation.
	42.01-2 (ESO1)	A permit is required to: <ul style="list-style-type: none"> - Construct a building or construct or carry out works, including site cuts greater than 300sq m in area; - Remove, destroy, or lop vegetation, including dead vegetation
	52.17-1 (Native Vegetation)	A permit is required to remove, destroy or lop native vegetation, including dead native vegetation
Number of submissions	153 letters of support 23 objections	

KEY ISSUES

Environmental impact and removal of vegetation

The plans and supporting documentation outline that the proposed trail network has generally been designed to attempt to avoid areas of high environmental significance. Whilst there is a reasonably large amount of overall cutting required to construct the proposed trails, the depths of these cuts is generally not expected to

me more than 300mm in depth, and the overall environmental impacts in relation to impacts upon soils and water quality are believed to be appropriately minimised by the proposed construction and maintenance techniques outlined in the submitted Environmental Management Plan.

The application was referred to the relevant water authorities in accordance with the *Hepburn Planning Scheme*, with responses as follows; Central Highlands Water (CHW) have provided conditional consent relating to ongoing maintenance of the trails is to be in accordance with the submitted Environmental Management Plan. Goulburn Murray Water have provided conditional consent relating to sediment control during construction and ongoing use. North Central Catchment Management Authority (NCCMA) have provided conditional consent relating to siting of trails.

A detailed report noting the extent to which vegetation (including native vegetation) will be impacted by the proposal has been submitted with the application (Attachment 2 – Flora and Fauna, Arborist and Native Vegetation Removal Report – Creswick Trails). This also details the required native vegetation offsets to be secured prior to the commencement of any works. The application was referred to the Department of Environment, Land, Water and Planning (DELWP) in accordance with the Act, to which they have provided conditional consent detailing requirements for protection of retained vegetation in accordance with the Environmental Management Plan (Attachment 3 – Environmental Management Plan – Creswick Trails) and appropriate native vegetation offsets. DELWP have also noted that they are satisfied that the applicant has taken adequate steps to avoid and minimise the proposed native vegetation removal, and have provided conditions for a construction environment management plan in relation to ensuring retained vegetation will not be inappropriately impacted. In meeting these requirements it is believed there will be no net loss to biodiversity as a result of the proposal, and that those aspects of vegetation to be retained will not be unduly impacted.

Car parking and use of existing road reserves

The proposed use of “informal outdoor recreation” does not incur a specific car parking requirement under the *Hepburn Planning Scheme*, rather it is to be provisioned “to the satisfaction of the Responsible Authority”. The application was referred internally to Council’s Engineering Department who have provided conditional consent, including a requirement for the submission of detailed layout plans for any proposed car parking to ensure compliance with the applicable Australian Standards. The application has provided details of existing car parking provided at the Hammon Park trailhead where there are currently 36 car parking spaces and additional drop-off areas. In addition to this there are also smaller car parking facilities proximate to other parts of the proposed trail alignment throughout Koala Park and close to St Georges Lake. It is understood that the sum of these car parking facilities will adequately service the expected patronage of the trails. When specific events are held and additional demand is required, this can be provided by

nearby parking within the commercial areas of Creswick near to the primary trailhead at Hammon Park.

The application proposes the use of some existing trails and use and construction of a small amount of new trails upon land within a Road Zone, Category 1. The application has been referred to the Department of Transport to seek the views of the relevant road authority, with Department of Transport providing conditional consent to the application. Council's Engineering Department have provided conditions requiring professionally prepared plans be submitted for those parts of the trails which directly access or cross any road reserves. In meeting the requirements of Department of Transport and Council Engineering it is believed that an appropriately safe design response which does not impact the operation of the road can be achieved for those parts of the proposal which fall within any road reserves.

Cultural Heritage Management Plan and other heritage considerations

The subject site is located within an area that has been identified as being an area of Aboriginal cultural heritage sensitivity. In accordance with the requirements of the *Aboriginal Heritage Regulations 2018*, a Cultural Heritage Management Plan (CHMP) has been prepared to support the proposal. The final CHMP was submitted to Dja Dja Wurrung Clans Aboriginal Corporation (DDWCAC) and subsequently approved in accordance with sections 63(1) and 148(d) of the *Aboriginal Heritage Act 2006*.

The proposal will not see any works taking place within the Heritage Overlay (HO 560) which partially covers the subject site. However, it is noted that some of the proposed works will traverse some historical features such as water races, reservoirs, alluvial workings and other mid-late nineteenth century gold mining features. The applicant has been working with Heritage Victoria to ensure that those identified heritage sites will be appropriately considered during the proposed works. Heritage Victoria have supplied a letter of advice to the permit applicant noting that initial concerns identified with the project have since been addressed through the preparation of *Creswick Mountain Bike Trails, Victoria: Historic Survey Report, Draft Report* (BIOSIS, 4 October 2021) and *Creswick Mountain Bike Trails, Stage 1, Historic Cultural Heritage, Impact Assessment Report* (David Bannear, Historic heritage & archaeology, November 2021) (Attachment 4 – PA 3141 – Historic Survey Report & Historic Cultural Heritage Assessment Report), and have advised that they are comfortable that the known historical cultural values of the subject area can be managed in accordance with the processes identified in the abovementioned impact assessment report. Heritage Victoria have also noted that additional approvals via a 'Consents to Damage' will be required prior to commencement of works. This process will afford Heritage Victoria the opportunity to provide conditions specific to each of the affected heritage sites prior to commencement of works in those areas.

Economic development and tourism

The application responds to the state, regional, and local policies which identify tourism as playing an important role in developing the economic self-sufficiency of the area. The proposal stands to strengthen and diversify the local economy in alignment with both state and local policies by utilising the unique natural assets of the area. There is expected growth resulting from the proposal to complimentary sectors of accommodation and retail.

Community infrastructure

The proposal will seek to enhance open space networks and provide a multi-purpose open space accessible to range of different community groups. The project aligns with additional future works at Hammon Park which will see the co-location of facilities for community and youth involvement. The trail is designed to cater to riders of all levels of experience, and those not using up-right bicycles, aligning with policies encouraging infrastructure of this kind be universally accessible.

Bushfire planning

In regards to the proposed use and associated works contained within the proposal, there are no formal planning permit triggers relating to bushfire planning which are required to be considered as part of the assessment. However, there are bushfire planning objectives and strategies contained within the State Planning Policy Framework of the *Hepburn Planning Scheme* which do apply to this application. In response to these considerations the application was referred to the Country Fire Authority (CFA) for comment. The CFA provided a letter of advice outlining that they are of the view that the use of emergency management planning is the most appropriate mechanism to ensure the applicable planning objectives are addressed. They also outlined expectations of what details an emergency management plan should contain, and that separate plans should be prepared for the proposed use overall, and any individual large events to be held in accordance with any approved use.

To address these expectations and ensure bushfire planning considerations are appropriately addressed, the officer recommendation includes conditions requiring an emergency management plan be prepared in accordance with the CFA's recommendation to the satisfaction of the Responsible Authority. It is also noted in DELWP's referral response that they have indicated that further consultation is required with DELWP for the preparation of such plans, and this requirement has been included as a permit note to the recommendation.

POLICY AND STATUTORY IMPLICATIONS

This application meets Council's obligations as Responsible Authority under the *Planning and Environment Act 1987*.

GOVERNANCE ISSUES

The implications of this report have been assessed in accordance with the requirements of the Victorian Charter of Human Rights and Responsibilities.

SUSTAINABILITY IMPLICATIONS

There are no sustainability implications associated with this report.

FINANCIAL IMPLICATIONS

Any application determined by Council or under delegation of Council is subject to appeal rights and may incur costs at VCAT if appealed.

RISK IMPLICATIONS

No risks to Council other than those already identified.

COMMUNITY AND STAKEHOLDER ENGAGEMENT

Prior to submission of the application, public consultation took place from 7 December 2019 to 29 January 2020. Community members and stakeholders contributed to the consultation through listening posts, online surveys, email queries, and Facebook posts. Some of this consultation was run alongside consultation for the Hammon Park Masterplan as it is understood the two proposals share some stakeholders.

Following submission of the planning application, the application has been advertised by sending notification of the proposal to adjoining and adjacent owners and a notice on the land. As a result, 23 objections have been received (Attachment 5 - Objections (redacted) - Creswick Trails). The issues raised in the objections are summarised below:

- Unacceptable impacts on heritage values throughout the area
 - Impact of proposal on application for UNESCO World Heritage Status
 - Contravenes objectives within Hepburn Heritage Strategy 2020-2030
- Amenity impacts from large events
 - Increased road traffic and parking issues
- Project designed for a single user group
 - Impacts usability and safety of existing walking tracks and surrounding areas for other activities, including passive activities of bushwalking, birdwatching, navigational exercises etc.
- Will result in formalising of existing illegally constructed trails
- Application for Informal outdoor recreation is inappropriate given the intention to use for formalised events
- Application documentation fails to identify the full biodiversity and habitat impact
 - The density of the proposal trail networks is not properly accounted for

- Proposed trail alignment was not known when impact studies were conducted
- Native vegetation offsets do not fully account for biodiversity impact of proposal
- Appropriate feasibility study has never been released for public comment
- Cost of managing possible adverse outcomes resulting from the proposal has not been appropriately considered
 - Further encourage use of the area by motorbike riders
- Issues throughout public consultation process
 - Specific groups targeted for comment
 - Implicit bias towards approval
- No guarantee recommendations of supporting documentation will be implemented
- Administrative errors throughout application

As a result of notification of the planning application 153 letters of support for the proposal have been received.



10 March 2021

Our reference: 2019.681

Planning Department
Hepburn Shire Council
PO Box 21
Daylesford VIC 3460

Dear Sir/Madam,

Re: Planning Permit Application | Creswick Trails Project

Hansen Partnership acts on behalf of Hepburn Shire Council to submit a planning permit application for the Creswick Trails Project.

Please note, Hansen are assisting with submitting the application however, Alison Breach (Project Manager – Creswick Trails) at Hepburn Shire Council will be the contact for the planning permit application (abreach@hepburn.vic.gov.au T: 5321 6474 M: 0428 183 930).

Please find enclosed the following documents in relation to a Council own planning permit application:

- A completed Application for Planning Permit Form;
- Public Land Manager Consent Letters from DELWP (x2), Parks Victoria, and Hancock Victorian Plantations (HVP);
- Formal Land Descriptions;
- Planning Report (Hansen March 2021)
- Trail Alignment Overview (Common Ground)
- Trail Development Plan (Common Ground, February 2021)
- Flora and Fauna Assessment (Biosis, 05.03.21) and associated Native Vegetation Removal Report;
- Construction Environmental Management Plan (Biosis, 24.02.21)
- Arborist / Tree Management Plan (Axiom, 18.01.21)
- Cultural Heritage Management Plan (Biosis, 23.02.21)
- Historic Survey Report (Biosis, 20.02.21)
- Bushfire Management Statement (Terramatrix, Oct 2019)
- Community Engagement Report (May 2020)
- LUAA Advisory Activities (26 March 2020)

Should you have any questions, regarding the submission, please don't hesitate to contact Joel Schmetzer on 9664 9826 or via email at jschmetzer@hansenpartnership.com.au.

Yours faithfully,

Hansen Partnership Pty Ltd


A handwritten signature in black ink, appearing to read "G. Wissenden".

Gary Wissenden | **Director**


Planning Enquiries
Phone: (03) 5348 1577
Web: www.hepburnshire.vic.gov.au


Application for a Planning Permit

If you need help to complete this form, read MORE INFORMATION at the end of this form.

 Any material submitted with this application, including plans and personal information, will be made available for public viewing, including electronically, and copies may be made for interested parties for the purpose of enabling consideration and review as part of a planning process under the *Planning and Environment Act 1987*. If you have any questions, please contact Council's planning department.

 Questions marked with an asterisk (*) must be completed.

 If the space provided on the form is insufficient, attach a separate sheet.

 Click for further information.

Clear Form

The Land


Address of the land. Complete the Street Address and one of the Formal Land Descriptions.

Street Address *

Unit No.:	St. No.:	St. Name: Multiple parcels (see attached)
Suburb/Locality:		Postcode:

Formal Land Description *


Complete either A or B.


 This information can be found on the certificate of title.

If this application relates to more than one address, attach a separate sheet setting out any additional property details.


A	Lot No.:	<input type="radio"/> Lodged Plan	<input type="radio"/> Title Plan	<input type="radio"/> Plan of Subdivision	No.:
OR					
B	Crown Allotment No.:		Section No.:		
Parish/Township Name: Multiple parcels (see attached)					


The Proposal

 You must give full details of your proposal and attach the information required to assess the application. Insufficient or unclear information will delay your application.


 For what use, development or other matter do you require a permit? *

Use and development of a mountain bike trail (informal outdoor recreation) and the removal of native vegetation

 Provide additional information about the proposal, including: plans and elevations; any information required by the planning scheme, requested by Council or outlined in a Council planning permit checklist; and if required, a description of the likely effect of the proposal.

 Estimated cost of any development for which the permit is required *

Cost \$4.2M

 You may be required to verify this estimate. Insert '0' if no development is proposed.



Existing Conditions ATTACHMENT 10.1.1

Describe how the land is used and developed now *

For example, vacant, three dwellings, medical centre with two practitioners, licensed restaurant with 80 seats, grazing.

State and Regional Park and pine plantation

Provide a plan of the existing conditions. Photos are also helpful.

Title Information ATTACHMENT 10.1.1

Encumbrances on title *

Does the proposal breach, in any way, an encumbrance on title such as a restrictive covenant, section 173 agreement or other obligation such as an easement or building envelope?

- Yes (If 'yes' contact Council for advice on how to proceed before continuing with this application.)
- No
- Not applicable (no such encumbrance applies).

Provide a full, current copy of the title for each individual parcel of land forming the subject site. The title includes: the covering 'register search statement', the title diagram and the associated title documents, known as 'instruments', for example, restrictive covenants.

Applicant and Owner Details ATTACHMENT 10.1.1

Provide details of the applicant and the owner of the land.

Applicant *

The person who wants the permit.

Name:

Title:

First Name:

Surname:

Organisation (if applicable): Hepburn Shire Council

Postal Address:

If it is a P.O. Box, enter the details here:

Unit No.:

St. No.:

St. Name: PO Box 21

Suburb/Locality: Daylesford

State: VIC

Postcode: 3460

Please provide at least one contact phone number *

Contact information for applicant OR contact person below

Business phone:

Email:

Mobile phone:

Fax:

Where the preferred contact person for the application is different from the applicant, provide the details of that person.

Contact person's details*

Same as applicant

Name:

Title:

First Name: Alison

Surname: Breach

Organisation (if applicable): Hepburn Shire Council

Postal Address:

If it is a P.O. Box, enter the details here:

Unit No.:

St. No.:

St. Name: PO Box 21

Suburb/Locality: Daylesford

State: VIC

Postcode: 3460

Owner *

The person or organisation who owns the land

Where the owner is different from the applicant, provide the details of that person or organisation.

Name:

Same as applicant

Title:

First Name:

Surname:

Organisation (if applicable): Multiple (please see attached)

Postal Address:

If it is a P.O. Box, enter the details here:

Unit No.:

St. No.:

St. Name:

Suburb/Locality:

State:

Postcode:

Owner's Signature (Optional):

Date:

day / month / year

Declaration

This form must be signed by the applicant *

Remember it is against the law to provide false or misleading information, which could result in a heavy fine and cancellation of the permit.

I declare that I am the applicant; and that all the information in this application is true and correct; and the owner (if not myself) has been notified of the permit application. **ATTACHMENT 10.1.1**

Signature: on behalf of applicant

Date: 10/03/21
day / month / year

If completing this form electronically, please tick the box to the right, include a date and type your name above to serve as a declaration that all the information in this application is true and correct; and the owner (if not myself) has been notified of the permit application.

Need help with the Application?

General information about the planning process is available at planning.vic.gov.au

Contact Council's planning department to discuss the specific requirements for this application and obtain a planning permit checklist. Insufficient or unclear information may delay your application.

Has there been a pre-application meeting with a council planning officer?

No Yes

If 'Yes', with whom?: Nathan Aikman

Date:

day / month / year

Checklist

Have you:

Filled in the form completely?

Paid or included the application fee?

Most applications require a fee to be paid. Contact Council to determine the appropriate fee.

Provided all necessary supporting information and documents?

A full, current copy of title information for each individual parcel of land forming the subject site.

A plan of existing conditions.

Plans showing the layout and details of the proposal.

Any information required by the planning scheme, requested by council or outlined in a council planning permit checklist.

If required, a description of the likely effect of the proposal (for example, traffic, noise, environmental impacts).

Completed the relevant council planning permit checklist?

Signed the declaration above?

Lodgement

Lodge the completed and signed form, the fee and all documents with:

Planning Department
Hepburn Shire Council
PO Box 21
Daylesford VIC 3460

Customer Service Centre
Cnr Duke & Albert Streets
Daylesford VIC 3460

Contact information:

Phone: (03) 5348 1577

Email: shire@hepburn.vic.gov.au

Deliver application in person, by post or by electronic lodgement.

Privacy Statement

Your application and the personal information on this form is collected by council for the purposes of the planning process as set out in the Planning and Environment Act 1987 (PE Act). If you do not provide your name and address, council will not be able to consider your application. Your application will be available at the council office for any person to inspect and copies may be made available on request to any person for the relevant period set out in the PE Act.

You must not submit any personal information or copyright material of third parties without their informed consent. By submitting the material, you agree that the use of the material as detailed above does not breach any third party's right to privacy and copyright. You can request access to your personal information by contacting Councils Governance Department.

The following table identifies the Formal Land Description of the Crown land that is the subject of this planning permit application and the relevant Public Land Manager.

Crown Allotment	SPI	Parcel	PLM	Zone
Allot. 16 Sec. B	16~B\PP5211	P101810	Parks Victoria	PCRZ
Allot. 27 Sec. 72	27~72\PP5211	P101808 PART OF	Parks Victoria	PCRZ
Allot. 25 Sec. 51	25~51\PP5211	P101785	Parks Victoria	PCRZ
Allot. Y32	Y32\PP2464	P108588	Parks Victoria	PCRZ
Allot. Y29H	Y29H\PP2464	68875 PART OF	Parks Victoria	PCRZ
Allot. 2015	2015\PP2464	P373753	Parks Victoria	FZ
Allot. 26 Sec. 51	26~51\PP5211	P101786	Parks Victoria	PCRZ
Allot. Y31	Y31\PP2464	P108669	Parks Victoria	PCRZ
Allot. 26 Sec. 72	26~72\PP5211	P101806	Parks Victoria	PPRZ
Allot. Y29	Y29\PP2464	P108189	DELWP	PCRZ
Allot. Y29H	Y29H\PP2464	P368875	DELWP	PCRZ
Allot. 2012	2012\PP2464	P372884	DELWP	PCRZ
Allot. 27 Sec. 72	27~72\PP5211	P101808 PART OF	DELWP	PCRZ
Allot. Y29D	Y29D\PP2464	P368949	HVP	FZ
Allot. Y29F	Y29F\PP2464	P368952	HVP	FZ



15 February 2021

Ms Alison Breach
 Project Manager – Creswick Trails
 Hepburn Shire Council
 PO Box 21
 DAYLESFORD VICTORIA 3460

Dear Ms Breach,

Public Land Manager Consent: STAGE 1 Creswick Mountain Bike Trail, Parks Victoria Creswick Regional Park

Thank-you for your request for Public Land Manager Consent (PLMC) from Parks Victoria for the proposed Stage 1 – Creswick Mountain Bike Trail. This stage includes trails within and surrounding St Georges Lake, Koala Park and Cheney Street areas in the Creswick Regional Park and the St Georges Lake Flora Reserve as reflected in the Stage 1 Detailed Design December 2020.

As you are aware, this project transects the following 10 Crown land parcels that form part of the Creswick Regional Park and St Georges Lake Flora Reserve. These areas are managed by Parks Victoria.

SPI	Parcel	LCC	Public Land Manager	Native Title	Land Zone
16~B\PP5211	P101810	Ballarat (1982) A4 (RP)	PV	DDWRSA	PCRZ
27~72\PP5211	P101808 PART OF	Ballarat (1982) A4 (RP)	PV	DDWRSA	PPRZ
25~51\PP5211	P101785	Ballarat (1982) A4 (RP)	PV	DDWRSA	PCRZ
Y32\PP2464	P108588	Ballarat (1982) A4 (RP)	PV	DDWRSA	PCRZ
Y29H\PP2464	P368875 PART OF	Ballarat (1982) A4 (RP)	PV	DDWRSA	PCRZ
2015\PP2464	P373753	Ballarat (1982) A4 (RP)	PV	DDWRSA	FZ
26~51\PP5211	P101786	Ballarat (1982) A4 (RP)	PV	DDWRSA	PCRZ
Y31\PP2464	P108669	Ballarat (1982) A4 (RP)	PV	DDWRSA	PCRZ
Y25A\PP2464	P365224	Ballarat (1982) A4 (RP)	PV	DDWRSA	PUZ1
26~72\PP5211	P101806		PV	DDWRSA	PPRZ

Under the Hepburn Shire Council Planning Scheme, these parcels are zoned as Public Conservation and Resource Zone (PCRZ), Public Use Zone (PUZ), Farming Zone (FZ) and Public Park and Recreation Zone (PPRZ). As required by the Application Requirements, Clause 36.03-3 PCRZ, Clause 36.01-3 (PUZ) and Clause 36.02-3 (PPRZ) of these zones:

- *An application for a permit by a person other than the relevant public land manager must be accompanied by the written consent of the public land manager, indicating that the public land manager consents generally or conditionally either:*
 - o *To the application for permit being made.*
 - o *To the application for permit being made and to the proposed use or development.*

Following a review of the project and detailed discussions with Hepburn Shire Council, Parks Victoria formally consents to the application being made, subject to the following conditions:

- *Prior to works commencing, an assessment of the proposed works is required and should be completed by the proponent along with any advisory, negotiation or agreement notifications under the Land Use Activity Agreement with the Dja Dja Wurrung Clans Aboriginal Corporation, being part of the Recognition and Settlement Agreement under the Traditional Owner Settlement Act 2010.*
- *Prior to works commencing for the installation of Infrastructure, the proponent must prepare and forward to Parks Victoria a Construction Environmental Management Plan (CEMP) which includes installation techniques, soil management, vegetation management, cultural heritage management, fire and emergency measures, and provision for liaison with and monitoring by the proponent. The CEMP must be to the satisfaction of Parks Victoria.*
- *Prior to the commencement of the proposed works, the proponent must prepare and forward to Parks Victoria a concept landscape plan for St Georges Lake detailing how the Creswick Mountain Bike Trail will consider its interaction with current recreation function that support visitor safety and use, while considering current amenity infrastructure such as power, septic, roads, and water access. This concept landscape plan must be to the satisfaction of Parks Victoria.*

This consent will expire after two years from the date of this letter.

Should you require further statutory planning advice on this matter please don't hesitate to contact Travis Riches (Statutory Planning Officer – West Region) on tel. 03 8427 3526.

Yours sincerely



Jodi Heath
District Manager
Western Basalt District



Department of Environment,
Land, Water and Planning

ATTACHMENT 10.1.1

402 – 406 Mair Street
BALLARAT VIC 3350
Telephone: 136 186
www.delwp.vic.gov.au

Our reference: SP468458

1 March 2021

Alison Breach
Manager Major Projects
Hepburn Shire Council
PO Box 21 Daylesford Victoria 3460

Dear Alison

Creswick Trails Project – Planning permit applications

I write further to your email request of 10 February 2021 seeking land owner / manager consent to make planning permit applications for the use and development of the Department of Environment, Land, Water and Planning (DELWP) managed Crown land for the Creswick Trails Project.

DELWP understands that under the revised project, stage one will construct approximately 60 km mountain bike trails within Crown land surrounding Creswick Township and north of Melbourne Road, variously owned or managed by DELWP, Parks Victoria and Hancock Victorian Plantations Pty Ltd.

DELWP understands that this project requires numerous approvals, including planning permits to be issued under Hepburn Planning Scheme. DELWP acknowledges that you have notified DELWP as the land owner of affected Crown land and met the requirement under Section 48 of the *Planning and Environment Act 1987*. Clause 36.02-3 of 36-03.3 of Hepburn Planning Scheme stipulates that an application for a permit on Crown land by a person other than relevant Public Land Manager (PLM) must be accompanied by written consent of the PLM indicating that the PLM consents generally or conditionally either:

- to the application for permit being made or
- to the application for permit being made and to the proposed use and development.

As the public land manager of the Creswick State Forest (including Crown parcel number P108189) and the Creswick Creek water frontage reserve (being Crown Allotment 27 Section 72 Parish of Creswick), DELWP consents to the required planning permit applications for stage one of this project being made.

DELWP's consent as land owner for construction to commence will be provided once all requirements as set out in our letter dated 6 August 2019 have been met to the satisfaction of the Regional Director DELWP Grampians Region.

Note that separate consents will need to be obtained from Parks Victoria and Hancock Victorian Plantations Pty Ltd regarding the respective segments of the trail on land they manage.

If you have any queries regarding this matter, please do not hesitate to contact me.

Yours sincerely

GRANT HULL

Regional Manager Land and Built Environment Programs - Grampians Region

Any personal information about you or a third party in your correspondence will be protected under the provisions of the *Privacy and Data Protection Act 2014*. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorized by law. Enquiries about access to information about you held by the Department should be directed to foi.unit@delwp.vic.gov.au or FOI Unit, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002.



OFFICIAL



402-406 Mair Street
Ballarat, VIC 3350
03 5336 6856

Our reference: SP468458

8 August 2019

Carl Telfar
Manager Major Projects
Hepburn Shire Council
PO Box 21 Daylesford Victoria 3460

Dear Carl

Creswick Trails Project – Crown land approvals

I write further to your meeting with Ezaz Sheikh of this office on 9 July 2019 and our recent telephone discussions regarding the planning and approvals process for the proposed use and development of the Department of Environment, Land, Water and Planning (DELWP) managed Crown land for the Creswick Trails Project.

The project proposes the construction of approximately 100 km mountain bike trails within Crown land surrounding Creswick Township, variously owned or managed by DELWP, Parks Victoria, Central Highlands Water and Hancock Victorian Plantations Pty Ltd. DELWP supports the project and is committed to ensuring the project delivers both sustainable environmental and community benefit. I understand that the final alignment of the trails is yet to be agreed with the land managers, and that environmental and cultural impact assessments are still underway to inform the final design and approvals for the project.

This project requires DELWP to participate in the planning and approvals process in several ways, including as a land owner, as a public land manager, as a planning permit referral authority and as administrator of the *Flora and Fauna Guarantee Act 1988*.

DELWP understands that this project requires planning permits to be issued under Hepburn Planning Scheme. DELWP acknowledges that you have notified DELWP as the land owner of affected Crown land and met the requirement under Section 48 of the *Planning and Environment Act 1987*.

Clause 36.02-3 of 36-03.3 of Hepburn Planning Scheme stipulates that an application for a permit on Crown land by a person other than relevant Public Land Manager (PLM) must be accompanied by written consent of the PLM indicating that the PLM consents generally or conditionally either:

- to the application for permit being made or
- to the application for permit being made and to the proposed use and development.

As the public land manager of the Creswick State Forest and the Creswick Creek water frontage reserve (being Crown Allotment 27 Section 72 Parish of Creswick), DELWP consents to the required planning permit applications for this project being made.

DELWP's consent, as land owner, for construction to commence will be provided once the following have been completed to the satisfaction of the Regional Director DELWP Grampians Region:

1. A Construction Environmental Management Plan prepared to avoid/minimise/mitigate environmental impacts during construction.
2. A planning permit being issued for the project for the removal of native vegetation.
3. A planning permit being issued for the project to meet the requirements of the Bushfire Management Overlay.

4. Consultation with DELWP regarding potential impact on protected flora and fauna listed under *Flora and Fauna Guarantee (FFG) Act 1988* and *Environment Protection and Biodiversity Conservation Act 1999*. Please contact Andrea Keleher on 0409018910 for more information.
5. A Protected Flora Permit being issued under the *Flora and Fauna Guarantee (FFG) Act 1988*. Please contact Andrea Keleher on 0409018910 for more information.
6. Evidence of consultation with the Dja Dja Wurrung Traditional Owners regarding the protection of artefacts, relics, places and archaeological sites, including completion of any required Cultural Heritage Management Plan.
7. Evidence of completion of the Land Use Activity Assessment (LUAA) with the Dja Dja Wurrung Traditional Owners.
8. Evidence that Heritage Victoria has been consulted regarding heritage matters associated with the proposal.
9. An agreement (licence) being in place with DELWP on the future management, maintenance and regulation of the trails and associated infrastructure forming part of this project.
10. Hepburn Shire Council agreeing to manage the Creswick Creek water frontage reserve adjoining the Hammon Park trailhead.

It should also be noted that the project area contains exposed and unexposed mine shafts which can pose significant public safety risk. Project planning and management must take account of the risk posed by mine shafts.

Note that separate land owner consents will need to be obtained from Parks Victoria, Central Highlands Water and Hancock Victorian Plantations Pty Ltd regarding the respective segments of the bike trails.

If you have any queries regarding this matter, please contact Ezaz Sheikh, at DELWP's Ballarat office on telephone 0409135603.

Yours sincerely



GRANT HULL
Regional Manager Land and Built Environment Programs
Grampians Region

16/02/2021

Alison Breach
Hepburn Shire Council
P.O. Box 21
Daylesford, Vic, 3460

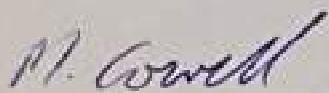
Re: Land Manager Consent

Alison,

Please find this letter as HVP Plantations ongoing support of the Creswick Trails Project and permission to progress to the Planning Permit stage for the trails on our land, Crown Allotment Y29D Parish of Creswick.

As discussed we will need to work together on finalising the Licence Agreement as there are some key issues that will need to be agreed upon but at this stage we are happy for the project to progress to the Planning Permit stage.

Yours sincerely,



Mark Cowell
Planning Manager, Western
HVP Plantations

AMENDMENT TO PLANNING APPLICATION

Pursuant to Sections 50, 50A and 57A of the Planning and Environment Act 1987

Is this form for me? This form is for making amendments to an application that has been lodged with Council, but which has not yet been decided.

Planning Permit

Permit number: PA 3141 Creswick Trails Network - Stage One

Address of the Land: Water Street, Creswick

The Applicant

Name: Alison Breach on behalf of Hepburn Shire Council Organisation: Hepburn Shire Council

Postal Address: Water Street, Creswick Postcode:

Telephone no (Business hours): 0434355884 Mobile phone no: 0434355887

Email Address: abreach@hepburn.vic.gov.au Fax no:

Amendment sought

Land manager Parks Victoria has identified that they made an unintentional error in identifying the parcel numbers associated with trails proposed in their land tenure. They have provided the attached letter to correct this error.

.....

.....

.....

.....

.....

.....

Attach a full schedule of all changes, including all changes to plans. If plans are to be amended, three full sets of amended plans are required. If the amendment changes the description of the use or development, please make that clear.

 Does the amendment breach a registered covenant, section 173 agreement or restriction on Title? Yes No

Prescribed Fee

 To amend an application before advertising
 To amend an application after advertising

No fee
 40% of application fee for the relevant class of permit

Declaration

I declare that I am the applicant and that all the information in this application is true and correct, and the owner (if not myself) has been notified of the amendment to the application.

Name: Alison Breach Date: 18 September 2021

 Signature: 
Remember it is against the law to provide false or misleading information, which could result in a heavy fine and cancellation of the permit.
Lodgement

Please lodge the completed form, appropriate fee and supporting documents with:

Planning Department

Hepburn Shire Council

Duke Street

Daylesford VIC 3460

Telephone: (03) 5348 1577

 email: shire@hepburn.vic.gov.au
Privacy Statement

Your application and the personal information on this form is collected by council for the purposes of the planning process as set out in the Planning and Environment Act 1987 (PE Act). If you do not provide your name and address, council will not be able to consider your application. Your application will be available at the council office for any person to inspect, and copies will be made available on request to any person for the relevant purposes set out in the PE Act.

You must not submit any personal information or copyright material of third parties without their informed consent. By submitting the material, you agree that the use of the material as detailed above does not breach any third party's right to privacy and copyright. You can request access to your personal information by contacting Councils Governance Department.



3 August 2021

Ms Alison Breach
 Project Manager – Creswick Trails
 Hepburn Shire Council
 PO Box 21
 DAYLESFORD VICTORIA 3460

Dear Ms Breach,

Updated Public Land Manager Consent: STAGE 1 Creswick Mountain Bike Trail, Parks Victoria Creswick Regional Park (updated from 15th February 2021)

Thank-you for your request for Public Land Manager Consent (PLMC) from Parks Victoria for the proposed Stage 1 – Creswick Mountain Bike Trail. This stage includes trails within and surrounding St Georges Lake, Koala Park and Cheney Street areas in the Creswick Regional Park and the St Georges Lake Flora Reserve as reflected in the Stage 1 Detailed Design December 2020.

As you are aware, this project transects the following 10 Crown land parcels that form part of the Creswick Regional Park and St Georges Lake Flora Reserve. These areas are managed by Parks Victoria.

SPI	Parcel	LCC	Public Land Manager	Native Title	Land Zone
16~B\PP5211	P101810	Ballarat (1982) A4 (RP)	PV	DDWRSA	PCRZ
27~72\PP5211	P101808 PART OF	Ballarat (1982) A4 (RP)	PV	DDWRSA	PPRZ
25~51\PP5211	P101785	Ballarat (1982) A4 (RP)	PV	DDWRSA	PCRZ
Y32\PP2464	P108588	Ballarat (1982) A4 (RP)	PV	DDWRSA	PCRZ
Y29H\PP2464	P368875 PART OF	Ballarat (1982) A4 (RP)	PV	DDWRSA	PCRZ
2015\PP2464	P373753	Ballarat (1982) A4 (RP)	PV	DDWRSA	FZ
26~51\PP5211	P101786	Ballarat (1982) A4 (RP)	PV	DDWRSA	PCRZ
Y31\PP2464	P108669	Ballarat (1982) A4 (RP)	PV	DDWRSA	PCRZ
2023\PP2464	P375471	Ballarat (1982) A4 (RP)	PV	DDWRSA	PCRZ
26~72\PP5211	P101806	Ballarat (1982) A4 (RP)	PV	DDWRSA	PPRZ

Under the Hepburn Shire Council Planning Scheme, these parcels are zoned as Public Conservation and Resource Zone (PCRZ), Public Use Zone (PUZ), Farming Zone (FZ) and Public Park and Recreation Zone (PPRZ). As required by the Application Requirements, Clause 36.03-3 PCRZ, Clause 36.01-3 (PUZ) and Clause 36.02-3 (PPRZ) of these zones:

- *An application for a permit by a person other than the relevant public land manager must be accompanied by the written consent of the public land manager, indicating that the public land manager consents generally or conditionally either:*
 - o *To the application for permit being made.*
 - o *To the application for permit being made and to the proposed use or development.*

Following a review of the project and detailed discussions with Hepburn Shire Council, Parks Victoria formally consents to the application being made, subject to the following conditions:

- *Prior to works commencing, an assessment of the proposed works is required and should be completed by the proponent along with any advisory, negotiation or agreement notifications under the Land Use Activity Agreement with the Dja Dja Wurrung Clans Aboriginal Corporation, being part of the Recognition and Settlement Agreement under the Traditional Owner Settlement Act 2010.*
- *Prior to works commencing for the installation of Infrastructure, the proponent must prepare and forward to Parks Victoria a Construction Environmental Management Plan (CEMP) which includes installation techniques, soil management, vegetation management, cultural heritage management, fire and emergency measures, and provision for liaison with and monitoring by the proponent. The CEMP must be to the satisfaction of Parks Victoria.*
- *Prior to the commencement of the proposed works, the proponent must prepare and forward to Parks Victoria a concept landscape plan for St Georges Lake detailing how the Creswick Mountain Bike Trail will consider its interaction with current recreation function that support visitor safety and use, while considering current amenity infrastructure such as power, septic, roads, and water access. This concept landscape plan must be to the satisfaction of Parks Victoria.*

This consent will expire after two years from the date of this letter.

Should you require further statutory planning advice on this matter please don't hesitate to contact Travis Riches (Statutory Planning Officer – West Region) on tel. 03 8427 3526.

Yours sincerely



Jodi Heath
District Manager
Western Basalt District



CRESWICK TRAILS PROJECT

PLANNING REPORT

Prepared by **Hansen Partnership**
for **Hepburn Shire Council**

April 2021

APPLICATION SUMMARY

Permit Triggers

The Use of the land within the PCRZ as 'Informal Outdoor Recreation'.

Buildings and works associated with 'Bicycle Pathways and Trails' under the ESO1 as more than 300sqm of site cut is proposed and sections will include cut deeper than 1m.

Vegetation removal under the ESO1 as the site is greater than 1ha.

The removal of native vegetation under Clause 52.17 (Native Vegetation).

While not a formal permit trigger, car parking is to be provided to the satisfaction of the Responsible Authority under Clause 52.06 (Car Parking) as the proposal is the establishment of a new use.

CONTENTS

1 INTRODUCTION	5
2 BACKGROUND	7
3 SUBJECT SITE & SURROUNDS	8
4 PROPOSAL	11
5 PLANNING FRAMEWORK	14
6 KEY PLANNING CONSIDERATIONS	20
7 CONCLUSION	30



Subject site

1

INTRODUCTION

Hansen Partnership has been engaged by Hepburn Shire Council to prepare a planning permit application for the construction of the Creswick Trails mountain bike project, located within State forest and pine plantations in Creswick.

The Creswick Trails project will be a unique tourist attraction and community asset that will provide a first of its kind outdoor recreation experience. It seeks to establish a multi-day purpose built mountain bike trail featuring a variety of trail types for all levels of experience.

The project is a Council and State Government initiative that when complete, will deliver up to 100km of new purpose-built mountain bike trails beginning at the recently completed trailhead at Hammon Park, Creswick.

This planning permit application relates to the first stage of the project which proposes to deliver 60km of the trail with the final 40km to be delivered at a later time.

The trails will be located on forested land within the Creswick region on both public and private land holdings. The landholdings are owned and managed by the following:

- Hepburn Shire Council
- Parks Victoria
- Department of Environment, Land, Water and Planning (DELWP)
- Hancock Victorian Plantations Pty Ltd
- Dja Dja Wurrung (traditional owners)

This report provides an assessment of the relevant planning matters and outlines reasons why the application for the construction of this unique and important project should be supported by Council and the broader community.

From a planning perspective, the site is located within a number of zones including the Public Park and Recreation Zone (PPRZ), Public Conservation and Resource Zone (PCRZ), and the Farming Zone (FZ), and is affected by a number of overlays including the Heritage Overlay (HO976), Environmental Significance Overlay (ESO1), Bushfire Management Overlay (BMO), and the Erosion Management Overlay (EMO).

Formally, the Planning Permit Application seeks approval for:

- The use of the site as 'Informal Outdoor Recreation' within the PCRZ.
- Buildings and works associated with 'Bicycle Pathways and Trails' under the ESO1 as more than 300sqm of site cut is proposed.
- Vegetation removal under the ESO1 as the site is greater than 1ha.
- The removal of native vegetation under Clause 52.17 (Native Vegetation).
- While not a formal permit trigger, car parking is to be provided to the satisfaction of the Responsible Authority under Clause 52.06 (Car Parking) as the proposal is the establishment of a new use.

This planning report provides details of the subject site, relevant planning controls and policies and a discussion of relevant planning considerations for vegetation removal.

As outlined throughout this report, the proposal is considered acceptable in relation to the relevant planning considerations for the following reasons:

- Set within a unique landscape, proximate to complimentary tourism experiences and services, Creswick Trails provides an exceptional and unique opportunity to strengthen the Shire's tourism offering and help support the local economy through an adventure / nature based tourism offering.
- The trail network has been designed to avoid areas of high environmental significance. The trails will be constructed to best-practice standards for sustainable design to ensure minimal ongoing environmental impacts and maintenance.
- The proposal has sought to work with and respond appropriately to the heritage context by avoiding and minimising impact on areas of heritage significance.
- the proposal is consistent with the purpose and decision guidelines of the PCRZ. The proposed use is consistent with the purpose of the zone as it will provide residents and visitors with the opportunity to experience the significant environment and landscape through a unique recreational opportunity.
- There is adequate car parking available and alternative transportation options to support the proposal.
- Techniques and measures implemented as part of the construction and ongoing management of the proposal will ensure that issues of water quality and erosion will be adequately addressed in accordance with ESO1.
- The avoidance and minimisation of native vegetation removal has been a key consideration through the design

of the trail alignment and will be an ongoing consideration through the construction process.

- Council intends to secure the necessary compliant offset to the satisfaction of the responsible authority as required by the Detailed Assessment pathway requirements for the removal of native vegetation.

The proposal provides an exciting opportunity for the Creswick and wider Hepburn Shire community that will result in a net community benefit. We therefore request that Council support the proposal through the issuing of a planning permit.

Technical / Management Reports

A range of technical and management reports have been prepared which have informed the alignment and proposed construction of the project. They will also ensure appropriate management techniques are implemented during the construction and ongoing management of the trails.

All of these reports have been submitted with the Planning Permit Application, noting that some are not a requirement of the Hepburn Shire Planning Scheme and the relevant planning controls that apply to the site but are required under other legislation or at the request of Public Land Managers.

These reports include:

- Bushfire Management Statement (Terramatrix, Oct 2019)
- Cultural Heritage Management Plan (Biosis, 23.02.21)
- Environmental Management Plan (Biosis, 24.02.21)
- Flora and Fauna Assessment (Biosis, 05.03.21)
- Historic Survey Report (Biosis, 20.02.21)
- Arborist / Tree Management Plan (Axiom, 18.01.21)

2 BACKGROUND

The idea to develop Creswick as a mountain bike trail destination was originally proposed by a group of mountain bike riders.

The natural bushlands of the Creswick region, which offer a range of diverse landscapes, and its mining history, provides a great opportunity to build the reputation of Creswick as an outdoor recreation destination. There are already a number of trail experiences through the Creswick Regional Park.

The project was first incepted in January 2018 following funding announcements.

The joint delivery of the project will be funded through a \$2.56 million grant from Regional Development Victoria, in addition to \$1.5 million from Hepburn Shire Council.

Due to the number of public land managers, a Project Control Group was set up to guide the project and to ensure all relevant parties have had input into the project, and appropriate permissions and approvals sought.

Consultation with the community on the trail alignment occurred between 25 November 2019 and 20 January 2020. This consultation was in the form of a number of drop-in sessions, an online questionnaire, letter drops to surrounding properties, and opportunities to submit comments and feedback.

Overall, there has been strong community support for the proposal due to the economic and tourism benefits it offers.

When complete, the Creswick Trails Project will deliver up to 100km of new purpose-built mountain bike trails beginning at the Hammon Park Trailhead. During the planing and design of the project, two distinct sections of the trail were identified: a 60km section to the north of Melbourne Road and a 40km section south of the road within the Creswick Regional Park.

Due to a number of reasons related to the differing land types across the two sections, detailed design of the northern section has occurred more quickly and as a result the project will be delivered in two stages. The first stage, which is the subject of this application, is proposed to deliver 60km of the trail with the final 40km to be delivered at a later time.

The Hammon Park trailhead and associated Pump Track and car parking was constructed in 2018-2019. The trailhead and Pump Track were opened in February 2019. Further facilities will be developed at the Hammon Park trailhead as part of the Hammon Park Trailhead: Community and Youth and Hub Master Plan, consisting of public toilets, community space, nature playground, jumps course, cyclocross track, learn to ride course as well as a pavilion able to house local events and clubs.

The project has been identified as one of 23 priority projects of Hepburn Shire Council that will stimulate the local economy following the impacts of the COVID-19 pandemic. The priority projects include a range of tourist attractions and community and sporting facilities.



Hammon Park Master Plan 2018 extract

3 SUBJECT SITE & SURROUNDS

The trail will be located within the Creswick Regional Park, the Creswick State Forest, and a commercial pine plantation, south-east of Creswick. The trail head is located at Hammon Park along Moore Street in Creswick.

The site consists of land managed by a range of land managers including the Department of Environment, Land, Water and Planning (DELWP), Parks Victoria, and Hancock Victorian Plantations Pty Ltd. The traditional owners of the land are the Dja Dja Wurrung.

The Stage 1 trail is predominantly located to the north of Melbourne Road with a portion south of the road near Cheney Street.

The site and surrounds are moderately hilly and generally forested with narrow creeks and gullies. The landscape has been modified through historical mining activities, with mine shafts and other earthworks evident throughout the area.

In terms of waterways and water bodies, the Creswick Creek and its tributaries run through the study area. St Georges Lake and Cosgrove Reservoir are the two largest water bodies in the surrounds.

The portion of the site not associated with the pine plantations consists of many walking trails, camping and picnicking areas, informal cycling trails, and other recreational uses. There is currently over 30km of existing walking trails within the Creswick Regional Park.

Various management tracks and access roads are situated variously throughout the site and surrounds.

The area contains a large amount of native vegetation on the DELWP and Parks Victoria land. The vegetation is regrowth from mining activities.

The Flora and Fauna Assessment has identified the following Ecological Vegetation Classes (EVC) within the study area:

- Heathy Dry Forest (EVC 20)
- Grassy Dry Forest (EVC 22)
- Valley Grassy Forest (EVC 47)
- Herb-rich Foothill Forest (EVC 23)
- Creekline Herb-rich Woodland (EVC 164)
- Plains Grassy Woodland (EVC 55)

Further details are provided within the Flora and Fauna Assessment.

As the trail head, Hammon Park currently contains a pump track at the southern end of the Hammon Park Oval. A range of car parking has been formalised recently within a cleared area to the south of the pump track. A range of other works and facilities will be constructed at Hammon Park as part of the Hammon Park Trailhead: Community and Youth Hub master plan.

When complete, the trailhead will contain public toilets, community space, nature playground, jumps course, cyclocross track, learn to ride course as well as a pavilion able to house local events and clubs.



Creswick Regional Park brochure



Site and surrounds aerial



Typical bush within the park



Existing trail



Existing trail



Typical bush within the park



Hancock Victorian Plantations Pine Plantation



Hammon Park Pump Trail (Reference: ridecreswick.com.au)

4 PROPOSAL

It is proposed to construct 60kms of mountain bike trails within the subject site. This will involve the removal of native vegetation to construct the trail.

Common Ground, who are a trail consultancy and specialise in mountain bike facilities, have prepared the detailed design and trail alignment for the project. They aim to work with the landscape through a sustainable approach that limits impacts to the local ecology.

Use

The use is formally defined as 'Informal Outdoor Recreation' under the Hepburn Shire Planning Scheme. Once complete, the trail will be managed by Hepburn Shire Council in collaboration with land managers (DELWP, Parks Victoria, Hancock Victoria Plantations).

The trails are proposed to be of varying levels of difficulty, providing a challenge for beginners all the way through to veterans. The trail will begin at the trailhead at Hammon Park which will include signage and parking. A recently constructed 'Pump Track' is also located at Hammon Park.

The network will include a variety of trail types and ride zones. This will include a series of 'adaptive trails', which are accessible trails designed and constructed specifically for riders who have limitations riding a standard, up-right, leg powered mountain bike. These will be the first of their kind in Victoria.

Further details regarding the alignment can be found within the Detailed Design Alignment Plans and Trail Development Plan prepared by Common Ground.

As outlined within the Hammon Park Master Plan, Hammon Park will also contain a range of other facilities such as public toilets, jumps track, picnic area, as well as the opportunity to hold events with start and finish lines. These works are not the subject of this planning permit application.

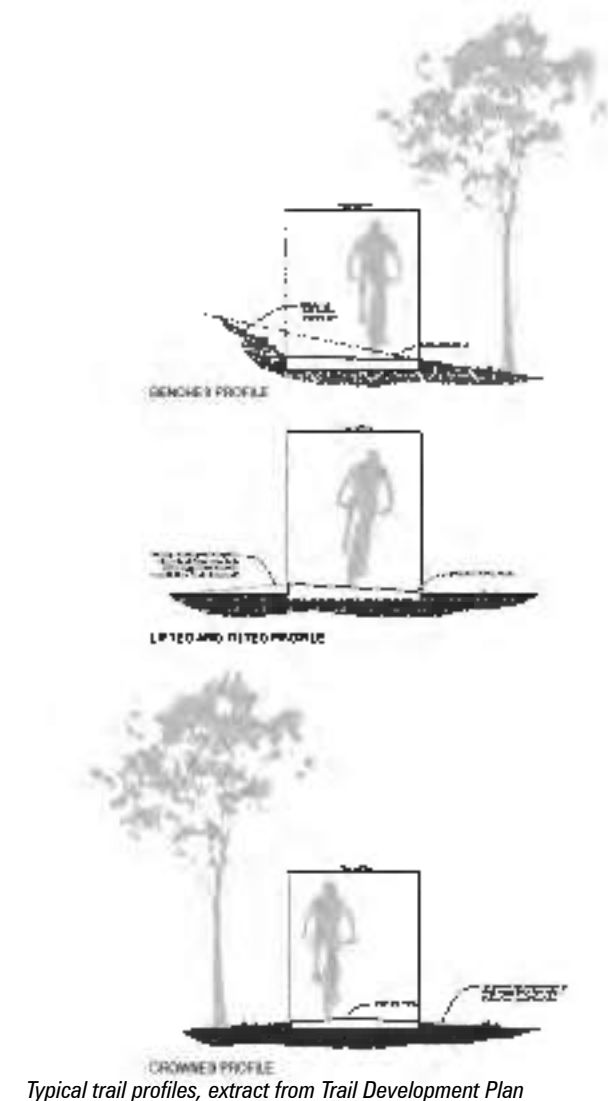
Construction

The alignment of the trail has utilised existing trails and roads as much as possible. Proposed construction techniques of the trails will consist of four types depending on the topography of the land:

- Standard benching - by machine
- Standard benching - by hand
- Rock armouring
- Elevated structures

The trail will also include a range of features and turns such as a range of jump types, rock rollovers, drop off obstacles, roller whoops, rock gardens, bermed turns, and switchback turns.

Excavation will involve the removal of the top surface layer of land which will generally consist of grass or understorey vegetation. The track will then be created through a 'bench' of approximately 1m in width. The maximum impact area will be 2m wide. Generally the steeper the elevation the greater the deeper the excavation to create a 'bench'. The majority of all excavation will be under 300mm in depth and will be shortened in areas of environmental sensitivity and around large trees. In steeper sections excavation of 1m in depth may be required to create the bench track.



Typical trail profiles, extract from Trail Development Plan

Rock paving / armouring will be used in sections where little digging or drainage is required and involves placing rock paving / armouring on top of the ground to create a crowned track.

The trail alignment has minimised the number of watercourse crossings as much as possible. Low points in the trail may require armouring or a low boardwalk. Some gullies will require more substantial bridges.

The trail will be constructed in 100 to 200 meter sections at a time.

Further details regarding the construction of the trail can be found within the Trail Development Plan prepared by Common Ground dated February 2021.

Native Vegetation Removal

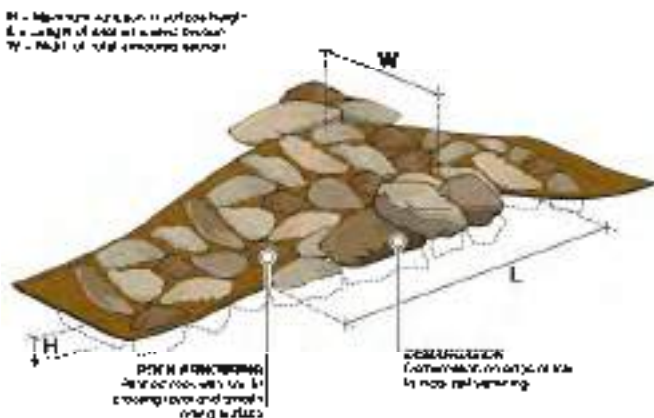
It is proposed to remove 11.867ha of native vegetation to accommodate the new trails.

The vegetation is made up of four EVCs:

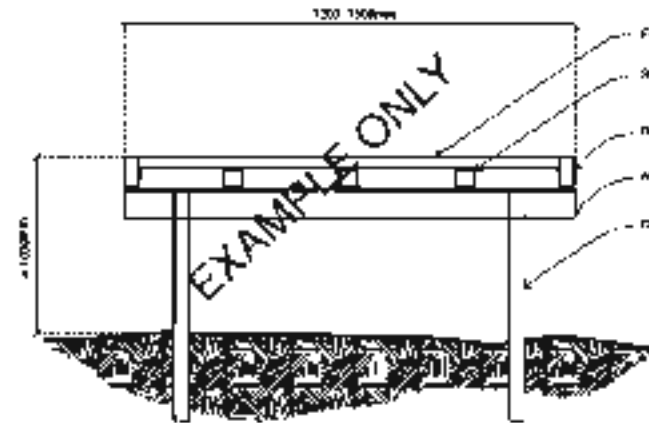
- Heathy Dry Forest (EVC 20)
- Grassy Dry Forest (EVC 22)
- Herb-rich Foothill Forest (EVC 23)
- Creekline Herb-rich Woodland (EVC 164)

Offset credits will be procured as required by Clause 52.17.

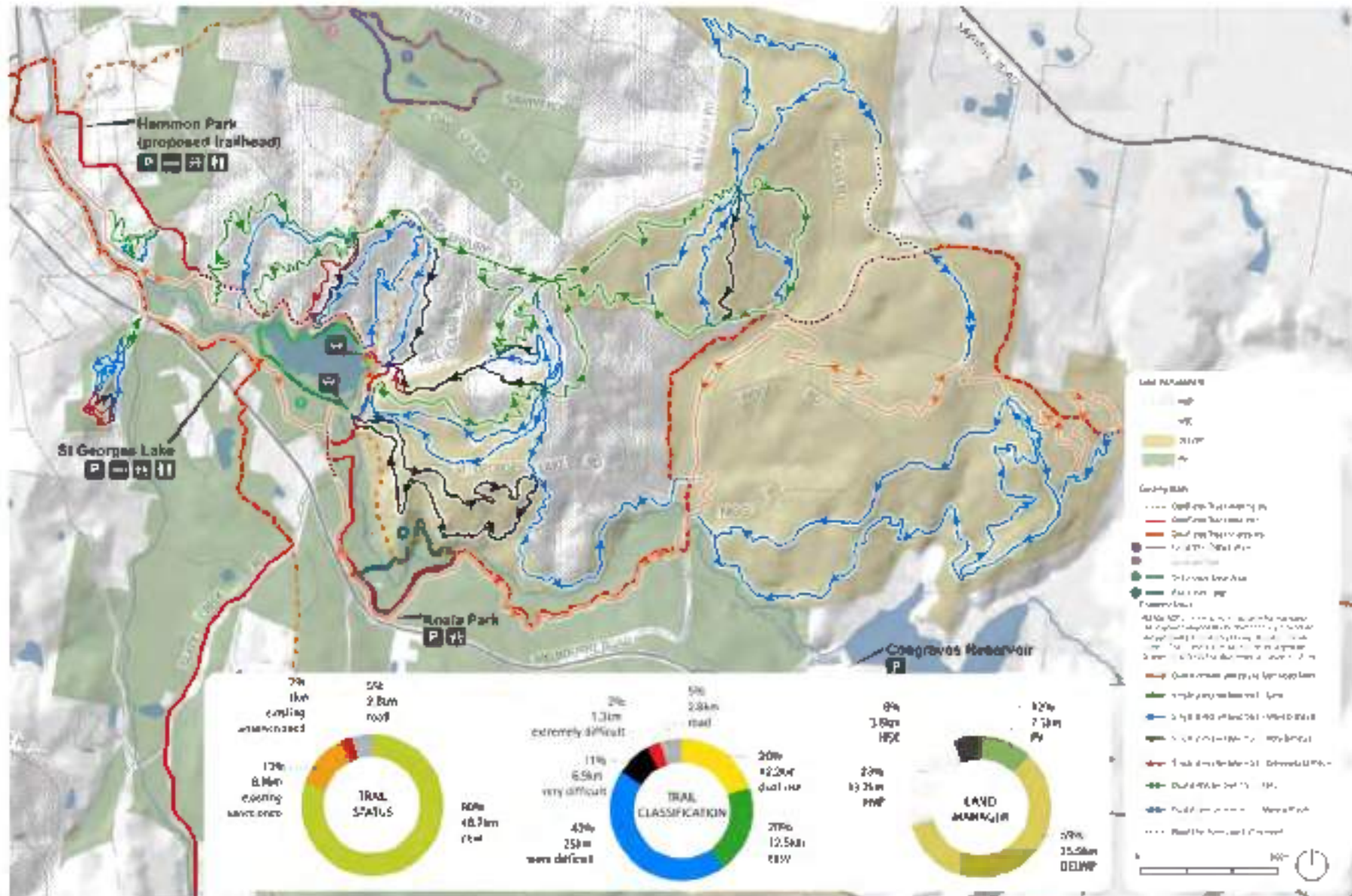
Further details regarding the native vegetation can be found within the Flora and Fauna Assessment prepared by Biosis dated 5 March 2021.



Typical rock armouring, extract from Trail Development Plan



Example boardwalk section, extract from Trail Development Plan



CRESWICK TRAILS STAGE 1 - OVERVIEW

Creswick Trails Stage 1 Overview, Common Ground 2021



5

PLANNING FRAMEWORK

PLANNING POLICY FRAMEWORK

The following provisions of the Planning Policy Framework (PPF) are considered to be relevant:

- **Clause 12: Environmental and Landscape Values**
 - Clause 12.01: Biodiversity
 - Clause 12.01-1S: Protection of Biodiversity
 - Clause 12.01-2S: Native Vegetation Management
 - Clause 12.03: Water Bodies and Wetlands
 - Clause 12.03-1S: River Corridors, Waterways, Lakes and Wetlands
- **Clause 15: Built Environment and Heritage**
 - Clause 15.03: Heritage
 - Clause 15.03-1S: Heritage Conservation
 - Clause 15.03-2S: Aboriginal Cultural Heritage
- **Clause 17: Economic Development**
 - Clause 17.01: Employment
 - Clause 17.01-1S: Diversified Economy
 - Clause 17.01-1R: Diversified Economy Central Highlands
 - Clause 17.04: Tourism
 - Clause 17.04-1S: Facilitating Tourism

- **Clause 18: Transport**
 - Clause 18.02: Movement Networks
 - Clause 18.02-1S: Sustainable Personal Transport
 - Clause 18.02-4S: Car Parking
- **Clause 19: Infrastructure**
 - Clause 19.02: Community Infrastructure
 - Clause 19.02-3S: Cultural Facilities
 - Clause 19.02-4S: Social and Cultural Infrastructure

LOCAL PLANNING POLICY FRAMEWORK

The following provisions of the Planning Policy Framework (PPF) are considered to be broadly relevant to this amendment request:

- Clause 21.01: Municipal Profile
- Clause 21.07: Economic Development
- Clause 21.09: Environment & Heritage
- Clause 22.01: Catchment and Land Protection

The main elements of state and local policies, as they relate to the proposal, are discussed in more detail within the planning considerations section of this report.

PARTICULAR & GENERAL PROVISIONS

The following particular and general provisions are relevant:

- **Clause 52.06 (Car Parking)** sets down statutory car parking requirements for land uses. While a planning permit is not triggered under the provision, car parking is to be provided to the satisfaction of the Responsible Authority.
- **Clause 52.17 (Native Vegetation)** seeks to ensure no net less to biodiversity as the result of development. A permit is required under this provision to remove, destroy or lop native vegetation.
- **Clause 52.31 (Local Government Projects)** applies to local government projects and, amongst other things, exempts any requirement within a zone to obtain a permit for buildings and works when this is carried out by or on behalf of a municipal council.
- **Clause 62.02 (Buildings and Works)** outlines a number of buildings and works not requiring a permit. Of particular relevance is the exemption related to buildings and works associated with 'Bicycle Pathways and Trails' and 'Park Furniture' (including Public Toilets) pursuant which are exempt from requiring a permit, unless specifically stated within a zone or overlay.
- **Clause 65 (Decision Guidelines)** requires that the Responsible Authority must consider whether the proposal is consistent with the orderly planning of the area.

ZONING

The site is located within a number of zones.

Public Park and Recreation Zone (PPRZ)

In addition to implementing the MPS and PPF, the purpose of the PPRZ is:

- *To recognise areas for public recreation and open space.*
- *To protect and conserve areas of significance where appropriate.*
- *To provide for commercial uses where appropriate.*

As set out at Clause 36.02-1, a permit is not required for the use of the land in the PPRZ for 'Informal Outdoor Recreation'.

A permit is not required for buildings and works due to the exemption provided by Clause 62.02.

Public Conservation and Resource Zone (PCRZ)

In addition to implementing the MPS and PPF, the purpose of the PCRZ is:

- *To protect and conserve the natural environment and natural processes for their historic, scientific, landscape, habitat or cultural values.*
- *To provide facilities which assist in public education and interpretation of the natural environment with minimal degradation of the natural environment or natural processes.*
- *To provide for appropriate resource based uses.*

A permit is required for the use of the land in the PCRZ for 'Informal Outdoor Recreation' where it is not carried out by a Public Land Manager (PLM) as per Clause 36.03-1. As Council are not the PLM for the land then a permit is triggered.

A permit is not required for buildings and works due to the exemption provided at Clause 52.31, which exempts any requirement within a zone to obtain a permit for buildings and works when this is carried out by or on behalf of a municipal council and where the estimated cost of development is under \$10M.

Farming Zone (FZ)

In addition to implementing the MPS and PPF, the purpose of the FZ is:

- *To provide for the use of land for agriculture.*
- *To encourage the retention of productive agricultural land.*
- *To ensure that non-agricultural uses, including dwellings, do not adversely affect the use of land for agriculture.*
- *To encourage the retention of employment and population to support rural communities.*
- *To encourage use and development of land based on comprehensive and sustainable land management practices and infrastructure provision.*
- *To provide for the use and development of land for the specific purposes identified in a schedule to this zone.*

As set out at Clause 35.07-1, a permit is not required for the use of the land in the FZ for 'Informal Outdoor Recreation'.

A permit is not required for buildings and works due to the exemption provided by Clause 62.02.

OVERLAYS

The site is affected by a number of overlays.

Environmental Significance Overlay - Schedule 1 (ES01)

In addition to implementing the MPS and PPF, the purpose of the ESO is:

- *To identify areas where the development of land may be affected by environmental constraints.*
- *To ensure that development is compatible with identified environmental values.*

Schedule 1 (Proclaimed Catchment Protection) applies to all land within Hepburn Shire in recognition of its situation within the Central Highlands which is the source of a number of catchments leading to Port Phillip Bay and the Murray River.

Pursuant to Clause 42.01-2 a permit is triggered for works associated with bicycle pathways and trails. As 'site cut' associated with the trail is likely to be greater than 300sqm and includes site cut greater than 1m in depth, then the proposal is not exempt under Clause 4.0 of Schedule 1.

Pursuant to Clause 42.01-2 and Clause 4.0 of Schedule 1, a permit is required for the removal of vegetation, including dead vegetation.

Heritage Overlay (H0976)

In addition to implementing the MPS and PPF, the purpose of the Heritage Overlay is:

- *To conserve and enhance heritage places of natural or cultural significance.*
- *To conserve and enhance those elements which contribute to the significance of heritage places.*
- *To ensure that development does not adversely affect the significance of heritage places.*
- *To conserve specified heritage places by allowing a use that would otherwise be prohibited if this will demonstrably assist with the conservation of the significance of the heritage place.*

H0976 relates to the Humbug Hill Hydraulic Gold Sluicing Site.

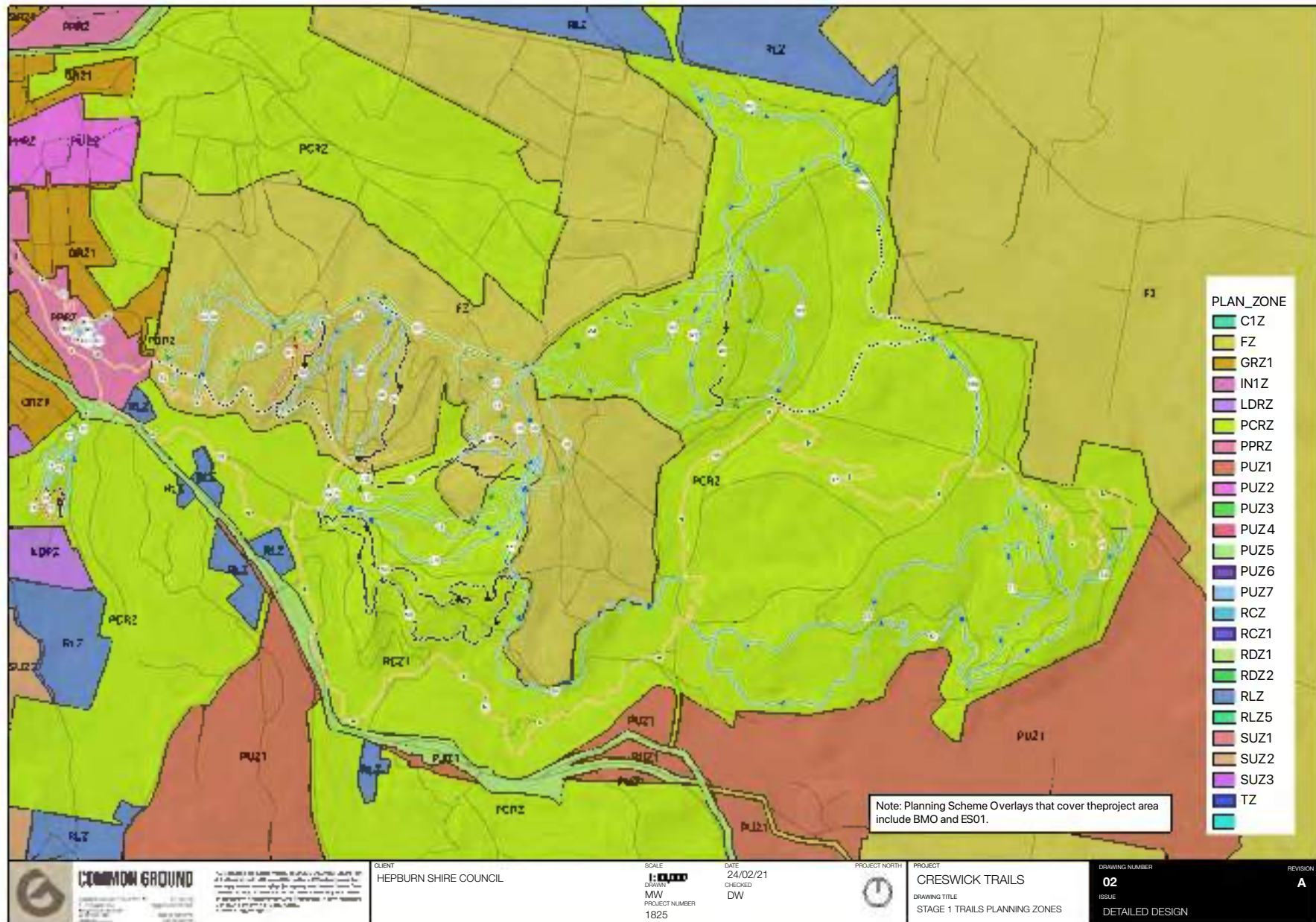
Stage 1 of the trail, which is the subject of this planning permit application avoids the Heritage Overlay. However, it is noted that pursuant to Clause 43.01-3, as the heritage place (H0976) is included on the Victorian Heritage Register, a permit is not required for development.

Bushfire Management Overlay (BMO)

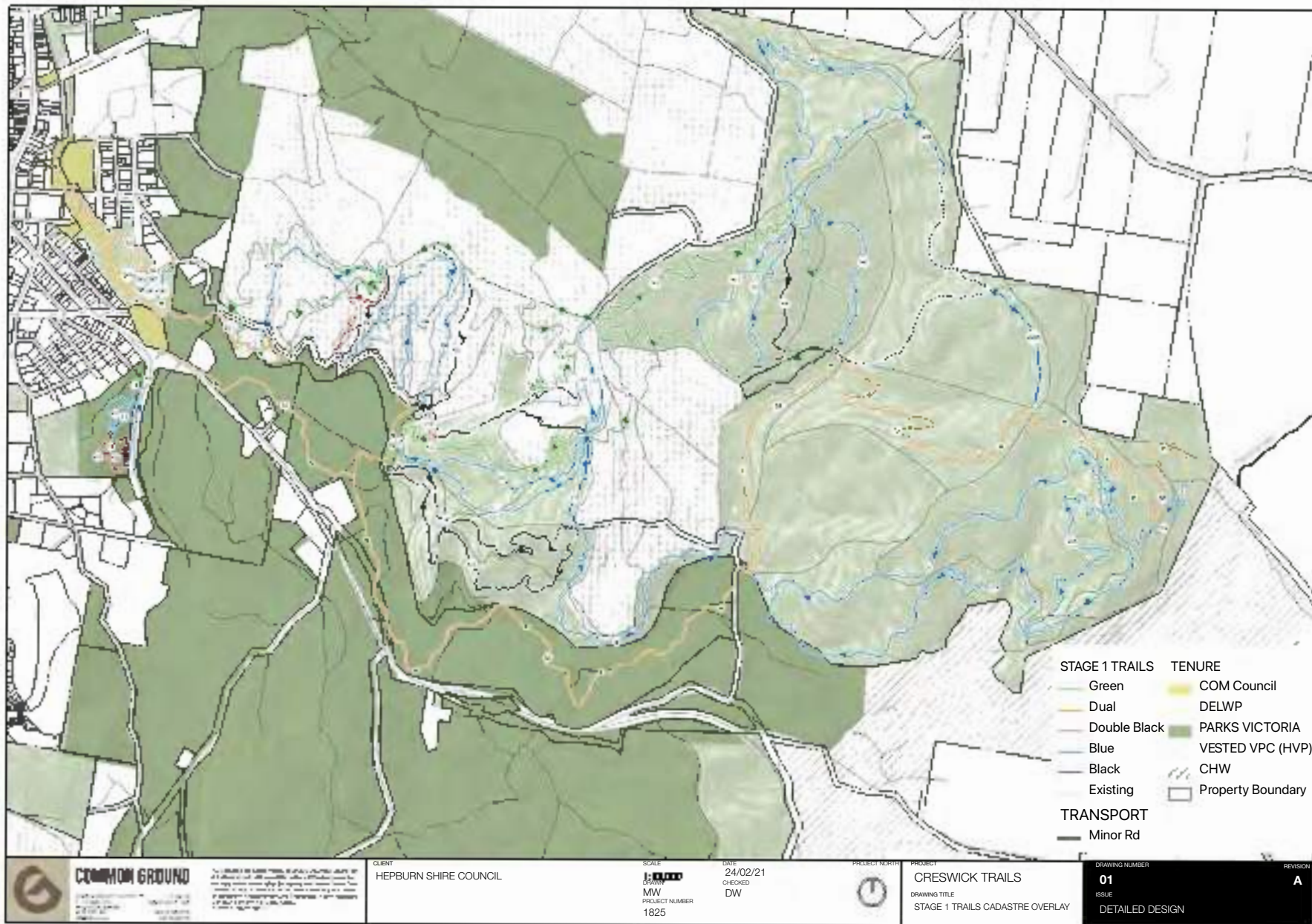
In addition to implementing the MPS and PPF, the purpose of the BMO is:

- *To ensure that the development of land prioritises the protection of human life and strengthens community resilience to bushfire.*
- *To identify areas where the bushfire hazard warrants bushfire protection measures to be implemented.*
- *To ensure development is only permitted where the risk to life and property from bushfire can be reduced to an acceptable level.*

A permit is required for buildings and works associated with a number of uses, including 'Leisure and Recreation', which 'Informal Outdoor Recreation' is nested under. However, a permit is not required for buildings and works due to the exemption provided by Clause 62.02.



Zoning and Overlays Map, Common Ground 2021



Public Land Manager Map, Common Ground 2021

AREA OF CULTURAL HERITAGE SENSITIVITY

The site is located within an area of Aboriginal cultural heritage sensitivity. A Cultural Heritage Management Plan has been prepared by Biosis dated 23 February 2021 which has been submitted with Aboriginal Victoria for approval.

PLANNING PERMIT TRIGGER SUMMARY

Due to the number of planning permit exemptions under the public zones and the exemptions outlined at Clause 62.02 for buildings and works, the proposal is limited to the following planning permit triggers outlined within the table.

- Use of the land within the PCRZ as 'Informal Outdoor Recreation'.
- Buildings and works associated with 'Bicycle Pathways and Trails' under the ESO1 as more than 300sqm of site cut is proposed and sections will include cut deeper than 1m.
- Vegetation removal under the ESO1 as the site is greater than 1ha.
- The removal of native vegetation under Clause 52.17 (Native Vegetation).
- While not a formal permit trigger, car parking is to be provided to the satisfaction of the Responsible Authority under Clause 52.06 (Car Parking) as the proposal is the establishment of a new use.

6

KEY PLANNING CONSIDERATIONS

Based on the provisions of the Hepburn Shire Planning Scheme and the decision guidelines of Clause 65, the following are considered to be the planning issues relevant to the proposed development of the subject site.

- Is there strategic policy support for the proposal?
- Is the proposal consistent with the decision guidelines of the PCRZ?
- Is there sufficient car parking to support the mountain bike trail?
- Does the proposal respond appropriately to the requirements of the ESO1?
- Will the removal of native vegetation impact the biodiversity and natural habitat of the area and will adequate offsets be provided to permit the removal of native vegetation?

STRATEGIC POLICY SUPPORT

The proposed purpose-built mountain bike trail will create a major mountain biking tourism destination within Creswick. The proposal seeks to capitalise on the unique surrounding landscape and boost the local economy. When complete, the trail will be a flagged ship tourism asset that will attract more visitors to the region and boost the local economy.

Economic Development & Tourism

Key economic planning policy at Clause 17 (Economic Development) highlights the importance of strengthening a diverse economic base to support employment (Clause 17.01-1S and 17.01-1R). A particular emphasis is placed on supporting the growth of regional economies through important strategic industries such as tourism.

Clause 17.04-1S highlights the importance of investing in and establishing innovative tourism experiences to support the economic, social and cultural benefits afforded by a strong domestic and international competitive tourism sector. A particular emphasis is placed on facilities that propose to build on existing assets and qualities of regions.

At a local level Clause 21.07 (Economic Development) highlights that tourism is becoming a more significant contributor to the local Hepburn Shire economy and provides important local employment opportunities. The establishment of high quality tourism development within the Shire is identified as a key strategy to build a diverse local economy.

As one of the largest employing sectors in the municipality, the Hepburn Shire Economic Development Strategy 2016-2021, identifies tourism as one of the key economic pillars of the Shire. An emphasis is placed on supporting tourism development. The forests and trails of the Shire are seen as key unique tourism assets.

Creswick Trails provides an exceptional and unique opportunity to strengthen the Shire's tourism offering and help support the local economy through an adventure / nature based tourism offering. It will also celebrate the unique landscape and cultural qualities of the area.

There are three key factors that determine the tourism attraction potential of a trail:

- The length of the trail.
- Location of the trail.
- Rider experience.

At 60km in length, the first stage of the project is longer than the one day benchmark of 20km, which is typically taken to be the length a rider will achieve in a day. Due to this, users of the trail are likely to stay longer in the area and inject money into the visitor economy. Based on the one day benchmark it can be reasonably assumed that Stage 1 has the potential to cater for three days of mountain biking, particularly when factoring in the repeat use of favoured tracks by users.

The proposal will therefore foster overnight and multi-night stays within the area and as a result will support local accommodation businesses.

The location of a trail has implications for its regional and / or national significance. Trails that are well located with respect to a town centre and facilities are of greater significance and will provide increased benefits to local economies. The start of the Creswick Trails is located less than 5min from the Creswick town centre and within 30min of Ballarat, which is a major regional centre. Creswick's location along a train line with direct connections to both Ballarat and Melbourne means the trail is ideally located and easily accessible to be a draw card for regional, national, and even international tourism.

Creswick and the surrounding area is also positioned near other significant tourism assets such as the Skate and Splash Park, hiking trails in the Regional Park and State Forest, St Georges Lake which offers swimming and fishing experiences, proximity to regional food and wine, and less than 30min from Daylesford.

It is also noted that once complete, the Hammon Park Trailhead will have the ability to attract and hold national and international mountain biking events.

The ideal location of the proposal will therefore help to generate tourism and visitor spending in the area in supporting the local economy.

Finally, the scenic trail and rider experience offered by the trail will be a significant draw card. The trail's setting will celebrate and showcase the shire and region's history and heritage such as the historic gold mining areas and cultural heritage. The mining-altered landscape offers a great opportunity to build on the unique and iconic landscape.

Set within a unique landscape, proximate to complimentary tourism experiences and services, the diverse 60km trail will therefore create a significant tourism destination within Creswick that will strongly support the local economy. The trail will build on the extensive range of tracks and trails already within the area such as the Goldfields Track, Great Dividing Trail, and St Georges Lake.

Community Infrastructure

Clause 19.02 outlines objectives and strategies to ensure the community is provided with a good range of community facilities and open space that supports the recreational needs of the community. Clause 19.02-3S seeks to increase access to recreational facilities that are well located.

Consistent with Clause 19.02-6S, the proposal will enhance the open space network *"for nature conservation, recreation and play, formal and informal sport, social interaction, opportunities to connect with nature and peace and solitude"*. The ride experience offered by the Creswick Trails is diverse with a range of different trails that take in the scenery and vistas offered by the forest and mining heritage.

Strategies at Clause 19.02-6S place a focus on multipurpose open space. The start of the trail at the Hammon Park Trailhead: Community and Youth Hub creates strategic benefits for co-locating facilities and building on the existing community asset. When complete, the trailhead will contain public toilets, community space, nature playground, jumps course, cyclocross track, learn to ride course as well as a pavilion able to house local events and clubs.

The trail is designed to cater towards all levels of experience. A majority of the trails in the Creswick Trails Network are

designed as beginner or intermediate level to cater to the broadest range of users to encourage the use of the trails by school groups, new riders and families.

In supporting Clause 19.02-4S, which seeks to ensure social infrastructure is designed to be universally accessible, the trail will include a series of 'adaptive trails', which are accessible trails designed and constructed specifically for riders who have limitations riding a standard, up-right, leg powered mountain bike. These will be the first of their kind in Victoria.

Environment

Planning policy places an emphasis on ensuring new development protects and enhances the environment. Key to this is ensuring the adequate protection and conservation of Victoria's biodiversity. Strategies outlined at Clause 12.01-1S (Protection of biodiversity) seek to ensure that the impacts of land use change or development within conservation reserves is appropriately considered. The importance of biodiversity information for identifying important biodiversity areas such as key habitats for rare or threatened species is highlighted.

Planning policy's main focus for protecting biodiversity is through the regulation of native vegetation removal. Key planning policy at Clause 12.01-2S (Native Vegetation Management) seeks to ensure that there is no net loss to biodiversity as a result of the removal of native vegetation. A three-step approach is taken to assessing the removal of native vegetation (avoid, minimise, offset). This is implemented through the provisions of Clause 52.17 (Native Vegetation) of the Hepburn Shire Planning Scheme and is addressed later on in this report.



Typical creek within the regional park

At a local level, sustainable long-term environmental management is identified as being fundamental to land use planning in the Shire. Objective 3 of Clause 21.09 notes the need to protect remnant native vegetation and habitat in recognition of the many forests across the Shire. Development should minimise the loss of significant remnant vegetation and habitat areas. An emphasis is placed on vegetation along waterways and maintaining the biodiversity and habitat significance of forests, grasslands, streams and bushlands in the Shire.

As detailed further throughout this report and supporting documentation, the trail network has been designed to avoid areas of high environmental significance. The trails will be constructed to best-practice standards for sustainable design to ensure minimal ongoing environmental impacts and maintenance. The trails will be constructed using International Mountain Bike Association (IMBA) guidelines and best practice principles with regard to environmental and cultural protection.

Heritage

Clause 15.03 (Heritage) sets out planning policy for the protection of places of heritage significance. Clause 15.03-1S (Heritage Conservation) seeks to ensure development respects and acknowledges, conserves, and responds to the significance of a heritage place. Clause 15.03-2S identifies the need to protect and conserve places of Aboriginal cultural heritage significance.

At a local level, Objective 1 of Clause 21.09 seeks to ensure that cultural heritage within the Shire is protected by identifying significant heritage places and ensuring new development does not impact upon significant places.

It is noted that there is no planning permit trigger under the Heritage Overlay for Stage 1 of the trail, which is the subject of this planning permit application. The Heritage Overlay (HO976) only applies to land that will form part of Stage 2 of the trails and relates to the Humberg Hill Hydraulic Gold Sluicing Site.

While a planning permit is not triggered, it is highlighted that the proposal has sought to work with and respond appropriately to the heritage context by avoiding and minimising impact on areas of heritage significance. The location of areas of heritage sensitivity have been avoided as much as possible in the design of the trail alignment.

The Historic Survey Report (Biosis, 20.02.21) outlines the results of background research and site investigations. It confirms the presence of *“a number of historical features primarily related to the mid to late nineteenth century gold mining undertakings, comprising water races, reservoirs, alluvial workings and other mining features”*. The assessment concludes that the *“impacts to heritage places from the proposed mountain bike trails are generally considered to be minimal”*. This report has been submitted to Heritage Victoria.

In terms of cultural heritage, the Dja Dja Wurrung Clans Aboriginal Corporation have been consulted with throughout the progression of the detailed design alignment and are a major stakeholder in the project. Officers have undertaken site visits and have provided input into the preparation of the Cultural Heritage Management Plan (CHMP). The Dja Dja Wurrung are supportive of the CHMP, which has been prepared and awaiting approval by Aboriginal Victoria.

It is highlighted that negotiations towards a Land Use Activity Agreement (LUAA) are also being carried out with the application attached to this planning permit application.

The CHMP notes that due to significant ground disturbance from historical gold mining activities, there is low potential for the unidentified Aboriginal cultural heritage within the activity area. Site investigations and surveys, undertaken as part of the preparation of the CHMP confirmed that it is "highly unlikely that Aboriginal cultural heritage will either be identified or harmed during the proposed works" and "no new Aboriginal cultural heritage was found during the assessment". The two recorded VAHR places within the area, comprising Scarred trees on Jackass road, are located outside of the activity area. They were also inspected during the assessment and considered unlikely to be of Aboriginal origin.

The Environmental Management Plan identifies areas of archaeological monitoring and a program of archaeological monitoring will be carried out in these sections.

USE WITHIN THE PCRZ

A permit is required for the use within the PCRZ as an 'Informal Outdoor Recreation'.

The purpose of the zone is to conserve the natural environment for its historic, scientific, landscape, habitat or cultural values while supporting facilities that provide for education and interpretation of the natural environment and resource based uses.

The PCRZ outlines the following decision guidelines that the responsible authority must consider when deciding on an application:

- *The Municipal Planning Strategy and the Planning Policy Framework.*
- *The comments of any public land manager or other relevant land manager having responsibility for the care or management of the land or adjacent land.*
- *Whether the development is appropriately located and designed, including in accordance with any relevant use, design or siting guidelines.*

With reference to the purpose of the zone and the decision guidelines, it is submitted that:

- The proposed use is consistent with the purpose of the zone as it will provide residents and visitors with the opportunity to experience the significant environment and landscape through a unique recreational opportunity.

- The trails will also provide interpretive signage that will seek to educate visitors and the community about the cultural, historic, and natural features of the area.
- As the public land managers of all PCRZ land within the site, DELWP, Hancock Victorian Plantations Pty Ltd, and Parks Victoria have been consulted with throughout the project and have provided input into the alignment, construction, ongoing management, and environmental matters of the project.
- All PLMs have provided either written consent for the project or for a planning permit application being made.
- It is noted that while DELWP have provided consent for the planing permit application being made (letter dated 1 March 2021), they have outlined a number of conditions they require being fulfilled before construction can commence (letter dated 8 August 2019). These conditions are currently being worked through with many already being fulfilled. A number of documents are attached to this application to demonstrate how these conditions are being fulfilled.
- The proposal has responded appropriately to the natural and environmental features of the site as detailed throughout this report and supporting documentation. In particular, native vegetation removal has been minimised and avoided as much as possible. This is detailed further in later sections.

It is therefore considered that the proposal is consistent with the purpose and decision guidelines of the PCRZ.

CAR PARKING

As the proposal is formally the establishment of a new use, consideration needs to be given to Clause 52.06 (Car Parking). While a planning permit is not triggered under the provision, car parking is to be provided to the satisfaction of the Responsible Authority.

Adequate car parking is provided at the Trailhead at Hammon Park. Car parking formed a key consideration for the development of the Hammon Park Master Plan. As part of the recent development of the pump track at the Trail Head, car parking has been formalised in a cleared area to the south of the oval / pump track.

The car park is capable of accommodating 36 spaces including 3 long spaces for larger vehicles, and a bus and shuttle drop off area. Additional car parking can be accommodated within town which is a short walk away.

In addition to the trail head parking, there are existing car parking areas at picnic and BBQ areas near the trail, such as at Koala Park and St Georges Lake, that can support provide further car parking spaces.

The trail is also provided with easy cycling access to the Creswick Train Station which provides train service connections to Melbourne and Ballarat. Users are therefore likely to use alternative modes of transport to access the trail.

It is therefore considered that there is adequate car parking available and alternative transportation options to support the proposal.

RESPONSE TO THE ESO1

The proposal requires a planning permit under the ESO1 for the removal of vegetation and any site cut that is either greater than 1m in depth or greater than 300sqm.

As noted, the excavation will generally involve the removal of the top surface layer of land which will predominantly consist of grass or understorey vegetation.

In steeper sections excavation of 1m in depth may be required to create the bench track.

The ESO1 applies extensively across the whole Shire in recognition of Hepburn Shire’s situation within the Central Highlands, which is the source of a number of catchments linked to Port Phillip Bay or the Murray River. The overlay seeks to protect the quality of this water as it has significant local and regional implications, especially where these catchments provide domestic water supply.

In particular, the overlay seeks to:

- Protect and enhance water quality and quantity and prevent runoff that may lead to erosion or siltation of watercourses.
- Prevent the erosion of banks and streambeds.
- Prevent pollution and increased turbidity and nutrient levels of watercourses, water bodies and storages.

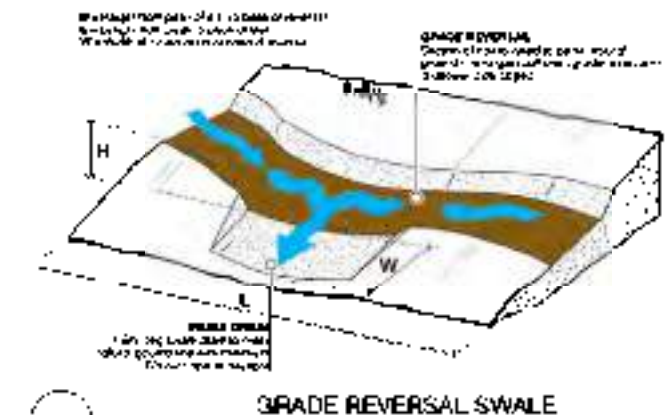
The Environmental Management Plan (EMP) prepared by Biosis provides a range of construction, management, and remediation techniques to ensure the proposal appropriately considers potential environmental impacts and the ways these can be mitigated or avoided. It addresses key aspects of the ESO1 related to erosion, water quality and quantity, and sediment build up.

With reference to the Decision Guidelines outlined at Clause 6.0 of the ESO1 and the prepared EMP, we consider that the proposal responds appropriately to the erosion, water quality and quantity, and sediment considerations of the overlay for the following reasons:

- The project must comply with State Environmental Protection Policy (Waters) which seeks to protect water quality for such things as the protection of ecological values and human consumption.
- The trail gradient will generally be less than 5% and follow the natural landscape contours in a gradually descending manner with switch backs, where required, to minimise erosion.
- The portions of the track that will involve a concave ‘bench’ of approximately 1m in width will allow for water to run off every five to ten metres to assist with drainage and to avoid the concentration and pooling of water on the track.
- Grade reversal swales will be incorporated into the trail to address drainage to ensure surface water is diverted at regular intervals.
- Around water races, the approach angles have been designed to be gentle and avoid dropping down steep hills and turning sharply on the formation. Rock armoring will

be utilised around boardwalks and bridges to reducing erosion on approach.

- Minimal riparian vegetation will be removed to construct elevated structures. These areas will be allowed to regenerate or activity rehabilitated (where required) when works are complete.
- A range of construction and management techniques will be used to minimise impacts of runoff and erosion:
 - Sediment fencing and modular sediment traps will be installed prior to construction. Fencing will be placed around vegetation that is not proposed for removal to avoid impacts where required. Sediment control measures will be checked and maintained at regular intervals.
 - Fill will be disposed of in designated stockpiles that will be moistened and covered with biodegradable jute matting.



Grade reversal swale design, extract from Trail Development Plan

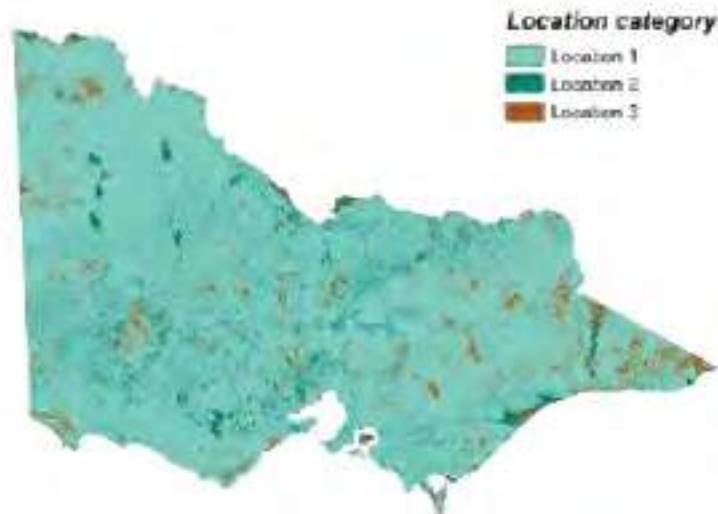
- Small lengths of the trail will be excavated on steep slopes to prevent channelling of water within trenches.
- Works around waterways will be undertaken by hand. The trail will be micro-sited with the assistance of an ecologist through high risk areas to avoid impacts on these sensitive ecosystems.
- Works under trees will be undertaken using hand tools to ensure minimal disturbance other than removing the grass and organic layer.
- Following completion of the trail the EMP recommends the implementation of the following relevant trail management measures:
 - Photo points should monitor the levels of sedimentation entering the adjacent waterways due to trail construction and remedial measures will be undertaken if significant levels of sedimentation enter any of the monitored waterways. Sedimentation levels will also be assessed along the length of the trail at drainage exit points.
 - Erosion of batters and trail surface should be monitored during assessments. Remedial works should be undertaken in the form of surface hardening or supplementary planting to reduce erosion in unstable areas.
 - Erosion and sediment controls for works near creeks and drainage lines to protect against any impacts to water quality should be implemented.
- Maintenance works in waterways should be avoided when they are flowing. Works in these areas should be undertaken in summer/autumn months when they are dry.

It is therefore considered that techniques and measures implemented as part of the construction and ongoing management of the proposal will ensure that issues of water quality and erosion will be adequately addressed in accordance with ES01.

NATIVE VEGETATION REMOVAL

A permit is triggered under Clause 52.17-1 for the removal of native vegetation on the site.

The incorporated document, *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP 2017), provides direction on the appropriate removal of native vegetation. The three step approach of avoid, minimise and offset underwrites the policy direction provided by the *Guidelines* to ensure no net less to biodiversity as a result of the removal, destruction or lopping of native vegetation.



Location map for determining assessment pathway

The three steps relate to:

1. Avoid the removal, destruction or lopping of native vegetation.
2. Minimise impacts from the removal, destruction or lopping of native vegetation that cannot be avoided.
3. Provide an offset to compensate for the biodiversity impact from the removal, destruction or lopping of native vegetation.

Any application to remove native vegetation must comply with the application requirements outlined at Section 6.4 of the *Guidelines*. The 'Flora and Fauna Assessment' prepared by Biosis dated 5 March 2021 provides an outline of the type of native vegetation to be removed, the method for calculating the potential native vegetation impacts, the biodiversity score, confirmation of the assessment pathway, and an offset calculation as outlined within the attached 'Native vegetation removal report'.

The Biosis report confirms that the proposed native vegetation removal is to be assessed against the Detailed Assessment pathway. The report provides the necessary information in response to the Detailed Assessment pathway and application requirements. Please refer to that assessment for further information.

While the native vegetation is located within Location 1, representing an area that does not contain an endangered Ecological Vegetation Class or sensitive coastal area, the proposed removal is to be assessed under the Detailed Assessment Pathway due to the extent of removal exceeding 0.5ha.

It is noted that the project also involves the removal of native vegetation on land managed by HVP. As noted within the Biosis report, this vegetation is exempt from requiring a permit as "has naturally established or regenerated on land lawfully cleared of naturally established native vegetation and is within the boundary of a timber production plantation... and has established after the plantation" (p. 40).

In considering the application requirements for the Detailed Assessment Pathway and relevant decision guidelines as set out at Section 7 of the *Guidelines*, the proposed native vegetation removal is considered to be acceptable as outlined below.

Decision Guideline 1 (Avoid and Minimise)

Measures have been taken to avoid the removal of native vegetation as much as possible. The construction of the trail will involve the removal of very narrow strips of understorey vegetation only. Native vegetation assessed to be more significant has been avoided.

The following measures have been taken to **avoid** the removal of native vegetation:

- A detailed process of trail micro-siting has been undertaken to inform the detailed design of the alignment and potential impacts to native vegetation. This was undertaken to inform the native vegetation removal so that a priority was given to avoiding large trees. Micro-siting took place in spring to take in the presence of spring flowering native plants that are not obvious throughout the year.
- Canopy trees will be avoided where possible, particularly large hollow-bearing trees.

- Trail micrositing was also utilised to avoid impacts to high quality understorey vegetation and threatened species.
- As a result of the micrositing process which has considered all potential impacts to native vegetation, the actual removal of native vegetation is likely to be less than calculated. Construction will occur under the guidance of the project arborist to ensure only native vegetation that cannot be avoided is removed.
- Dead trees requiring removal will be left onsite where appropriate with input from land managers.
- Existing trails have been utilised where possible.

Measures undertaken through the design of the alignment and key strategies that will be implemented to **minimise** the impact on native vegetation and biodiversity include:

- The utilisation of sustainable building practices to limit impacts to the direct removal of native vegetation rather than secondary impacts through erosion.
- Trail construction will be minimised in sensitive areas associated with steep slopes and riparian areas.
- Site storage during construction will be located on existing disturbed land to minimise impacts to native vegetation.
- A Tree Management Plan will be prepared that ensures trees are appropriately protected during the construction phase.

Decision Guideline 2 (Water and Soil Degradation)

As outlined above, best practice sustainable construction techniques will be utilised to ensure direct removal of native

vegetation and the avoidance of secondary impacts as a result of erosion.

The construction of the trail near waterways and streams has been minimised. It is also noted that limited riparian vegetation is present as there are no perennial waterways.

Appropriate erosion and sediment controls for works near creeks and drainage lines will be implemented to protect against any impacts to water quality.

The Environmental Management Plan provides measures to ensure water quality is not impacted by the construction of the trails.

Decision Guideline 3 (Landscape Value)

As the removal of native vegetation is generally limited to strips of understorey vegetation, the implications for landscape values are considered to be minor. Only one large tree is proposed to be removed. Large trees are considered to have a greater contribution to landscape values.

Decision Guideline 4 (Culturally Significant Vegetation)

As outlined within the Cultural Heritage Management Plan, the two recorded VAHR Scarred trees on Jackass road, were inspected, but considered unlikely to be of Aboriginal origin. These trees are outside the activity area of the proposal and as such will not be impacted by the trail.

Decision Guideline 5 (Bushfire Risk)

No vegetation is required to be removed to create defensible space or to reduce bushfire risk.

Decision Guideline 6 (Property Vegetation Plan)

No Property Vegetation Plan applies to the site.

Decision Guideline 7 (Offsets)

The **offset** requirement is 6.585 general habitat units with a minimum strategic biodiversity value of 0.530. Hepburn Shire will purchase the offset credits from the Victorian native vegetation credit register. A quote has been obtained for the offset amount. Offset planting is to be taken place in the North Central Catchment Management Authority Area or Hepburn Shire Council local government area. This will result in the planting of appropriate native vegetation in the wider region of the CMA.

Decision Guideline 8 (Native Vegetation Precinct Plan)

Not applicable to the application.

Decision Guideline 9 (Value of Native Vegetation)

The Decision Guidelines require further assessment of applications under the Detailed Assessment Pathway. Consideration should be given to the extent, condition score, strategic biodiversity value of the vegetation, the number of large trees to be removed and whether the vegetation is from an endangered EVC or near any sensitive wetlands.

While the condition score of a lot of the assessed vegetation is in excess of 0.6, and the strategic biodiversity score of some of the vegetation exceeds 0.8, which is considered to be at the higher end of both scores, the approach taken to the alignment of the trail and the proposed construction has ensured that minimising the extent of eventual native vegetation removal is at the centre of consideration.

This is due to the detailed micro-siting process which has considered any potential impact on native vegetation. This assessment will ensure that when construction occurs, only the necessary vegetation will be removed. As a result, the offset calculation may reduce.

In response to the decision guideline it is noted that:

- The removal does not involve any vegetation from an endangered Ecological Vegetation Class (EVC).
- The extent of vegetation removal has been greatly minimised through a detailed micro-siting process that has placed a focus on avoiding the impacts to trees and areas of high quality understorey and significant flora. As a result only one 'large tree' as defined by the native vegetation provisions is proposed to be removed along the whole trail alignment.
- While some of the canopy trees require removal for safety reasons, many of the trees included in the offset calculations have been assessed to be 'potentially impacted' by the project arborist. Once construction of the trail commences under the guidance of the arborist, many of the trees may not be impacted upon and may be removed from the offset calculation in consultation with DELWP.
- The vegetation is not proximate to any sensitive wetlands.
- No species offsets are required.

Decision Guideline 10 (Impacts on Habitat for Rare or Endangered Species)

For applications in the Detailed Assessment Pathway, consideration is to be given to the impacts on habitat for rare or threatened species. Please refer to the fauna and habitat assessment provided in the Biosis report.

Key conclusions drawn within that report include the following:

- Modelled habitat for 19 rare or threatened fauna species has been predicted to occur within 10km of the study area. Most of the species are unlikely to occur within the study area, with development unlikely to have a significant impact. The assessed native vegetation impact is considered to account for less than 0.005% habitat impact for all species.
- As noted previously, no species offsets are required.
- The report provides an assessment of the likely impacts to the habitat of the five rare or threatened species considered likely to occur within the area. The impacts are considered to be unlikely with the implementation of the avoidance measures outlined within the Biosis report.
- The study area does not provide important habitat for an ecologically significant proportion of the thirteen migratory birds recorded or likely to occur within the study area.
- As the trail involves the removal of a very narrow strip of vegetation it is unlikely to pose a significant barrier to the movement of fauna species known to occur within the study area. The majority of species recorded were birds which will have minimal difficulty crossing the trails.

7

CONCLUSION

It is submitted that the proposal is consistent with the matters set out in Clause 65 of the Hepburn Shire Planning Scheme as detailed throughout this report, including the relevant policies and provisions for the following reasons:

- The proposal provides an appropriate response to the relevant policies of the Planning Policy Framework.
- It provides an exceptional and unique opportunity to strengthen the Shire's tourism offering and help support the local economy.
- The trail network has been designed to avoid areas of high environmental significance work with and respond appropriately to the heritage context.
- It is consistent with the purpose and decision guidelines of the PCRZ.
- Adequate car parking is available and alternative transportation options to support the proposal.
- It appropriately responds to the requirements and decision guidelines of the ESO1.
- The removal of native vegetation to support the proposal is considered to be appropriate in relation to ensuring net community benefit is achieved.

In summary, the proposal is considered a positive outcome for the subject site and surrounds and will provide the community with a unique asset that will make a positive contribution to the local economy.



Creswick Mountain Bike Trail: Flora and fauna assessment

Prepared for Hepburn Shire Council

5 March 2021

Biosis offices

NEW SOUTH WALES

Albury

Phone: (02) 6069 9200
Email: albury@biosis.com.au

Newcastle

Phone: (02) 4911 4040
Email: newcastle@biosis.com.au

Sydney

Phone: (02) 9101 8700
Email: sydney@biosis.com.au

Western Sydney

Phone: (02) 9101 8700
Email: westernsydneyoffice@biosis.com.au

Wollongong

Phone: (02) 4201 1090
Email: wollongong@biosis.com.au

VICTORIA

Ballarat

Phone: (03) 5304 4250
Email: ballarat@biosis.com.au

Melbourne (Head Office)

Phone: (03) 8686 4800
Email: melbourne@biosis.com.au

Wangaratta

Phone: (03) 5718 6900
Email: wangaratta@biosis.com.au

Document information

Report to:	Hepburn Shire Council
Prepared by:	Josh Howard and John Muchan
Biosis project no.:	27822
File name:	27822.CreswickMTB.DFT03.20210305
Citation:	Biosis 2020. Creswick Mountain Bike Trail. Report for Hepburn Shire Council. Authors: Howard, J. and Muchan, J. Biosis Pty Ltd, Ballarat. Project no. 27822

Document control

Version	Internal reviewer	Date issued
Draft version 01	Matthew Gibson	10/06/2020
Final version 01	Matthew Gibson	05/03/2021

Acknowledgements

Biosis acknowledges the contribution of the following people and organisations in undertaking this study:

- Hepburn Shire Council: Alison Breach, Michael McCallum
- Department of Environment, Land, Water and Planning for access to the Victorian Biodiversity Atlas and Native Vegetation Information Tools
- Department of the Environment and Energy for access to the Protected Matters Search Tool of the Australian Government

Biosis staff involved in this project were:

- Samantha Barron & Matthew Gibson (assistance in the field)
- Lucy Wilson & Sally Mitchell (mapping)
- Matthew Gibson (quality assurance)

© Biosis Pty Ltd

This document is subject to copyright and may only be used for the purposes in respect of which it was commissioned and in accordance with the Terms of Engagement of the commission. Unauthorised use of this document in any form whatsoever is prohibited.

Disclaimer:

Biosis Pty Ltd has completed this assessment in accordance with the relevant federal, state and local legislation and current industry best practice. The company accepts no liability for any damages or loss incurred as a result of reliance placed upon the report content or for any purpose other than that for which it was intended.

Contents

Summary	vi
1. Introduction	1
1.1 Project background	1
1.2 Trail construction methods and possible impacts.....	1
1.3 Scope of assessment.....	1
1.4 Location of the study area	2
2. Methods	4
2.1 Database review	4
2.2 Definitions of significance	4
2.3 Determining likelihood of occurrence of significant species	5
2.4 Site investigation.....	5
2.4.1 Flora assessment.....	5
2.4.2 Fauna assessment.....	6
2.4.3 Permits	6
2.5 Qualifications.....	6
2.6 Legislation and policy.....	7
2.7 Mapping.....	7
3. Results	8
3.1 Vegetation and fauna habitat.....	8
3.2 Landscape context.....	13
3.3 Significant species and ecological communities	13
3.3.1 EPBC Act and FFG Act listed species	13
3.3.2 DELWP advisory list of rare and threatened species	14
3.3.3 Significant ecological communities	15
3.4 Other ecological values.....	16
3.5 Further survey recommendations.....	16
4. Biodiversity legislation and government policy.....	30
4.1 Commonwealth	30
4.1.1 Environment Protection and Biodiversity Conservation Act 1999	30
4.1.2 Swift Parrot <i>Lathamus discolor</i>	31
4.1.3 Matted Flax-lily <i>Dianella amoena</i>	32
4.1.4 Painted Honeyeater <i>Grantiella picta</i>	34
4.1.5 Grey-headed Flying-fox <i>Pteropus poliocephalus</i>	35
4.1.6 Growling Grass Frog <i>Litoria raniformis</i>	36
4.2 State	37
4.2.1 Flora and Fauna Guarantee Act 1988 (FFG Act)	37
4.2.2 Catchment and Land Protection Act 1994 (CaLP Act).....	40
4.2.3 Planning and Environment Act 1987 (incl. Planning Schemes).....	40

4.2.4	Environment Effects Act 1978	41
4.2.5	Water Act 1989.....	45
4.2.6	Environment Protection Act 1970: State Environmental Protection Policy (Waters) 2018	45
5.	Victoria's Guidelines for the removal, destruction or lopping of native vegetation	47
5.1	Proposed removal of native vegetation	48
5.2	Determining the assessment pathway.....	67
5.3	Offset requirements.....	67
5.4	Proposed offset strategy	68
6.	Key ecological values and recommendations	69
6.1	Recommendations	70
	References.....	72
	Appendices.....	74
Appendix 1	Survey methods	75
Appendix 2	Flora	76
Appendix 3	Fauna	91
Appendix 4	Photos of the study area.....	109
Appendix 5	Vegetation impact assessment results.....	123
Appendix 6	Native Vegetation Removal Report.....	132

Tables

Table 1	Criteria for determining significance of species & ecological communities	4
Table 2	Summary of vegetation and habitat types within the study area	10
Table 3	Summary of EPBC and FFG Act listed species most likely to occur in the study area	13
Table 4	Summary of rare or threatened species' habitats modelled in the study area.....	14
Table 5	Assessment of project in relation to the EPBC Act.....	30
Table 6	Swift Parrot - assessment against Significant Impact Criteria	31
Table 7	Matted Flax-lily - assessment against Significant Impact Criteria	33
Table 8	Painted Honeyeater - assessment against Significant Impact Criteria	34
Table 9	Grey-headed Flying-fox - assessment against Significant Impact Criteria	35
Table 10	Growling Grass Frog- assessment against Significant Impact Criteria	36
Table 11	FFG Act potentially threatening processes.....	38
Table 12:	Assessment of the project against the individual potential environmental effects referral criteria of the <i>Environment Effects Act 1978</i>	42
Table 13:	Assessment of the project against the combined potential environmental effects referral criteria of the <i>Environment Effects Act 1978</i>	44

Table 14	Methods for calculating potential native vegetation impacts	48
Table 14	Summary of DELWP Native Vegetation Removal Report	67
Table 13	Summary of key ecological values, potential implications of developing the study area and recommendations to minimise ecological impacts during the design phase.....	69

Figures

Figure 1	Location of the study area, Victoria	3
Figure 2	Ecological features of the study area, Victoria.....	17
Figure 3	Proposed vegetation removal within the study area	50

Photos

Photo 1	Heathy Dry Forest – Habitat hectare quadrat 1 (see Figure 2).	109
Photo 2	Heathy Dry Forest– Habitat hectare quadrat 2 (see Figure 2).	109
Photo 3	Grassy Dry Forest – Habitat hectare quadrat 3 (see Figure 2).	110
Photo 4	Heathy Dry Forest– Habitat hectare quadrat 4 (see Figure 2).	110
Photo 5	Herb-rich Foothill Forest– Habitat hectare quadrat 5 (see Figure 2).....	111
Photo 6	Valley Grassy Forest– Habitat hectare quadrat 6 (see Figure 2).....	111
Photo 7	Grassy Dry Forest– Habitat hectare quadrat 7 (see Figure 2).	112
Photo 8	Heathy Dry Forest– Habitat hectare quadrat 8 (see Figure 2).	112
Photo 9	Heathy Dry Forest– Habitat hectare quadrat 9 (see Figure 2).	113
Photo 10	Herb-rich Foothill Forest– Habitat hectare quadrat 10 (see Figure 2).....	113
Photo 11	Grassy Dry Forest– Habitat hectare quadrat 11 (see Figure 2).	114
Photo 12	Grassy Dry Forest– Habitat hectare quadrat 12 (see Figure 2).	114
Photo 13	Heathy Dry Forest– Habitat hectare quadrat 13 (see Figure 2).	115
Photo 14	Grassy Dry Forest– Habitat hectare quadrat 14 (see Figure 2).	115
Photo 15	Herb-rich Foothill Forest– Habitat hectare quadrat 15 (see Figure 2).....	116
Photo 16	Valley Grassy Forest– Habitat hectare quadrat 16 (see Figure 2).....	116
Photo 17	Creekline Herb-rich Woodland – Habitat hectare quadrat 17 (see Figure 2).....	117
Photo 18	Creekline Herb-rich Woodland – Habitat hectare quadrat 18 (see Figure 2).....	117
Photo 19	Grassy Dry Forest – Habitat hectare quadrat 19 (see Figure 2). Note that the area was modelled as Plains Grassy Woodland EVC 55 in the DELWP 2005 EVC modelling.....	118
Photo 20	Herb-rich Foothill Forest – Habitat hectare quadrat 20 (see Figure 2).....	118
Photo 21	Grassy Dry Forest – Habitat hectare quadrat 21 (see Figure 2).	119
Photo 22	Heathy Dry Forest – Habitat hectare quadrat 22 (see Figure 2).	119
Photo 23	Heathy Dry Forest – Habitat hectare quadrat 23 (see Figure 2).	120
Photo 24	Heathy Dry Forest – Habitat hectare quadrat 24 (see Figure 2).	120
Photo 25	Herb-rich Foothill Forest – Habitat hectare quadrat 25 (see Figure 2).....	121
Photo 26	Grassy Dry Forest – Habitat hectare quadrat 26 (see Figure 2).	121
Photo 27	Heathy Dry Forest – Habitat hectare quadrat 27 (see Figure 2).	122

Photo 28 Herb-rich Foothill Forest – Habitat hectare quadrat 28 (see Figure 2)..... 122

Summary

Biosis Pty Ltd was commissioned by Hepburn Shire Council to undertake a flora and fauna assessment of an area of land proposed for the construction of a mountain bike trail. The study area is located approximately three kilometres south-east of Creswick and approximately 14 kilometres north of Ballarat.

Ecological values

Key ecological values identified within the study area are as follows:

- The majority of the study area is covered by Heathy Dry Forest EVC and Grassy Dry Forest EVC. Areas of high quality habitat were found throughout the study area with most habitat zones containing a high diversity of native herb and grass species with few weeds. Habitat zones near waterways typically contained a greater coverage of weed species, however these zones also typically contained higher numbers of large trees.
- Areas of Creekline Herb-rich Woodland EVC within the Central Victorian Uplands Bioregion have a bioregional conservation status of vulnerable.
- Potential habitat for 13 species listed under the EPBC Act or FFG Act (significant species).
- Several small streams and creeks which may provide habitat for a variety of native aquatic species including Growling Grass Frog *Litoria raniformis* and Brown Toadlet *Pseudophyrne bibronii*.
- The remnant vegetation forms part of a large wildlife corridor along the east side of Ballarat starting with Creswick Regional Park in the north, extending through Nerrina, Woookarung Regional Park, Union Jack Reserve, and Mount Buninyong to the south.

Government legislation and policy

An assessment of the project in relation to key biodiversity legislation and policy is provided and summarised below.

Legislation / policy	Relevant ecological feature on site	Permit / approval required	Notes
EPBC Act	The Protected Matters Search Tool (PMST) indicates that 17 flora and 19 fauna species listed under the EPBC Act could occur within 10 km of the study area. The PMST also indicates there are 13 migratory species that could occur within 10 km of the study area. Six Ramsar listed wetlands are within 500 km of the study area however they are all at least over 50 km away.	Referral not recommended	<p>Only five species of flora and fauna that were listed on the PMST search have a medium or high likelihood of occurring within the study area:</p> <ul style="list-style-type: none"> • Swift Parrot <i>Lathamus discolor</i> • Matted Flax-lily <i>Dianella amoena</i> • Grey-headed Flying-fox <i>Pteropus poliocephalus</i> • Painted Honeyeater <i>Grantiella picta</i> • Growling Grass Frog <i>Litoria raniformis</i> <p>An assessment against the Significant Impact Guidelines (CoA 2013) indicates that the project is unlikely to significantly impact any of these species. The project is also unlikely to significantly impact any migratory species or Ramsar sites.</p>
FFG Act	Fourty-three protected flora species.	Protected Flora Permit required.	Site is public land.
Environmental Effects Act 1978	Native vegetation	Referral not recommended	An assessment of the proposed project in relation to the EES referral triggers is provided.
Planning & Environment Act	Remnant native vegetation.	Planning permit required to lop or remove native vegetation.	Permit application needs to address provisions of ESO1 and VPO1.
CaLP Act	Nine noxious weeds Three pest animals	N/A	Comply with requirements to control/eradicate.
Water Act	Jackass Gully, Slaty Creek, Wrights Gully, Longs Gully and Creswick Creek and associated unnamed tributaries.	Referral to the North Central CMA.	The proposed development will involve construction or maintenance activities that affect beds and banks of waterways, riparian vegetation or quality or quantity of water in Jackass Gully, Slaty Creek, Wrights Gully, Longs Gully and Creswick Creek.

Legislation / policy	Relevant ecological feature on site	Permit / approval required	Notes
SEPP (Waters)	Jackass Gully, Slaty Creek, Wrights Gully, Longs Gully, Creswick Creek and associated unnamed tributaries and their aquatic ecosystems.	N/A	Impacts to surface water quality must not result in changes that exceed background levels and/or the water quality objectives specified for the applicable segment to protect surface water uses and values. Hepburn Shire needs to ensure that direct and indirect (e.g. runoff) impacts to surface water quality do not exceed the background levels and/or water quality objectives.

Guidelines for the removal, destruction or lopping of native vegetation (the Guidelines)

Vegetation impacts have been determined for stage 1 of the project, which includes approximately 60km of trail, located to the north of Melbourne Road.

The trail network has been designed, where possible, to avoid impacts to native vegetation through:

- Use of existing trail.
- Avoidance of impacts to trees through trail micro-siting.
- Avoidance of impacts to high quality understorey vegetation through trail micro-siting.
- Minimisation of indirect vegetation impacts by using best practice sustainable trail construction techniques.

The proposed removal of native vegetation was assessed in accordance with the detailed micro-sited trail alignment. The development proposes to impact upon 11.867 hectares of native vegetation, which includes 174 canopy trees (including one large canopy tree). Total area of patch vegetation (50% loss) impacted is 7.91 hectares, and the area of impact due to potential canopy tree impacts is 5.47 hectares. Note that the sum of these losses is greater than 11.867 ha due to overlap between trees and the trail.

The offset specification includes 6.858 general habitat units and one large tree, with a minimum strategic biodiversity score of 0.530. The offset site(s) must be located within the North Central Catchment Management Authority area, or the Hepburn Shire Council Local Government Area.

Recommendations

The results of this assessment should be incorporated into the project design, by adding the flora and fauna mapping information into the planning maps and investigating options to retain as much of the mapped vegetation/habitats as possible.

Key avoidance and minimisation strategies and mitigation measures to reduce the ecological impacts that the project will have within the study area include:

- Minimise track construction within riparian areas and use structures where required for crossing aquatic features.
- Use suitable existing tracks in the network where possible.

- Avoid removing canopy trees, especially large hollow-bearing trees.
- Avoid impacting on canopy trees through tree protection zone incursion.
- Avoid placement of trail close to hazard trees.
- Restrict disturbance to track margins in areas where and existing trail is present.
- Ensuring that all construction activities stay within the designated construction footprint.
- Implementing weed and pathogen hygiene protocols during construction and operation of trails. This includes vehicle, equipment and footwear washdown stations for Cinnamon fungus and weeds during construction of the trails. Also ensuring protocols are in place for the wash down of bikes and footwear to prevent the spread of Cinnamon fungus when the trails are operational.
- Minimise use of foreign material in the trail construction, and use of imported materials is required, ensure that they are free of weeds and pathogens.
- Ensuring all plant, equipment and construction vehicles should be washed down prior to use and after use to prevent the spread of weeds and pathogens.
- Creation of a Construction Environment Management Plan which includes the construction footprint, weed/pathogen hygiene, sediment control and vegetation removal protocol.
- Minimising the deposition of sediment into waterways, drainage lines and creeks as far as possible.
- Avoid working in creeks when they are flowing and instead undertake works in these areas in summer/autumn months when they are dry.
- Implement appropriate erosion and sediment controls for works near creeks and drainage lines to protect against any impacts to water quality.

1. Introduction

1.1 Project background

Biosis Pty Ltd was commissioned by Hepburn Shire Council to undertake a flora and fauna assessment of the study area. The construction of approximately 100 km of Mountain Bike Trails are proposed for the study area. This will involve construction of new tracks and some use and upgrade of existing tracks.

A preliminary biodiversity constraints assessment was completed in July 2019 (Biosis 2019). This assessment highlighted 14 flora and fauna species listed under either the EPBC Act or FFG Act that could potentially occur within the study area. However, the conclusions from the preliminary assessment were that none of these species were likely to be significantly impacted by the trail construction. The only species of possible concern was the Growling Grass Frog *Litoria raniformis* which would only be impacted if construction impacted on waterways or wetlands within the study area. The preliminary biodiversity constraints assessment also recommended that the trail alignment should avoid encroaching on waterways where possible to avoid impacting riparian vegetation and decrease the chance of sediment deposition in waterways.

1.2 Trail construction methods and possible impacts

It is understood that the trails will be constructed by small machinery and by hand resulting in a range of possible impacts on native vegetation, habitat, soils and potentially waterways. The following possible impacts resulting from the project have been identified:

- Removal of native understorey vegetation within the 2 metre wide construction corridor. Noting that the final trail width will mainly be less than 1 metre wide.
- Possible local disturbance to wildlife through increased human presence in forested areas, especially nesting and roosting sites for birds and arboreal mammals.
- Increased risk of weed introduction and spread.
- Increased risk of spreading Cinnamon Fungus *Phytophthora cinnamomi* throughout the area.
- Possibility of small scale disturbance to waterways within the study area during trail construction. Including the disturbance of soil which may lead to sediment deposition in drainage lines and waterways.

1.3 Scope of assessment

The objectives of this investigation are to:

- Review databases relating to flora and fauna issues relevant to the study area, including the Victorian Biodiversity Atlas (VBA) and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool.
- Describe the vascular flora (ferns, conifers, flowering plants) and vertebrate fauna (mammals, birds, reptiles, frogs, fishes).
- Map Ecological Vegetation Classes (EVCs) and other habitat features.
- Assess the potential for the study area to support habitat for threatened species.
- Conduct a vegetation quality assessment.

- Review the implications of relevant biodiversity legislation and policy, including Victoria's *Guidelines for the removal, destruction or lopping of native vegetation* ('the Guidelines').
- Identify potential implications of the proposed development and provide recommendations to assist with development design.
- Recommend any further assessments of the site that may be required (such as targeted searches for significant species).

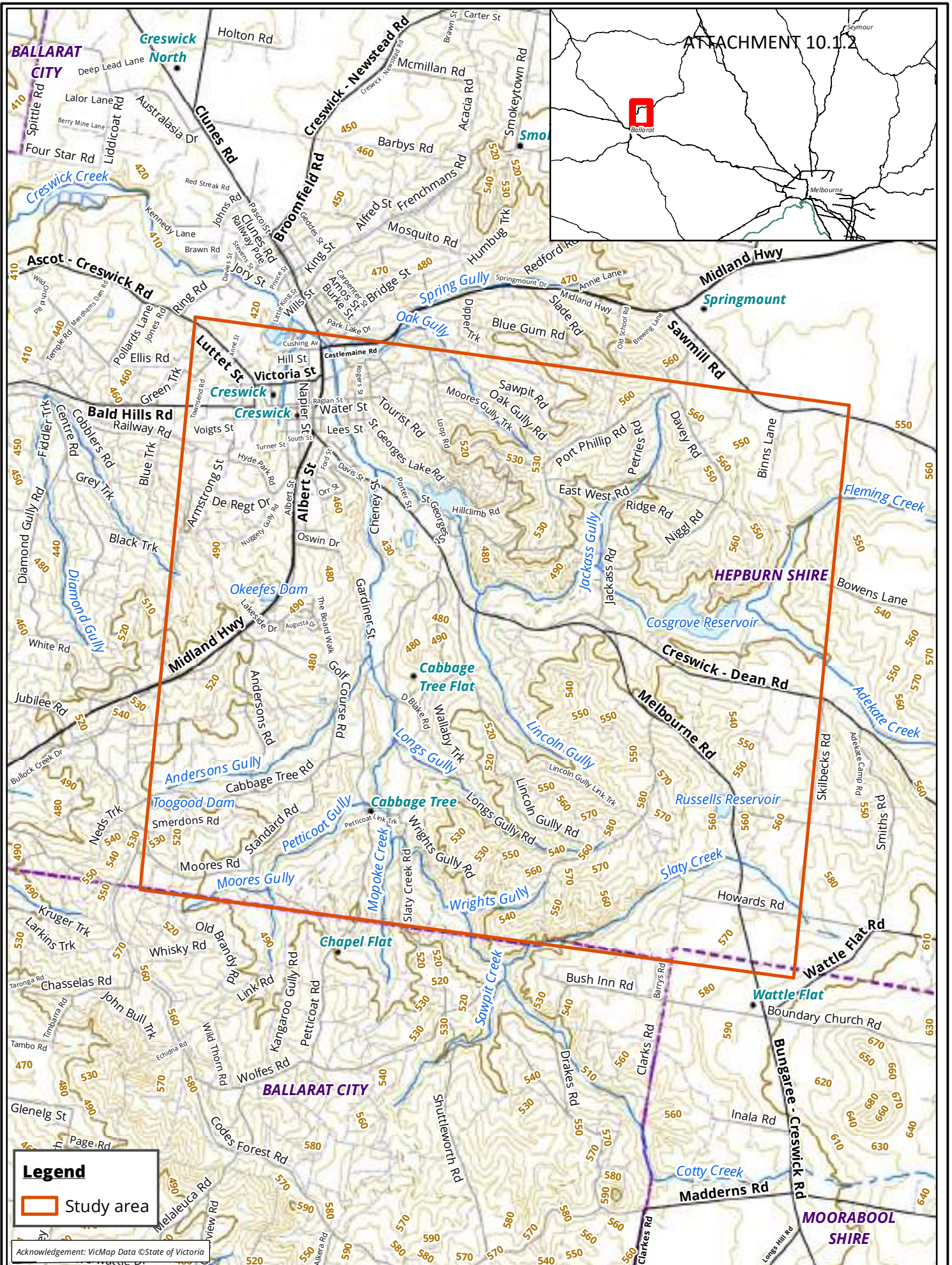
1.4 Location of the study area


The study area is located immediately south-east of Creswick and is approximately 1,300 ha in size.

Due to its size and location the study area contains a large amount of native vegetation which is generally regrowth from mining activity. The native vegetation is in land predominantly managed by Parks Victoria (i.e. Creswick Regional Park), Central Highlands Water and the Department of Environment, Land, Water and Planning (DELWP) (Creswick State Forest), with small amounts of native vegetation also present in roadside reserves. The study area also contains areas of Hancock Victorian Plantation (HVP) Land which is currently pine plantation that has been heavily cleared of native canopy vegetation.

The study area is within the:

- Central Victorian Uplands and Victorian Volcanic Plain Bioregion
- Loddon River Basin
- Management area of North Central Catchment Management Authority (CMA)
- Hepburn Shire Council.



Legend
 Study area

Acknowledgement: VicMap Data ©State of Victoria

Figure 1 Location of the study area

2. Methods

2.1 Database review

In order to provide a context for the study area, information about flora and fauna from within 5 kilometres of the study area (the 'local area') was obtained from relevant biodiversity databases, many of which are maintained by DELWP or the Australian Government Department of the Environment and Energy (DoEE). Records from the following databases were collated and reviewed:

- DELWP's Victorian Biodiversity Atlas (VBA), including the 'VBA_FLORA25, FLORA100 & FLORA Restricted' and 'VBA_FAUNA25, FAUNA100 & FAUNA Restricted' datasets
- DoEE's Protected Matters Search Tool for matters protected by the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

Other sources of biodiversity information were examined including:

- DELWP's NatureKit mapping tool
- DELWP's Habitat Importance maps
- DELWP's Native Vegetation Information Management (NVIM) system
- DELWP's Native Vegetation Support team was provided with site-based spatial information in order to generate a Native Vegetation Removal Report for the study area.
- Planning Scheme overlays relevant to biodiversity based on <http://planningschemes.dpcd.vic.gov.au>.
- Biosis 2019. Preliminary biodiversity constraints assessment: Creswick Mountain Bike Trails. Report for Hepburn Shire. Authors: Gibson, M. & Howard, J. Biosis Pty Ltd. Project no. 27822.
- Birdlife Australia (Ballarat Branch) provided a bird list for the Creswick Forest area, including Cosgrove Reservoir and St Georges Lake (dated 2/6/2020).
- iNaturalist records of vascular plants from the Creswick Forest area. Note – only records of native species, of currently accepted taxa have been added. Records have been excluded if they were of questionable identification, or widely out of range.

2.2 Definitions of significance

The significance of a species or ecological community is determined by its listing status under Commonwealth or State legislation / policy (Table 1).

Table 1 Criteria for determining significance of species & ecological communities

Significance	
National	Listed as critically endangered, endangered or vulnerable under the EPBC Act
State	Listed as critically endangered, endangered or vulnerable in Victoria on a DELWP Advisory List (DSE 2009; DSE 2013; DEPI 2014a) Listed as threatened under the FFG Act

Lists of significant species generated from the databases are provided in Appendix 2 (flora) and Appendix 3 (fauna) and the species have been assessed to determine their likelihood of occurrence based on the process outlined below.

2.3 Determining likelihood of occurrence of significant species

Likelihood of occurrence indicates the potential for a species or ecological community to occur regularly within the study area. It is based on expert opinion, information in relevant biodiversity databases and reports, and an assessment of the habitats on site. Likelihood of occurrence is ranked as negligible, low, medium, high or recorded. The rationale for the rank assigned is provided for each species in Appendix 2 (flora) and Appendix 3 (fauna). Those species for which there is little or no suitable habitat within the study area are assigned a likelihood of low or negligible and are not considered further.

Likelihood of occurrence is determined for species listed under the EPBC Act or the FFG Act and species listed on DELWP Advisory Lists.

Species which have at least medium likelihood of occurrence are given further consideration in this report. The need for targeted survey for these species is also considered.

2.4 Site investigation

2.4.1 Flora assessment

The flora assessment was undertaken during April 2020 and a list of flora species was collected. This list will be submitted to DELWP for incorporation into the Victorian Biodiversity Atlas. Planted species have not been recorded unless they are naturalised. Additional flora surveys were undertaken in spring and early summer 2020 during trail micro-siting of sections of the network for stage 1.

Native vegetation is defined in the Victoria Planning Provisions as 'plants that are indigenous to Victoria, including trees, shrubs, herbs, and grasses' (Clause 73.01).

The Guidelines classify native vegetation into two categories (DELWP 2017):

- A **patch** of native vegetation (measured in hectares) is either:
 - An area of native vegetation, with or without trees, where at least 25 percent of the total perennial understorey cover is native plants.
 - An area with three or more native canopy trees where the drip line (i.e. the outermost boundary of a tree canopy) of each tree touches the drip line of at least one other tree, forming a continuous canopy.
 - Any mapped wetland included in the *Current wetlands map*, available in DELWP systems and tools.

Patch vegetation is classified into ecological vegetation classes (EVCs). An EVC contains one or more floristic (plant) communities, and represents a grouping of broadly similar environments. Definitions of EVCs and benchmarks (condition against which vegetation quality at the site can be compared) are determined by DELWP.

- A **scattered tree** is defined as a native canopy tree that does not form part of a patch of native vegetation.

A canopy tree is a mature tree that is greater than three metres in height and is normally found in the upper layer of a vegetation type. Ecological vegetation class descriptions provide a list of the typical canopy species.

A scattered tree is defined as either small or large, and is determined using the large tree benchmark for the relevant EVC. The extent of a small scattered tree is the area of a circle with a 10 metre radius (i.e. 0.031 hectares), while the extent of a large scattered tree is a circle with a 15 metre radius (i.e. 0.070 hectares). A condition score is applied to each scattered tree based on information provided by DELWP's NVIM system.

Vegetation Quality Assessment (VQA) was undertaken across 28 quadrats within the study area. Sample quadrats were located within the trail footprint wherever practical. The 28 quadrats sampled all five EVCs present and represented the differing vegetation quality across each EVC. The scores from the quadrats were extrapolated out across segments of the trails within the corresponding EVC (based on DELWP Modelled 2005 EVC mapping) to create habitat zones.

All sections of new trail proposed for construction for Stage 1 of the project were walked by a botanist and arborist to inform trail micro-siting (December 2020).

Species nomenclature for flora follows the Victorian Biodiversity Atlas (VBA).

2.4.2 Fauna assessment

A desktop fauna assessment was undertaken by a zoologist to assess the fauna habitat values of the study area, and to determine the likelihood of significant fauna species occurring. The desktop fauna assessment incorporated a review of database records of significant fauna species, along with photographs and vegetation descriptions obtained during the flora assessment.

All species of fauna observed during the assessment were noted and active searching for fauna was undertaken. Fauna species were recorded with a view to characterising the values of the site and the investigation was not intended to provide a comprehensive survey of all fauna that has potential to utilise the site over time. Fauna records will be submitted to DELWP for incorporation into the VBA.

2.4.3 Permits

Biosis undertakes flora and fauna assessments under the following permits and approvals:

- Research Permit/Management Authorisation and Permit to Take/Keep Protected Flora & Protected Fish issued by DELWP under the Victorian *Wildlife Act 1975*, *Flora and Fauna Guarantee Act 1988* (FFG Act), *National Parks Act 1975* and *Crown Land (Reserves) Act 1978* (Permit Number 10008711)
- Permit to catch and release fish issued by the Victorian Fisheries Authority under the Victorian *Fisheries Act 1995* (Permit Number RP 1220, Personal File Number 13041)
- Approvals 30.17 and 19.18 issued by the Wildlife and Small Institutions Animal Ethics Committee of the Victorian Government Department of Economic Development, Jobs, Transport and Resources (DEDJTR)
- Scientific Procedures Fieldwork Licence issued by DEDJTR's Wildlife and Small Institutions Animal Ethics Committee (Licence Number 20020).

2.5 Qualifications

Ecological surveys provide a sampling of flora and fauna at a given time and season. There are a number of reasons why not all species will be detected at a site during survey, such as low abundance, patchy distribution, species dormancy, seasonal conditions, and migration and breeding behaviours. In many cases these factors do not present a significant limitation to assessing the overall biodiversity values of a site.

The current flora and fauna assessment was conducted in Autumn, which is generally not an optimal time for survey as native orchids and other native plant species in the region generally have little flowering or fruiting

bodies during this time of year. However, most flora specimens observed during field surveys were able to be identified to species level. Additional flora surveys, including all sections of new trail within stage 1, were undertaken in December 2020.

Native Vegetation Removal Reports are prepared through DELWP's NVIM system or requested through DELWP's Native Vegetation Support team. Biosis supplies relevant site-based spatial information as inputs to DELWP and we are entirely reliant on DELWP's output reports for all assessment pathway applications. Biosis makes every effort to ensure site and spatial information entered into the NVIM, or supplied to DELWP, is an accurate reflection of proposed native vegetation removal. The Native Vegetation Removal Report can be viewed in Appendix 6.

2.6 Legislation and policy

The implications for the project were assessed in relation to key biodiversity legislation and policy including:

- Matters listed under the EPBC Act), associated policy statements, significant impacts guidelines, listing advice and key threatening processes
- Threatened taxa, communities and threatening processes listed under Section 10 of the FFG Act and associated action statements and listing advice
- Guidelines for the removal, destruction or lopping of native vegetation (DELWP 2017)
- Native Vegetation Management Plans prepared by Catchment Management Authorities
- *Planning and Environment Act 1987* – specifically Clauses 12.01-2, 52.17 and 66.02 and Overlays in the Hepburn Planning Scheme
- Noxious weeds and pest animals lists under the *Catchment and Land Protection Act 1994* (CaLP Act)
- *Environment Effects Act*
- *Water Act 1989*
- *Environment Protection Act 1971*: State Environmental Protection Policy (Waters) 2018.

2.7 Mapping

Hepburn Shire Council supplied aerial photography and site plans (200115 DD alignments for Biosis).

Mapping was conducted using hand-held GPS-enabled tablets and aerial photo interpretation. The accuracy of this mapping is therefore subject to the accuracy of the tablets (generally ± 7 metres) and dependent on the limitations of aerial photo rectification and registration.

Mapping has been produced using a Geographic Information System (GIS). Electronic GIS files which contain our flora and fauna spatial data are available to incorporate into design concept plans. However this mapping may not be sufficiently precise for detailed design purposes.

3. Results

The ecological features of the study area are described below and mapped in Figure 2.

Species recorded during the flora and fauna assessment are listed in Appendix 2 (flora) and Appendix 3 (fauna). Unless of particular note, these species are not discussed further.

Those species recorded or predicted to occur in the local area is also provided in those appendices, along with an assessment of the likelihood of the species occurring within the study area.

3.1 Vegetation and fauna habitat

The study area supports a range of ecological features including large areas of remnant native vegetation, waterways, pine plantation, management tracks, existing trails and exotic vegetation. These features are described further in Table 2 and mapped in Figure 2.

The study area varies in topography ranging from 400 metres to 600 metres above sea level. There are areas of steep slopes including north and east of St. Georges Lake (largely in the HVP Plantation area) and slopes leading to a number of small creek sand drainage lines. The area is not covered by an erosion management overlay in the planning schemes but some existing trails and roads do show signs of erosion, especially larger 4WD tracks.

The numerous drainage lines and creeks within the study area are mostly ephemeral and dry out in the summer months. However, permanent waterways may provide habitat for Growling Grass Frog and although there are no records within 10 km of the study area FFG Act listed Brown Toadlet *Pseudophryne bibronii* could also be present near drainage lines and creeks and other damp areas within the study area.

There are four large lakes/reservoirs within the study area which include St. Georges Lake, Blue Waters, Russell's Reservoir and Cosgrave's Reservoir. These areas provide potential habitat for a range of native waterbirds and aquatic species.

The effects of Cinnamon Fungus (PC) *Phytophthora cinnamomi* (e.g. plant dieback in susceptible species) was not observed during our field assessment. However, Cinnamon Fungus is known to be present in the local area and pathogen hygiene protocols should be implemented during construction and operation of the trails prevent the spread of this pathogen. One of the key species susceptible to PC infection is Austral Grass-tree *Xanthorrhoea australis*, which often shows visible signs that the pathogen is present or has moved through the area in the past. No Austral Grass-trees were observed within the study area. The species is common further south in Heathy Dry Forest around Ballarat. Small Grass-tree *Xanthorrhoea minor* subsp. *lutea* is common and widespread within the area, but this species appears to be more resistant to PC infection.

It is understood that some members of the community are concerned with the fragmentation caused by the trails and the impact that heavy use of the trails may have on nesting and breeding bird species. This is a valid concern as many studies have highlighted the impact that recreational activities, including mountain biking has on the density of bird populations around the world (Miller, S, Knight, R, & Miller, C 1998, Bötsch et al. 2018). However, although the regular use of the mountain bike trails has potential to decrease the density of populations of ground foraging birds close to the trails it is unlikely that the construction or use of trails will significantly impact threatened bird species listed under the EPBC Act or FFG Act.

The Powerful Owl *Ninox strenua* (FFG Act listed), which is known to occur throughout the region, has been recorded nesting near Cosgrave Reservoir in the past (one VBA record from 1990). Due to the large size of Powerful Owl home ranges, it is likely that the trail network will pass through habitat used by Powerful Owls

for foraging and breeding. Heavy use of the trails by mountain bikes near current Powerful Owl nesting areas (large old trees with hollows) between April and September may cause some disruption the breeding of Powerful Owls, however, the dispersed nature of usage of the majority of the trail network is not considered likely to result in significant disruption. Powerful Owls nest in the hollows of large old trees, typically along riparian areas with a high density of canopy cover and large trees (DSE 2004a). Therefore, the trail alignment should avoid large old trees containing hollows, especially in the vicinity of waterways where possible. Although trail use may cause some adverse impact to Powerful Owl breeding there is only one record in the VBA of nesting throughout the study area and the disruption of breeding is unlikely to significantly impact upon the species or lead to a long term decline of the species. Powerful Owl are known to use habitats within and close to large cities with high levels of visitation by recreational users. The long term decline of this species is further unlikely as tree removal is expected to be avoided or kept to an absolute minimum.

Concerns have also been raised regarding the trail impacting upon native orchid and lily species. However the only native understorey species that are listed as threatened under the EPBC Act and FFG act and are deemed to have a medium to high likelihood of occurring within the study area are Small Milkwort *Comesperma polygaloides*, Australian Anchor Plant *Discaria pubescens* and Matted Flax-lily *Dianella amoena*. None of these species were recorded during field assessments, and no VBA records of these species intersect the proposed trail alignment.

Other native understorey species protected under the FFG Act (but not listed as threatened) including species in the orchidaceae family (e.g. Sun Orchids *Thelymitra* spp. and Greenhoods *Pterostylis* spp.) will likely have individual plants directly impacted by the proposed trail construction. The species that were recorded during the field assessment and are protected under the FFG Act are listed in Appendix 2. An FFG Act permit will be required to gain permission to impact upon these species, and other FFG Act protected flora including daisies and wattles.

Photos of vegetation within the study area are provided in Appendix 4.

Table 2 Summary of vegetation and habitat types within the study area

Vegetation or habitat type	Description	Location	Significant values
Heathy Dry Forest EVC Bioregional Conservation Status: Least Concern.	Canopy dominated by Messmate <i>Eucalyptus obliqua</i> , Narrow-leaf Peppermint <i>Eucalyptus radiata</i> and Broad-leaf Peppermint <i>Eucalyptus dives</i> . The understorey layer was generally sparse in cover throughout the study area, with some areas containing Blackwood <i>Acacia melanoxylon</i> and Silver Wattle <i>Acacia dealbata</i> . The ground layer was typically dominated by grasses and small shrubs. The majority of sites generally contained little to no exotic flora species.	Covers the majority of Creswick Regional Park. Most common EVC in the study area.	Eucalypts, especially large old trees, in the area provide potential habitat for Powerful Owl <i>Ninox strenua</i> , Grey-headed Flying-fox <i>Pteropus poliocephalus</i> , Swift Parrot <i>Lathamus discolor</i> and Painted Honeyeater <i>Grantiella picta</i> .
Grassy Dry Forest EVC Bioregional Conservation Status: Depleted.	Characterised by relatively dense canopy cover of Messmate, Narrow-leaf Peppermint and Broad-leaf Peppermint. The understorey layer is typically sparse except for a few scattered Wattles. Ground layer was dominated by native grass species with few exotic species.	Second most common EVC in the study area, covers a large amount of Creswick State Forest.	Includes some areas of potential habitat for Matted Flax-lily <i>Dianella amoena</i> and Small Milkwort <i>Comesperma polygaloides</i> . Eucalyptus canopy, especially large old trees, provide potential habitat for Powerful Owl, Grey-headed Flying-fox, Swift Parrot and Painted Honeyeater.
Valley Grassy Forest EVC Bioregional Conservation Status: Vulnerable.	Dense canopy cover of Narrow-leaf Peppermint and Swamp Gum <i>Eucalyptus ovata</i> , very few shrub species present in the understorey, with the cover of vegetation in the understorey being dominated by small herb and grass species.	Near Cosgrove's Reservoir and Russell's Reservoir.	Includes some areas of potential habitat for Matted Flax-lily <i>Dianella amoena</i> , Small Milkwort <i>Comesperma polygaloides</i> and Australian Anchor Plant <i>Discaria pubescens</i> . Eucalyptus canopy, especially large old trees, provide potential habitat for Powerful Owl, Grey-headed Flying-fox, Swift Parrot and Painted Honeyeater.

Vegetation or habitat type	Description	Location	Significant values
Herb-rich Foothill Forest EVC Bioregional Conservation Status: Depleted.	Contained a diverse range of Eucalypt canopy species including Swamp Gum, Narrow-leaf Peppermint, Broad-leaf Peppermint, Manna Gum <i>Eucalyptus viminalis</i> , Candlebark <i>Eucalyptus rubida</i> , and Scentbark <i>Eucalyptus aromaphloia</i> . The understorey layer was characterised by a high diversity and cover of small and medium herb species and grass species.	Occurs next to major creek lines and drainage lines throughout the study area.	Includes some areas of potential habitat for Australian Anchor Plant. Eucalyptus species could provide habitat for Grey Goshawk <i>Accipiter novaehollandiae</i> , Powerful Owl, Grey-headed Flying-fox, Swift Parrot and Painted Honeyeater.
Creepline Herb-rich Woodland EVC Bioregional Conservation Status: Vulnerable.	Contained a relatively sparse canopy layer of Narrow-leaf Peppermint and Swamp Gum. The understorey contained very few shrubs and the ground layer was mainly comprised of exotic species such as Cocksfoot <i>Dactylis glomerata</i> , Great Brome <i>Bromus diandrus</i> , Brown-top Bent Grass <i>Agrostis capillaris</i> and Sweet Vernal Grass <i>Anthoxanthum odoratum</i> .	Creswick Creek.	Includes some areas of potential habitat for Australian Anchor Plant. Eucalyptus species could provide habitat for Grey Goshawk, Powerful Owl, Grey-headed Flying-fox, Swift Parrot and Painted Honeyeater.
Large Lakes/reservoirs	There are four large lakes/reservoirs in the area including Russell's Reservoir, Cosgrove's Reservoir, St. Georges Lake and Blue Waters.	Russell's Reservoir, Cosgrove's Reservoir, St. Georges Lake, Blue Waters	These waterways provide habitat for a range of native waterbirds species and potential habitat for Freckled Duck <i>Scitonetta naevosa</i> and Blue-billed Duck <i>Oxyura australis</i> . Growling Grass Frog <i>Litoria raniformis</i> may also be present in these waterways.
Existing trails	There is over 30 km of existing trail network in the Creswick Regional Park (both sanctioned e.g. Wallaby Track and unsanctioned). These tracks are primarily used for mountain biking and bushwalking and are typically less than one metre wide.	Creswick Regional Park.	
Pine plantation	There is a large area to the north and east of St. Georges Lake which is a Hancock Victorian Plantations (HVP) Pine plantation. This area contained little to no native vegetation besides a few scattered grass species, such as Spear Grass <i>Austrostipa</i> spp.	North and east of St. Georges Reservoir.	No threatened species are likely to be present however Yellow-tailed Black-cockatoos <i>Calyptorhynchus funereus</i> could forage in the pine plantations when the trees are mature.

Vegetation or habitat type	Description	Location	Significant values
Management tracks and access roads	Creswick Regional Park and Creswick State Forest are intersected by a large number of gravel/dirt management tracks and access roads. These areas are typically 2m or more in width and are completely cleared of vegetation	Various locations throughout the study area.	
Creeks and drainage lines	Several small creeks and drainage lines occur throughout the region. These creek lines are generally ephemeral and most dry out in summer.	Slaty Creek, Lincoln Gully, Longs Gully, Wrights Gully, Jackass Gully, Creswick Creek, Fleming Creek, Adekate Creek	Permanent creeks and waterways could provide habitat for Growling Grass Frog.
Exotic vegetation	There are small areas within the study area that contain little to no native vegetation and are dominated by exotic species including Gorse <i>Ulex europaeus</i> and a range of exotic grass species.	Various areas throughout the study area.	Some small native bird species may use exotic shrubs such as gorse for habitat.

3.2 Landscape context

The topography of the study area is quite varied with many hills and gullies ranging in altitude from approximately 450 metres above sea level to 550 metres above sea level. The study area contains large amount of native vegetation which is generally regrowth from mining activity. The native vegetation is in land predominantly managed by Parks Victoria (Creswick Regional Park), DELWP (Creswick State Forest) and Central Highlands Water (surrounding Cosgrove Reservoir), with small amounts of native vegetation also present in roadside reserves. The study area also contains areas of Hancock Victorian Plantation (HVP) Land which is currently pine plantation that has been heavily cleared of native canopy vegetation.

The remnant vegetation forms part of a large wildlife corridor along the east side of Ballarat starting with Creswick Regional Park in the north, extending through Nerrina, Woowookarung Regional Park, Union Jack Reserve, and Mount Buninyong to the south.

Several waterways are present in the study area including Cosgrave Reservoir, St Georges Lake, Blue Waters, Slaty Creek, Lincoln Gully Creek, Longs Gully Creek and Mopoke Creek.

3.3 Significant species and ecological communities

3.3.1 EPBC Act and FFG Act listed species

Lists of EPBC Act and FFG Act listed species recorded or predicted to occur within 5 kilometres of the study area or from the relevant catchment (aquatic species) are provided in Appendix 2 (flora) and Appendix 3 (fauna). An assessment of the likelihood of these species occurring in the study area and an indication of where within the site (i.e. which habitats or features of relevance to the species) is included. A summary of those species recorded or with a medium or higher likelihood of occurring in the study area is provided in Table 3. No EPBC Act or FFG Act listed species were recorded during this field assessment.

Table 3 Summary of EPBC and FFG Act listed species most likely to occur in the study area

Species name	Listing status	Area of value within the study area
Swift Parrot	Critically Endangered under EPBC Act Listed under FFG Act	Remnant eucalypt forest.
Matted Flax-lily	Endangered under EPBC Act Listed under FFG Act	Areas within the study area mapped as Valley Grassy Forest and Grassy Dry Forest.
Painted Honeyeater	Vulnerable under EPBC Act Listed under FFG Act	Remnant eucalypt forest and woodland.
Grey-headed Flying-fox	Vulnerable under EPBC Act Listed under FFG Act	Remnant eucalypt forest and woodland.
Growling Grass Frog	Vulnerable under EPBC Act Listed under FFG Act	Wetlands and waterways within the study area.
Grey Goshawk	Listed under FFG Act	Remnant eucalypt forest and woodland.
Square-tailed Kite	Listed under FFG Act	Remnant eucalypt forest and woodland.
Powerful Owl	Listed under FFG Act	Remnant eucalypt forest and woodland.
Freckled Duck	Listed under FFG Act	Wetlands and waterways within the study area.
Blue-billed Duck	Listed under FFG Act	Wetlands and waterways within the study area.

Species name	Listing status	Area of value within the study area
Australian Anchor Plant	Listed under FFG Act	Remnant eucalypt forest and woodland.
Small Milkwort	Listed under FFG Act	Remnant eucalypt forest and woodland.
Brown Toadlet	Listed under FFG Act	Damp areas of remnant eucalypt forest. It should be noted that this species has not been recorded within 10 km of the study area but is known to occur within the broader region and could find suitable habitat within the study area.

3.3.2 DELWP advisory list of rare and threatened species

To support decision making under the Guidelines, DELWP has produced maps for Victoria showing the modelled extent of habitat for most listed rare or threatened species. These maps are called 'habitat importance maps' and they assign a 'habitat importance score' to a location based on the importance of that location in the landscape as habitat for a particular rare or threatened species, in relation to other suitable habitat for that species (DELWP 2017).

Under the Guidelines, these maps form the basis for determining the impact of potential native vegetation removal on rare and threatened species. The maps only apply where a proposal to remove native vegetation is considered on detailed assessment pathway. The habitat importance scores are used to calculate the type and extent of biodiversity offsets required for native vegetation removal that impacts on individual rare or threatened species habitat.

A summary of those species for which habitat is modelled in the study area is provided in Table 4. These data were provided by DELWP and a full Native Vegetation Removal Report is provided in Appendix 6. Most of these species (17) have database records within the local area (refer relevant Appendix for species records). No DELWP advisory listed species were recorded during this assessment.

Determination of the requirement for a species offset based on the extent of impact to one or more rare or threatened species is addressed in Section 5.

Table 4 Summary of rare or threatened species' habitats modelled in the study area

Species number	Species scientific name	Species common name
501549	<i>Grevillea repens</i>	Creeping Grevillea
500064	<i>Acacia nano-dealbata</i>	Dwarf Silver Wattle
501326	<i>Eucalyptus yarraensis</i>	Yarra Gum
501256	<i>Eucalyptus brookeriana</i>	Brooker's Gum
10230	<i>Lophoictinia isura</i>	Square-tailed Kite
10220	<i>Accipiter novaehollandiae novaehollandiae</i>	Grey Goshawk
501072	<i>Discaria pubescens</i>	Australian Anchor Plant
10334	<i>Hirundapus caudacutus</i>	White-throated Needle-tail
500324	<i>Dipodium pardalinum</i>	Spotted Hyacinth-orchid
13125	<i>Pseudophryne semimarmorata</i>	Southern Toadlet
13207	<i>Litoria raniformis</i>	Growling Grass Frog
507008	<i>Eucalyptus</i> aff. <i>goniocalyx</i> (Dandenong Ranges)	Tremont Bundy

Species number	Species scientific name	Species common name
10215	<i>Aythya australis</i>	Hardhead
10212	<i>Anas rhynchos</i>	Australasian Shoveler
10050	<i>Porzana pusilla palustris</i>	Baillon's Crake
10170	<i>Rostratula australis</i>	Australian Painted Snipe
10217	<i>Biziura lobata</i>	Musk Duck
10216	<i>Oxyura australis</i>	Blue-billed Duck
10598	<i>Grantiella picta</i>	Painted Honeyeater
10045	<i>Lewinia pectoralis pectoralis</i>	Lewin's Rail
10498	<i>Calamanthus pyrrhopygius</i>	Chestnut-rumped Heathwren

3.3.3 Significant ecological communities

EPBC Act listed communities

The EPBC Act Protected Matters search lists five threatened ecological communities with the potential to occur within 10 km the study area:

- **Grassy Eucalypt Woodland of the Victorian Volcanic Plain**
This community is known to occur within 10 km of the study area.
- **Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived native Grasslands of South-eastern Australia**
This community may occur within 10 km of the study area.
- **Natural Temperate Grassland of the Victorian Volcanic Plain**
This community may occur within 10 km of the study area.
- **Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains**
This community is likely to occur within 10 km of the study area.
- **White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland**
This community is likely to occur within 10 km of the study area.

Due to the nature of vegetation at the site, which is mainly Heathy Dry Forest EVC 20 and Grassy Dry Forest EVC 22 of the Central Victorian Uplands, it is unlikely that any of these communities would be directly impacted by the construction of mountain bike trails. None of these communities were deemed to be present in the site inspection.

The EPBC Act Protected Matters search also indicates the relatively close proximity of six wetlands of international importance (Ramsar) sites. The only Ramsar site within 100 km of the study area the Port Phillip Bay (western shoreline) and Bellarine Peninsula (50-100 km upstream) site. The construction of mountain bike trails at this site is unlikely to impact upon any of the Ramsar sites listed in the Protected Matters Search.

FFG Act listed communities

One FFG Act listed community, Western Basalt Plains (River Red Gum) Grassy Woodland has been modelled as potentially occurring within the study area. However, following the field assessment this community does not appear to be present within the study area.

3.4 Other ecological values

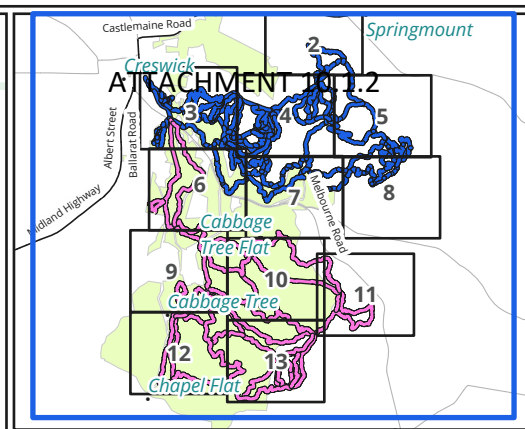
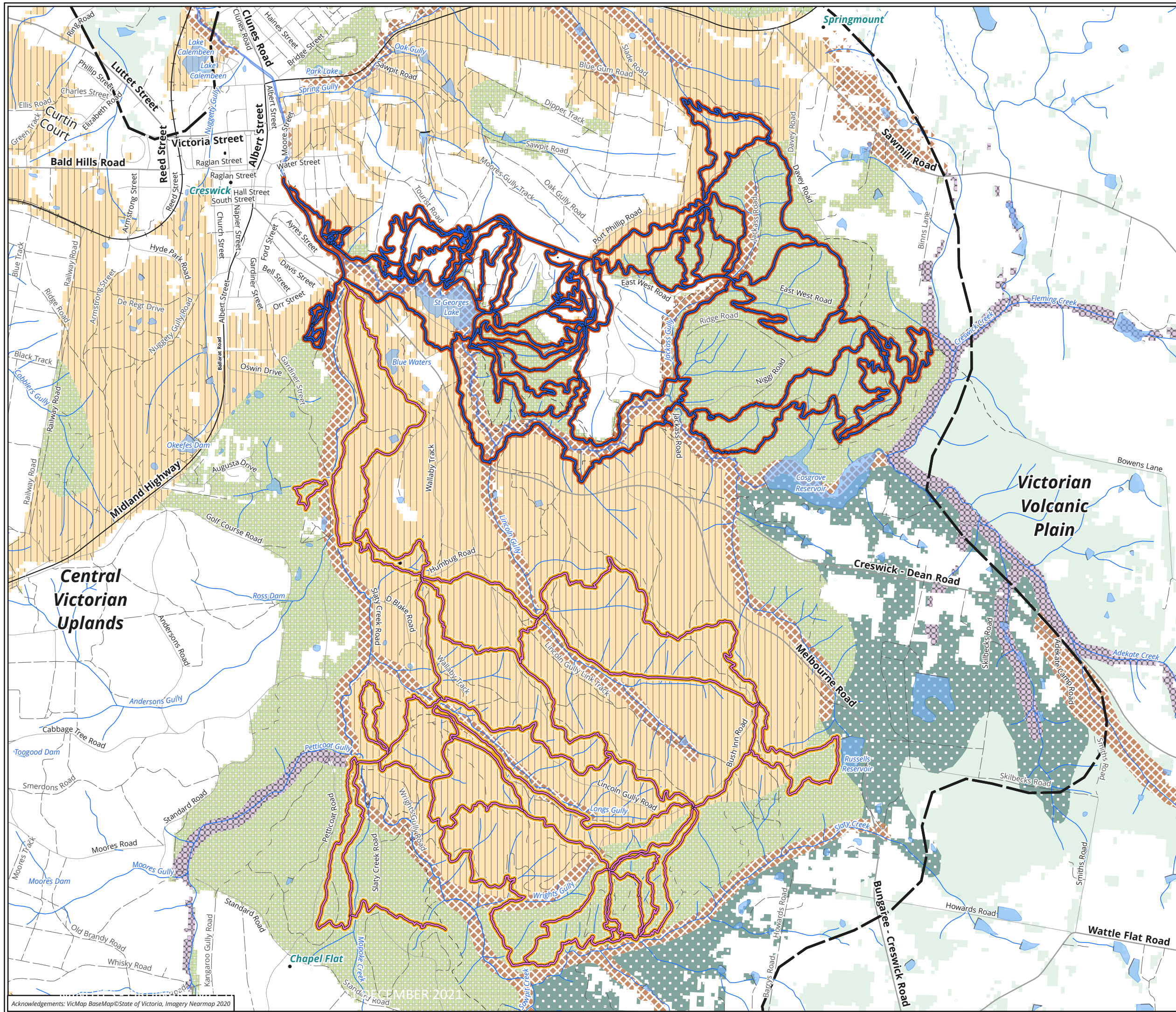
The study area has numerous other ecological values which are not listed as threatened on the FFG Act or the EPBC Act. The site provides habitat for a range of locally common flora (including flora protected on the FFG Act) and fauna. There are VBA records of nine species of flora being recorded within 10 km of the study area that are listed on the Victorian Advisory List of Threatened Flora which we have assessed as having a medium or high likelihood of occurring within the study area Appendix 2. One of these species, Pale Swamp Everlasting *Coronidium gunnianum*, is listed as vulnerable and eight species are listed as rare (Wiry Bossiaea *Bossiaea cordigera*, Spotted Hyacinth-orchid *Dipodium pardalinum*, Snowy River Wattle *Acacia boormanii*, Dwarf Silver-wattle *Acacia nanodealbata*, Brooker's Gum Eucalyptus *Brookeriana*, Yarra Gum *Eucalyptus yarraensis*, Austral Crane's-bill *Geranium solanderi* var. *solanderi* and Creeping Grevillea *Grevillea repens*).

There are also VBA records of nine species of fauna recorded within 10 km of the study area listed on the Victorian Advisory List of Threatened Fauna which we have assessed as having a medium or high likelihood of occurring within the study area Appendix 3. Five of these species are listed as vulnerable (Australasian Shoveler *Anas rhynchotis*, Hardhead *Aythya australis*, Musk Duck *Biziura lobata*, White-throated Needletail *Hirundapus caudacutus* and Southern Toadlet *Pseudophryne semimarmorata*) and four species are listed as near threatened (Pied Cormorant *Phalacrocorax varius*, Latham's Snipe *Gallinago hardwickii*, Spotted Quail-thrush *Cinlosoma punctatum* and Brown Treecreeper *Climacteris picumnus victoriae*).

Creswick Creek was assessed in the 2004 Index of Stream Condition (ISC) assessment to be very poor in condition (DSE 2005). Physical form was the highest scoring sub-index (6/10) with all other sub-indices scoring 5/10 or below. No ISC data exists for other waterways in the vicinity of the study area.

3.5 Further survey recommendations

If permanent waterbodies or waterways will be directly impacted by the construction of the proposed trail alignment then targeted surveys for Growling Grass Frog may be needed to determine the presence/absence of this species in the affected areas. Survey guidelines for detecting Growling Grass Frog state that surveys be undertaken between November and March over at least two nights in suitable conditions, with suitable conditions being defined as days with daytime temperatures greater than 15°C, with moderate to no wind, and night time air temperatures greater than 12°C, with moderate to no wind (DEWHA 2009).



- Legend**
- Study area, stage 1
 - Study area, stage 2
 - Stage 1
 - Stage 2
 - Victorian Bioregion boundary
- Ecological vegetation class**
- 164 Creekline Herb-rich Woodland
 - 20 Heathy Dry Forest
 - 22 Grassy Dry Forest
 - 23 Herb-rich Foothill Forest
 - 47 Valley Grassy Forest
 - 55 Plains Grassy Woodland

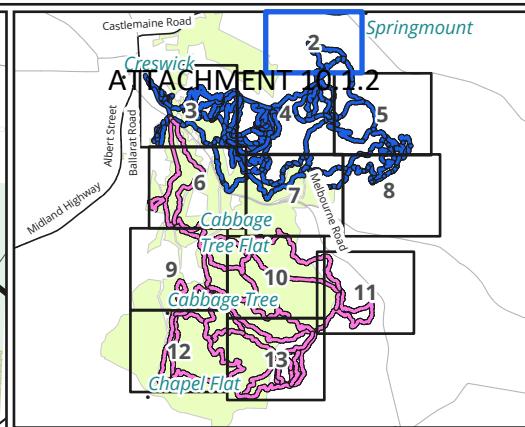
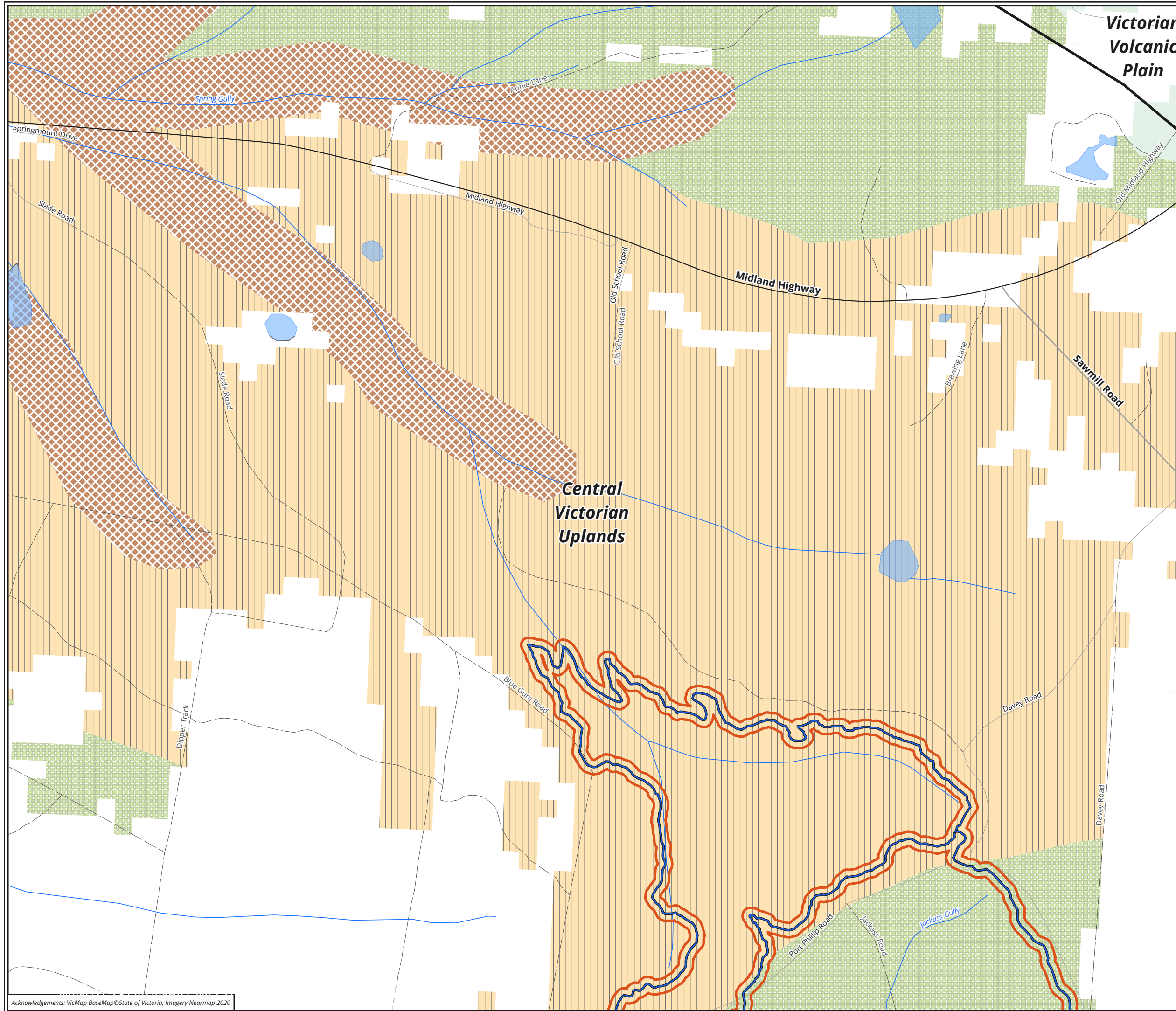
Figure 2.1 Ecological features of the study area - Overview

0 200 400 600 800 1,000
 Metres
 Scale: 1:25,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 54



Matter: 34416,
 Date: 05 March 2021,
 Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
 Layout: 34416_F2_Eco_features
 Project: P:\34400s\34416\Mapping\34416_CreswickMTB_FFA.prx

Acknowledgements: VicMap BaseMap © State of Victoria, Imagery Nearmap 2020



- Legend**
- Study area, stage 1
 - Proposed MTB Trail
 - Stage 1
 - Victorian Bioregion boundary
- Ecological vegetation class**
- 20 Heathy Dry Forest
 - 22 Grassy Dry Forest
 - 23 Herb-rich Foothill Forest
 - 55 Plains Grassy Woodland

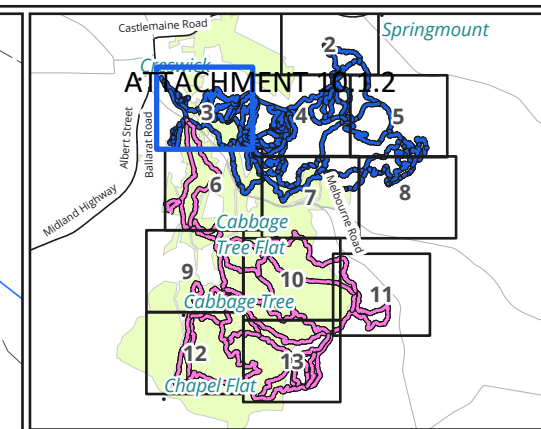
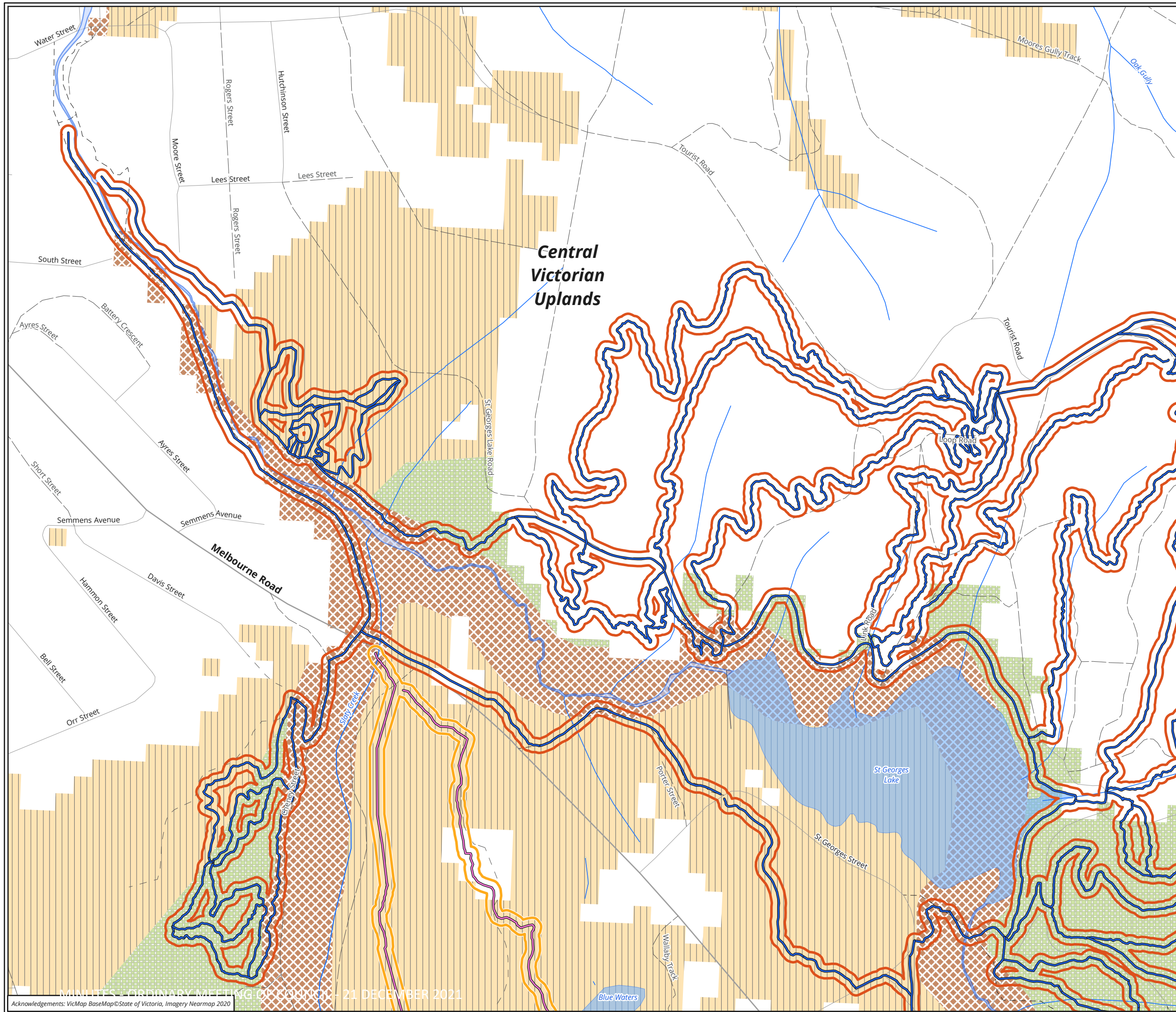
Figure 2.2 Ecological features of the study area

0 40 80 120 160 200
 Metres
 Scale: 1:5,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 54



Matter: 34416,
 Date: 05 March 2021,
 Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
 Layout: 34416_F2_Eco_features
 Project: P:\34400s\34416\Mapping\
 34416_CreswickMTB_FFA.aprx

Acknowledgements: VicMap BaseMap © State of Victoria, Imagery Nearmap 2020



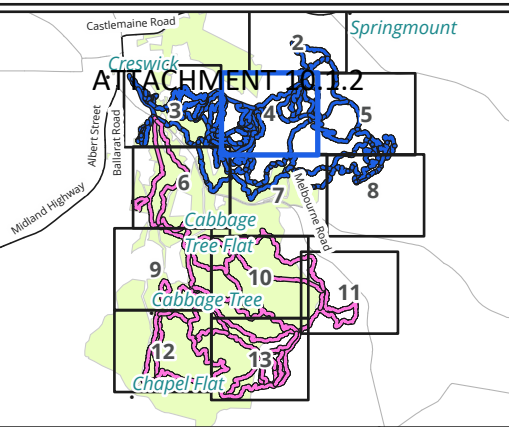
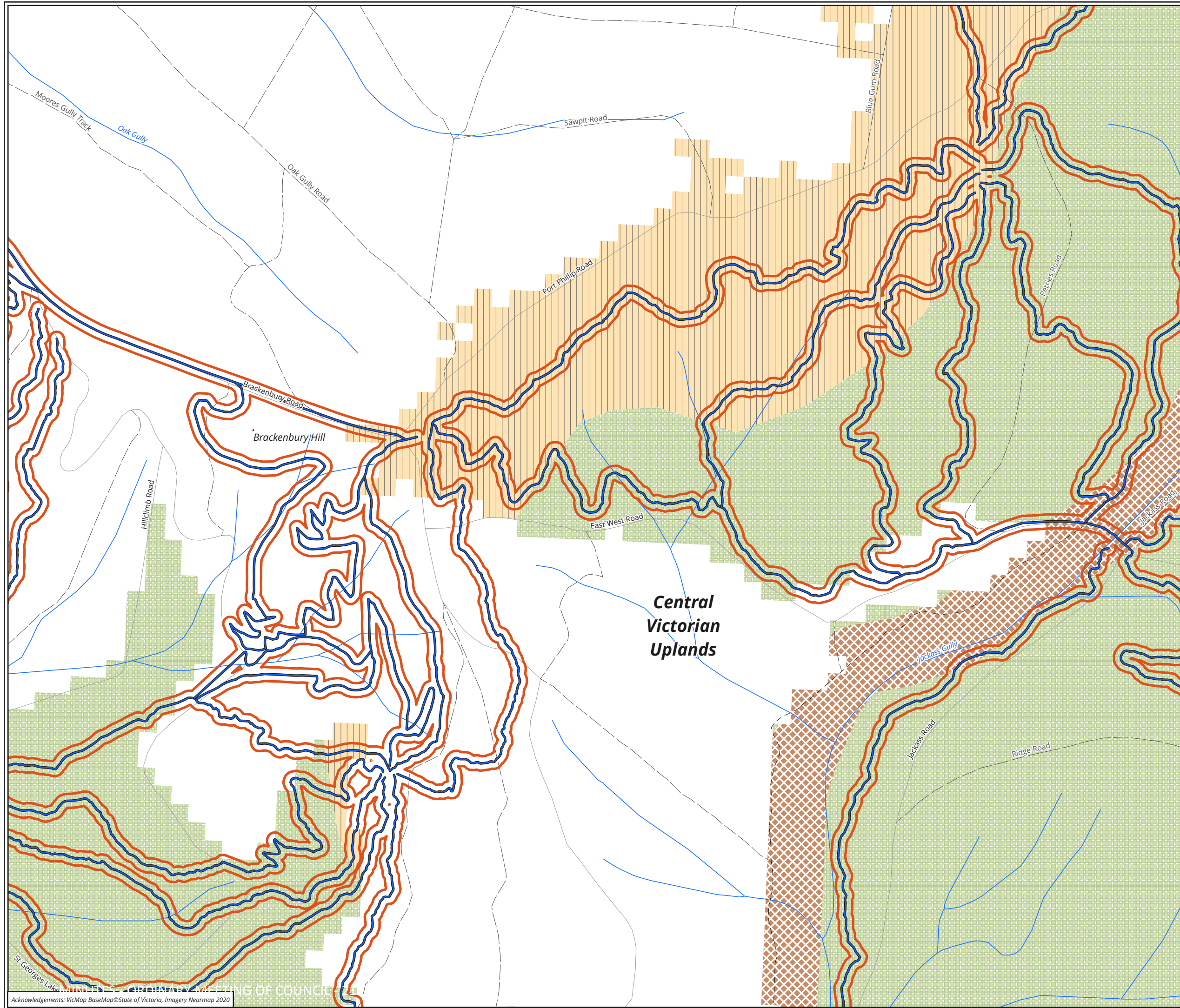
- Legend**
- Study area, stage 1
 - Study area, stage 2
 - Stage 1
 - Stage 2
 - Victorian Bioregion boundary
 - Ecological vegetation class**
 - 20 Heathy Dry Forest
 - 22 Grassy Dry Forest
 - 23 Herb-rich Foothill Forest

Figure 2.3 Ecological features of the study area

0 40 80 120 160 200
 Metres
 Scale: 1:5,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 54

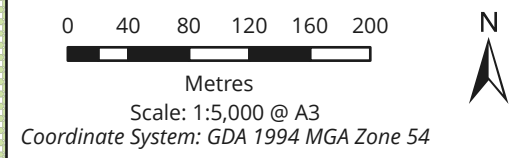


Matter: 34416,
 Date: 05 March 2021,
 Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
 Layout: 34416_F2_Eco_features
 Project: P:\34400s\34416\Mapping\
 34416_CreswickMTB_FFA.aprx



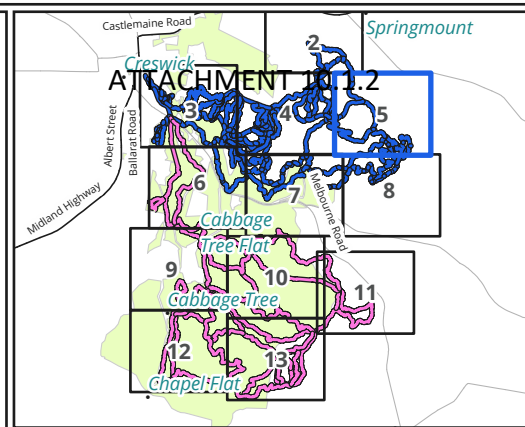
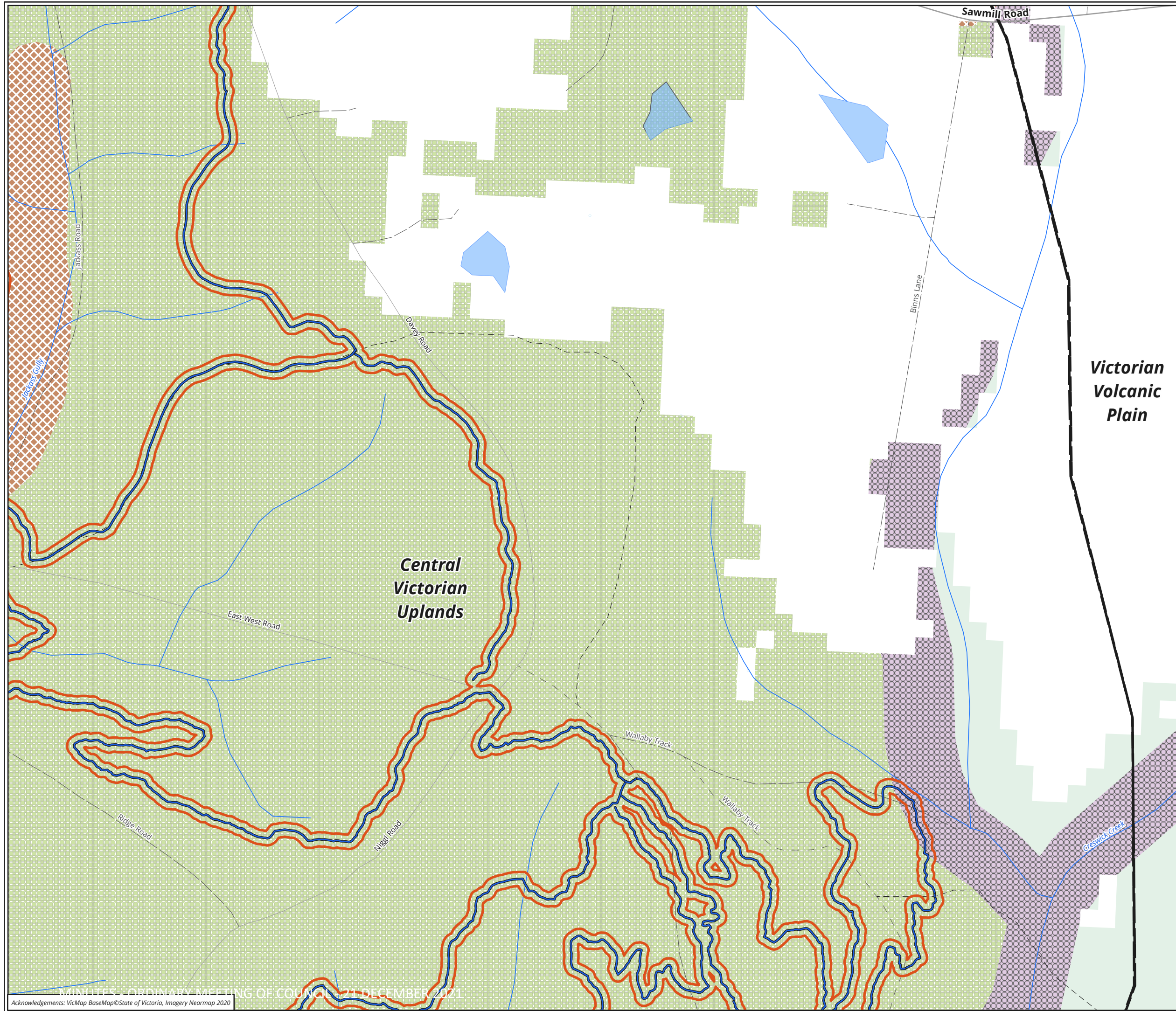
- Legend**
- Study area, stage 1
 - Proposed MTB Trail
 - Victorian Bioregion boundary
- Ecological vegetation class**
- 20 Heathy Dry Forest
 - 22 Grassy Dry Forest
 - 23 Herb-rich Foothill Forest

Figure 2.4 Ecological features of the study area



Matter: 34416,
 Date: 05 March 2021,
 Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
 Layout: 34416_F2_Eco_features
 Project: P:\34400s\34416\Mapping\34416_CreswickMTB_FFA.aprx

Acknowledgements: VicMap BaseMap © State of Victoria, Imagery Nearmap 2020



- Legend**
- Study area, stage 1
 - Proposed MTB Trail
 - Stage 1
 - Victorian Bioregion boundary
 - Ecological vegetation class**
 - 164 Creekline Herb-rich Woodland
 - 22 Grassy Dry Forest
 - 23 Herb-rich Foothill Forest
 - 55 Plains Grassy Woodland

**Victorian
Volcanic
Plain**

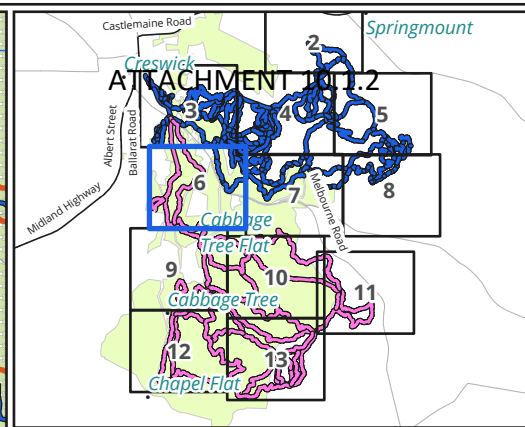
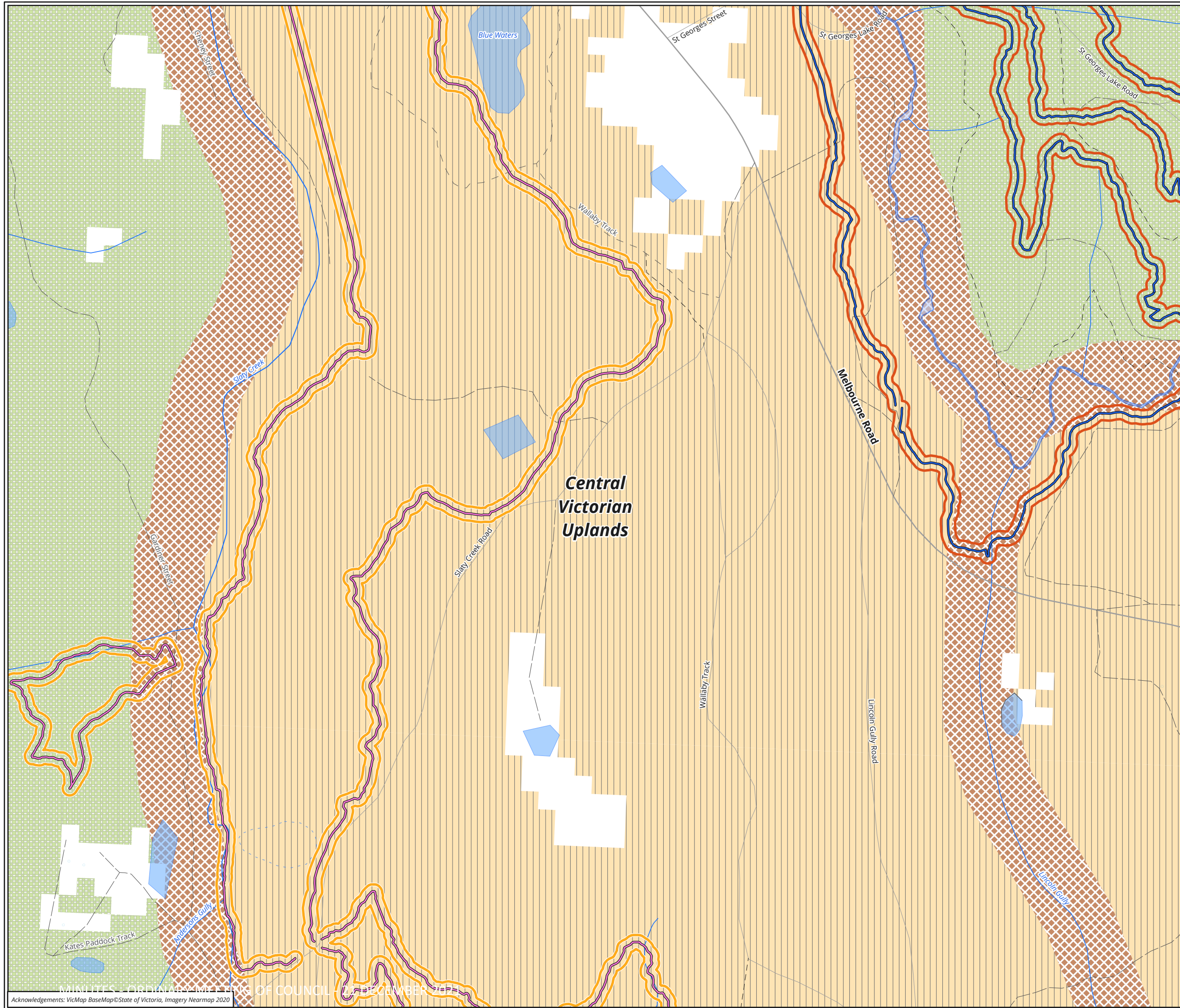
**Central
Victorian
Uplands**

Figure 2.5 Ecological features of the study area

0 40 80 120 160 200
Metres
Scale: 1:5,000 @ A3
Coordinate System: GDA 1994 MGA Zone 54



Matter: 34416,
Date: 05 March 2021,
Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
Layout: 34416_F2_Eco_features
Project: P:\34400s\34416\Mapping\34416_CreswickMTB_FFA.aprx



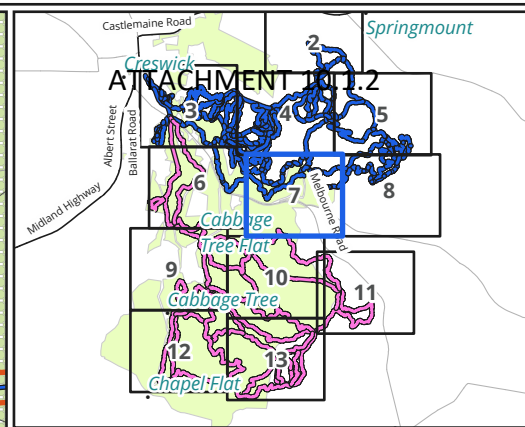
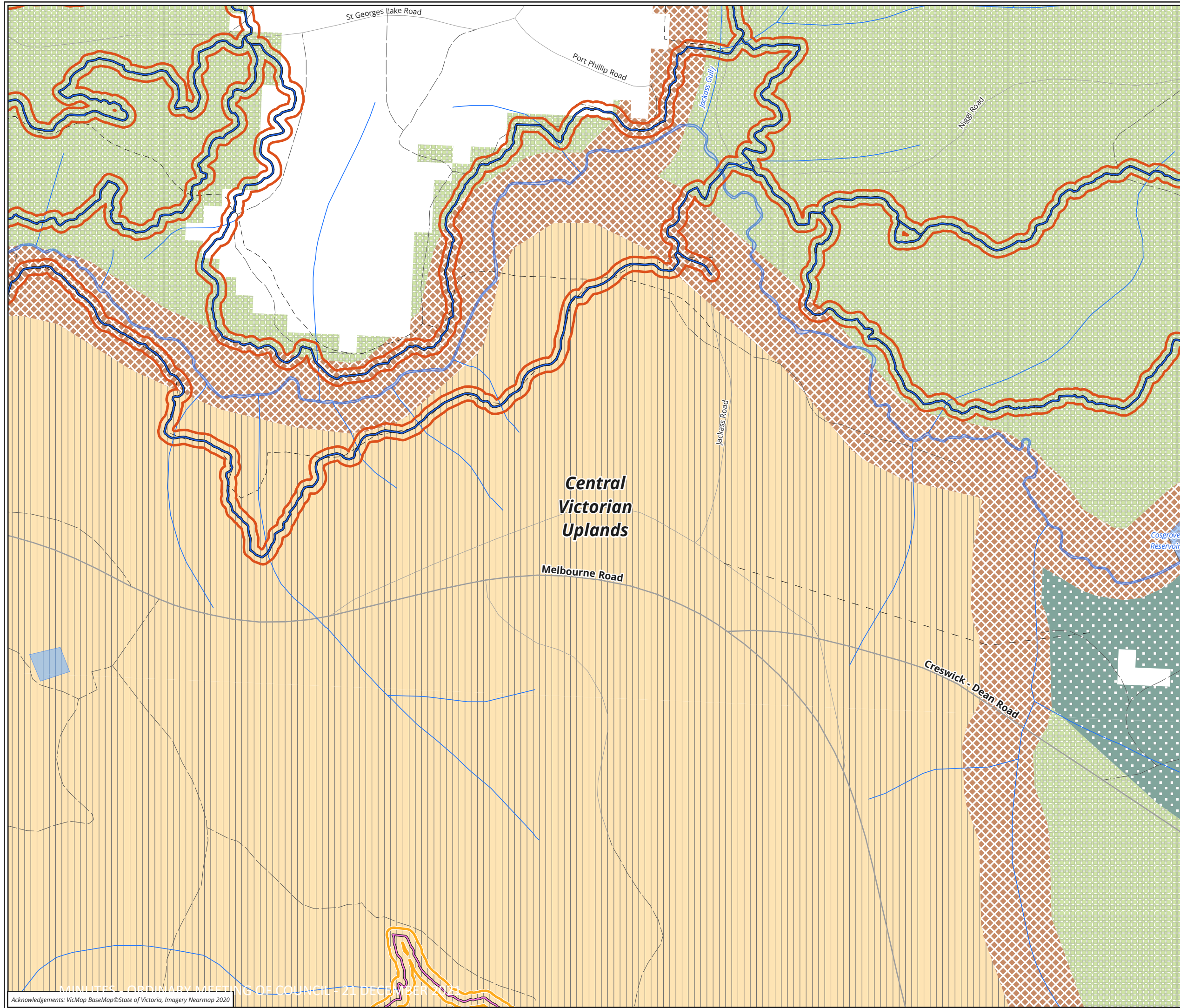
- Legend**
- Study area, stage 1
 - Study area, stage 2
- Proposed MTB Trail**
- Stage 1
 - Stage 2
- Victorian Bioregion boundary
- Ecological vegetation class**
- 20 Heathy Dry Forest
 - 22 Grassy Dry Forest
 - 23 Herb-rich Foothill Forest

Figure 2.6 Ecological features of the study area

0 40 80 120 160 200
Metres
Scale: 1:5,000 @ A3
Coordinate System: GDA 1994 MGA Zone 54



Matter: 34416,
Date: 05 March 2021,
Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
Layout: 34416_F2_Eco_features
Project: P:\34400s\34416\Mapping\34416_CreswickMTB_FFA.aprx



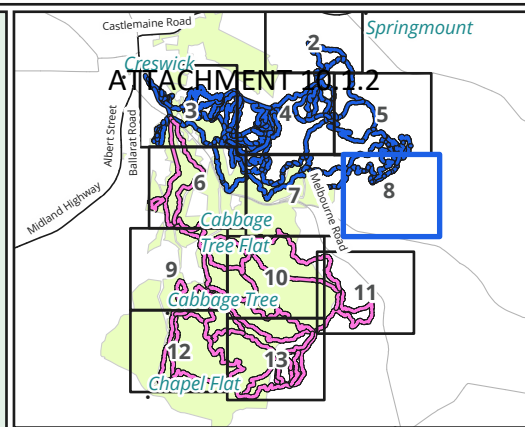
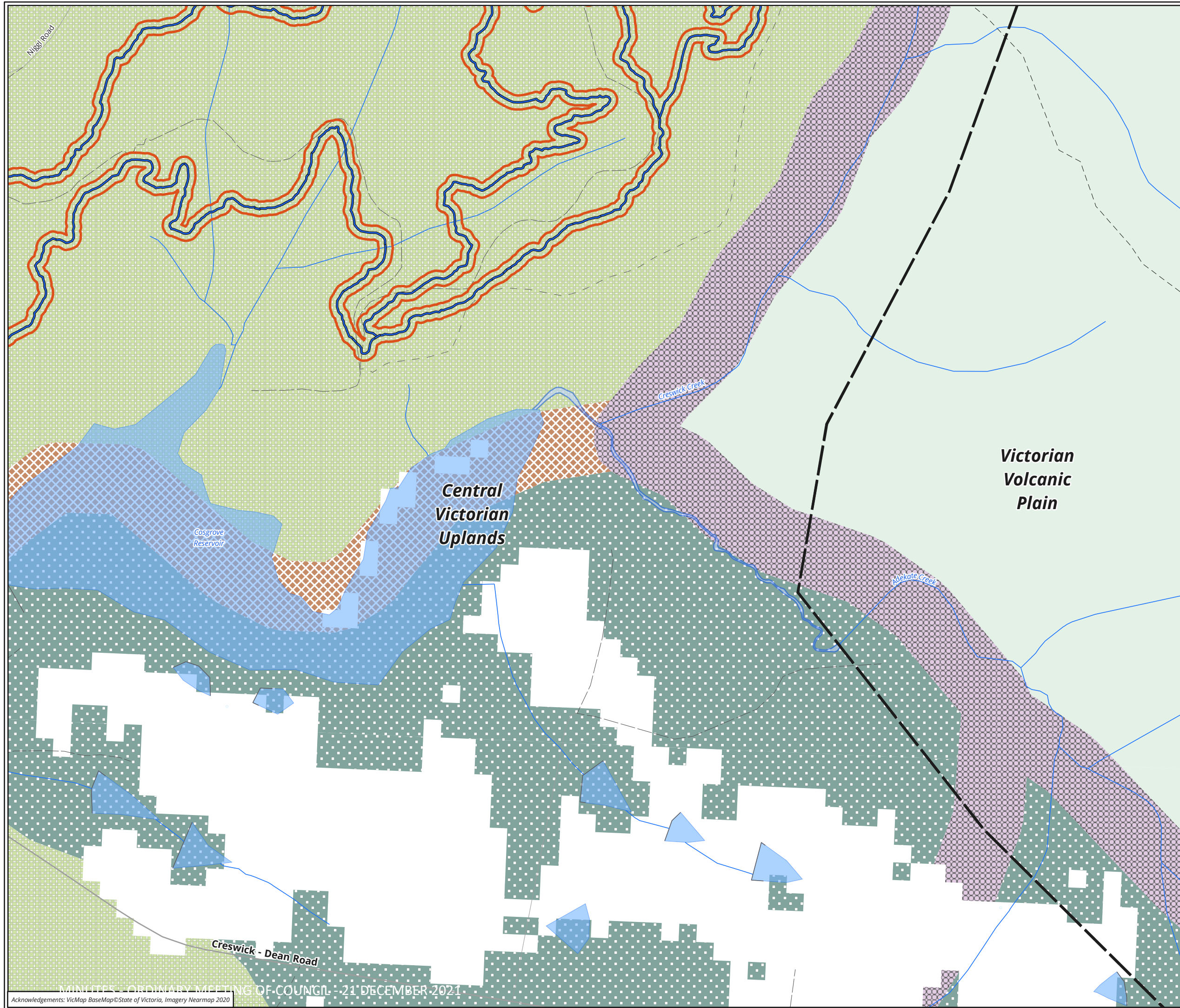
- Legend**
- Study area, stage 1
 - Study area, stage 2
- Proposed MTB Trail**
- Stage 1
 - Stage 2
- Victorian Bioregion boundary
- Ecological vegetation class**
- 20 Heathy Dry Forest
 - 22 Grassy Dry Forest
 - 23 Herb-rich Foothill Forest
 - 47 Valley Grassy Forest

Figure 2.7 Ecological features of the study area

0 40 80 120 160 200
Metres
Scale: 1:5,000 @ A3
Coordinate System: GDA 1994 MGA Zone 54



Matter: 34416,
Date: 05 March 2021,
Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
Layout: 34416_F2_Eco_features
Project: P:\34400s\34416\Mapping\34416_CreswickMTB_FFA.aprx



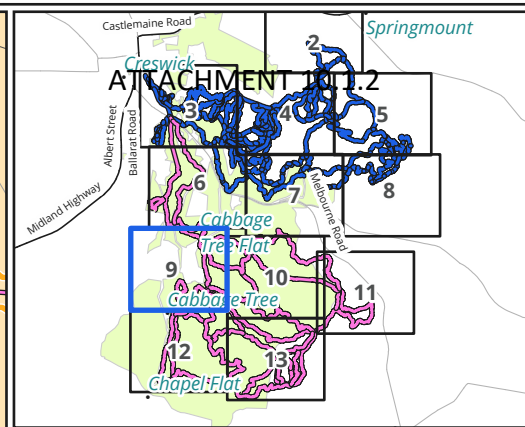
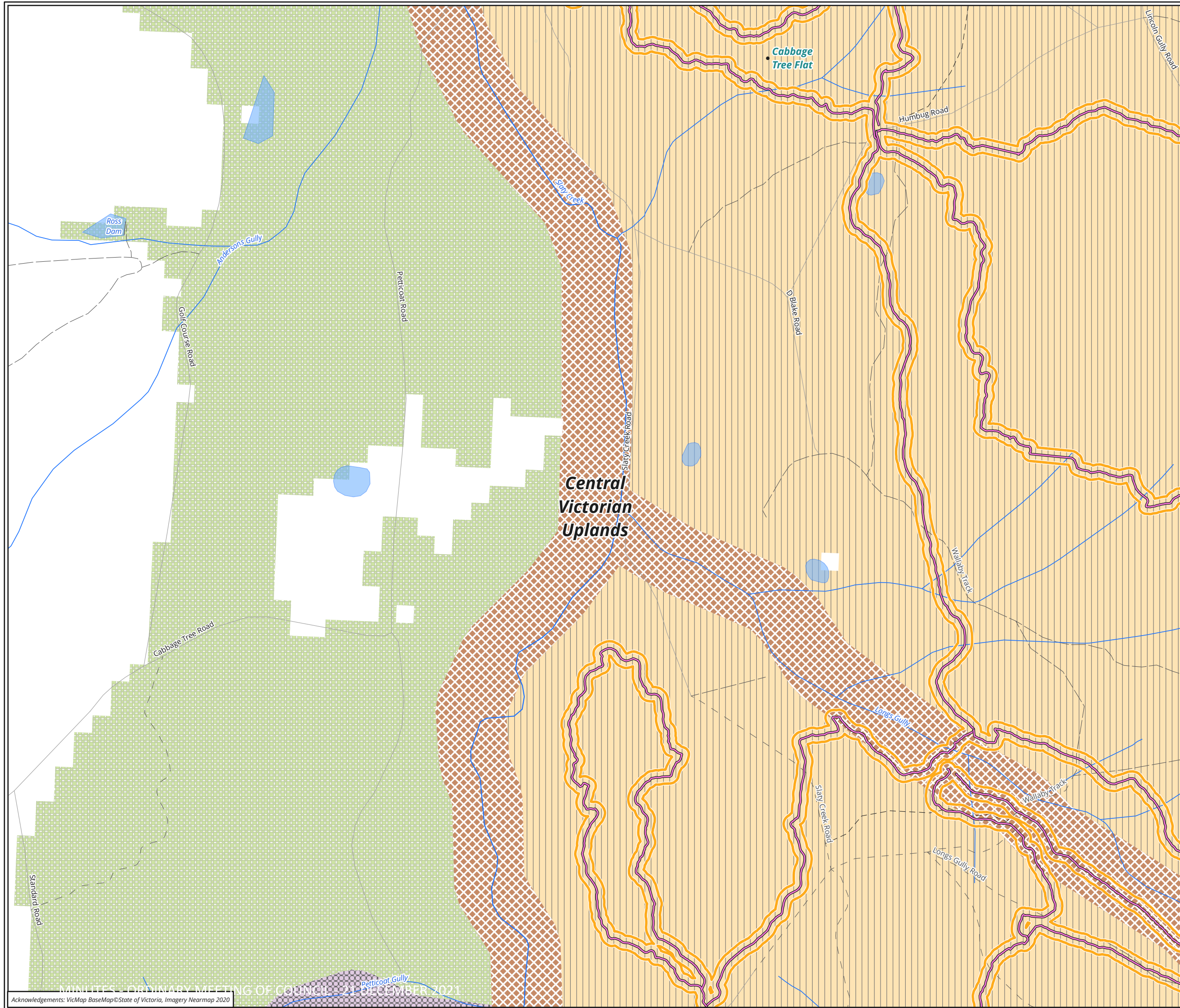
- Legend**
- Study area, stage 1
 - Proposed MTB Trail
 - Victorian Bioregion boundary
- Ecological vegetation class**
- 164 Creekline Herb-rich Woodland
 - 22 Grassy Dry Forest
 - 23 Herb-rich Foothill Forest
 - 47 Valley Grassy Forest
 - 55 Plains Grassy Woodland

Figure 2.8 Ecological features of the study area

0 40 80 120 160 200
Metres
Scale: 1:5,000 @ A3
Coordinate System: GDA 1994 MGA Zone 54



Matter: 34416,
Date: 05 March 2021,
Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
Layout: 34416_F2_Eco_features
Project: P:\34400s\34416\Mapping\34416_CreswickMTB_FFA.aprx



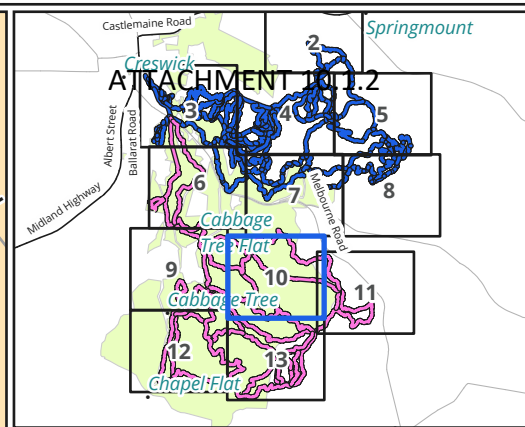
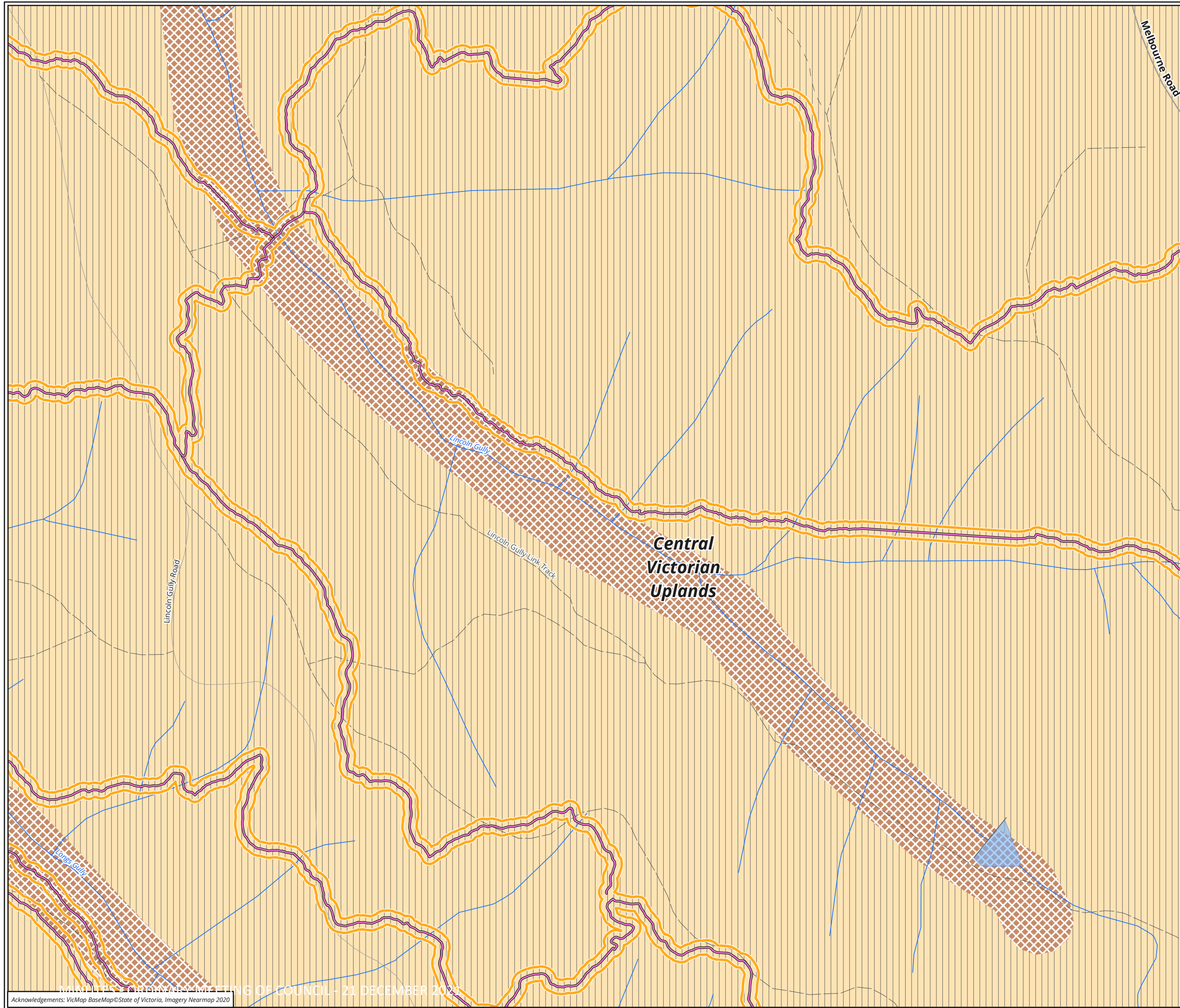
- Legend**
- Study area, stage 2
 - Proposed MTB Trail
 - Victorian Bioregion boundary
 - Ecological vegetation class**
 - 164 Creekline Herb-rich Woodland
 - 20 Heathy Dry Forest
 - 22 Grassy Dry Forest
 - 23 Herb-rich Foothill Forest

Figure 2.9 Ecological features of the study area

0 40 80 120 160 200
 Metres
 Scale: 1:5,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 54



Matter: 34416,
 Date: 05 March 2021,
 Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
 Layout: 34416_F2_Eco_features
 Project: P:\34400s\34416\Mapping\34416_CreswickMTB_FFA.aprx



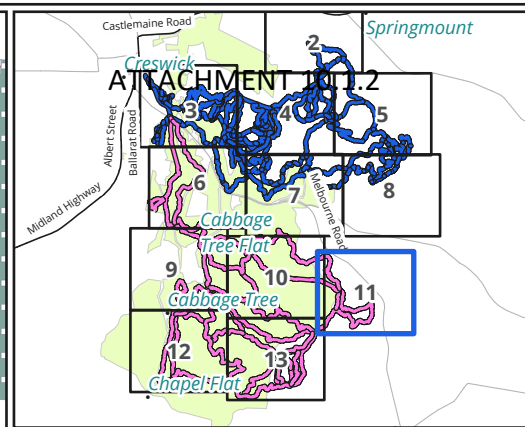
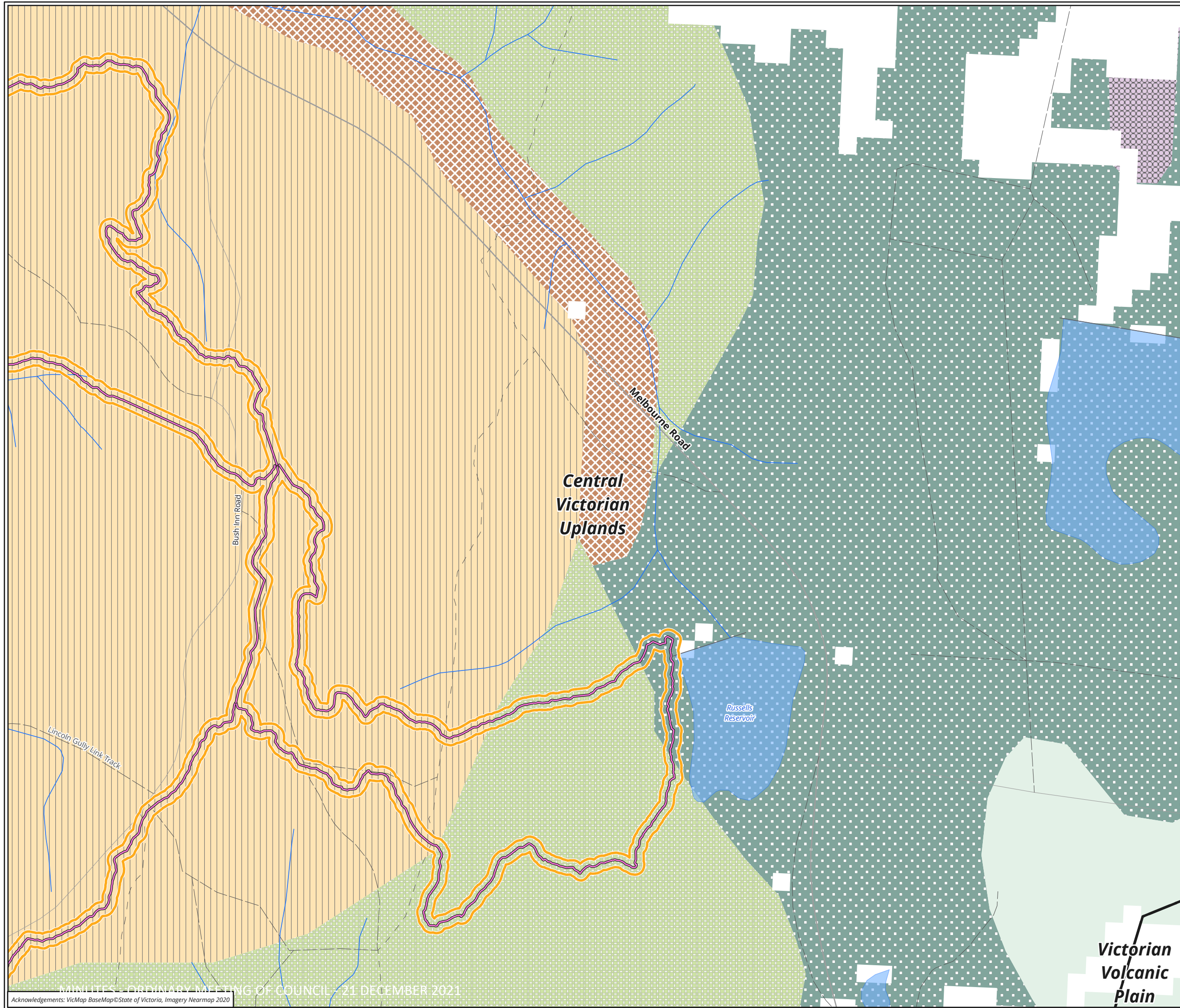
- Legend**
- Study area, stage 2
 - Proposed MTB Trail
 - Victorian Bioregion boundary
 - Ecological vegetation class**
 - 20 Heathy Dry Forest
 - 23 Herb-rich Foothill Forest

Figure 2.10 Ecological features of the study area

0 40 80 120 160 200
 Metres
 Scale: 1:5,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 54



Matter: 34416,
 Date: 05 March 2021,
 Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
 Layout: 34416_F2_Eco_features
 Project: P:\34400s\34416\Mapping\34416_CreswickMTB_FFA.aprx



- Legend**
- Study area, stage 2
 - Proposed MTB Trail
 - Victorian Bioregion boundary
- Ecological vegetation class**
- 164 Creekline Herb-rich Woodland
 - 20 Heathy Dry Forest
 - 22 Grassy Dry Forest
 - 23 Herb-rich Foothill Forest
 - 47 Valley Grassy Forest
 - 55 Plains Grassy Woodland

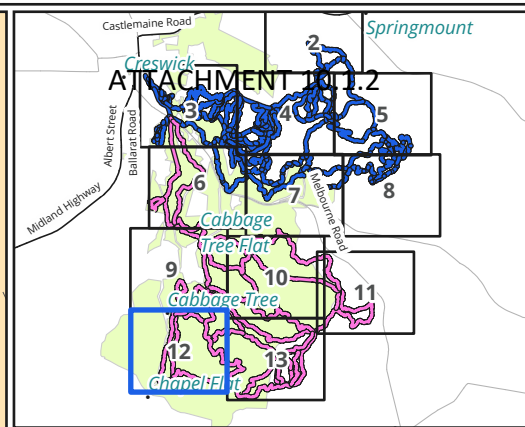
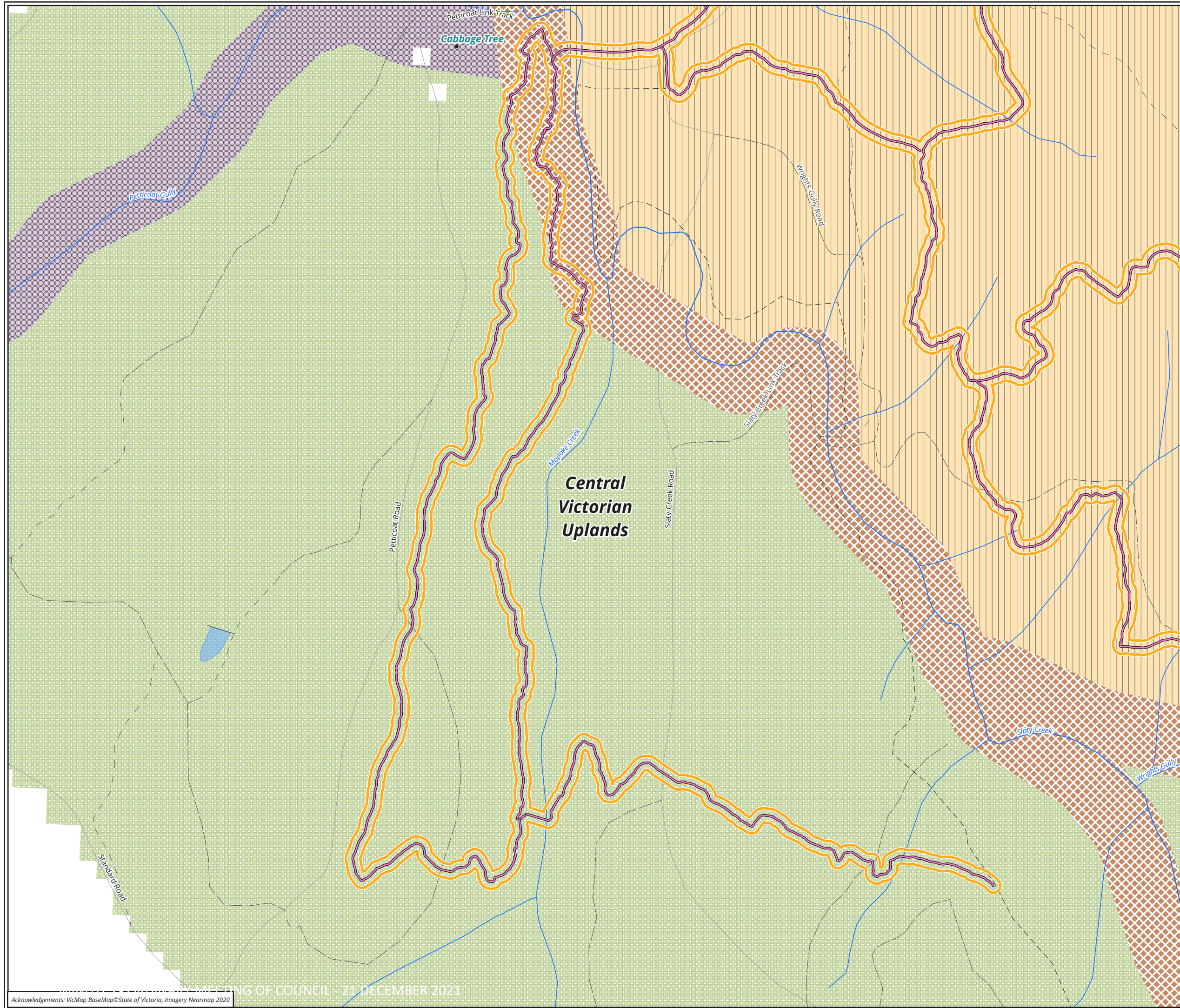
Figure 2.11 Ecological features of the study area

0 40 80 120 160 200
Metres
Scale: 1:5,000 @ A3
Coordinate System: GDA 1994 MGA Zone 54



Matter: 34416,
Date: 05 March 2021,
Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
Layout: 34416_F2_Eco_features
Project: P:\34400s\34416\Mapping\34416_CreswickMTB_FFA.aprx

**Victorian
Volcanic
Plain**



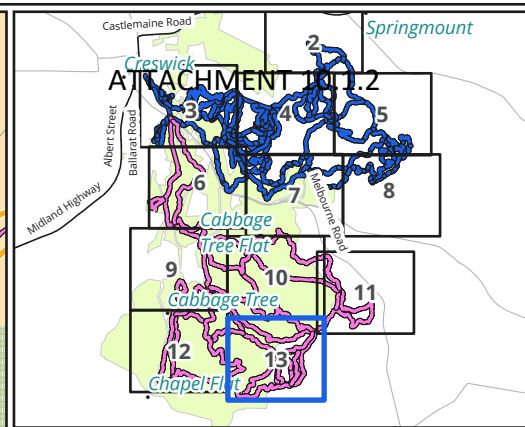
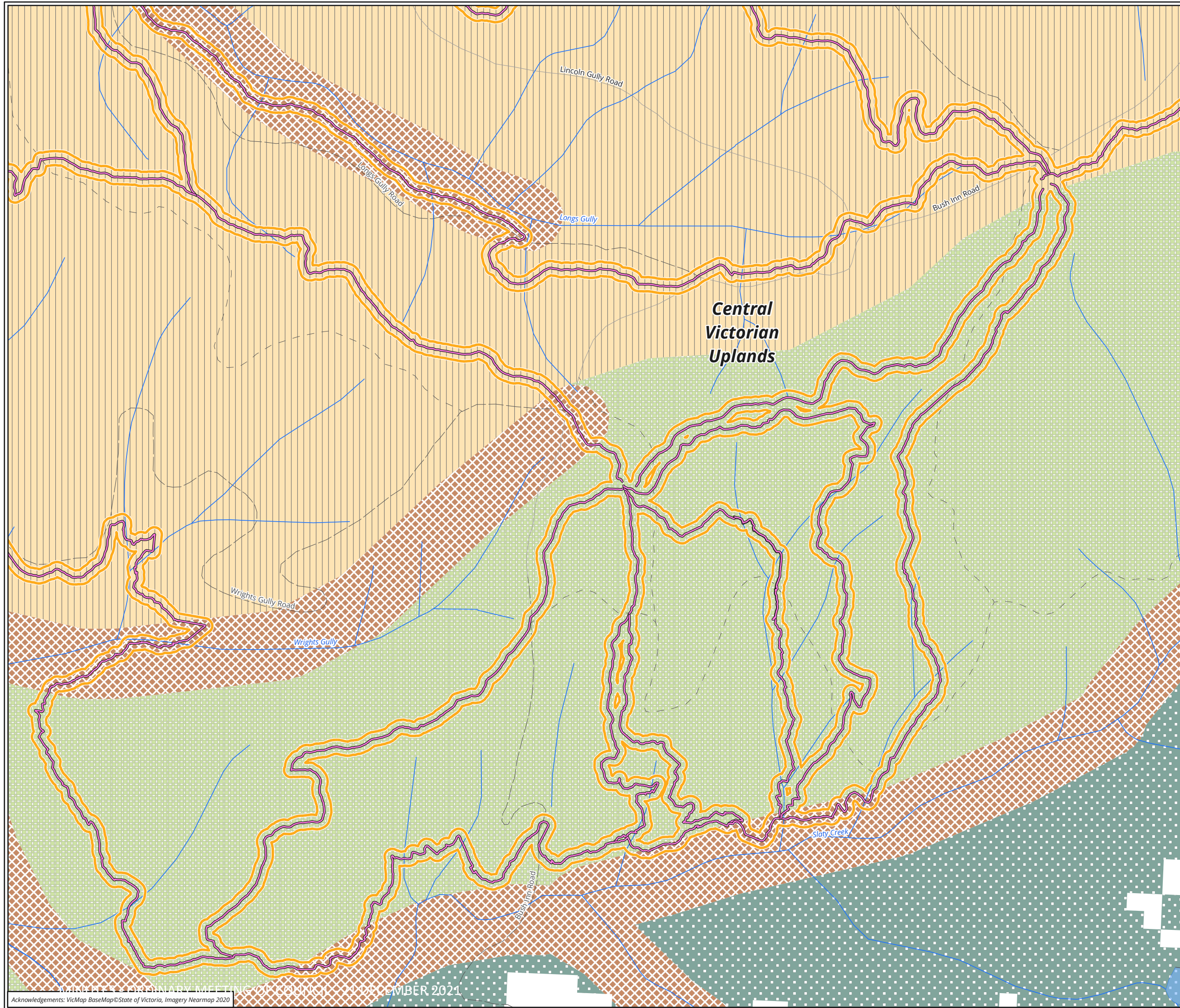
- Legend**
- Study area, stage 2
 - Proposed MTB Trail
 - Victorian Bioregion boundary
 - Ecological vegetation class**
 - 164 Creekline Herb-rich Woodland
 - 20 Heathy Dry Forest
 - 22 Grassy Dry Forest
 - 23 Herb-rich Foothill Forest

Figure 2.12 Ecological features of the study area

0 40 80 120 160 200
 Metres
 Scale: 1:5,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 54



Matter: 34416,
 Date: 05 March 2021,
 Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
 Layout: 34416_F2_Eco_features
 Project: P:\34400s\34416\Mapping\34416_CreswickMTB_FFA.aprx



- Legend**
- Study area, stage 2
 - Proposed MTB Trail
 - Victorian Bioregion boundary
 - Ecological vegetation class**
 - 20 Heathy Dry Forest
 - 22 Grassy Dry Forest
 - 23 Herb-rich Foothill Forest
 - 47 Valley Grassy Forest

Figure 2.13 Ecological features of the study area

0 40 80 120 160 200
 Metres
 Scale: 1:5,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 54



Matter: 34416,
 Date: 05 March 2021,
 Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
 Layout: 34416_F2_Eco_features
 Project: P:\34400s\34416\Mapping\34416_CreswickMTB_FFA.aprx

4. Biodiversity legislation and government policy

This section provides an assessment of the project in relation to key biodiversity legislation and government policy. This section does not describe the legislation and policy in detail. Where available, links to further information are provided.

4.1 Commonwealth

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act applies to developments and associated activities that have the potential to significantly impact on Matters of National Environmental Significance (MNES) protected under the Act.

Link for further information including a guide to the referral process is available at:

<http://www.environment.gov.au/epbc/index.html>.

MNES relevant to the project are summarised in Table 5. It includes an assessment against the EPBC Act policy statements published by the Australian Government which provide guidance on the practical application of EPBC Act.

Table 5 Assessment of project in relation to the EPBC Act

MNES	Project specifics	Assessment against significant impact guidelines
Threatened species	Seventeen species of flora and 19 species of fauna listed on the EPBC Act have been recorded or predicted to occur within 10km of the study area. The likelihood of these species occurring in the study area is assessed in Appendix 2 (flora) and Appendix 3 (fauna).	<p>Most of these species are not likely to occur and development unlikely to constitute a significant impact.</p> <p>Five species were assessed as having medium or high likelihoods of occurring in the study area:</p> <ul style="list-style-type: none"> • Swift Parrot • Matted Flax-lily • Grey-headed Flying-fox • Painted Honeyeater • Growling Grass Frog <p>Assessments against the Significant Impact Criteria (CoA 2013) have been prepared for the five species mentioned above. It has been concluded that if the avoidance minimisation and mitigation measures recommended in the report are strictly implemented a significant impact is unlikely and a referral to the federal Minister of the Environment is not required unless Hepburn Shire requires legal certainty regarding the project.</p>

MNES	Project specifics	Assessment against significant impact guidelines
Threatened ecological communities	Five threatened ecological communities have been recorded or predicted to occur in the project search area.	None of these communities were deemed to be present within the study area during the field assessment.
Migratory species	Thirteen migratory species have been recorded or predicted to occur in the project search area (Appendix 3).	While some of these species would be expected to use the study area on occasions, and some of them may do so regularly or may be resident, it does not provide important habitat for an ecologically significant proportion of any of these species.
Wetlands of international importance (Ramsar sites).	The study area is identified as being within the catchment of six Ramsar wetlands: Banrock Station Wetland Complex, Hattah-kulkyne Lakes, Kerang Wetlands, Port Phillip Bay (western shoreline) and Bellarine Peninsula, Riverland, and the Coorong, and Lakes Alexandrina and Albert Wetland.	The study area does not drain directly into any Ramsar site and the development is not likely to result in a significant impact to any of these sites.

4.1.2 Swift Parrot *Lathamus discolor*

Swift Parrot is listed as Critically Endangered under the EPBC Act and is also listed as threatened under the FFG Act. Swift Parrots are a medium-sized parrot approximately 23-26 cm in size and breed in Tasmania from September to April and then migrates to the mainland during April (Higgins 1999). On mainland Australia Swift Parrots prefer to inhabit dry open eucalypt forests and woodlands, especially box-ironbark forests. However, it is also often recorded in urban areas, including parks, gardens, street trees and golf courses (Higgins 1999).

Significant impact assessment

The Swift Parrot's migratory nature means it cannot be discounted from occurring in dry-open eucalypt forests and woodlands in Victoria, however the Creswick/Ballarat area is not considered an important habitat for this species, which typically forages in drier Box Ironbark Forests further north. If tree losses are kept to a minimum then it is highly unlikely that the proposed mountain bike trail will result in a significant impact on the Swift Parrot. An assessment and justification is provided in Table 6.

Table 6 Swift Parrot - assessment against Significant Impact Criteria

Significant Impact Criteria	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of a population	Highly unlikely	The proposed action is likely to occur within suitable foraging habitat for the Swift Parrot. However, minimal tree removal is proposed as part of the project. Also the main threats to the Swift Parrot population are loss of breeding habitat in Tasmania and nest predation by Sugar Gliders.

Significant Impact Criteria	Likelihood of significant impact	Justification
Reduce the area of occupancy of the species	Unlikely	A minimal number of trees are proposed to be removed as part of the project.
Fragment an existing population into two or more populations	Highly unlikely	Due to its complex movement patterns typified by migration and local nomadism, the Swift Parrot has what is effectively a single national population. Individuals move interchangeably between key wintering sites on the Australian mainland and can move freely through areas of unsuitable and marginal habitat to seek out and exploit favourable habitat patches.
Adversely affect habitat critical to the survival of the species	Highly unlikely	A minimal number of trees are proposed to be removed as part of the project.
Disrupt the breeding cycle of a population	Highly unlikely	This species only breeds in Tasmania.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	A minimal number of trees are proposed to be removed as part of the project.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	Unlikely	The proposed action is unlikely to exacerbate the current level of invasive species threat within the study area to the point that they become harmful to the Swift Parrot.
Introduce disease that may cause the species to decline	Highly unlikely	The proposed action is unlikely to introduce a disease that causes the Swift Parrot to decline.
Interfere with the recovery of a species	Unlikely	The study area is not defined as priority habitat for the Swift Parrot in the national recovery plan (Saunders & Tzaros 2011) and therefore the proposed mountain bike trails are unlikely to impact upon any important populations of the species. Also minimal tree removal is proposed for the project.

4.1.3 Matted Flax-lily *Dianella amoena*

Matted Flax-lily is Endangered under the EPBC Act and is also listed as threatened under the FFG Act. Matted Flax-lily is a perennial tufted lily with a flowering stem up to 90cm high and 12-45 cm long leaves. The species is found in grassland and grassy woodland in Victoria and Tasmania. However, a large amount of its habitat has been cleared and its current distribution is highly fragmented (DoE 2020a).

Significant impact assessment

The study area contains large areas of grassy eucalypt woodland (Grassy Dry Forest EVC) which could be potential habitat for Matted Flax-lily. However no specimens were observed during the field assessment and no records of the species exist within 10 km of the study area. Based on the lack of records within the study area it is considered unlikely that Matted Flax-lily will be significantly impacted by the proposed trail project Table 7.

Table 7 Matted Flax-lily - assessment against Significant Impact Criteria

Significant Impact Criteria	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of a population	Highly unlikely	No populations of Matted Flax-lily are known from within the study area.
Reduce the area of occupancy of the species	Highly Unlikely	No Matted Flax-lily specimens are known to occur within the study area.
Fragment an existing population into two or more populations	Highly unlikely	No populations of Matted Flax-lily are known from within the study area
Adversely affect habitat critical to the survival of the species	Highly unlikely	No populations of Matted Flax-lily are known from within the study area
Disrupt the breeding cycle of a population	Highly unlikely	No populations of Matted Flax-lily are known from within the study area
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	No records of Matted Flax-lily in the area.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	Unlikely	The proposed action is unlikely to exacerbate the current level of invasive species threat within the study area to the point that they become harmful to Mated Flax-lily.
Introduce disease that may cause the species to decline	Highly unlikely	The proposed action is unlikely to introduce a disease that causes the matted Flax-lily to decline.
Interfere with the recovery of a species	Unlikely	The study area does not contain a significant population of Matted Flax-lily as classified in the threat Abatement Plan (Carter 2010) and therefore the proposed mountain bike trails are unlikely to impact upon any important populations necessary to the long-term survival and recovery of the species.

4.1.4 Painted Honeyeater *Grantiella picta*

Painted Honeyeater is listed as Vulnerable under the EPBC Act and is listed as threatened under the FFG Act. This species is a small-medium sized honey eater bird with a pink bill and almost wholly white underparts (Higgins P.J, Peter J.M, & Steele W.K 2001). An endemic species to mainland Australia, it is sparsely distributed from south-eastern Australia to northern Queensland and eastern Northern Territory. The Painted Honeyeater exhibits seasonal north-south migrations based on mistletoe flowering periods, which is matched with its breeding periods (October-March) (Barea L.P & Watson D.M 2007). The species will often nest amongst mistletoe, however nesting success is relatively low, with the majority of failures caused by predation.

The species inhabits a range of environments including Box Ironbark-yellow Gum Woodland, Riparian Woodlands of Black Box and River Red-gums and trees in farmlands or gardens. Generally they prefer areas that hold mature trees as they host more mistletoe.

Significant impact assessment

The Painted Honeyeater's migratory nature means that it cannot be discounted from occurring in any open eucalypt woodland with mistletoe in Central Victoria. The species was last recorded within 10 km of the study area in 2010. Furthermore no mistletoe was observed during the field assessment and if no trees are removed or tree losses are kept to a minimum then it is highly unlikely that the proposed mountain bike trail will result in a significant impact on Painted Honeyeater. An assessment and justification is provided in Table 8.

Table 8 Painted Honeyeater - assessment against Significant Impact Criteria

Significant Impact Criteria	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of an important population of a species	Highly unlikely	No known important populations occur within the study area.
Reduce the area of occupancy of an important population	Highly unlikely	No known important populations occur within the study area.
Fragment an existing important population into two or more populations	Highly unlikely	No known important populations occur within the study area.
Adversely affect habitat critical to the survival of the species	Highly unlikely	Habitat within the study area is not thought to be critical to the survival of the Painted Honeyeater.
Disrupt the breeding cycle of an important population	Highly unlikely	No known important populations occur within the study area.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Highly unlikely	The study area is not known to hold important habitat for the Painted Honeyeater. Removal of habitat here is unlikely to result in species decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Highly unlikely	The proposed action is unlikely to exacerbate the current level of invasive species threat operating within the study area to the point that they become harmful to the Painted Honeyeater.
Introduce disease that may cause the	Highly unlikely	The proposed action is unlikely to introduce a disease

Significant Impact Criteria	Likelihood of significant impact	Justification
species to decline		that causes the Painted Honeyeater to decline.
Interfere substantially with the recovery of a species	Highly unlikely	No recovery plan for this species has been produced. However, as the area does not appear to support any important populations of the Painted Honeyeater, the proposal is unlikely to directly interfere with the recovery of the species.

4.1.5 Grey-headed Flying-fox *Pteropus poliocephalus*

Grey-headed Flying-fox is listed as Vulnerable under the EPBC Act and is listed as threatened under the FFG Act. It is the largest Australian bat species with a body length between 23-29 cm (Tidemann, C.R 1998). An endemic species to Australia, its distribution ranges from Bundaberg in Queensland to Melbourne, from the coast to the western slopes of New South Wales (Tidemann, C.R 1998). It can be found in a range of environments including tall, sclerophyll forests and woodlands. Breeding season commences in January and ends in May. Grey-headed Flying foxes feed on nectar from Eucalypts, Melaleuca and Banksia trees (Eby, P 1998). The abundance of this species within western Victoria appears to be increasing, with several new populations being recently established in locations such as Bendigo, Colac, Warrnambool and Geelong.

Significant impact assessment

The Grey-headed Flying-Foxes distribution means that it cannot be discounted from occurring within the study area. However, it is unlikely that a project of this scale will have an effect on any important populations of the Grey-headed Flying-fox especially if tree losses are avoided and/or kept to a minimum Table 9.

Table 9 Grey-headed Flying-fox - assessment against Significant Impact Criteria

Significant Impact Criteria	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of an important population of a species	Highly unlikely	No known important populations occur within the study area.
Reduce the area of occupancy of an important population	Highly unlikely	No known important populations occur within the study area.
Fragment an existing important population into two or more populations	Highly unlikely	No known important populations occur within the study area.
Adversely affect habitat critical to the survival of the species	Highly unlikely	Habitat within the study area is not thought to be critical to the survival of the Grey-headed Flying-fox.
Disrupt the breeding cycle of an important population	Highly unlikely	No known important populations occur within the study area.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Highly unlikely	The study area is not known to hold important habitat for the Grey-headed Flying-fox. Removal of habitat here is not likely to result in species decline.

Significant Impact Criteria	Likelihood of significant impact	Justification
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Highly unlikely	The proposed action is unlikely to exacerbate the current level of invasive species threat operating within the study area to the point that they become harmful to the Grey-headed Flying-fox.
Introduce disease that may cause the species to decline	Highly unlikely	The proposed action is unlikely to introduce a disease that causes the Grey-headed Flying-fox to decline.
Interfere substantially with the recovery of a species	Highly unlikely	No recovery plan for this species has been produced. However, as the area does not appear to support any important populations of the Grey-headed Flying-fox, the proposal is unlikely to directly interfere with the recovery of the species.

4.1.6 Growling Grass Frog *Litoria raniformis*

Growling Grass Frog is listed as vulnerable under the EPBC Act and is also listed as threatened under the FFG Act. The Growling Grass Frog can reach over 10 cm in length making it one of the largest frog species in Australia (DoE 2020b). The Growling Grass Frog occurs throughout New South Wales, the ACT, Victoria, South Australia and Tasmania although its range is now reduced across these states (DoE 2020b). Growling grass frogs are typically found in still or slow-flowing waterbodies with emergent vegetation.

Significant impact assessment

Growling Grass Frog could occur in creek lines, dams and large waterbodies that contain permanent water within the study area. Growling Grass Frog was last recorded within 10 km of the study area in 2013. There is one record within the study area from 2001 near Russell's Reservoir. If no waterways or waterbodies containing water will be directly impacted by the trails then a significant impact to Growling Grass Frog is unlikely as summarised in the table below. If permanent waterbodies or waterways will be directly impacted by the construction of the proposed trail alignment then targeted surveys for Growling Grass Frog may be needed to determine the presence/absence of this species in the affected areas Table 10.

Table 10 Growling Grass Frog- assessment against Significant Impact Criteria

Significant Impact Criteria	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of an important population of a species	Highly unlikely	No known important populations occur within the study area.
Reduce the area of occupancy of an important population	Highly unlikely	No known important populations occur within the study area.
Fragment an existing important population into two or more populations	Highly unlikely	No known important populations occur within the study area.
Adversely affect habitat critical to the survival of the species	Highly unlikely	Habitat within the study area is not thought to be critical to the survival of the Growling Grass Frog

Significant Impact Criteria	Likelihood of significant impact	Justification
Disrupt the breeding cycle of an important population	Highly unlikely	No known important populations occur within the study area.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Highly unlikely	The study area is not known to hold important habitat for the Growling Grass Frog. Removal of habitat here is not likely to result in species decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Highly unlikely	The proposed action is unlikely to exacerbate the current level of invasive species threat operating within the study area to the point that they become harmful to the Growling Grass Frog.
Introduce disease that may cause the species to decline	Unlikely	The proposed action is unlikely to introduce a disease that causes the Growling Grass Frog to decline if vehicle and equipment hygiene practices are in place during trail construction.
Interfere substantially with the recovery of a species	Highly unlikely	No recovery plan for this species has been produced. However, as the area does not appear to support any important populations of the Grey-headed Flying-fox, the proposal is unlikely to directly interfere with the recovery of the species.

On the basis of criteria outlined in the relevant *Significant Impact Guidelines* it is considered unlikely that a significant impact on a Matter of National Environmental Significance would result from the proposed action. Referral of the proposed action to the Australian Government Minister for the Environment to determine whether the action requires approval under the EPBC Act is therefore unlikely to be required. As noted above if permanent waterbodies or waterways will be directly impacted by the construction of the proposed trail alignment then targeted surveys for Growling Grass Frog may be needed to determine the presence/absence of this species in the affected areas.

4.2 State

4.2.1 Flora and Fauna Guarantee Act 1988 (FFG Act)

The FFG Act is the key piece of Victorian legislation for the conservation of threatened species and communities and for the management of potentially threatening processes. Under the FFG Act a permit is required from DELWP to 'take' protected flora species from public land. A permit is generally not required for removal of protected flora from private land. Authorisation under the FFG Act is required to collect, kill, injure or disturb listed fish.

Link for further information: <https://www.environment.vic.gov.au/conserving-threatened-species/flora-and-fauna-guarantee-act-1988>.

Native vegetation on site is not a listed community, but does contain numerous protected flora species (Appendix 2). As the study area is on public land, a protected flora permit from DELWP would be required if any of these species will be affected by the proposal.

The FFG Amendment Act 2019 came into effect on 1 June 2020. This amendment introduced a requirement for public authorities (such as Hepburn Shire Council) to consider the FFG Act and potential biodiversity impacts when exercising functions that may impact upon biodiversity. The amendment will also result in a change to the approach to listing threatened species (using the Common Assessment Method), however no species relevant to this project have changed status to date.

The FFG Act also includes a list of potentially threatening processes (Section 10 of the Act). An assessment of potential impacts and recommended mitigation for relevant threatening processes is provided in Table 11.

Table 11 FFG Act potentially threatening processes

Threatening process	Potential for impact	Mitigation recommendations
<p>Alteration to the natural flow regimes of rivers and streams. Action Statement No. 178.</p>	<p>Low. The trail construction project will not be making significant modifications to overland flows. No instream structures are planned.</p>	<p>Any stream crossing structures should be constructed in a manner to not interfere with flows.</p>
<p>Degradation of native riparian vegetation along Victorian rivers and streams. Action Statement No. 183.</p>	<p>Low. Limited riparian vegetation is present as there are no perennial waterways.</p>	<p>Avoid trail construction near major waterways. Minimise trails through riparian zones. Avoid impacts to large trees within riparian zones. Sensitive trail design to avoid erosion and sediment transfer.</p>
<p>Habitat fragmentation as a threatening process for fauna in Victoria. No Action Statement.</p>	<p>Low. The trail construction involves the removal of very narrow strips of understorey vegetation only. This is considered unlikely to pose a significant barrier to the movement of fauna species known to occur within the study area. Most significant species recorded or potentially occurring within the project area are birds (mostly wetland birds, aerial species, raptors or owls) that will not have difficulty crossing trails, or occupying home ranges that include areas of trail. Southern Toadlet and Brown Toadlet (if present) have potential to be impacted by fragmentation where trails are constructed through damp sites.</p>	<p>Microsite trails to minimise tree removal. Minimise trail construction through seasonally wet areas, using elevated structures (boardwalks) where necessary.</p>

Threatening process	Potential for impact	Mitigation recommendations
<p>Increase in sediment input into Victorian rivers and streams due to human activities. Action Statement No. 122.</p>	<p>Low.</p>	<p>Trails to be constructed using sustainable construction techniques to avoid accumulation of water and erosion.</p>
<p>Loss of coarse woody debris from Victorian native forests and woodlands. No Action Statement.</p>	<p>Low. Coarse woody debris may be relocated away from trails, but will not be removed.-</p>	<p>Any fallen timber to be moved for trail construction should be relocated nearby.</p>
<p>Loss of hollow-bearing trees from Victorian native forests. Action Statement No. 192.</p>	<p>Low. Trail micro-siting is being undertaken to minimise tree removal, with priority given to avoiding large trees or trees with hollows.</p>	<p>Microsite trails to avoid impacts to hollow bearing or large trees through direct removal, TPZ impacts or requirements to remove hazard trees for safety reasons.</p>
<p>Predation of native wildlife by the cat, <i>Felis catus</i>. Action Statement No. 80.</p>	<p>Low. Vegetation within the project area is generally very open in structure and would not limit the movement of cats. Construction of additional trails is unlikely to increase the level of access by cats or to increase cat activity.</p>	<p>Feral cat control is an existing responsibility of the land managers.</p>
<p>Predation of native wildlife by the introduced Red Fox <i>Vulpes vulpes</i>. Action Statement No. 44.</p>	<p>Low. Vegetation within the project area is generally very open in structure and would not limit the movement of Red Foxes. Construction of additional trails is unlikely to increase the level of access by Foxes or to increase Fox activity.</p>	<p>Red Fox control is an existing responsibility of the land managers.</p>
<p>Prevention of passage of aquatic biota as a result of the presence of instream structures. Action Statement No. 129.</p>	<p>Low. No instream structures are planned.</p>	<p>Any stream crossing structures should be constructed in a manner to not interfere with flows.</p>
<p>The spread of <i>Phytophthora cinnamomi</i> from infected sites into parks and reserves, including roadsides, under the control of a state or local government authority. No Action Statement.</p>	<p>Low.</p>	<p>Avoid importation of foreign materials from infected sites. Construction teams to implement strict hygiene protocols when moving into the site.</p>

Threatening process	Potential for impact	Mitigation recommendations
<p>Use of Phytophthora-infected gravel in construction of roads, bridges and reservoirs.</p> <p>No Action Statement.</p>	<p>Medium.</p> <p>Movement of soil within the site, or importation of foreign materials has potential to spread Phytophthora to uninfected areas.</p>	<p>Avoid transportation of materials within the site.</p> <p>Where possible, avoid importation of foreign materials.</p> <p>If foreign material, such as rock or gravel, is required, these should be sourced from clean sources.</p>

4.2.2 Catchment and Land Protection Act 1994 (CaLP Act)

The CaLP Act identifies and classifies certain species as noxious weeds or pest animals, and provides a system of controls on noxious species.

Nine declared noxious weeds were identified in the study area and are listed in Appendix 2 (Table A2.1) and three established pest animals were recorded within the study area which are listed in Appendix 3 (Table A3.1).

The proponent/landowner must take all reasonable steps to eradicate regionally prohibited weeds, prevent the growth and spread of regionally controlled weeds, and prevent the spread of and as far as possible eradicate established pest animals. The State is responsible for eradicating State prohibited weeds from all land in Victoria.

Link for further information: <http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds>.

4.2.3 Planning and Environment Act 1987 (incl. Planning Schemes)

The *Planning and Environment Act 1987* controls the planning and development of land in Victoria, and provides for the development of planning schemes for all municipalities.

Of particular relevance to the development proposal are controls relating to the removal, destruction or lopping of native vegetation contained within the Hepburn Planning Scheme (the Scheme), including permit requirements. The Scheme (Clause 73.01) defines 'native vegetation' as 'Plants that are indigenous to Victoria, including trees, shrubs, herbs, and grasses'. It is an objective of Clause 12.01-2 of the State Planning Policy Framework (Native Vegetation Management) that removal of native vegetation results in no net loss in the contribution made by native vegetation to Victoria's biodiversity.

Clause 52.17 (Native Vegetation) requires a planning permit to remove, destroy or lop native vegetation including some dead native vegetation. However, the Regrowth exemption in the table of exemptions (Clause 52.17-7) specifies that the requirement to obtain a permit does not apply when native vegetation that is to be removed, destroyed or lopped has naturally established or regenerated on land lawfully cleared of naturally established native vegetation and is within the boundary of a timber production plantation, as indicated on a Plantation Development Notice or other documented record, and has established after the plantation.

Therefore, to our understanding any native understorey vegetation within land managed by HVP is exempt from requiring a permit and does not need to be offset. Decision guidelines that must be considered by the referral or responsible authority are contained in Section 7 of the Guidelines, and referred to in Clause 52.17-4. Clause 52.17 does not apply if a Native Vegetation Precinct Plan corresponding to the land is incorporated in the Scheme. It should be noted that where native vegetation does not meet the definition of a patch or scattered tree, as described in Section 3.1, the Guidelines do not apply. However, a permit may still be required to remove, destroy or lop native vegetation under the provisions of the Scheme.

Under Clause 66.02 a permit application to remove, destroy or lop native vegetation is required to be referred to DELWP as a recommending referral authority if any of the following apply:

- the class of application is on the detailed assessment pathway
- a property vegetation precinct plan applies to the site or
- the native vegetation is on Crown land occupied or managed by the Responsible Authority.

The need for a permit to remove native vegetation may also be triggered by overlays within the Scheme. The location of the overlays in relation to the study area can be determined via the following link:

<https://mapshare.vic.gov.au/vicplan/>. The provisions of the following overlays apply to the study area:

Environmental Significance Overlay – Schedule 1 (ESO1) covers the entire study area, this overlay is concerned with proclaimed catchment protection. A permit is required under this overlay to remove any vegetation on a site area greater than 1 hectare and any vegetation within 30 metres of a waterway.

Bushfire Management Overlay (BMO) covers the entire study area. A permit is required to construct a building or construct or carry out works associated with a number of uses including: leisure and recreation. An application must be accompanied by:

- A bushfire hazard site assessment
- A bushfire hazard landscape assessment
- A bushfire management statement

Vegetation Protection Overlay – Schedule 1 (VPO1) is located to the south of the trail alignment just north of Bush Inn Road and Drakes Road. As this overlay is not within the trail alignment a permit should not be required under this overlay.

Victoria's Guidelines for the removal, destruction or lopping of native vegetation

The Guidelines are incorporated into the Victoria Planning Provisions and all planning schemes in Victoria (DELWP 2017). The Guidelines replaced the previous incorporated document titled *Permitted clearing of native vegetation – Biodiversity assessment guidelines* (DEPI 2013) on 12 December 2017.

The purpose of the Guidelines is to guide how impacts to biodiversity should be considered when assessing a permit application to remove, destroy or lop native vegetation. The objective for the guidelines in Victoria is 'No net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation'.

A detailed assessment of the implications for the project under the Guidelines is provided in Section 5 of this report. Under the Guidelines, there are three assessment pathways for assessing an application for a permit to remove native vegetation: basic, intermediate and detailed.

A detailed determination of the assessment pathway for the planning application relevant to the proposed development is provided in Section 5.2. In summary, the planning application for removal of native vegetation must meet the requirements of, and be assessed in, the detailed assessment pathway].

4.2.4 Environment Effects Act 1978

The *Environment Effects Act 1978* establishes a process to assess the environmental impacts of a project. If applicable, the Act requires that an Environment Effects Statement (EES) be prepared by the proponent. The EES is submitted to the Minister for Planning and enables them to assess the potential environmental effects of the proposed development.

The general objective of the assessment process is *to provide for the transparent, integrated and timely assessment of the environmental effects of projects capable of having a significant effect on the environment* (DSE 2006).

The 'Ministerial Guidelines for Assessment of Environmental Effects under the Environment Effects Act 1978' (DSE 2006a) provide a range of criteria that can be used to determine whether an EES may be required for a project. These criteria relate to individual potential environmental effects and a combination of (two or more) potential environmental effects.

The project may result in the removal of over 10 ha of native vegetation. This extent of native vegetation removal can warrant an EES referral if either the native vegetation to be removed is of significant biodiversity value (endangered EVCs or very high conservation significance) or another of the combined potential effects referral criteria are also met. An assessment of the EES referral criteria is provided in Table 12 and Table 13.

An assessment of the project against the individual and combined potential effects criteria based on the level of proposed native vegetation removal, EVC bioregional conservation status (and small amount of impacts to endangered EVCs), impacts on FFG Act listed species and impacts on wetlands indicates the project is unlikely to trigger a referral to the Minister for Planning for an EES determination.

However, the guidelines are not binding, and the decision as to whether an EES is required is ultimately at the discretion of the Minister for Planning.

Table 12: Assessment of the project against the individual potential environmental effects referral criteria of the *Environment Effects Act 1978*

Referral criteria	Referral criteria met?	Comments
<p>Potential clearing of 10 ha or more of native vegetation from an area that:</p> <ul style="list-style-type: none"> • is of an EVC classified as Endangered within the Bioregion • is, or is likely to be, of Very High Conservation Significance; and, • is not authorised under an approved Forest Management Plan or Fire Protection Plan. 	No	The project will not involve the clearance of more than 10 ha of any endangered EVCs.
Potential long-term loss of a significant proportion of known remaining habitat or population of a threatened species within Victoria	No	The project area provides habitat for several bird species listed as threatened under the FFG Act. Construction and operation of the facility is not likely to lead to a long term loss of a significant proportion of habitat for any of these species.
Potential long-term change to the ecological character of a wetland listed under the Ramsar Convention or in 'A Directory of Important Wetlands in Australia' (Environment Australia, 2001).	No	The site does not contain, or drain directly into, any wetland listed under the Ramsar Convention or in 'A Directory of Important Wetlands in Australia' (Environment Australia, 2001).

Referral criteria	Referral criteria met?	Comments
Potential extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems, over the long term.	No	The project will not impact upon aquatic systems if recommended avoidance and mitigation measures are adopted and enforced..
Potential extensive or major effects on the health, safety or well-being of a human community, due to emissions to air or water or chemical hazards or displacement of residences.		Outside scope of the current study
Potential greenhouse gas emissions exceeding 200,000 tonnes of carbon dioxide equivalent per annum, directly attributable to the operation of the facility.		Outside scope of the current study

Table 13: Assessment of the project against the combined potential environmental effects referral criteria of the *Environment Effects Act 1978*

Referral criteria	Referral criteria met?	Comments
Potential clearing of 10 ha or more of native vegetation, unless authorised under an approved Forest Management Plan or Fire Protection Plan.	Possible	It is possible that the combination of actual and assumed losses of native vegetation may exceed 10 ha. Most of this removal will be temporary, however, and it is expected that, following post construction regeneration, the total losses will be less than 10 ha.
Matters listed under the FFG Act 1988: <ul style="list-style-type: none"> <li>Potential loss of a genetically important population of an endangered or threatened species (listed or nominated for listing) including as a result of the loss or fragmentation of habitats 	No	The project area provides habitat for several bird species listed as threatened under the FFG Act. Construction and operation of the track network is not likely to lead to a loss of any important populations.
<ul style="list-style-type: none"> <li>potential loss of a significant area of a listed ecological community; or 	No	There are no threatened ecological communities present within the study area (refer to Section 3.3.3).
<ul style="list-style-type: none"> <li>potential loss of critical habitat; or, 	No	There is no declared critical habitat within the state, including the study area.
<ul style="list-style-type: none"> <li>potential significant effects on habitat values of a wetland supporting migratory bird species. 	No	The site does not support any major wetlands and it is unlikely that the project will interrupt the flight paths of migratory birds to a major wetland.
Potential extensive or major effects on landscape values of regional importance, especially where recognised by a planning scheme overlay or within or adjoining land reserved under the <i>National Parks Act 1975</i> .	Outside scope of current study.	
Potential extensive or major effects on land stability, acid sulphate soils or highly erodible soils over the short term.	Outside scope of current study.	
Potential extensive or major effects on beneficial uses of waterbodies over the long term due to changes in water quality, streamflows or regional groundwater levels.	Unlikely	The project is unlikely to result in long-term changes to the hydrology of the area.
Potential extensive or major effects on social or economic well-being due to indirect or indirect displacement of non-residential land use activities.	Outside scope of current study.	
Potential for extensive displacement of residences or severance of residential access to community resources due to infrastructure development	Outside scope of current study.	

Referral criteria	Referral criteria met?	Comments
Potential significant effects on the amenity of a substantial number of residents due to extensive or major long term changes in visual, noise and traffic conditions	Outside scope of current study.	
Potential exposure of a human community to severe or chronic health or safety hazards over the short or long term, due to emissions to air or water or noise or chemical hazards or associated transport	Outside scope of current study.	
Potential extensive or major effects on Aboriginal cultural heritage	Outside scope of current study. Separate studies have been undertaken regarding Aboriginal cultural heritage.	
Potential extensive or major effects on cultural heritage places listed on the Heritage Register or the Archaeological Inventory under the <i>Heritage Act 1995</i> .	Outside scope of current study. Separate studies have been undertaken regarding cultural heritage places.	

4.2.5 Water Act 1989

The primary purpose of the *Water Act 1989* is to provide a framework for the allocation and management of surface water and groundwater throughout Victoria. It provides a principal mechanism for maintenance of ecosystem functions including those of aquatic ecosystems. Under By-Laws created by the relevant Authority under the Act, the authorities regulate the works within and in the vicinity of waterways.

The proposed development will involve construction or maintenance activities that affect beds and banks of waterways, riparian vegetation or quality or quantity of water in Jackass Gully, Slaty Creek, Wrights Gully, Longs Gully and Creswick Creek.

Development within the study area will require a permit from the North Central Catchment Management Authority. It is recommended that North East CMA is consulted on the status of waterways crossed by the trails. Guidelines and application forms are available from the North Central CMA website:

<http://www.nccma.vic.gov.au/resources/publications/works-waterways-permit-application-october-2019><http://www.nccma.vic.gov.au/resources/publications/works-waterways-permit-application-october-2019>.

4.2.6 Environment Protection Act 1970: State Environmental Protection Policy (Waters) 2018

The Environment Protection Act underpins the SEPP (Waters) which provides a legal framework for the protection and management of Victoria's water environments, including surface waters, estuarine and marine waters and groundwaters.

The project may directly and/or indirectly impact upon Jackass Gully, Slaty Creek, Wrights Gully, Longs Gully, Creswick Creek and associated unnamed tributaries and their aquatic ecosystems. The SEPP requires that aquatic ecosystem values be protected. Environmental quality objectives and indicators are defined to protect beneficial uses (i.e. the uses and values of the water environment) and an attainment program provides guidance on protection of the beneficial uses.

Impacts to surface water quality must not result in changes that exceed background levels and/or the water quality objectives specified for the applicable segment to protect surface water uses and values. Hepburn

Shire needs to ensure that direct and indirect (e.g. runoff) impacts to surface water quality do not exceed the background levels and/or water quality objectives.

Link to further information: <https://www.epa.vic.gov.au/about-us/legislation/water-legislation/water-related-policies>.

5. Victoria's Guidelines for the removal, destruction or lopping of native vegetation

The Guidelines were introduced in December 2017. They set out and describe the application of Victoria's statewide policy in relation to assessing and compensating for the removal of native vegetation in order to achieve the objective of 'no net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation'.

This objective is to be achieved through Victoria's planning system using an assessment approach that relies on strategic planning and the permit and offset system. The key policy for achieving no net loss to biodiversity is the three-step approach of avoid, minimise and offset:

- **Avoid** the removal, destruction or lopping of native vegetation to ensure that the important biodiversity values of native vegetation continue to be delivered into the future.
- **Minimise** impacts resulting from the removal of native vegetation that cannot be avoided.
- Provide an **offset** to compensate for the biodiversity impact resulting from the removal of native vegetation.

The steps that have been taken during the design of the development to ensure that impacts on biodiversity from the removal of native vegetation have been minimised include:

- Ensure that sustainable trail building practices are followed, so that impacts are limited to the direct removal of vegetation, rather than secondary impacts from erosion.
- Minimise trail construction within sensitive areas such as steep slopes and riparian areas.
- Locating temporary site storage and compounds on existing disturbed land to minimise impacts to native vegetation
- Designing the trail network to avoid impacts to large trees.
- Prepare a tree management plan, in consultation with an Arborist, to ensure tree impacts are minimised in the design and construction phases.
- Micrositing the trail with an arborist and botanist to minimise impacts to trees, threatened species and high quality understorey areas.

DELWP has provided biodiversity information tools to assist with determining the assessment pathway associated with the removal of native vegetation and the contribution that native vegetation within the study area makes to Victoria's biodiversity.

All planning permit applications to remove native vegetation are assigned to an assessment pathway determined by the extent and location of proposed native vegetation removal. The assessment pathway will dictate the information to be provided in a planning permit application and the decision guidelines the responsible authority (e.g. Council) and/or DELWP as a referral authority will use to assess the permit application.

The biodiversity information tools have two components:

Site-based information

The site-based information is observable at a particular site. Biosis has collected the requisite site-based information for the assessment against the Guidelines.

Landscape scale information

Landscape scale information requires consideration of information beyond the site. This information is managed by DELWP and can be accessed via the NVIM.

The following section summarises the results of the site-based assessment and the outputs generated by the Native Vegetation Removal Report, which identifies the assessment pathway on which the planning application will be assessed. The full Native Vegetation Removal Report can be viewed in Appendix 6.

5.1 Proposed removal of native vegetation

The extent of native vegetation patches, the location of large trees within patches and any scattered trees were mapped within the study area (Figure 2) and the condition was assessed in relation to standard methods provided by DSE (2004) and pre-determined EVC benchmarks:

<https://www.environment.vic.gov.au/biodiversity/bioregions-and-evc-benchmarks>.

Following consultation with DELWP, the extent of potential native vegetation impacts have been determined as outlined in Table 14.

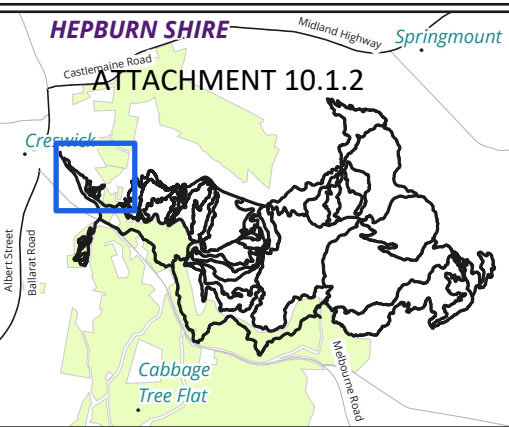
Table 14 Methods for calculating potential native vegetation impacts

Trail type	Native vegetation	Approach to determine extent of impact
New trail	Understorey vegetation	50% loss to 2 m width for the length of the trail.
	Large trees (including large dead trees)	100% impact for area with 10 m radius (0.031 ha per tree).
	Other trees (including dead trees with DBH > 40 cm)	100% impact for area with 15 m radius (0.071 ha per tree).
Existing trail to be upgraded	Understorey vegetation	50% impact to 1.1 m for the length of the trail.

Extensive micro-siting of new trail was undertaken to avoid impacts to trees, particularly large trees, and to avoid impacts to areas of high quality understorey and significant flora species. The micro-siting was undertaken by the Hepburn Shire trail construction manager, an arborist and a botanist working together with a high accuracy differential GPS (sub-metre accuracy). Trees included in the NVR loss calculations were determined by the arborist as 'potentially impacted'. Some of these trees require direct removal for safety reasons. Many of these trees may not be impacted during construction, once excavation is carried out under the guidance of an arborist, and these trees may be removed from the offset specification, in consultation with DELWP.

The proposed removal of native vegetation was assessed in accordance with the detailed micro-sited trail alignment. The development proposes to impact upon 11.867 hectares of native vegetation, which includes 174 canopy trees (including one large canopy tree). Total area of patch vegetation (50% loss) impacted is 7.91 hectares, and the area of impact due to potential canopy tree impacts is 5.47 hectares. Note that the sum of these losses is greater than 11.867 ha due to overlap between trees and the trail. Vegetation proposed for removal is shown in Figure 3.

Spatial data (shapefiles) of proposed vegetation removal were submitted to DELWP's native vegetation support team, who provided a Native Vegetation Removal Report for the project. This is provided in Appendix 6 and summarised in the following sections.



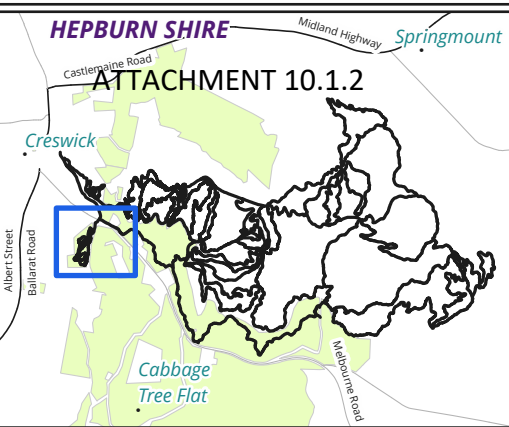
- Legend**
- Study area
 - Trail alignment
 - Tree to be removed
- Understorey vegetation to be removed**
- Ecological Vegetation Class (EVC)**
- 20 Heathy Dry Forest
 - 22 Grassy Dry Forest
 - 23 Herb-rich Foothill Forest

Figure 3.1 Proposed vegetation removal within the study area

0 20 40 60 80 100
 Metres
 Scale: 1:2,500 @ A3
 Coordinate System: GDA2020 MGA Zone 54



Matter: 34416,
 Date: 03 March 2021,
 Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
 Layout: 34416_F3_Veg_removal
 Project: P:\34400s\34416\Mapping\34416_CresswickMTB_FFA.aprx



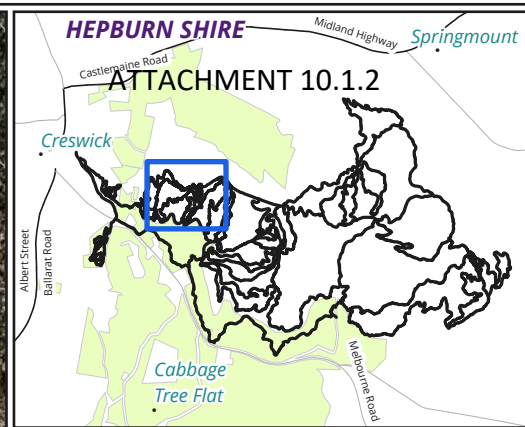
- Legend**
- Study area
 - Trail alignment
 - Tree to be removed
- Understorey vegetation to be removed**
- Ecological Vegetation Class (EVC)**
- 20 Heathy Dry Forest
 - 22 Grassy Dry Forest
 - 23 Herb-rich Foothill Forest

Figure 3.2 Proposed vegetation removal within the study area

0 20 40 60 80 100
 Metres
 Scale: 1:2,500 @ A3
 Coordinate System: GDA2020 MGA Zone 54



Matter: 34416,
 Date: 03 March 2021,
 Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
 Layout: 34416_F3_Veg_removal
 Project: P:\34400s\34416\Mapping\
 34416_CreswickMTB_FFA.aprx



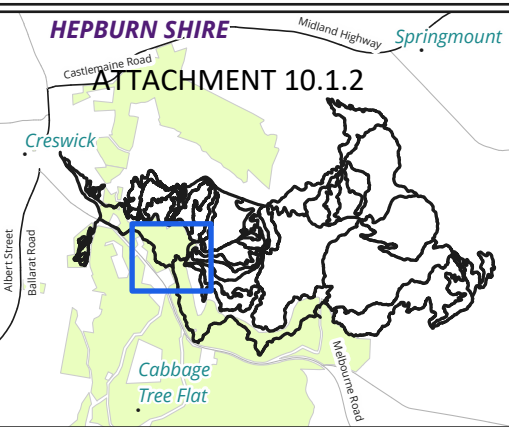
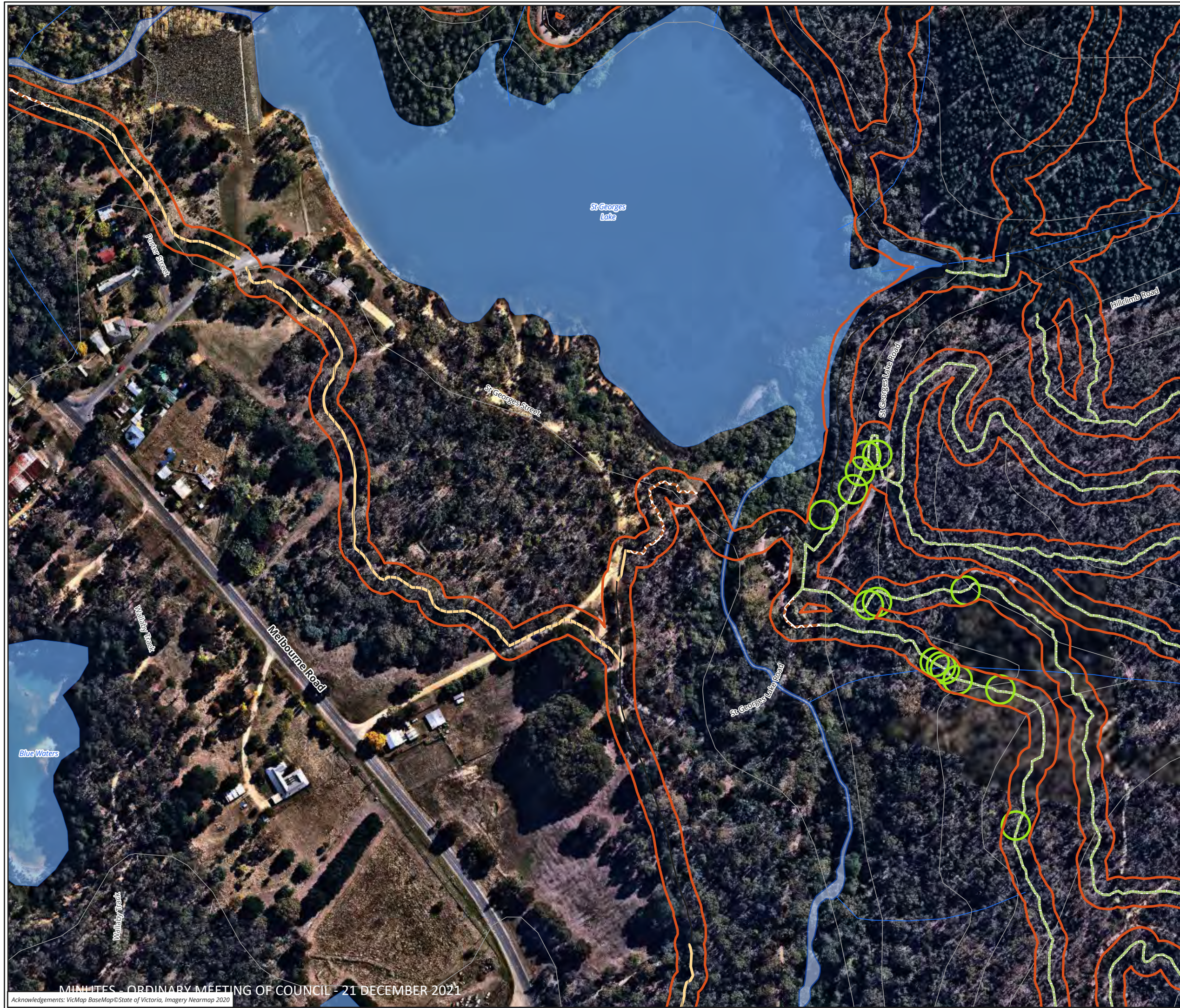
- Legend**
- Study area
 - Trail alignment

Figure 3.3 Proposed vegetation removal within the study area

0 20 40 60 80 100
 Metres
 Scale: 1:2,500 @ A3
 Coordinate System: GDA2020 MGA Zone 54



Matter: 34416,
 Date: 03 March 2021,
 Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
 Layout: 34416_F3_Veg_removal
 Project: P:\34400s\34416\Mapping\
 34416_CreswickMTB_FFA.aprx



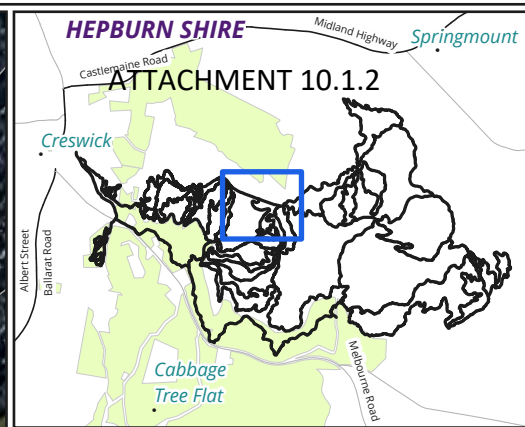
- Legend**
- Study area
 - Trail alignment
 - Tree to be removed
- Understorey vegetation to be removed**
- Ecological Vegetation Class (EVC)**
- 20 Heathy Dry Forest
 - 22 Grassy Dry Forest
 - 23 Herb-rich Foothill Forest

Figure 3.4 Proposed vegetation removal within the study area

0 20 40 60 80 100
Metres
Scale: 1:2,500 @ A3
Coordinate System: GDA2020 MGA Zone 54



Matter: 34416,
Date: 03 March 2021,
Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
Layout: 34416_F3_Veg_removal
Project: P:\34400s\34416\Mapping\
34416_CreswickMTB_FFA.aprx



Legend

- Study area
 - Trail alignment
 - Tree to be removed
- Understorey vegetation to be removed**
- Ecological Vegetation Class (EVC)**
- 20 Heathy Dry Forest
 - 22 Grassy Dry Forest

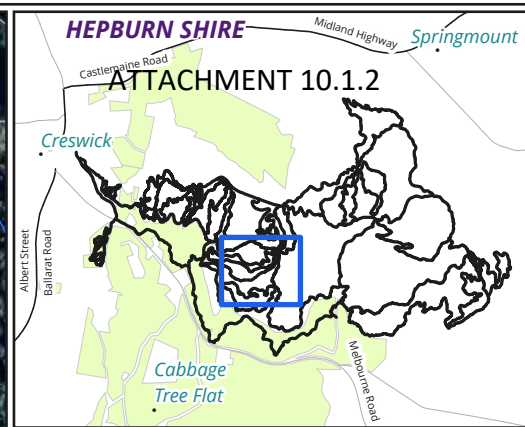


Figure 3.5 Proposed vegetation removal within the study area

0 20 40 60 80 100
 Metres
 Scale: 1:2,500 @ A3
 Coordinate System: GDA2020 MGA Zone 54



Matter: 34416,
 Date: 03 March 2021,
 Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
 Layout: 34416_F3_Veg_removal
 Project: P:\34400s\34416\Mapping\
 34416_CreswickMTB_FFA.aprx



Legend

- Study area
- Trail alignment
- Tree to be removed

Understorey vegetation to be removed

Ecological Vegetation Class (EVC)

- 20 Heathy Dry Forest
- 22 Grassy Dry Forest

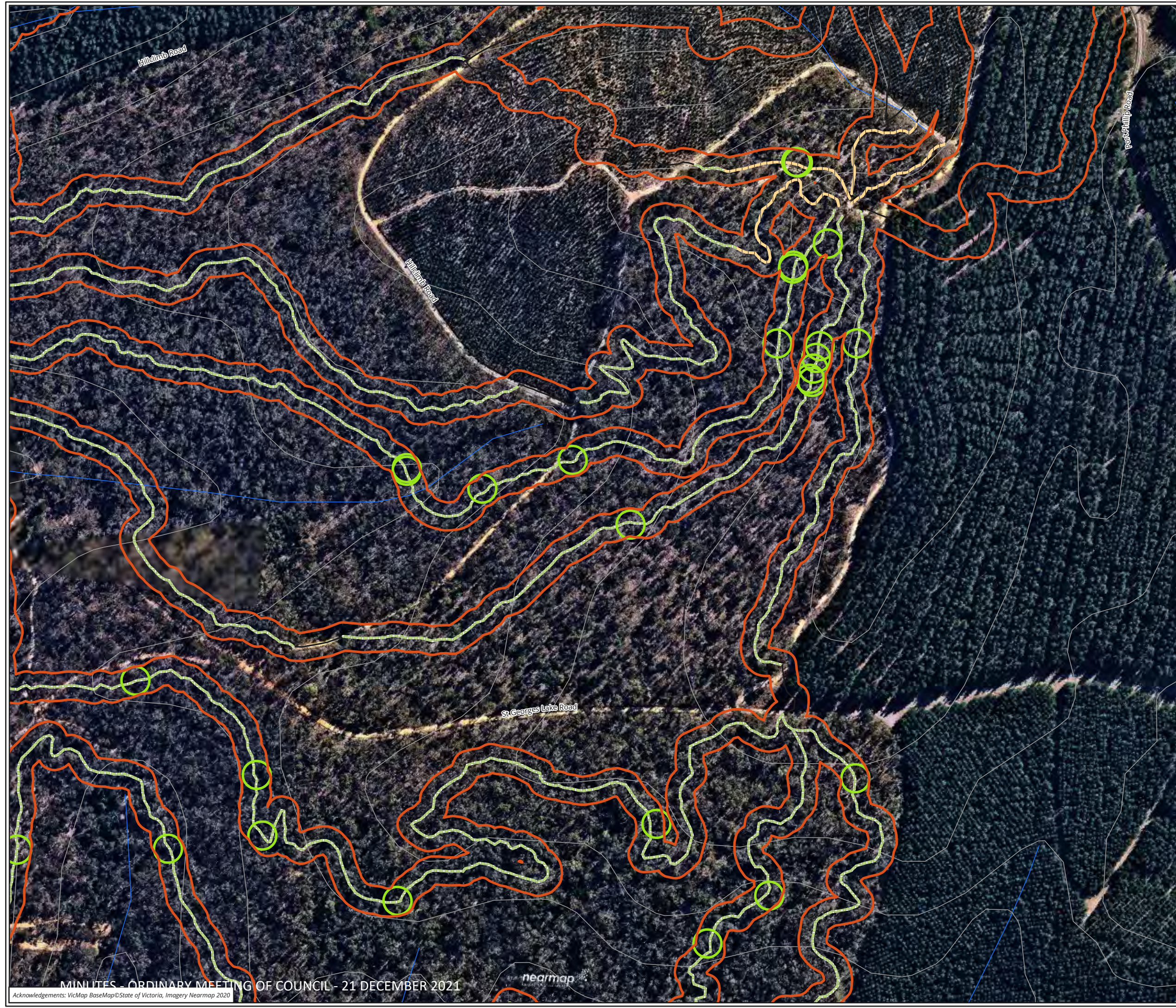
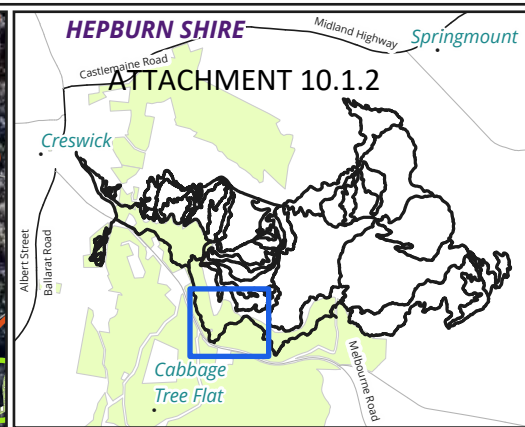


Figure 3.6 Proposed vegetation removal within the study area

0 20 40 60 80 100
 Metres
 Scale: 1:2,500 @ A3
 Coordinate System: GDA2020 MGA Zone 54



Matter: 34416,
 Date: 03 March 2021,
 Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
 Layout: 34416_F3_Veg_removal
 Project: P:\34400s\34416\Mapping\
 34416_CreswickMTB_FFA.aprx



Legend

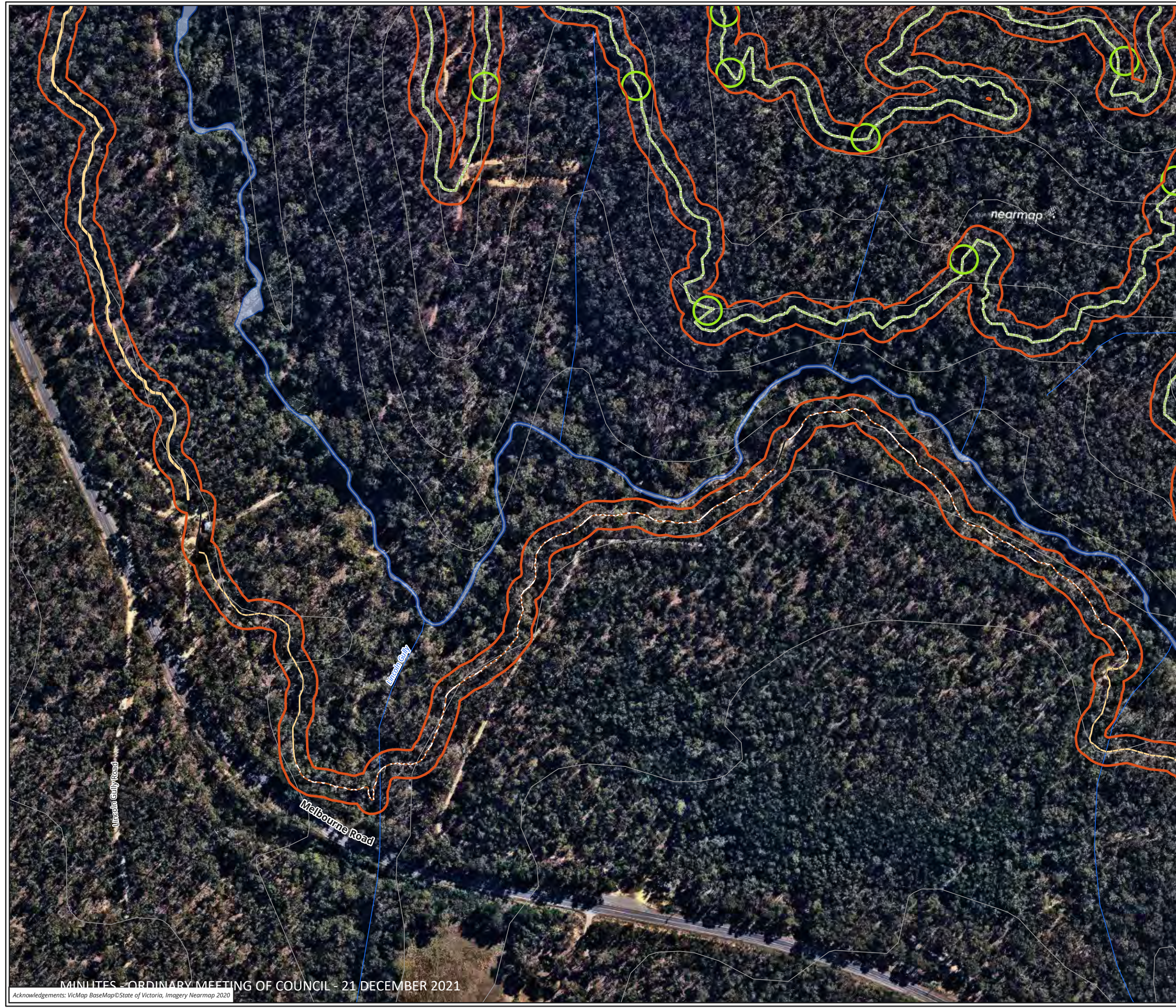
- Study area
 - Trail alignment
 - Tree to be removed
- Understorey vegetation to be removed**
- Ecological Vegetation Class (EVC)**
- 20 Heathy Dry Forest
 - 22 Grassy Dry Forest
 - 23 Herb-rich Foothill Forest

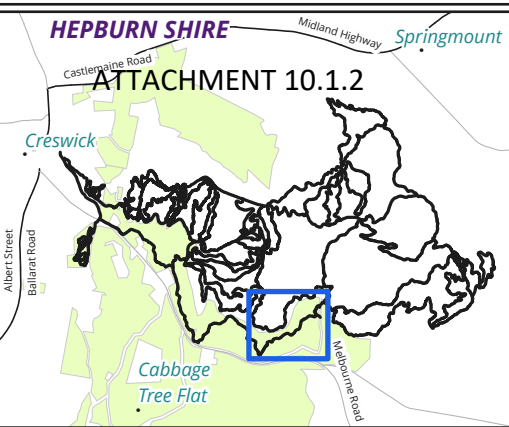
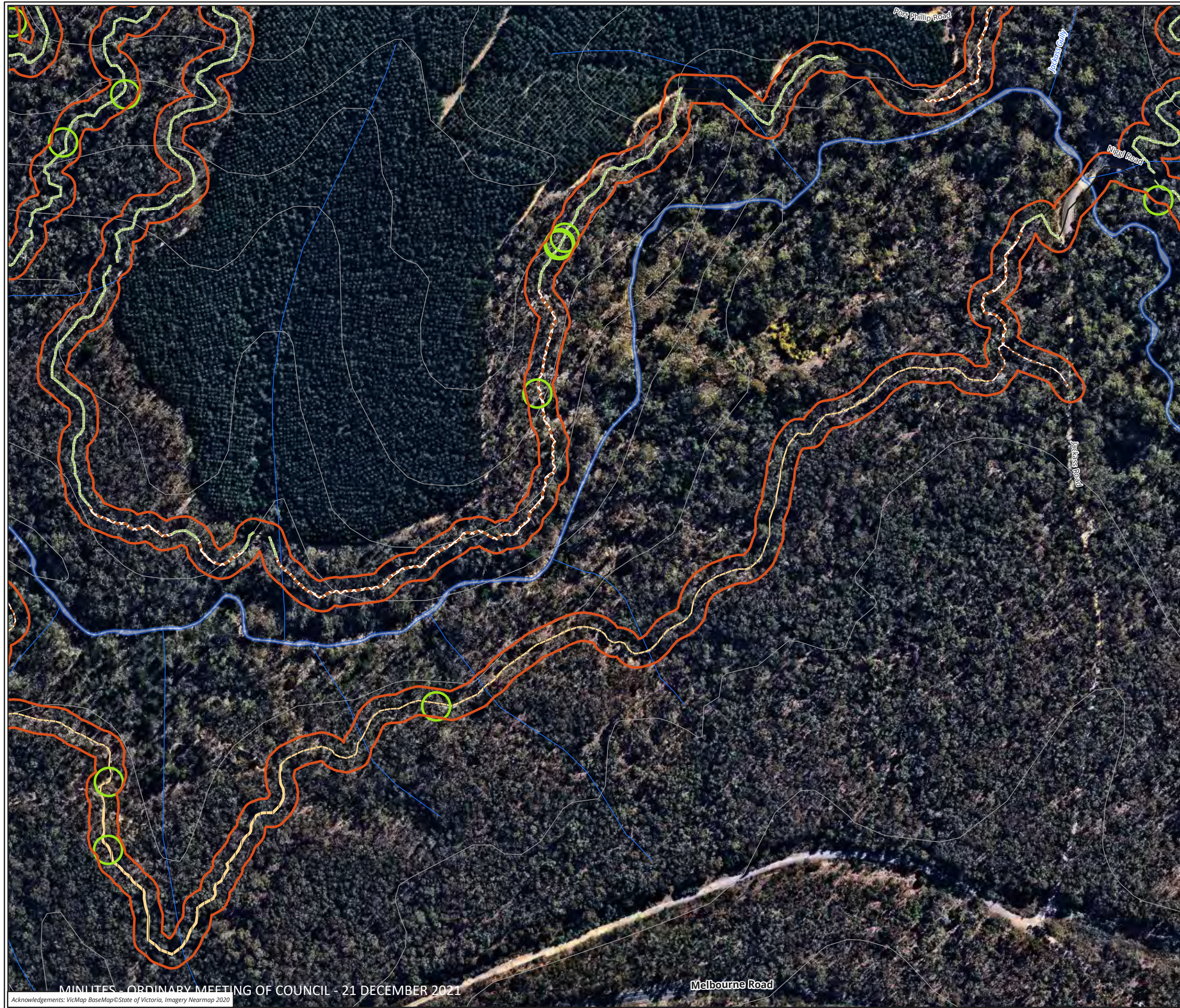
Figure 3.7 Proposed vegetation removal within the study area

0 20 40 60 80 100
 Metres
 Scale: 1:2,500 @ A3
 Coordinate System: GDA2020 MGA Zone 54



Matter: 34416,
 Date: 03 March 2021,
 Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
 Layout: 34416_F3_Veg_removal
 Project: P:\34400s\34416\Mapping\
 34416_CreswickMTB_FFA.aprx





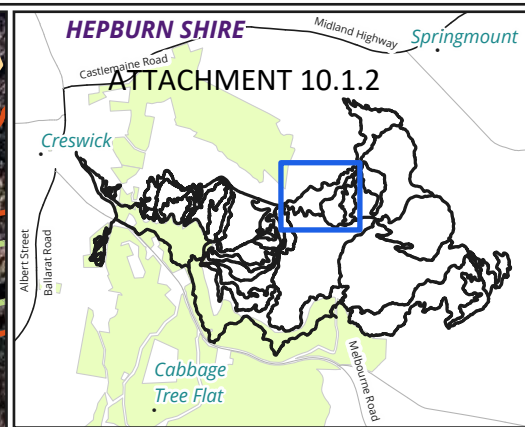
- Legend**
- Study area
 - Trail alignment
 - Tree to be removed
- Understorey vegetation to be removed**
- Ecological Vegetation Class (EVC)**
- 20 Heathy Dry Forest
 - 22 Grassy Dry Forest
 - 23 Herb-rich Foothill Forest

Figure 3.8 Proposed vegetation removal within the study area

0 20 40 60 80 100
 Metres
 Scale: 1:2,500 @ A3
 Coordinate System: GDA2020 MGA Zone 54



Matter: 34416,
 Date: 03 March 2021,
 Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
 Layout: 34416_F3_Veg_removal
 Project: P:\34400s\34416\Mapping\
 34416_CreswickMTB_FFA.aprx



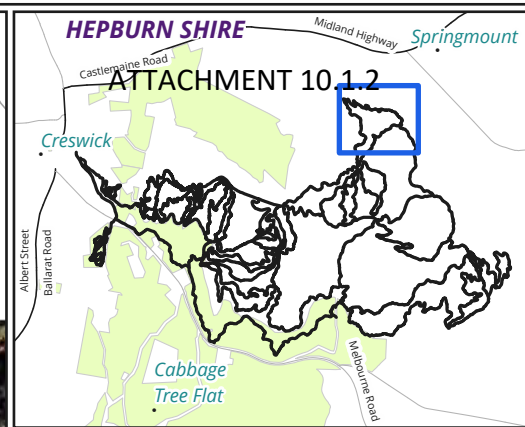
- Legend**
- Study area
 - Trail alignment
 - Tree to be removed
- Understorey vegetation to be removed**
- Ecological Vegetation Class (EVC)**
- 20 Heathy Dry Forest
 - 22 Grassy Dry Forest

Figure 3.9 Proposed vegetation removal within the study area

0 20 40 60 80 100
 Metres
 Scale: 1:2,500 @ A3
 Coordinate System: GDA2020 MGA Zone 54



Matter: 34416,
 Date: 03 March 2021,
 Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
 Layout: 34416_F3_Veg_removal
 Project: P:\34400s\34416\Mapping\
 34416_CreswickMTB_FFA.aprx



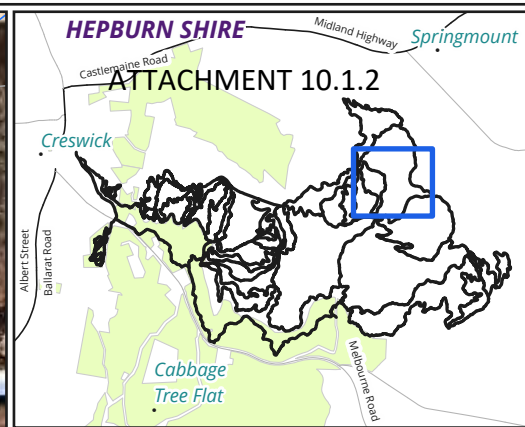
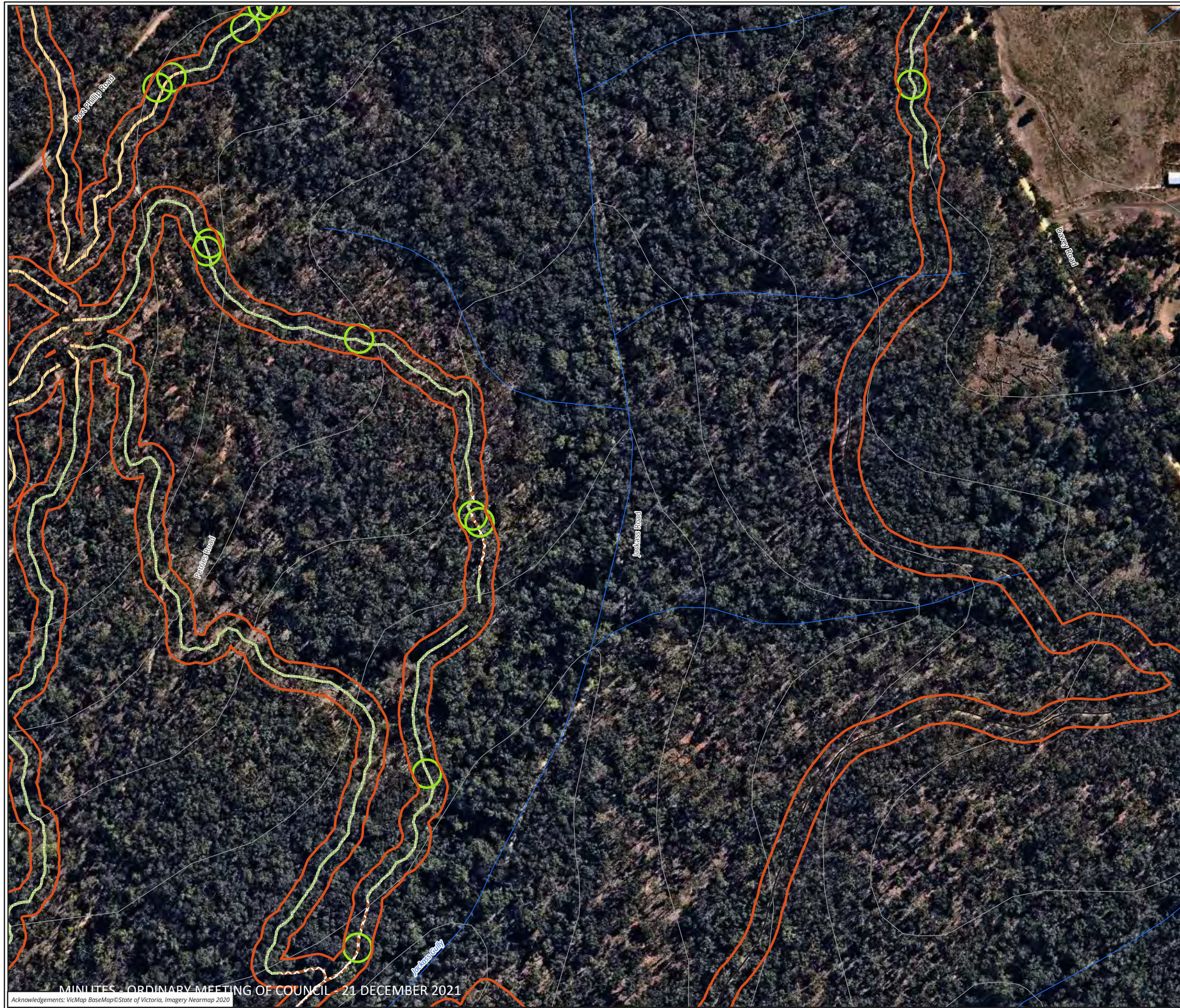
- Legend**
- Study area
 - Trail alignment
 - Tree to be removed
- Understorey vegetation to be removed**
- Ecological Vegetation Class (EVC)**
- 20 Heathy Dry Forest
 - 22 Grassy Dry Forest

Figure 3.10 Proposed vegetation removal within the study area

0 20 40 60 80 100
Metres
Scale: 1:2,500 @ A3
Coordinate System: GDA2020 MGA Zone 54

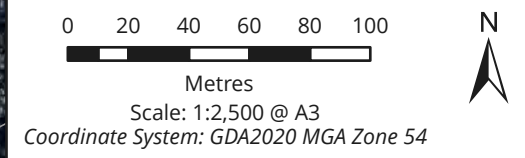


Matter: 34416,
Date: 03 March 2021,
Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
Layout: 34416_F3_Veg_removal
Project: P:\34400s\34416\Mapping\
34416_CreswickMTB_FFA.aprx

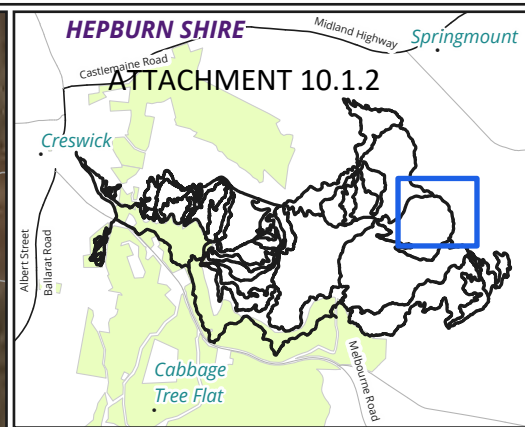


- Legend**
- Study area
 - Trail alignment
 - Tree to be removed
- Understorey vegetation to be removed**
- Ecological Vegetation Class (EVC)**
- 20 Heathy Dry Forest
 - 22 Grassy Dry Forest
 - 23 Herb-rich Foothill Forest

Figure 3.11 Proposed vegetation removal within the study area



Matter: 34416,
Date: 03 March 2021,
Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
Layout: 34416_F3_Veg_removal
Project: P:\34400s\34416\Mapping\
34416_CreswickMTB_FFA.aprx



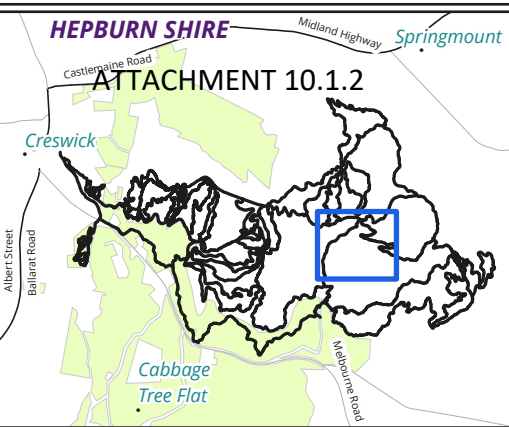
- Legend**
- Study area
 - Trail alignment
 - Tree to be removed
- Understorey vegetation to be removed**
- Ecological Vegetation Class (EVC)**
- 22 Grassy Dry Forest

Figure 3.12 Proposed vegetation removal within the study area

0 20 40 60 80 100
 Metres
 Scale: 1:2,500 @ A3
 Coordinate System: GDA2020 MGA Zone 54



Matter: 34416,
 Date: 03 March 2021,
 Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
 Layout: 34416_F3_Veg_removal
 Project: P:\34400s\34416\Mapping\
 34416_CreswickMTB_FFA.aprx



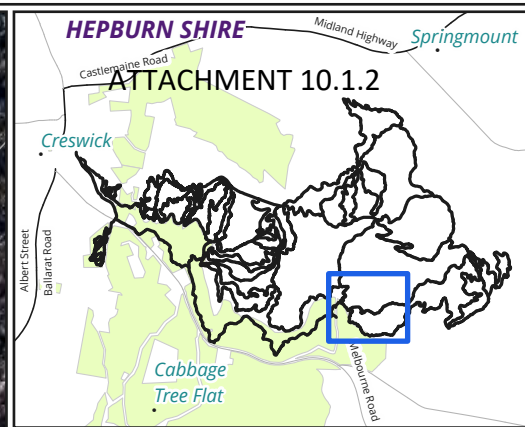
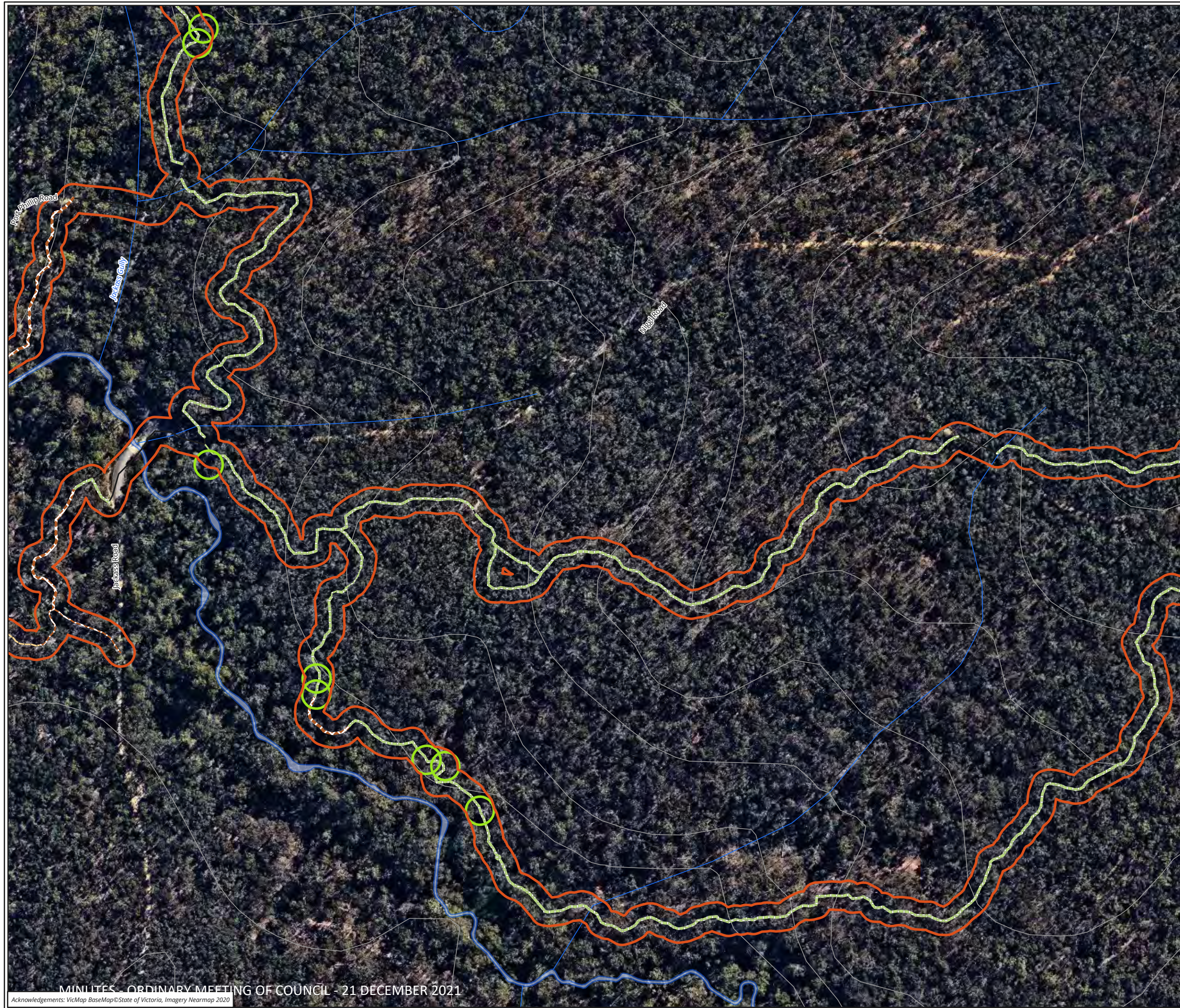
- Legend**
- Study area
 - Trail alignment
 - Tree to be removed
- Understorey vegetation to be removed**
- Ecological Vegetation Class (EVC)**
- 22 Grassy Dry Forest
 - 23 Herb-rich Foothill Forest

Figure 3.13 Proposed vegetation removal within the study area

0 20 40 60 80 100
Metres
Scale: 1:2,500 @ A3
Coordinate System: GDA2020 MGA Zone 54



Matter: 34416,
Date: 03 March 2021,
Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
Layout: 34416_F3_Veg_removal
Project: P:\34400s\34416\Mapping\
34416_CreswickMTB_FFA.aprx



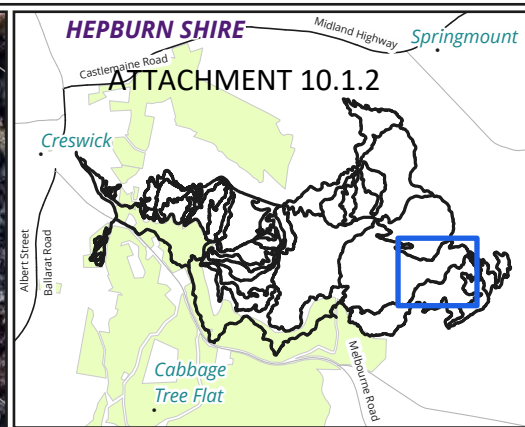
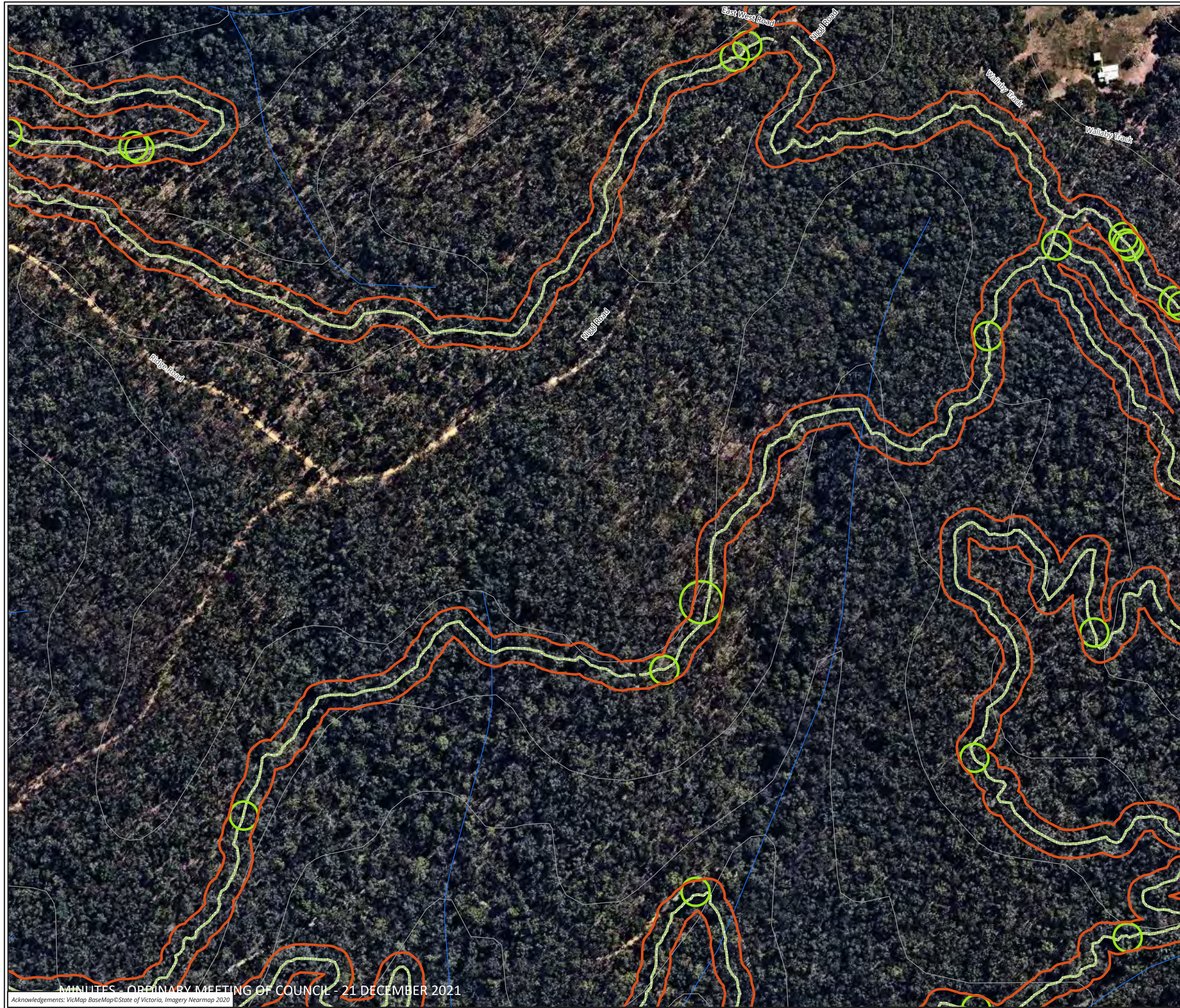
- Legend**
- Study area
 - Trail alignment
 - Tree to be removed
- Understorey vegetation to be removed**
- Ecological Vegetation Class (EVC)**
- 20 Heathy Dry Forest
 - 22 Grassy Dry Forest
 - 23 Herb-rich Foothill Forest

Figure 3.14 Proposed vegetation removal within the study area

0 20 40 60 80 100
 Metres
 Scale: 1:2,500 @ A3
 Coordinate System: GDA2020 MGA Zone 54



Matter: 34416,
 Date: 03 March 2021,
 Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
 Layout: 34416_F3_Veg_removal
 Project: P:\34400s\34416\Mapping\
 34416_CreswickMTB_FFA.aprx



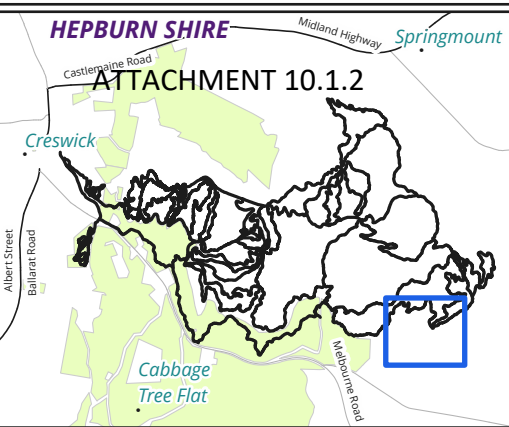
- Legend**
- Study area
 - Trail alignment
 - Tree to be removed
- Understorey vegetation to be removed**
- Ecological Vegetation Class (EVC)**
- 22 Grassy Dry Forest

Figure 3.15 Proposed vegetation removal within the study area

0 20 40 60 80 100
 Metres
 Scale: 1:2,500 @ A3
 Coordinate System: GDA2020 MGA Zone 54



Matter: 34416,
 Date: 03 March 2021,
 Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
 Layout: 34416_F3_Veg_removal
 Project: P:\34400s\34416\Mapping\
 34416_CreswickMTB_FFA.aprx



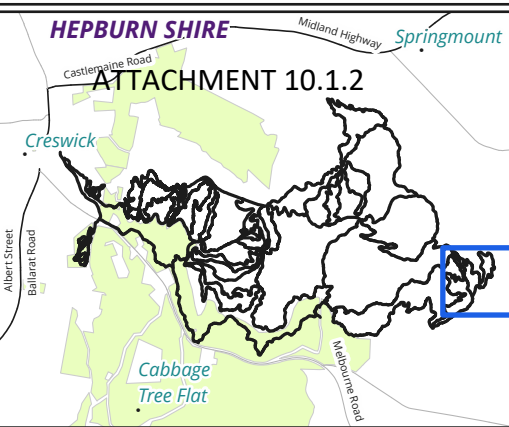
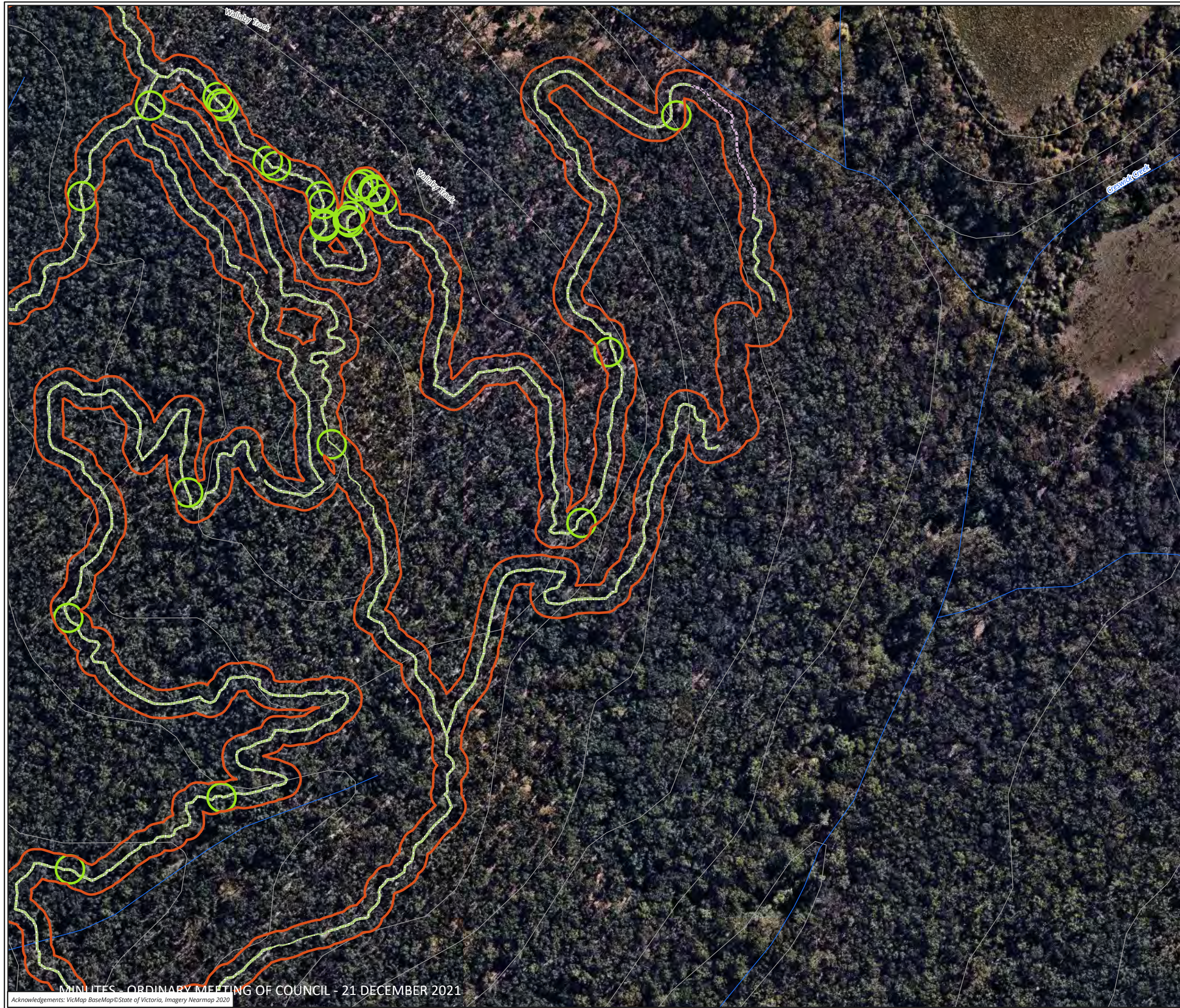
- Legend**
- Study area
 - Trail alignment
 - Tree to be removed
- Understorey vegetation to be removed**
- Ecological Vegetation Class (EVC)**
- 22 Grassy Dry Forest

Figure 3.16 Proposed vegetation removal within the study area

0 20 40 60 80 100
 Metres
 Scale: 1:2,500 @ A3
 Coordinate System: GDA2020 MGA Zone 54



Matter: 34416,
 Date: 03 March 2021,
 Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
 Layout: 34416_F3_Veg_removal
 Project: P:\34400s\34416\Mapping\
 34416_CreswickMTB_FFA.aprx



- Legend**
- Study area
 - Trail alignment
 - Tree to be removed
- Understorey vegetation to be removed**
- Ecological Vegetation Class (EVC)**
- 164 Creekline Herb-rich Woodland
 - 22 Grassy Dry Forest

Figure 3.17 Proposed vegetation removal within the study area

0 20 40 60 80 100
 Metres
 Scale: 1:2,500 @ A3
 Coordinate System: GDA2020 MGA Zone 54



Matter: 34416,
 Date: 03 March 2021,
 Prepared for: MG, Prepared by: SKM, Last edited by: smitchell
 Layout: 34416_F3_Veg_removal
 Project: P:\34400s\34416\Mapping\
 34416_CreswickMTB_FFA.aprx

5.2 Determining the assessment pathway

Applications to remove native vegetation are categorised into one of three assessment pathways: basic, intermediate or detailed. Two factors are used to determine the assessment pathway for a permit application, the **location** and **extent** of the native vegetation proposed to be removed. Location has been divided into three possible categories by DELWP, and has been pre-determined by DELWP for all locations in Victoria. The location of a particular site is determined using the *location map* available in the Native Vegetation Information Management (NVIM) system (<http://nvim.depi.vic.gov.au>).

The extent of native vegetation proposed to be removed determines the assessment pathway by considering the following:

- The total area (hectares) of native vegetation (including any patches and scattered trees) proposed to be removed
- Whether any large trees are proposed to be removed, either as scattered trees or occurring in patches.

It is proposed to > 0.5 hectares and 1 large tree of native vegetation from within location category 1, therefore the application for removal of this native vegetation must meet the requirements of, and be assessed in, the detailed assessment pathway. These requirements are provided in Appendix 6.

5.3 Offset requirements

In order to ensure a gain to Victoria's biodiversity that is equivalent to the loss resulting from the proposed removal of native vegetation, compensatory offsets are required. Losses and gains are measured in general or species habitat scores or units. The offset must also include at least one large tree for every large tree removed.

For a detailed assessment pathway application, the species-general offset test will determine if a general offset, species offset or combination of both is required.

The results of the species-general offset test are provided in Appendix 6 and summarized in Table 14.

Table 15 Summary of DELWP Native Vegetation Removal Report

Attribute	Outcome
Location category	1
Native vegetation removal extent	11.867 ha
Assessment pathway	Detailed
Strategic Biodiversity Value Score (SBS)	0.663
Modelled habitat for rare or threatened species	19 species – as listed in Appendix 6. Percent habitat affected for all species < 0.005%.
Offset type	General
Offset amount	6.858 general habitat units
General offset vicinity	North Central Catchment Management Authority Area or Hepburn Shire Council local government area
Offset site minimum SBS	0.530

Attribute	Outcome
Large tree attributes	1 large tree

5.4 Proposed offset strategy

Hepburn Shire intends to purchase the offset credits from the Victorian native vegetation credit register.

A quote has been obtained to purchase general habitat units that satisfy the offset requirements as specified in Section 5.3.

6. Key ecological values and recommendations

This section identifies the key ecological features of the study area, provides an outline of potential implications of proposed development on those values and includes recommendations to assist Hepburn Shire Council to design a development to minimise impacts on biodiversity.

The primary measure to reduce impacts to biodiversity values within the study area is to avoid and minimise removal of native vegetation and terrestrial and aquatic habitat. It is critical that this be considered during the design phase of the project, when key decisions are made about the location of the trails. The results of this assessment should therefore be incorporated into the project design, by adding the flora and fauna mapping information into the planning maps and investigating options to retain as much of the mapped vegetation/habitats as possible. Priority should be given to highest value areas and retaining larger areas in preference to numerous smaller ones.

A summary of potential implications of development of the study area and recommendations to minimise impacts during the **design phase** of the project is provided in Table 13.

Table 16 Summary of key ecological values, potential implications of developing the study area and recommendations to minimise ecological impacts during the design phase.

Ecological feature (Figure 2)	Implications of development	Recommendations
Native vegetation	<p>The development proposes to impact upon 11.867 hectares of native vegetation, which includes 174 canopy trees (including one large canopy tree).</p> <p>The application will be assessed on the detailed assessment pathway.</p> <p>Proportional impacts to native vegetation above the species offset threshold for one species: Creeping Grevillea</p>	<p>Avoid and minimise removal of native vegetation, in accordance with the Guidelines. Refer to Section 5.</p> <p>Retained vegetation should be fenced off and treated as no-go zones.</p> <p>Identify and implement appropriate offsets for vegetation losses as outlined in Section 5.3.</p>
Significant species and ecological communities	<p>Removal of known/potential habitat for 13 significant species (as identified in Table 3).</p> <p>No threatened EPBC Act or FFG Act communities were recorded within the study area during the field assessment.</p>	<p>Avoid and minimise removal of permanent waterways to avoid potential impacts to Growling Grass Frog and Brown Toadlet.</p> <p>Further surveys for Growling Grass Frog may be required if trails will impact permanent waterways.</p>
Aquatic habitat features	<p>Potential loss of, or alterations to, riparian and in-stream habitat within and in the vicinity of the study area (e.g. downstream) via: direct removal, notable hydrological changes, deterioration in water quality (including pollution event) and, sedimentation.</p>	<p>Avoid/minimise removal of terrestrial and/or aquatic habitat by designing to avoid or minimise instream works.</p> <p>Protect key values (including waterways) by retaining features and including appropriate buffers into design.</p>

Ecological feature (Figure 2)	Implications of development	Recommendations
Habitat connectivity	Removal of understorey vegetation / habitat that forms part of a notable habitat linkage from Creswick Regional Park, Nerrina, Woookarung Regional Park, Union Jack Reserve and Buninyong.	Retain fauna habitat linkages within the development and the local area. If the removal of trees is avoided or kept to a minimum it is unlikely that the trail construction would impact upon this large wildlife corridor.

Construction and post-construction management

Specific detail relating to preventing impacts to retained native vegetation and aquatic and terrestrial habitat should be addressed in a site-specific Construction Environmental Management Plan. This will include issues relating to contractors such as environmental inductions, installation of temporary fencing/signage, drainage and sediment control.

6.1 Recommendations

The results of this assessment should be incorporated into the project design, by adding the flora and fauna mapping information into the planning maps and investigating options to retain as much of the mapped vegetation/habitats as possible.

Key avoidance and minimisation strategies and mitigation measures to reduce the ecological impacts that the project will have within the study area include:

- Minimise track construction within riparian areas and use structures where required for crossing aquatic features.
- Use suitable existing tracks in the network where possible.
- Avoid removing canopy trees, especially large hollow-bearing trees.
- Restrict disturbance to track margins in areas where and existing trail is present.
- Ensuring that all construction activities stay within the designated construction footprint.
- Implementing weed and pathogen hygiene protocols during construction and operation of trails. This includes vehicle, equipment and footwear washdown stations for Cinnamon fungus and weeds during construction of the trails. Also ensuring protocols are in place for the wash down of bikes and footwear to prevent the spread of Cinnamon fungus when the trails are operational.
- Minimise use of foreign material in the trail construction, and use of imported materials is required, ensure that they are free of weeds and pathogens.
- Ensuring all plant, equipment and construction vehicles should be washed down prior to use and after use to prevent the spread of weeds and pathogens.
- Creation of a Construction Environment Management Plan which includes the construction footprint, weed/pathogen hygiene, sediment control and vegetation removal protocol.
- Minimising the deposition of sediment into waterways, drainage lines and creeks as far as possible.
- Avoid working in creeks when they are flowing and instead undertake works in these areas in summer/autumn months when they are dry.

- Implement appropriate erosion and sediment controls for works near creeks and drainage lines to protect against any impacts to water quality.

References

- Barea L.P & Watson D.M 2007. 'Temporal variation in food resources determines onset of breeding in an Australian mistletoe species', *Emu*, 107: 203–209.
- Biosis 2019. *Preliminary biodiversity constraints assessment - Creswick Mountain Bike Trail*, Report prepared for Hepburn Shire. Authors: Gibson, M. & Howard, J, Biosis Pty Ltd, Ballarat. Project no. 27822.
- Bötsch Y, Tablado Z, Scherl D, Kéry M, Graf RF, & Jenni L 2018. 'Effect of Recreational Trails on Forest Birds: Human Presence Matters', *Frontiers in Ecology and Evolution*, 6, accessed 22 May 2020, <https://www.frontiersin.org/articles/10.3389/fevo.2018.00175/full>.
- Carter O 2010. National Recovery Plan for the Matted Flax-lily *Dianella amoena*, Victorian Government Department of Sustainability and Environment. Melbourne, Victoria.
- CoA 2013. Matters of National Environmental Significance: Significant impact guidelines 1.1. Environment Protection and Biodiversity Conservation Act 1999.
- DELWP 2017. *Guidelines for the removal, destruction or lopping of native vegetation*. Victorian Government Department of Land, Water and Planning, Melbourne (December 2017).
- DEPI 2013. *Permitted clearing of native vegetation - Biodiversity assessment guidelines*. Victorian Government Department of Environment and Primary Industries, Melbourne (September 2013).
- DEPI 2014. *Advisory List of Rare or Threatened Plants in Victoria – 2014*. Victorian Government Department of Environment & Primary Industries, East Melbourne.
- DEWHA 2009. *Significant impact guidelines for the vulnerable Growling Grass Frog (Litoria raniformis). Nationally threatened species and ecological communities EPBC Act policy statement 3.14*, Australian Government Department of the Environment, Water, Heritage, and the Arts. Canberra, Australian Capital Territory.
- DoE 2020a. *Dianella amoena* in Species Profile and Threats (SPRAT) Database, https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=64886.
- DoE 2020b. *Litoria raniformis* in Species Profile and Threats (SPRAT) Database, http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1828.
- DSE 2004a. Action Statement Flora and Fauna Guarantee Act 1988: Powerful Owl *Ninox strenua* No. 92.
- DSE 2004b. *Native Vegetation: Sustaining a living landscape. Vegetation Quality Assessment Manual – Guidelines for applying the Habitat hectares scoring method. Version 1.3*. Victorian Government Department of Sustainability & Environment, Melbourne.
- DSE 2009. *Advisory List of Threatened Invertebrate Fauna in Victoria - 2009*. Department of Sustainability and Environment, East Melbourne, Victoria.
- DSE 2010. Victorian Biodiversity Atlas 'VBA_FAUNA25, FAUNA100 & FAUNARestricted, FLORA25, FLORA100 & FLORARestricted' August 2010 © The State of Victoria. Victorian Government Department of Sustainability & Environment, Melbourne.

DSE 2013. *Advisory List of Threatened Vertebrate Fauna in Victoria – 2013*. Victorian Government Department of Environment & Primary Industries, Melbourne.

Eby, P 1998. 'An analysis of diet specialization in frugivore *Pteropus poliocephalus* in Australian subtropical rainforest.', *Australian Journal of Ecology*, 23: 443–456.

Higgins P 1999. *Handbook of Australian, New Zealand and Antarctic Birds. Volume 4, Parrots to Dollarbird*, Oxford University Press.

Higgins P.J, Peter J.M, & Steele W.K 2001. *Handbook of Australian, New Zealand and Antarctic Birds. Volume 5: Tyrant-flycatchers to Chats*, Oxford University Press, Melbourne.

Miller, S, Knight, R, & Miller, C 1998. 'Influence of recreational trails on breeding bird communities', *Ecological Applications*, 8, 1: 162–169.

Tidemann, C.R 1998. *Grey-headed Flying-fox, Pteropus poliocephalus, Temminck, 1824*. In: Strahan, R., ed. *The Mammals of Australia*, New Holland Publishers Pty Ltd, Frenchs Forest.

Appendices

Appendix 1 Survey methods

A1.1 Flora survey methods

Flora survey was conducted under the terms of a research permit/management authorisation permit to take/keep protected flora and protected fish issued by DELWP under the *Wildlife Act 1975*, *Flora and Fauna Guarantee Act 1988*, *National Parks Act 1975* and *Crown Land (Reserves) Act 1978* (Permit Number 10008711, expires 30 April 2021).

Standard practices were used to collect data relating to flora as outlined below. Locations of flora sampling sites are provided in the figures.

Vascular Flora

Quadrats

Vascular plant species were recorded in a series of rectangular quadrats of 20 m X 50 m dimension. All vascular plant species (ferns, conifers and flowering plants) observed in or overhanging the quadrat were recorded. A total of 28 quadrats were sampled within the study area. A vegetation quality assessment was undertaken at each of the 28 quadrats and these scores were extrapolated out for areas of similar habitat within the study area.

Information on vegetation structure, vegetation condition, site aspect and topography and any other information considered to be informative for the description of the vegetation was recorded.

Incidental records

Incidental records of additional species not found in quadrats were recorded in a defined area species list. The locations of any state or nationally listed rare or threatened species were recorded by hand held GPS.

Appendix 2 Flora

Notes to tables:

<p>EPBC Act: CR - Critically Endangered EN - Endangered VU - Vulnerable</p> <p>PMST – Protected Matters Search Tool</p>	<p>DEPI 2014a: e - endangered v - vulnerable r - rare k - poorly known</p>
<p>FFG Act: L - listed as threatened under FFG Act P - protected under the FFG Act (public land only)</p>	<p>Noxious weed status: SP - State prohibited species RP - Regionally prohibited species RC - Regionally controlled species R - Restricted species</p> <p># - Native species outside natural range</p>

A2.1 Flora species recorded from the study area

Table A2.1 Flora species recorded from the study area

* Unless otherwise noted, the source for records is the field surveys conducted for the trail project.

FNCB = Field Naturalists Club of Ballarat.

iNaturalist = iNaturalist records downloaded 4/12/2020.

Status	Scientific Name	Common Name	*Record Source
Indigenous species			
P	<i>Acacia aculeatissima</i>	Thin-leaf Wattle	
	<i>Acacia dealbata</i>	Silver Wattle	
P	<i>Acacia genistifolia</i>	Spreading Wattle	iNaturalist
P	<i>Acacia gunnii</i>	Ploughshare Wattle	iNaturalist
P	<i>Acacia mearnsii</i>	Black Wattle	
	<i>Acacia melanoxylon</i>	Blackwood	
P	<i>Acacia stricta</i>	Hop Wattle	
P	<i>Acacia verticillata</i>	Prickly Moses	
	<i>Acaena novae-zelandiae</i>	Bidgee-widgee	
P	<i>Acrotriche serrulata</i>	Honey-pots	
P	<i>Adiantum aethiopicum</i>	Common Maidenhair	iNaturalist
	<i>Amyema preissii</i>	Wire-leaf Mistletoe	
	<i>Anthosachne scabra s.l.</i>	Common Wheat-grass	
	<i>Arthropodium fimbriatum</i>	Nodding Chocolate-lily	
	<i>Arthropodium milleflorum s.l.</i>	Pale Vanilla-lily	
	<i>Arthropodium</i> spp.	Vanilla Lily	

Status	Scientific Name	Common Name	*Record Source
	<i>Arthropodium strictum s.l.</i>	Chocolate Lily	
	<i>Arthropodium strictum s.s.</i>	Chocolate Lily	
	<i>Asperula conferta</i>	Common Woodruff	
P	<i>Asplenium flabellifolium</i>	Necklace Fern	iNaturalist
P	<i>Astroloma humifusum</i>	Cranberry Heath	
	<i>Austrostipa</i> spp.	Spear Grass	
	<i>Bankisa marginata</i>	Banksia	FNCB, iNaturalist
	<i>Billardiera mutabilis</i>	Common Apple-berry	
	<i>Bossiaea buxifolia</i>	Matted Bossiaea	
	<i>Bossiaea decumbens</i>	Trailing Bossiaea	iNaturalist
	<i>Bossiaea prostrata</i>	Creeping Bossiaea	
	<i>Bossiaea</i> spp.	Bossiaea	
P	<i>Brachyscome diversifolia</i>	Tall Daisy	iNaturalist
P	<i>Brachyscome perpusilla</i>	Rayless Daisy	iNaturalist
P	<i>Brunonia australis</i>	Blue Pincushion	
	<i>Burchardia umbellata</i>	Milkmaids	
	<i>Bursaria spinosa</i>	Sweet Bursaria	
P	<i>Caladenia carnea s.s.</i>	Pink Fingers	
P	<i>Caladenia transitoria</i>	Eastern Bronzewood Orchid	iNaturalist
P	<i>Caleana major</i>	Large Duck-orchid	iNaturalist
	<i>Carex appressa</i>	Tall Sedge	
P	<i>Cassinia aculeata</i> subsp. <i>aculeata</i>	Common Cassinia	
	<i>Cassytha glabella</i>	Slender Dodder-laurel	
	<i>Cassytha</i> spp.	Dodder Laurel	
P	<i>Chiloglottis valida</i>	Common Bird-orchid	
P	<i>Chrysocephalum semipapposum</i>	Clustered Everlasting	
	<i>Comesperma volubile</i>	Love Creeper	
	<i>Coprosma quadrifida</i>	Prickly Currant-bush	
P	<i>Coronidium scorpioides s.s.</i>	Button Everlasting	
P	<i>Corybas</i> spp.	Helmet Orchid	
P	<i>Craspedia variabilis</i>	Variable Billy-buttons	iNaturalist
P	<i>Cymbonotus preissianus</i>	Austral Bear's-ear	
	<i>Daucus glochidiatus</i>	Australian Carrot	
	<i>Daviesia latifolia</i>	Hop Bitter-pea	
	<i>Daviesia leptophylla</i>	Narrow-leaf Bitter-pea	
	<i>Dianella revoluta s.l.</i>	Black-anther Flax-lily	
	<i>Dichelachne crinita</i>	Long-hair Plume-grass	
	<i>Dichelachne</i> spp.	Plume Grass	
	<i>Dichondra repens</i>	Kidney-weed	
	<i>Dillwynia cinerascens s.l.</i>	Grey Parrot-pea	
	<i>Dillwynia glaberrima</i>	Smooth Parrot-pea	

Status	Scientific Name	Common Name	*Record Source
	<i>Dillwynia ramosissima</i>	Bushy Parrot-pea	iNaturalist
	<i>Dillwynia sericea</i>	Showy Parrot-pea	
	<i>Dillwynia</i> spp.	Parrot Pea	
P	<i>Dipodium</i> spp.	Hyacinth Orchid	FNCB
P	<i>Diuris pardina</i>	Leopard Orchid	iNaturalist
P	<i>Diuris sulphurea</i>	Tiger Orchid	iNaturalist
	<i>Drosera aberrans</i>	Scented Sundew	
	<i>Drosera auriculata</i>	Tall Sundew	
	<i>Echinopogon ovatus</i>	Common Hedgehog-grass	
P	<i>Epacris impressa</i>	Common Heath	
P	<i>Eriochilus cucullatus</i> s.l.	Parson's Bands	
	<i>Eryngium vesiculosum</i>	Prickfoot	iNaturalist
	<i>Eucalyptus aromaphloia</i>	Scentbark	
	<i>Eucalyptus dives</i>	Broad-leaf Peppermint	
	<i>Eucalyptus obliqua</i>	Messmate Stringybark	
	<i>Eucalyptus ovata</i>	Swamp Gum	
	<i>Eucalyptus radiata</i> s.l.	Narrow-leaf Peppermint	
	<i>Eucalyptus rubida</i>	Candlebark	
	<i>Eucalyptus viminalis</i>	Manna Gum	
P	<i>Euchiton involucratus</i> s.l.	Common Cudweed	
P	<i>Euchiton sphaericus</i>	Annual Cudweed	
	<i>Exocarpos cupressiformis</i>	Cherry Ballart	
	<i>Gahnia radula</i>	Thatch Saw-sedge	
	<i>Geranium solanderi</i> s.l.	Austral Crane's-bill	
	<i>Geranium</i> spp.	Crane's Bill	
P	<i>Glossodia major</i>	Wax-lip Orchid	
P	<i>Gompholobium huegelii</i>	Common Wedge-pea	
	<i>Gonocarpus elatus</i>	Tall Raspwort	
	<i>Gonocarpus tetragynus</i>	Common Raspwort	
	<i>Goodenia lanata</i>	Trailing Goodenia	
	<i>Goodenia ovata</i>	Hop Goodenia	
	<i>Hakea decurrens</i>	Bushy Needlewood	
P	<i>Hardenbergia violacea</i>	Purple Coral-pea	
	<i>Hovea heterophylla</i>	Common Hovea	
	<i>Hydrocotyle laxiflora</i>	Stinking Pennywort	
	<i>Hydrocotyle</i> spp.	Pennywort	
	<i>Hypericum gramineum</i> spp. agg.	Small St John's Wort	
	<i>Indigofera australis</i>	Austral Indigo	
	<i>Juncus articulatus</i> subsp. <i>articulatus</i>	Jointed Rush	iNaturalist
	<i>Juncus holoschoenus</i>	Joint-leaf Rush	iNaturalist
	<i>Juncus pallidus</i>	Pale Rush	

Status	Scientific Name	Common Name	*Record Source
	<i>Juncus</i> spp.	Rush	
	<i>Kennedia prostrata</i>	Running Postman	
	<i>Kunzea</i> spp.	Kunzea	
P	<i>Lagenophora stipitata</i>	Common Bottle-daisy	
	<i>Lepidosperma filiforme</i>	Common Rapier-sedge	
	<i>Lepidosperma laterale</i>	Variable Sword-sedge	
P	<i>Leptorhynchos</i> spp.	Buttons	
P	<i>Leptorhynchos squamatus</i>	Scaly Buttons	
	<i>Leptospermum myrsinoides</i>	Heath Tea-tree	
	<i>Leptospermum</i> spp.	Tea Tree	
P	<i>Leucopogon virgatus</i> var. <i>virgatus</i>	Common Beard-heath	
	<i>Lobelia gibbosa</i>	Tall Lobelia	FNCB, iNaturalist
	<i>Lomandra filiformis</i>	Wattle Mat-rush	
	<i>Lomandra longifolia</i>	Spiny-headed Mat-rush	
	<i>Lomandra nana</i>	Dwarf Mat-rush	
	<i>Luzula meridionalis</i>	Common Woodrush	
	<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Grass	
P	<i>Microseris walteri</i>	Yam Daisy	
P	<i>Olearia erubescens</i>	Moth Daisy-bush	
P	<i>Olearia myrsinoides</i>	Silky Daisy-bush	
	<i>Opercularia ovata</i>	Broad-leaf Stinkweed	
	<i>Opercularia varia</i>	Variable Stinkweed	
	<i>Oxalis perennans</i>	Grassland Wood-sorrel	
P	<i>Ozothamnus ferrugineus</i>	Tree Everlasting	iNaturalist
P	<i>Ozothamnus obcordatus</i>	Grey Everlasting	
	<i>Pauridia glabella</i> var. <i>glabella</i>	Tiny Star	
	<i>Pelargonium rodneyanum</i>	Magenta Stork's-bill	
	<i>Phragmites australis</i>	Common Reed	
	<i>Pimelea humilis</i>	Common Rice-flower	
	<i>Pimelea linifolia</i>	Slender Rice-flower	
	<i>Plantago varia</i>	Variable Plantain	
	<i>Platylobium formosum</i> spp. agg.	Handsome Flat-pea	
	<i>Poa labillardierei</i>	Common Tussock-grass	
	<i>Poa sieberiana</i>	Grey Tussock-grass	
P	<i>Podolepis decipiens</i>	Common Podolepis	iNaturalist
P	<i>Podolepis jaceoides</i> s.s.	Showy Podolepis	iNaturalist
	<i>Podolobium procumbens</i>	Trailing Podolobium	
	<i>Pomaderris</i> spp.	Pomaderris	
	<i>Poranthera microphylla</i> s.l.	Small Poranthera	
P	<i>Prasophyllum</i> spp.	Leek Orchid	
	<i>Pteridium esculentum</i>	Austral Bracken	

Status	Scientific Name	Common Name	*Record Source
P	<i>Pterostylis melagramma</i>	Tall Greenhood	
P	<i>Pterostylis nutans</i>	Nodding Greenhood	
P	<i>Pterostylis parviflora s.l.</i>	Tiny Greenhood	
P	<i>Pterostylis</i> spp.	Greenhood	
	<i>Pultenaea daphnoides</i>	Large-leaf Bitter-pea	
	<i>Pultenaea gunnii</i>	Golden Bush-pea	
	<i>Ranunculus</i> spp.	Buttercup	
	<i>Ranunculus repens</i>	Creeping Buttercup	iNaturalist
	<i>Rytidosperma caespitosum</i>	Common Wallaby-grass	
	<i>Rytidosperma pallidum</i>	Silvertop Wallaby-grass	
	<i>Rytidosperma</i> spp.	Wallaby Grass	
P	<i>Senecio glomeratus</i>	Annual Fireweed	
P	<i>Senecio linearifolius</i>	Fireweed Groundsel	
P	<i>Senecio odoratus</i>	Scented Groundsel	
P	<i>Senecio phelleus</i>	Stony Fireweed	
P	<i>Senecio quadridentatus</i>	Cotton Fireweed	
P	<i>Senecio</i> spp.	Groundsel	
	<i>Solanum laciniatum</i>	Large Kangaroo Apple	
	<i>Stackhousia monogyna s.s.</i>	Creamy Candles	
	<i>Stellaria pungens</i>	Prickly Starwort	
P	<i>Stylidium armeria</i>	Common Triggerplant	
	<i>Tetrarrhena juncea</i>	Forest Wire-grass	
	<i>Tetradthea ciliata</i>	Pink-bells	
P	<i>Thelymitra</i> spp.	Sun Orchid	
P	<i>Thelymitra ixiooides s.s.</i>	Spotted Sun-orchid	iNaturalist
	<i>Themeda triandra</i>	Kangaroo Grass	
P	<i>Thysanotus patersonii</i>	Twining Fringe-lily	
	<i>Veronica calycina</i>	Hairy Speedwell	
	<i>Veronica gracilis</i>	Slender Speedwell	
	<i>Veronica plebeia</i>	Trailing Speedwell	
	<i>Viola betonicifolia</i>	Showy Violet	
	<i>Viola hederacea sensu Entwisle (1996)</i>	Ivy-leaf Violet	
	<i>Wahlenbergia</i> spp.	Bluebell	
	<i>Wahlenbergia stricta</i> subsp. <i>stricta</i>	Tall Bluebell	iNaturalist
	<i>Wurmbea dioica</i>	Common Early Nancy	
P	<i>Xanthorrhoea minor</i> subsp. <i>lutea</i>	Small Grass-tree	
P	<i>Xerochrysum bracteatum</i>	Golden Everlasting	
Introduced species			
	<i>Acacia baileyana</i>	Cootamundra Wattle	
	<i>Acacia howittii</i>	Sticky Wattle	
	<i>Acetosella vulgaris</i>	Sheep Sorrel	

Status	Scientific Name	Common Name	*Record Source
	<i>Agrostis capillaris</i>	Brown-top Bent	
	<i>Aira</i> spp.	Hair Grass	
	<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	
	<i>Arbutus unedo</i>	Irish Strawberry Tree	
	<i>Arctotheca calendula</i>	Cape Weed	
	<i>Briza maxima</i>	Large Quaking-grass	
	<i>Briza minor</i>	Lesser Quaking-grass	
	<i>Bromus diandrus</i>	Great Brome	
	<i>Cassinia sifton</i>	Sifton Bush	
	<i>Centaureum erythraea</i>	Common Centaury	
	<i>Centaureum</i> spp.	Centaury	
RR	<i>Cirsium vulgare</i>	Spear Thistle	
RR	<i>Conium maculatum</i>	Hemlock	
	<i>Corymbia maculata</i>	Spotted Gum	
RR	<i>Crataegus monogyna</i>	Hawthorn	
	<i>Cupressus</i> spp.	Cypress	
RR	<i>Cytisus scoparius</i>	English Broom	
	<i>Dactylis glomerata</i>	Cocksfoot	
	<i>Ehrharta erecta</i> var. <i>erecta</i>	Panic Veldt-grass	
	<i>Erica lusitanica</i>	Spanish Heath	
	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	
	<i>Galium aparine</i>	Cleavers	
RR	<i>Genista monspessulana</i>	Montpellier Broom	
	<i>Grevillea rosmarinifolia</i>	Rosemary Grevillea	
	<i>Hedera helix</i>	English Ivy	
	<i>Holcus lanatus</i>	Yorkshire Fog	
	<i>Hypochaeris radicata</i>	Flatweed	
	<i>Lagurus ovatus</i>	Hare's-tail Grass	
	<i>Leontodon taraxacoides</i> subsp. <i>taraxacoides</i>	Hairy Hawkbit	
	<i>Lysimachia arvensis</i>	Pimpernel	
	<i>Petasites fragrans</i>	Winter Heliotrope	
	<i>Pinus radiata</i>	Radiata Pine	
	<i>Plantago lanceolata</i>	Ribwort	
	<i>Romulea rosea</i>	Onion Grass	
RC	<i>Rosa rubiginosa</i>	Sweet Briar	
RC	<i>Rubus anglocandicans</i>	Common Blackberry	
RR	<i>Salix</i> spp.	Willow	
	<i>Senecio vulgaris</i>	Common Groundsel	
	<i>Sonchus asper</i> s.l.	Rough Sow-thistle	
	<i>Sonchus oleraceus</i>	Common Sow-thistle	
RC	<i>Ulex europaeus</i>	Gorse	

Status	Scientific Name	Common Name	*Record Source
	<i>Vulpia</i> spp.	Fescue	

A2.2 Listed flora species

The following table includes the listed flora species that have potential to occur within the study area. The list of species is sourced from the Victorian Biodiversity Atlas and the Protected Matters Search Tool (DoEE; accessed on 08.08.2018).

Table A2.2 Listed flora species recorded / predicted to occur within 10 km of the study area

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
National significance									
<i>Amphibromus fluitans</i>	River Swamp Wallaby-grass	VU		I	1997	PMST	Swampy areas, mainly along the Murray River between Wodonga and Echuca with scattered records from southern Victoria.	Low	Limited suitable habitat within study area.
<i>Caladenia amoena</i>	Charming Spider-orchid	EN	e	L	1932		Dry ridges in Box Ironbark forest.	Low	Limited suitable habitat within study area.
<i>Dianella amoena</i>	Matted Flax-lily	EN	e	L		PMST	Lowland grassland and grassy woodland, on well-drained to seasonally waterlogged fertile sandy loam soils to heavy cracking clays.	Medium	Few scattered records throughout Ballarat and Daylesford region, potentially small areas of suitable habitat.
<i>Dodonea procumbens</i>	Trailing Hop-bush	VU	v			PMST	Sandy or clay soils in low-lying, winter-wet areas in grasslands, woodlands, and low-open forest.	Low	Limited suitable habitat within study area.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Eucalyptus aggregata</i>	Black Gum	VU	e	L		PMST	Riparian woodland, primarily on floodplains but occasionally extending up adjacent lower slopes.	Low	Limited suitable habitat within study area.
<i>Glycine latrobeana</i>	Clover Glycine	VU	v	L		PMST	Grasslands and grassy woodlands, particularly those dominated by Kangaroo Grass.	Low	Limited suitable habitat within study area.
<i>Lachnagrostis adamsonii</i>	Adamson's Blown-grass	EN	v	L		PMST	Low-lying, seasonally wet or swampy areas of plains communities, often in slightly saline conditions.	Low	Limited suitable habitat within study area.
<i>Lepidium hyssopifolium</i> s.s.	Basalt Peppercross	EN	e	L	1941	PMST	Basalt plains grassland and woodland communities.	Low	Limited suitable habitat within study area.
<i>Leucochrysum albicans</i> subsp. <i>tricolor</i>	White Sunray	EN	e	L	1928	PMST	Grasslands of the Victorian Volcanic Plains, primarily on acidic clay soils derived from basalt, with occasional occurrences on adjacent sedimentary, sandy-clay soils.	Low	Limited suitable habitat within study area.
<i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Spiny Rice-flower	CR	e	L		PMST	Primarily grasslands featuring a moderate diversity of other native species and inter-tussock spaces, although also recorded in grassland dominated by introduced perennial grasses.	Low	Limited suitable habitat within study area.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Prasophyllum frenchii</i>	Maroon Leek-orchid	EN	e	L		PMST	Grassland and grassy woodland environments on sandy or black clay loam soils, that are generally damp but well drained.	Low	Limited suitable habitat within study area.
<i>Rutidosis leptorhynchoides</i>	Button Wrinklewort	EN	e	L		PMST	Higher quality Plains Grassland and Grassy Woodland in Western Victoria, particularly those with fertile soil and light timber cover.	Low	Limited suitable habitat within study area.
<i>Senecio behrianus</i>	Stiff Groundsel	EN	e	L	2007		Specific habitat requirements of this species are poorly understood, but they are known to occur in seasonally inundated habitats on clay soils.	Low	Nearby records of this species are near Miners Rest. No suitable habitat within study area.
<i>Senecio psilocarpus</i>	Swamp Fireweed	VU	v			PMST	Seasonally inundated herb-rich swamps, growing on peaty soils or volcanic clays.	Low	No suitable habitat within study area.
<i>Prasophyllum suaveolens</i>	Fragrant Leek-orchid	EN	e	L	1934		Open, species rich grasslands dominated by <i>Themeda triandra</i> on poorly draining red-brown soils in western Victoria.	Low	Limited suitable habitat within study area.
<i>Thelymitra matthewsii</i>	Spiral Sun-orchid	VU	v	L		PMST	Typically on well-drained soils on slightly elevated sites, but also on coastal sandy flats. Often in open	Low	Limited suitable habitat within study area.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
							situations following disturbance.		
<i>Xerochrysum palustre</i>	Swamp Everlasting	VU	v	L		PMST	Sedge-swamps and shallow freshwater marshes and swamps in lowlands, on black cracking clay soils.	Low	Limited suitable habitat within study area.
State significance									
<i>Acacia boormanii</i>	Snowy River Wattle		r		2016		Restricted mostly to open-forest on rocky slopes and along banks of the Snowy River and its tributaries, with outlying populations at Mt Typo and Gapsted in the Myrtleford area.	Low	Records in the Ballarat region are from planted specimens.
<i>Acacia nano-dealbata</i>	Dwarf Silver-wattle		r		1994		A range of vegetation communities including wet forests, dry forests, heathy woodlands and grassy woodlands.	Medium	Potentially suitable habitat within the study area.
<i>Amphibromus pithogastrus</i>	Plump Swamp Wallaby-grass		e	L	1991		Seasonally damp depressions in grassland or grassy wetland.	Low	Limited suitable habitat within study area.
<i>Billardiera scandens</i> s.s.	Velvet Apple-berry		r		1930		Common in heathland, woodland and forests from near sea level to the subalps.	Low	Limited suitable habitat within study area.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Bossiaea cordigera</i>	Wiry Bossiaea		r		1982		Moist habitats in heathland, heathy woodland and open-forest.	Medium	Potentially suitable habitat within the study area.
<i>Cardamine papillata</i>	Forest Bitter-cress		v		1943		Hilly or mountainous forest areas.	Low	Limited suitable habitat within study area.
<i>Comesperma polygaloides</i>	Small Milkwort		v	L	1992		Grasslands on the western basalt plains; less commonly in grassy woodlands between Bendigo and the Wimmera.	Medium	Old records (>30 years) within the study area, potential suitable habitat.
<i>Coronidium gunnianum</i>	Pale Swamp Everlasting		v		1990		Widespread and sometimes locally common, particularly in high-rainfall areas of Victoria; often in moist sites in open forests and woodlands.	Medium	Potentially suitable habitat within the study area.
<i>Cullen tenax</i>	Tough Scurf-pea		e	L	1852		Lowland grasslands, including pastures and occasionally in otherwise disturbed grassy areas.	Low	Limited suitable habitat within study area.
<i>Dipodium pardalinum</i>	Spotted Hyacinth-orchid		r		2015		Scattered in higher rainfall parts of western Victoria.	Medium	Potentially suitable habitat within the study area.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Discaria pubescens</i>	Australian Anchor Plant		r	L	1982		Grassy open woodlands and forests in the east of the State, and along stream and river valleys west of Melbourne.	Medium	Old records (>30 years) within the study area, potential suitable habitat.
<i>Eucalyptus brookeriana</i>	Brooker's Gum		r		2015		Moist forest communities in valleys and on hills and ridges, often in association with <i>E. obliqua</i> .	Medium	Potentially suitable habitat within the study area.
<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum		r		2016		Damp forest communities. Restricted to South Gippsland and the Otway Ranges.	Medium	This species could occur within the study area. However, if it occurs it is likely to be planted as it does not naturally occur in the region.
<i>Eucalyptus leucoxyton</i> subsp. <i>megalocarpa</i>	Large-fruit Yellow-gum		e	L	2016		Coastal, near Nelson.	Low	Species is unlikely to occur in study area, as this is well outside its natural range.
<i>Eucalyptus yarraensis</i>	Yarra Gum		r	I	2011		Valley flats and along stream on soils subject to periodic inundation or waterlogging.	High	Species could occur within the study region.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Euphrasia scabra</i>	Rough Eyebright		e	L	1770		Grassy woodlands and clearings in subalpine woodlands or sclerophyll forests.	Low	Very old record near study area. No recent records near study area. The closest record within the last 20 years is over 200 km away near Mt Buller.
<i>Geranium solanderi</i> var. <i>solanderi</i> s.s.	Austral Crane's-bill		v		1928		Grasslands or grassy woodlands where hydrology is not a limiting factor.	Medium	Potentially suitable habitat within the study area.
<i>Goodenia lineata</i>	Grampians Goodenia		r		2006		Heathland on sandy soils.	Low	Limited suitable habitat within study area.
<i>Grevillea micrantha</i>	Small-flower Grevillea		r		1967		Poor stony soils in mallee or Ironbark woodlands.	Low	Limited suitable habitat within study area.
<i>Grevillea repens</i>	Creeping Grevillea		r		1978		Well drained shallow clay soils in dry forest.	Medium	Potentially suitable habitat within the study area.
<i>Levenhookia sonderi</i>	Slender Stylewort		r		1982		Lowland areas in seasonally damp grounds and drying swamps.	Low	Limited suitable habitat within study area.
<i>Melaleuca armillaris</i> subsp. <i>armillaris</i>	Giant Honey-myrtle		r		2011		Near coastal heath/scrub, rocky coast and foothill outcrops.	Low	Limited suitable habitat within study area.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Prasophyllum</i> aff. <i>validum</i> B	Woodland Leek-orchid		e			PMST	Apparently endemic to Victoria where scattered across northern and western open forest and woodland communities on stony and sandy soils	Low	Limited suitable habitat within study area.
<i>Pterostylis multiflora</i>	Mountain Brown-tip Greenhood		r		1928		Widespread in north-eastern Victoria in tall open forest with a dense shrubby or grassy understorey, on well-drained loams.	Low	Limited suitable habitat within study area.
<i>Pterostylis rubescens</i>	Inland Red-tip Greenhood		r		1944		Widespread across northern Victoria on slopes and ridges in drier open forests and woodlands on well-drained soils.	Low	Limited suitable habitat within study area.

Appendix 3 Fauna

Notes to tables:

<p>EPBC Act:</p> <p>EX - Extinct CR - Critically Endangered EN - Endangered VU - Vulnerable CD - Conservation dependent</p>	<p>DSE 2009, DSE 2013:</p> <p>ex - extinct cr - critically endangered en - endangered vu - vulnerable nt - near threatened dd - data deficient rx - regionally extinct</p>
<p>FFG Act:</p> <p>L - listed as threatened under FFG Act N - nominated for listing as threatened I - determined ineligible for listing</p>	<p>Introduced species</p> <p>PS - pest species listed under the CaLP Act * - introduced species</p>
<p>Most recent database records are from the Victorian Biodiversity Atlas unless otherwise specified as follows</p> <p>PMST – Protected Matters Search Tool</p>	

A3.1 Fauna species recorded from the study area

Table A3.1 Vertebrate fauna recorded from the study area (present assessment)

Status	Scientific Name	Common Name
Indigenous species		
	<i>Cormobates leucophaeus</i>	White-throated Treecreeper
	<i>Eolophus roseicapilla</i>	Galah
	<i>Gymnorhina tibicen</i>	Australian Magpie
	<i>Rhipidura albiscarpa</i>	Grey Fantail
	<i>Phaps chalcoptera</i>	Common Bronzewing
	<i>Fulica atra</i>	Eurasian Coot
	<i>Microcarbo melanoleucos</i>	Little Pied Cormorant
	<i>Tadorna tadornoides</i>	Australian Shelduck
	<i>Anas superciliosa</i>	Pacific Black Duck
	<i>Aquila audax</i>	Wedge-tailed Eagle
	<i>Haliastur sphenurus</i>	Whistling Kite
	<i>Calyptorhynchus funereus</i>	Yellow-tailed Black-Cockatoo
	<i>Cacatua tenuirostris</i>	Long-billed Corella
	<i>Platycercus elegans</i>	Crimson Rosella
	<i>Dacelo novaeguineae</i>	Laughing Kookaburra

Status	Scientific Name	Common Name
	<i>Petroica boodang</i>	Scarlet Robin
	<i>Eopsaltria australis</i>	Eastern Yellow Robin
	<i>Pachycephala pectoralis</i>	Golden Whistler
	<i>Colluricincla harmonica</i>	Grey Shrike-thrush
	<i>Acanthiza lineata</i>	Striated Thornbill
	<i>Acanthiza pusilla</i>	Brown Thornbill
	<i>Acanthiza reguloides</i>	Buff-rumped Thornbill
	<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill
	<i>Sericornis frontalis</i>	White-browed Scrubwren
	<i>Malurus cyaneus</i>	Superb Fairy-wren
	<i>Daphoenositta chrysoptera</i>	Varied Sittella
	<i>Pardalotus punctatus</i>	Spotted Pardalote
	<i>Melithreptus lunatus</i>	White-naped Honeyeater
	<i>Melithreptus brevirostris</i>	Brown-headed Honeyeater
	<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill
	<i>Lichenostomus chrysops</i>	Yellow-faced Honeyeater
	<i>Anthochaera carunculata</i>	Red Wattlebird
	<i>Corcorax melanorhamphos</i>	White-winged Cough
	<i>Strepera graculina</i>	Pied Currawong
	<i>Strepera versicolor</i>	Grey Currawong
	<i>Cracticus torquatus</i>	Grey Butcherbird
	<i>Corvus coronoides</i>	Australian Raven
	<i>Pardalotus striatus</i>	Striated Pardalote
	<i>Tachyglossus aculeatus</i>	Short-beaked Echidna
	<i>Macropus giganteus</i>	Eastern Grey Kangaroo
	<i>Geocrinia victoriana</i>	Victorian Smooth Froglet
	<i>Crinia signifera</i>	Common Froglet
	<i>Litoria ewingii</i>	Southern Brown Tree Frog
Introduced species		
	<i>Turdus merula</i>	Common Blackbird
PS	<i>Oryctolagus cuniculus</i>	European Rabbit
PS	<i>Lepus europeaus</i>	European Hare
PS	<i>Vulpes vulpes</i>	Red Fox

A3.2 Birdlife Ballarat bird list for Creswick Forest including Cosgrove Reservoir and St Georges Lake

Table A3.2 Birdlife Ballarat bird list

Status	Scientific Name	Common Name
Indigenous species		
	<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill
	<i>Acanthiza lineata</i>	Striated Thornbill
	<i>Acanthiza pusilla</i>	Brown Thornbill
	<i>Acanthiza reguloides</i>	Buff-rumped Thornbill
	<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill
	<i>Accipiter cirrocephalus</i>	Collared Sparrowhawk
	<i>Accipiter fasciatus</i>	Brown Goshawk
vu, L	<i>Accipiter novaehollandiae</i>	Grey Goshawk
	<i>Acrocephalus australis</i>	Reed-Warbler
	<i>Aegotheles cristatus</i>	Australian Owlet-nightjar
	<i>Anas gracilis</i>	Grey Teal
	<i>Anas superciliosa</i>	Pacific Black Duck
	<i>Anhinga novaehollandiae</i>	Australasian Darter
	<i>Anthochaera carunculata</i>	Red Wattlebird
	<i>Apus pacificus</i>	Fork-tailed Swift
	<i>Aquila audax</i>	Wedge-tailed Eagle
	<i>Ardea pacifica</i>	White-necked Heron
	<i>Artamus cyanopterus</i>	Dusky Woodswallow
vu	<i>Aythya australis</i>	Hardhead
vu	<i>Biziura lobata</i>	Musk Duck
	<i>Bubulcus coromandus</i>	Eastern Cattle Egret
	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo
	<i>Cacatua tenuirostris</i>	Long-billed Corella
	<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo
	<i>Cacomantis pallidus</i>	Pallid Cuckoo
	<i>Cacomantis variolosus</i>	Brush Cuckoo
	<i>Caligavis chrysops</i>	Yellow-faced Honeyeater
	<i>Calyptorhynchus funereus</i>	Yellow-tailed Black-Cockatoo
	<i>Chenonetta jubata</i>	Australian Wood Duck
	<i>Chrysococcyx basalis</i>	Horsfield's Bronze-Cuckoo

Status	Scientific Name	Common Name
	<i>Chrysococcyx lucidus</i>	Shining Bronze-Cuckoo
nt	<i>Cinlosoma punctatum</i>	Spotted Quail-thrush
	<i>Circus approximans</i>	Swamp Harrier
	<i>Colluricincla harmonica</i>	Grey Shrike-thrush
	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike
	<i>Corcorax melanorhamphos</i>	White-winged Chough
	<i>Cormobates leucophaea</i>	White-throated Treecreeper
	<i>Corvus mellori</i>	Little Raven
	<i>Cracticus torquatus</i>	Grey Butcherbird
	<i>Cygnus atratus</i>	Black Swan
	<i>Dacelo novaeguineae</i>	Laughing Kookaburra
	<i>Daphoenositta chrysoptera</i>	Varied Sittella
	<i>Dicaeum hirundinaceum</i>	Mistletoebird
	<i>Egretta novaehollandiae</i>	White-faced Heron
	<i>Elseyornis melanops</i>	Black-fronted Dotterel
	<i>Eolophus roseicapilla</i>	Galah
	<i>Eopsaltria australis</i>	Eastern Yellow Robin
	<i>Epthianura albifrons</i>	White-fronted Chat
	<i>Falco berigora</i>	Brown Falcon
	<i>Falco cenchroides</i>	Nankeen Kestrel
	<i>Falco longipennis</i>	Australian Hobby
	<i>Falco peregrinus</i>	Peregrine Falcon
	<i>Falcunculus frontatus</i>	Eastern Shrike-tit
	<i>Fulica atra</i>	Eurasian Coot
nt	<i>Gallinago hardwickii</i>	Latham's Snipe
	<i>Gallinula tenebrosa</i>	Dusky Moorhen
	<i>Gerygone olivacea</i>	White-throated Gerygone
	<i>Glossopsitta concinna</i>	Musk Lorikeet
	<i>Grallina cyanoleuca</i>	Magpie-lark
	<i>Gymnorhina tibicen</i>	Australian Magpie
	<i>Haliastur sphenurus</i>	Whistling Kite
	<i>Hieraetus morphnoides</i>	Little Eagle
VU,vu,L	<i>Hirundapus caudacutus</i>	White-throated Needletail
	<i>Hirundo neoxena</i>	Welcome Swallow
	<i>Hypotaenidia philippensis</i>	Buff-banded Rail

Status	Scientific Name	Common Name
	<i>Lalage tricolor</i>	White-winged Triller
vu,L	<i>Lophoictinia isura</i>	Square-tailed Kite
	<i>Malurus cyaneus</i>	Superb Fairy-wren
	<i>Melithreptus brevirostris</i>	Brown-headed Honeyeater
	<i>Melithreptus lunatus</i>	White-naped Honeyeater
	<i>Microcarbo melanoleucos</i>	Little Pied Cormorant
	<i>Microeca fascians</i>	Jacky Winter
	<i>Milvus migrans</i>	Black Kite
	<i>Myiagra cyanoleuca</i>	Satin Flycatcher
	<i>Myiagra inquieta</i>	Restless Flycatcher
	<i>Neochmia temporalis</i>	Red-browed Finch
	<i>Neophema chrysostoma</i>	Blue-winged Parrot
	<i>Nesoptilotis leucotis</i>	White-eared Honeyeater
	<i>Ninox boobook</i>	Southern Boobook
vu, L	<i>Ninox strenua</i>	Powerful Owl
nt	<i>Nycticorax caledonicus</i>	Nankeen Night-Heron
	<i>Ocyphaps lophotes</i>	Crested Pigeon
	<i>Oriolus sagittatus</i>	Olive-backed Oriole
	<i>Pachycephala pectoralis</i>	Golden Whistler
	<i>Pachycephala rufiventris</i>	Rufous Whistler
	<i>Pardalotus punctatus</i>	Spotted Pardalote
	<i>Pardalotus striatus</i>	Striated Pardalote
	<i>Pelecanus conspicillatus</i>	Australian Pelican
	<i>Petrochelidon ariel</i>	Fairy Martin
	<i>Petrochelidon nigricans</i>	Tree Martin
	<i>Petroica boodang</i>	Scarlet Robin
	<i>Petroica goodenovii</i>	Red-capped Robin
	<i>Petroica phoenicea</i>	Flame Robin
	<i>Petroica rodinogaster</i>	Pink Robin
	<i>Petroica rosea</i>	Rose Robin
	<i>Phalacrocorax carbo</i>	Great Cormorant
	<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant
	<i>Phaps chalcoptera</i>	Common Bronzewing
	<i>Phaps elegans</i>	Brush Bronzewing
	<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater

Status	Scientific Name	Common Name
	<i>Phylidonyris pyrrhopterus</i>	Crescent Honeyeater
	<i>Platalea flavipes</i>	Yellow-billed Spoonbill
	<i>Platycercus elegans</i>	Crimson Rosella
	<i>Platycercus eximius</i>	Eastern Rosella
	<i>Podargus strigoides</i>	Tawny Frogmouth
	<i>Poliocephalus poliocephalus</i>	Hoary-headed Grebe
	<i>Poodytes gramineus</i>	Little Grassbird
	<i>Porphyrio melanotus</i>	Australasian Swampphen
	<i>Ptilotula penicillata</i>	White-plumed Honeyeater
	<i>Rhipidura albiscapa</i>	Grey Fantail
	<i>Rhipidura leucophrys</i>	Willie Wagtail
	<i>Rhipidura rufifrons</i>	Rufous Fantail
	<i>Sericornis frontalis</i>	White-browed Scrubwren
vu	<i>Spatula rhynchotis</i>	Australasian Shoveler
	<i>Strepera graculina</i>	Pied Currawong
	<i>Strepera versicolor</i>	Grey Currawong
	<i>Tachybaptus novaehollandiae</i>	Australasian Grebe
	<i>Tadorna tadornoides</i>	Australian Shelduck
	<i>Threskiornis molucca</i>	Australian White Ibis
	<i>Threskiornis spinicollis</i>	Straw-necked Ibis
	<i>Todiramphus sanctus</i>	Sacred Kingfisher
	<i>Trichoglossus molucannus</i>	Rainbow Lorikeet
	<i>Turnix varius</i>	Painted Button-quail
	<i>Tyto alba</i>	Barn Owl
	<i>Vanellus miles</i>	Masked Lapwing
	<i>Zoothera lunulata</i>	Bassian Thrush
	<i>Zosterops lateralis</i>	Silvereye
Introduced species		
	<i>Carduelis carduelis</i>	European Goldfinch
	<i>Turdus merula</i>	Common Blackbird
	<i>Sturnus vulgaris</i>	Common Starling
	<i>Passer domesticus</i>	House Sparrow

A3.3 Listed fauna species

The following table includes a list of the listed fauna species that have potential to occur within the study area. The list of species is sourced from the Victorian Biodiversity Atlas and the Protected Matters Search Tool (DoEE; accessed on 08.08.2018).

Table A3.3 Listed fauna species recorded, or predicted to occur, within 10 km of the study area

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
National significance									
<i>Prototroctes maraena</i>	Australian Grayling	VU	v	L		PMST	Adults inhabit cool, clear, freshwater streams.	Low	Could potentially occur in waterbodies surrounding the study area, however the study area is outside the typical range for the species and there are no records of the species within the region.
<i>Galaxias rostratus</i>	Flat-headed Galaxias	CR	v	I		PMST	Still or slow-moving waters of rivers, billabongs, lakes and swamps.	Low	Could potentially occur in waterbodies surrounding the study area, however the study area is outside the typical range for the species and there are no records of the species within the region.
<i>Galaxiella toourtkoourt</i> * Note this taxon has recently been split from the Dwarf Galaxias <i>Galaxiella pusilla</i> . Although not formally listed under the EPBC or FFG Acts as <i>Galaxiella toourtkoourt</i> , for the	Little Galaxis	VU	e	L		PMST	Slow-flowing or still freshwater wetlands such as swamps, drains and backwaters of streams.	Low	Could potentially occur in waterbodies surrounding the study area, however the study area is outside the typical range for the species and there are no records of the species within the region.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
purpose of this report this taxon is assigned the same conservation status as <i>Galaxiella pusilla</i> .									
<i>Maccullochella peelii</i>	Murray Cod	VU	v	L		PMST	A diverse range of stream habitats in the Murray-Darling basin; principally the main channels of rivers and their major tributaries.	Low	Could potentially occur in waterbodies surrounding the study area, however the study area is outside the typical range for the species and there are no records of the species within the region.
<i>Pedionomus torquatus</i>	Plains-wanderer	CR	e	L		PMST	Native grassland with a sparse, open structure.	Low	Unlikely to find suitable habitat within study area, species not known to occur within region.
<i>Numenius madagascariensis</i>	Eastern Curlew	CR	v			PMST	Large intertidal sandflats, banks, mudflats, estuaries, inlets, sewage farms, saltworks, harbours, coastal lagoons and bays.	Low	Unlikely to find suitable habitat within the study area.
<i>Calidris ferruginea</i>	Curlew Sandpiper	CR	e			PMST	Large intertidal sandflats, banks, mudflats, estuaries, inlets, sewage farms, saltworks, harbours, coastal lagoons and bays.	Low	Unlikely to find suitable habitat within the study area.
<i>Rostratula australis</i>	Australian Painted Snipe	EN	e	L	2009	PMST	Shallows of well-vegetated freshwater wetlands.	Low	Could find suitable habitat within the region. However,

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Botaurus poiciloptilus</i>	Australasian Bittern	EN	e	L		PMST	Shallow freshwater and brackish wetlands with abundant emergent aquatic vegetation.	Low	only one record, 10 years ago, within 10 km of study area. Could find suitable habitat within the region, however no records within 10 km of the study area.
<i>Lathamus discolor</i>	Swift Parrot	CR	e	L		PMST	A range of forests and woodlands, especially those supporting nectar-producing tree species. Also well-treed urban areas.	Medium	This species migratory nature means it cannot be discounted from occurring anywhere in Victoria where there are suitable forage species.
<i>Grantiella picta</i>	Painted Honeyeater	VU	v	L	2010	PMST	Dry open woodlands and forests. Typically forages for fruit and nectar in mistletoes and in tree canopies.	Medium	The species has been recorded in the region.
<i>Anthochaera phrygia</i>	Regent Honeyeater	CR	e	L		PMST	A range of dry woodlands and forests dominated by nectar-producing tree species.	Low	Generally confined to their core habitat in the Chiltern-box Ironbark areas with some migration north and east from there.
<i>Petauroides volans</i>	Greater Glider	VU	v	L		PMST	Wet and damp sclerophyll forest with large hollow-bearing trees.	Low	Unlikely to occur within the study area, as it is outside of the species distribution.
<i>Potorous tridactylus tridactylus</i>	Long-nosed Potoroo	VU	nt	L	1970	PMST	Forest, heathy woodlands and heathlands.	Low	Unlikely to occur within the study area, as it is outside of the species distribution.
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	VU	v	L		PMST	Rainforest, wet and dry sclerophyll forest,	Medium	Unlikely to occur within the study area, as it is outside of the species distribution.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
							woodland and urban areas.		
<i>Pseudomys fumeus</i>	Smoky Mouse	EN	e	L		PMST	Coastal heath and heathy woodland, wet forest, sub-alpine heath and dry sclerophyll forest.	Low	Unlikely to occur within the study area, as it is outside of the species distribution.
<i>Delma impar</i>	Striped Legless Lizard	VU	e	L	1988	PMST	Natural temperate grassland, grassy woodland and exotic grassland.	Low	Has previously been recorded within the region, but is unlikely to find suitable grassland habitat within the study area.
<i>Litoria raniformis</i>	Growling Grass Frog	VU	e	L	2013	PMST	Still or slow-flowing waterbodies and surrounding terrestrial vegetation.	Medium	Could potentially occur in waterbodies surrounding the study area, recent records from the surrounding region.
<i>Synemon plana</i>	Golden Sun Moth	CR	e	L	2011	PMST	Natural temperate grassland, grassy woodland and pasture supporting spear grasses and wallaby grasses and exotic grassland dominated by Chilean needle grass.	Low	Unlikely to find suitable habitat within the study area.
State significance									
<i>Pseudophryne bibronii</i>	Brown Toadlet		e	L	-	-	A wide variety of woodland, forest and grassland habitats.	Medium	No database records within the search area however suitable habitat is present and the study area is within the range of the species.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Lewinia pectoralis pectoralis</i>	Lewin's Rail		v	L	1992		Swamps, dense riparian vegetation and saltmarsh.	Low	Could potentially find suitable habitat within and surrounding the study area, however, no recent records within 10 km of the study area.
<i>Phalacrocorax varius</i>	Pied Cormorant		nt		2013		Primarily marine environments and coastal waters including beaches, coastal lagoons, estuaries and rock platforms. Also, found in terrestrial wetlands with open expanses of permanent water including rivers, inland lakes and billabongs. Breeds and roosts in trees or bushes along the edges of water body, as well as on artificial structures such as pylons.	High	Known to use waterbodies throughout the region and could potentially fly over the study area in search of habitat.
<i>Gallinago hardwickii</i>	Latham's Snipe		nt		2009	Birdlife Ballarat	A migrant to Australia from July to April occurring in a wide variety of permanent and ephemeral wetlands. Prefers open freshwater wetlands with nearby cover, but also	Recorded	Could potentially occur in waterbodies within and surrounding the study area within summer months.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
							recorded on the edges of creeks and rivers, river-pools and floodplains.		
<i>Ardeotis australis</i>	Australian Bustard		e	L	1954		Grassland, open dry woodlands of mallee and mulga, arid heathland saltbush and bluebush.	Low	Unlikely to find suitable habitat within the study area.
<i>Platalea regia</i>	Royal Spoonbill		nt		1977		Permanent and ephemeral wetlands and wet grassland areas, particularly large expanses of water such as lakes, swamps or lagoons. Also utilises rivers for its feeding activities and has regularly been recorded in coastal habitats such as estuaries, inlets and intertidal mudflats.	Low	No recent records within 10 km of the study area.
<i>Ardea modesta</i>	Eastern Great Egret		v	L	2001		Prefer shallow water, particularly when flowing, but may be seen on any watered area, including damp grasslands.	Low	Could use waterbodies within the region but has not been recorded within 10 km of the study area in the last 15 years.
<i>Nycticorax caledonicus hillii</i>	Nankeen Night Heron		nt		1978	Birdlife Ballarat	A variety of estuarine and terrestrial wetlands where it	Recorded	Could potentially find suitable habitat within the study area.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
							forages on the margins in shallow still or slow-moving water or exposed banks, mudflats and swamp vegetation of these environments.		
<i>Anas rhynchos</i>	Australasian Shoveler		v		2009	Birdlife Ballarat	Prefers large, permanent lakes and swamps with deep water, stable conditions and abundant aquatic vegetation. Less commonly recorded in small or shallow waters, such as billabongs, sewage ponds, freshwater rivers and densely vegetated farm dams. Forages in open water but nests in densely vegetated freshwater wetlands, where fringing vegetation may be an important habitat feature.	Recorded	Could potentially occur in permanent waterbodies within and surrounding the study area.
<i>Stictonetta naevosa</i>	Freckled Duck		e	L	2006		Large freshwater wetlands, generally with dense vegetation.	Medium	Could potentially occur in permanent waterbodies within and surrounding the study area.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Aythya australis</i>	Hardhead		v		2009	Birdlife Ballarat	A mainly aquatic species preferring large, deep freshwater environments with abundant aquatic vegetation, including slow moving areas of rivers.	Recorded	Could potentially occur in permanent waterbodies within and surrounding the study area.
<i>Oxyura australis</i>	Blue-billed Duck		e	L	2009		Open or densely vegetated wetlands.	Medium	Could potentially occur in waterbodies within and surrounding the study area.
<i>Biziura lobata</i>	Musk Duck		v		2013	Birdlife Ballarat	A largely aquatic species preferring deep water on large, permanent swamps, lakes and estuaries with abundant aquatic vegetation. Often occurs in areas of dense vegetated cover within a wetland.	Recorded	Could potentially occur in waterbodies within and surrounding the study area. Recorded by BirdlifeAustralia.
<i>Circus assimilis</i>	Spotted Harrier		nt		2001		Inhabits open and wooded country of inland and sub-inland Australia, where they hunt over flat or undulating country with low vegetation cover.	Low	Unlikely to find habitat within the study area.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Accipiter novaehollandiae novaehollandiae</i>	Grey Goshawk		v	L	1991	Birdlife Ballarat 2016.	Rainforest, gallery forest, tall wet forest and woodland. Also partially cleared agricultural land.	Recorded	Could find potential roosting sites within the study area.
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle		v	L	1991		Coastal areas such as beaches and estuaries, inland wetlands and major inland streams.	Low	Old record (>25 years) within 10 km of study area, unlikely to find suitable habitat.
<i>Lophoictinia isura</i>	Square-tailed Kite		v	L	2005	Birdlife Ballarat	Eucalypt woodlands, open forest and partially cleared farmland.	Recorded	Could find potential roosting sites within the study area.
<i>Ninox strenua</i>	Powerful Owl		v	L	2017	Birdlife Ballarat	Eucalypt forests and woodlands, well-treed urban areas.	Recorded	Could find potential habitat within the study area in areas of remnant forest and woodland. Has been recorded recently within the area.
<i>Neophema elegans</i>	Elegant Parrot		v		1886		Woodlands, open woody grasslands, partially cleared farmlands and the fringes of clearings in forests, tree-lined watercourses and mallee environments.	Low	Could potentially find some areas of suitable habitat within the study area, but the study area is on the eastern edge of the species distribution and it has not been recorded in the region since 1886.
<i>Hirundapus caudacutus</i>	White-throated Needletail		v		2008	Birdlife Ballarat	An almost exclusively aerial species within Australia, occurring over most types of habitat, particularly wooded areas.	Recorded	Migratory species which could potentially be recorded flying over the study area.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Cinlosoma punctatum</i>	Spotted Quail-thrush		nt		2001	Birdlife Ballarat	Occurs in drier forests, woodlands and scrub of south eastern Australia. Prefers areas with leaf litter, branches, rocks and tussocks. Often found on the sunny side of dry ridges.	Recorded	Could find potential habitat in parts of the study area which contain remnant forest and woodland.
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (south-eastern ssp.)		nt		1991		Often observed feeding on insects as it spirals up trees or when hopping along the ground or on fallen litter. Generally inhabits open eucalypt forests, woodlands and mallee, often where there are stands of dead trees.	Medium	Could find potential habitat in parts of the study area which contain remnant forest and woodland.
<i>Sminthopsis crassicaudata</i>	Fat-tailed Dunnart		nt		1947		Inhabits sparse grasslands and open shrubland habitats, usually where there is a significant component of bare ground and suitable refuge sites such as surface rocks or logs where it constructs nests of grass or	Low	Unlikely to find suitable grassland habitat within the study area.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Pseudophryne semimarmorata</i>	Southern Toadlet		v		2013		<p>other dried plant material.</p> <p>A variety of habitats such as open forests, lowland woodlands and heathlands where adults shelter beneath leaf litter and other debris in moist soaks and depressions.</p>	High	Could find potential habitat in parts of the study area that are damp and contain abundant leaf litter.

A3.4 Migratory species (EPBC Act listed)

Table A3.3 Migratory fauna species recorded or predicted to occur within 10 km of the study area

Scientific name	Common name	Most recent record
<i>Charadrius bicinctus</i>	Double-banded Plover	2013
<i>Actitis hypoleucos</i>	Common Sandpiper	PMST
<i>Tringa nebularia</i>	Common Greenshank	PMST
<i>Calidris ferruginea</i>	Curlew Sandpiper	PMST
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	PMST
<i>Gallinago hardwickii</i>	Latham's Snipe	2009
<i>Hirundapus caudacutus</i>	White-throated Needletail	2008
<i>Apus pacificus</i>	Fork-tailed Swift	PMST
<i>Rhipidura rufifrons</i>	Rufous Fantail	PMST
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	2000
<i>Monarcha melanopsis</i>	Black-faced Monarch	PMST
<i>Motacilla flava</i>	Yellow Wagtail	PMST
<i>Calidris melanotos</i>	Pectoral Sandpiper	PMST

Appendix 4 Photos of the study area



Photo 1 Heathy Dry Forest – Habitat hectare quadrat 1 (see Figure 2).



Photo 2 Heathy Dry Forest- Habitat hectare quadrat 2 (see Figure 2).



Photo 3 Grassy Dry Forest – Habitat hectare quadrat 3 (see Figure 2).



Photo 4 Heathy Dry Forest – Habitat hectare quadrat 4 (see Figure 2).



Photo 5 Herb-rich Foothill Forest- Habitat hectare quadrat 5 (see Figure 2).



Photo 6 Valley Grassy Forest- Habitat hectare quadrat 6 (see Figure 2).



Photo 7 Grassy Dry Forest- Habitat hectare quadrat 7 (see Figure 2).



Photo 8 Heathy Dry Forest- Habitat hectare quadrat 8 (see Figure 2).



Photo 9 Heathy Dry Forest- Habitat hectare quadrat 9 (see Figure 2).



Photo 10 Herb-rich Foothill Forest- Habitat hectare quadrat 10 (see Figure 2).



Photo 11 Grassy Dry Forest- Habitat hectare quadrat 11 (see Figure 2).



Photo 12 Grassy Dry Forest- Habitat hectare quadrat 12 (see Figure 2).



Photo 13 Heathy Dry Forest- Habitat hectare quadrat 13 (see Figure 2).



Photo 14 Grassy Dry Forest- Habitat hectare quadrat 14 (see Figure 2).



Photo 15 Herb-rich Foothill Forest- Habitat hectare quadrat 15 (see Figure 2).



Photo 16 Valley Grassy Forest- Habitat hectare quadrat 16 (see Figure 2).



Photo 17 Creekline Herb-rich Woodland – Habitat hectare quadrat 17 (see Figure 2).



Photo 18 Creekline Herb-rich Woodland – Habitat hectare quadrat 18 (see Figure 2).



Photo 19 Grassy Dry Forest – Habitat hectare quadrat 19 (see Figure 2).

Note that the area was modelled as Plains Grassy Woodland EVC 55 in the DELWP 2005 EVC modelling.



Photo 20 Herb-rich Foothill Forest – Habitat hectare quadrat 20 (see Figure 2).



Photo 21 Grassy Dry Forest – Habitat hectare quadrat 21 (see Figure 2).



Photo 22 Heathy Dry Forest – Habitat hectare quadrat 22 (see Figure 2).



Photo 23 Heathy Dry Forest – Habitat hectare quadrat 23 (see Figure 2).



Photo 24 Heathy Dry Forest – Habitat hectare quadrat 24 (see Figure 2).



Photo 25 Herb-rich Foothill Forest – Habitat hectare quadrat 25 (see Figure 2).



Photo 26 Grassy Dry Forest – Habitat hectare quadrat 26 (see Figure 2).



Photo 27 Heathy Dry Forest – Habitat hectare quadrat 27 (see Figure 2).



Photo 28 Herb-rich Foothill Forest – Habitat hectare quadrat 28 (see Figure 2).

Appendix 5 Vegetation impact assessment results

A5.1 Quantification and significance of losses

Table A5.1 Habitat hectares of native vegetation within the study area

Bioregion		CVU	CVU	CVU	CVU	CVU	CVU	CVU	CVU	CVU	CVU	CVU	CVU	CVU	CVU	
Habitat Zone ID		1	2	3	4	5	6	7	8	9	10	11	12	13	14	
EVC #: Name		20: HDF	20:HDF	22:GDF	20:HDF	23: HRFF	47:VGF	22:GDF	20:HDF	20:HDF	23:HRFF	22:GDF	22:GDF	20:HDF	22:GDF	
	Max Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	
Site Condition	Large Old Trees	10	5	5	2	2	9	5	9	9	9	2	0	9	9	9
	Canopy Cover	5	4	4	4	4	4	4	4	4	2	2	2	4	4	4
	Lack of Weeds	15	15	13	15	15	11	9	7	15	6	4	9	9	9	13
	Understorey	25	15	15	15	15	15	15	20	15	20	15	15	15	20	15
	Recruitment	10	10	10	6	10	10	6	5	10	6	6	6	10	3	10
	Organic Matter	5	3	3	3	3	5	5	5	5	5	5	5	3	3	3
	Logs	5	4	4	4	4	4	4	4	4	5	4	5	4	5	4
	Total Site Score		56	54	49	53	58	48	54	62	53	38	42	54	53	58
Landscape Value	Patch Size	10	8	8	8	8	8	8	8	8	2	8	8	8	8	8
	Neighbourhood	10	7	6	7	7	7	6	6	7	5	5	5	5	4	4
	Distance to Core	5	4	4	4	4	4	4	4	4	3	4	4	4	4	4
	Total Landscape Score		19	18	19	19	19	18	18	19	10	17	17	17	16	16
HABITAT SCORE		100	75	72	68	72	77	66	72	81	63	55	59	71	69	74
Habitat points = #/100		1	0.75	0.72	0.68	0.72	0.77	0.66	0.72	0.81	0.63	0.55	0.59	0.71	0.69	0.74

Table A5.1 Habitat hectares of native vegetation within the study area

Bioregion		CVU	CVU	VVP	CVU	VVP	CVU	CVU	CVU	CVU	CVU	CVU	CVU	CVU	CVU		
Habitat Zone ID		15	16	17	18	19	20	21	22	23	24	25	26	27	28		
EVC #: Name		23:HRFF	47:VGF	164:CHRW	164:CHRW	22:GDF	23:HRFF	22:GDF	20:HDF	20:HDF	20:HDF	23:HRFF	22:GDF	20:HDF	23:HRFF		
	Max Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score		
Site Condition	Large Old Trees	10	9	0	0	9	5	9	0	0	0	0	9	9	0	0	
	Canopy Cover	5	2	4	4	4	4	2	4	4	2	4	2	4	2	2	
	Lack of Weeds	15	4	11	6	16	15	7	11	7	15	7	7	7	11	0	
	Understorey	25	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
	Recruitment	10	6	3	6	3	5	10	10	5	3	6	6	6	6	6	
	Organic Matter	5	5	3	5	3	2	5	3	3	3	5	5	3	3	5	
	Logs	5	5	5	5	5	4	5	4	4	2	4	5	4	4	4	
Total Site Score			46	41	41	55	50	53	47	38	40	41	49	48	41	32	
Landscape Value	Patch Size	10	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
	Neighbourhood	10	6	5	5	5	6	6	6	6	7	6	7	7	7	7	
	Distance to Core	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
	Total Landscape Score			18	17	17	17	18	18	18	18	19	18	19	19	19	19
HABITAT SCORE		100	64	58	58	72	68	71	65	56	59	59	68	67	60	51	
Habitat points = #/100		1	0.64	0.58	0.58	0.72	0.68	0.71	0.65	0.56	0.59	0.59	0.68	0.67	0.6	0.51	

A5.2 Tree data

Trees included in the NVR calculations are listed in Table A5.2. The NVR type field specifies if trees have been included as canopy trees (CT) or patch vegetation (P). Trees were assigned to patches where numerous small trees were located in close proximity.

Table A5.2. Potentially impacted trees included in NVR calculations

Tree #	Species	Status	DBH cm (largest stem)	NVR type
1	<i>Eucalyptus obliqua</i>	Live	15	CT
2	<i>Eucalyptus obliqua</i>	Live	12	CT
3	<i>Eucalyptus dives</i>	Live	11	CT
4	<i>Eucalyptus obliqua</i>	Live	6	CT
5	<i>Eucalyptus radiata</i>	Live	10	CT
6	<i>Eucalyptus radiata</i>	Dead	47	CT
7	<i>Eucalyptus dives</i>	Live	12	CT
8	<i>Eucalyptus obliqua</i>	Live	10	CT
9	<i>Eucalyptus obliqua</i>	Live	16	CT
10	<i>Eucalyptus aromaphloia</i>	Live	7	CT
11	<i>Eucalyptus dives</i>	Live	14	CT
12	<i>Eucalyptus dives</i>	Live	10	CT
13	<i>Eucalyptus dives</i>	Live	12	CT
14	<i>Eucalyptus dives</i>	Live	6	CT
15	<i>Eucalyptus obliqua</i>	Live	7	P
16	<i>Eucalyptus obliqua</i>	Live	6	P
17	<i>Eucalyptus obliqua</i>	Live	5	P
18	<i>Eucalyptus obliqua</i>	Live	7	P
19	<i>Eucalyptus obliqua</i>	Live	6	P
20	<i>Eucalyptus obliqua</i>	Live	8	P
21	<i>Eucalyptus obliqua</i>	Live	9	P
22	<i>Eucalyptus dives</i>	Live	6	CT
23	<i>Eucalyptus obliqua</i>	Live	12	CT
24	<i>Eucalyptus dives</i>	Live	11	CT
25	<i>Eucalyptus obliqua</i>	Live	8	CT

Tree #	Species	Status	DBH cm (largest stem)	NVR type
26	<i>Eucalyptus dives</i>	Live	11	CT
27	<i>Eucalyptus dives</i>	Live	13	CT
28	<i>Eucalyptus dives</i>	Live	10	CT
29	<i>Eucalyptus dives</i>	Live	16	CT
30	<i>Eucalyptus dives</i>	Live	10	CT
31	<i>Eucalyptus obliqua</i>	Live	13	CT
32	<i>Eucalyptus dives</i>	Live	6	P
33	<i>Eucalyptus dives</i>	Live	6	P
34	<i>Eucalyptus dives</i>	Live	6	P
35	<i>Eucalyptus dives</i>	Live	6	P
36	<i>Eucalyptus dives</i>	Live	6	P
37	<i>Eucalyptus dives</i>	Live	6	P
38	<i>Eucalyptus dives</i>	Live	9	CT
39	<i>Eucalyptus dives</i>	Live	7	CT
40	<i>Eucalyptus dives</i>	Live	9	CT
41	<i>Eucalyptus dives</i>	Live	9	CT
42	<i>Eucalyptus obliqua</i>	Live	8	CT
43	<i>Eucalyptus obliqua</i>	Live	10	CT
44	<i>Eucalyptus obliqua</i>	Live	28	CT
45	<i>Eucalyptus dives</i>	Live	22	CT
46	<i>Eucalyptus obliqua</i>	Live	12	CT
47	<i>Eucalyptus dives</i>	Live	13	CT
48	<i>Eucalyptus dives</i>	Live	12	CT
49	<i>Eucalyptus dives</i>	Live	7	CT
50	<i>Eucalyptus radiata</i>	Live	10	CT
51	<i>Eucalyptus radiata</i>	Live	10	CT
52	<i>Eucalyptus obliqua</i>	Live	9	CT
53	<i>Eucalyptus obliqua</i>	Live	12	CT
54	<i>Eucalyptus obliqua</i>	Live	14	CT
55	<i>Eucalyptus obliqua</i>	Live	17	CT

Tree #	Species	Status	DBH cm (largest stem)	NVR type
56	<i>Eucalyptus dives</i>	Live	5	CT
57	<i>Eucalyptus dives</i>	Live	9	CT
58	<i>Eucalyptus obliqua</i>	Live	17	CT
59	<i>Eucalyptus dives</i>	Live	10	CT
60	<i>Eucalyptus dives</i>	Live	17	CT
61	<i>Eucalyptus dives</i>	Live	8	CT
62	<i>Eucalyptus obliqua</i>	Live	10	CT
63	<i>Eucalyptus obliqua</i>	Live	7	CT
64	<i>Eucalyptus obliqua</i>	Live	8	CT
65	<i>Eucalyptus obliqua</i>	Live	8	CT
66	<i>Eucalyptus obliqua</i>	Live	14	CT
67	<i>Eucalyptus obliqua</i>	Live	9	CT
68	<i>Eucalyptus obliqua</i>	Live	8	CT
69	<i>Eucalyptus obliqua</i>	Live	8	CT
70	<i>Eucalyptus obliqua</i>	Live	10	CT
71	<i>Eucalyptus obliqua</i>	Live	9	CT
72	<i>Eucalyptus radiata</i>	Live	7	CT
73	<i>Eucalyptus obliqua</i>	Live	9	CT
74	<i>Eucalyptus obliqua</i>	Live	9	CT
75	<i>Eucalyptus obliqua</i>	Live	13	CT
76	<i>Eucalyptus obliqua</i>	Live	9	CT
77	<i>Eucalyptus dives</i>	Live	7	CT
78	<i>Eucalyptus obliqua</i>	Live	11	CT
79	<i>Eucalyptus obliqua</i>	Live	12	CT
80	<i>Eucalyptus dives</i>	Live	11	CT
81	<i>Eucalyptus dives</i>	Live	32	CT
82	<i>Eucalyptus obliqua</i>	Live	11	CT
83	<i>Eucalyptus obliqua</i>	Live	14	CT
84	<i>Eucalyptus dives</i>	Dead	60	CT
85	<i>Eucalyptus obliqua</i>	Live	9	CT

Tree #	Species	Status	DBH cm (largest stem)	NVR type
86	<i>Eucalyptus radiata</i>	Live	13	CT
87	<i>Eucalyptus obliqua</i>	Live	10	CT
88	<i>Eucalyptus obliqua</i>	Live	17	CT
89	<i>Eucalyptus radiata</i>	Live	32	CT
90	<i>Eucalyptus obliqua</i>	Live	11	CT
91	<i>Eucalyptus obliqua</i>	Live	11	CT
92	<i>Eucalyptus dives</i>	Live	8	CT
93	<i>Eucalyptus obliqua</i>	Live	8	CT
94	<i>Eucalyptus obliqua</i>	Live	8	CT
95	<i>Eucalyptus obliqua</i>	Live	7	CT
96	<i>Eucalyptus ovata</i>	Live	20	CT
97	<i>Eucalyptus ovata</i>	Live	4	CT
98	<i>Eucalyptus ovata</i>	Live	60	CT
99	<i>Eucalyptus obliqua</i>	Live	7	CT
100	<i>Eucalyptus obliqua</i>	Live	8	CT
101	<i>Eucalyptus obliqua</i>	Live	9	CT
102	<i>Eucalyptus radiata</i>	Live	8	CT
103	<i>Eucalyptus radiata</i>	Live	13	CT
104	<i>Eucalyptus obliqua</i>	Live	8	CT
105	<i>Eucalyptus radiata</i>	Live	11	CT
106	<i>Eucalyptus radiata</i>	Live	8	CT
107	<i>Eucalyptus radiata</i>	Live	4	CT
108	<i>Eucalyptus radiata</i>	Live	14	CT
109	<i>Eucalyptus obliqua</i>	Dead	70	CT
110	<i>Eucalyptus obliqua</i>	Live	9	CT
111	<i>Eucalyptus obliqua</i>	Live	15	CT
112	<i>Eucalyptus radiata</i>	Live	6	CT
113	<i>Eucalyptus radiata</i>	Live	8	CT
114	<i>Eucalyptus dives</i>	Live	9	CT
115	<i>Eucalyptus dives</i>	Live	9	CT

Tree #	Species	Status	DBH cm (largest stem)	NVR type
116	<i>Eucalyptus obliqua</i>	Live	7	CT
117	<i>Eucalyptus aromaphloia</i>	Live	10	CT
118	<i>Eucalyptus obliqua</i>	Live	10	CT
119	<i>Eucalyptus obliqua</i>	Live	8	CT
120	<i>Eucalyptus obliqua</i>	Live	8	CT
121	<i>Eucalyptus obliqua</i>	Live	9	CT
122	<i>Eucalyptus dives</i>	Live	7	CT
123	<i>Eucalyptus obliqua</i>	Live	10	CT
124	<i>Eucalyptus obliqua</i>	Live	9	CT
125	<i>Eucalyptus aromaphloia</i>	Live	7	CT
126	<i>Eucalyptus obliqua</i>	Live	6	CT
127	<i>Eucalyptus dives</i>	Live	7	CT
128	<i>Eucalyptus dives</i>	Live	7	CT
129	<i>Eucalyptus radiata</i>	Live	11	CT
130	<i>Eucalyptus obliqua</i>	Live	9	CT
131	<i>Eucalyptus dives</i>	Live	6	CT
132	<i>Eucalyptus dives</i>	Live	6	CT
133	<i>Eucalyptus dives</i>	Live	7	CT
134	<i>Eucalyptus obliqua</i>	Live	7	CT
135	<i>Eucalyptus obliqua</i>	Live	6	CT
136	<i>Eucalyptus obliqua</i>	Live	10	CT
137	<i>Eucalyptus radiata</i>	Live	15	CT
138	<i>Eucalyptus aromaphloia</i>	Dead	53	CT
139	<i>Eucalyptus aromaphloia</i>	Live	21	CT
140	<i>Eucalyptus dives</i>	Live	11	CT
141	<i>Eucalyptus obliqua</i>	Live	11	CT
142	<i>Eucalyptus dives</i>	Live	15	CT
143	<i>Eucalyptus dives</i>	Live	18	CT
144	<i>Eucalyptus obliqua</i>	Live	10	CT
145	<i>Eucalyptus obliqua</i>	Live	7	CT

Tree #	Species	Status	DBH cm (largest stem)	NVR type
146	<i>Eucalyptus obliqua</i>	Live	21	CT
147	<i>Eucalyptus radiata</i>	Live	7	CT
148	<i>Eucalyptus obliqua</i>	Live	8	CT
149	<i>Eucalyptus obliqua</i>	Live	22	CT
150	<i>Eucalyptus radiata</i>	Live	7	CT
151	<i>Eucalyptus dives</i>	Live	7	CT
152	<i>Eucalyptus dives</i>	Live	12	CT
153	<i>Eucalyptus dives</i>	Live	16	CT
154	<i>Eucalyptus obliqua</i>	Live	6	CT
155	<i>Eucalyptus obliqua</i>	Dead	54	CT
156	<i>Eucalyptus obliqua</i>	Live	9	CT
157	<i>Eucalyptus obliqua</i>	Dead	48	CT
158	<i>Eucalyptus obliqua</i>	Live	7	CT
159	<i>Eucalyptus dives</i>	Live	16	CT
160	<i>Eucalyptus dives</i>	Live	5	P
161	<i>Eucalyptus dives</i>	Live	5	P
162	<i>Eucalyptus dives</i>	Live	5	P
163	<i>Eucalyptus dives</i>	Live	5	P
164	<i>Eucalyptus dives</i>	Live	5	CT
165	<i>Eucalyptus aromaphloia</i>	Live	7	CT
166	<i>Eucalyptus obliqua</i>	Live	10	CT
167	<i>Eucalyptus dives</i>	Live	5	CT
168	<i>Eucalyptus obliqua</i>	Live	11	CT
169	<i>Eucalyptus aromaphloia</i>	Live	6	CT
170	<i>Eucalyptus radiata</i>	Live	14	CT
171	<i>Eucalyptus radiata</i>	Live	15	CT
172	<i>Eucalyptus obliqua</i>	Dead	54	CT
173	<i>Eucalyptus dives</i>	Live	7	CT
174	<i>Eucalyptus dives</i>	Live	12	CT
175	<i>Eucalyptus dives</i>	Live	12	CT

Tree #	Species	Status	DBH cm (largest stem)	NVR type
176	<i>Eucalyptus dives</i>	Live	7	CT
177	<i>Eucalyptus aromaphloia</i>	Live	5	CT
178	<i>Eucalyptus dives</i>	Live	9	CT
179	<i>Eucalyptus obliqua</i>	Live	5	CT
180	<i>Eucalyptus radiata</i>	Live	18	CT
181	<i>Eucalyptus obliqua</i>	Live	16	CT
182	<i>Eucalyptus radiata</i>	Live	11	CT
183	<i>Eucalyptus aromaphloia</i>	Live	6	CT
184	<i>Eucalyptus aromaphloia</i>	Live	4	CT
185	<i>Eucalyptus obliqua</i>	Live	8	CT
186	<i>Eucalyptus obliqua</i>	Live	4	CT
187	<i>Eucalyptus aromaphloia</i>	Live	9	CT
188	<i>Eucalyptus dives</i>	Live	7	CT
189	<i>Eucalyptus dives</i>	Live	4	CT
190	<i>Eucalyptus radiata</i>	Live	31	CT
191	<i>Eucalyptus radiata</i>	Live	38	CT

Appendix 6 Native Vegetation Removal Report

Native vegetation removal report

This report provides information to support an application to remove, destroy or lop native vegetation in accordance with the *Guidelines for the removal, destruction or lopping of native vegetation*. The report is **not an assessment by DELWP** of the proposed native vegetation removal. Native vegetation information and offset requirements have been determined using spatial data provided by the applicant or their consultant.

Date of issue: 01/03/2021
Time of issue: 3:16 pm

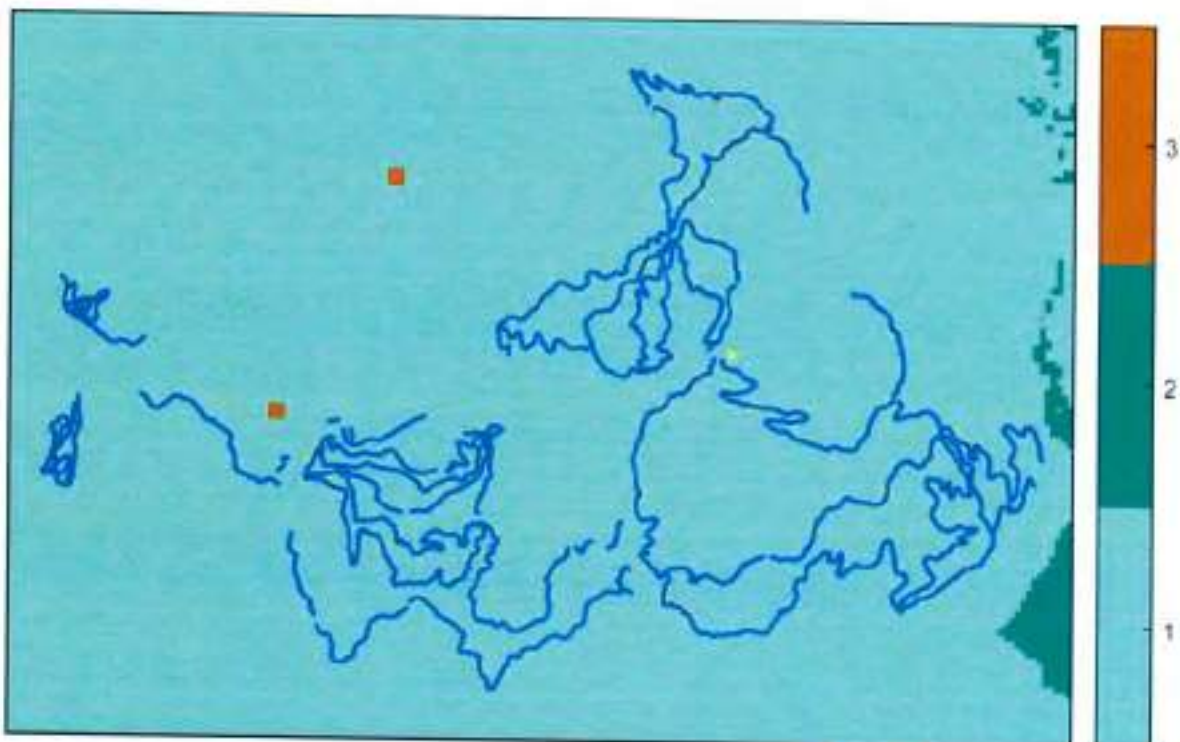
Report ID: BIO_2021_012

Project ID: Creswick_MTB_trails

Assessment pathway

Assessment pathway	Detailed Assessment Pathway
Extent including past and proposed	11.867 ha
Extent of past removal	0.000 ha
Extent of proposed removal	11.867 ha
No. Large trees proposed to be removed	1
Location category of proposed removal	Location 1 The native vegetation is not in an area mapped as an endangered Ecological Vegetation Class (as per the statewide EVC map), sensitive wetland or coastal area. Removal of less than 0.5 hectares in this location will not have a significant impact on any habitat for a rare or threatened species

1. Location map



Native vegetation removal report

Offset requirements if a permit is granted

Any approval granted will include a condition to obtain an offset that meets the following requirements:

General offset amount¹	6.858 general habitat units
Vicinity	North Central Catchment Management Authority (CMA) or Hepburn Shire Council
Minimum strategic biodiversity value score ²	0.530
Large trees	-1 large tree

NB: values within tables in this document may not add to the totals shown above due to rounding

Appendix 1 includes information about the native vegetation to be removed

Appendix 2 includes information about the rare or threatened species mapped at the site

Appendix 3 includes maps showing native vegetation to be removed and extracts of relevant species habitat importance maps

¹ The general offset amount required is the sum of all general habitat units in Appendix 1.

² Minimum strategic biodiversity score is 80 per cent of the weighted average score across habitat zones where a general offset is required.

Native vegetation removal report

Next steps

Any proposal to remove native vegetation must meet the application requirements of the Detailed Assessment Pathway and it will be assessed under the Detailed Assessment Pathway.

If you wish to remove the mapped native vegetation you are required to apply for a permit from your local council. Council will refer your application to DELWP for assessment, as required. **This report is not a referral assessment by DELWP.**

This *Native vegetation removal report* must be submitted with your application for a permit to remove, destroy or lop native vegetation.

Refer to the *Guidelines for the removal, destruction or lopping of native vegetation* (the Guidelines) for a full list of application requirements. This report provides information that meets the following application requirements:

- The assessment pathway and reason for the assessment pathway
- A description of the native vegetation to be removed (partly met)
- Maps showing the native vegetation and property (partly met)
- Information about the impacts on rare or threatened species.
- The offset requirements determined in accordance with section 5 of the Guidelines that apply if approval is granted to remove native vegetation.

Additional application requirements must be met including:

- Topographical and land information
- Recent dated photographs
- Details of past native vegetation removal
- An avoid and minimise statement
- A copy of any Property Vegetation Plan that applies
- A defensible space statement as applicable
- A statement about the Native Vegetation Precinct Plan as applicable
- A site assessment report including a habitat hectare assessment of any patches of native vegetation and details of trees
- An offset statement that explains that an offset has been identified and how it will be secured.

© The State of Victoria Department of Environment, Land, Water and Planning Melbourne 2021

This work is licensed under a Creative Commons Attribution 4.0 International licence. You are free to re-use the work under that licence, on the condition that you credit the State of Victoria as author. The licence does not apply to any images, photographs or branding, including the Victorian Coat of Arms, the Victorian Government logo and the Department of Environment, Land, Water and Planning logo. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/3.0/vic/>

Authorised by the Victorian Government, 8 Nicholson Street, East Melbourne.

For more information contact the DELWP Customer Service Centre 136 136

www.delwp.vic.gov.au

Disclaimer

This publication may be of assistance to you but the State of Victoria and its employees do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication.

Obtaining this publication does not guarantee that an application will meet the requirements of Clauses 52.16 or 52.17 of the Victoria Planning Provisions and Victorian planning schemes or that a permit to remove native vegetation will be granted.

Notwithstanding anything else contained in this publication, you must ensure that you comply with all relevant laws, legislation, awards or orders and that you obtain and comply with all permits, approvals and the like that affect, are applicable or are necessary to undertake any action to remove, lop or destroy or otherwise deal with any native vegetation or that apply to matters within the scope of Clauses 52.16 or 52.17 of the Victoria Planning Provisions and Victorian planning schemes.

Appendix 1: Description of native vegetation to be removed

The species-general offset test was applied to your proposal. This test determines if the proposed removal of native vegetation has a proportional impact on any rare or threatened species habitats above the species offset threshold. The threshold is set at 0.005 per cent of the mapped habitat value for a species. When the proportional impact is above the species offset threshold a species offset is required. This test is done for all species mapped at the site. Multiple species offsets will be required if the species offset threshold is exceeded for multiple species.

Where a zone requires species offset(s), the species habitat units for each species in that zone is calculated by the following equation in accordance with the Guidelines:

$$\text{Species habitat units} = \text{extent} \times \text{condition} \times \text{species landscape factor} \times 2, \text{ where the species landscape factor} = 0.5 + (\text{habitat importance score}/2)$$

The species offset amount(s) required is the sum of all species habitat units per zone

Where a zone does not require a species offset, the general habitat units in that zone is calculated by the following equation in accordance with the Guidelines:

$$\text{General habitat units} = \text{extent} \times \text{condition} \times \text{general landscape factor} \times 1.5, \text{ where the general landscape factor} = 0.5 + (\text{strategic biodiversity value score}/2)$$

The general offset amount required is the sum of all general habitat units per zone.

Native vegetation to be removed

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym				
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type		
6-1	Patch	cvu_0022	Depleted	0	yes	0.370	0.011	0.011	0.690		0.005	General		
4-1	Patch	cvu_0022	Depleted	0	yes	0.295	0.041	0.041	0.296		0.012	General		
4-2	Patch	cvu_0023	Depleted	0	yes	0.355	0.079	0.079	0.701		0.036	General		
4-3	Patch	cvu_0022	Depleted	0	yes	0.325	0.023	0.023	0.780		0.010	General		
6-2	Patch	cvu_0022	Depleted	0	yes	0.370	0.113	0.113	0.681		0.053	General		
4-4	Patch	cvu_0023	Depleted	0	yes	0.355	0.032	0.032	0.778		0.015	General		
6-3	Patch	cvu_0022	Depleted	0	yes	0.370	0.076	0.076	0.720		0.036	General		
6-4	Patch	cvu_0022	Depleted	0	yes	0.370	0.134	0.134	0.698		0.063	General		
4-5	Patch	cvu_0022	Depleted	0	yes	0.295	0.252	0.252	0.715		0.096	General		
4-6	Patch	cvu_0022	Depleted	0	yes	0.295	0.448	0.448	0.712		0.170	General		
6-5	Patch	cvu_0022	Depleted	0	yes	0.370	0.299	0.299	0.686		0.140	General		

Information provided by or on behalf of the applicant in a GIS file						Information calculated by EnSym						
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
6-6	Patch	cvu_0022	Depleted	0	yes	0.370	0.041	0.041	0.640		0.019	General
4-7	Patch	cvu_0022	Depleted	0	yes	0.355	0.437	0.437	0.641		0.191	General
4-8	Patch	cvu_0020	Least Concern	0	yes	0.315	0.021	0.021	0.231		0.006	General
6-7	Patch	cvu_0022	Depleted	0	yes	0.370	0.027	0.027	0.790		0.013	General
6-8	Patch	cvu_0022	Depleted	0	yes	0.370	0.053	0.053	0.709		0.025	General
4-9	Patch	cvu_0022	Depleted	0	yes	0.355	0.113	0.113	0.632		0.049	General
3-2	Patch	cvu_0020	Least Concern	0	yes	0.315	0.037	0.037	0.676		0.015	General
6-9	Patch	cvu_0022	Depleted	0	yes	0.370	0.451	0.451	0.712		0.214	General
6-10	Patch	cvu_0022	Depleted	0	yes	0.370	0.359	0.359	0.706		0.170	General
6-11	Patch	cvu_0022	Depleted	0	yes	0.370	0.121	0.121	0.780		0.060	General
7-1	Patch	cvu_0020	Least Concern	0	yes	0.345	0.328	0.328	0.655		0.140	General
7-2	Patch	cvu_0022	Depleted	0	yes	0.370	0.131	0.131	0.591		0.061	General
7-3	Patch	cvu_0020	Least Concern	0	yes	0.345	0.073	0.073	0.694		0.032	General
7-4	Patch	cvu_0020	Least Concern	0	yes	0.345	0.234	0.234	0.686		0.102	General
6-12	Patch	cvu_0022	Depleted	0	yes	0.370	0.056	0.056	0.673		0.026	General
6-13	Patch	cvu_0022	Depleted	0	yes	0.370	0.256	0.256	0.752		0.125	General
6-14	Patch	cvu_0022	Depleted	0	yes	0.370	0.035	0.035	0.747		0.017	General
6-15	Patch	cvu_0022	Depleted	0	yes	0.370	0.014	0.014	0.700		0.007	General
6-16	Patch	cvu_0022	Depleted	0	yes	0.370	0.002	0.002	0.700		0.001	General
6-17	Patch	cvu_0022	Depleted	0	yes	0.370	0.002	0.002	0.700		0.001	General
6-18	Patch	cvu_0022	Depleted	0	yes	0.370	0.039	0.039	0.690		0.018	General
6-19	Patch	cvu_0022	Depleted	0	yes	0.370	0.001	0.001	0.690		0.000	General

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym				
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type		
6-20	Patch	cvu_0022	Depleted	0	yes	0.370	0.023	0.023	0.690		0.011	General		
6-21	Patch	cvu_0022	Depleted	0	yes	0.370	0.165	0.165	0.680		0.077	General		
7-5	Patch	cvu_0020	Least Concern	0	yes	0.345	0.070	0.070	0.643		0.030	General		
6-22	Patch	cvu_0023	Depleted	0	yes	0.355	0.010	0.010	0.700		0.004	General		
4-10	Patch	cvu_0022	Depleted	0	yes	0.355	0.005	0.005	0.240		0.002	General		
6-23	Patch	cvu_0022	Depleted	0	yes	0.370	0.015	0.015	0.630		0.007	General		
6-24	Patch	cvu_0164	Vulnerable	0	yes	0.360	0.022	0.022	0.630		0.010	General		
2-5	Patch	cvu_0022	Depleted	0	yes	0.355	0.023	0.023	0.560		0.009	General		
2-7	Patch	cvu_0022	Depleted	0	yes	0.355	0.002	0.002	0.560		0.001	General		
2-8	Patch	cvu_0023	Depleted	0	yes	0.275	0.005	0.005	0.710		0.002	General		
2-6	Patch	cvu_0020	Least Concern	0	yes	0.315	0.006	0.006	0.510		0.002	General		
2-4	Patch	cvu_0023	Depleted	0	yes	0.275	0.039	0.039	0.672		0.014	General		
2-3	Patch	cvu_0020	Least Concern	0	yes	0.315	0.044	0.044	0.512		0.016	General		
2-2	Patch	cvu_0023	Depleted	0	yes	0.275	0.051	0.051	0.566		0.016	General		
3-1	Patch	cvu_0023	Depleted	0	yes	0.275	0.013	0.013	0.780		0.005	General		
3-3	Patch	cvu_0020	Least Concern	0	yes	0.315	0.037	0.037	0.514		0.014	General		
6-25	Patch	cvu_0023	Depleted	0	yes	0.320	0.011	0.011	0.755		0.005	General		
6-26	Patch	cvu_0023	Depleted	0	yes	0.320	0.012	0.012	0.740		0.005	General		
6-27	Patch	cvu_0022	Depleted	0	yes	0.370	0.041	0.041	0.740		0.020	General		
7-6	Patch	cvu_0022	Depleted	0	yes	0.370	0.002	0.002	0.520		0.001	General		
7-7	Patch	cvu_0022	Depleted	0	yes	0.370	0.004	0.004	0.550		0.002	General		
7-8	Patch	cvu_0020	Least Concern	0	yes	0.345	0.007	0.007	0.600		0.003	General		

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym				
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type		
7-9	Patch	cvu_0022	Depleted	0	yes	0.370	0.006	0.008	0.620		0.003	General		
7-10	Patch	cvu_0020	Least Concern	0	yes	0.345	0.010	0.010	0.550		0.004	General		
7-11	Patch	cvu_0020	Least Concern	0	yes	0.345	0.016	0.016	0.620		0.007	General		
7-12	Patch	cvu_0020	Least Concern	0	yes	0.345	0.064	0.064	0.616		0.027	General		
7-13	Patch	cvu_0022	Depleted	0	yes	0.370	0.407	0.407	0.641		0.185	General		
7-14	Patch	cvu_0020	Least Concern	0	yes	0.345	0.120	0.120	0.625		0.051	General		
7-15	Patch	cvu_0022	Depleted	0	yes	0.370	0.002	0.002	0.730		0.001	General		
7-16	Patch	cvu_0023	Depleted	0	yes	0.320	0.003	0.003	0.730		0.001	General		
7-17	Patch	cvu_0020	Least Concern	0	yes	0.345	0.003	0.003	0.604		0.001	General		
7-18	Patch	cvu_0020	Least Concern	0	yes	0.345	0.003	0.003	0.628		0.001	General		
7-19	Patch	cvu_0022	Depleted	0	yes	0.370	0.004	0.004	0.730		0.002	General		
7-20	Patch	cvu_0023	Depleted	0	yes	0.320	0.009	0.009	0.730		0.004	General		
7-21	Patch	cvu_0023	Depleted	0	yes	0.320	0.031	0.031	0.670		0.012	General		
7-22	Patch	cvu_0022	Depleted	0	yes	0.370	0.047	0.047	0.841		0.024	General		
7-23	Patch	cvu_0022	Depleted	0	yes	0.370	0.091	0.091	0.704		0.043	General		
7-24	Patch	cvu_0022	Depleted	0	yes	0.370	0.027	0.027	0.680		0.012	General		
7-25	Patch	cvu_0020	Least Concern	0	yes	0.345	0.037	0.037	0.680		0.016	General		
4-11	Patch	cvu_0020	Least Concern	0	yes	0.315	0.031	0.031	0.230		0.009	General		
4-12	Patch	cvu_0022	Depleted	0	yes	0.295	0.039	0.039	0.305		0.011	General		
4-13	Patch	cvu_0022	Depleted	0	yes	0.355	0.073	0.073	0.548		0.030	General		
4-14	Patch	cvu_0022	Depleted	0	yes	0.355	0.029	0.029	0.219		0.009	General		
6-26	Patch	cvu_0022	Depleted	0	yes	0.370	0.103	0.103	0.740		0.050	General		

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym					
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type			
2-1	Patch	cvu_0022	Depleted	0	yes	0.355	0.226	0.226	0.581		0.095	General			
4-15	Patch	cvu_0022	Depleted	0	yes	0.355	0.003	0.003	0.720		0.001	General			
4-16	Patch	cvu_0022	Depleted	0	yes	0.325	0.038	0.038	0.463		0.014	General			
4-17	Patch	cvu_0022	Depleted	0	yes	0.295	0.003	0.003	0.720		0.001	General			
4-18	Patch	cvu_0023	Depleted	0	yes	0.355	0.009	0.009	0.720		0.004	General			
7-71	Patch	cvu_0020	Least Concern	0	no	0.690	0.002	0.002	0.580		0.001	General			
7-72	Patch	cvu_0020	Least Concern	0	yes	0.345	0.124	0.124	0.611		0.052	General			
7-73	Patch	cvu_0022	Depleted	0	no	0.740	0.001	0.001	0.680		0.001	General			
7-74	Patch	cvu_0022	Depleted	0	yes	0.370	0.005	0.005	0.680		0.002	General			
6-89	Patch	cvu_0022	Depleted	0	no	0.740	0.002	0.002	0.990		0.002	General			
4-50	Patch	cvu_0022	Depleted	0	no	0.590	0.001	0.001	0.600		0.001	General			
4-51	Patch	cvu_0022	Depleted	0	yes	0.295	0.054	0.054	0.587		0.019	General			
1-1	Patch	cvu_0020	Least Concern	0	yes	0.315	0.293	0.293	0.543		0.107	General			
1-2	Patch	cvu_0023	Depleted	0	yes	0.275	0.007	0.007	0.570		0.002	General			
1-3	Patch	cvu_0023	Depleted	0	yes	0.275	0.040	0.040	0.586		0.013	General			
1-4	Patch	cvu_0022	Depleted	0	yes	0.355	0.029	0.029	0.750		0.014	General			
3-4	Patch	cvu_0020	Least Concern	0	yes	0.315	0.097	0.097	0.554		0.036	General			
4-52	Patch	cvu_0022	Depleted	0	yes	0.355	0.012	0.012	0.590		0.005	General			
3-5	Patch	cvu_0023	Depleted	0	yes	0.275	0.021	0.021	0.620		0.007	General			
4-58	Patch	cvu_0023	Depleted	0	yes	0.275	0.009	0.009	0.520		0.003	General			
3-6	Patch	cvu_0020	Least Concern	0	yes	0.315	0.005	0.005	0.620		0.002	General			
4-59	Patch	cvu_0022	Depleted	0	yes	0.355	0.077	0.077	0.661		0.034	General			

Information provided by or on behalf of the applicant in a GIS file						Information calculated by EnSym						
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
4-61	Patch	cvu_0022	Depleted	0	yes	0.355	0.037	0.037	0.214		0.012	General
4-62	Patch	cvu_0022	Depleted	0	yes	0.355	0.033	0.033	0.215		0.011	General
4-63	Patch	cvu_0020	Least Concern	0	yes	0.315	0.017	0.017	0.230		0.005	General
4-64	Patch	cvu_0020	Least Concern	0	yes	0.315	0.018	0.018	0.230		0.005	General
4-73	Patch	cvu_0023	Depleted	0	yes	0.355	0.013	0.013	0.720		0.006	General
4-74	Patch	cvu_0022	Depleted	0	yes	0.295	0.005	0.005	0.720		0.002	General
7-75	Patch	cvu_0022	Depleted	0	yes	0.370	0.084	0.084	0.701		0.040	General
6-90	Patch	cvu_0022	Depleted	0	yes	0.370	0.124	0.124	0.836		0.063	General
5-1	Patch	cvu_0020	Least Concern	0	yes	0.280	0.158	0.158	0.712		0.057	General
5-2	Patch	cvu_0020	Least Concern	0	yes	0.295	0.086	0.086	0.573		0.030	General
5-3	Patch	cvu_0020	Least Concern	0	yes	0.295	0.021	0.021	0.800		0.008	General
5-4	Patch	cvu_0022	Depleted	0	yes	0.370	0.007	0.007	0.700		0.003	General
5-5	Patch	cvu_0023	Depleted	0	yes	0.355	0.031	0.031	0.768		0.015	General
5-9	Patch	cvu_0023	Depleted	0	yes	0.355	0.017	0.017	0.733		0.008	General
5-10	Patch	cvu_0023	Depleted	0	yes	0.355	0.003	0.003	0.620		0.001	General
5-11	Patch	cvu_0023	Depleted	0	yes	0.355	0.006	0.006	0.654		0.003	General
5-12	Patch	cvu_0023	Depleted	0	yes	0.355	0.009	0.009	0.620		0.004	General
5-13	Patch	cvu_0023	Depleted	0	yes	0.355	0.020	0.020	0.752		0.009	General
6-92	Patch	cvu_0022	Depleted	0	yes	0.370	0.002	0.002	0.690		0.001	General
6-93	Patch	cvu_0022	Depleted	0	yes	0.370	0.001	0.001	0.690		0.000	General
6-94	Patch	cvu_0022	Depleted	0	yes	0.370	0.005	0.005	0.690		0.002	General
6-95	Patch	cvu_0022	Depleted	0	yes	0.370	0.008	0.008	0.644		0.004	General

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym					
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type			
7-80	Patch	cvu_0020	Least Concern	0	yes	0.175	0.003	0.003	0.680		0.001	General			
6-96	Patch	cvu_0022	Depleted	0	yes	0.370	0.002	0.002	0.766		0.001	General			
6-97	Patch	cvu_0022	Depleted	0	yes	0.370	0.002	0.002	0.720		0.001	General			
6-98	Patch	cvu_0022	Depleted	0	yes	0.370	0.002	0.002	0.700		0.001	General			
6-99	Patch	cvu_0022	Depleted	0	yes	0.370	0.001	0.001	0.700		0.000	General			
5-14	Patch	cvu_0023	Depleted	0	yes	0.355	0.037	0.037	0.722		0.017	General			
7-26	Canopy Tree	cvu_0020	Least Concern	0	no	0.350	0.031	0.028	0.680		0.012	General			
7-27	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.690		0.024	General			
7-28	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.646		0.023	General			
7-29	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.025	0.740		0.022	General			
7-30	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.025	0.740		0.022	General			
7-31	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.770		0.025	General			
7-32	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.025	0.770		0.023	General			
7-33	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.022	0.610		0.018	General			
7-34	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.021	0.610		0.017	General			
7-35	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.025	0.610		0.021	General			
7-36	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.610		0.022	General			

Information provided by or on behalf of the applicant in a GIS file						Information calculated by EnSym						
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
7-37	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.590		0.022	General
7-38	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.590		0.022	General
7-39	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.580		0.022	General
6-29	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.720		0.026	General
7-40	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.580		0.022	General
7-41	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.580		0.022	General
7-42	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.580		0.022	General
7-43	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.023	0.589		0.019	General
7-44	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.024	0.590		0.019	General
7-45	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.680		0.024	General
7-46	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.680		0.023	General
7-47	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.573		0.022	General
7-48	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.018	0.680		0.017	General
7-49	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.018	0.680		0.017	General
7-50	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.019	0.690		0.017	General

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym					
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type			
7-51	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.019	0.680		0.017	General			
7-52	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.690		0.025	General			
7-53	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.024	0.680		0.021	General			
7-54	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.024	0.680		0.021	General			
7-55	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.019	0.700		0.018	General			
7-56	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.019	0.700		0.018	General			
7-57	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.700		0.026	General			
7-58	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.019	0.730		0.018	General			
7-59	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.020	0.730		0.019	General			
7-60	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.990		0.030	General			
7-61	Canopy Tree	cvu_0023	Depleted	0	no	0.640	0.031	0.027	0.670		0.022	General			
7-62	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.620		0.023	General			
7-63	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.017	0.620		0.014	General			
7-64	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.016	0.620		0.014	General			
7-65	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.620		0.023	General			

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym				
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type		
7-66	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.620		0.023	General		
7-67	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.017	0.620		0.014	General		
7-68	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.017	0.620		0.014	General		
7-69	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.780		0.025	General		
6-30	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.029	0.640		0.026	General		
7-70	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.600		0.022	General		
6-31	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.025	0.790		0.025	General		
6-32	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.640		0.025	General		
6-34	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.028	0.690		0.025	General		
6-35	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.690		0.025	General		
6-36	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.720		0.026	General		
6-37	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.720		0.026	General		
6-38	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.650		0.025	General		
6-39	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.650		0.025	General		
6-40	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.020	0.710		0.019	General		

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym				
Zone	Type	BioEVC	BioEVC conservation status	Large trees(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type		
6-41	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.008	0.718		0.008	General		
6-42	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.009	0.711		0.008	General		
6-43	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.016	0.790		0.016	General		
6-44	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.007	0.790		0.007	General		
6-45	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.017	0.790		0.017	General		
6-46	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.011	0.762		0.010	General		
6-47	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.015	0.790		0.015	General		
6-48	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.008	0.790		0.007	General		
6-49	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.013	0.790		0.013	General		
6-50	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.014	0.790		0.014	General		
6-51	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.012	0.790		0.012	General		
6-52	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.017	0.790		0.016	General		
6-53	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.019	0.790		0.019	General		
6-54	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.020	0.790		0.019	General		
6-55	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.020	0.790		0.019	General		

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym				
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type		
6-56	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.018	0.790		0.018	General		
6-57	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.028	0.702		0.026	General		
6-58	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.023	0.800		0.023	General		
6-59	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.024	0.800		0.024	General		
6-60	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.770		0.027	General		
6-61	Canopy Tree	cvu_0023	Depleted	0	no	0.640	0.031	0.027	0.770		0.023	General		
6-62	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.015	0.740		0.015	General		
6-63	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.014	0.740		0.014	General		
6-64	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.740		0.026	General		
6-65	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.022	0.740		0.021	General		
6-66	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.021	0.740		0.021	General		
6-67	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.028	0.590		0.026	General		
6-68	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.660		0.025	General		
6-69	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.730		0.025	General		
6-70	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.990		0.030	General		

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym					
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type			
6-71	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.025	0.600		0.022	General			
6-72	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.025	0.600		0.022	General			
6-73	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.023	0.700		0.022	General			
6-74	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.023	0.700		0.022	General			
6-75	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.030	0.702		0.029	General			
6-76	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.790		0.027	General			
6-77	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.670		0.025	General			
6-78	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.680		0.026	General			
6-A	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.730		0.026	General			
6-79	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.730		0.026	General			
6-80	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.730		0.026	General			
6-81	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.730		0.026	General			
6-82	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.730		0.026	General			
6-83	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.018	0.680		0.016	General			
6-84	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.018	0.680		0.017	General			

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
6-85	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.695		0.025	General
6-86	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.023	0.790		0.023	General
6-87	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.024	0.790		0.023	General
4-19	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.027	0.200		0.017	General
4-20	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.027	0.740		0.025	General
4-21	Canopy Tree	cvu_0020	Least Concern	0	no	0.630	0.031	0.015	0.230		0.009	General
4-22	Canopy Tree	cvu_0020	Least Concern	0	no	0.630	0.031	0.015	0.230		0.009	General
4-23	Canopy Tree	cvu_0023	Depleted	0	no	0.710	0.031	0.027	0.670		0.024	General
4-24	Canopy Tree	cvu_0022	Depleted	0	no	0.650	0.031	0.015	0.670		0.012	General
4-25	Canopy Tree	cvu_0022	Depleted	0	no	0.650	0.031	0.006	0.670		0.005	General
4-26	Canopy Tree	cvu_0022	Depleted	0	no	0.650	0.031	0.018	0.670		0.015	General
4-27	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.016	0.691		0.014	General
4-28	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.015	0.682		0.014	General
4-29	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.027	0.740		0.025	General
2-9	Canopy Tree	cvu_0023	Depleted	0	no	0.550	0.031	0.028	0.560		0.018	General

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym					
Zone	Type	BioEVC	BioEVC conservation status	Large trees(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type			
2-10	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.006	0.510		0.005	General			
2-11	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.010	0.510		0.008	General			
2-12	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.014	0.510		0.011	General			
2-13	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.014	0.510		0.011	General			
2-14	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.027	0.560		0.023	General			
2-15	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.027	0.510		0.022	General			
2-16	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.017	0.560		0.014	General			
2-17	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.016	0.560		0.014	General			
4-30	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.027	0.750		0.021	General			
4-31	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.027	0.848		0.020	General			
4-32	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.027	0.770		0.021	General			
4-33	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.026	0.750		0.020	General			
4-34	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.027	0.850		0.022	General			
4-35	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.027	0.850		0.022	General			
4-36	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.027	0.850		0.022	General			

Information provided by or on behalf of the applicant in a GIS file				Information calculated by EnSym								
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
4-37	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.026	0.850		0.021	General
4-38	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.027	0.808		0.022	General
4-39	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.028	0.800		0.022	General
4-40	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.018	0.611		0.013	General
4-41	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.018	0.581		0.013	General
4-42	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.027	0.580		0.019	General
4-43	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.027	0.600		0.019	General
4-44	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.027	0.600		0.019	General
4-45	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.027	0.580		0.019	General
4-46	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.023	0.580		0.016	General
4-47	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.013	0.580		0.009	General
4-48	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.008	0.580		0.006	General
4-49	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.018	0.590		0.013	General
6-88	Canopy Tree	cvu_0022	Depleted	1	no	0.740	0.070	0.064	0.670		0.060	General
4-53	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.029	0.620		0.025	General

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym				
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type		
4-54	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.019	0.646		0.017	General		
4-55	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.016	0.770		0.015	General		
4-56	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.021	0.760		0.020	General		
4-57	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.025	0.625		0.021	General		
4-50	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.027	0.740		0.025	General		
4-65	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.027	0.200		0.017	General		
4-66	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.027	0.230		0.018	General		
4-67	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.015	0.230		0.010	General		
4-68	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.015	0.230		0.010	General		
4-69	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.021	0.200		0.014	General		
4-70	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.013	0.200		0.008	General		
4-71	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.010	0.200		0.007	General		
4-72	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.015	0.200		0.010	General		
7-76	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.760		0.026	General		
7-77	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.610		0.024	General		

Information provided by or on behalf of the applicant in a GIS file				Information calculated by EnSym								
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
7-78	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.588		0.024	General
6-91	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.960		0.030	General
5-6	Canopy Tree	cvu_0020	Least Concern	0	no	0.560	0.031	0.029	0.720		0.021	General
5-7	Canopy Tree	cvu_0020	Least Concern	0	no	0.560	0.031	0.029	0.683		0.020	General
5-8	Canopy Tree	cvu_0020	Least Concern	0	no	0.560	0.031	0.027	0.650		0.019	General
7-79	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.026	0.761		0.025	General
6-C	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.031	0.990		0.034	General
6-B	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.031	0.934		0.033	General
4-75	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.014	0.200		0.009	General
6-33	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.690		0.025	General
1-5	Canopy Tree	cvu_0020	Least Concern	0	no	0.630	0.031	0.016	0.528		0.012	General
1-6	Canopy Tree	cvu_0020	Least Concern	0	no	0.630	0.031	0.016	0.542		0.011	General
4-76	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.027	0.750		0.021	General

Appendix 2: Information about impacts to rare or threatened species' habitats on site

This table lists all rare or threatened species' habitats mapped at the site.

Species common name	Species scientific name	Species number	Conservation status	Group	Habitat impacted	% habitat value affected
Creeping Grevillea	<i>Grevillea repens</i>	501549	Rare	Dispersed	Habitat importance map	0.0037
Dwarf Silver Wattle	<i>Acacia nano-dealbata</i>	500064	Rare	Dispersed	Habitat importance map	0.0009
Yarra Gum	<i>Eucalyptus yarraensis</i>	501326	Rare	Dispersed	Habitat importance map	0.0007
Square-tailed Kite	<i>Lophoictinia isura</i>	10230	Vulnerable	Dispersed	Habitat importance map	0.0004
Grey Goshawk	<i>Accipiter novae-hollandiae</i> <i>novae-hollandiae</i>	10220	Vulnerable	Dispersed	Habitat importance map ; special site	0.0003
Australian Anchor Plant	<i>Discaria pubescens</i>	501072	Rare	Dispersed	Habitat importance map	0.0002
Brooker's Gum	<i>Eucalyptus brookeriana</i>	501256	Rare	Dispersed	Habitat importance map	0.0002
White-throated Needletail	<i>Myndopus caudatus</i>	10334	Vulnerable	Dispersed	Habitat importance map	0.0001
Spotted Hyacinth-orchid	<i>Dipodium parlatinum</i>	500324	Rare	Dispersed	Habitat importance map	0.0001
Southern Toadlet	<i>Pseudophryne semimarmorata</i>	13125	Vulnerable	Dispersed	Habitat importance map	0.0000
Tremont Bundy	<i>Eucalyptus aff. gonocalyx</i> (Dandenong Ranges)	507008	Vulnerable	Dispersed	Habitat importance map	0.0000
Australasian Showeler	<i>Anas rhynchobis</i>	10212	Vulnerable	Dispersed	Habitat importance map	0.0000
Growing Grass Frog	<i>Litoria raniformis</i>	13207	Endangered	Dispersed	Habitat importance map	0.0000
Hardhead	<i>Aythya australis</i>	10215	Vulnerable	Dispersed	Habitat importance map	0.0000
Baird's Crane	<i>Porzana pusilla palustris</i>	10050	Vulnerable	Dispersed	Habitat importance map	0.0000
Australian Painted Snipe	<i>Rostratula australis</i>	10170	Critically endangered	Dispersed	Habitat importance map	0.0000
Blue-billed Duck	<i>Oxyura australis</i>	10216	Endangered	Dispersed	Habitat importance map	0.0000
Musk Duck	<i>Biziura lobata</i>	10217	Vulnerable	Dispersed	Habitat importance map	0.0000
Lewin's Rail	<i>Lewinia pectoralis pectoralis</i>	10045	Vulnerable	Dispersed	Habitat importance map	0.0000

Habitat group

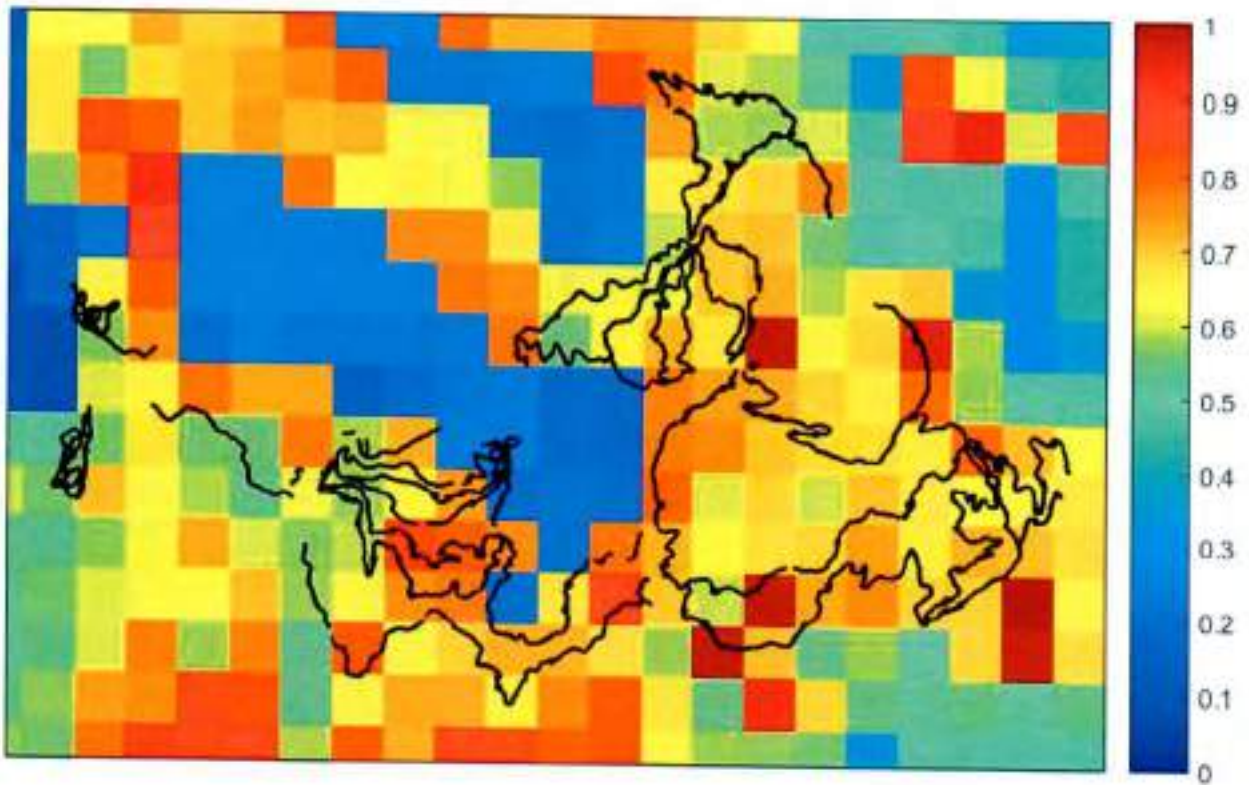
- Highly localised habitat means there is 2000 hectares or less mapped habitat for the species
- Dispersed habitat means there is more than 2000 hectares of mapped habitat for the species

Habitat impacted

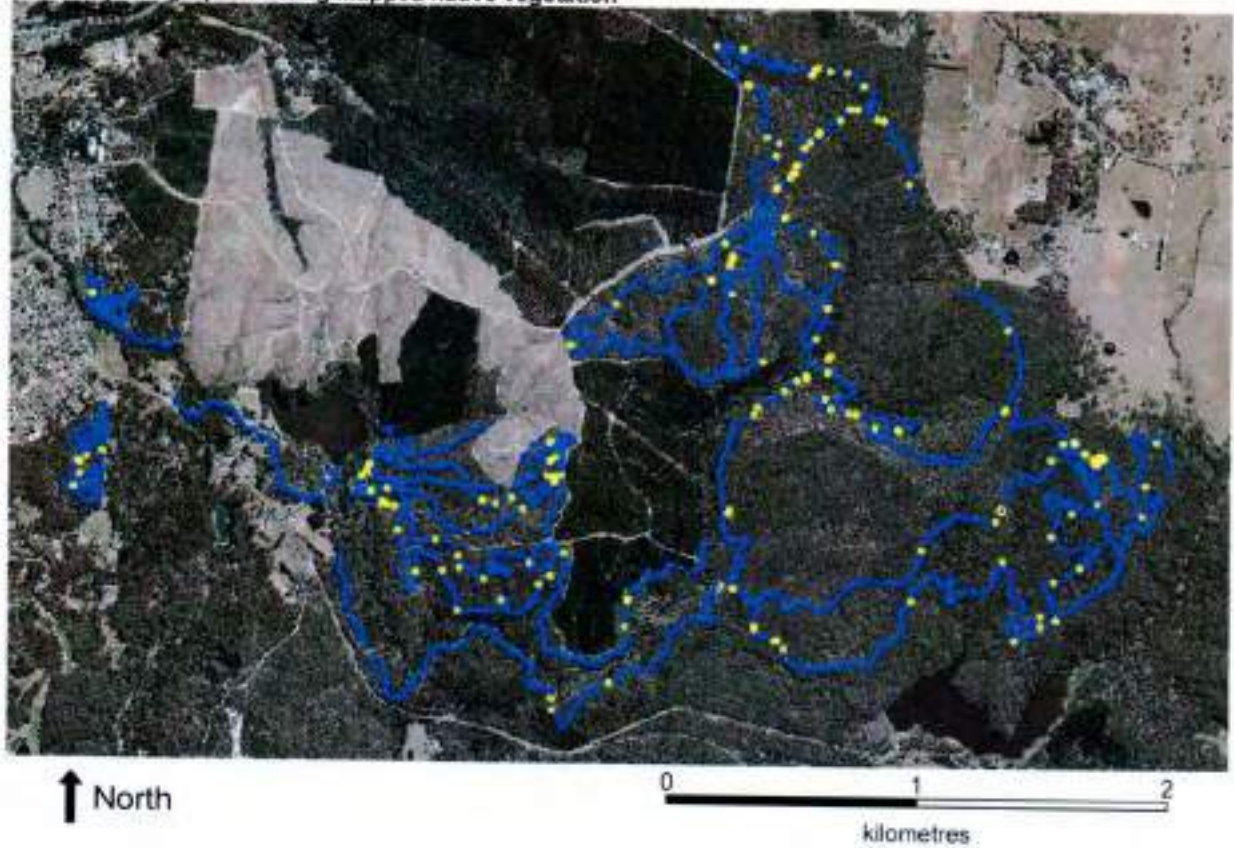
- Habitat importance maps are the maps defined in the Guidelines that include all the mapped habitat for a rare or threatened species
- Top ranking maps are the maps defined in the Guidelines that depict the important areas of a dispersed species habitat, developed from the highest habitat importance scores in dispersed species habitat maps and selected VBA records
- Selected VBA record is an area in Victoria that represents a large population, roosting or breeding site etc.

Appendix 3 – Images of mapped native vegetation

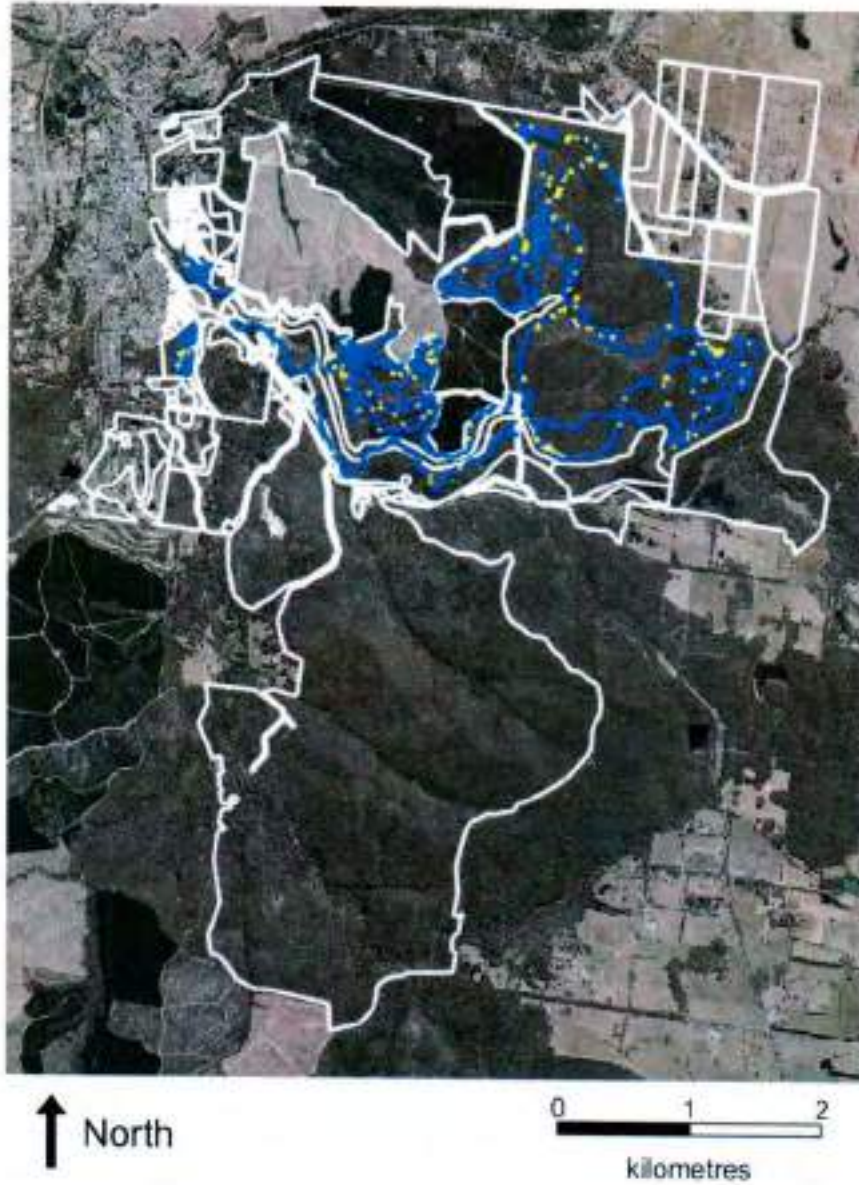
2. Strategic biodiversity values map



3. Aerial photograph showing mapped native vegetation



4. Map of the property in context



Yellow boundaries denote areas of proposed native vegetation removal.

Blue boundaries denote zones of partial removal with a halved condition score.

This report provides information to support an application to remove, destroy or lop native vegetation in accordance with the *Guidelines for the removal, destruction or lopping of native vegetation*. The report **is not an assessment by DELWP** of the proposed native vegetation removal. Native vegetation information and offset requirements have been determined using spatial data provided by the applicant or their consultant.

Date of issue: 01/03/2021

Report ID: BIO_2021_012

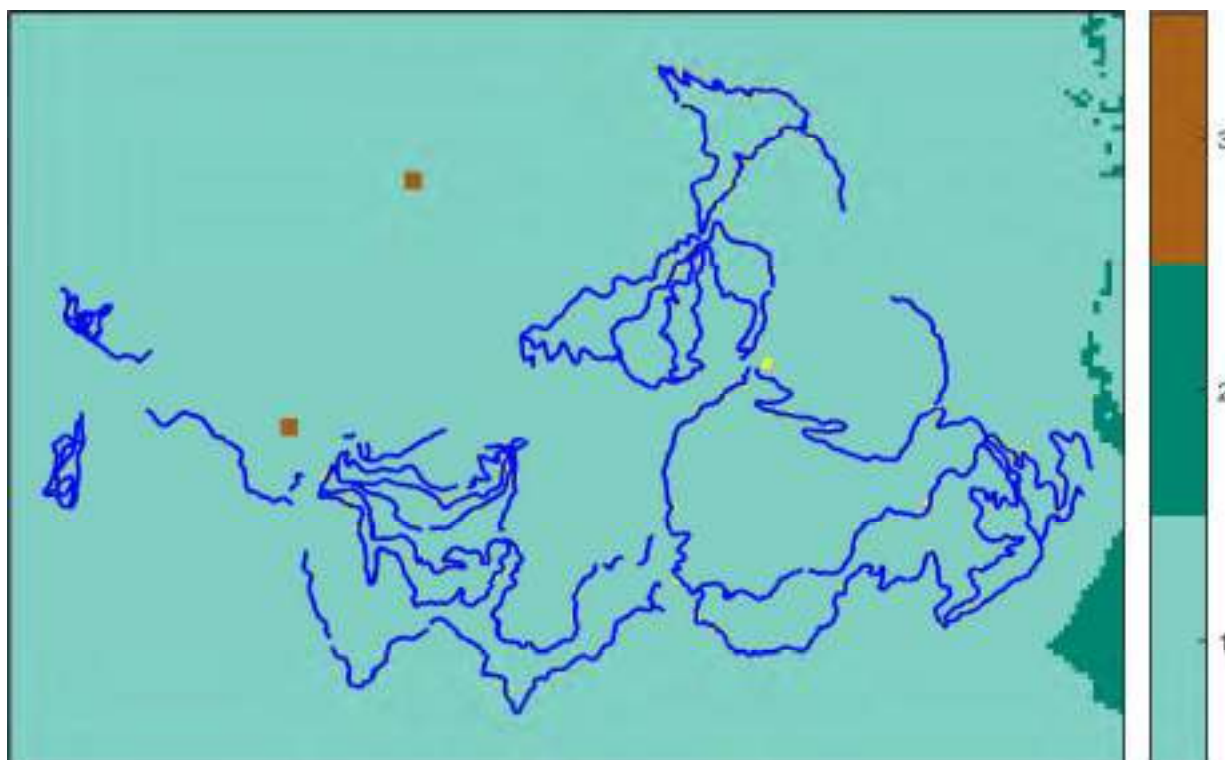
Time of issue: 3:16 pm

Project ID	Creswick_MTB_trails
------------	---------------------

Assessment pathway

Assessment pathway	Detailed Assessment Pathway
Extent including past and proposed	11.867 ha
Extent of past removal	0.000 ha
Extent of proposed removal	11.867 ha
No. Large trees proposed to be removed	1
Location category of proposed removal	Location 1 The native vegetation is not in an area mapped as an endangered Ecological Vegetation Class (as per the statewide EVC map), sensitive wetland or coastal area. Removal of less than 0.5 hectares in this location will not have a significant impact on any habitat for a rare or threatened species

1. Location map



Offset requirements if a permit is granted

Any approval granted will include a condition to obtain an offset that meets the following requirements:

General offset amount¹	6.858 general habitat units
Vicinity	North Central Catchment Management Authority (CMA) or Hepburn Shire Council
Minimum strategic biodiversity value score ²	0.530
Large trees	1 large tree

NB: values within tables in this document may not add to the totals shown above due to rounding

Appendix 1 includes information about the native vegetation to be removed

Appendix 2 includes information about the rare or threatened species mapped at the site.

Appendix 3 includes maps showing native vegetation to be removed and extracts of relevant species habitat importance maps

¹ The general offset amount required is the sum of all general habitat units in Appendix 1.

² Minimum strategic biodiversity score is 80 per cent of the weighted average score across habitat zones where a general offset is required

Next steps

Any proposal to remove native vegetation must meet the application requirements of the Detailed Assessment Pathway and it will be assessed under the Detailed Assessment Pathway.

If you wish to remove the mapped native vegetation you are required to apply for a permit from your local council. Council will refer your application to DELWP for assessment, as required. **This report is not a referral assessment by DELWP.**

This *Native vegetation removal report* must be submitted with your application for a permit to remove, destroy or lop native vegetation.

Refer to the *Guidelines for the removal, destruction or lopping of native vegetation* (the Guidelines) for a full list of application requirements. This report provides information that meets the following application requirements:

- The assessment pathway and reason for the assessment pathway
- A description of the native vegetation to be removed (partly met)
- Maps showing the native vegetation and property (partly met)
- Information about the impacts on rare or threatened species.
- The offset requirements determined in accordance with section 5 of the Guidelines that apply if approval is granted to remove native vegetation.

Additional application requirements must be met including:

- Topographical and land information
- Recent dated photographs
- Details of past native vegetation removal
- An avoid and minimise statement
- A copy of any Property Vegetation Plan that applies
- A defensible space statement as applicable
- A statement about the Native Vegetation Precinct Plan as applicable
- A site assessment report including a habitat hectare assessment of any patches of native vegetation and details of trees
- An offset statement that explains that an offset has been identified and how it will be secured.

© The State of Victoria Department of Environment, Land, Water and Planning Melbourne 2021

This work is licensed under a Creative Commons Attribution 4.0 International licence. You are free to re-use the work under that licence, on the condition that you credit the State of Victoria as author. The licence does not apply to any images, photographs or branding, including the Victorian Coat of Arms, the Victorian Government logo and the Department of Environment, Land, Water and Planning logo. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/3.0/au/deed.en>

Authorised by the Victorian Government, 8 Nicholson Street, East Melbourne.

For more information contact the DELWP Customer Service Centre 136 186

www.delwp.vic.gov.au

Disclaimer

This publication may be of assistance to you but the State of Victoria and its employees do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication.

Obtaining this publication does not guarantee that an application will meet the requirements of Clauses 52.16 or 52.17 of the Victoria Planning Provisions and Victorian planning schemes or that a permit to remove native vegetation will be granted.

Notwithstanding anything else contained in this publication, you must ensure that you comply with all relevant laws, legislation, awards or orders and that you obtain and comply with all permits, approvals and the like that affect, are applicable or are necessary to undertake any action to remove, lop or destroy or otherwise deal with any native vegetation or that apply to matters within the scope of Clauses 52.16 or 52.17 of the Victoria Planning Provisions and Victorian planning schemes.

Appendix 1: Description of native vegetation to be removed

The species-general offset test was applied to your proposal. This test determines if the proposed removal of native vegetation has a proportional impact on any rare or threatened species habitats above the species offset threshold. The threshold is set at 0.005 per cent of the mapped habitat value for a species. When the proportional impact is above the species offset threshold a species offset is required. This test is done for all species mapped at the site. Multiple species offsets will be required if the species offset threshold is exceeded for multiple species.

Where a zone requires species offset(s), the species habitat units for each species in that zone is calculated by the following equation in accordance with the Guidelines:

$$\text{Species habitat units} = \text{extent} \times \text{condition} \times \text{species landscape factor} \times 2, \text{ where the species landscape factor} = 0.5 + (\text{habitat importance score}/2)$$

The species offset amount(s) required is the sum of all species habitat units per zone

Where a zone does not require a species offset, the general habitat units in that zone is calculated by the following equation in accordance with the Guidelines:

$$\text{General habitat units} = \text{extent} \times \text{condition} \times \text{general landscape factor} \times 1.5, \text{ where the general landscape factor} = 0.5 + (\text{strategic biodiversity value score}/2)$$

The general offset amount required is the sum of all general habitat units per zone.

Native vegetation to be removed

Zone	Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym				
	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
3-1	Patch	cvu_0022	Depleted	0	yes	0.370	0.011	0.011	0.690		0.005	General
4-1	Patch	cvu_0022	Depleted	0	yes	0.295	0.041	0.041	0.296		0.012	General
4-2	Patch	cvu_0023	Depleted	0	yes	0.355	0.079	0.079	0.701		0.036	General
4-3	Patch	cvu_0022	Depleted	0	yes	0.325	0.023	0.023	0.780		0.010	General
6-2	Patch	cvu_0022	Depleted	0	yes	0.370	0.113	0.113	0.681		0.053	General
4-4	Patch	cvu_0023	Depleted	0	yes	0.355	0.032	0.032	0.778		0.015	General
6-3	Patch	cvu_0022	Depleted	0	yes	0.370	0.076	0.076	0.720		0.036	General
6-4	Patch	cvu_0022	Depleted	0	yes	0.370	0.134	0.134	0.698		0.063	General
4-5	Patch	cvu_0022	Depleted	0	yes	0.295	0.252	0.252	0.715		0.096	General
4-6	Patch	cvu_0022	Depleted	0	yes	0.295	0.448	0.448	0.712		0.170	General
6-5	Patch	cvu_0022	Depleted	0	yes	0.370	0.299	0.299	0.686		0.140	General

ATTACHMENT 10.1.2

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym				
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type		
6-6	Patch	cvu_0022	Depleted	0	yes	0.370	0.041	0.041	0.640		0.019	General		
4-7	Patch	cvu_0022	Depleted	0	yes	0.355	0.437	0.437	0.641		0.191	General		
4-8	Patch	cvu_0020	Least Concern	0	yes	0.315	0.021	0.021	0.231		0.006	General		
6-7	Patch	cvu_0022	Depleted	0	yes	0.370	0.027	0.027	0.790		0.013	General		
6-8	Patch	cvu_0022	Depleted	0	yes	0.370	0.053	0.053	0.709		0.025	General		
4-9	Patch	cvu_0022	Depleted	0	yes	0.355	0.113	0.113	0.632		0.049	General		
3-2	Patch	cvu_0020	Least Concern	0	yes	0.315	0.037	0.037	0.676		0.015	General		
6-9	Patch	cvu_0022	Depleted	0	yes	0.370	0.451	0.451	0.712		0.214	General		
6-10	Patch	cvu_0022	Depleted	0	yes	0.370	0.359	0.359	0.706		0.170	General		
6-11	Patch	cvu_0022	Depleted	0	yes	0.370	0.121	0.121	0.780		0.060	General		
7-1	Patch	cvu_0020	Least Concern	0	yes	0.345	0.328	0.328	0.655		0.140	General		
7-2	Patch	cvu_0022	Depleted	0	yes	0.370	0.131	0.131	0.691		0.061	General		
7-3	Patch	cvu_0020	Least Concern	0	yes	0.345	0.073	0.073	0.694		0.032	General		
7-4	Patch	cvu_0020	Least Concern	0	yes	0.345	0.234	0.234	0.686		0.102	General		
6-12	Patch	cvu_0022	Depleted	0	yes	0.370	0.056	0.056	0.673		0.026	General		
6-13	Patch	cvu_0022	Depleted	0	yes	0.370	0.258	0.258	0.752		0.125	General		
6-14	Patch	cvu_0022	Depleted	0	yes	0.370	0.035	0.035	0.747		0.017	General		
6-15	Patch	cvu_0022	Depleted	0	yes	0.370	0.014	0.014	0.700		0.007	General		
6-16	Patch	cvu_0022	Depleted	0	yes	0.370	0.002	0.002	0.700		0.001	General		
6-17	Patch	cvu_0022	Depleted	0	yes	0.370	0.002	0.002	0.700		0.001	General		
6-18	Patch	cvu_0022	Depleted	0	yes	0.370	0.039	0.039	0.690		0.018	General		
6-19	Patch	cvu_0022	Depleted	0	yes	0.370	0.001	0.001	0.690		0.000	General		

ATTACHMENT 10.1.2

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym				
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type		
6-20	Patch	cvu_0022	Depleted	0	yes	0.370	0.023	0.023	0.690		0.011	General		
6-21	Patch	cvu_0022	Depleted	0	yes	0.370	0.165	0.165	0.680		0.077	General		
7-5	Patch	cvu_0020	Least Concern	0	yes	0.345	0.070	0.070	0.643		0.030	General		
6-22	Patch	cvu_0023	Depleted	0	yes	0.355	0.010	0.010	0.700		0.004	General		
4-10	Patch	cvu_0022	Depleted	0	yes	0.355	0.005	0.005	0.240		0.002	General		
6-23	Patch	cvu_0022	Depleted	0	yes	0.370	0.015	0.015	0.630		0.007	General		
6-24	Patch	cvu_0164	Vulnerable	0	yes	0.360	0.022	0.022	0.630		0.010	General		
2-5	Patch	cvu_0022	Depleted	0	yes	0.355	0.023	0.023	0.560		0.009	General		
2-7	Patch	cvu_0022	Depleted	0	yes	0.355	0.002	0.002	0.560		0.001	General		
2-8	Patch	cvu_0023	Depleted	0	yes	0.275	0.005	0.005	0.710		0.002	General		
2-6	Patch	cvu_0020	Least Concern	0	yes	0.315	0.006	0.006	0.510		0.002	General		
2-4	Patch	cvu_0023	Depleted	0	yes	0.275	0.039	0.039	0.672		0.014	General		
2-3	Patch	cvu_0020	Least Concern	0	yes	0.315	0.044	0.044	0.512		0.016	General		
2-2	Patch	cvu_0023	Depleted	0	yes	0.275	0.051	0.051	0.566		0.016	General		
3-1	Patch	cvu_0023	Depleted	0	yes	0.275	0.013	0.013	0.780		0.005	General		
3-3	Patch	cvu_0020	Least Concern	0	yes	0.315	0.037	0.037	0.614		0.014	General		
6-25	Patch	cvu_0023	Depleted	0	yes	0.320	0.011	0.011	0.755		0.005	General		
6-26	Patch	cvu_0023	Depleted	0	yes	0.320	0.012	0.012	0.740		0.005	General		
6-27	Patch	cvu_0022	Depleted	0	yes	0.370	0.041	0.041	0.740		0.020	General		
7-6	Patch	cvu_0022	Depleted	0	yes	0.370	0.002	0.002	0.620		0.001	General		
7-7	Patch	cvu_0022	Depleted	0	yes	0.370	0.004	0.004	0.550		0.002	General		
7-8	Patch	cvu_0020	Least Concern	0	yes	0.345	0.007	0.007	0.600		0.003	General		

ATTACHMENT 10.1.2

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
7-9	Patch	cvu_0022	Depleted	0	yes	0.370	0.008	0.008	0.620		0.003	General
7-10	Patch	cvu_0020	Least Concern	0	yes	0.345	0.010	0.010	0.550		0.004	General
7-11	Patch	cvu_0020	Least Concern	0	yes	0.345	0.016	0.016	0.620		0.007	General
7-12	Patch	cvu_0020	Least Concern	0	yes	0.345	0.064	0.064	0.616		0.027	General
7-13	Patch	cvu_0022	Depleted	0	yes	0.370	0.407	0.407	0.641		0.185	General
7-14	Patch	cvu_0020	Least Concern	0	yes	0.345	0.120	0.120	0.625		0.051	General
7-15	Patch	cvu_0022	Depleted	0	yes	0.370	0.002	0.002	0.730		0.001	General
7-16	Patch	cvu_0023	Depleted	0	yes	0.320	0.003	0.003	0.730		0.001	General
7-17	Patch	cvu_0020	Least Concern	0	yes	0.345	0.003	0.003	0.604		0.001	General
7-18	Patch	cvu_0020	Least Concern	0	yes	0.345	0.003	0.003	0.628		0.001	General
7-19	Patch	cvu_0022	Depleted	0	yes	0.370	0.004	0.004	0.730		0.002	General
7-20	Patch	cvu_0023	Depleted	0	yes	0.320	0.009	0.009	0.730		0.004	General
7-21	Patch	cvu_0023	Depleted	0	yes	0.320	0.031	0.031	0.670		0.012	General
7-22	Patch	cvu_0022	Depleted	0	yes	0.370	0.047	0.047	0.841		0.024	General
7-23	Patch	cvu_0022	Depleted	0	yes	0.370	0.091	0.091	0.704		0.043	General
7-24	Patch	cvu_0022	Depleted	0	yes	0.370	0.027	0.027	0.680		0.012	General
7-25	Patch	cvu_0020	Least Concern	0	yes	0.345	0.037	0.037	0.680		0.016	General
4-11	Patch	cvu_0020	Least Concern	0	yes	0.315	0.031	0.031	0.230		0.009	General
4-12	Patch	cvu_0022	Depleted	0	yes	0.295	0.039	0.039	0.305		0.011	General
4-13	Patch	cvu_0022	Depleted	0	yes	0.355	0.073	0.073	0.548		0.030	General
4-14	Patch	cvu_0022	Depleted	0	yes	0.355	0.029	0.029	0.219		0.009	General
6-28	Patch	cvu_0022	Depleted	0	yes	0.370	0.103	0.103	0.740		0.050	General

ATTACHMENT 10.1.2

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
2-1	Patch	cvu_0022	Depleted	0	yes	0.355	0.226	0.226	0.581		0.095	General
4-15	Patch	cvu_0022	Depleted	0	yes	0.355	0.003	0.003	0.720		0.001	General
4-16	Patch	cvu_0022	Depleted	0	yes	0.325	0.038	0.038	0.463		0.014	General
4-17	Patch	cvu_0022	Depleted	0	yes	0.295	0.003	0.003	0.720		0.001	General
4-18	Patch	cvu_0023	Depleted	0	yes	0.355	0.009	0.009	0.720		0.004	General
7-71	Patch	cvu_0020	Least Concern	0	no	0.690	0.002	0.002	0.580		0.001	General
7-72	Patch	cvu_0020	Least Concern	0	yes	0.345	0.124	0.124	0.611		0.052	General
7-73	Patch	cvu_0022	Depleted	0	no	0.740	0.001	0.001	0.680		0.001	General
7-74	Patch	cvu_0022	Depleted	0	yes	0.370	0.005	0.005	0.680		0.002	General
8-89	Patch	cvu_0022	Depleted	0	no	0.740	0.002	0.002	0.990		0.002	General
4-50	Patch	cvu_0022	Depleted	0	no	0.590	0.001	0.001	0.600		0.001	General
4-51	Patch	cvu_0022	Depleted	0	yes	0.295	0.054	0.054	0.587		0.019	General
1-1	Patch	cvu_0020	Least Concern	0	yes	0.315	0.293	0.293	0.543		0.107	General
1-2	Patch	cvu_0023	Depleted	0	yes	0.275	0.007	0.007	0.570		0.002	General
1-3	Patch	cvu_0023	Depleted	0	yes	0.275	0.040	0.040	0.586		0.013	General
1-4	Patch	cvu_0022	Depleted	0	yes	0.355	0.029	0.029	0.750		0.014	General
3-4	Patch	cvu_0020	Least Concern	0	yes	0.315	0.097	0.097	0.554		0.036	General
4-52	Patch	cvu_0022	Depleted	0	yes	0.355	0.012	0.012	0.590		0.005	General
3-5	Patch	cvu_0023	Depleted	0	yes	0.275	0.021	0.021	0.620		0.007	General
4-58	Patch	cvu_0023	Depleted	0	yes	0.275	0.009	0.009	0.620		0.003	General
3-6	Patch	cvu_0020	Least Concern	0	yes	0.315	0.005	0.005	0.620		0.002	General
4-59	Patch	cvu_0022	Depleted	0	yes	0.355	0.077	0.077	0.661		0.034	General

ATTACHMENT 10.1.2

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym				
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type		
4-61	Patch	cvu_0022	Depleted	0	yes	0.355	0.037	0.037	0.214		0.012	General		
4-62	Patch	cvu_0022	Depleted	0	yes	0.355	0.033	0.033	0.215		0.011	General		
4-63	Patch	cvu_0020	Least Concern	0	yes	0.315	0.017	0.017	0.230		0.005	General		
4-64	Patch	cvu_0020	Least Concern	0	yes	0.315	0.018	0.018	0.230		0.005	General		
4-73	Patch	cvu_0023	Depleted	0	yes	0.355	0.013	0.013	0.720		0.006	General		
4-74	Patch	cvu_0022	Depleted	0	yes	0.295	0.005	0.005	0.720		0.002	General		
7-75	Patch	cvu_0022	Depleted	0	yes	0.370	0.084	0.084	0.701		0.040	General		
5-90	Patch	cvu_0022	Depleted	0	yes	0.370	0.124	0.124	0.836		0.063	General		
5-1	Patch	cvu_0020	Least Concern	0	yes	0.280	0.158	0.158	0.712		0.057	General		
5-2	Patch	cvu_0020	Least Concern	0	yes	0.295	0.086	0.086	0.573		0.030	General		
5-3	Patch	cvu_0020	Least Concern	0	yes	0.295	0.021	0.021	0.800		0.008	General		
5-4	Patch	cvu_0022	Depleted	0	yes	0.370	0.007	0.007	0.700		0.003	General		
5-5	Patch	cvu_0023	Depleted	0	yes	0.355	0.031	0.031	0.769		0.015	General		
5-9	Patch	cvu_0023	Depleted	0	yes	0.355	0.017	0.017	0.733		0.008	General		
5-10	Patch	cvu_0023	Depleted	0	yes	0.355	0.003	0.003	0.620		0.001	General		
5-11	Patch	cvu_0023	Depleted	0	yes	0.355	0.006	0.006	0.654		0.003	General		
5-12	Patch	cvu_0023	Depleted	0	yes	0.355	0.009	0.009	0.620		0.004	General		
5-13	Patch	cvu_0023	Depleted	0	yes	0.355	0.020	0.020	0.752		0.009	General		
6-92	Patch	cvu_0022	Depleted	0	yes	0.370	0.002	0.002	0.690		0.001	General		
6-93	Patch	cvu_0022	Depleted	0	yes	0.370	0.001	0.001	0.690		0.000	General		
6-94	Patch	cvu_0022	Depleted	0	yes	0.370	0.005	0.005	0.690		0.002	General		
6-95	Patch	cvu_0022	Depleted	0	yes	0.370	0.008	0.008	0.644		0.004	General		

ATTACHMENT 10.1.2

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym				
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type		
7-80	Patch	cvu_0020	Least Concern	0	yes	0.175	0.003	0.003	0.680		0.001	General		
6-96	Patch	cvu_0022	Depleted	0	yes	0.370	0.002	0.002	0.786		0.001	General		
6-97	Patch	cvu_0022	Depleted	0	yes	0.370	0.002	0.002	0.720		0.001	General		
6-98	Patch	cvu_0022	Depleted	0	yes	0.370	0.002	0.002	0.700		0.001	General		
6-99	Patch	cvu_0022	Depleted	0	yes	0.370	0.001	0.001	0.700		0.000	General		
5-14	Patch	cvu_0023	Depleted	0	yes	0.355	0.037	0.037	0.722		0.017	General		
7-26	Canopy Tree	cvu_0020	Least Concern	0	no	0.350	0.031	0.028	0.680		0.012	General		
7-27	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.680		0.024	General		
7-28	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.646		0.023	General		
7-29	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.025	0.740		0.022	General		
7-30	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.025	0.740		0.022	General		
7-31	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.770		0.025	General		
7-32	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.025	0.770		0.023	General		
7-33	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.022	0.610		0.018	General		
7-34	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.021	0.610		0.017	General		
7-35	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.025	0.610		0.021	General		
7-36	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.610		0.022	General		

ATTACHMENT 10.1.2

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym				
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type		
7-37	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.590		0.022	General		
7-38	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.590		0.022	General		
7-39	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.580		0.022	General		
7-29	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.720		0.026	General		
7-40	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.580		0.022	General		
7-41	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.580		0.022	General		
7-42	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.580		0.022	General		
7-43	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.023	0.589		0.019	General		
7-44	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.024	0.590		0.019	General		
7-45	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.680		0.024	General		
7-46	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.680		0.023	General		
7-47	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.573		0.022	General		
7-48	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.018	0.680		0.017	General		
7-49	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.018	0.680		0.017	General		
7-50	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.019	0.680		0.017	General		

ATTACHMENT 10.1.2

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym				
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type		
7-51	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.019	0.680		0.017	General		
7-52	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.680		0.025	General		
7-53	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.024	0.680		0.021	General		
7-54	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.024	0.680		0.021	General		
7-55	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.019	0.700		0.018	General		
7-56	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.019	0.700		0.018	General		
7-57	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.700		0.026	General		
7-58	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.019	0.730		0.018	General		
7-59	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.020	0.730		0.019	General		
7-60	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.990		0.030	General		
7-61	Canopy Tree	cvu_0023	Depleted	0	no	0.640	0.031	0.027	0.670		0.022	General		
7-62	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.620		0.023	General		
7-63	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.017	0.620		0.014	General		
7-64	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.016	0.620		0.014	General		
7-65	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.620		0.023	General		

ATTACHMENT 10.1.2

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym				
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type		
7-66	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.620		0.023	General		
7-67	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.017	0.620		0.014	General		
7-68	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.017	0.620		0.014	General		
7-69	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.780		0.025	General		
6-30	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.029	0.640		0.026	General		
7-70	Canopy Tree	cvu_0020	Least Concern	0	no	0.690	0.031	0.027	0.600		0.022	General		
6-31	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.025	0.790		0.025	General		
6-32	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.640		0.025	General		
6-34	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.028	0.690		0.026	General		
6-35	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.690		0.025	General		
6-36	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.720		0.026	General		
6-37	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.720		0.026	General		
6-38	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.650		0.025	General		
6-39	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.650		0.025	General		
6-40	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.020	0.710		0.019	General		

ATTACHMENT 10.1.2

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym				
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type		
6-41	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.008	0.718		0.008	General		
6-42	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.009	0.711		0.008	General		
6-43	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.016	0.790		0.016	General		
6-44	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.007	0.790		0.007	General		
6-45	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.017	0.790		0.017	General		
6-46	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.011	0.762		0.010	General		
6-47	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.015	0.790		0.015	General		
6-48	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.008	0.790		0.007	General		
6-49	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.013	0.790		0.013	General		
6-50	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.014	0.790		0.014	General		
6-51	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.012	0.790		0.012	General		
6-52	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.017	0.790		0.016	General		
6-53	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.019	0.790		0.019	General		
6-54	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.020	0.790		0.019	General		
6-55	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.020	0.790		0.019	General		

ATTACHMENT 10.1.2

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym				
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type		
6-56	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.018	0.790		0.018	General		
6-57	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.028	0.702		0.026	General		
6-58	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.023	0.800		0.023	General		
6-59	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.024	0.800		0.024	General		
6-60	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.770		0.027	General		
6-61	Canopy Tree	cvu_0023	Depleted	0	no	0.640	0.031	0.027	0.770		0.023	General		
6-62	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.015	0.740		0.015	General		
6-63	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.014	0.740		0.014	General		
6-64	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.740		0.026	General		
6-65	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.022	0.740		0.021	General		
6-66	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.021	0.740		0.021	General		
6-67	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.028	0.690		0.026	General		
6-68	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.660		0.025	General		
6-69	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.730		0.026	General		
6-70	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.990		0.030	General		

ATTACHMENT 10.1.2

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym				
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type		
6-71	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.025	0.600		0.022	General		
6-72	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.025	0.600		0.022	General		
6-73	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.023	0.700		0.022	General		
6-74	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.023	0.700		0.022	General		
6-75	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.030	0.702		0.029	General		
6-76	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.790		0.027	General		
6-77	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.670		0.025	General		
6-78	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.690		0.026	General		
6-A	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.730		0.026	General		
6-79	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.730		0.026	General		
6-80	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.730		0.026	General		
6-81	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.730		0.026	General		
6-82	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.730		0.026	General		
6-83	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.018	0.680		0.016	General		
6-84	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.018	0.680		0.017	General		

ATTACHMENT 10.1.2

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym				
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type		
6-85	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.695		0.025	General		
6-86	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.023	0.790		0.023	General		
6-87	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.024	0.790		0.023	General		
4-19	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.027	0.200		0.017	General		
4-20	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.027	0.740		0.025	General		
4-21	Canopy Tree	cvu_0020	Least Concern	0	no	0.630	0.031	0.015	0.230		0.009	General		
4-22	Canopy Tree	cvu_0020	Least Concern	0	no	0.630	0.031	0.015	0.230		0.009	General		
4-23	Canopy Tree	cvu_0023	Depleted	0	no	0.710	0.031	0.027	0.670		0.024	General		
4-24	Canopy Tree	cvu_0022	Depleted	0	no	0.650	0.031	0.015	0.670		0.012	General		
4-25	Canopy Tree	cvu_0022	Depleted	0	no	0.650	0.031	0.006	0.670		0.005	General		
4-26	Canopy Tree	cvu_0022	Depleted	0	no	0.650	0.031	0.018	0.670		0.015	General		
4-27	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.016	0.691		0.014	General		
4-28	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.015	0.682		0.014	General		
4-29	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.027	0.740		0.025	General		
2-9	Canopy Tree	cvu_0023	Depleted	0	no	0.550	0.031	0.028	0.560		0.018	General		

ATTACHMENT 10.1.2

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym				
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type		
2-10	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.006	0.510		0.005	General		
2-11	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.010	0.510		0.008	General		
2-12	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.014	0.510		0.011	General		
2-13	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.014	0.510		0.011	General		
2-14	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.027	0.560		0.023	General		
2-15	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.027	0.510		0.022	General		
2-16	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.017	0.560		0.014	General		
2-17	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.016	0.560		0.014	General		
4-30	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.027	0.750		0.021	General		
4-31	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.027	0.648		0.020	General		
4-32	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.027	0.770		0.021	General		
4-33	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.026	0.750		0.020	General		
4-34	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.027	0.850		0.022	General		
4-35	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.027	0.850		0.022	General		
4-36	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.027	0.850		0.022	General		

ATTACHMENT 10.1.2

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym				
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type		
4-37	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.026	0.850		0.021	General		
4-38	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.027	0.808		0.022	General		
4-39	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.028	0.800		0.022	General		
4-40	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.018	0.611		0.013	General		
4-41	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.018	0.581		0.013	General		
4-42	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.027	0.580		0.019	General		
4-43	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.027	0.600		0.019	General		
4-44	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.027	0.600		0.019	General		
4-45	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.027	0.580		0.019	General		
4-46	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.023	0.580		0.016	General		
4-47	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.013	0.580		0.009	General		
4-48	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.008	0.580		0.006	General		
4-49	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.018	0.580		0.013	General		
6-88	Canopy Tree	cvu_0022	Depleted	1	no	0.740	0.070	0.064	0.670		0.060	General		
4-53	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.029	0.620		0.025	General		

ATTACHMENT 10.1.2

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym				
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type		
4-54	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.019	0.646		0.017	General		
4-55	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.016	0.770		0.015	General		
4-56	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.021	0.760		0.020	General		
4-57	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.025	0.625		0.021	General		
4-60	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.027	0.740		0.025	General		
4-65	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.027	0.200		0.017	General		
4-66	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.027	0.230		0.018	General		
4-67	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.015	0.230		0.010	General		
4-68	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.015	0.230		0.010	General		
4-69	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.021	0.200		0.014	General		
4-70	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.013	0.200		0.008	General		
4-71	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.010	0.200		0.007	General		
4-72	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.015	0.200		0.010	General		
7-76	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.760		0.026	General		
7-77	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.610		0.024	General		

ATTACHMENT 10.1.2

Information provided by or on behalf of the applicant in a GIS file										Information calculated by EnSym				
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type		
7-78	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.588		0.024	General		
6-91	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.960		0.030	General		
5-6	Canopy Tree	cvu_0020	Least Concern	0	no	0.560	0.031	0.029	0.720		0.021	General		
5-7	Canopy Tree	cvu_0020	Least Concern	0	no	0.560	0.031	0.029	0.683		0.020	General		
5-8	Canopy Tree	cvu_0020	Least Concern	0	no	0.560	0.031	0.027	0.650		0.019	General		
7-79	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.026	0.761		0.026	General		
6-C	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.031	0.990		0.034	General		
6-B	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.031	0.934		0.033	General		
4-75	Canopy Tree	cvu_0022	Depleted	0	no	0.710	0.031	0.014	0.200		0.009	General		
6-33	Canopy Tree	cvu_0022	Depleted	0	no	0.740	0.031	0.027	0.690		0.025	General		
1-5	Canopy Tree	cvu_0020	Least Concern	0	no	0.630	0.031	0.016	0.628		0.012	General		
1-6	Canopy Tree	cvu_0020	Least Concern	0	no	0.630	0.031	0.016	0.542		0.011	General		
4-76	Canopy Tree	cvu_0022	Depleted	0	no	0.590	0.031	0.027	0.750		0.021	General		

ATTACHMENT 10.1.2

Appendix 2: Information about impacts to rare or threatened species' habitats on site

This table lists all rare or threatened species' habitats mapped at the site.

Species common name	Species scientific name	Species number	Conservation status	Group	Habitat impacted	% habitat value affected
Creeping Grevillea	<i>Grevillea repens</i>	501549	Rare	Dispersed	Habitat importance map	0.0037
Dwarf Silver Wattle	<i>Acacia nano-dealbata</i>	500064	Rare	Dispersed	Habitat importance map	0.0009
Yarra Gum	<i>Eucalyptus yarraensis</i>	501326	Rare	Dispersed	Habitat importance map	0.0007
Square-tailed Kite	<i>Lophoictinia isura</i>	10230	Vulnerable	Dispersed	Habitat importance map	0.0004
Grey Goshawk	<i>Accipiter novaehollandiae novaehollandiae</i>	10220	Vulnerable	Dispersed	Habitat importance map ; special site	0.0003
Australian Anchor Plant	<i>Discaria pubescens</i>	501072	Rare	Dispersed	Habitat importance map	0.0002
Brooker's Gum	<i>Eucalyptus brookeriana</i>	501256	Rare	Dispersed	Habitat importance map	0.0002
White-throated Needletail	<i>Hirundapus caudacutus</i>	10334	Vulnerable	Dispersed	Habitat importance map	0.0001
Spotted Hyacinth-orchid	<i>Dipodium pardalinum</i>	500324	Rare	Dispersed	Habitat importance map	0.0001
Southern Toadlet	<i>Pseudophryne semimarmorata</i>	13125	Vulnerable	Dispersed	Habitat importance map	0.0000
Tremont Bundy	<i>Eucalyptus aff. goniocalyx (Dandenong Ranges)</i>	507008	Vulnerable	Dispersed	Habitat importance map	0.0000
Australasian Shoveler	<i>Anas rhynchosotis</i>	10212	Vulnerable	Dispersed	Habitat importance map	0.0000
Growing Grass Frog	<i>Litoria raniformis</i>	13207	Endangered	Dispersed	Habitat importance map	0.0000
Hardhead	<i>Aythya australis</i>	10215	Vulnerable	Dispersed	Habitat importance map	0.0000
Baillon's Crake	<i>Porzana pusilla palustris</i>	10050	Vulnerable	Dispersed	Habitat importance map	0.0000
Australian Painted Snipe	<i>Rostratula australis</i>	10170	Critically endangered	Dispersed	Habitat importance map	0.0000
Blue-billed Duck	<i>Oxyura australis</i>	10216	Endangered	Dispersed	Habitat importance map	0.0000
Musk Duck	<i>Biziura lobata</i>	10217	Vulnerable	Dispersed	Habitat importance map	0.0000
Lewin's Rail	<i>Lewinia pectoralis pectoralis</i>	10045	Vulnerable	Dispersed	Habitat importance map	0.0000

Habitat group

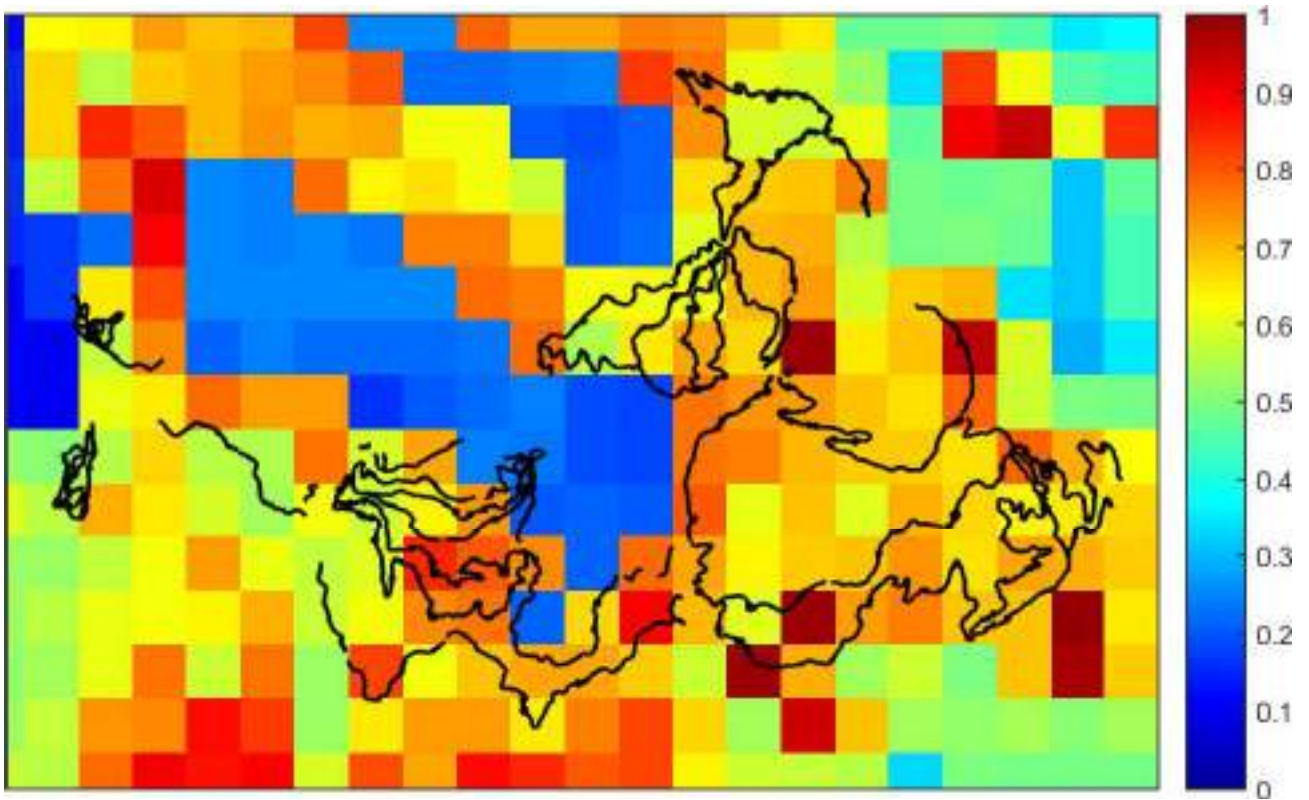
- Highly localised habitat means there is 2000 hectares or less mapped habitat for the species
- Dispersed habitat means there is more than 2000 hectares of mapped habitat for the species

Habitat impacted

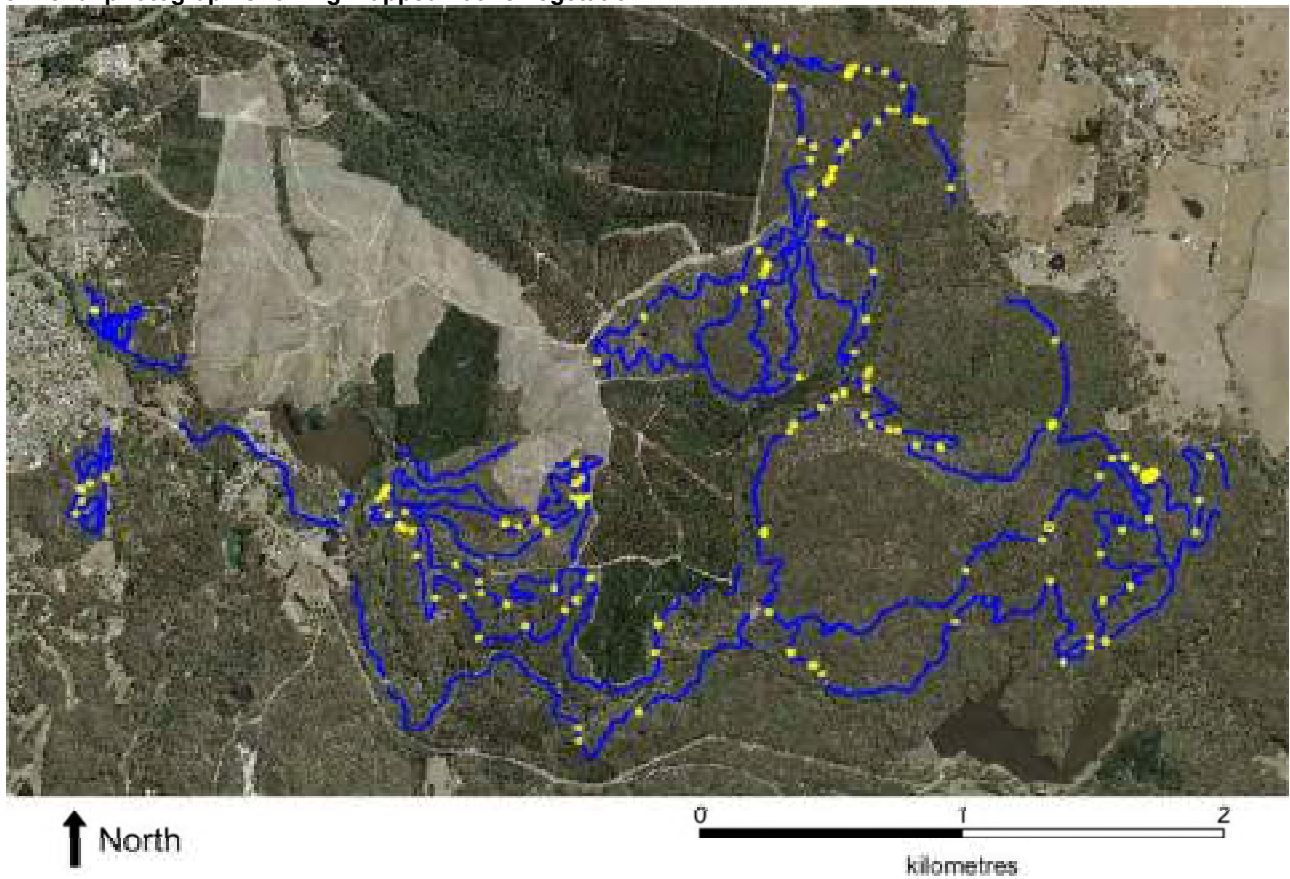
- Habitat importance maps are the maps defined in the Guidelines that include all the mapped habitat for a rare or threatened species
- Top ranking maps are the maps defined in the Guidelines that depict the important areas of a dispersed species habitat, developed from the highest habitat importance scores in dispersed species habitat maps and selected VBA records
- Selected VBA record is an area in Victoria that represents a large population, roosting or breeding site etc.

Appendix 3 – Images of mapped native vegetation

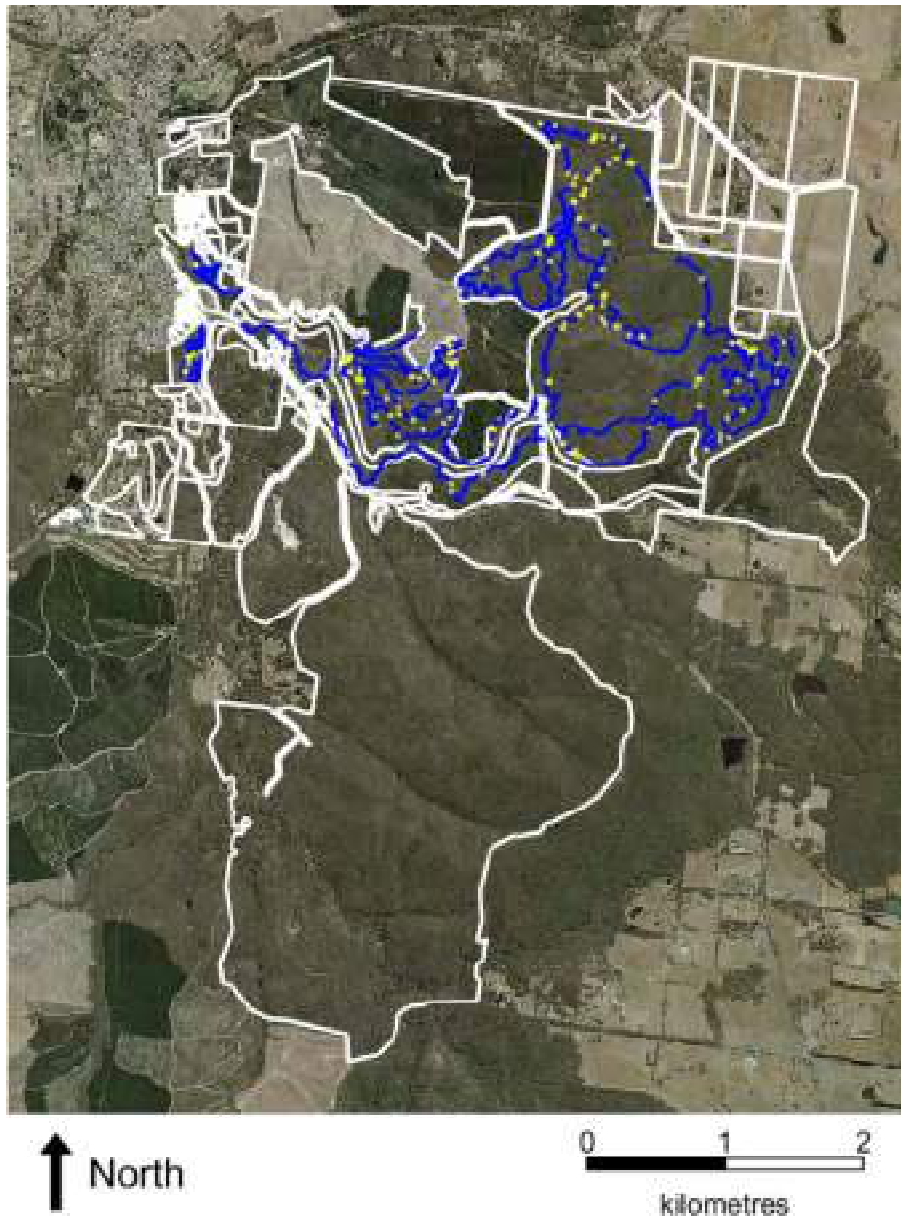
2. Strategic biodiversity values map



3. Aerial photograph showing mapped native vegetation



4. Map of the property in context



Yellow boundaries denote areas of proposed native vegetation removal.

Blue boundaries denote zones of partial removal with a halved condition score.



Arborist Report/Tree Management Plan

Creswick Trails Project

Prepared For:

Hepburn Shire Council
PO Box 21
Daylesford VIC 3460

Prepared By:

Tim Cameron - Consulting Arborist
Qualifications:
-Graduate Certificate Arboriculture
-Diploma Horticulture (Arboriculture)

Axiom Tree Management Pty Ltd

Suite 2/13 Goode St
Gisborne VIC 3437
Ph: 0428 896 951
Email: timcameron@axiomtrees.com

Monday, 18 January 2021



Contents

1	EXECUTIVE SUMMARY	3
2	INTRODUCTION.....	3
2.1	IMPACTS FROM MTB CONSTRUCTION AND USE	6
2.1.1	<i>Construction Impacts.....</i>	6
2.1.2	<i>Soil Compaction.....</i>	6
2.2	EXISTING STANDARD	8
2.2.1	<i>Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) Specifications</i>	9
2.2.2	<i>Encroachment</i>	9
2.3	METHOD FOR ASSESSING AND REDUCING IMPACT TO TREES	10
2.3.1	<i>Stage 1 Trail Mapping</i>	10
2.3.2	<i>Stage 2 Tree Assessment</i>	11
2.3.2.1	<i>Tree Assessment Findings.....</i>	11
2.3.3	<i>Stage 3 Data Preparation and Submission for Offset Calculation</i>	12
2.3.3.1	<i>Offset Definitions and Exemptions.....</i>	12
3	TREE MANAGEMENT PLAN.....	14
3.1	ENGAGEMENT OF THE PROJECT ARBORIST.....	14
3.2	TRAIL CONSTRUCTION INDUCTIONS.....	14
3.3	CONSTRUCTION GUIDELINES.....	14
3.3.1	<i>Placement of Fill</i>	14
3.3.2	<i>Exposed Roots</i>	15
3.4	COMPLIANCE CHECKS.....	15

1 Executive Summary

Under the Flora & Fauna Guarantee Act 1988, the State of Victoria requires projects on native bushland to obtain a Native Vegetation Removal (NVR) permit before progressing to construction. Approval of the permit requires the calculation and purchase of project specific NVR offset credits.

A standardised assessment method for calculating the impact of walking and mountain bike trail construction on native vegetation is not currently established. The existing standard (AS 4970-2009 Protection of Trees on Development Sites) is designed for the assessment of high-impact, deep, and/or broad-area excavations, typical of building developments, roads, pipelines etc. Due to its focus on excavation area without consideration of depth, undertaking tree loss assessments through a typical application of the Standard would result in inaccurately high NVR offset costs, prohibitive to the progression of most projects. The shallow and comparatively low impact of trail construction necessitates an industry appropriate interpretation of the Standard, to be undertaken by suitably qualified and experienced arborists.

With the intent of designing an replicable, best-practice method of assessing and minimising vegetation loss, the following approach was guided by the principals of *avoid, minimise and offset*.

By employing the methods described in this plan the Project will minimise tree impact from trail construction, while accurately calculating NVR offset requirements.



Figure 1 Typical bushland with many medium sized trees present

2 Introduction

Stage 1 of the Creswick Trails Project will see the construction of 60km of purpose-built mountain bike and shared use trails, originating from a pump-track, car park, and trailhead - located at the former Hammon Park football oval. The Project Site extends from Hammon Park into surrounding native bushland and commercial timber plantations to the south and east. Land in the Stage 1 Project area is managed by Parks Victoria (PV), the Department of Environment, Land Water & Planning (DELWP), Hancock Victoria Plantations (HVP) and to a small degree, Hepburn Shire Council (HSC).

Several vegetation communities are present throughout the subject area, as identified in the Biodiversity Constraints Assessments – Creswick Mountain Bike Trail, carried out by Biosis (Gibson & Howard, 2019).

Victorian native species that have the potential to reach a moderate to large size and may be included in the scope of this report are included in Table 1.

Table 1: Potentially large native tree species that have the potential to be impacted by construction

<i>Acacia melanoxylon</i> (Blackwood)	<i>Eucalyptus ovata</i> (Swamp Gum)
<i>Eucalyptus aromaphloia</i> (Scent bark)	<i>Eucalyptus radiata</i> (Narrow-leaf Peppermint)
<i>Eucalyptus dives</i> (broad-leaved peppermint)	<i>Eucalyptus rubida</i> (Candlebark)
<i>Eucalyptus obliqua</i> (Messmate)	<i>Eucalyptus viminalis</i> (Manna Gum)

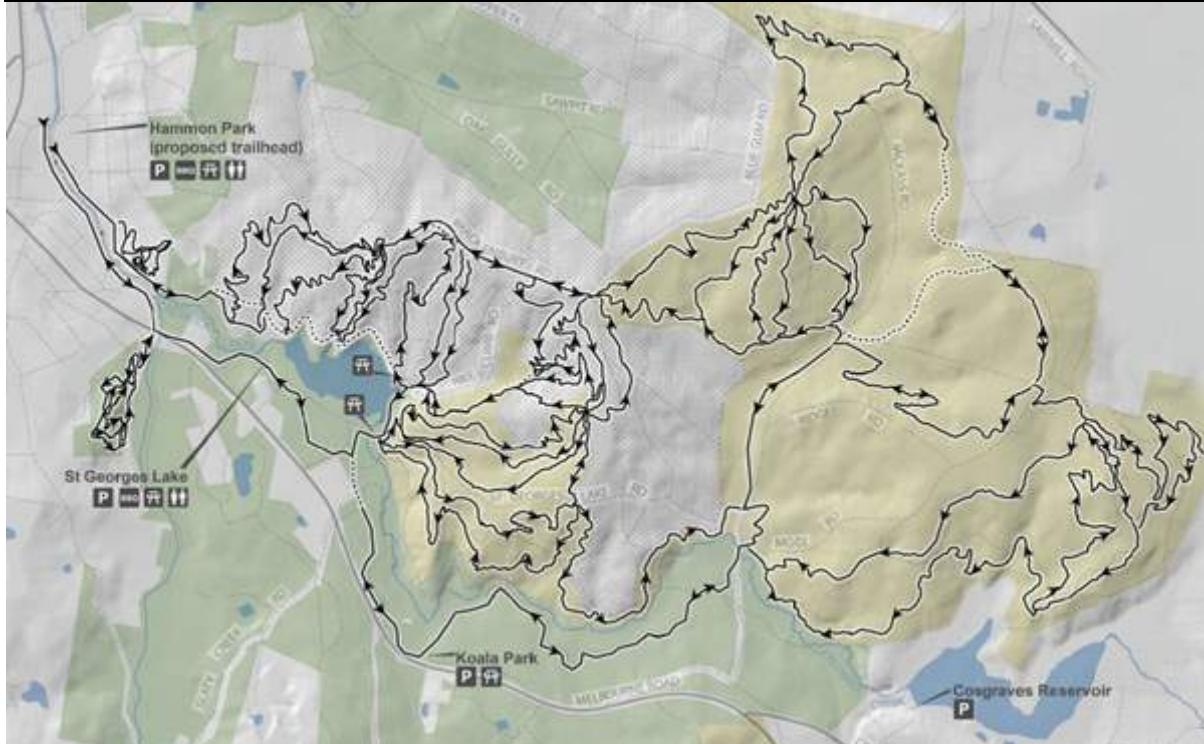


Figure 2 Site extent (HSC 2021)

At a minimum, the construction of mountain bike and walking trail requires the removal of ground cover and some understory vegetation. In densely wooded areas, some disturbance of tree root structure is unavoidable. The consequence of tree root disturbance can range from insignificant to loss of the tree.

HSC worked with PV, DELWP, ecologists Biosis, and arborists Axiom Tree Management - to develop an appropriate method for minimising and assessing impacts to trees and other native vegetation and accurately calculate the Project's NVR offsets. Based on typical trail widths and construction methods Biosis proposed that for understory and ground cover, a 2-meter-wide corridor be considered disturbed for the length of the trail network - and that a 50% of this corridor be considered loss for the duration of 'new trail' in native vegetation. Where 'existing trail' is to be upgraded, the percentage of trail already clear of vegetation will be factored into the offset calculation.

As the States governing body for NVR, DELWP approved this approach with the requirement that a suitably qualified arborist be engaged to produce construction guidelines, management practices, and assessment methods to minimise and quantify the Projects impact on trees. Axiom Tree Management Pty Ltd was engaged by Hepburn Shire Council to undertake this work, which forms this document.

Documents viewed as part of the preparation of this report include:

- Preliminary biodiversity constraints assessment- Creswick Mountain Bike Trail Draft Report Biosis July 2019.
- Typical MTB (Mountain bike) trail construction methodology July 2019
- AS 4970 – 2009 – Protection of trees on development sites;
- AS 4373-2007 – Pruning of amenity trees;
- Assessors handbook Applications to remove, lop or destroy native vegetation V1.1 October 2018; and



-
- Guidelines for the removal, destruction or lopping of native vegetation December 2017.



2.1 Impacts from Mountain Bike Construction and Use

Various impacts are likely to occur from the construction and subsequent use of trails associated with the completed Creswick Trails Network. Impacts include; compaction from various stakeholders accessing the site for assessment purposes, mechanical excavation for construction of the trail, and ongoing compaction from normal use of the trails.

2.1.1 Construction Impacts

Trail construction will follow culturally, historically, ecologically and land manager approved, Differential GPS mapped alignments and will be overseen by a dedicated Construction Manager. Where suitable trail design utilises existing geological features to reduce impact, while enhancing trail user experience.

Where possible, trail construction will require the removal of ground cover and understory vegetation only. Impacts to trees will vary depending on the proximity of the trail to trees and the depth of excavation.

Trail builders will follow the established industry principals of sustainable trail building, constructing trail which passively sheds and drains water with minimal erosion and maintenance requirements. See IMBA Guide to Sustainable Trail Building.

Construction equipment typically includes a <2 ton excavator, followed by laborers using hand tools to perform the final shaping of the trail surface. Construction depth will vary depending on site-specific terrain and the style of trail. Predominantly, the trail network will involve shallow, low impact construction, consisting of the removal of ground cover and organic matter, followed by minimal shaping of the mineral earth below.

Potential construction impact to trees may include:

- Soil excavation resulting in damage or removal of roots.
 - Removal of small feeder roots reduce the amount of water and chemicals that are conducted throughout the tree for normal function. Although fibrous roots are highly regenerative, recovering from a loss of root mass requires additional energy.
 - Damage or removal of larger lateral roots removes the trees ability to transport water and chemical from the feeder roots to the rest of the tree.
 - Removal or damage of large roots within the SRZ of the tree not only affects the transport of water and chemicals to the tree but may also impact the structural stability of the tree.
- Soil fill in the form of soil placement over roots:
 - Placement of soil over large areas of a trees root system create a layer that inhibits or completely prevents water infiltration and gas exchange with the soil that is required for normal tree function. In the long term, the placement soil fill can result in reduced tree function and growth and dieback of roots leading to tree death or complete failure in extreme cases. Small amounts of soil fill can be used in certain circumstances in consultation with a qualified Arborist.

2.1.2 Soil Compaction

Subsequent damage from soil compaction and the impact on tree roots is a major cause of decline in urban areas. Depending on land use, this can also occur in a bush or rural setting. Soil compaction can come in many forms including pedestrian traffic, vehicles, and construction equipment. Roots provide mechanical stability to a tree and are the organs which absorb water and nutrients required to carry out life processes such as photosynthesis, transpiration, and cell respiration. Compaction occurs when repeated mechanical pressure forces the air out of the soil, and reduces the space between soil particles (Harris, Matheny, and Clark, 2004) which would have been available for water and air to penetrate.



Trees can tolerate some degree of soil compaction over time and may adapt to certain amounts. Soil compaction is likely to result from trail construction equipment and labourers, normal use of trails by MTB riders and trail users stopping along the trails for rest stops and repairs.

Activities that may cause soil compaction include:

- Trail construction equipment and labourers:
 - This type of soil compaction will occur during construction from excavation equipment and labourers walking through the site and is likely to be short term and for the period of construction;
 - Provided excavation equipment and pedestrian traffic is confined to the area of trail construction, the long-term impact to the tree's health is expected to be minor;
- Normal use of trails by mountain bike rider:
 - This type of compaction will occur within the footprint of the trail and will occur in already compacted soil over an extended period (Figure 3):
 - Provided periodic trail maintenance is carried out to avoid trail deviation from the accumulation of water and mud, the long-term impact to the tree's health is expected to be minor;
- Trail users stopping along the trails for rest stops and repairs:
 - Trail users stopping to rest and for repairs may result in soil compaction from foot traffic outside the defined trail corridor.
 - To reduce soil compaction, trail heads and rest stops should be constructed to provide space for multiple trail users to stop and rest;
 - Construction of trail head and rest stop surfaces should include larger diameter gravel (>10mm) where possible to allow for water infiltration and to reduce compaction.



Figure 3 Example of existing trail close to trees with minimal excavation and minor compaction.

2.2 Existing Standard

AS 4970-2009 Protection of Trees on Development Sites provides guidance on the principles for protecting trees on land subject to development and follows, in sequence the stages of development from planning to implementation (AS 4970-2009). The standard is to be used by qualified Arborists (AQF level 5) who interpret and use the standard based on data collected on-site to inform and justify decisions in relation to protecting the tree (Moore, 2018).

AS 4970-2009 provides methods for calculating the approximate area that a tree requires to remain viable and upright. It was primarily developed for the protection of trees on development sites in urban areas and is commonly applied to determine tree impact during the construction of buildings, roads and various infrastructure and provide guidance for working within these areas.



2.2.1 Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) Specifications

The principle method of protecting trees throughout development is by establishing a tree protection zone (TPZ). TPZs have been calculated according to *Protection of Trees on Development Sites* (AS 4970-2009) for all trees to be retained calculating the TPZ as 12 times the trunk diameter at 1.4m above ground level (DBH). The TPZ is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable. This method is commonly used for trees in urban situations and is an effective way of protecting trees.

$$\text{TPZ} = \text{DBH} \times 12$$

The SRZ is the minimum volume of roots required by the tree to remain stable in the ground. If the SRZ is breached the chances of windthrow are significantly increased, especially if roots are cut on the same side as prevailing winds. Windthrow is an event where the entire tree fails/falls over. Often, the tree is completely uprooted with devastating results. It is important to note that the SRZ is not related to tree health. It refers to the physical volume of roots required for the tree to remain stable in the ground. It is in no way related to the physiological requirements of the tree but is the minimum volume of roots required for the tree to remain standing.

$$\text{SRZ radius} = (D \times 50)^{0.42} \times 0.64$$

2.2.2 Encroachment

Encroachment into the TPZ of trees is allowed under certain circumstances depending on several factors including site and tree conditions. Encroachment of less than 10% of the TPZ and outside the SRZ is deemed to be minor encroachment provided construction proceed with caution and standard tree protection measures are adhered to. Detailed root investigations should not be required but must be compensated with an extension to the TPZ elsewhere. Variations must be made by the project arborist considering other relevant factors including tree health, vigour, stability, species sensitivity and soil characteristics.

Encroachment of more than 10% of the TPZ or into the SRZ will require a qualified Arborist (AQF level 5) to demonstrate that the tree(s) will remain viable. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. This may require the Arborist to consider the following:

- Root investigation by non-destructive methods
- Location and distribution of the roots
- Tree species and tolerance to root disturbance.
- Lean and stability of the tree
- The presence of existing or past structures or obstacles affecting root growth (AS4970-2009).
- Root sensitive construction techniques and design
- The potential loss of root mass from encroachment
- Age, vigour, and size of the tree.
- Soil traits and volume, topography, and drainage.

2.3 Method for Assessing and Reducing Impact to Trees

It is proposed to accurately map all future mountain bike trails within areas where native vegetation is present and have the potential to be impacted. The trail will be aligned to reduce the impact on adjoining trees, to avoid areas of significant ground cover and to allow for a free flowing, easily maintained trails. Where impacts to trees have the potential to impact tree health and longevity, mitigation measures have been recommended. Where avoidance or mitigations options are not available, the tree will be included in offset calculations.

2.3.1 Stage 1 Trail Mapping

The proposed trails were designed, assessed and located using Differential GPS (DGPS, +/- 1m accuracy) with existing ground conditions recorded. The condition, characteristics and use of the trails was recorded including; new trail through undisturbed bushland, existing unsanctioned mountain bike trail, existing managed and unmanaged roads, and commercial pine plantations. Where native vegetation is not present, mountain bike trails and adjoining trees were not assessed and located.

The final alignments for construction are based on data, recommendations, and collaborative design between the appointed Arborist (Min AQF level 5), Botanist, and Construction Manager/Trail designer. The final trail alignment takes into consideration:

- Potential impacts to native trees during construction and through future use of the trails;
- Impacts to significant native understory during construction and through future use of the trails;
- Avoidance of large dead or dying trees that have a high potential to fail in the short term and impact future trails and trail users;
- Functional trail design to maximise user experience and safety; and
- Functional trail design to allow for adequate maintenance, drainage, and stability over time.



Figure 4 Mapped trail alignment highlighted red

2.3.2 Stage 2 Tree Assessment

Following DGPS mapping of the proposed trail alignment, trees directly adjoining the trail were individually assessed and located. Trees were assessed and located by the Arborist (Min AQF level 5) with guidance from the Construction Manager/Trail designer regarding trail design and construction methods. Assessment methodology includes:

- All mature trees greater than three (3) metres in height and up to 50cm trunk diameter assessed and located within two (2) metres of the proposed trail centerline;
- All large trees greater than 50cm trunk diameter that have the potential to be impacted by the proposed trail assessed within five (5) metres of the proposed trail centerline;

Mitigation measures are recommended where trail construction and design have the potential to impact tree health and longevity. Mitigation measures include:

- Minimum excavation no greater than 100mm including organic matter;
- Use of soil fill to protect surface roots from damage from excavation equipment and trail users.
- Use of raised bridges, decking and retaining walls in steep terrain and high use areas.

Where future construction and use of the trail has the potential to impact tree health and longevity and avoidance or mitigation options are not available, the tree was considered a loss and included in NVR offset calculations.

2.3.2.1 Tree Assessment Findings

Of the 12480 trees assessed twelve (18) different species were assessed which are all native to Victoria. Tree details include:

- The dominant species assessed include *Eucalyptus obliqua*, *Eucalyptus dives*, *Eucalyptus radiata* and *Eucalyptus aromaphloia* (Table 2).
- Most of the trees are mature specimens that can flower and are normally found in the upper layer of the relevant vegetation type.
- Most of the trees were live specimens at the time of inspection
- Most of the trees are large and are greater than ten (10) metres in height.

Table 2 Tree details

Species composition		Maturity	
Botanical Name	Count	Age Rating	Count
<i>Eucalyptus obliqua</i>	4213	Young	524
<i>Eucalyptus dives</i>	2937	Mature	11956
<i>Eucalyptus radiata</i>	2234	Total	12480
<i>Eucalyptus aromaphloia</i>	2067	Health	
<i>Eucalyptus viminalis</i>	325	Health Rating	Count
<i>Acacia melanoxylon</i>	236	Live	10419
<i>Eucalyptus ovata</i>	142	Dead	2061
<i>Eucalyptus rubida</i>	136	Total	12480
<i>Exocarpos cupressiformis</i>	95	Size	
<i>Acacia dealbata</i>	66	Height	Count
<i>Eucalyptus melliodora</i>	13	≤ 10m	3517
Other species (< 4 individuals)	16	> 10m	8963
Total	12480	Total	12480

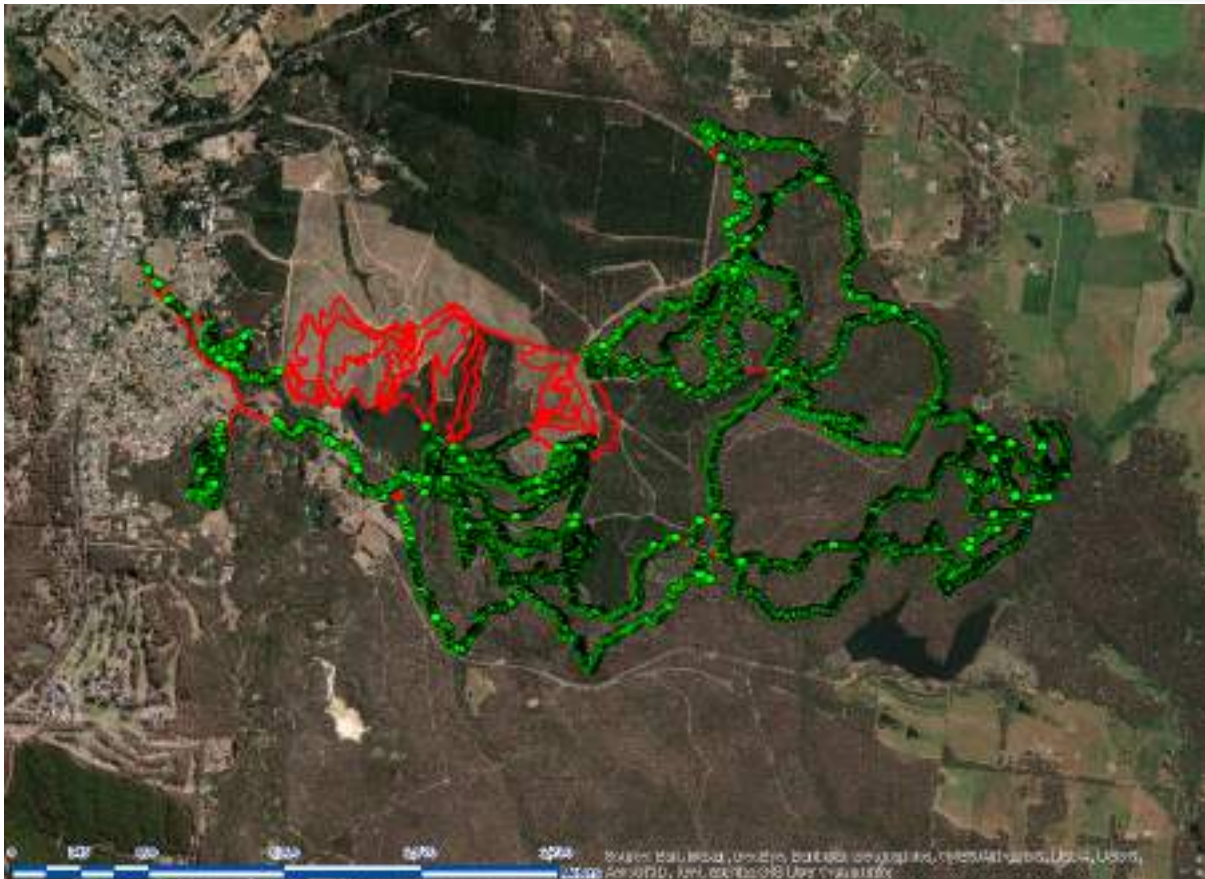


Figure 5 Mapped trail alignment highlighted red

2.3.3 Stage 3 Data Preparation and Submission for Offset Calculation

Information recorded as part of the trail mapping and tree assessment was collated and formatted for use in offset calculations. Tree data collected as part of Arborist Assessments include:

- Location of tree (+/- 1m accuracy);
- Canopy dimensions (H x W in metres);
- Trunk Diameter at Breast Height (DBH) measured at 1.3m from ground level;
- Genus and species;
- Health (Dead or Live);
- Mitigation Measures (Minimal excavation, soil fill or use of decking, bridging, retaining walls, Pruning);
- Additional comments

2.3.3.1 Offset Definitions and Exemptions

Native canopy trees are mature trees (able to flower), are greater than three (3) metres in height and are normally found in the upper layer of the relevant vegetation type (EVC). Live native canopy trees are not included in native vegetation offset calculations when:

- The tree is not found in the upper layer of the relevant vegetation type (EVC);
- Native canopy tree that is 3m in height or less and is not flowering. Where the determination that the tree is flowering is uncertain, the tree is assumed to be a native canopy that is required to be offset.
- Trees that originate from another state other than Victoria or country other than Australia have not been assessed and recorded (Examples include *Pinus radiata* self-sown from neighbouring plantations)

Dead canopy trees were assessed throughout the trail alignment. Dead trees are required to be included in offset calculations when:



- Dead native canopy tree (>3m in height) has a single trunk diameter of 40cm or more at 1.3m, and is lost due to construction impacting the trees structural integrity; or
- Dead native canopy tree (>3m in height) has a trunk diameter of 40cm or more at 1.3m and is lost as it requires removal to reduce risk of failure onto future trails.

Dead native canopy trees are exempt from native offset requirements when the tree has a trunk diameter of less than 40cm at 1.3m. Multi-stemmed trees, and trees with multi-stemmed coppice regrowth, are mapped and assessed as single trees. Their size is determined from the stem with the largest circumference at 1.3 metres above the ground.

Trees were assessed, located, and recorded including

- Total trees recorded - 9813 trees
- Total trees lost - 1601 trees

Live Native Canopy Trees

- Total native canopy trees lost - 146
 - Total native canopy trees lost (requires offset) - 49
 - Total native canopy trees lost (does not require offset) - 173

Dead Native Canopy Trees

- Total Dead native canopy trees lost - 1428
 - Dead native canopy trees lost (requires offset) - 6
 - Dead native canopy trees lost (does not require offset) - 1422



3 Tree Management Plan

Construction of the proposed trails will follow a DGPS alignment in accordance with arborist and botanist assessments, sustainable trail building practices, and project specific construction requirements. Equipment includes up to 2-ton excavator followed by labourers using hand tools to perform the final shaping of the trail. For vegetation offset calculations the area considered disturbed by trail construction will be a two (2) meter width unless otherwise defined. Construction depth will vary depending on existing terrain, location of the trail and recommended mitigation as outlined in the Arborist report.

Trail construction will be predominantly shallow and low impact, involving removal of organic matter and topsoil, followed by minimal shaping of the mineral earth below. Mitigation such as soil fill, reduced excavation, retaining walls, boardwalks and bridges have been recommended where appropriate to reduce the impact on trees.

3.1 Engagement of the Project Arborist

A project Arborist should be engaged to conduct inductions providing detailed advice for steep and riparian areas, and to assess trees following trail construction. The project Arborist must be suitably qualified in Arboriculture and experienced in tree protection on development sites. The project Arborist must hold minimum AQF level 5 in Arboriculture.

3.2 Trail Construction Inductions

Site inductions are to be carried out for all trail workers prior to commencing trail works. Site inductions are to be conducted by the Site supervisor and project Arborist and will include:

- Basic tree function and the impact of damage from trail construction;
- Construction guidelines for working close to trees;
- Protocol for essential alterations to existing alignments;
- Protocol for damage to ground parts of trees above/below; and
- Education around environmental and financial impact of tree loss.

3.3 Construction Guidelines

NOTE: Illustrated and expanded construction guidelines will be provided to trail builders during the induction process.

Trail construction works close to trees have the potential to damage above and below ground parts of the trees. Specifications include:

- Trail construction works within proximity of trees should be carried out with care not to damage below and above ground parts of the tree;
- Excavation within a 2m radius of the main stem of the tree should be carried out by hand with no mechanical excavation equipment used;
- Where the alignment of the trail is close to the main stem of large trees, preference should be given for construction to the high side of the main stem where root growth is reduced;
- Where substantial roots greater than 40cm are uncovered and not damaged/removed, soil fill should be used over the root, trail alignment moved, or the tree is to be assessed by the project Arborist determine management and whether native vegetation offsets are required.

3.3.1 Placement of Fill

The placement of fill may be used close the main stem of the tree provided the following specifications are adhered to including:

- Fill is not to extend greater than 30% of the circumference of the main stem and exceed a depth greater than 200mm; and

3.3.2 Where fill exceeds these amounts, the tree must be assessed by the project Arborist determine management and whether native vegetation offsets are required. Exposed Roots

Given the large population of trees and proximity to them, tree roots may unavoidably emerge as natural features within new trails. Specifications for incorporating exposed roots include:

- Where possible having exposed roots within the trail should be avoided. However, construction of trails may result in exposed roots over time through wear and erosion.
- Where exposed roots are required to be incorporated within the trail, gravel (diameter > 10mm) should be used to reduce erosion and wear over time.

3.4 Compliance Checks

Compliance checks will be carried by the project Arborist to monitor construction methods and to assess the actual impact on trees directly adjacent the constructed trail. If required, additional NVR offset costs may be incurred. Arborist compliance assessments will be required to be carried out at agreed intervals throughout the project depending on project resources and speed of progression.

During the construction phase, the Project’s construction manager will be onsite daily, overseeing trail building and liaising with land managers and specialist consultants as required.

Table 3 is an example of compliance timeframes that can be adopted during the project.

Table 3 Arborist compliance

Timeframe	Action
First day (induction)	Arborist will be onsite to induct trail workers regarding various tree impacts and recommended construction methods
First week (Induction and supervision)	Arborist will be onsite supervising construction for 2 days during the first week including initial induction
First month (Induction, supervision and compliance)	Arborist will be onsite for at least 1 day per week for supervision and compliance excluding first week
Every month following initial month (supervision and compliance)	Arborist will be onsite for at least 1 day per month primarily for compliance. Based on 10km per month. Where additional resources are used additional inspections will be required. Trees along the trail will be assessed based on damage/removal to substantial roots. Only trees considered to be significantly impacted and are likely to die within the next five years will be recorded photographed and DGPS located.





Creswick Trails: Environmental Management Plan

Final Report

Prepared for Hepburn Shire Council

8 April 2021

Biosis offices

NEW SOUTH WALES

Albury

Phone: (02) 6069 9200
Email: albury@biosis.com.au

Newcastle

Phone: (02) 4911 4040
Email: newcastle@biosis.com.au

Sydney

Phone: (02) 9101 8700
Email: sydney@biosis.com.au

Wollongong

Phone: (02) 4201 1090
Email: wollongong@biosis.com.au

VICTORIA

Ballarat

Phone: (03) 5304 4250
Email: ballarat@biosis.com.au

Melbourne (Head Office)

Phone: (03) 8686 4800
Email: melbourne@biosis.com.au

Wangaratta

Phone: (03) 5718 6900
Email: wangaratta@biosis.com.au

Document information

Report to: Hepburn Shire Council

Prepared by: Hannah Harbourd

Biosis project no.: 30872

File name: 30872.CreswickTrails.EMP.Fin.20210224

Citation: Biosis 2021.Creswick Trails: Environmental Management Plan. Report for Hepburn Shire Council. Authors: Harbourd. H, Biosis Pty Ltd, Melbourne. Project no. 30872

Document control

Version	Internal reviewer	Date issued
Draft version 01	BRH	18/06/2020
Draft version 02	BRH	30/11/2020
Draft version 03	BRH	22/02/2021

Acknowledgements

Biosis acknowledges the contribution of the following people and organisations in undertaking this study:

- Client: Hepburn Shire Council (Alison Breach and Michael McCallum)

Biosis staff involved in this project were:

- Hannah Harbourd (Report writing)
- Ben Howells (Quality assurance)
- Matt Gibson, Josh Howard, John Muchan (Ecology)
- Gary Vines (Heritage)

© Biosis Pty Ltd

This document is and shall remain the property of Biosis Pty Ltd. The document may only be used for the purposes for which it was commissioned and in accordance with the Terms of the Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

Disclaimer:

Biosis Pty Ltd has completed this assessment in accordance with the relevant federal, state and local legislation and current industry best practice. The company accepts no liability for any damages or loss incurred as a result of reliance placed upon the report content or for any purpose other than that for which it was intended.

Contents

1.	Introduction	3
1.1	Introduction	3
1.2	Site location	3
1.3	Project description.....	3
1.4	EMP objectives.....	3
1.5	How to use this EMP	4
2.	Project management	5
2.1	The Project Manager responsibilities	5
2.2	Responsibilities of all staff or contractors on site	5
2.3	Management responsibilities.....	6
2.4	Construction Schedule.....	6
2.5	Environmental approvals / permits and applicable legislation	6
2.6	Enforcement	7
2.7	Project monitoring.....	7
2.8	Easements and existing service locations	8
3.	Trail construction	9
3.1	Common Ground.....	9
3.2	Trail construction	9
3.3	Trail building equipment.....	9
3.4	Trail construction techniques.....	9
4.	Site environmental values.....	1
4.1	Ecological values	1
5.	Cultural Heritage Management Plan	2
5.1	Key findings, including key Aboriginal cultural values and risks	2
5.2	Avoiding, minimising and offsetting impacts to Aboriginal cultural heritage	2
5.3	Development of impact mitigation measures for implementation within the EMP	2
6.	Historical Heritage	3
6.1	Key findings, including key historical values and risks	3
6.2	Avoiding, minimising and mitigating impacts to historical heritage.....	3
7.	Water quality.....	4
8.	Environmental aspects, management objectives and risk assessment	5
8.1	Environmental and heritage risk assessment	8
9.	Environmental management plan	12
10.	Environmental management map.....	20
11.	Post construction site remediation and reporting	59

11.1	Site clean up	59
11.2	Site stabilisation and remediation	59
11.3	Trail Maintenance Plan (Post-construction)	60
12.	Glossary	66
13.	Useful information resources:	67
14.	References	69

Tables

Table 1	Management responsibilities	6
Table 2	Works schedule	6
Table 3	Construction techniques	1
Table 4	Project management objectives and risk factors	5
Table 5	Risk assessment matrix	8
Table 6	Risk rating score ranges	8
Table 7	Risk Assessment	9
Table 8	Key regulation	11
Table 9	Environmental Management Plan	12
Table 10	Post-construction trail management plan	60

Figures

Figure 1	Environmental management map	21
----------	------------------------------------	----

1. Introduction

1.1 Introduction

Biosis was commissioned by Hepburn Shire Council (Council) to prepare an Environmental Management Plan (EMP) to support the construction and ongoing maintenance of the Creswick Trails mountain bike project (the Project).

This EMP is a document detailing the potential environmental impacts of the use and/or development of mountain bike trails and the ways that these impacts may be avoided or mitigated. This EMP identifies potential environmental impacts arising during the construction phase of the proposed trail construction and provides guidance to avoid or manage these impacts. It also details the ongoing management and monitoring activities required as part of the trail management.

This document has been prepared to ensure the appropriate management and monitoring of the environmental risks associated with the construction and maintenance of the Project. This EMP will support the permit application process for this Project being prepared by Council.

1.2 Site location

The Project site (the Site) is located approximately three kilometres south-east of Creswick. The trail head is located at Hammon Park. The trail is within the Creswick Regional Park and is bordered by Golf Course Road in the east, Blue Gum Road in the North, Melbourne Road in the south-west, and Standard Road in the South. The project is being developed on land governed by a range of land managers including Parks Victoria (PV), Department of Environment, Land, Water and Planning (DELWP) and Hancock Victoria Plantations (HVP). Creswick Trails will be maintained by Council in partnership with the land managers and includes State Forest, Regional Park, HVP Plantations and Council land.

1.3 Project description

Council have engaged Common Ground Trails Pty Ltd (Common Ground) to develop a trail network of approximately 60 km of mountain bike trails near Creswick, Victoria. The Biosis reports for the Creswick Trails project including the Flora and Fauna Assessment (Biosis 2021a), Cultural Heritage Management Plan (CHMP) (Biosis 2021b) and the Historical Heritage report (Biosis 2021c) have been undertaken simultaneously with this EMP to identify and avoid potentially sensitive areas during the design and construction process and these findings have been incorporated into this EMP. The assessments originally examined 100km of trail network. This has since been revised to 60km. It is expected the additional 40km may form part of a future stage of this project.

1.4 EMP objectives

The objectives of this EMP are to:

- Protect the identified site environmental values.
- Prevent inadvertent environmental damage or harm to fauna and flora during construction.
- Protect heritage values of the site.
- Prevent off site impacts from dust or pollution.
- Ensure mitigation measures are in place to manage environmental incidents.

- Ensure compliance with environmental regulation and legislation.
- Weed and pathogen hygiene.

1.5 How to use this EMP

The EMP is presented over six sections (Sections 2 – 7). These sections detail the site values, the potential risks to these values and actions required to avoid or mitigate the risks. The six sections and their purpose are described below.

Section 2 – Project management

This section details aspects of the plan that relate to overall project management. This section contains the following:

- Identifies responsibilities for delivery of the EMP.
- A generalised construction schedule.
- Disclaimer on easements and service locations.
- Relevant environmental approvals.
- Requires input of details of people responsible for delivery of the EMP and the construction schedule.

Section 3 – Site environmental values

This section identifies the site environmental values to be protected by the EMP.

Section 4 – Environmental aspects, management objectives and risk assessment

This section identifies the potential risks to the site values posed by the project and details the management objectives to be achieved.

Section 5 – Environmental management action plan

This section is presented as an action matrix. The environmental risks identified are detailed with associated actions to be taken to address the risk. Monitoring responses and responsibilities are also provided.

Section 6 – Environmental management map (EMM)

This section comprises an environmental management plan map that shows the location of required EMP features or structures such as sediment controls, location of stock piles and so on.

Section 7 – Post construction site remediation

This section details requirements for post construction site remediation.

2. Project management

Responsibility for delivery of the EMP lies with the Project manager. The Project manager may delegate any tasks and responsibilities as required provided that the details of the delegate and their responsibilities are documented. Section 2.3 provides a table to record the details of delegates and their responsibilities.

Responsible Project Manager:

Name: Alison Breach
Role: Project Manager - Creswick Trails
Company: Hepburn Shire Council
Address: PO Box 21 Daylesford Victoria 3460
Email: abreach@hepburn.vic.gov.au
Telephone: (03) 5321 6474
Mobile: 0428183930

2.1 The Project Manager responsibilities

- Implement EMP.
- Deliver site inductions.
- Ensure all personnel (including contractor/sub-contractors) are aware of contents of the EMP and what their responsibilities are.
- Be available for on-site meetings when required.
- Ensure all staff and contractors comply with all EMP requirements.
- Include the EMP and EMM as part of any enforceable contracts or that the EMP links with internal personnel job descriptions.

2.2 Responsibilities of all staff or contractors on site

- Work according to this plan.
- Work within designated impact areas only.
- Report any issues or incidents to the Project Manager.

2.3 Management responsibilities

Table 1 Management responsibilities

Position	Responsibilities
Project manager:	<ul style="list-style-type: none"> • Implement the EMP • Monitor progress and outcomes • Delegate tasks as required
Public Land Manager	<ul style="list-style-type: none"> • Public Land Manager must work in partnership with the Project Manager/ Council regarding implementing EMP.
All personnel and Contractors	<ul style="list-style-type: none"> • Comply with EMP requirements and directions of the Project manager

2.4 Construction Schedule

An indicative construction schedule is outlined in Table 2. The timeframe will be updated by the Project manager once the construction plan has been finalised.

The key items of construction should be undertaken in the following sequence.

Table 2 Works schedule

Stage	Date/timing
Site Establishment (i.e. site facilities, temporary access tracks, survey pre-works sediment controls)	TBC
Excavation to establish construction area	TBC
Construction	TBC
Site clean-up and stabilisation	TBC

TBC – to be confirmed

2.5 Environmental approvals / permits and applicable legislation

Hepburn Planning Scheme - Planning and Environment Act 1987 (PE Act)

The Planning Permit Process is currently being undertaken by Hepburn Shire Council and will be obtained for the construction of the Creswick Trails.

Aboriginal Heritage Aboriginal Heritage Act 2006 (AH Act)

A Cultural Heritage Management Plan (CHMP) has been prepared for Creswick Trails (refer to Biosis Report (Biosis 2020b) Once approved, conditions of the management plan must be complied with. Failure to comply with a condition is an offence under Section 67A of the Aboriginal Heritage Act 2006.

Heritage Victoria *Heritage Act 2017 (HV Act)*

Permits or permit exemptions must be sought from Heritage Victoria for the Victorian Heritage Register site listed in the Biosis Historical Heritage Survey (Biosis 2021c). Consent to Damage or exemptions must be sought from Heritage Victoria for the Victorian Heritage Inventory (VHI) listed places in the Biosis report (Biosis 2021c).

Australian Government - *Environment Protection Biodiversity Conservation Act 1999 (EPBC Act)*

An assessment against the Significant Impact Guidelines (CoA 2013) in the Biosis Creswick Trails Flora and Fauna Reports (Biosis 2021a) indicates that the project is unlikely to significantly impact any of these species. The project is also unlikely to significantly impact any migratory species or Ramsar sites. If permanent waterbodies or waterways will be directly impacted by the construction of the proposed trail alignment then targeted surveys for Growling Grass Frog may be needed to determine the presence/absence of this species in the affected areas.

Land Use Activity Agreements

The Land Use Activity Agreement (LUAA) is part of the broader [Settlement Package](#) with the Dja Dja Wurrung that commenced on 24 October 2013. In that package, the Dja Dja Wurrung people agreed not to pursue the legal recognition of native title rights that they may hold through the national native title process, in return for a package of agreements, including the LUAA.

These agreements are legally binding on the State of Victoria, including government agencies, and on the Dja Dja Wurrung Clans Aboriginal Corporation (DDWCAC) as the representative body of the Dja Dja Wurrung people.

2.6 Enforcement

Once approved compliance with this EMP is mandatory. This EMP is expected to form part of the planning permit application. If breaches to the EMP are to occur, the Project Manager must immediately notify the relevant land manager.

2.7 Project monitoring

The environmental risks associated with construction will be monitored on a regular basis. The project manager will be responsible for undertaking a general daily assessment of positive and negative impacts during the construction program and appropriate written and photographic records will be kept. Specialist advice on environmental issues will be sought as required from a suitably qualified environmental professional during the construction period.

The project manager will keep records of the implementation of the EMP during the construction phase. These records may take the form of an email, spread sheet or word document or other format that can easily be supplied to the relevant authority in the event of an audit or incident. Minimum records content must cover:

- Construction progress (simple notes).
- Summary of activities flagged for reporting in Table 3 of the EMP at the recommended frequency.
- Any environmental issues encountered.
- Responses implemented to address issues encountered.
- Dated photographs of key issues and responses – or links to an archive (e.g. DropBox, Evernote)

The construction monitoring program for identified environmental risks is outlined in Table 4.

2.8 Easements and existing service locations

This plan does not provide details of any easements or utility services that may be present within the project impact area. The Project manager is responsible for managing any impacts on easements and utility services. As a minimum, the Project manager should:

- Obtain easement and utility service details from Land Victoria (<http://www.land.vic.gov.au/>) 'Dial Before You Dig' and liaise with the utility to identify permitted, controlled or prohibited activities within the easement.
- Contact the 'Dial Before You Dig' service (phone 1100 or web www.1100.com.au) to identify where all existing easements, services and infrastructure are located.
- Contact the relevant service utility, service provider or council to determine what measures need to be implemented to best protect service assets. (For Information regarding Telstra: Telstra Network Integrity Services 1800 810 443).
- Review this EMP if required. Where results of Dial Before You Dig or easement discovery require changes to this EMP, the EMP must be reviewed to incorporate any changes necessary.

3. Trail construction

3.1 Common Ground

Common Ground have been engaged by Council to undertake the design component of the Project. They are a trail consultancy specialising in all facets of developing and establishing mountain bike facilities in an aim to connect people with trails, spaces, and landscapes. Common Ground aim to develop sustainable trails which complement and enhance landscapes without detriment to the local ecology (*Common Ground Mountain Bike Trail Services*, n.d.).

3.2 Trail construction

The mountain bike trail construction will occur by working on 100-200 metre segments at a time. The ground-truthed corridor will be marked out ahead of trail construction using coloured flagging tape tied to trees/vegetation and mapped with GPS. The ground-truthed corridor will be defined to include 10m 'study area' either side of the 'trail alignment' (varying depending on environmental values) identified in the Biosis ecology and heritage reports ((Biosis 2021a, Biosis 2021b, Biosis 2021c)) (refer to Figure 1). The trail will have a typical width of 1.2 meters. Trail alignments are currently subject to final approval and may vary slightly within the 'study area'.

3.3 Trail building equipment

Standard trail equipment consists of machinery and hand and motorised tools. The trail construction team generally includes a sub 2 ton excavator and operator and 2 or 3 manual trail builders. Motorised tools (including brushcutters and chainsaws) may be used to clear vegetation and hand tools (including rake hoes, rakes, picks, shovels, and crowbars) are used to refine and smooth the trail surface once the excavator has initiated the trail pathway.

3.4 Trail construction techniques

Construction techniques can be summarised into four (4) construction types primarily being used in the construction of the Creswick Trails:

- Standard Benching – machine
- Standard Benching – hand
- Rock Armouring
- Elevated Structures

These four techniques will be used in different areas of the trail construction. The general build of the trail will be within the 20 metre trail corridor buffer, the excavator operator will move within this trail buffer to build the exact trail alignment, creating natural features and minimising environmental damage where applicable. The operator will first remove the surface layer of the land which is generally grass, or understorey vegetation then begin to 'bench' the track, creating trail in a 'rolling which typically allows water to run off every five to ten meters.

Compaction of the newly formed track is performed by the machines tracks and bucket. It may further compacted by foot or with the back of a shovel if the soil type and moisture content is conducive. Natural compaction then occurs through rain, settling of the soil and eventually riding. Generally, the steeper the gradient the deeper the excavation required to create a bench and the easier it is to create drains.

In sensitive areas such as under trees there needn't be more disturbance than removing the grass and organic layer and these areas will be constructed using hand tools. Rock paving/armouring can also be placed on top of ground to create a crowned track which requires little or no digging of drainage.

Where possible, trail construction will require the removal of ground cover and understory vegetation only. Where excavation is required, the general excavation depth will not exceed 300mm and would be shortened in certain areas of environmental sensitivity including highly vegetated areas and around large trees. encroachment of more than 10% of the Tree Protection Zone (TPZ) or into the Structural Root Zone (SRZ) will require a qualified Arborist (AQF level 5) to demonstrate that the tree(s) will remain viable. There may be certain area in steeper terrain excavations of around 1000mm depth may be required to create a benched track. Please refer to the Arborist Report for further detail regarding excavation in SRZs and TPZs(Axiom Tree Management and Hepburn Shire Council 2020).

Refer to Table 3 for further detail regarding the basic trail construction techniques.

Table 3 Construction techniques

Construction technique	Process
Standard benching machine	<ol style="list-style-type: none"> <li>1. Review the ground-truthed corridor up to 100-200m ahead of excavator. The ground-truthed corridor is marked using coloured flagging tape tied to trees/vegetation during the ground-truthing stage and mapped with GPS. The ground-truthed corridor is generally defined to include 20m (this may vary depending on environmental values) either side of the flagged with a maximum impact area within this corridor being two metres. <li>2. Determine the exact alignment to be taken within the ground-truthed corridor. <li>3. Clear the construction corridor of vegetation to the minimum extent necessary. The maximum impact area within the corridor will be two metres wide as assessed in the Biosis Flora and Fauna Assessment(Biosis 2021a), Figure 3. The construction corridor is defined as the horizontal corridor from the top of the upslope batter to the toe of the downslope batter and the vertical corridor to about 2m high and 2 m wide (sufficient to allow passage of the excavator). Clearing of the construction corridor is usually undertaken manually using motorized tools such as brush cutters, chainsaws and hedge trimmers and hand tools like loppers, hand saws and secateurs. Large trees (greater than 200mm DBH) do not need to be removed, as the trail can be routed to avoid them, however, it is likely that small boughs and limbs may need to be removed. All vegetation that is removed is cut into small pieces and dispersed throughout the surrounding area - no large windrows or stockpiles should be present. At this stage, all vegetation is removed except for ground covers, herbs and grasses (which are left in place for later removal by the excavator). In some circumstances it may be possible to remove the vegetation, stockpile it beside the trail and then mulch it after the excavator has cut the trail and moved forward. The mulched material can then be spread out over the upper and lower batters. While this technique is useful, it can be difficult to achieve in steep or heavily wooded country where there is no available space to stockpile the material and it can add considerable time and cost to the construction process. Hollow bearing trees must be avoided where possible. <li>4. Cut the bench using cut and fill technique. The topsoil and mineral earth removed from the inner side of the bench are used to build up the outer edge of the bench. The excavator works forwards, cutting the bench ahead of it and then moving forward onto the bench. The bench must be wide enough and stable enough for the excavator to operate safely on. Using a rubber-tracked mini-excavator with a minimum track width of about 900mm, the bench is generally constructed at 1m width. On steeper slopes, the outer edge of the bench may need to be retained. In MTB trail construction this is generally done using dry stone rock walls, built from rock sourced during the construction of the bench.

Construction technique	Process
	<p>5. Define the ride line by placing rocks, logs and other obstacles as necessary. Large obstacles work best and should be manoeuvred into placed by the excavator. The ideal ride line is generally on the inner side of the bench, at the toe of the upslope batter, where the soil is firm and compacted. Obstacles are manually and deliberately placed to control rider speed and position riders towards the inside of the bench, away from the soft outer edge.</p> <p>6. Clean up the trail tread, removing loose rocks and roots, compacting the tread, back sloping the batter and managing drainage (for example, ensuring the trail is outsloped where practical). This step is undertaken manually, by trail labourers working behind the excavator.</p>
<p>Standard benching – hand</p>	<p>This type of construction is very similar to ‘Standard Benching – Machine’ except that it is used in situations where it may not be possible or desirable to use a mini-excavator. Hand construction replaces the role of the mini-excavator, resulting in narrower and generally tighter trails.</p> <p>The process for this type of construction is the same as the previous technique, except that step 4 is undertaken by hand instead of by a mini-excavator. All other steps remain the same.</p>
<p>Rock armouring</p>	<ol style="list-style-type: none"> 1. Mark out the area to be rock armoured. 2. Collect suitable rocks. Ideally, these are uncovered and placed to the side during normal trail construction, for usage later on. Rocks should be as large as is practical- ‘microwave’ sized as a minimum. Rocks should ideally be ‘plate’ shaped, with flat upper and lower surfaces, but this is not always possible. 3. Excavate soil from the area to be rock armoured, to the approximate depth of the rocks to be used. Dispose of spoil appropriately, keeping some in reserve for packing in around rocks. 4. Beginning from the bottom and working uphill, place rocks into the excavated trench, locking them together and packing each one in place before moving onto the next. The goal is to ensure that the upper surface of the rock-armoured section is as flat and uniform as possible, (although sometimes it may be desirable to make it uneven or rough). Rocks should not be placed in uniform rows, as this causes the gaps/joins to line up, creating potential traps for water and wheels

Construction technique	Process
	5. Once all rock armouring is complete, use any leftover soil/rocks to pack in around the edges of the rock armouring.
Elevated structures	<p>This project calls for the construction of 31 boardwalk bridges/elevated structures, totalling approximately 104m in length varying in widths between 0.5 to 1.2m.</p> <p>These structures are typically used to enable a trail to cross over a waterway or area of soft or boggy ground.</p> <p>It is anticipated that the structures will be less than 1m above the ground and will not require handrails (excluding a boardwalk bridge on A13 which will be 1.5 high. For any of the proposed bridges/elevated structures be higher than 1m above the ground, handrails should be installed (although possibly only on one side). It is recommended avoiding handrails where possible (and structures are below 1 metre) as they can be a crushing hazard for mountain bikers' fingers. If a handrail can be avoided by slightly adjusting the location of a bridge and thus reducing the height of the drop off, then this may be beneficial.</p>

4. Site environmental values

4.1 Ecological values

Significant ecological values have been identified on site. These values are documented in the Biosis report *Creswick Mountain Bike Trail: Flora and Fauna Assessment* (Biosis 2021a). The ecological values on the site are:

- The majority of the study area is covered by Heathy Dry Forest EVC and Grassy Dry Forest EVC. Areas of high quality habitat were found throughout the study area with most habitat zones containing a high diversity of native herb and grass species with few weeds. Habitat zones near waterways typically contained a greater coverage of weed species, however these zones also typically contained higher numbers of large trees.
- Areas of Creekline Herb-rich Woodland EVC within the Central Victorian Uplands Bioregion have a bioregional conservation status of vulnerable.
- Removal of known/potential habitat for 13 significant species.
- Several small streams and creeks which may provide habitat for a variety of native aquatic species including Growling Grass Frog *Litoria raniformis* and Brown Toadlet *Pseudophyrne bibronii*.

Native vegetation to be retained or permitted for removal is shown on the Figure 1 of the EMM mapping.

The project will impact upon 11.867 hectares of native vegetation, which includes 174 canopy trees (including one large canopy tree) for removal subject to approval under the PE Act. All other native vegetation beyond the impact area is protected and must not be impacted by development works. Areas of native vegetation to be retained will be shown on all construction plans and shown as a 'No Go Area'. The 'No Go Area'/ native vegetation to be retained native vegetation will be identified by flagging tape when marking out the trail alignment. Anywhere outside the 20 metre 'study area' is a strictly no go zone, as detailed in Table 4 and show on Figure 1.

5. Cultural Heritage Management Plan

Significant Aboriginal Cultural values have been identified on site. These values are documented in the Biosis report *Creswick Mountain Bike Trail Cultural Heritage Management Plan 14915* (Biosis 2021b).

5.1 Key findings, including key Aboriginal cultural values and risks

No new Aboriginal cultural heritage places were recorded during assessment. Two previously recorded Aboriginal places were identified in the activity area. These are both scarred trees:

- VAHR 7623-0204 (Jackass ST 1) and
- VAHR7623-0205 (Jackass ST 2).

5.2 Avoiding, minimising and offsetting impacts to Aboriginal cultural heritage

The trails have been designed to avoid the recorded Aboriginal cultural heritage places and areas of high Aboriginal archaeological potential. In most cases trail alignments follow either disturbed gold mining areas where topsoil (and therefore any potential Aboriginal remains) has been entirely removed, steep slopes that are unlikely to have retained Aboriginal material, or existing tracks.

The two scarred trees should be avoided during works. If construction activities are proposed within 20 metres of the scar trees, fencing should be erected at least 3 metres beyond the tree protection zone around the trees to prevent accidental harm. Fencing can be star picket and wire with suitable marking to indicate it as a no go area.

5.3 Development of impact mitigation measures for implementation within the EMP

Measures to inspect areas of archaeological potential during works in order to manage any unsuspected Aboriginal cultural heritage have been included in the CHMP. The Dja Dja Wurrung Clans Aboriginal Corporation will be involved in formulating and approving management actions for Aboriginal cultural Heritage in the activity area.

6. Historical Heritage

Significant Historical Heritage values have been identified on site. These values are documented in the Biosis report *Creswick Mountain Bike Trails, Victoria: Historic Survey Report* (Biosis 2021c).

6.1 Key findings, including key historical values and risks

The assessment undertaken by Biosis has determined that there are two historical places included on the Victorian Heritage Register (VHR) (and by default also on the Hepburn Heritage Overlay), nineteen historic archaeological places on the Victorian Heritage Inventory (VHI) and two places on the Hepburn Heritage Overlay (but not on the VHR) and are included in the Biosis report (Biosis 2021c).

The assessment has also determined that there is potential for further unrecorded historic places and archaeological remains within the study area.

The historical places comprise sluiced ground from gold mine sites, shafts, mullock heaps, water races, and dwelling sites. There are no standing structures likely to be affected but the subtle landscape features are fragile and easily altered through clearance of vegetation, erosion or other disturbance. There is therefore a risk that mining features and archaeological deposits might be harmed by the construction and use of the mountain bike trails.

6.2 Avoiding, minimising and mitigating impacts to historical heritage

Measures have been devised to ensure that works minimise any impacts to potential archaeological and heritage places, and if any historic or archaeological features are encountered during works, these can be appropriately managed.

- Design works to minimise impacts.
- Avoid cutting across tram formations, water races or sluice banks.
- Induction for contractors in how to recognise and manage historic features, when to stop works, who to contact.
- Heritage advisor inspection during works in sensitive areas.
- Realign to avoid features if possible.
- If not possible to avoid, record and obtain heritage approval.
- Implement a regular process of inspection in case use of the trails reveals historical or archaeological remains which should then be managed appropriately.
- Prior to commencing construction on each section of trail, the trail builder is to walk the alignment and mark and avoid mine shafts.

7. Water quality

The project works must comply with the State Environmental Protection Policy (Waters) (SEPP) (EPA Victoria, 2018). Specifically the project manager must:

- a) *ensure their activities are managed to minimise the risks to **beneficial uses**, so far as reasonably practicable, including risks from dewatering, land disturbance, soil erosion or the discharge of sediments and other pollutants to waters; and*
- b) *monitor surface waters where the construction activity adjoins or crosses surface waters to assess if beneficial uses are being protected; and*
- c) *comply with guidelines published or approved by the Authority in relation to the construction activity.'*

Environmental quality objectives and indicators are defined in the SEPP to protect 'beneficial uses'. Beneficial uses include water quality for the protection of ecological values, human consumption, agriculture and industry, recreation, spiritual values and other uses (EPA Victoria, 2018).

Impacts to surface and ground water quality must not result in changes that exceed background levels and / or the range of environmental objectives (biological, nutrient, water quality) specified for the area in which the construction activity occurs. Where background levels exceed the specified environmental objectives, water quality must align to background levels (EPA Victoria, 2018).

This EMP provides measures to ensure water quality is not impacted by the construction of the mountain bike park. See Table 4.

Water quality monitoring

Provided all sediment controls are in place, regularly inspected and maintained; water quality monitoring is not mandatory for this project. The project manager may choose to monitor water quality to check water quality leaving the site meets SEPP requirements. Minimum variables to monitor are, turbidity, pH, and salinity.

Any water physically discharged from the site must be tested and treated to ensure it complies with SEPP requirements.

8. Environmental aspects, management objectives and risk assessment

This section identifies the potential environmental and heritage risks associated with the project and their likelihood and consequence. The Project Risk Assessment is outlined in Table 4 below. Please note this is not a risk assessment of other aspects of the project such as personnel occupational health and safety or material assets in proximity to the project area.

Table 4 Project management objectives and risk factors

Project management objectives and risk factors

Environmental factor	Environmental and heritage values / assets	Management objectives	Risk factors
Flora/ Fauna	<p>The project will impact upon 11.867 hectares of native vegetation, which includes 174 canopy trees (including one large canopy tree). Known/potential habitat for 13 significant species. Riparian and in-stream habitat within and in the vicinity of the study area (e.g. downstream. understory vegetation / habitat that forms part of a notable habitat linkage from Creswick Regional Park, Nerrina, Woookarung Regional Park, Union Jack Reserve and Buninyong. All native vegetation (flora) adjacent the impact area are protected and must not be disturbed, traversed or used to stock pile materials or plant. Deliberate or inadvertent access to native vegetation adjacent the site must be prevented to reduce the likelihood of harm to native flora and fauna. There is a minor possibility that fauna may enter the site during the construction period. Flagging tape must be used to secure the 20 meter 'study area'. Anywhere outside this area is the no go zone and must not be damaged. The impact area must strictly be a maximum of two metres wide.</p>	<ul style="list-style-type: none"> No harm to flora and fauna arising from the project, other than as approved. Areas with flora and fauna present neighbouring the construction corridor clearly designated a 'no-go' area by temporary highly visible flagging tape, as shown in Figure 1. 	<ul style="list-style-type: none"> Deliberate or accidental clearing of protected vegetation. Deliberate or accidental physical injury or death of protected fauna. Work activities that disturb vegetation or soil. Deliberate or accidental removal of nesting or roosting sites Potential isolated deaths of fauna due to works. Inappropriate location of stockpiles on protected vegetation. Vehicle / plant movement through protected areas. Introduction of soil or invasive plant seed on dirty vehicles. Pollution arising from erosion or fuel / chemical spills.
Historical Heritage	<ul style="list-style-type: none"> Two historical places included on the VHR (and by default also on the Hepburn Heritage Overlay), nineteen historic archaeological places on the VHI and two places on the Hepburn Heritage Overlay (but not on the VHR) and are included in the Biosis Report(Biosis 2021c) Potential for further unrecorded historic places and archaeological remains within the study area. 	<ul style="list-style-type: none"> Obtain all necessary heritage permits before works commence No harm to historical heritage arising from the project, other than as approved. Avoid cutting across tram formations, water races or sluice banks. Realign to avoid features identified if possible during construction. Areas with historical heritage present neighbouring the construction corridor clearly designated a 'no-go' area by temporary security fencing or temporary high visibility exclusion fencing, as shown in Figure 1. Unmarked mine shafts within the construction area pose a risk to the construction crew and trail users. Construction crew need to be made aware of the risk and have a procedure in place for marking, notification and making safe and mineshaft within the project corridor. If any mineshafts are located outside of the project footprint, the relevant public land manager is to be notified so the mineshaft can be made safe by that public land manager. 	<ul style="list-style-type: none"> Loss of historical heritage values. Excavation of areas of historical heritage without a heritage permit. Accidental damage to unidentified mine shafts

Environmental factor	Environmental and heritage values / assets	Management objectives	Risk factors
Cultural Heritage	<p>The CHMP has identified two Aboriginal Heritage Places in the activity area. These are both scarred trees:</p> <ul style="list-style-type: none"> • VAHR 7623-0204 (Jackass ST 1) • VAHR7623-0205 (Jackass ST 2) 	<ul style="list-style-type: none"> • A copy of approved CHMP must be held onsite at all times. • No inadvertent or deliberate damage to cultural heritage • Areas with Aboriginal heritage present neighbouring the construction corridor clearly designated a 'no-go' area by temporary security fencing or temporary high visibility exclusion fencing, as shown in Figure 1. • Project manager must notify the land manager in the event of any unexpected finds. 	<ul style="list-style-type: none"> • Loss of cultural heritage values. • Excavation of areas of cultural heritage without an approved CHMP.
Water pollution – Erosion and sediment	<p>Construction works will expose soil to erosion which could potentially lead to sediment movement by water within and beyond the impact area. Sediment movement in water is a pollutant of waterways and is a serious environmental risk that must be mitigated.</p> <p>Land owners and Project managers have responsibilities under law to prevent erosion and sediment pollution of waterways under the Environment Protection Act 1972 (EPA Act) and the Catchment and Land Protection Act 1994 (CaLP Act). Sediment management is required to meet requirements under the EPA State Environmental Protection Policy (Waters) (EPA Victoria, 2018)</p> <p>Diverting surface water off the trail is of the highest priority in achieving sustainable trails. Running water will erode the tread and support structures and result in the deposition of sedimentation. Standing water can result in soft boggy conditions, and tread and support structure failure (TRC Tourism Pty Ltd n.d.)</p>	<ul style="list-style-type: none"> • No discharge of sediment laden runoff from the impact area directly or indirectly to waterways or stormwater. • No removal of vegetation beyond the impact area (retained vegetation helps reduce sediment movement.) • Any potential erosion / sediment source of pollution will be contained within the impact area. • Design contour trails and frequently out sloping the tread. • Other drainage treatments include grade or drain dips and water bars. 	<ul style="list-style-type: none"> • Erosion and sediment sources including cut/fill surface, exposed batters, stockpiles, waterway crossings and access tracks. • Potential erosion and sediment receptors include downslope storm water drains. • Extent of exposed earth and duration of time exposed: Access track and construction area. Exposed for 18 mths approximately. • Soil type and erosivity: Basalt – low erosivity due to limited slope • Site drainage regime: Urban stormwater system- surface water drains naturally to the urban storm water system. • Rainfall: Variable – thunderstorms possible • Slope: Flat • Vehicle movements on and off site: Vehicle movements will be continuous, measures required to manage vehicle soil transport.
Invasive species	<p>Invasive plants (weeds) and animals pose serious threats to native ecosystems and are costly to control once established.</p> <p>All contractors are required to ensure that all plant and equipment brought onto or removed from the impact area are clean and free of invasive plant seeds, soil and other propagules that could spread invasive plants onto, within or beyond the impact area.</p>	<ul style="list-style-type: none"> • Prevent invasive plants and animals from establishing in the impact area. • Ensure all vehicles and equipment are cleaned before entry to and exit from the impact area. • Works in wet areas must be undertaken during dry weather to reduce the risk of Phytophthora species adhering to footwear and equivalent. • Ensure all vehicles and machinery are cleaned down when moving from one location to another within the impact area from a heavily infested site to a low/no infested weed area. • Weeds will be removed from trail surfaces, trail batters and surrounding vegetation by either hand pulling, bagging and removing from the site to be disposed sanitarly disposed 	<ul style="list-style-type: none"> • Invasive plants introduced to the site during construction by vehicles or materials. • Existing invasive plants impacts expand due to construction and other disturbance. • Invasive plants spread to neighbouring properties or beyond.
Fuel and chemical spill	<p>Spills of fuel, oils or chemicals can cause temporary or persistent environmental pollution that may be hazardous to people and the environment and may be difficult to remediate. Prevention of spills is the most effective way to prevent pollution by fuels or chemicals. Fuels and oils are most likely to be spilled during refuelling or due to equipment failure. The risk of spills can be reduced by</p>	<ul style="list-style-type: none"> • No spills or pollution arising from the use of fuels, oils and chemicals during the project. • Management practices will be in place to help prevent spills or clean up spills. • Appropriate clean up kits will be available on site during at all times during construction. 	<ul style="list-style-type: none"> • Types of chemicals and fuels used on site: Petrol, diesel, paint, solvent (no chemical storage permitted on site). • Quantities of chemicals and fuels used and/or stored on site: <200l (fuels) <20l (other). • Potential chemical receptors: Personnel, soils, vegetation, nearby adjacent ephemeral waterways, fauna.

Environmental factor	Environmental and heritage values / assets	Management objectives	Risk factors
	<p>planning, the use of appropriate equipment, providing appropriate storage and having clean up kits accessible in the event of an accident.</p> <p>Use of hazardous chemicals will be avoided on site during construction. Fuels and oils will only be used to refill construction equipment and will not be stored on site.</p>		<ul style="list-style-type: none"> Proximity to potential chemical receptors: Immediate.
Waste disposal and litter	<p>Waste generation and disposal is costly and can generally be avoided by forward planning and by recycling which is usually free. Adequate waste / recycling materials storage facilities will be provided on the construction site at all times to help make recycling the easy option. Waste must be secured on site at all times to prevent it being blown beyond the impact area or being accessed by fauna.</p>	<ul style="list-style-type: none"> All contractors and staff commit to reducing waste and recycling materials where practical. All waste or recycling materials secured on site against wind / water movement or disturbance by wildlife until it can be legally removed to landfill or a recycling facility. All waste disposed of legally with records kept. All waste management and recycling storage maintained with lockable lid, fit for purpose, in a tidy condition and emptied regularly. 	<ul style="list-style-type: none"> Nature of waste to be generated: Spoil (soil from excavation), general, building waste. Presence of waste on site prior to work commencement: Nil. Quantity of waste anticipated: < 40 cubic metres. Potential waste receptors: Local residents. Proximity to potential waste receptors: Immediate.
Dust air pollution	<p>Dust raised during construction is a serious issue for the health and safety of employees and the public. Dust can also be a traffic hazard that can limit visibility or distract drivers. During dry periods dust is easily suppressed by water sprinkler from a fixed system or a truck.</p>	<ul style="list-style-type: none"> Dust will not reach a volume that causes a health hazard to employees or the public. Dust will not reach a volume that causes a traffic hazard. If required, dust will be managed by water sprinkler from a fixed system or truck. 	<ul style="list-style-type: none"> Dust sources: Soil disturbance by vehicles and equipment in dry weather. Vehicle movements on dirt surfaces in dry weather. Potential dust receptors: Workers, local residents, roadway, waterways. Proximity of works to dust receptors: Immediate. Extent of exposed earth and duration of time exposed: 6 mths Wind conditions: Exposed.
Noise	<p>Construction noise can be obtrusive, stressful and disruptive. The project impact area is not located near residential development so impact should be minimal. Good-will of immediate neighbours should be fostered by consulting with them prior to commencing construction works where applicable is advised. All plant and equipment shall be maintained in accordance with manufacturer's specifications to help prevent unnecessary noise.</p>	<ul style="list-style-type: none"> Noise generated from construction does not cause a nuisance to neighbours. Neighbours consulted with to communicate potential noise impacts and to identify any sensitivity. Manage noise according to EPA Victoria Environment Protection (Residential Noise) Regulations 2008 (EPA Victoria, 2008) 	<ul style="list-style-type: none"> Nature of noise generating works: Construction activities, power tools, large machinery reversing vehicles, radios. Potential noise receptors: Workers, local residents.

8.1 Environmental and heritage risk assessment

Risk assessment statement - Project risks have been assessed as generally Significant to High. With risk management processes in place, environmental and heritage risks are reduced to Moderate and Low

Table 5 Risk assessment matrix

		Likelihood (L)				
		Rare (1)	Unlikely (2)	Possible (5)	Likely (10)	Almost certain (20)
Consequence (C)	Catastrophic (16)	Moderate (16)	Significant (32)	High (80)	High (160)	High (320)
	Major (8)	Moderate (8)	Moderate (16)	Significant (40)	High (80)	High (160)
	Moderate (4)	Low (4)	Moderate (8)	Significant (20)	Significant (40)	High (80)
	Minor (2)	Low (2)	Low (4)	Moderate (10)	Significant (20)	Significant (40)
	Limited (1)	Low (1)	Low (2)	Low (5)	Moderate (10)	Significant (20)

Table 6 Risk rating score ranges

Risk rating (R)	Score	Response
High risk (H)	41 - 320	Immediate action required as a priority
Significant risk (S)	20 - 40	Senior management attention needed
Moderate risk (M)	8 - 19	Management responsibility must be specified and standard procedures followed and documented
Low risk (L)	1 - 7	Managed by routine procedures / practices

Table 7 Risk Assessment

Reference	Responsibility	Operation or activity	Inherent risk (uncontrolled)			Residual risk (with controls in place)							
			Environmental aspect	Environmental / heritage impact	C	L	R	Current monitoring / control/ operational procedures	Frequency of monitoring	C	L	R*	Direct legal or other req.?
1	Project manager	Construct temporary security fence or border off no go areas with flagging tape (no ground disturbance required)	<ul style="list-style-type: none"> Inadvertent access of vehicles and machinery onto native vegetation 	<ul style="list-style-type: none"> Damage to native vegetation or fauna Soil compaction 	2	10	S	<ul style="list-style-type: none"> Secure areas of protected native vegetation 'no go areas' as shown in Figure 1 prior to works with high visibility temporary fencing. Photograph vegetation showing fencing installed/ flagging tape mapped out. Provide 'No Go Area' signage on temporary fencing at 30m intervals. No work, parking of vehicles, machinery or storage of equipment is permitted outside of the designated locations as described on the Site Access Plan. Parking areas and equipment / materials storage areas are to be clearly delineated with high vis bunting and or rope. Access points to the worksites are to be clearly identified with temporary construction signage stating authorised access only. 	Daily during construction	2	2	L	Yes <ul style="list-style-type: none"> EPBC Act FFG Act P&E Act
2	Project manager	<ul style="list-style-type: none"> Excavation and grading for Standard benching 	<ul style="list-style-type: none"> Inadvertent excavation at incorrect location Uncontrolled access to native vegetation, historical heritage or areas of cultural heritage sensitivity 	<ul style="list-style-type: none"> Destruction of native vegetation or fauna habitat Destruction of cultural heritage or historical heritage 	8	10	H	<ul style="list-style-type: none"> Mark alignment of trails prior to works commencing. Secure areas of protected native vegetation and heritage areas as shown in Figure 1 prior to works with high visibility temporary fencing or flagging tape. Follow weed management protocol. Around water races, approach angles should be gentle, avoiding dropping down steep hills and especially turning sharply on the formation. Preferably the approach angle to any linear historic features will be less than 10 degrees. Induct staff into EMP and provide training in responding to cultural heritage contingencies provided in this EMP. 	Daily during construction	8	2	M	Yes <ul style="list-style-type: none"> EPBC Act Aboriginal Heritage Act Heritage Act P&E Act
3	Project manager	<ul style="list-style-type: none"> Excavation and grading by Standard machine benching and rock armouring 	<ul style="list-style-type: none"> Creation of exposed soil surfaces and stockpiles of fill 	<ul style="list-style-type: none"> Sedimentation and erosion source Dust source Source of pollution of waterways Illegal disposal or inappropriate disposal or movement of fill 	4	20	H	<ul style="list-style-type: none"> Install sediment fencing and modular sediment traps prior to works commencing. Induction protocol to all staff and contractors for identifying and managing unexpected finds. During construction, a program of inspection and archaeological monitoring should be carried out in areas of historical and archaeological sensitivity in areas. Only excavate small lengths of trenches down steeper slopes to prevent channelling of water within trenches. Provide cut off drains to divert surface water from excavated trenches on steeper slopes. Cover or moisten stockpiles to prevent dust. Provide designated fill disposal sites in already disturbed areas. Induct and train staff in management of stockpiles and fill. 	Daily during construction and following rain events	8	2	M	Yes <ul style="list-style-type: none"> EPA Act - State Environment Protection Policy (Waters) 2018
4	Project manager	<ul style="list-style-type: none"> Machinery and power tool use for trail excavation and building boardwalk bridges 	<ul style="list-style-type: none"> Noise Fuel and chemical use Dust 	<ul style="list-style-type: none"> Loss of amenity due to noise Pollution due to fuel/chemical spill Creation of dust from brush cutting, chain sawing, power tools. 	4	20	H	<ul style="list-style-type: none"> Use machinery or power tools during agreed operating hours. Maintain equipment to standard. Use fuel tenders in good working order. Provide spill kits and portable bunding. No fuel or chemical storage on site. Provide training to personnel in safe use of fuels or chemicals. Wet surfaces during drilling or cutting to suppress dust. 	Daily during construction	2	2	L	Yes <ul style="list-style-type: none"> EPA Act - Environment Protection (Residential Noise) Regulations 2008

5	Project manager	<ul style="list-style-type: none"> Site access Movement of construction teams, plant and equipment 	<ul style="list-style-type: none"> Introduction of weeds and or pathogens 	<ul style="list-style-type: none"> Invasive species 	4	10	S	<ul style="list-style-type: none"> Ensure site is clean of waste at all times. Plant and equipment should remain in the construction site for the duration of the project. Machines should remain at the work site at the end of each day. Where it is necessary to remove plant and equipment from the worksite it must be transported via an approved route. Hand tools should be stored in work vehicles or other pre-approved secure location. Tools should not be left on the trail at the end of each day. Tools should not be used in areas outside of the worksite for the duration of the trail construction period to avoid the spread of weed and pathogens. All equipment including hand tools and footwear must be thoroughly cleaned prior to entering the work site to avoid the spread of weeds and pathogens or introduce any foreign material that may impact on the environment. Wash down of plant and equipment must take place at an approved wash down location to be approved by the Council Project Manager. 	Daily	2	5	M	Y <ul style="list-style-type: none"> CaLP Act
6	Project manager	<ul style="list-style-type: none"> Deconstruct temporary fencing and flagging tape 	<ul style="list-style-type: none"> Noise Dust Fuel and chemical use Waste 	<ul style="list-style-type: none"> See 4 above 	4	20	H	<ul style="list-style-type: none"> See 4 above 	Daily	2	2	L	See 4 above
7	Project manager	<ul style="list-style-type: none"> Surface reinstatement 	<ul style="list-style-type: none"> Exposed soils Invasive plants (Weeds) 	<ul style="list-style-type: none"> See 3 above Weed invasion of exposed soils 	4	20	H	<ul style="list-style-type: none"> See 3 above Remove and dispose of fill to designated stockpiles Cover exposed soil with biodegradable jute matting or as per 3 above. Monitor for and control invasive species during the course of the project 	Inspect during course of works	2	5	L	Y <ul style="list-style-type: none"> EPA Act - State Environment Protection Policy (Waters) 2018

Table 8 Key regulation

Environmental aspect	Regulation
Waste and resource management	<ul style="list-style-type: none"> • Environment Protection (Industrial Waste Resource) Regulations 2009 (Vic) • <i>Environment Protection Act 1970</i> (EPA Act)
Water quality	<ul style="list-style-type: none"> • State Environment Protection Policy (Waters) 2018 and Schedules • <i>Water Act 1989 (Vic)</i> (Water Act) • Urban Stormwater: Best Practice Environmental Management Guidelines 1999 (Vic) • <i>Fisheries Act 1995</i> (Fisheries Act) • <i>Catchment and Land Protection Act 1994 (CaLP Act)</i> • <i>Environment Protection Act 1970</i> (EP Act)
Biodiversity, conservation and land management	<ul style="list-style-type: none"> • <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act) • <i>Flora and Fauna Guarantee Act 1988</i> (FFG Act) • <i>Catchment and Land Protection Act 1994</i> (CaLP Act) • <i>Planning and Environment Act 1987</i>(P&E Act) • <i>Environment Protection Act 1970</i> (EP Act)
Cultural heritage	<ul style="list-style-type: none"> • <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act) • <i>Aboriginal Heritage Act 2006</i> (AH Act) • <i>Heritage Act 2017</i> (Heritage Act) • <i>Planning and Environment Act 1987</i> (P&E Act)

9. Environmental management plan

This section provides an Environmental management plan that responds to the addresses all environmental factors, management objectives and risks identified in the Project Risk Assessment as outlined in Section 4.

Please refer to Environmental Management Map for specific obligations for each land manager.

Table 9 Environmental Management Plan

Environmental aspect or management activity	Actions to address risk	Monitoring response	Frequency of monitoring	Responsibility	Documentation
Impact area preparation and identification	<p>Prior to the commencement of works the Project manager will ensure that the impact area and key site features are clearly established and identifiable on-ground and on plans according to the EMM (See Figure 1). The following items must be established and clearly identified:</p> <ul style="list-style-type: none"> - Impact area 'study area' – establish the impact area with exclusion fencing appropriate to the site. All construction works must be confined to the defined impact area or 'study area'. - Access points for the impact area must be made obvious to all staff and contractors prior to commencement of works and at all times during the construction process. Any access areas other than those identified in the EMM must be closed during construction. - Stockpile locations. - Site facilities and vehicle parking area. - Site sediment and erosion controls. - Site fencing, including other fencing to protect environmental or heritage values within the impact area. - Site waste and recycling storage facilities. - Chemical spill clean-up facilities or kits. 	<ul style="list-style-type: none"> • Document impact area preparation and identification including photographs 	<ul style="list-style-type: none"> • Prior to commencement of works 	<ul style="list-style-type: none"> • Project manager 	<ul style="list-style-type: none"> • Project records • Photographs

Environmental aspect or management activity	Actions to address risk	Monitoring response	Frequency of monitoring	Responsibility	Documentation
Site induction/ site access	<ul style="list-style-type: none"> • Site induction to be provided for all personnel working on site, including sub-contractors. Induction must be undertaken by the Project manager before all personnel commence work. • The induction will cover all the content of the EMP relevant to the role of the personnel. Details of the induction and content covered will be recorded for each person. The induction process will describe the location of copies of the EMP and will provide the contact details for the Project manager and Project manager. • 'Ask before acting' will be emphasised and encouraged to help prevent incidents. • Site access will vary depending on the alignment under construction and construction method. Trail construction team will enter site via an existing road or previously constructed trail. They will progress along the trail until it is completed, emerging on to another trail or road or beginning the construction of a new alignment. If safe, excavators are to be parked where they finish each day and crews will access the work site on foot. • If access is required which deviates from the agreed trail construction corridor, construction crews must seek site specific prior approval from the Construction/ Project Manager. In turn the Construction/Project Manager will seek approval from the appropriate Land Manager Machinery may be temporarily parked where it can be positioned safety off roads and does not, block or impede traffic, or create hazards by obstructing site or other means. • A cultural heritage induction must be conducted with all site workers/contractors by representatives of the Dja Dja Wurrung (DDWCAC) immediately prior to the commencement of ground disturbance activities. A Heritage Advisor/archaeologist must also attend this training session. The induction must include: <ul style="list-style-type: none"> - a brief history of the Aboriginal occupation of the Activity Area and the broader region - a summary of the archaeological investigations conducted within the Activity Area - specific details of all Aboriginal Places and Heritage located during the CHMP assessment - a summary of the conditions and contingencies contained within the CHMP - the obligations of site workers/contractors and Sponsors under the Victorian Aboriginal Heritage Act 2006. • The main aim of the cultural heritage induction is: <ul style="list-style-type: none"> - to explain the procedures outlined in the CHMP - show the site contractors examples of the most likely Aboriginal cultural heritage material to be located within the Activity Area - explain the procedure outlined in the Contingency Plan section of the CHMP in the unlikely event that this material is uncovered by them during the course of construction works. • A notification period of at least 2 weeks must be provided to the RAP to present a cultural heritage induction. • A historical heritage induction must be completed to ensure contractors are able to identify Old Mine Shafts. This must be completed by a qualified Heritage Advisor. • Site induction access – restrict access tracks being formed in the construction zone to avoid these trails that are made permanent by other vehicles. 	<ul style="list-style-type: none"> • Document delivery of site inductions and details of participants 	<ul style="list-style-type: none"> • Prior to personnel commencing work on site 	<ul style="list-style-type: none"> • Project manager 	<ul style="list-style-type: none"> • Project records

Environmental aspect or management activity	Actions to address risk	Monitoring response	Frequency of monitoring	Responsibility	Documentation
Removal of native vegetation	<ul style="list-style-type: none"> No trees, dead or alive, or native vegetation is to be removed, lopped or adversely impacted upon by the construction process, unless in the impact area and in accordance with the endorsed plans. Native vegetation permitted to be removed will be clearly marked as on site by the Project manager prior to removal, in accordance with the endorsed plans. Document marked area with photographs. Native vegetation to be retained will be secured by flagging tape. Signage must be installed stating 'Vegetation Protection Zone – No Work Permitted'. Where possible, the preferred method of marking no-go areas or trail alignments on land managed by Parks Victoria is to use stake flags. All flagging tape/ stake flags and signage must be removed once trail construction has been completed. 	<ul style="list-style-type: none"> Photos of site with tree protection fencing in place prior to commencement of works 	<ul style="list-style-type: none"> Weekly or in response to reports 	<ul style="list-style-type: none"> Project manager 	<ul style="list-style-type: none"> Photos of any changes Summary notes of changes
Local erosion and sedimentation as a result of exposed soil within the impact area.	<ul style="list-style-type: none"> Trail gradients will mostly be less than 5% and will generally follow the landscape contours in a gradually descending manner with switch backs, where required. The trails will be built according to current best practice guidelines for outsloping and grade reversal. In addition to the four construction types described above, suitable erosion control measures will be implemented during all proposed works. The most common sediment control measure to be implemented during the works is a sediment fence. Sediment fences will be installed on all grade reversals, drainage outlets and in wet areas during the construction period and removed once practical completion has been achieved with Hepburn Shire, usually once the trails have bed in. Subject to rain events, sediments traps should also be installed downslope of the mini excavator during construction. This will be determined by the Project Manager and project supervisor. Sediment traps (such as silt fences) will be erected at regular intervals to intercept sediment laden run-off and minimise any impacts on surrounding vegetation and known drainage lines and waterways. Sediment control measures will be checked and maintained at regular intervals (daily during construction of the relevant trail and weekly once construction of the relevant trail has been completed or after rainfall events greater than 10 mm in a 24 hour period). Major stockpiles of materials (if required) will be located in existing car park areas, as agreed with Creswick Trails/ Hepburn Shire. Minor stockpiles of materials may be temporarily located at the trailhead in a fully bunded location that does not impact native vegetation or cause any risk of environmental damage due to silt movement. 	<ul style="list-style-type: none"> Visual inspections of the of sediment control measures supported by photographs. Sediment control measures will be checked and maintained weekly Water quality measurements for parameters described in Section 3.2, measured where water leaves the impact area. 	<ul style="list-style-type: none"> Weekly Daily inspection of access points Following any rain event. 	<ul style="list-style-type: none"> Project manager. 	<ul style="list-style-type: none"> Marked up plan indicating sediment traps have been placed. Project records Water quality records Site photographs.

Environmental aspect or management activity	Actions to address risk	Monitoring response	Frequency of monitoring	Responsibility	Documentation
Disturbance and sedimentation of waterways, drainage systems and aquatic habitats, including beds and banks beyond the impact area.	<ul style="list-style-type: none"> No activity or access is permitted beyond the impact area. All stockpiles, materials, vehicle movements and so on must be contained within the impact area or as shown in Figure 1. Sediment controls will be installed where sedimentation risks are identified. No vegetation is to be removed within or beyond the impact area, other than vegetation approved for removal. All works in and around waterways and seasonally wet areas will be undertaken by hand. The trail will be micro-sited with the assistance of an ecologist through high risk areas to avoid impacts on these sensitive ecosystems. The works will be timed over summer to coincide with low flow or dry periods and works near waterways will be scheduled appropriately. For example, works will be timed to coincide with periods of low flow and completed quickly. Works will be stopped if conditions are not suitable, such as during and after heavy rain. Works will include manual digging and drilling of footings and hand construction of elevated structures. Access to these sites will only be along the built trails or existing access tracks. Materials for construction will be transported in small sections along the trails. Repeated crossings of waterways by personnel during construction will be avoided to minimise disturbances to substrates. Sediment control devices will be installed where sedimentation risks are identified and stream condition will be regularly visually monitored during and after rainfall events. Minimal riparian vegetation will be removed to allow for elevated structure works and these areas will be allowed to regenerate or activity rehabilitated (where required) when works are complete. The use of a high sunlight penetration product, such as fibreglass reinforced plastic (FRP) decking, will ensure some vegetation cover and aquatic primary production is maintained under the elevated structures. 	<ul style="list-style-type: none"> Visual inspection of all sediment controls Observe water movements during rainfall events and modify sediment traps to ensure they are located where they are most effective Observe water movements during rainfall to check that flows are not being concentrated which could lead to offsite erosion or creek bank instability. 	<ul style="list-style-type: none"> Weekly during works in these areas. During and after rain events. 	<ul style="list-style-type: none"> Project manager. 	<ul style="list-style-type: none"> Project records Photographs of site condition. Documentation of any remediation works.
Community concern for environmental protection or loss of amenity during works.	<ul style="list-style-type: none"> Communicate project plan with neighbours or community, provide EMP to the public on request. 	<ul style="list-style-type: none"> Communications project with neighbours. 	<ul style="list-style-type: none"> 1 month prior to works and as needed during. 	<ul style="list-style-type: none"> Project manager 	<ul style="list-style-type: none"> Project records Media release, flyer signage etc.
Bushfire	<p>No construction works will take place on days of total fire ban (TFB). The use of spark or flame emitting equipment such as grinders and welders, or risks posed by hot exhausts on chainsaws and machines, will be monitored by a spotter equipped with a fire extinguisher, rake hoe and suitable water supply. No fires will be lit for cooking or warmth by the contractor within or near the construction corridors. Cigarette smoking also poses a risk of bushfire ignition and this risk will need to be managed by the contractor.</p> <ul style="list-style-type: none"> The contractor will be responsible for developing an OHS and emergency management plan to deal with issues such as bushfire. No fires are to be lit on high risk days or outside fire designated areas. No fires to be lit at all on all Parks Victoria land unless they are in the provided fireplaces in the visitor node. 	<ul style="list-style-type: none"> Have a spotter observing any welding or grinding operations, and when chainsaws or machinery with hot exhausts are in use 	<ul style="list-style-type: none"> During warmer months and daily during high risk days 	<ul style="list-style-type: none"> Project manager 	<ul style="list-style-type: none"> Project records

Environmental aspect or management activity	Actions to address risk	Monitoring response	Frequency of monitoring	Responsibility	Documentation
Identification of planned burns	<ul style="list-style-type: none"> Project manager must liaise with land manager regarding any planned burns in the area during the construction period. Construction works must halt on days of planned burns within the study area. 	<ul style="list-style-type: none"> Weekly communication must occur between project manager and fire authority/ public land manager to ensure no overlap of construction works and planned burns. 	<ul style="list-style-type: none"> Weekly during works in these areas. 	<ul style="list-style-type: none"> Project manager 	<ul style="list-style-type: none"> Project records
Movement of invasive plants (weeds) and soil pathogens onto or off site.	<ul style="list-style-type: none"> Prior to entering or leaving the impact area, any vehicles, machinery, equipment and PPE will be washed down to remove soil and invasive plant seeds / propagules at a wash down area to be provided during construction. Vehicles and machinery should be cleaned when moving from an area of greater invasive species (weeds, pathogens, etcetera) area to a lesser infected area. All construction and landscaping materials must be certified free of contamination by invasive plant seeds / propagules or pathogens by the contractor/supplier. All works contracts are to specify the contractor is responsible for prevention or follow up control of any invasive plants or pathogens introduced to the site for a minimum of 12 months post construction. Fill, soil and landscaping materials imported onto the impact area must be certified free of pest plant seed / propagules, soil pathogens and pollutants. The Project manager must be satisfied that the materials are obtained from legal sources. Any invasive plants germinating within the impact area must be eradicated and not be allowed to flower and produce seed. Any soil or material contaminated with weed seed or propagules must be disposed of onsite or according to the requirements of the Catchment and Land Protection Act 1994. Where possible, construction should be planned in areas of lesser pathogen infection first, 	<ul style="list-style-type: none"> Contractor and Project manager to sign a statement that all vehicles have been washed down as prescribed and inspected. Follow up visual inspections to detect invasive plant germination and signs of soil pathogen infection. Appropriate contract specification clauses included to allow for vehicle wash-down procedures. Retain quality statements for soil, fill and landscaping materials Record details of all contaminated soil/material disposal locations. 	<ul style="list-style-type: none"> As required for vehicles entering and leaving the impact area Weekly during construction and monthly for 1 year after construction completion. Monitoring will be part of ongoing project management. 	<ul style="list-style-type: none"> Project manager. 	<ul style="list-style-type: none"> Contract specification Project records Signed statement for each vehicle recording wash-down and inspection measures. Certification that materials not contaminated.

Environmental aspect or management activity	Actions to address risk	Monitoring response	Frequency of monitoring	Responsibility	Documentation
Disturbance or injury to terrestrial or aquatic wildlife	<ul style="list-style-type: none"> The impact area does include native vegetation. The proposed development will result in permitted loss of native vegetation (PE Act, FFG Act & EPBC Act). All other native vegetation (flora) within the surrounding area of the subject site is protected and must not be disturbed, traversed or used to stock pile materials or plant. Deliberate or inadvertent access to native vegetation adjacent to the site must be prevented to reduce the likelihood of harm to native flora and fauna. Large logs or rocks will be left in situ to minimise disturbance to fauna habitats. Where required, sections of large logs will be cut or the trails will be aligned to pass over or around significant logs. Where rocky outcrops are encountered during construction the trails will have a reduced footprint to take advantage of naturally open areas. No large loose or embedded rocks will be disturbed in rocky outcrop habitats. The proposed alignments have been assessed by a professional ecologist and the alignments have been adjusted to avoid and minimise impacts to significant flora species. An assessment against the Significant Impact Criteria has been undertaken for the Project and is included in the flora and fauna assessment (Biosis 2021a). This assessment has concluded that the Project is unlikely to have any significant impacts on threatened flora and ecological communities. The trail will be micro-sited with the assistance of an ecologist through sedgeland to avoid impacts on these sensitive ecosystems. A FFG Act protected flora permit will be obtained from DELWP and all conditions of this permit will be adhered to. Works impacting on protected flora will not commence until the FFG permit is issued by DELWP. Disturbance or injury to wildlife is unlikely if all works are restricted to the impact area. Prior to tree removal any subject tree must be inspected by an appropriately qualified zoologist to determine the presence of any native animals living or nesting in the tree. Should any native animals be detected they must be caught and relocated to a site deemed appropriate by the zoologist. If injured wildlife is encountered the Project manager will be immediately notified and a licenced wildlife handler/carer or local veterinarian will be consulted. Wildlife Victoria – ph. 1300 094 535 or www.wildlifevictoria.org.au Project manager must notify the relevant land manager in the event of mortality or injured wildlife found within the project footprint. 	<ul style="list-style-type: none"> Visual inspection of fences to ensure that there are no access points suitable for fauna to enter the impact area. 	<ul style="list-style-type: none"> Weekly. During habitat removal 	<ul style="list-style-type: none"> Project manager 	<ul style="list-style-type: none"> Project records Photographs Record any incidents and notify DELWP if native animals are injured or killed.

Environmental aspect or management activity	Actions to address risk	Monitoring response	Frequency of monitoring	Responsibility	Documentation
Litter, waste and recycling	<ul style="list-style-type: none"> Waste is to be reduced by selecting, in this order of preference, avoidance, reduction, reuse and recycling methods. Construction should involve the reuse of materials and the recycling of waste wherever possible. Impact areas must be kept free of litter at all times. Litter must be prevented from being blown or washed from the impact area and secured from wildlife. Adjacent areas must be checked for litter monthly and at the completion of works. All litter, recyclable or waste materials introduced to the work site must be removed frequently basis for legal disposal or recycling. Waste storage must not be allowed to overflow. Adequate storage for waste and recycling materials must be provided to ensure recycling is as easy and practical as possible. No waste may be disposed of in the impact area. All unused construction materials and waste must be removed from the site when the project is completed. Preparation of a Waste Management Plan in conjunction with the Project manager and Project manager is encouraged to help achieve compliance with the relevant performance standards. No waste to be disposed of in domestic kerbside collection bins. All flagging tape/ stake flags used onsite as part of construction must be removed following construction. Where possible, the preferred method of marking no-go areas or trail alignments on land managed by Parks Victoria is to use stake flags. 	<ul style="list-style-type: none"> Visual inspections of storage and machinery/equipment lay down areas. 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> Project manager 	<ul style="list-style-type: none"> Project records Incident reporting as required.
Dust and air pollution	<ul style="list-style-type: none"> Schedule activities to minimise dust generation and impacts, avoid receiving bulk deliveries on days of strong wind Reduce speed through worksite Cover storage areas either temporary or permanently Regularly inspect boundaries of worksite for dust build up All complaints from neighbours concerning dust to be recorded A water truck shall also be available on site to assist in any necessary dust suppression as need 	<ul style="list-style-type: none"> Observe weather and wind conditions daily Note weather forecasts in advance of works and plan for water sprinkler use during dry and windy conditions 	<ul style="list-style-type: none"> Daily or as required when conditions are dry and windy. 	<ul style="list-style-type: none"> Project manager 	<ul style="list-style-type: none"> Project records Record when dust mitigation measures are taken.
Noise	<ul style="list-style-type: none"> Work will only occur between the hours of 7.00 am and 5.00 pm week days and 9.00am and 1.00pm Saturdays. Refer to EPA Victoria Environment Protection (Residential Noise) Regulations 2008 (EPA Victoria, 2008) Consultation with immediate neighbours to identify sensitivities that can be managed or negotiated around. Plant maintained in good order, particularly mufflers and other sound emitting components. 	<ul style="list-style-type: none"> Record consultation process including details of who has been consulted. Enforce work hours 	<ul style="list-style-type: none"> As required 	<ul style="list-style-type: none"> Project manager 	<ul style="list-style-type: none"> Project records Record of consultation.
Inadvertent environmental damage or works without necessary permits. Non-compliance with Environmental Legislation	<ul style="list-style-type: none"> Ensure all required permits have been obtained and that design meets any permit requirements or other legislative requirements for the works. Ensure all personnel are aware of the permitted works activities and the extent of the impact area. Permit check list – <ul style="list-style-type: none"> Planning Permit (once obtained – review and comply with conditions) FFG Permit (once obtained – review and comply with conditions) Heritage Victoria Permit (once obtained – review and comply with conditions) Cultural Heritage Management Plan (once finalised – review and comply with conditions) Regulatory compliance checklist – Construction design will meet standards of key legislation and regulation including the Water Act, EPA Act, CALP Act, PE Act. Project manager must notify the relevant land manager in the event of any unexpected finds or inadvertent damage. 	<ul style="list-style-type: none"> Prepare a permit and regulatory compliance checklist. 	<ul style="list-style-type: none"> Project planning stage prior to the commencement of construction 	<ul style="list-style-type: none"> Project manager 	<ul style="list-style-type: none"> Permits obtained Completed management plans to address regulatory compliance.

Environmental aspect or management activity	Actions to address risk	Monitoring response	Frequency of monitoring	Responsibility	Documentation
Storage areas for construction materials and transport of excavation spoil / fill off site	<ul style="list-style-type: none"> The storage of all equipment, waste and building materials must be contained within the impact area. No soil is to be removed from the site without written consent of the Project manager. Any loads of excavation materials being taken off site must be covered and taken to a legal point of use or disposal. The Project manager must confirm that the destination for excavation material is legal and keep records of the source and destination of the material. Locations for the storage and stockpile of materials and equipment will vary depending on the alignment under construction. Construction crews must seek site specific approval from the Construction Manager. In turn the Construction Manager will seek approval from the appropriate Land Manager. 	<ul style="list-style-type: none"> EMM map specifies suitable stockpile locations Record details of any material transported off site provide evidence of its destination. 	<ul style="list-style-type: none"> As required 	<ul style="list-style-type: none"> Project manager 	<ul style="list-style-type: none"> EMM Project Records
Fuel, oil and chemical spill or pollution	<ul style="list-style-type: none"> Use of hazardous chemicals or materials will be avoided as far as practical. The works generally do not require the specific use of any hazardous substances other than machinery fuels and oils or standard construction materials. No fuels, oil or any potential harmful substance will be stored or used on site without the prior written consent of the Project manager. Spill kits will be available, easily accessible and kept on the construction site at all times and all employees will be trained in their use. Daily plant safety procedures for all plant shall be completed at the start of each day. All refuelling shall be conducted at least 30 m away from waterways using a built for purpose fuel tender that is in good condition and does not have defects or leaks. The tender vehicle must have materials at hand to manage and clean up any spill incidents. Machinery servicing and oil changes will not be performed on-site without the written consent of the Project manager. The Project manager will specify measures to manage risks associated with any machinery servicing. When hazardous materials are used, the following controls measures will be put in place; <ul style="list-style-type: none"> The Project manager will verify that staff or contractors have the relevant qualifications to use chemicals or hazardous materials. Lids to be kept securely closed on containers of chemicals. Containers on vehicles to be secure. Ensure no leaks and all taps and pipes are securely isolated. MSDS's are available on site for all relevant chemicals or materials. Storage of chemicals, temporary or otherwise' in the vicinity of a waterway is not permitted. Storage - Separate designated area shall be identified for the storage of chemicals and fuels that meets current work standards. The following practices shall be adopted; <ul style="list-style-type: none"> Storage areas kept clean and tidy. MSDS's available for all chemicals on site. All chemicals and fuels labelled correctly. Spills shall be reported immediately to Project manager. Treatment of fuel / oil / chemical spills shall be immediately reported to the Project manager. Disposal of contaminated soil materials shall be at locations acceptable to EPA requirements. 	<ul style="list-style-type: none"> Inspect the condition of any fuel tender before access is granted to the impact area. Inspect condition of spill kits. Observation of staff contractor behaviour with fuels / oils / chemicals and ensure safe work practices are followed. 	<ul style="list-style-type: none"> Monthly 	<ul style="list-style-type: none"> Project manager 	<ul style="list-style-type: none"> Project records Maintain a spread sheet or similar recording inspections and outcomes. Maintain a register of spill incidents and the action taken.
Flood mitigation	<ul style="list-style-type: none"> Project manager to monitor extreme weather forecasts, especially those including heavy rain or flash flooding. Construction works must not occur on days of high risks of flash flooding. Risk associated with floods must be included within the Emergency Management Plan. 	<ul style="list-style-type: none"> Project Manager must review weather forecast every few days. 	<ul style="list-style-type: none"> Ongoing as required. 	<ul style="list-style-type: none"> Project manager 	<ul style="list-style-type: none"> Project records Maintain a register of high risk flood days.

10. Environmental management map

The Environmental management map (EMM) shows the location of areas with environmental or heritage values. It also shows the locations of the minimum requirements for environmental management required to protect these values as specified in the Section 5 Environmental management plan.

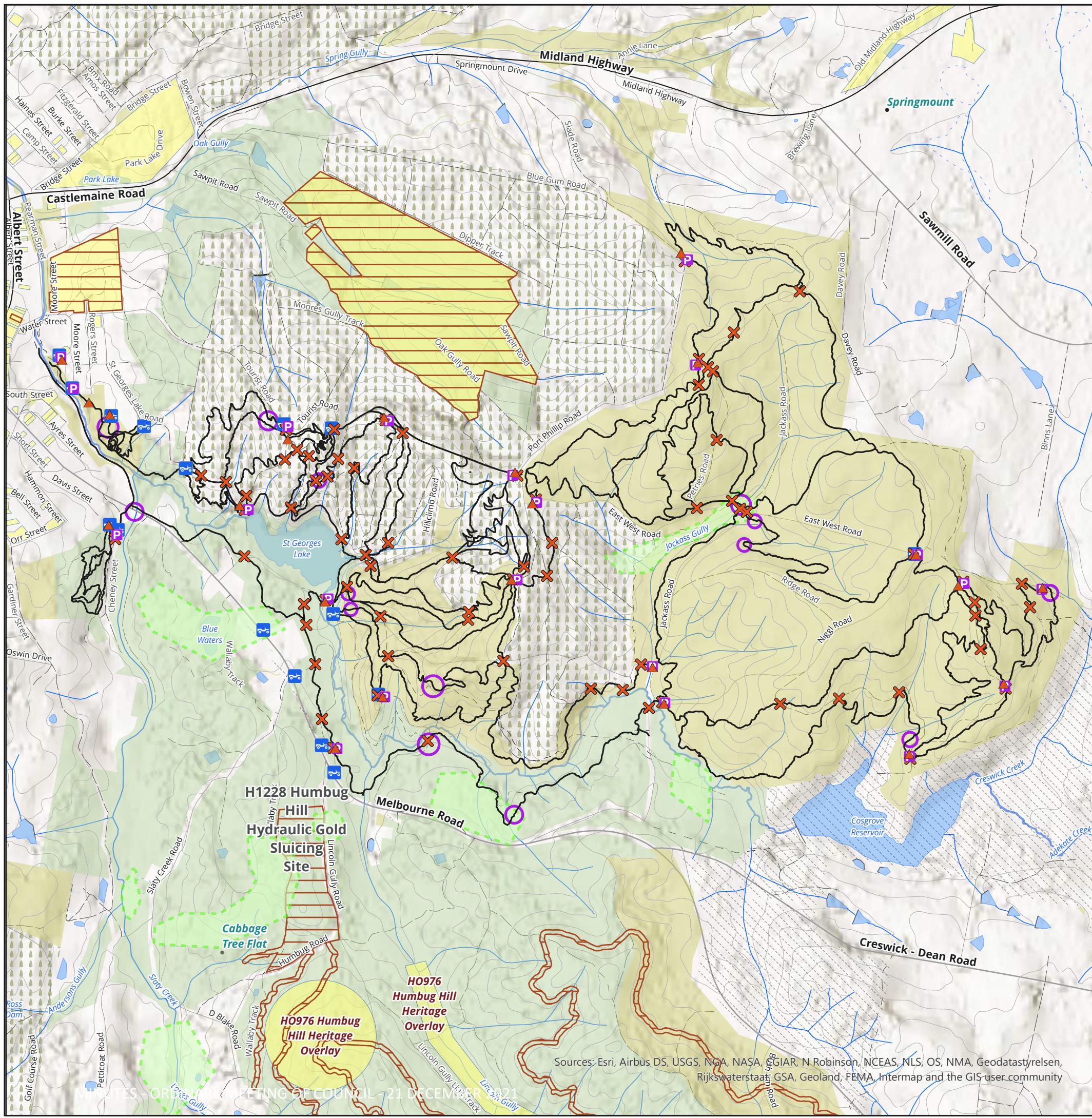
The construction works for this project must be implemented according to this EMM for the project to fully meet the planning permit conditions or other approvals for this project.

The EMM maps form part of the EMP and must be provided to the contractor.

Written approval of Project manager must be obtained if EMM needs to be amended in any way. All works must be implemented according to this plan.

Digital data included in these maps is available upon request.

Note -Existing easements / services locations are not shown. The Project manager is responsible for identifying all relevant easements and service locations.

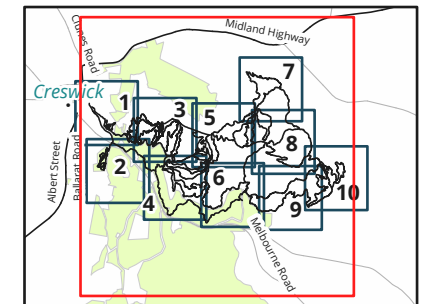


Legend

- Trail alignment
- Environmental Management Plan**
- ▲ Stockpile site
- Ⓟ Vehicle/plant parking
- ✕ Excavator access
- Ⓛ Site access
- Access roads**
- Highway
- Major road
- Local road
- - - Unsealed road
- - - 4WD track
- - - Walking track

Land Manager

- ATTACHMENT 10.1.3**
- Parks Victoria
- HVP
- CHW
- Proposed historical archaeological monitoring location
- Area of potential historical archaeological sensitivity
- Victorian Heritage Register
- Heritage overlay



To note, road access: many of these roads are not managed or maintained regularly and care should be taken when traversing and locating them.

Sediment controls

- Place filter fence or modular sediment traps at any point of potential concentrated surface water flow.
- Indicative locations for filter fence or modular sediment controls.
- Place sediment controls according to detailed design or to terrain.
- Provide cut-off drains along trails to prevent concentrated water flows
- For silt fence refer to EPA 960 p30.
- **Hay bales or straw bales not permitted.**

Fuels, oils and chemicals

- No fuel or chemical storage on site
- Machinery fuelling to be completed using portable bunding
- Spill kit to be provided on all plant or on site

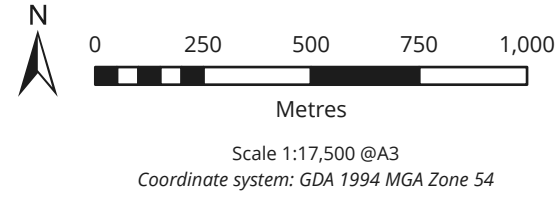
Stockpile management

- Stockpiles must be constructed according to EPA 960 p.24-26.
- Sediment controls such as silt fence must be in place.
- A catch drain must be constructed upslope, and runoff directed through filter fence.
- Appropriate dust suppression must be in place at all times.

Trail alignment

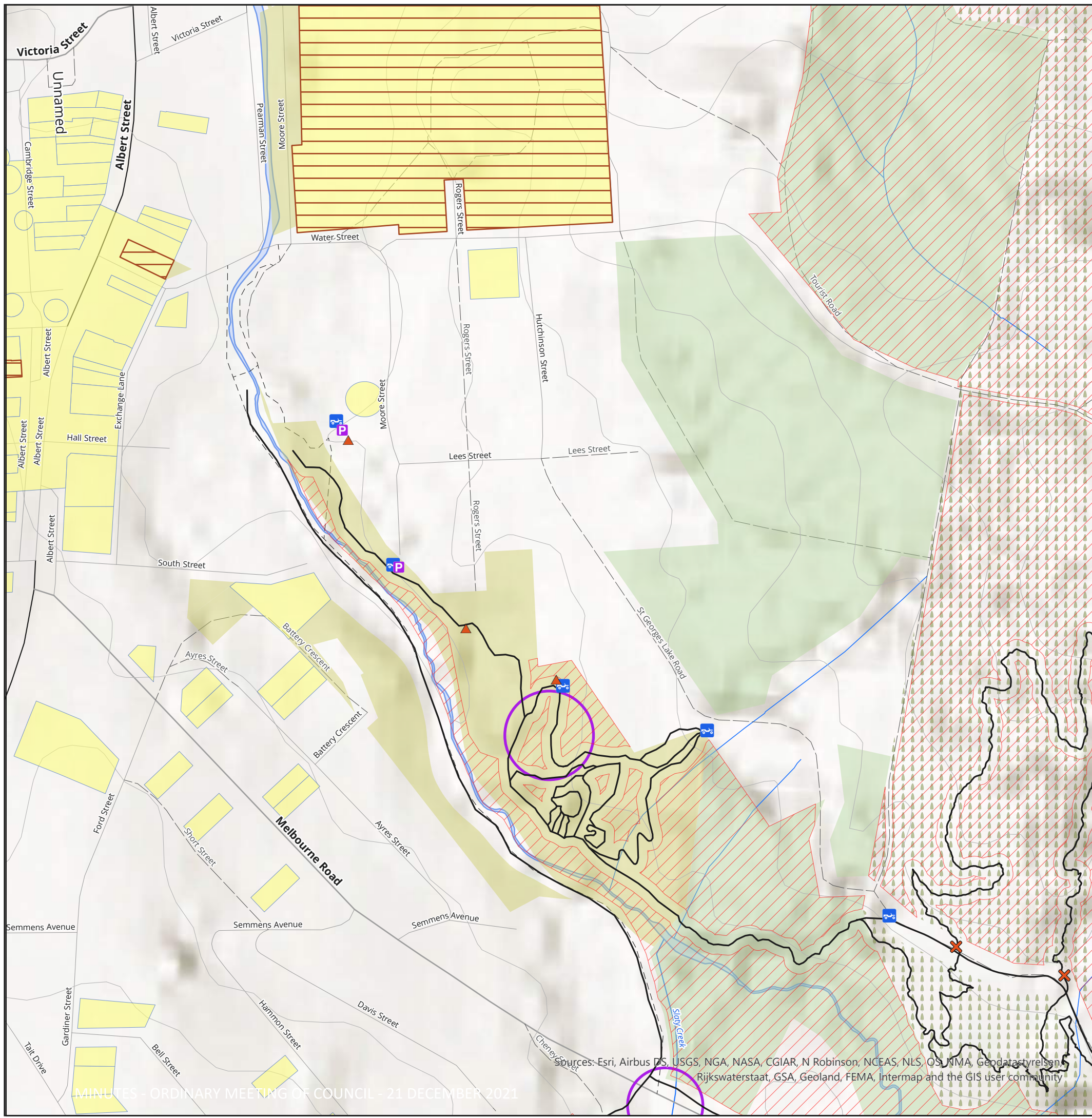
Exact trail alignment subject to final approval - may vary slightly

Environmental Management Plan - Creswick Trails Map 1 Overview



Layout: 30872_M1_EMP_V2
 Matter: 30872 Date: 18 February 2021,
 Checked by: HH, Drawn by: SKM, Last edited by: smitchell
 Location: P:
 \30800s\30872\Mapping\30872_CreswickMTB_EMP\30872_CreswickMTB_EMP.aprx

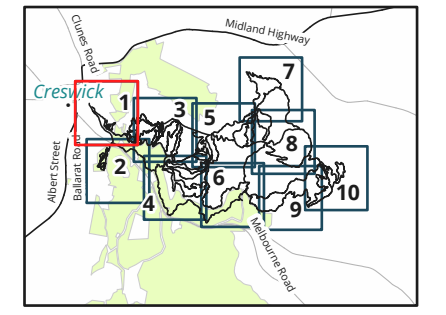




Legend

- Trail alignment
- Environmental Management Plan**
- ▲ Stockpile site
- P Vehicle/plant parking
- ✕ Excavator access
- Site access
- No-Go Area
- Access roads**
- Highway
- Major road
- Local road
- Unsealed road
- 4WD track
- Walking track

- Land Manager**
- ATTACHMENT 10.1.3
- Parks Victoria
- HVP
- Proposed historical archaeological monitoring location
- Victorian Heritage Register
- Heritage overlay



To note, road access: many of these roads are not managed or maintained regularly and care should be taken when traversing and locating them.

Sediment controls

- Place filter fence or modular sediment traps at any point of potential concentrated surface water flow.
- Indicative locations for filter fence or modular sediment controls.
- Place sediment controls according to detailed design or to terrain.
- Provide cut-off drains along trails to prevent concentrated water flows
- For silt fence refer to EPA 960 p30.
- **Hay bales or straw bales not permitted.**

Fuels, oils and chemicals

- No fuel or chemical storage on site
- Machinery fuelling to be completed using portable bunding
- Spill kit to be provided on all plant or on site

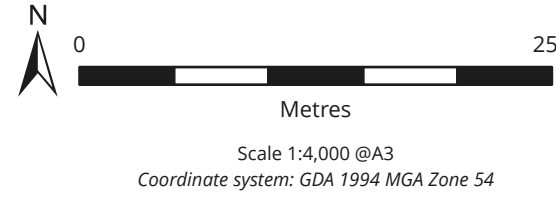
Stockpile management

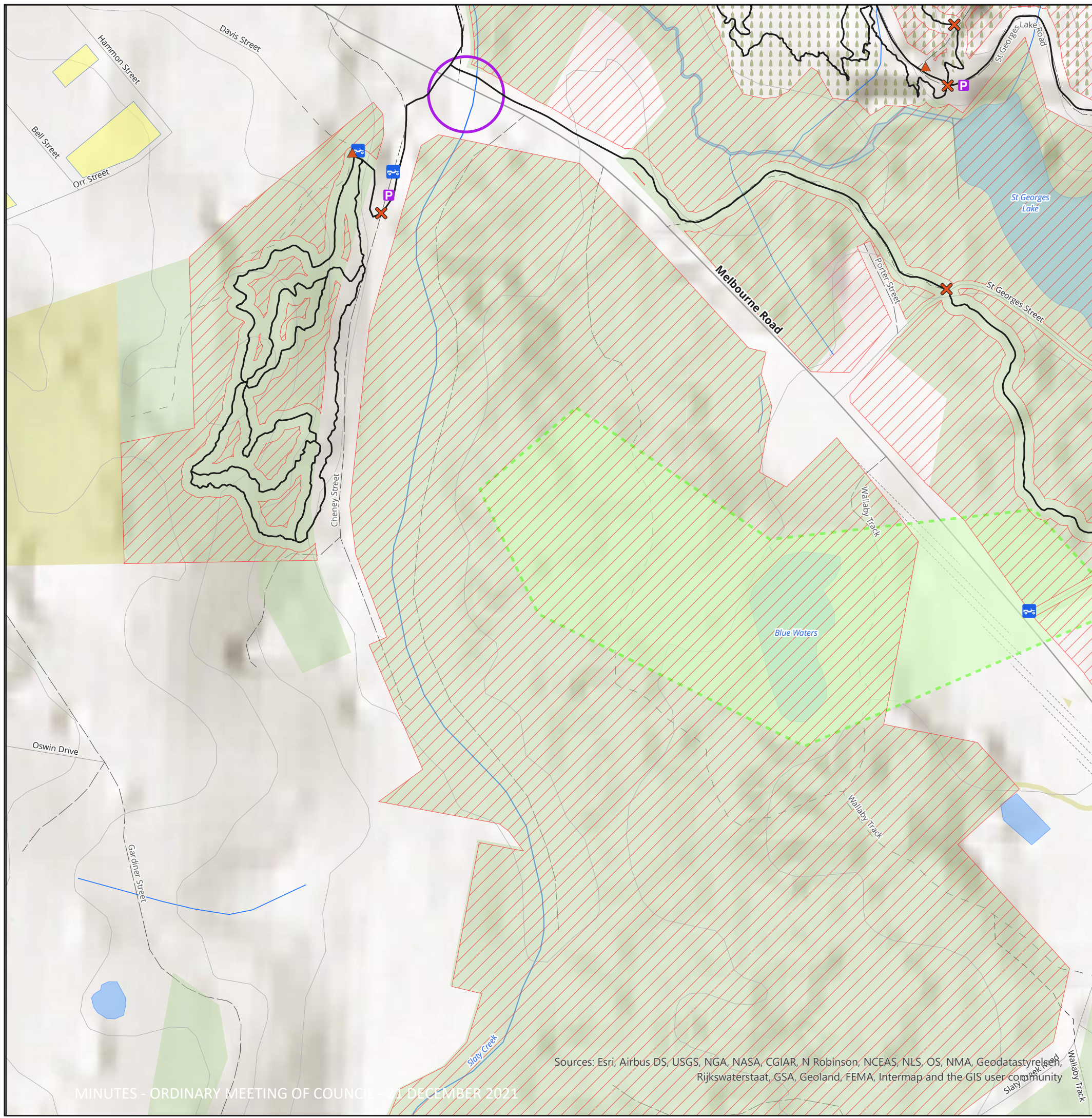
- Stockpiles must be constructed according to EPA 960 p.24-26.
- Sediment controls such as silt fence must be in place.
- A catch drain must be constructed upslope, and runoff directed through filter fence.
- Appropriate dust suppression must be in place at all times.

Trail alignment

Exact trail alignment subject to final approval - may vary slightly

Environmental Management Plan - Creswick Trails Map 1.1



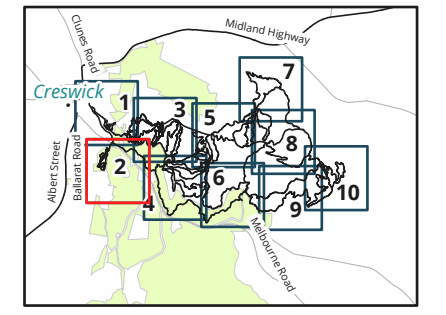


Legend

- Trail alignment
- Environmental Management Plan**
- ▲ Stockpile site
- Ⓟ Vehicle/plant parking
- ✂ Excavator access
- Ⓜ Site access
- ▨ No-Go Area
- Access roads**
- Major road
- Local road
- - - Unsealed road
- - - 4WD track
- - - Walking track

Land Manager

- ATTACHMENT 10.1.3**
- Parks Victoria
- ▨ HVP
- ▨ CHW
- Proposed historical archaeological monitoring location
- ▨ Area of potential historical archaeological sensitivity
- Heritage overlay



To note, road access: many of these roads are not managed or maintained regularly and care should be taken when traversing and locating them.

Sediment controls

- Place filter fence or modular sediment traps at any point of potential concentrated surface water flow.
- Indicative locations for filter fence or modular sediment controls.
- Place sediment controls according to detailed design or to terrain.
- Provide cut-off drains along trails to prevent concentrated water flows
- For silt fence refer to EPA 960 p30.
- **Hay bales or straw bales not permitted.**

Fuels, oils and chemicals

- No fuel or chemical storage on site
- Machinery fuelling to be completed using portable bunding
- Spill kit to be provided on all plant or on site

Stockpile management

- Stockpiles must be constructed according to EPA 960 p.24-26.
- Sediment controls such as silt fence must be in place.
- A catch drain must be constructed upslope, and runoff directed through filter fence.
- Appropriate dust suppression must be in place at all times.

Trail alignment

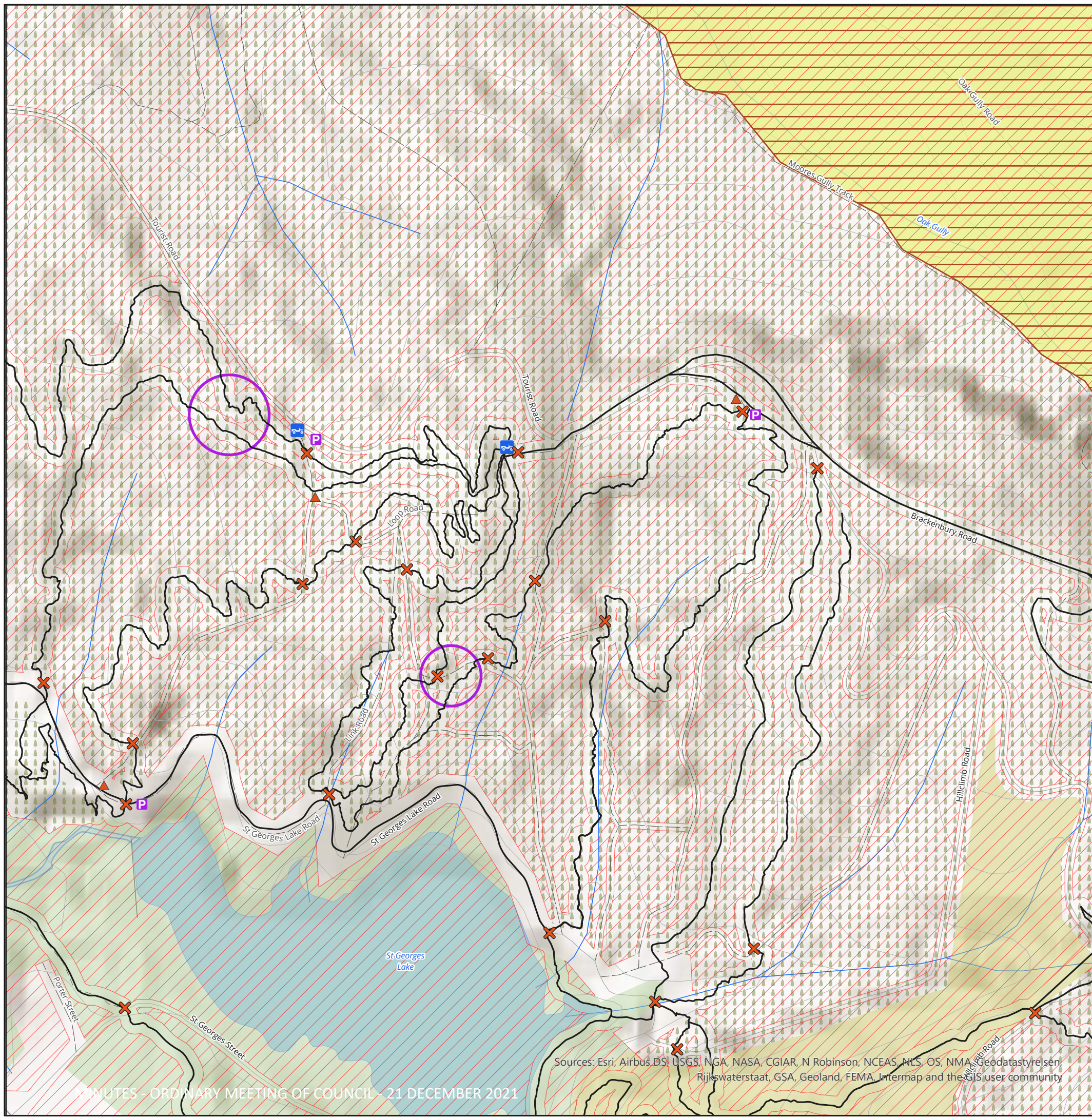
Exact trail alignment subject to final approval - may vary slightly

Environmental Management Plan - Creswick Trails Map 1.2

Layout: 30872_M1_EMP_V2
 Matter: 30872 Date: 18 February 2021,
 Checked by: HH, Drawn by: SKM, Last edited by: smitchell
 Location: P:
 I:\30800s\30872\Mapping\30872_CreswickMTB_EMP\30872_CreswickMTB_EMP.aprx

Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

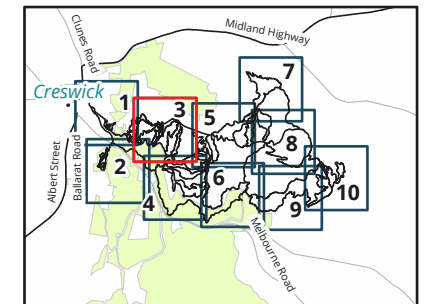
Scale 1:4,000 @A3
 Coordinate system: GDA 1994 MGA Zone 54



Legend

- Trail alignment
- Environmental Management Plan**
- ▲ Stockpile site
- P Vehicle/plant parking
- ✕ Excavator access
- 🚚 Site access
- 🚫 No-Go Area
- Access roads**
- Major road
- Local road
- - - Unsealed road
- - - Walking track

- Land Manager**
- ATTACHMENT 10.1.3
- Parks Victoria
- HVP
- Proposed historical archaeological monitoring location
- Victorian Heritage Register
- Heritage overlay



To note, road access: many of these roads are not managed or maintained regularly and care should be taken when traversing and locating them.

Sediment controls

- Place filter fence or modular sediment traps at any point of potential concentrated surface water flow.
- Indicative locations for filter fence or modular sediment controls.
- Place sediment controls according to detailed design or to terrain.
- Provide cut-off drains along trails to prevent concentrated water flows
- For silt fence refer to EPA 960 p30.
- **Hay bales or straw bales not permitted.**

Fuels, oils and chemicals

- No fuel or chemical storage on site
- Machinery fuelling to be completed using portable bunding
- Spill kit to be provided on all plant or on site

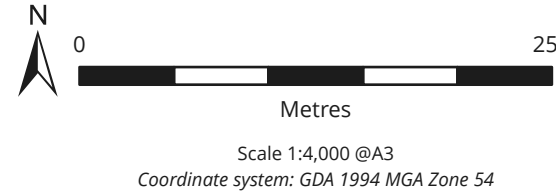
Stockpile management

- Stockpiles must be constructed according to EPA 960 p.24-26.
- Sediment controls such as silt fence must be in place.
- A catch drain must be constructed upslope, and runoff directed through filter fence.
- Appropriate dust suppression must be in place at all times.

Trail alignment

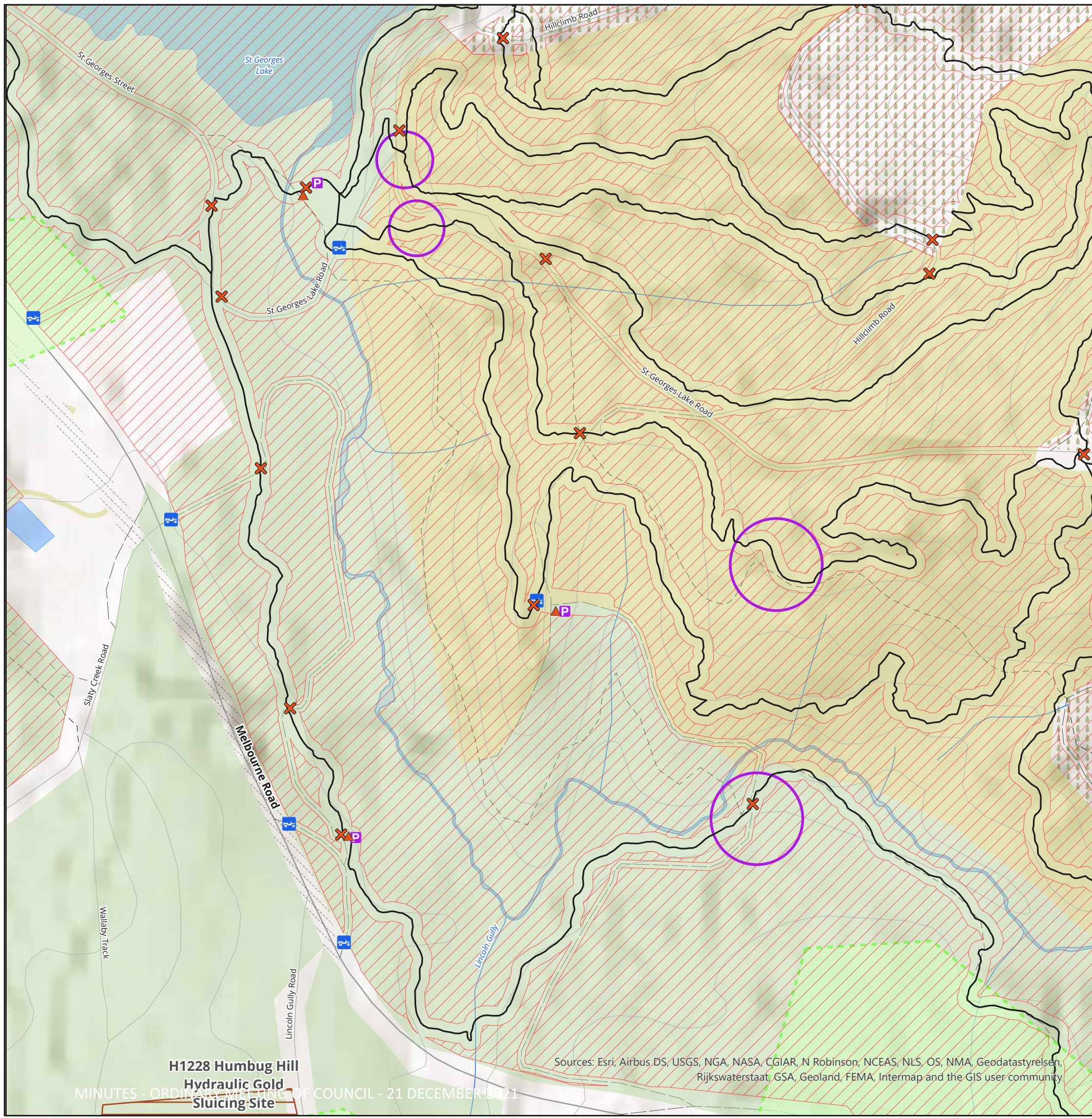
Exact trail alignment subject to final approval - may vary slightly

Environmental Management Plan - Creswick Trails Map 1.3



Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

Layout: 30872_M1_EMP_V2
 Matter: 30872 Date: 18 February 2021,
 Checked by: HH, Drawn by: SKM, Last edited by: smitchell
 Location: P:
 \30800s\30872\Mapping\30872_CreswickMTB_EMP\30872_CreswickMTB_EMP.aprx



Legend

— Trail alignment

Environmental Management Plan

▲ Stockpile site

Ⓟ Vehicle/plant parking

✕ Excavator access

Ⓜ Site access

▨ No-Go Area

Access roads

— Major road

— Local road

- - - Unsealed road

- - - 4WD track

- - - Walking track

Land Manager

ATTACHMENT 10.1.3

■ Parks Victoria

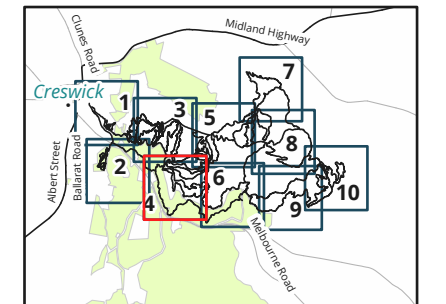
▨ HVP

▨ CHW

○ Proposed historical archaeological monitoring location

▨ Area of potential historical archaeological sensitivity

▨ Victorian Heritage Register



To note, road access: many of these roads are not managed or maintained regularly and care should be taken when traversing and locating them.

Sediment controls

- Place filter fence or modular sediment traps at any point of potential concentrated surface water flow.
- Indicative locations for filter fence or modular sediment controls.
- Place sediment controls according to detailed design or to terrain.
- Provide cut-off drains along trails to prevent concentrated water flows
- For silt fence refer to EPA 960 p30.
- **Hay bales or straw bales not permitted.**

Fuels, oils and chemicals

- No fuel or chemical storage on site
- Machinery fuelling to be completed using portable bunding
- Spill kit to be provided on all plant or on site

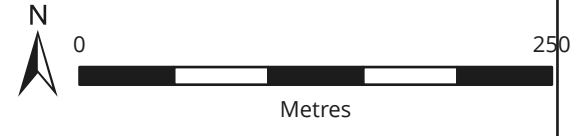
Stockpile management

- Stockpiles must be constructed according to EPA 960 p.24-26.
- Sediment controls such as silt fence must be in place.
- A catch drain must be constructed upslope, and runoff directed through filter fence.
- Appropriate dust suppression must be in place at all times.

Trail alignment

Exact trail alignment subject to final approval - may vary slightly

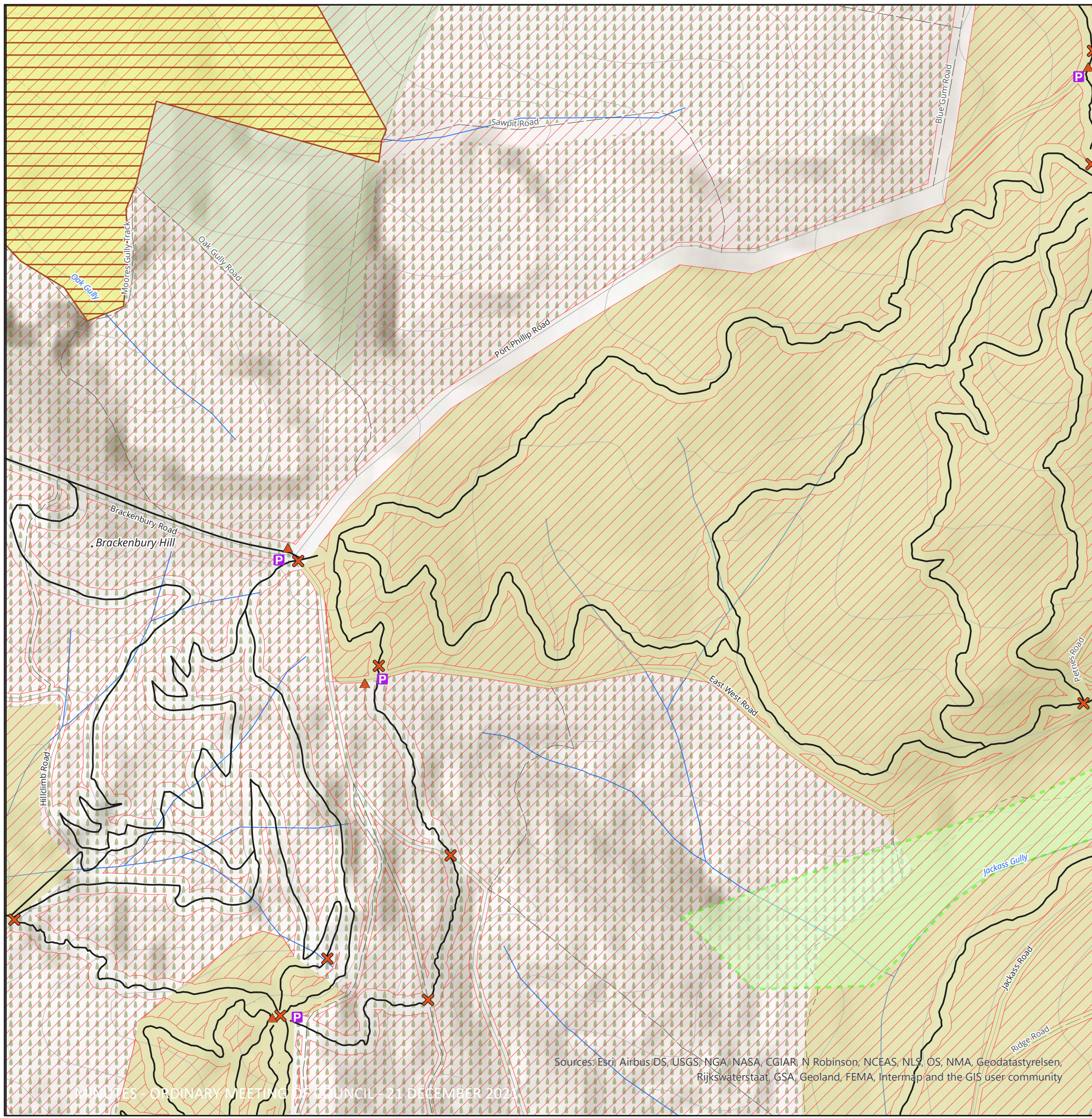
Environmental Management Plan - Creswick Trails Map 1.4



H1228 Humbug Hill Hydraulic Gold Sluicing Site

Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

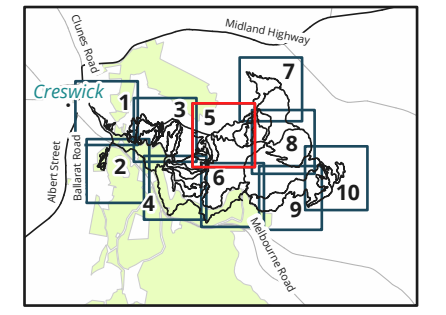
Layout: 30872_M1_EMP_V2
 Matter: 30872 Date: 18 February 2021,
 Checked by: HH, Drawn by: SKM, Last edited by: smitchell
 Location: P:
 \30800s\30872\Mapping\30872_CreswickMTB_EMP\30872_CreswickMTB_EMP.aprx



Legend

- Trail alignment
- Environmental Management Plan**
- ▲ Stockpile site
- P Vehicle/plant parking
- ✕ Excavator access
- ▨ No-Go Area
- Access roads**
- Local road
- - - Unsealed road
- - - Walking track

- Land Manager**
- ATTACHMENT 10.1.3
- Parks Victoria
- HVP
- Area of potential historical archaeological sensitivity
- Victorian Heritage Register
- Heritage overlay



To note, road access: many of these roads are not managed or maintained regularly and care should be taken when traversing and locating them.

Sediment controls

- Place filter fence or modular sediment traps at any point of potential concentrated surface water flow.
- Indicative locations for filter fence or modular sediment controls.
- Place sediment controls according to detailed design or to terrain.
- Provide cut-off drains along trails to prevent concentrated water flows
- For silt fence refer to EPA 960 p30.
- **Hay bales or straw bales not permitted.**

Fuels, oils and chemicals

- No fuel or chemical storage on site
- Machinery fuelling to be completed using portable bunding
- Spill kit to be provided on all plant or on site

Stockpile management

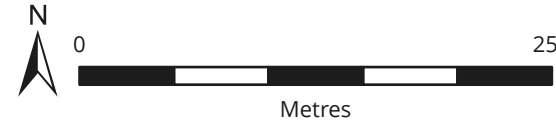
- Stockpiles must be constructed according to EPA 960 p.24-26.
- Sediment controls such as silt fence must be in place.
- A catch drain must be constructed upslope, and runoff directed through filter fence.
- Appropriate dust suppression must be in place at all times.

Trail alignment

Exact trail alignment subject to final approval - may vary slightly

Environmental Management Plan - Creswick Trails Map 1.5

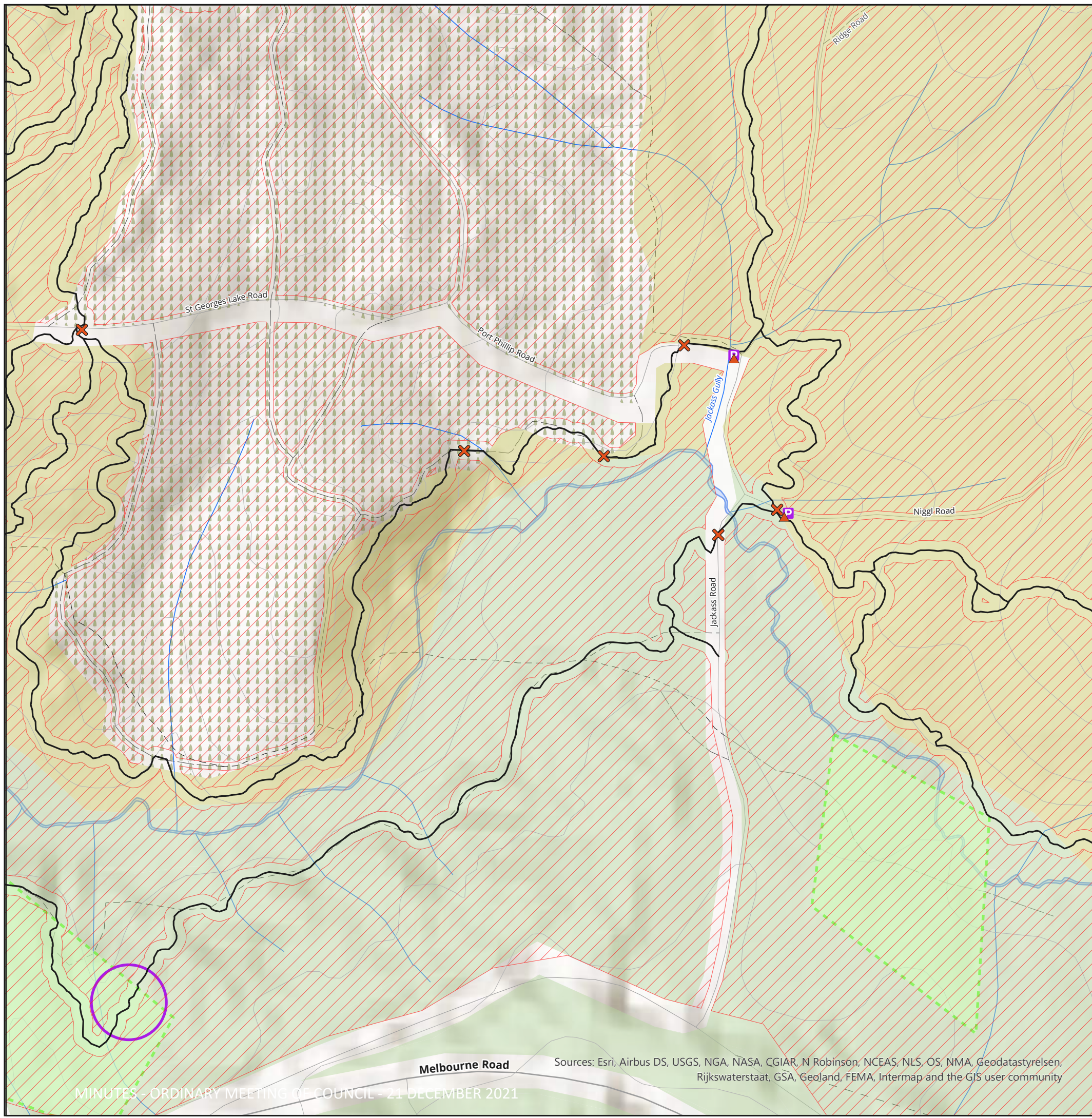
Scale 1:4,000 @A3
Coordinate system: GDA 1994 MGA Zone 54



Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

Layout: 30872_M1_EMP_V2
Matter: 30872 Date: 18 February 2021,
Checked by: HH, Drawn by: SKM, Last edited by: smitchell
Location: P:
\\30800s\30872\Mapping\30872_CreswickMTB_EMP\30872_CreswickMTB_EMP.aprx



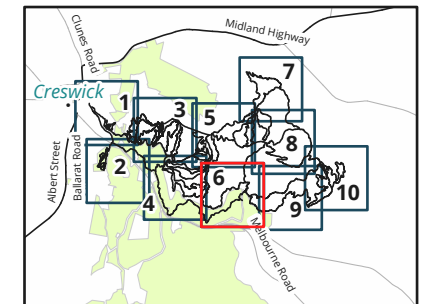


Legend

- Trail alignment
- Environmental Management Plan**
- ▲ Stockpile site
- ▣ Vehicle/plant parking
- ✕ Excavator access
- ▨ No-Go Area
- Access roads**
- Major road
- Local road
- - - Unsealed road
- - - Walking track

- Land Manager**
- ATTACHMENT 10.1.3
- ▭ Parks Victoria
- ▨ HVP
- Proposed historical archaeological monitoring location
- ▭ Area of potential historical archaeological sensitivity

To note, road access: many of these roads are not managed or maintained regularly and care should be taken when traversing and locating them.



Sediment controls

- Place filter fence or modular sediment traps at any point of potential concentrated surface water flow.
- Indicative locations for filter fence or modular sediment controls.
- Place sediment controls according to detailed design or to terrain.
- Provide cut-off drains along trails to prevent concentrated water flows
- For silt fence refer to EPA 960 p30.
- **Hay bales or straw bales not permitted.**

Fuels, oils and chemicals

- No fuel or chemical storage on site
- Machinery fuelling to be completed using portable bunding
- Spill kit to be provided on all plant or on site

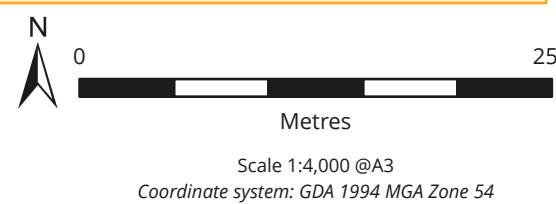
Stockpile management

- Stockpiles must be constructed according to EPA 960 p.24-26.
- Sediment controls such as silt fence must be in place.
- A catch drain must be constructed upslope, and runoff directed through filter fence.
- Appropriate dust suppression must be in place at all times.

Trail alignment

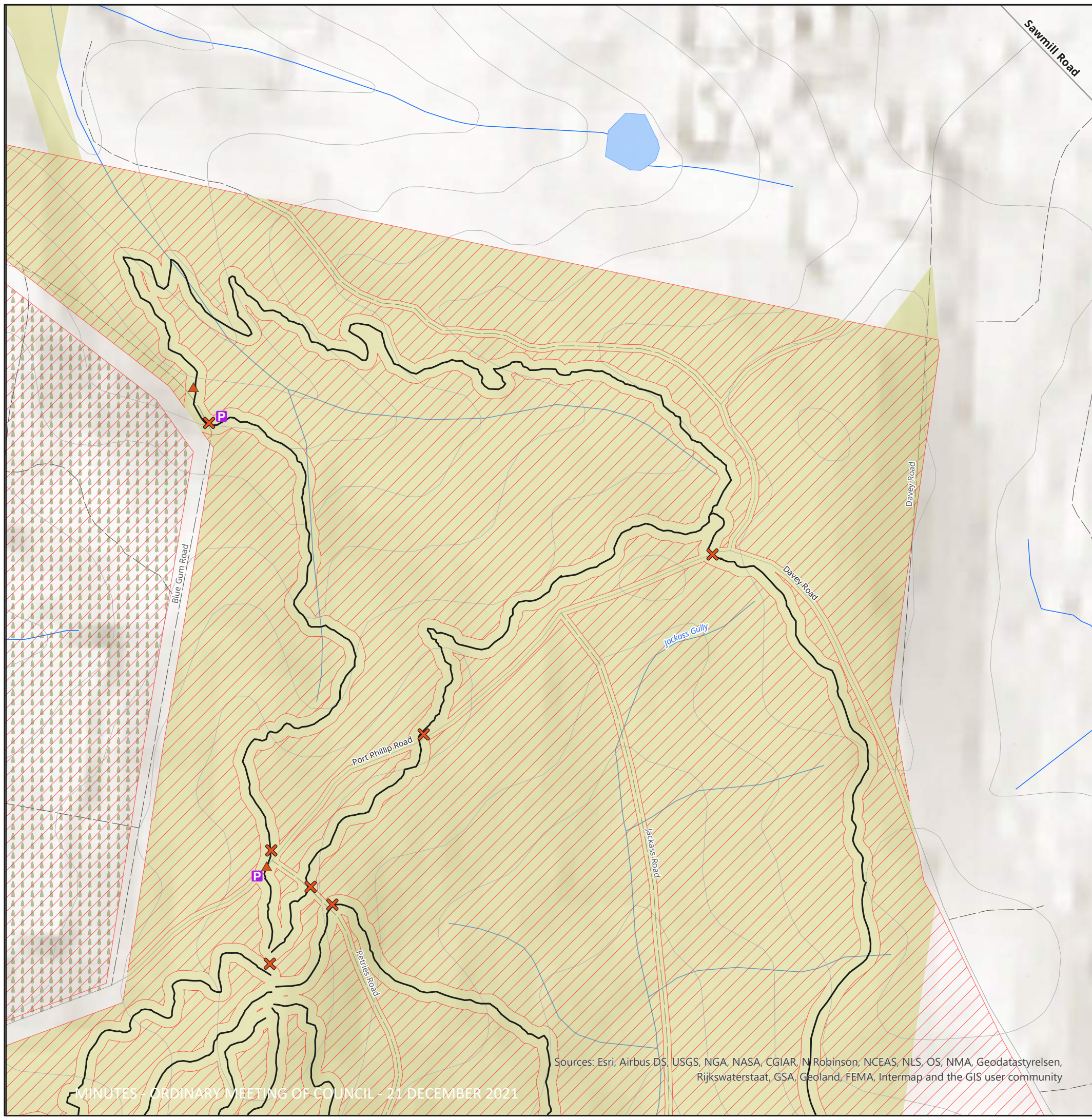
Exact trail alignment subject to final approval - may vary slightly

Environmental Management Plan - Creswick Trails Map 1.6



Layout: 30872_M1_EMP_V2
 Matter: 30872 Date: 18 February 2021,
 Checked by: HH, Drawn by: SKM, Last edited by: smitchell
 Location: P:
 \30800s\30872\Mapping\30872_CreswickMTB_EMP\30872_CreswickMTB_EMP.aprx



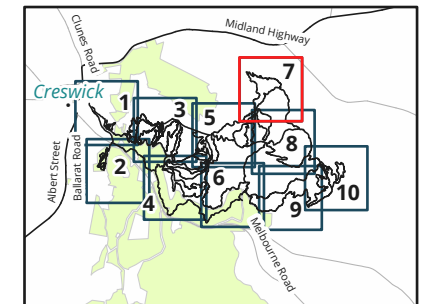


Legend

- Trail alignment
- Environmental Management Plan**
- ▲ Stockpile site
- Ⓟ Vehicle/plant parking
- ✕ Excavator access
- ▨ No-Go Area
- Access roads**
- Major road
- Local road
- - - Unsealed road

Land Manager

- ATTACHMENT 10.1.3
- HVP



To note, road access: many of these roads are not managed or maintained regularly and care should be taken when traversing and locating them.

Sediment controls

- Place filter fence or modular sediment traps at any point of potential concentrated surface water flow.
- Indicative locations for filter fence or modular sediment controls.
- Place sediment controls according to detailed design or to terrain.
- Provide cut-off drains along trails to prevent concentrated water flows
- For silt fence refer to EPA 960 p30.
- **Hay bales or straw bales not permitted.**

Fuels, oils and chemicals

- No fuel or chemical storage on site
- Machinery fuelling to be completed using portable bunding
- Spill kit to be provided on all plant or on site

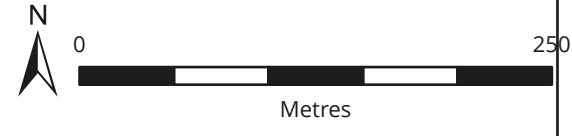
Stockpile management

- Stockpiles must be constructed according to EPA 960 p.24-26.
- Sediment controls such as silt fence must be in place.
- A catch drain must be constructed upslope, and runoff directed through filter fence.
- Appropriate dust suppression must be in place at all times.

Trail alignment

Exact trail alignment subject to final approval - may vary slightly

Environmental Management Plan - Creswick Trails Map 1.7

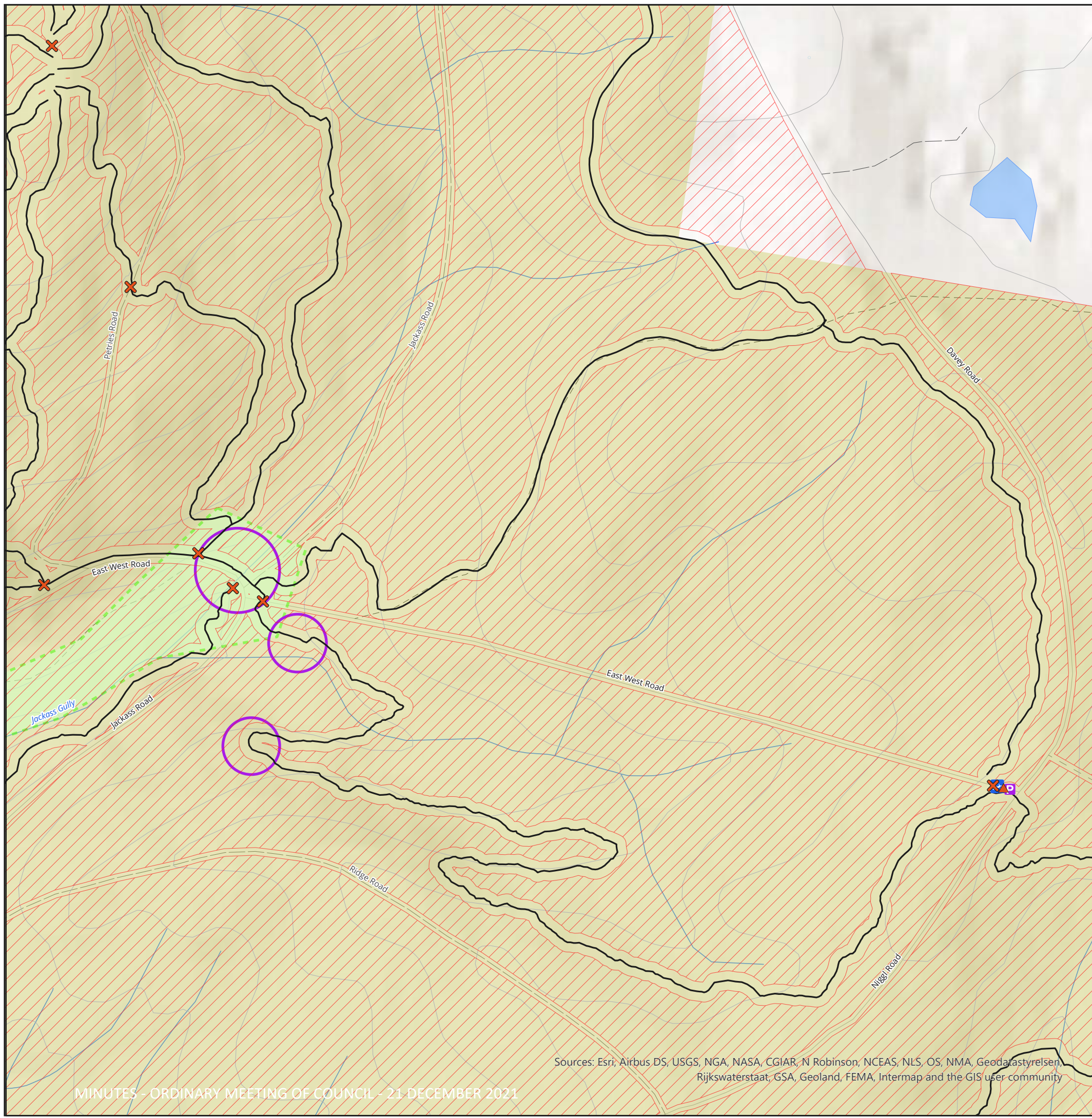


Scale 1:4,000 @A3
Coordinate system: GDA 1994 MGA Zone 54



Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

Layout: 30872_M1_EMP_V2
Matter: 30872 Date: 18 February 2021,
Checked by: HH, Drawn by: SKM, Last edited by: smitchell
Location: P:
\\30800s\30872\Mapping\30872_CreswickMTB_EMP\30872_CreswickMTB_EMP.aprx

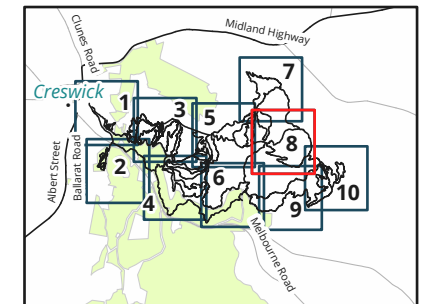


Legend

- Trail alignment
- ▲ Stockpile site
- 🚚 Vehicle/plant parking
- ✂ Excavator access
- 🚗 Site access
- 🚫 No-Go Area
- Access roads**
- Local road
- - - Unsealed road
- - - 4WD track
- - - Walking track

- Land Manager**
ATTACHMENT 10.1.3
DELWP
- Proposed historical archaeological monitoring location
 - 🌿 Area of potential historical archaeological sensitivity

To note, road access: many of these roads are not managed or maintained regularly and care should be taken when traversing and locating them.



Sediment controls

- Place filter fence or modular sediment traps at any point of potential concentrated surface water flow.
- Indicative locations for filter fence or modular sediment controls.
- Place sediment controls according to detailed design or to terrain.
- Provide cut-off drains along trails to prevent concentrated water flows
- For silt fence refer to EPA 960 p30.
- **Hay bales or straw bales not permitted.**

Fuels, oils and chemicals

- No fuel or chemical storage on site
- Machinery fuelling to be completed using portable bunding
- Spill kit to be provided on all plant or on site

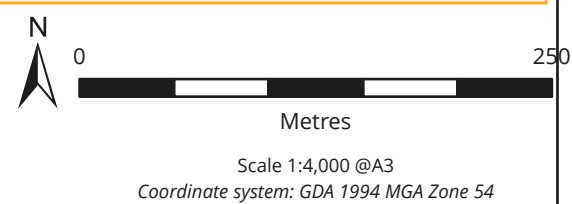
Stockpile management

- Stockpiles must be constructed according to EPA 960 p.24-26.
- Sediment controls such as silt fence must be in place.
- A catch drain must be constructed upslope, and runoff directed through filter fence.
- Appropriate dust suppression must be in place at all times.

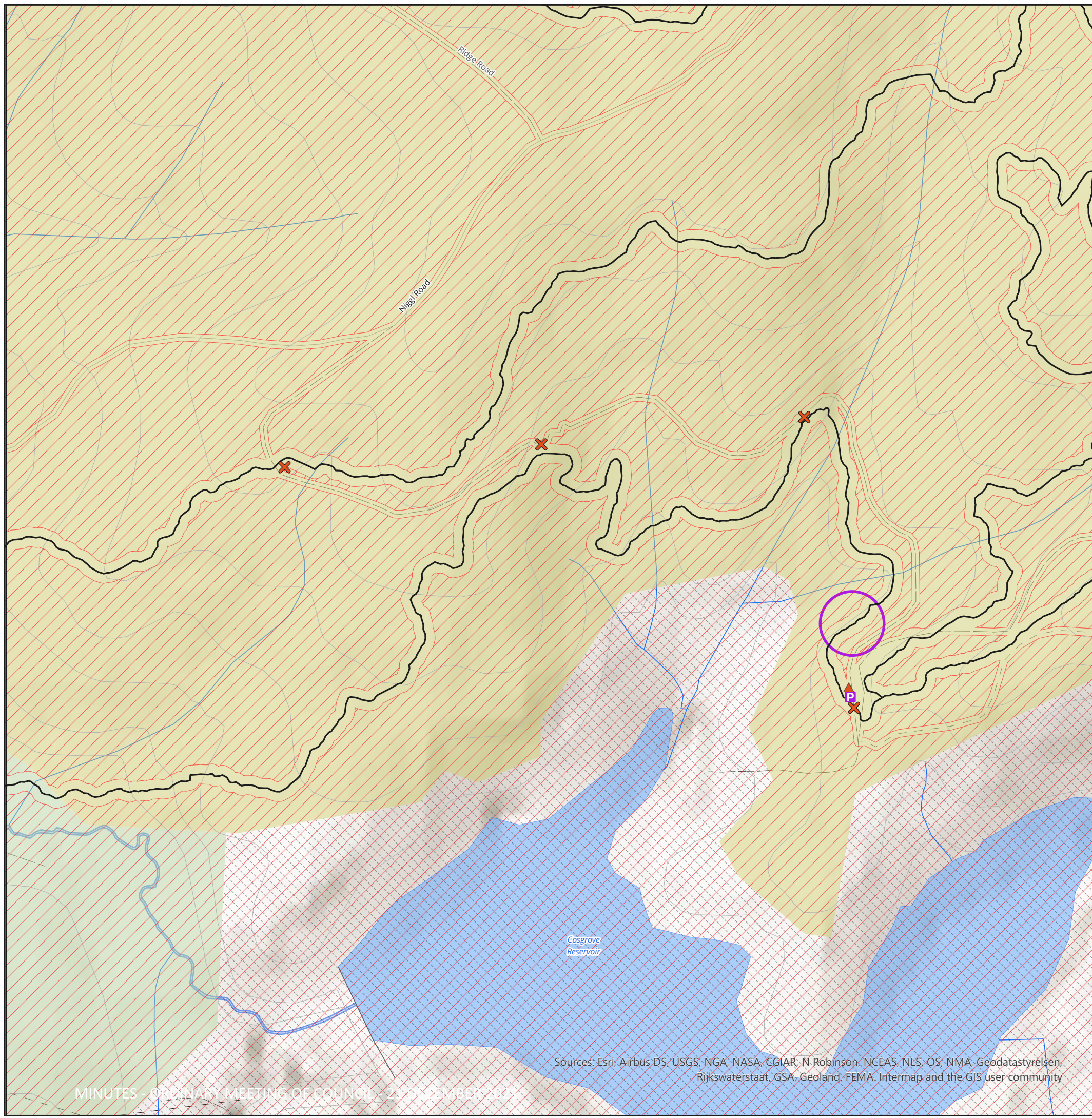
Trail alignment

Exact trail alignment subject to final approval - may vary slightly

Environmental Management Plan - Creswick Trails Map 1.8



Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

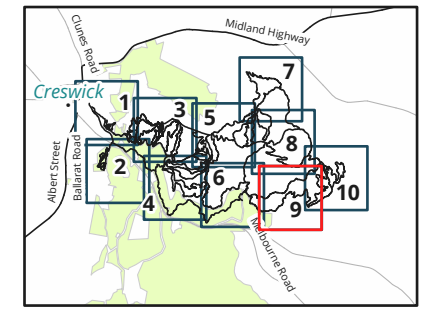


Legend

- Trail alignment
- Environmental Management Plan**
- ▲ Stockpile site
- Ⓟ Vehicle/plant parking
- ✕ Excavator access
- ▨ No-Go Area
- Access roads**
- Local road
- - - Unsealed road
- - - 4WD track

- Land Manager**
- ATTACHMENT 10.1.3
 - Parks Victoria
 - ▨ CHW
 - Proposed historical archaeological monitoring location

To note, road access: many of these roads are not managed or maintained regularly and care should be taken when traversing and locating them.



Sediment controls

- Place filter fence or modular sediment traps at any point of potential concentrated surface water flow.
- Indicative locations for filter fence or modular sediment controls.
- Place sediment controls according to detailed design or to terrain.
- Provide cut-off drains along trails to prevent concentrated water flows
- For silt fence refer to EPA 960 p30.
- **Hay bales or straw bales not permitted.**

Fuels, oils and chemicals

- No fuel or chemical storage on site
- Machinery fuelling to be completed using portable bunding
- Spill kit to be provided on all plant or on site

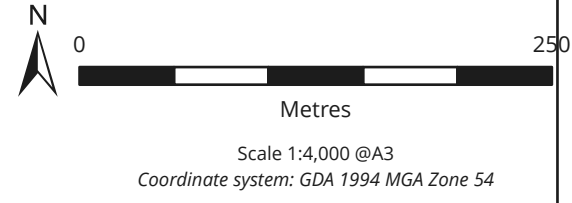
Stockpile management

- Stockpiles must be constructed according to EPA 960 p.24-26.
- Sediment controls such as silt fence must be in place.
- A catch drain must be constructed upslope, and runoff directed through filter fence.
- Appropriate dust suppression must be in place at all times.

Trail alignment

Exact trail alignment subject to final approval - may vary slightly

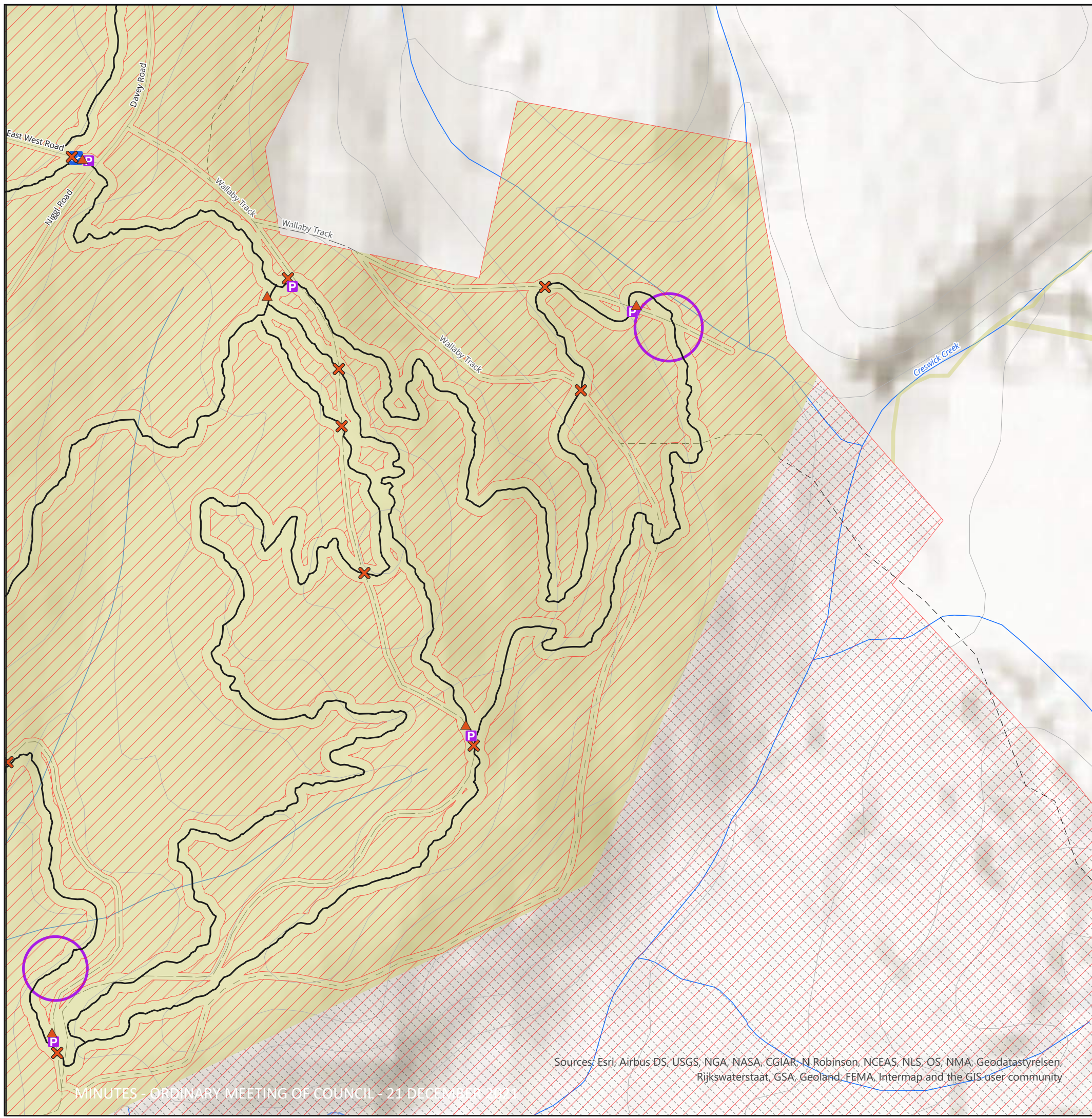
Environmental Management Plan - Creswick Trails Map 1.9



Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

Layout: 30872_M1_EMP_V2
 Matter: 30872 Date: 18 February 2021,
 Checked by: HH, Drawn by: SKM, Last edited by: smitchell
 Location: P:
 \30800s\30872\Mapping\30872_CreswickMTB_EMP\30872_CreswickMTB_EMP.aprx

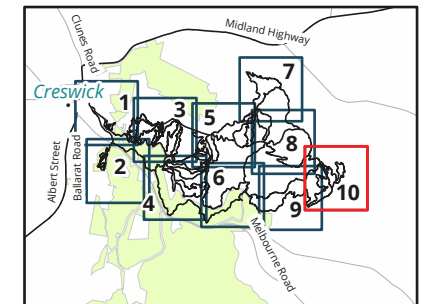




Legend

- Trail alignment
- Environmental Management Plan**
- ▲ Stockpile site
- Ⓟ Vehicle/plant parking
- ✕ Excavator access
- 🚚 Site access
- 🚫 No-Go Area
- Access roads**
- Local road
- - - Unsealed road
- - - 4WD track
- - - Walking track

- Land Manager**
- ATTACHMENT 10.1.3
 - CHW
 - Proposed historical archaeological monitoring location



To note, road access: many of these roads are not managed or maintained regularly and care should be taken when traversing and locating them.

Sediment controls

- Place filter fence or modular sediment traps at any point of potential concentrated surface water flow.
- Indicative locations for filter fence or modular sediment controls.
- Place sediment controls according to detailed design or to terrain.
- Provide cut-off drains along trails to prevent concentrated water flows
- For silt fence refer to EPA 960 p30.
- **Hay bales or straw bales not permitted.**

Fuels, oils and chemicals

- No fuel or chemical storage on site
- Machinery fuelling to be completed using portable bunding
- Spill kit to be provided on all plant or on site

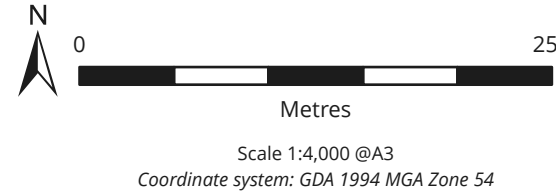
Stockpile management

- Stockpiles must be constructed according to EPA 960 p.24-26.
- Sediment controls such as silt fence must be in place.
- A catch drain must be constructed upslope, and runoff directed through filter fence.
- Appropriate dust suppression must be in place at all times.

Trail alignment

Exact trail alignment subject to final approval - may vary slightly

Environmental Management Plan - Creswick Trails Map 1.10



Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

Layout: 30872_M1_EMP_V2
 Matter: 30872 Date: 18 February 2021,
 Checked by: HH, Drawn by: SKM, Last edited by: smitchell
 Location: P:
 \30800s\30872\Mapping\30872_CreswickMTB_EMP\30872_CreswickMTB_EMP.aprx



11. Post construction site remediation and reporting

This section outlines the approach required to stabilise and rehabilitate the impact area post construction. This is not a landscape plan.

Site remediation will be achieved within the specification and design of the Mountain Bike Park, as detailed in the approved design or landscape plan. The objective of the Mountain Bike Park design with respect to remediation is to ensure all disturbed surfaces are secured against further disturbance by erosion and sediment control measures.

The Project manager must compile all records in a suitable format and make a brief summary report on the implementation of the EMP, noting positive and negative outcomes.

11.1 Site clean up

Removal all temporary structures and fencing.

Dispose of all construction waste to recycling or legal landfill. The Project manager must document all waste movements from site and retain evidence of all waste disposal or recycling.

Dispose of all excess spoil to a legal disposal point. Disposal site for any spoil removal from site and truck route is to be submitted to and approved by the Hepburn Shire Council chief executive officer and/or their representative in writing prior to the commencement of any works.

11.2 Site stabilisation and remediation

Minimum post construction stabilisation and remediation methods to implemented are:

- Batters or other areas of exposed soil covered with permeable, biodegradable matting, e.g. durable jute matting securely pinned to soil surfaces sufficient to prevent soil movement for 18 months.
- Minimum of soil disturbance must be achieved, i.e. no soil disturbance other than that required to construct Mountain Bike Park. No disturbance beyond these areas.
- **No use of viable non-native vegetation such as lawn seed mixes or grass / straw bales anywhere on site.**

11.3 Trail Maintenance Plan (Post-construction)

Following the construction component of the project, the Project manager or person(s) of delegation must continue to maintain necessary environmental measures detailed below in the Trail Maintenance Plan (Table 10) and further documented in the Hepburn Shire Council Trail Maintenance Plan (Hepburn Shire Council 2020) as an ongoing component of the Trail Management The Project manager must compile all records in a suitable format

Table 10 Post-construction trail management plan

Environmental aspect or management activity	Control Measure	Timing	Delegation
Routine inspections/ trail safety assessments	The trails will be assessed: <ul style="list-style-type: none"> On the Friday once a month. After a severe weather warning from the Bureau of Meteorology has passed. Require event organisers to repair impact to trails caused by the event. 	<ul style="list-style-type: none"> Monthly Document impact area preparation and identification including photographs. 	<ul style="list-style-type: none"> Hepburn Shire Council services officers (with support from Environmental officers).
Trail opening	<ul style="list-style-type: none"> The trails will only be opened after remedial and maintenance works have ensured that the use of the trail does not pose a significant personal or environmental risk. 	<ul style="list-style-type: none"> On opening of Trails (TBC) 	<ul style="list-style-type: none"> Hepburn Shire Council services officers
Trail closure	<ul style="list-style-type: none"> Signs clearly marking 'TRAIL CLOSED' will be installed at the trail heads when the trails are deemed to be closed The trails may be closed prior to or during any severe weather warning issued by the Bureau of Meteorology for Hepburn area 	<ul style="list-style-type: none"> On any event where Trail closure is required 	<ul style="list-style-type: none"> Hepburn Shire Council services officers

<p>Unsanctioned trail management</p>	<ul style="list-style-type: none"> • Enforce a strict policy of 'no unauthorised trail modifications' and remove or repair any such modifications immediately. • Under Council's licence agreement with Land Managers any unsanctioned trails within the agreed 20m construction corridor, which are not upgraded as part of the formal trail network, will be rehabilitated during construction and general maintenance. • The rehabilitation of trails outside the licenced 20m maintenance corridor has been discussed but is not within the current scope or funding of the Creswick Trails Project. Council is open to working with Land Managers and stakeholders regarding the closure and rehabilitation of unsanctioned trails outside the licensed 20m corridor. • Unsanctioned trails within the project footprint/ Hepburn Shire lease area will be clearly marked as closed if illegal trail building occurs. Large logs will be moved across the trails to prevent use by motorbikes or mountain bikes where possible. Signs will be installed to indicate unauthorised access is not permitted. 	<ul style="list-style-type: none"> • Monthly • As required 	<ul style="list-style-type: none"> • Hepburn Shire Council services officers
<p>Damage due to unintended use</p>	<ul style="list-style-type: none"> • The Creswick Regional Park is subject to frequent legal and illegal use by off road vehicles. While 4 wheel drives are unlikely to impact trails motorbikes are likely to attempt to ride them, particularly in the early days of the networks opening. The design and construction of mountain bike trails tends not to suit motorbike riding due to the circumference of turns and winding nature. 	<ul style="list-style-type: none"> • Monthly • As required 	<ul style="list-style-type: none"> • Hepburn Shire Council services officers

	<ul style="list-style-type: none"> The passive surveillance through legitimate trail users will have a self-policing affect, discouraging unintended trail use. Typically after an initial phase of exploration the misuse of trails by motorbike riders becomes infrequent or ceases completely. 		
<p>Native Vegetation</p>	<ul style="list-style-type: none"> Elevated structures are constructed over the areas of sensitive vegetation to limit the damage to vegetation due to trail usage. Vegetation will be monitored under and adjacent to each elevated structure to assess the vegetation community's response to the shading effect of the structure and damage caused by unauthorised traffic. Sensitive areas of native vegetation to remain fenced off for the first couple of months of the trail opening. The trail batters' will be left after construction to regenerate with native vegetation from the surrounding seedbank. If native vegetation is not establishing on areas of the batters after two years, supplementary planting with locally grown, local provenance species will be undertaken to stabilise the batters and provide further seed to the seedbank. Species used for potential supplementary planting will be in accordance with the DELWP published Benchmark species for the EVC where the planting will occur. Only low growing grasses and forbs will be planted on the batters. 	<ul style="list-style-type: none"> Oct / Dec / Mar / May As required 	<ul style="list-style-type: none"> Hepburn Shire Council Environmental Officer

	<ul style="list-style-type: none"> • If vegetation in these areas is in decline an Action Plan will be developed in conjunction with DELWP. • No trees, dead or alive, or native vegetation is to be removed, lopped or adversely impacted upon during the maintenance phase of the project without an approved permit. 		
Creeks and waterways	<ul style="list-style-type: none"> • Photo points will monitor the levels of sedimentation entering the adjacent waterways due to trail construction. • Remedial measures will be undertaken if significant levels of sedimentation enter any of the monitored waterways. • Sedimentation levels will also be assessed along the length of the trail at drainage exit points. • Implement appropriate erosion and sediment controls for works near creeks and drainage lines to protect against any impacts to water quality. • Avoid maintenance works in waterways when they are flowing and instead undertake works in these areas in summer/autumn months when they are dry. • Photos will be recorded during each monitoring session. 	<ul style="list-style-type: none"> • Oct / Dec / Mar / May • As required 	<ul style="list-style-type: none"> • Hepburn Shire Council Environmental Officer
Erosion	<ul style="list-style-type: none"> • Erosion of batters and trail surface will be monitored during assessments. • Remedial works will be undertaken in the form of surface hardening or supplementary planting to reduce erosion in unstable areas. 	<ul style="list-style-type: none"> • Monthly • As required 	<ul style="list-style-type: none"> • Hepburn Shire Council services officers

<p>Graffiti/ damage of trail</p>	<ul style="list-style-type: none"> • Signage will be monitored during trail assessments. • Signage is a vital component of a successful mountain bike trail network providing trail users with important information to ensure a safe and enjoyable ride. • Signage needs to be clearly visible, standing out from the surroundings and located at key decision points at the trail beginning, intersections and significant ride features. • Signage will be repaired and cleaned from graffiti as required. • Enforce a strict policy of 'no unauthorised trail modifications' and remove or repair any such modifications immediately. 	<ul style="list-style-type: none"> • Monthly • As required 	<ul style="list-style-type: none"> • Hepburn Shire Council services officers
<p>Weed management</p>	<ul style="list-style-type: none"> • Implementing weed and pathogen hygiene protocols during operation of trails. This includes vehicle, equipment and footwear wash down stations for Cinnamon fungus and weeds during construction of the trails. • Protocols must be in place for the wash down of bikes and footwear to prevent the spread of Cinnamon fungus and other weeds when the trails are operational. • Weeds must be monitored during the trail assessments in the operational phase of the project. • Weeds should be removed from trail surfaces, trail batters and surrounding vegetation by either hand pulling, bagging and removing from the site to be disposed sanitarily disposed. 	<ul style="list-style-type: none"> • Monthly • As required 	<ul style="list-style-type: none"> • Hepburn Shire Environmental Officers

<p>Heritage</p>	<ul style="list-style-type: none"> • Regularly inspect the site in case use of the trails reveals cultural, historical or archaeological remains which should then be managed appropriately. Refer to Figure 1 and proposed monitoring locations. • Implement the unexpected finds protocol in the CHMP and Historical Survey report (Biosis 2021b, Biosis 2021c). 	<ul style="list-style-type: none"> • Oct / Dec / Mar / May • As required 	<ul style="list-style-type: none"> • Hepburn Shire Heritage Officers
<p>Biosecurity</p>	<ul style="list-style-type: none"> • To avoid mud and dirt from trails spreading microscopic pests, pathogens and weeds seeds cleaning of bikes with non-toxic biodegradable cleaning agent before and after rides will be advised to trail users. • Advertise high risk pest, pathogens and weeds. • Display signs to identify signs of pests, diseases or weeds. • Advertising signs stating to keep everything clean and report anything unusual. • In areas of high-risk, wash down stations are advised. • Ongoing weed management monitoring is required within the 20 m trail corridor. 	<ul style="list-style-type: none"> • Oct / Dec / Mar / May • As required 	<ul style="list-style-type: none"> • Hepburn Shire Environmental Officers

12. Glossary

Term	Definition
Impact area	The area within a site required for all works, including access tracks, stockpiles, temporary facilities, plant, the construction footprint and so on. Anywhere likely to be disturbed or impacted on by the works.
Native vegetation	Plants that are indigenous to Victoria including trees, shrubs, herbs and grasses (from the Victorian planning provisions – note this may include planted vegetation in addition to naturally occurring native vegetation)
Invasive plants	<p>An invasive plant species is a species occurring, as a result of human activities, beyond its accepted normal distribution and which threatens valued environmental, agricultural or other social resources by the damage it causes.</p> <p>Invasive species have a major impact on Australia's environment, threatening our unique biodiversity and reducing overall species abundance and diversity.</p>
Invasive animals	An invasive animal species is a species occurring, as a result of human activities, beyond its accepted normal distribution and which threatens valued environmental, agricultural or other social resources by the damage it causes.

13. Useful information resources:

SEPP (Waters)

State Environmental Protection Policy (Waters) 2018-

<http://www.gazette.vic.gov.au/gazette/Gazettes2018/GG2018S499.pdf>

EPA publications

Environmental Guidelines for Major Construction Sites (EPA Publication 480) -

<https://www.epa.vic.gov.au/~media/Publications/480.pdf>

Construction Techniques for Sediment Pollution Control (EPA Publication 275) -

<https://www.epa.vic.gov.au/~media/Publications/275.pdf>

Doing it Right on Subdivisions: Temporary Environment Protection Measures for Subdivision Construction Sites (EPA Publication 960) - <https://www.epa.vic.gov.au/~media/Publications/960.pdf>

Current design specifications for sediment and erosion control measures

Some example control measures are provided here, a full range of specifications can be sourced from the Catchment and Creeks website - <https://www.catchmentsandcreeks.com.au/index.html>. All content from this website is freely available for reproduction and use.

Standard controls

Sediment fence - <https://www.catchmentsandcreeks.com.au/docs/SF-1.pdf>

Filter sock / rock sausage - <https://www.catchmentsandcreeks.com.au/docs/FS-1.pdf>

Catch drain - <https://www.catchmentsandcreeks.com.au/docs/CD1-1.pdf>

Chute - <https://www.catchmentsandcreeks.com.au/docs/CH1-1.pdf>

Outlet structure - <https://www.catchmentsandcreeks.com.au/docs/OS-1.pdf>

Concentrated flows

Modular sediment trap - <https://www.catchmentsandcreeks.com.au/docs/MST-1.pdf>

Check dam sediment traps- <https://www.catchmentsandcreeks.com.au/docs/CDT-1.pdf>

Filter tube dam - <https://www.catchmentsandcreeks.com.au/docs/FTD-1.pdf>

Instream sediment controls

Filter tube barrier - <https://www.catchmentsandcreeks.com.au/docs/I-FTB-1.pdf>

Site access

Rumble / Vibration grid - <https://www.catchmentsandcreeks.com.au/docs/V-Exit-1.pdf>

Wash bay - <https://www.catchmentsandcreeks.com.au/docs/W-Exit-1.pdf>

Stockpile management - <https://www.catchmentsandcreeks.com.au/docs/SPM-1.pdf>

Storm water management

Urban stormwater best practice environmental management guidelines - [State Environmental Protection Policy \(Waters\)](#) - <http://www.gazette.vic.gov.au/gazette/Gazettes2018/GG2018S499.pdf>

Noise

EPA Victoria: Environment Protection (Residential Noise) Regulations 2008-

[http://www.legislation.vic.gov.au/domino/web_notes/LDMS/LTObject_Store/LTObjSt4.nsf/d1a8d8a9bed958efca25761600042ef5/6ffcb6621349aaafca2577610035fbb6/\\$FILE/08-121sr001.pdf](http://www.legislation.vic.gov.au/domino/web_notes/LDMS/LTObject_Store/LTObjSt4.nsf/d1a8d8a9bed958efca25761600042ef5/6ffcb6621349aaafca2577610035fbb6/$FILE/08-121sr001.pdf)

14. References

Axiom Tree Management and Hepburn Shire Council 2020. *Arborist Report, Construction Methodology for Creswick Trails Project*.

Biosis 2021a. *Creswick Mountain Bike Trail: Flora and fauna assessment*, Biosis Pty Ltd, Ballarat, Victoria.

Biosis 2021b. *Creswick Mountain Bike Trail: Cultural Heritage Management Plan 14915*, Biosis Pty Ltd, Melbourne.

Biosis 2021c. *Creswick Mountain Bike Trails, Victoria: Historic Survey Report*, Biosis Pty Ltd, Melbourne, Victoria.

CoA 2013. Matters of National Environmental Significance: Significant impact guidelines 1.1. Environment Protection and Biodiversity Conservation Act 1999.

Common Ground Mountain Bike Trail Services, n.d., <https://www.commonground.org.au/>.

EPA Victoria. (2008). *Environmental Protection (Residential Noise) Regulations 2008*. Melbourne: EPA Victoria.

EPA Victoria. (2018). *State Environment Protection Policy (Waters)*. Melbourne: EPA Victoria.

Hepburn Shire Council 2020. *DRAFT Trail Maintenance Plan*.

TRC Tourism Pty Ltd n.d. *Guidelines for trail planning, design and management*, Jindabyne, NSW.



Creswick Mountain Bike Trails, Stage 1: Historic Survey Report

DRAFT REPORT

Prepared for Hepburn Shire

Gary Vines

4 October 2021

Biosis offices

NEW SOUTH WALES

Newcastle

Phone: (02) 4911 4040
Email: newcastle@biosis.com.au

Sydney

Phone: (02) 9101 8700
Email: sydney@biosis.com.au

Wollongong

Phone: (02) 4201 1090
Email: wollongong@biosis.com.au

Albury

Phone: (02) 6069 9200
Email: albury@biosis.com.au

VICTORIA

Melbourne

Phone: (03) 8686 4800
Email: melbourne@biosis.com.au

Ballarat

Phone: (03) 5304 4250
Email: ballarat@biosis.com.au

Wangaratta

Phone: (03) 5718 6900
Email: wangaratta@biosis.com.au

Document information

Location: Creswick, Victoria

Report to: Shire of Hepburn

Prepared by: Gary Vines

Date: 04 October 2021

Biosis project no.: 28089

File name: 35554.CreswickMTB.Hist..stage1.20210910
(Autosaved)

Citation: Biosis 2019. Creswick Mountain Bike Trails, Stage 1: Historic Survey Report. Report for Shire of Hepburn. Authors: Vines, G., Biosis Pty Ltd, Melbourne.

Document control

Version	Internal reviewer	Date issued
Draft version 01	LMT	12/06/2020
Draft version 02	GV	9/12/2020
Final version 01	GV	20/2/2021
Revised version 01	GV	4/9/2021

© Biosis Pty Ltd

This document is and shall remain the property of Biosis Pty Ltd. The document may only be used for the purposes for which it was commissioned and in accordance with the Terms of the Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

Disclaimer:

Biosis Pty Ltd has completed this assessment in accordance with the relevant federal, state and local legislation and current industry best practice. The company accepts no liability for any damages or loss incurred as a result of reliance placed upon the report content or for any purpose other than that for which it was intended.

Summary

Shire of Hepburn proposes to construct mountain bike trails in the Creswick Forest. The project will involve staged development of about 60 kilometres of trails to the north of Melbourne Road as the first stage. A future development of further trails south of Melbourne Road may occur in the future but is not part of this assessment. Some trails will also use existing tracks and trails. Construction will take the form of minor earthworks with some excavation for benching, cutting and other features. Some waterways will require bridging, and other infrastructure such as signage, shelters and way marking may be required.

This report documents the background history of the study area and results of archaeological survey of existing historical places, areas of archaeological potential, locations identified through predictive modelling,

The field survey was carried out by archaeologists from Biosis Pty Ltd Gary Vines, Luke Gunton and Alexandra Squires, Kym Oataway, Leah Tepper and from Charlotte Allen with input from trail designers who marked out the trail alignments and the Biosis ecological team who walked the entire alignments recording flora and fauna. The study has also benefited from the cumulative survey undertaken by Susan Lawrence and Peter Davies and survey data provided by Jodi Turnbull, all of La Trobe University.

The background research and field investigations have confirmed the presence of a number of historical features primarily related to the mid to late nineteenth century gold mining undertakings, comprising settlements, water races, reservoirs, alluvial workings, and other mining features.

The study has identified and assessed seven places previously recorded on the VHI, four additional places proposed to be included on the VHI and eight places identified from research and field survey which were considered not to meet the thresholds and criteria for inclusion on the VHI as archaeological sites.

Impacts to heritage places from the proposed mountain bike trails are generally considered to be minor, confined in the most part to where trails cross or run along water races, and through sluiced ground. Other heritage features have been avoided.

A separate Cultural Heritage Management Plan (CHMP) has been undertaken for Aboriginal heritage.

Recommendations

Recommendation 1 Avoiding historic places

Identified historic archaeological and heritage places, and areas of historical and archaeological sensitivity marked on Map 4 should be avoided during construction wherever possible. Note that in addition to the places recorded on the Victorian Heritage Inventory, there are other features such as minor water races, mining debris such as mullock heaps, mine shafts, and the eroded ground surface from hydraulic sluicing, which do not meet the thresholds for inclusion on the VHI, but are nonetheless of local interest and contribute to the historic character of the Creswick forest.

If construction is proposed near areas of historical and archaeological sensitivity works should be designed to avoid impacts and assist in managing the place. For example, tracks may lead to areas of hydraulic sluicing and gold workings, in order to provide interpretation opportunities, but the tracks should not cut across the sluiced faces and banks. Similarly, if level areas from former water races are to be used, approaches should avoid causing erosion or other damage to the features.

Where listed heritage places are nearby proposed mountain bike trails, these places should be protected from impacts during construction, such as by placing bunting or parra-webbing around the site and marking the sites on construction plans as no-go areas.

Heritage listed places in the vicinity of the proposed Stage 1 Mountain Bike Trails, but not impacted by their construction are listed below.

- Pinus jeffreyii (Jeffrey Pine) (HO560)
- Creswick State Battery (HO974, VHI H7623-0239)
- Back Creek Chinese Garden and Orchard. H7623-0346
- Bragg's Water Race H7623-0333
- Back Creek Chinese Garden and Orchard H7623-0346
- W G Spence house (VHI H7623-####)
- Jackass Road mine (VHI H7623-####)
- Chinese Camp Melbourne Road (VHI H7623-####)

A number of other historic places that have been assessed as not reaching the thresholds or criteria for inclusion on statutory heritage listings have also been identified during the study. Those places that are avoided by the mountain bike trails are as follows:

- Watkins Mine
- Old School House Road mines
- Koala Park
- Back Creek Hotel
- Brackenbury Hill Lookout
- Orr's Store

If any construction activity is likely to occur in the vicinity of these site, they should be protected during the course of works including fencing off with suitable barriers, informing works the foreman and marking on any construction plans as no go areas.

Two of the historic places that have been assessed as not reaching the thresholds or criteria for inclusion on statutory heritage listings cannot be avoided by the mountain bike trails and so recommendations are also included for managing impacts to these:

- Georges Diggings
- Jackass Gully sluicing area

Recommendation 2 Statutory approvals

There are no places listed on the Victorian Heritage Register that will be impacted by the proposed mountain bike trails.

There are no places included on the Shire of Hepburn Heritage Overlay that will be impacted by the proposed mountain bike trails.

There are five places listed on the Victorian Heritage Inventory place that will be impacted by the proposed mountain bike trails. A Consent to Damage must be obtained from Heritage Victoria prior to any works conducted within the extent of the following places:

- Roycraft's Water Race H7623-0328
- Davis' Water Race H7623-0332
- Smokeytown Water Race H7623-0334
- Eaton's Water Race and Dam Wall H7623-0338
- Princess Alexandra Mine H7623-####

Recommendation 3 Induction and protocol for unexpected finds

A protocol should be implemented to inform contractors of the need to avoid historical and archaeological features, how to recognise them, and who to contact should unexpected historical and archaeological features or objects should be discovered during works. In order that contractors are able to fulfil this recommendation an induction should be presented by a suitably qualified heritage professional on site, which covers information needed.

Recommendation 4 Management protocols

The following proposed management protocols must be enacted to ensure that works minimise any impacts to archaeological and heritage places, and if any historic or archaeological deposits are encountered during works, these can be appropriately managed.

- Design works to minimise impacts
- Avoid cutting across water race formations or sluice banks
- Induction for contractors in how to recognise and manage historic features, when to stop works, who to contact
- An archaeologist should be present to inspect construction works within the VHI places.
- If significant archaeological features or deposits are uncovered, the trail should be realigned to avoid the features identified if possible, the material should be assessed and recorded by the archaeologist according the Heritage Victoria Guidelines for Investigating Historical Archaeological Artefacts and Sites (Heritage Victoria, 2014) and the area reinstated.
- If is not possible to avoid the features or deposit, a program of archaeological salvage should be submitted for approval to Heritage Victoria, and the material should be excavated and analysed by the archaeologist according the Guidelines for Investigating Historical Archaeological Artefacts and Sites (Heritage Victoria, 2014).
- An unexpected finds protocol (Appendix 3) in the event any significant archaeological artefacts or features are identified during the works.
- A regular process of inspection should be implemented in case use of the trails reveals historical or archaeological remains which should then be managed appropriately.

Recommendation 5 Recording heritage places

If any previously unrecorded historic archaeological sites are identified during trail construction works and inspection, an assessment should be made as to whether they fulfil the criteria for inclusion on the VHI as

historical archaeological sites. Such places are generally more than 75 years old and have a component that includes archaeological deposits. Consultation with Heritage Victoria should be undertaken to confirm whether criteria and thresholds for the VHI are met, and if so, a VHI site record card should be completed by a qualified archaeologist and submitted to Heritage Victoria.

Any place recorded in the VHI, will then be subject to the Recommendation if it is likely to be impacted by works.

Contents

Summary	ii
Recommendations	ii
1 Introduction	1
1.1 Objectives	1
1.2 Authorship	1
1.3 Study area	1
1.4 Owners/occupiers	2
1.5 Proposed works	2
2 Background	4
2.1 Environment	4
2.2 Land Use History	4
2.3 Previous assessments	8
2.3.1 Archaeological and heritage studies	8
2.3.2 Cultural heritage registers and inventories	10
3 Fieldwork	15
3.1 Survey Strategy	15
3.2 Predictive model	15
3.3 Survey method and coverage	17
3.4 Survey results - Previously recorded places in the study area	28
3.4.1 Pinus jeffreyii (Jeffrey Pine) (HO560)	29
3.4.2 Creswick State Battery (VHI H7623-0239, HO974) and surrounds	30
3.4.3 Eaton's Water Race and Dam wall (VHI H7623-0338)	32
3.4.4 Smokeytown Water Race (VHI H7623-0334)	35
3.4.5 Roycraft's Water Race (H7623-0328)	37
3.4.6 Braggs Water Race (H7623-0333)	38
3.4.7 Davis Water Race (H7623-0332)	39
3.4.8 Back Creek Chinese Garden and Orchard. H7623-0346	40
3.5 Survey results - Newly recorded places	40
3.5.1 W G Spence house (VHI H7623-####)	40
3.5.2 Jackass Road mine (VHI H7623-####)	43
3.5.3 Chinese Camp Melbourne Road (VHI H7623-####)	46
3.5.4 Princess Alexandra Mine (VHI H7623-####)	50
3.6 Survey results - non VHI places	53
3.6.1 Georges Diggings	53
3.6.2 Watkins Mine	55
3.6.3 Old School House Road mines	56
3.6.4 Jackass Gully sluicing area	58
3.6.5 Koala Park	59

3.6.6	Back Creek Hotel	60
3.6.7	Brakenbury Hill Lookout.....	60
3.6.8	Orrs Store.....	62
3.7	Conclusions from the survey	62
4	Cultural heritage significance	64
4.1	Significance assessment.....	64
5	Legislative requirements	75
6	Potential Impacts	77
6.1	Construction impacts.....	77
6.2	Managing impacts during construction.....	79
6.2.1	Avoidance.....	79
6.2.2	Clearing vegetation only with no earth works	79
6.2.3	Importing soil to build up rather than excavating	80
6.2.4	Monitoring and micro siting during works	80
6.2.5	Unexpected finds protocol.....	80
6.3	Specific construction impacts.....	80
6.3.1	Roycraft's Water Race H7623-0328.....	80
6.3.2	Davis' Water Race (H7623-0332).....	81
6.3.3	Smokeytown Water Race (H7623-0334)	82
6.3.4	Eaton's Water Race and Dam wall (VHI H7623-0338).....	85
6.3.5	Princess Alexandra Mine (H7623-####).....	86
6.3.6	Georges Diggings	88
6.3.7	Jackass Gully	89
6.4	Management of impacts during use	90
7	Management recommendations.....	91
7.1	Recommendation 1 Avoiding historic places	91
7.2	Recommendation 2 Statutory approvals	92
7.3	Recommendation 3 Induction and protocol for unexpected finds.....	92
7.4	Recommendation 4 Management protocols	93
7.5	Recommendation 5 Recording heritage places.....	93
	Appendices	94
Appendix 1	Significance assessment	95
Appendix 2	Existing and proposed heritage listings	97
7.5.1	Pinus jeffreyii (Jeffrey Pine) (HO560)	97
7.5.2	Creswick State Battery (VHI H7623-0239) existing VHI Listing	97
7.5.3	Eaton's Water Race and Dam wall (VHI H7623-0338) existing VHI listing	98
7.5.4	Smokeytown Water Race (VHI H7623-0334) existing listing.....	100
7.5.5	Roycraft's Water Race (H7623-0328) Existing listing	101
7.5.6	Braggs Water Race and Dam H7623-0333	102

7.5.7	Davis Water Race H7623-0332	103
7.5.8	Back Creek Chinese Garden and Orchard. H7623-0346 existing listing.....	104

Appendix 3	Unexpected Finds Protocol.....	106
-------------------	---------------------------------------	------------

Tables

Table 1	Cadastral information for the study area.....	1
Table 2	Owners/Occupiers of the Activity Area.....	2
Table 3	Victorian Heritage Register sites in the vicinity of the study area.....	10
Table 4	Victorian Heritage Inventory sites in the vicinity of the study area (Places in the Stage 1 project area highlighted in green).....	10
Table 5	Heritage Overlay sites in the vicinity of the study area (Places in the Stage 1 area highlighted in green).....	11
Table 6	Predictive model	17
Table 7	Summary of survey units and results	25
Table 8	Heritage Places in the Study Area	65
Table 9	Places heritage requireing permits of consent	75
Table 10	Locations of specific impacts to Roycraft's Water Race (H7623-0328).....	80
Table 11	Locations of specific impacts to Davis' Water Race (H7623-0332).....	82
Table 12	Locations of specific impacts to the Smokeytown Water Race (H7623-0334)	83
Table 13	Locations of specific impacts to Eaton's Water Race and Dam wall (VHI H7623-0338)	85
Table 14	Locations of specific impacts to Princess Alexandra Mine H7623-####	87
Table 15	Locations of specific impacts to proposed mitiagion near Georges Diggings	88
Table 16	Locations of specific impacts to proposed mitiagion near Jackass Gully.....	90
Table 17	Victorian Heritage Council heritage significance criteria.	96

Maps

Map 1	Extent of the study area	3
Map 2	Location of Victorian Heritage Register, Heritage Inventory and Heritage Overlay sites, and areas of potential.....	13
Map 3	Survey areas.....	19
Map 4	Areas of potential impact to historical archaeological sites	69

Figures

Figure 1	Historic features in the Creswick area (Turnbull, 2019)	16
Figure 2	Features at Eatons Dam with proposed extension to VHI H7623-0338 in green	34
Figure 3	Roycraft's Water Race (H7623-0328) showing additional section to the north in green ..	38
Figure 4	Location of W. G. Spence house site (Red line)	42
Figure 5	Plan of Chinese miners camp (VHI H7623-####) proposed extent (red line).....	46

Figure 6	Parish of Creswick, Sheet 2 Crown Allotment Plan, C400A11 Land Victoria.....	48
Figure 7	Creswick Parish Plan, Imperial measure 2464 (PROV).....	49
Figure 8	Nearmap aerial photo of Oak Gully and Watkins mine site shortly after replanting 28 10 2016.....	56
Figure 9	Jackass Gully sluicing area – marked by blue.....	59
Figure 10	Water Race – Trail Cleared	78
Figure 11	Fabricated Bridge Crossing	78
Figure 12	Fabricated bridge over breach in a water race.....	79

Photographs

Photograph 1	Spring Hill, from Road to Government Camp, Creswick's Creek; Sands and Kenny; S.T. Gill; 1857; 02.0665 Ballarat Gold Museum	5
Photograph 2	Chinese Camp Creswick (1855), Horace Burkitt	7
Photograph 3	Four wheel drive impacts in the northern part of the study area (Survey Unit 65)	21
Photograph 4	Complex race cut through rocky slope (Survey Unit 23).....	21
Photograph 5	Existing unofficial trail running along edge of water race (Survey Unit 14).....	22
Photograph 6	Sluiced and regenerated area, goldfields track, car in distance is on top of bank, sluice face immediately in front, quartz gravel dump left of centre (Survey Unit 31).....	22
Photograph 7	Regenerated forest on ridges and upper slopes with informal mountain bike track showing ground visibility and exposure (Survey Unit 38).....	23
Photograph 8	Mountain bike track crossing major water race (H7623 -0338) in regrowth native and pine forest (Survey Unit 13).....	23
Photograph 9	Existing mountain bike track following water race (H7623-0332) Survey Unit 68).....	24
Photograph 10	Jeffrey Pine at Creswick Football Ground (HO560)	29
Photograph 11	Creek flats after dredging, sluicing and reclamation of sludge affected ground (Survey Unit 2).....	30
Photograph 12	Existing trail on west side of Creswick Creek (Survey Unit 2)	31
Photograph 13	Creswick gold stamping battery (Survey Unit 2).....	31
Photograph 14	Eatons race, Breached embankment at small dam	32
Photograph 15	Eatons Race Existing trail following water race	33
Photograph 16	Eatons Dam wall, Back Creek (Survey Unit 68).....	33
Photograph 17	Puddling Machine near Eatons Dam (Survey Unit 68).....	34
Photograph 18	Location of Smokeytown race crossed by Loop Road (Survey Unit 20)	35
Photograph 19	Smokeytown race near Watkins mine (Survey Unit 66)	36
Photograph 20	Smokeytown race at eastern end of study area (Survey Unit 66).....	36
Photograph 21	Roycraft's Water Race (H7623-0328)(Survey Unit 62)	37
Photograph 22	Davis and another water race (H7623-0332) near Eaton's Dam (Survey Unit 68)	39
Photograph 23	Spence hut at Jackass Gully James Maxwell Spence (Jr) in doorway.....	42
Photograph 24	Location of Spence House from Wallaby Track looking south east. (Survey Unit 63).....	43
Photograph 25	Adit, open cut and mullock heaps, Jackass Road mine (Survey Unit 69).....	44
Photograph 26	Mine shafts and mullock heaps east of Jackass Road (Survey Unit 69)	44

Photograph 27	Water race near Jackass Gully (Survey Unit 69)	45
Photograph 28	Cart track with building site beyond within Chinese Camp Reserve (Survey Unit 67)	47
Photograph 29	Gold rush era bottle class in water race bank immediatley below Chinese Camp (Survey Unit 67).....	47
Photograph 30	Extent of workings at Princess Alexandra Mine (VHI H7623-####)	50
Photograph 31	Rock piles from Sluicing Princess Alexandra Mine (Survey Unit 59).....	51
Photograph 32	Sluice Banks, Princess Alexandra Mine (Survey Unit 59).....	52
Photograph 33	Georges Diggings showing recent pine plantation around gully (Survey Unit.....	54
Photograph 34	Watkins Mine sluicing at the head of Oak gully (Survey Unit 66)	55
Photograph 35	Shafts and Mullock heaps, Old Shool Road Springmount (Survey Unit 58)	57
Photograph 36	Mining Camp, Jackass Gully, Creswick, Victoria, 1931 (SLV).....	58
Photograph 37	Remnant gateposts and fence at Koala Park entrance.	60
Photograph 38	orientation table at Brackenbury Hill lookout.	61

1 Introduction

The *Heritage Act 2017* and *Planning and Environment Act 1987* provide protection to historical sites in Victoria. These sites are an important part of our heritage as they represent evidence of the more recent period of settlement in Victoria and can provide us with important information about past lifestyles and cultural change.

Biosis Pty Ltd was commissioned by Shire of Hepburn to complete a historical archaeological survey for the Creswick Mountain Bike Trails.

1.1 Objectives

The objective of the study is to assess the cultural heritage potential of the study area, record any historical sites that are present and to develop recommendations to ensure best cultural heritage practise is maintained. Applications for statutory approvals will be prepared based on the management recommendations. However, the primary objective is to provide sufficient information of heritage values to allow for the development of options to avoid impacts.

1.2 Authorship

The current study was completed by the Biosis staff including Gary Vines, who is responsible for the fieldwork and report writing, and Elise Nuridin who undertook background research. Lachlan Milne completed the mapping.

1.3 Study area

The proposed Mountain Bike Trails are located within forest areas to the east of Creswick township. Most of the land is designated State Forest and Creswick Regional Park. The initial study area comprised a larger area to the south and south east of Creswick township, but was subsequently reduced to the Stage 1 Area located north of the Melbourne Road along Creswick and Back Creek and the slopes and gullies to the north of the creek and a small area to the east of Cheney Street.

The location of the study area is shown on Map 1. Cadastral information for the study area is listed in Table 1.

Table 1 Cadastral information for the study area

Cadastral Information	
Local Government Authority	Hepburn
Parish	Creswick
County	Talbot
Crown parcel	Section T, U V Z, various allotments
VicRoads	Map 58 G8

1.4 Owners/occupiers

The study area proposed for the trails comprises private and Crown Land vested in State Forest and the Creswick Regional Park, with various land tenure. Parts are managed by the Crown (various agencies), or by private timber entity Hancock Victorian Plantations (HVP). Crown land is managed by a range of agencies, with most of the land managed by both Parks Victoria (PV) and The Department of Environment, Land, Water and Planning (DELWP). Additional Crown land management agencies across the study area include Hepburn Shire Council and Ballarat City Council.

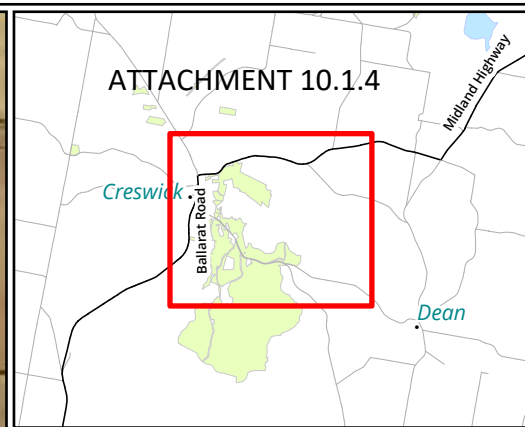
The relative areas of land for which each owner/occupier is responsible, are included in Table 2 and Map 2.

Table 2 Owners/Occupiers of the Activity Area.

Corporate name	Department of Environment, Land, Water and Planning	Parks Victoria	Hepburn Shire	Hancock Victorian Plantations
ABN	90 719 052 204	95 337 637 697		20 084 801 132
Address	2 Lonsdale St, Melbourne VIC 3000	Level 10, 535 Bourke Street Melbourne Victoria 3000	P.O. Box 21, Daylesford 3460	World Trade Centre, Level 12, Tower 4, 18-38 Siddeley Street, Melbourne. VIC. 3005
Phone	9310 9222	13 1963	5348 2306	9289 1400
Area controlled	Forest west of HVP plantations and east of Creswick State Park	Creswick State Park	Council managed roads and parks	Timber plantations north of Creswick Creek

1.5 Proposed works

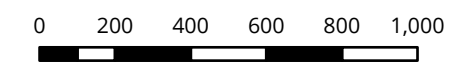
Shire of Hepburn proposes to construct up to 60 Kilometres of mountain bike trails in the Creswick State forest and other public land north of Melbourne Road in the area of Creswick Creek and Back Creek. There are presently no plans to progress to Stage 2 of construction.



Legend

- Study area
- Proposed Mountain Bike trails

Map 1 Extent of the study area



Scale: 1:20,000 @ A3
Coordinate System: GDA 1994 MGA Zone 54



Matter: 35554,
Date: 29 September 2021,
Prepared for: GV, Prepared by: DK, Last edited by: dkang
Layout: 35554_F1_StudyArea
Project: P:\35500s\35554\Mapping\35554_CreswickMTB.aprx

2 Background

When new development is proposed, it must be established whether there are any historical sites within the study area and how they might be impacted. Therefore, background research in to regional history and previously recorded historical sites can inform the likelihood of sites being in the study area.

2.1 Environment

The study area lies within the Dissected Uplands of west-central Victoria, comprising a relatively low-lying landscapes comprising a broad, elongated and dome-like east-west drainage basin, with an average elevation of only 300 metres. Volcanic plains occur within the Dissected Uplands but these are beyond the study area (Victoria Department of Economic Development, Jobs, Transport and Resources, 2017).

The main geological formations in the study area are Ordovician sandstone and mudstone dating to 490 million years old. Pleistocene and Holocene sedimentary deposits are in the bottom of the valleys and in some cases as remnant capping layers on higher ground overlying the Ordovician deposits. Coarse weathered bedrock fragments and quartz occur throughout the profile (Victoria Department of Economic Development, Jobs, Transport and Resources, 2017).

Creswick Creek runs through the study area east to west with a series of tributaries, the main one being Slaty Creek. At European settlement the area was covered with dry sclerophyll eucalypt forest which is still the predominant vegetation type, although it has been subject to modification by forestry, mining and land clearance. Extensive radiata pine plantations have also been established since the early 20th century.

Soil types are clay and shale with minor alluvial soils along creeks. The predominant geographical features are rolling hills comprising about 20--40% grades, with some steep 40--60% grades. Total elevation is within a variation of about 120 metres with the highest point being about 550 metres. Some areas have been significantly disturbed by past mining activities. The average annual rainfall is 690 millimetres (Ballarat-- www.bom.gov.au).

2.2 Land Use History

The Creswick District is part of the country belonging to the Tureet Balug clan of the Dja Dja wurrung Aboriginal language group.

Captain Charles Sturt followed the earlier Mitchell expedition, driving cattle through northwest Victoria to South Australia. He reported that the extensive grassy, treeless plains and woodlands were suitable for grazing (Coutts, 1977). Squatters soon arrived, and in 1839, W J T Clarke acquired 7,868 acres of land and established the Downing Forest and Bean pastoral runs (Spreadborough, R. and Anderson, H., 1983). The runs, which include the current Activity Area study area, were predominantly used for grazing sheep.

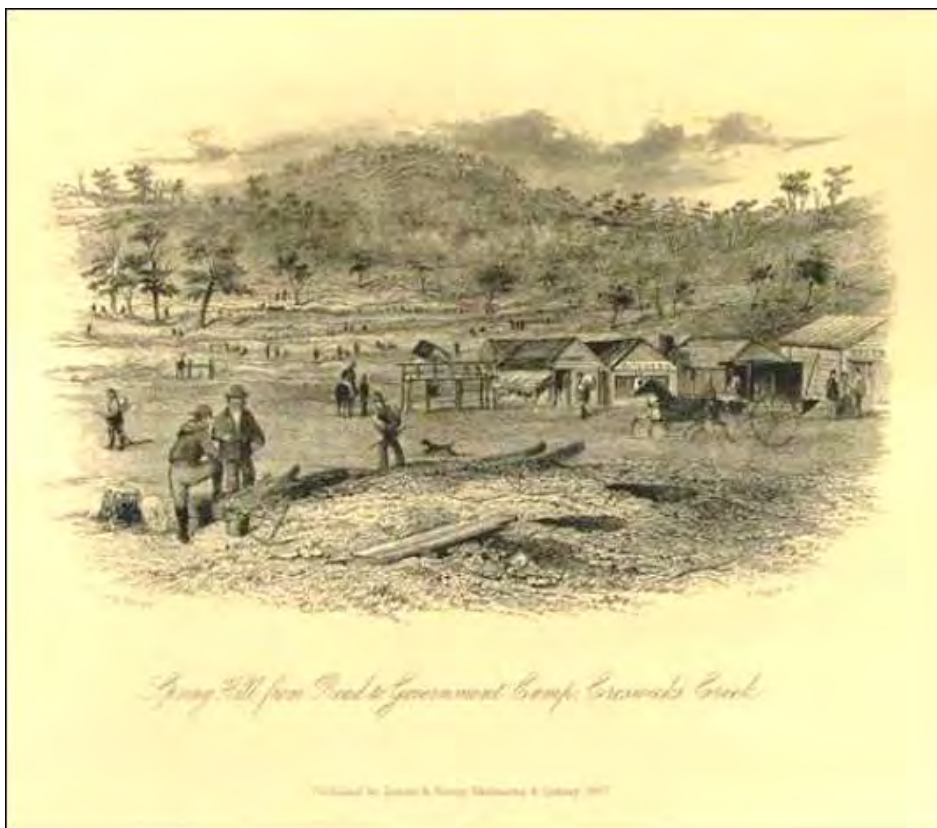
When first taken up by squatter's runs in the 1830s and 1840s, the region was used for grazing cattle and sheep, with limited dairying and agriculture. This was a period of increased land cultivation and the clearance of much of the region's forests. Wheat and other crops were grown, which was transported for milling to Inglewood or Bridgewater (Long, A. and Edmonds, V. , 2001).

The first European settlers were brothers Henry, Charles and John Creswick, who started a large sheep station in 1842. Others took up pastoral licences including William Coghill at Glendaruel Run and his brother David Coghill at Glendonald Run, both around 1845.

Gold mining

After the discovery of gold in 1851 areas of northwest Victoria, particularly along watercourses, were subjected to intensive mining activity (Waarden, 1994). By 1888 the mining activities in the regions resulted in extensive damage to native forests as timber was cut for mine props and firewood. This led to the establishment of the Creswick Plantation and the Saw Pit Gully Plantation to supply the timber needs of the region. The study area falls within the current Creswick Plantation boundary. So successful were the plantations they led to the establishment of the School of Forestry in 1910 (Taylor, 1998). The forest, established by John La Gerche became one of the largest and most successful “models of forest management” (Taylor, 1998).

Creswick is noted as the site for the first discovery of marketable gold in Victoria on 1 July 1851, credited to two parties of miners, Mains' and Hogbens' This led to a rush to the area in 1851. Initially shallow alluvial mining occurred along a system of shallow auriferous leads around the site of the present town and to the north and east. Discovery of an extensive system of shallow leads west of the town saw a further rush in 1854. By early 1852, a sizeable population had descended on Creswick Creek and the basis of a town was formed by the establishment of a Government Police Camp in December of that year. A further rush in 1855-6 as a result of deeper workings being opened up combined with steadily maintained alluvial yields saw Creswick's population rise to about 5,000 by 1861 (Darbyshire, 1974). A township survey had been completed by 1854, and shops, hotels, churches and various other services set up around Victoria and Albert Streets (Crown Lands and Survey., 1857). By 1861, the town expanded to the west with a sludge channel formed along the eroded and sedimented Nuggety Gully (Dept. of Lands & Survey, 1861).



Photograph 1 Spring Hill, from Road to Government Camp, Creswick's Creek; Sands and Kenny; S.T. Gill; 1857; 02.0665 Ballarat Gold Museum

Major mining areas included Graham's, Bald, Clarke's, Hard, White, Humbug, Lucknow and Ironstone; and associated gullies like Long, Mopoke and Nuggety. After the 1854 rush had subsided, diggers who stayed on the field re-worked old up-rooted auriferous ground with puddling machines and sluice boxes; worked

cemented (conglomerate) gravels; extracted gold from quartz reefs; and followed the deep alluvial leads (Flett, 1970, p. 416).

Sluicing commenced at Creswick at the shallow end of the field, principally to the west and south of the town. Water to work the alluvial deposits was brought in open races from dams constructed in the higher catchments of Slaty and Back Creeks. The races wound their way for considerable distances around the heads of intervening gullies. The Humbug Sluicing Company also used a patent bitumenized pipe to cross Slaty Creek: the pipe had a diameter of 8 inches and was a half mile (800 metres) long.

The Humbug Hill Hydraulic Gold Sluicing Site comprised a sluicing pit about 100 metres by 50 metres containing a network of pebble dumps and tail races. The slope below the pit has been extensively ground sluiced and the gully draining from the southern end of the pit has been deeply excavated by high pressure water. At least two water races brought water to Humbug Hill, one from Bragg's Dam (across Salty Creek); the other from Russell's Reservoir (down Lincoln Gully). About 30 feet of soil was washed from the surface to bedrock at Humbug Hill.

Sluicing operations were very seasonal, as they were dependent on adequate water supply to direct high pressure water against the base of the face and collapsing blocks of ground from 20 to 50 tons. This appears to be the principal sluicing technique used at Creswick.

Horse-powered puddling machines were also widespread on the Creswick field. The mining registrar reported 159 puddling machines at work in August 1859. Puddling, however, could only process a fraction of the ground that could be worked by sluicing parties but as they required much less water, puddlers generally had a much longer mining season.

Creswick Chinese Camps

Early on, Chinese were prominent in the goldfields, with the Ballarat Chinese Protector, W.H. Forster, estimating there were 1100 Chinese in the Creswick area in 1859. District Mining Surveyor reports show that the Chinese population at Creswick was stable at around 400 individuals throughout the 1860's and 1870's, while the total Chinese population of the surrounding district fell from a high of nearly 2000 in the early 1860's to less than 1000 in the mid 1870's. All of the Chinese miners were alluvial miners. For much of the 1860's, there were relatively even numbers of Europeans and Chinese alluvial miners in the Creswick area. In the early 1860s there were approximately 60 Chinese ratepayers listed in council rate books.

By the end of the 1865 and 1866 droughts only the Chinese were still persevering with shallow alluvial mining, particularly sluicing. Chinese sluicers were to be particularly successful in the 1870s when the Spring Hill leads were opened, for example, in 1874, a Chinese party sluiced up a 96 ounce nugget in Mosquito Gully, near Spring Hill (Bannear, 1996).

The main Chinese community in Creswick was located at Black Lead to the north west of the main settlement. Other Chinese communities were located at Portuguese Flat, Hard Hills, Clarke's Flat, Bloody Gully, Mopoke and Slaty Creek. A number of Chinese run businesses were also located in Albert Street. The main Chinese cultural events, such as circus, theatre and Chinese New Year celebrations occurred at the Black Lead area.

Horace Burkitt's painting of the Creswick Chinese Camp depicts lines of small step pitch roofed buildings huddled close together, and adorned with flags (Photograph 2). The distinctive buildings separated from other habitation suggest an insular community. The extent of the Chinese Camp is apparent in the various early maps that depict a series of narrow streets with small allotments, running at a skewed alignment to the main township grid.



Photograph 2 Chinese Camp Creswick (1855), Horace Burkitt

Surviving images of Creswick's Chinatown and the township plan show three narrow streets lined with very narrow, adjoining, allotments. In addition to mining, members of the community were active as merchants, tea shop proprietors, publicans, gamblers, pork butchers, market gardeners, hawkers, farm labourers, timber cutters, cartage contractors, joss house operators, and Chinese missionaries. The Argus newspaper described the camp and its inhabitants in the manner of the time:

*"...here, as elsewhere, they bear the character of a peaceable, hardworking people. They have one of their large, miserable, rickety encampments just outside the town, and round about they have numerous market gardens, in which they toil with the patient, plodding industry peculiar to the race. The total number of Chinese in and near the town is nearly one thousand."*¹

There may have been two joss houses, or mutual support societies at Black Lead, with around 390 Chinese buried in the current cemetery at Creswick. There are also at least 20 Chinese burials in the former Creswick Old Cemetery, located on the south east boundary of the study area, which was begun as an informal burial ground as early as 1852 and closed in the late 1850s (Creswick Cemetery Trust, 2018).

In the 1860s the Black Lead area was rated at a low value, with buildings described as tenements. There were no brick or stone buildings but only simple wooden structures. Shops, workshops, dwellings and a large number of saloons were the most common buildings listed. Opium dealers, smiths, cooks, a goldsmith, a barber, a tailor, doctors, chemists, herbalists, a fruiterer and a fish dealer were also to be found in the camp.²

¹ "COUNTRY SKETCHES." The Argus (Melbourne, Vic.: 1848 - 1957) 30 September 1864: 6. Web. 30 Aug 2018 <<http://nla.gov.au/nla.news-article5738597>>.

² 'Mud, Sludge and Town Water: Civic Action in Creswick's Chinatown', Provenance: The Journal of Public Record Office Victoria, issue no. 11, 2012. ISSN 1832-2522. Copyright © Elizabeth Denny. Citing rate books (PROV, VPRS

Unusually for Chinese mining interests in Victoria, a consortia led by local Chinese business man Pin Que in 1861 were involved in leasing and operating a major deep alluvial mine; the Grand Trunk Gold Mine (later the Key Company Gold Mine) (The Chinese Heritage Interest Network, 2006).

The Lindsay family have been prominent in Australian arts and literature and left us some vivid images of Creswick and the Chinese Camp. Lionel Lindsay describes the Creswick Chinese in his book *Comedy of Life*.

"The Chinese camp was our Paradise. Here were two joss houses, from which the burning joss-sticks could be looted, and here lived a wizen old Chow called Sinkum who would match his inimitable fi-shang toffee against our pennies. At the entry of the Chinese camp stood the dwelling of Ginger Mary Ann, a bedraggled representative of the oldest profession on earth... and sometimes we would see the ginger beer maker. But our business was with Sinkum the toffee-maker, and we debated the inevitable alternative - should we toss or buy?." [and also] "The Australian boy likes the Chinese, yet nothing will keep him from pelting a distant Chow. Now when I think of this great race, with its amazing art, its profound philosophy. I know we were the barbarian atavistically impelled by our instinctive savagery. The honours were with the Chinese."

The Chinese petitioned the council to improve the conditions in the Black Lead camp several times due to the difficulty of getting around in wet weather, pointing out in 1867, that:

"... the ditch across the road on the Black Lead Creswick is in want of repair – That when it overflows it is very offensive [-] That a pathway is much wanting and the road requires levelling [.]"

Post mining

The Creswick Advertiser (1914) stated that with the acquisition of the Creswick Plantation the Department of State Forests then had more than 15,000 acres of forest on its books in that year. The article also outlined the Department's plan to re-vegetate other areas that had been affected by disturbance due to "mining operations on a mammoth scale" (The Creswick Advertiser, 1914).

In the early twentieth century the Eureka Terra Cotta and Tile Company and later Selkirk's brickworks in Ballarat exploited the underlying clays on the west side of Humbug Hill, creating a large open cut clay pit that obliterated part of the earlier Humbug Hill Sluicing Co workings (Davis, Lawrence, & Turnbull, 2015). In some instances these works took advantage of the clay deposits that had been left behind by sluicing which contained very pure terracotta clays in readily workable form.

2.3 Previous assessments

2.3.1 Archaeological and heritage studies

Considerable historical and field research has been undertaken in the Creswick Forests into former mining areas, including studies of the intricate and complex water supply systems used for directing water to mining and sluicing areas. The main publication of this work relates to interpretation of the water race system (Davis, Lawrence, & Turnbull, 2015). Earlier studies have dealt with interpreting the broader cultural landscape which considered the Creswick mining area which it described as:

"Some remnants of mining from the initial period of the gold rushes to Creswick. These include remnants of shafts and signs of later reworking and sluicing operations. These have largely been filled and graded but they are recognisable as remnants of the beginnings of the mining industry of Creswick. (Chris McConville and Associates Pty. Ltd., n.d.)"

3726/P0, Unit 1 Special Rate Book 1864-1870, Unit 2 General Rate Book 1864-1870, and Unit 3 General Rate Book 1870-1878)

The Historic Mining Study undertaken by Heritage Victoria has identified numerous individual mines and workings in the Creswick Area. Historical information has been compiled in the South West goldfields report (Bannear, 1996). This describes the Humbug Hill workings as follows:

“The alluvial workings surviving on Humbug Hill are mainly associated with the mining of high terrace Tertiary gravels which were deposited up to 40 million years ago. The hill, along with others in the vicinity, was rushed in 1854 and proved to be extremely good for sluicing, being covered by 30ft of rich gold-bearing gravels. Water to work the deposits was brought in an open channel (called a race) from a reservoir, now known as Russel’s Reservoir. The race from this reservoir wound its way for considerable distance round the heads of intervening gullies before reaching the hill. The Humbug Sluicing Company used a patent bitumentized pipe to cross Slaty Creek: the pipe had a diameter of 8 inches, was a half mile long, and had a maximum thickness of 7/8th of an inch. Due to the dryness of the environment, sluicing was extremely seasonal, and when a good stream of water came through, work was carried on day and night. This was the case on Humbug Hill in the winter of 1859, where a sluicing party worked shifts (6 hours on, 12 hours off) washing 1,500 cubic yards of soil before the water run out. For their efforts they obtained 245 ounces of gold. The Humbug Hill operation, which involved cutting faces, turning the water along the base of the face and collapsing blocks of ground from 20 to 50 tons, appears to be the principal sluicing technique used at Creswick. The main work on the Tertiary gravels at Creswick had ended by the mid-1860s. By the end of the 1865/66 drought only the Chinese were still preserving with shallow alluvial mining at Creswick, particularly sluicing.” (Bannear, 1996).

The workings are described as follows:

- Modern quarry - Large stone quarry, Selkirk’s extraction lease, crown of Humbug Hill.
- Sluice hole - Immediately north of the entrance to the extraction lease is a massive sluice hole which is approximately 200 metres wide and 50 metres deep. The sluice hole is partly filled with wash which has now turned the sluice hole into a dam. There is a smaller sluice hole further down the track to the south.
- Cement workings - The workings are located 500 metres south of the entrance road to extraction lease, near summit of Humbug Hill. Workings consist of extensive open cutting (5 metre high faces), dumps of pebbles, drainage channels and traces of a water race. Several tail races run from the open cutting, some appear to feed into slum ponds.
- Hillslope sluicing - The slopes below the cement workings have been stripped to bedrock: now a bare landscape containing dumps of quartz, water races and dam embankments.
- Mine workings - On the hill, to the east of the cement workings, are a partly quarried mullock heap, several small heaps with short dumping lines and a collapsed adit.
- Sand dumps - Below the cement/hillslope workings (east of track) is a large full sand pond.

Other mining areas identified by Bannear include:

- Alluvial workings at Lincoln Gully, which Bannear claims are associated with the mining of Humbug Hill, with the main mining period spanning the mid-1850s to 1870s.
- Mills Reef workings of the mid 1880s, which included the Surprise Company who erected a 10-head battery.
- Mopoke Gully workings, for which no specific history had been found.
- Russel’s Reservoir, which was constructed by the Humbug Sluicing Company although the race running from the reservoir would have been used by other miners, including Chinese, to work the various gullies draining from the hill.

- Tavistock Hill where working high level Tertiary gravels that topped a number of low hills, commenced in 1854. By 1860 many of the hills were being extensively sluiced.
- Creswick State Battery, installed in 1902 to provide assistance to quartz gold prospectors

Historic assessments have also been undertaken documenting the history of the gold fields. Among these was a study of the State Gold Battery in Creswick, which was installed in 1902 (Barnham, 2001).

2.3.2 Cultural heritage registers and inventories

A number of heritage places have been previously recorded within the study area and have been listed on either the Victorian Heritage Register (VHR), the Victorian Heritage Inventory (VHI) which covers historical archaeological places, and the Shire of Hepburn Planning Scheme Heritage Overlay (HO).

The principal sites within the study area include mining landscapes of Lincoln Gully, Humbug Hill, Tavistock Hill and Mopoke Gully, numerous water races and reservoirs that were mapped as part of the La Trobe University research project (Davis, Lawrence, & Turnbull, 2015).

Sites in the vicinity of the study area listed on the various cultural heritage registers are shown on Map 2, and listed in Table 3, Table 4 and Table 5. (Note that places within the Stage 1 project area are highlighted in green)

Table 3 Victorian Heritage Register sites in the vicinity of the study area

VHR No.	Name	Location	Land Manager
H1228	Humbug Hill Hydraulic Gold Sluicing Site	Lincoln Gully Road, Creswick and Cabbage Tree	Parks Victoria, DELWP, Central Highlands Water
H1951	Sawpit Gully Plantation	Sawpit Gully Road, Creswick	Parks Victoria
H1192	Old State Nursery Office	Sawpit Road, Creswick	Parks Victoria
H1511	School Of Forestry	4 Water Street, Creswick	Parks Victoria
H1669	Creswick Railway Station Complex	Reed Street, Creswick	VicTrack
H398	Calembeen Park	12-18 Cushing Avenue, Creswick	Hepburn Shire

Table 4 Victorian Heritage Inventory sites in the vicinity of the study area (Places in the Stage 1 project area highlighted in green)

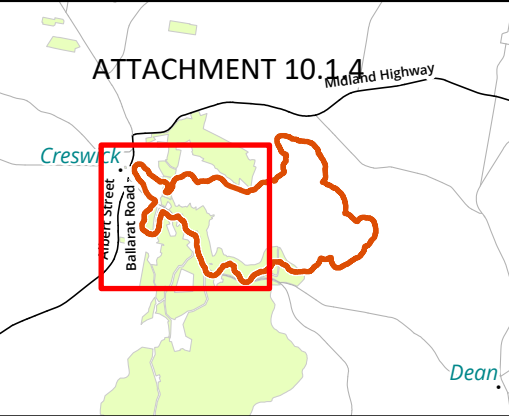
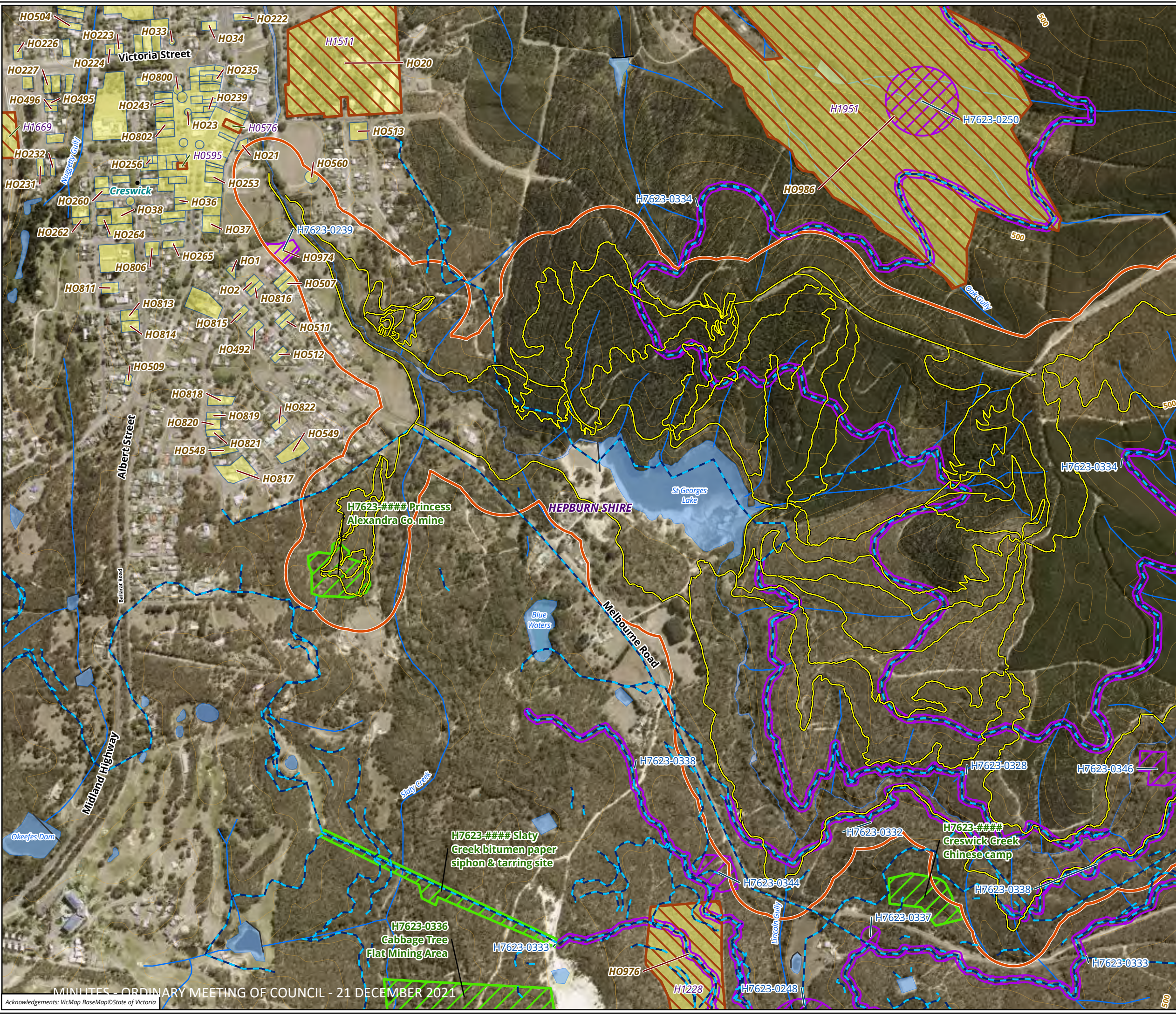
VHI No.	Name	Location	Land Manager
H7623-0239	Creswick State Battery	Battery Crescent On Edge Of Creswick Township	DELWP
H7623-0244	Tavistock Hill	Petticoat Road Chapel Flat	Parks Victoria
H7623-0245	Mopoke Gully Sluicing	Government Road Cabbage Tree	Parks Victoria
H7623-0246	Russel's Reservoir	Off Creswick-Bungaree Road Wattle Flat	Central Highlands Water
H7623-0247	Mills Reef Workings	Off Lincoln Gully Road Creswick,	Parks Victoria, Central Highlands Water
H7623-0248	Lincoln Gully	Lincoln Gully Road, Creswick and Cabbage Tree	Parks Victoria

VHI No.	Name	Location	Land Manager
H7623-0249	Humbug Hill Workings	Creswick Regional Park and Slaty Creek Road Creswick	Parks Victoria
H7623-0327	Russell's' Water Race	Lincoln Gully Road and Bush Inn Road Cabbage Tree	Parks Victoria and DELWP
H7623-0328	Roycraft's Water Race	Georges Lake Road Creswick, Hepburn Shire	Hancock Victorian Plantations, Parks Victoria
H7623-0329	Han Kee's Water Race	Petticoat Road And Standard Road Creswick	Parks Victoria
H7623-0331	St George's Water Race	Creswick-Dean Road Wattle Flat and Lincoln Gully Road And Bush Inn Road Cabbage Tree	Parks Victoria, DELWP, Central Highlands Water
H7623-0332	Davis' Water Race	Creswick Regional Park, Hepburn, Hepburn Shire. Municipality. Hepburn Shire	Parks Victoria, DELWP
H7623-0333	Bragg's Water Race And Dam	Creswick-Bungaree Road And Melbourne Road Creswick And Slaty Creek Road Cabbage Tree	Hancock Victorian Plantations, Parks Victoria
H7623-0334	Smokeytown Water Race	Midland Highway Springmount and Castlemaine Road Creswick and Sawmill Road Newlyn	Hancock Victorian Plantations, DELWP, Parks Victoria
H7623-0335	Slaty Creek Hydraulic Sluicing Company Water Race	White Swan Road and Clarks Road Glen Park and Standard Road Cabbage Tree	Parks Victoria
H7623-0336	Ah Young's Gardens	Slaty Creek Road Cabbage Tree	Parks Victoria
H7623-0337	Former Lincoln Gully Service Reservoir	Creswick-Bungaree Road Creswick	Parks Victoria
H7623-0338	Eaton's Water Race And Dam Wall	Creswick-Bungaree Road and Jackass Road Creswick and Slaty Creek Road Cabbage	Parks Victoria, DELWP
H7623-0346	Back Creek Chinese Garden and Orchard	Back Creek Creswick	Parks Victoria, DELWP

Table 5 Heritage Overlay sites in the vicinity of the study area (Places in the Stage 1 area highlighted in green)

HO No.	Name	Location	
HO20	School of Forestry	4 Water Street, Creswick	Parks Victoria
HO560	Pinus jeffreyii (Jeffrey Pine),	Moore Street, east of Creswick Football Ground, Creswick	Hepburn Shire
HO561	Creswick Railway Station Complex	Reed Street, Creswick	VicTrack

HO No.	Name	Location	
HO562	Old State Nursery Office	Sawpit Road, Creswick	Parks Victoria
HO846	Creswick Public Gardens including Timber Summer House (Rotunda) and Former Gold Commissioner's House	Bridge Street, Creswick	Hepburn Shire
HO974	Ore Crushing Battery	Battery Crescent Creswick	DELWP
HO976	Humbug Hill Hydraulic Gold Sluicing Site	Lincoln Gully Road, Creswick and Cabbage Tree	Parks Victoria
HO 983	Calembeen Park	12-18 Cushing Avenue, Creswick	Hepburn Shire
HO986	Sawpit Gully Nursery and Plantation	Sawpit Gully Road, Creswick	Parks Victoria



Legend

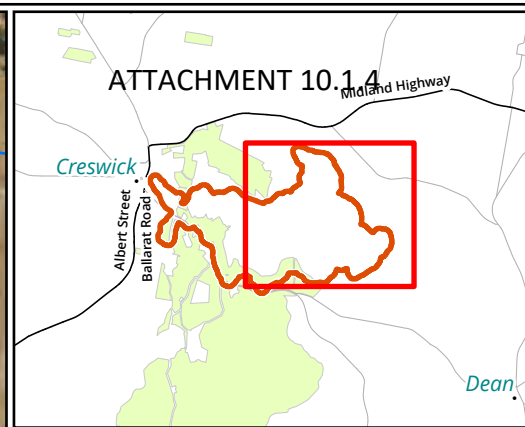
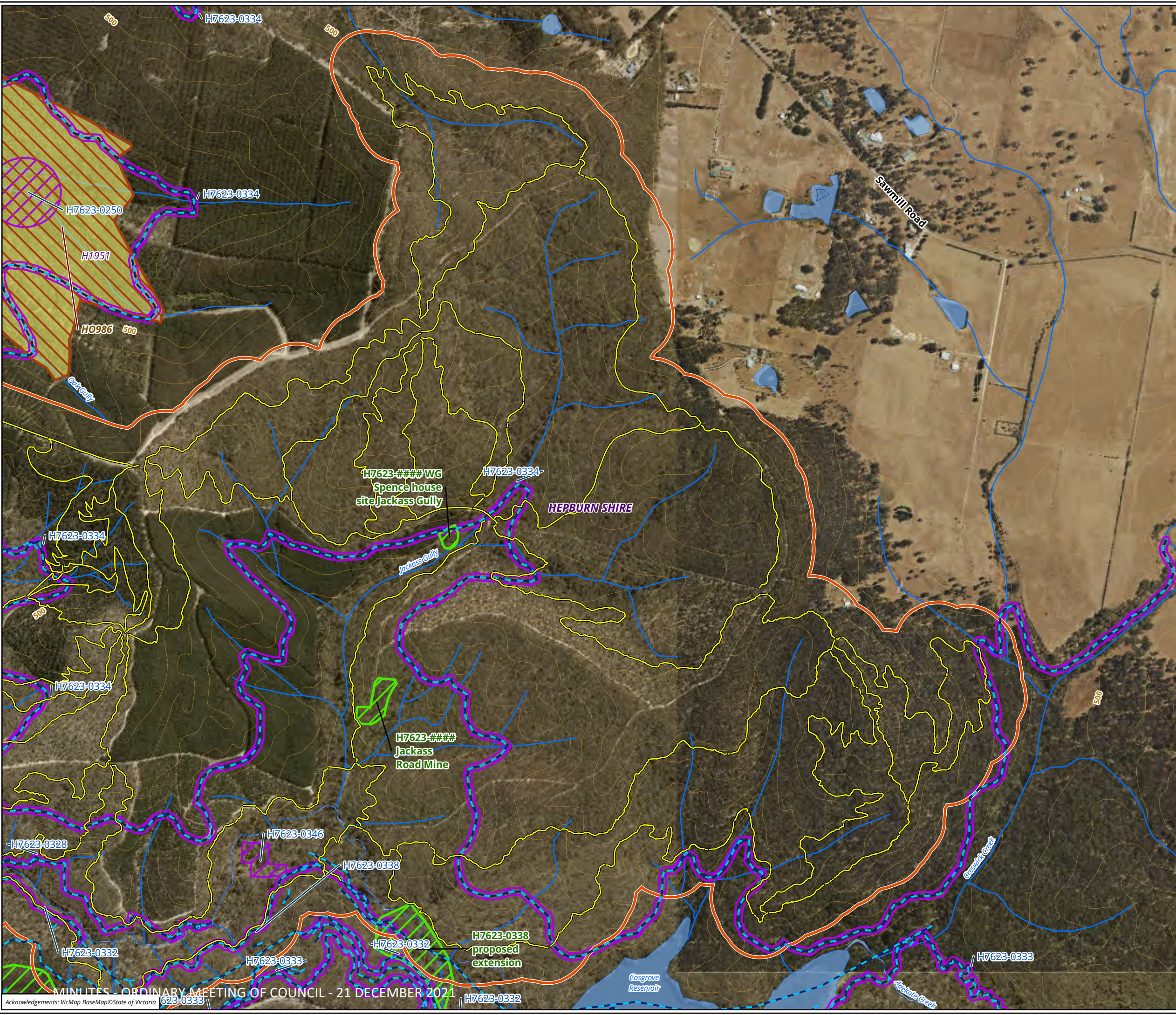
- Study area
- Water race
- Proposed Mountain Bike trails
- Victorian Heritage Register
- Victorian Heritage Inventory
- Proposed VHI
- Heritage Overlay

Map 2.1 Existing heritage listed places

0 100 200 300 400 500
 Metres
 Scale: 1:10,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 54

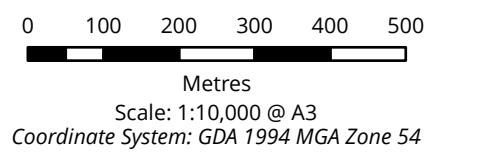


Matter: 35554,
 Date: 30 September 2021,
 Prepared for: GV, Prepared by: DK, Last edited by: dkang
 Layout: 35554_F2_ExistingHeritage
 Project: P:\35500s\35554\Mapping\35554_CreswickMTB.aprx



- Legend**
- Study area
 - Water race
 - Proposed Mountain Bike trails
 - Victorian Heritage Register
 - Victorian Heritage Inventory
 - Proposed VHI
 - Heritage Overlay

Map 2.2 Existing heritage listed places



Matter: 35554,
 Date: 30 September 2021,
 Prepared for: GV, Prepared by: DK, Last edited by: dkang
 Layout: 35554_F2_ExistingHeritage
 Project: P:\35500s\35554\Mapping\35554_CreswickMTB.aprx

3 Fieldwork

3.1 Survey Strategy

The aim of the survey was to assess the study area to determine if and to what level, the proposed Mountain Bike Trails might impact heritage values, and where it would be possible to avoid these impacts.

The survey strategy entailed drawing data from a variety of existing sources and databases in order to both characterise the historic landscapes of the study area and develop a predictive model for identifying areas where further heritage places may be found, or where subsequent land uses may have impacted historic landscapes and features. The survey strategy therefore incorporated the following stages

1. Background historical research to identify historical land uses and potential historic places
2. Compilation of historical and contemporary maps including the La Trobe University Turnbull map (Figure 1)
3. Digitising features from 1 and 2 onto a base plan
4. Develop a predictive model based on 1, 2 & 3 (see section 2.3 below)
5. Reconnaissance vehicle and foot survey along all roads and 4x4 tracks to ground truth model
6. Refine predictive model based on 5
7. Consult with Hepburn's shire trail designers on the trail survey,
8. Input from CHMP, ecological, and trail survey teams to identify any potential features
9. Undertake field survey of sample areas based on predictive model and specific potential historic site locations
10. Liaison with Heritage Victoria
11. Additional field survey to address gaps and amended trail alignments

Field survey was designed to assess locations where known and predicted historical features and sites might be impacted by the proposed route alignment for the mountain bike trails. As there has been considerable previous survey in the area (see section 2.3.1), which could inform the predictive model and survey strategy, this was seen as an effective survey strategy, which would ensure that all potential impacts to historical values could be readily assessed.

3.2 Predictive model

Locations of potential historical places were determined from historic mapping, documentary research, local informants and analysis of aerial photography. This includes data from previous assessments by Peter Davies and Susan Lawrence in the Archaeology Department at La Trobe University and Luke Gunton (who is undertaking honours research in the Archaeology Department at La Trobe) and data provided by local informants including local resident David Henderson (Davis, Lawrence, & Turnbull, 2015). In particular, mapping of historical source material and survey results was provided in digital form by Jodi Turnbull of La Trobe University Archaeology (see Figure 1).

The mapping data prepared by Jodi Turnbull, was itself compiled from local informants and historical sources, and unpublished orienteering maps, which included extensive ground feature data for much of the study

area. Turnbull's data also included geospatial data for many water races and other features provided by Dr Kevin Tolhurst, who, using a non-differential GPS unit had mapped a large number of features. Turnbull also digitised numerous historical plans (including from archive files specifically related to water leases and race alignments), sourced from the State Library and Public Records Office Victoria. Combined, these datasets covered a large proportion of the extant and non-extant races in the Creswick Regional Park (Turnbull, 2019).



Figure 1 Historic features in the Creswick area (Turnbull, 2019)

The recorded historic and archaeological sites in the study area represent a sample of the remaining physical evidence of historic land use. Water races, historic settlements, mining areas and other features have been plotted from various historical maps and documentary sources, and the results of the field investigations by La Trobe University which has involved survey and mapping of water races.

Concentrations of sites and features can be distinguished from these compilation plans resulting in areas of greater potential for further historical archaeological places. These areas have been used to inform the development of a predictive model and ultimately the survey strategy...

The predictive model has been developed from historical and field sources as described in Section 3.1 above, and is set out in Table 6.

Table 6 Predictive model

Land form	Potential site types	Likelihood	Sites identified
Creek flats and gentler sloping gullies	alluvial workings, sluicing, occupation sites	high	Spence House, Eaton's Dam, Chinese garden,
Slopes >15° close to creeks	alluvial workings, exploration shafts, water races, paddocking, occupation sites	high	Chinese camp, Braggs, Davis, Roycrafts races
Slopes <15° and more than 100m from creeks	water races, shafts, adits, costeans	moderate	Smokeytown race
Slopes <30°	water races, adits	low	Princess Alexandra mine
Ridges and spurs >15°	shafts, mullock, costeans, occasional occupation sites	Moderate	Jackass Rd mine, Princess Alexandra mine
Pine plantations - all slopes	Water races alluvial workings, sluicing	low	Smokeytown race, George diggings, Watkins mine,

The predictive model has been employed in determining the survey strategy, so that a representative sample of each land form was surveyed, and all areas of the highest potential were comprehensively surveyed. Map 3 shows the survey areas.

3.3 Survey method and coverage

Biosis staff and trail marking staff were inducted on the types of heritage sites to report if encountered along the proposed trails. In addition, data from local informants historical references and the survey data from La Trobe University was compiled to assist in the identification of potential historic sites.

A vehicle reconnaissance survey was initially conducted on 18 June 2018 by Biosis Archaeologists Gary Vines and Amy Wood, covering all roads and four wheel drive tracks in the larger study area. A follow up inspection of specific locations was undertaken on 11 January 2019 by Gary Vines. This identified the range of landforms, and inspected all previously recorded heritage places.

Additional survey input was provided by the trail designers, and as part of the concurrent CHMP and ecological assessments, which assisted in identifying areas of historical archaeological features. These separate survey teams submitted georeferenced photographs and location data for surface features that warranted further investigation, such as mine shafts, mullock heaps, water races, terraces, structural remains and surface artefacts. Data obtained through this process was used in conjunction with the La Trobe survey data (Turnbull, 2019) for compiling base data, which then informed the detailed historical survey.

In this way the entire length of the proposed mountain bike trails were inspected by members of the larger assessment team. All of the areas of proposed trails on ridges, gullies, creek flats and in valleys were physically inspected by the historical archaeologists, but areas on steep slopes relied on input from the parties listed above.

Detailed historical archaeological survey was undertaken by Gary Vines, Luke Gunton and Alexandra Squires on 21 August 2019, 12 July 2021, and 30 July 2021, with additional survey input provided by Kym Oataway, Leah Tepper and Charlotte Allen as part of the CHMP Standard Assessment.

All sections of the proposed trails alignments were marked out with flagging tape by the trail designers and a 10 metre buffer was inspected. Survey was undertaken on foot, using a Trimble R1 GNSS receiver DGPS to record archaeological and historic features. All Identified sites of potential were inspected by the historical archaeologists.

The locations of survey units are shown in Map 3.

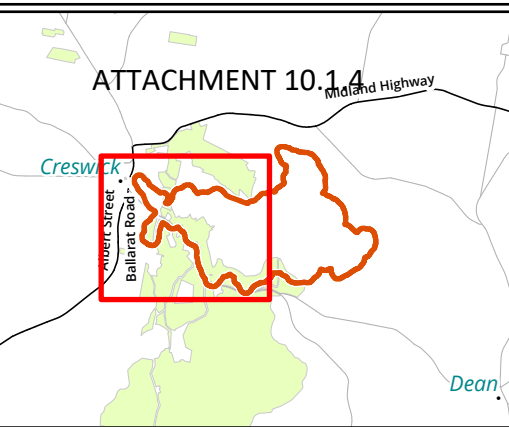
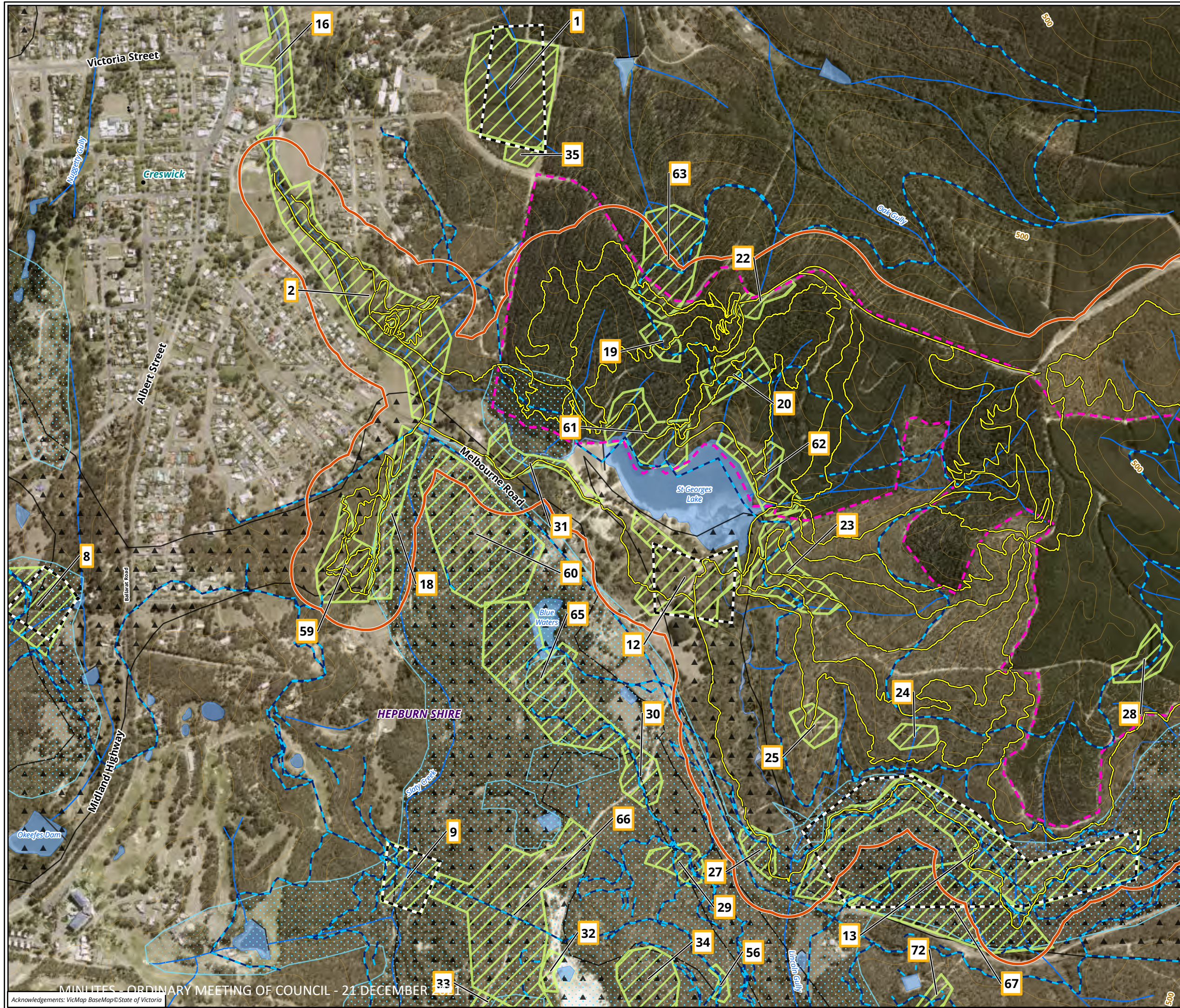
A number of factors hinder the identification of cultural heritage material. Ground surface visibility can be defined as how much of the ground surface is visible and what other factors (such as vegetation, gravels or leaf litter) may limit the detection of cultural heritage material (Burke & Smith, 2004). The higher the level of ground surface visibility, the more easily cultural heritage material can be identified (Ellender & Weaver, 1994).

The majority of the survey was completed in optimal weather conditions with no rain and clear skies, while one day of survey was completed in misty and overcast conditions. There were no impediments to carrying out the survey. Overall ground visibility was moderate with between 10% and 30% commonly identified in forested areas, except for along tracks and trails where close to 100% ground visibility was present. However, these areas were either narrow – such as along existing mountain bike trails where the clear track is less than 1 metre wide, or partly disturbed such as four wheel drive tracks where either separate wheel tracks between 0.5 and 1 metre wide were rutted, or there was a more extensive eroded surface up to 3 metres wide. Formed and graded tracks were not considered as part of the survey area, as the natural ground surface or topsoil has been completely removed.

Survey coverage comprised selected sample areas, and locations where historic features were anticipated based on background research and local informants. About 10% of the overall study area was surveyed specifically for historical archaeology. All of the areas considered likely to contain historical sites on the ridges, spurs, alluvial flats, valley bottoms and gully sides were inspected by the historical archaeologist. The entire extent of the proposed trails was inspected by either the historical archaeologist, or by other Biosis staff undertaking Aboriginal archaeological survey and flora and fauna surveys and trail marking staff. Any potential details of historical features identified by other field staff were provided to the historical archaeologist who then inspected them.

Survey units are described in Table 7 and the areas surveyed are shown in Map 3. Ultimately, only areas comprising forested slopes of 30 degrees or more were not inspected in full. The survey sample included examples of steep slopes, as well as the coverage provided by the trail marking and ecological teams of all trails within steep slopes. The predictive model above indicate it was highly unlikely that historic sites would be found on slopes greater than 30 degrees. This was born out in the results of the survey, with only the possible mid-twentieth century log landing/spot mill site and the fire tower complex recorded outside of the valley and alluvial flats survey areas.

Several types of historical archaeological feature were identified during the survey. These ranged from the very obvious and well defined major water races, which have previously been recorded by La Trobe University and are included on the VHI, to ephemeral mining features such as tailings, spoil heaps, sludge deposits, costeans, minor water races and check border banks, and possible tracks and paths. The areas examined during the survey are described and discussed in Table 7. Sample photographs of the landscape types, survey areas and archaeological features are shown below.



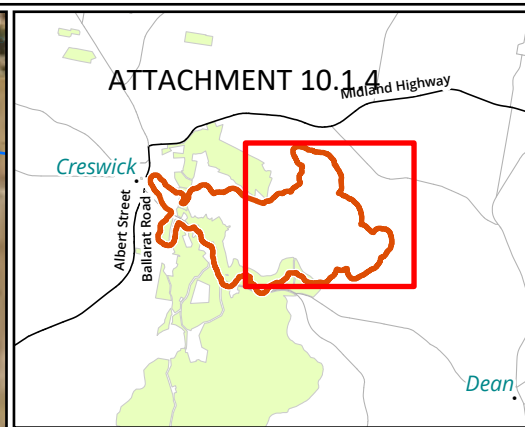
- Legend**
- Study area
 - Proposed Mountain Bike trails
 - Water race
 - Area of ground survey
- Disturbance**
- Area of disturbance
 - Pine plantation
 - ▲
 Shallow workings (Source DPI)
 - Sluiced Areas

Map 3.1 Survey areas

0 100 200 300 400 500
 Metres
 Scale: 1:10,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 54



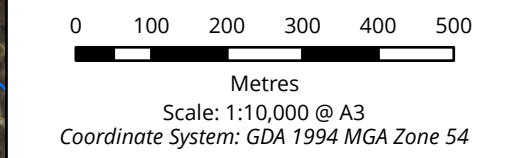
Matter: 35554,
 Date: 30 September 2021,
 Prepared for: GV, Prepared by: DK, Last edited by: dkang
 Layout: 35554_F4_SurveyAreas
 Project: P:\35500s\35554\Mapping\35554_CreswickMTB.aprx



- Legend**
- Study area
 - Proposed Mountain Bike trails
 - Water race
 - Area of ground survey
- Disturbance**
- Area of disturbance
 - Pine plantation
 - ▲

 Shallow workings (Source DPI)
 - Sluiced Areas

Map 3.2 Survey areas



Matter: 35554,
 Date: 30 September 2021,
 Prepared for: GV, Prepared by: DK, Last edited by: dkang
 Layout: 35554_F4_SurveyAreas
 Project: P:\35500s\35554\Mapping\35554_CreswickMTB.aprx



Photograph 3 Four wheel drive impacts in the northern part of the study area (Survey Unit 65)



Photograph 4 Complex race cut through rocky slope (Survey Unit 23)



Photograph 5 Existing unofficial trail running along edge of water race (Survey Unit 14)



Photograph 6 Sluced and regenerated area, goldfields track, car in distance is on top of bank, sluice face immediately in front, quartz gravel dump left of centre (Survey Unit 31)



Photograph 7 Regenerated forest on ridges and upper slopes with informal mountain bike track showing ground visibility and exposure (Survey Unit 38)



Photograph 8 Mountain bike track crossing major water race (H7623 -0338) in regrowth native and pine forest (Survey Unit 13)



Photograph 9 Existing mountain bike track following water race (H7623-0332) Survey Unit 68)

Table 7 Summary of survey units and results

Survey Unit	Staff	Survey Area (sq. m)	Ground visibility (%)	Landform	Discussion (shallow workings, dredged and sluiced areas source DPI, water races source La Trobe University)
Note: Archaeologists are: GV-Gary Vines, LG-Luke Gunton, KO-Kym Oatway LT-Leah Tepper, AS-Alexandra Squires, CA-Charlotte Allen ,					
2	GV, KO AS CA LT	102000	0-20%	Creek flats	Former sluiced and dredged areas, reclamation and sludge channel works, new gravel paths constructed former shallow workings (note wrongly identified in VHI as State Battery site)
8	GV, AS LT	36800	10-30%	Hill slope and creek flats	Heavily disturbed lower slopes and creek flats, shallow workings, sluiced, water races, lower areas reclaimed
12	GV, AS	48500	10-20%	Creek flats, gullies and slopes	Heavily disturbed from hydraulic sluicing with 5 metre high bank near road, shallow workings, sluiced at creek with reclaimed sludge
13	AS LT	117500	20-30%	Creek flats, gullies and slopes	Extensively disturbed from shallow workings, sluiced areas, water races and forestry
14	AS	48500	10-20%	Creek flats and banks	Heavily disturbed by shallow workings and sluicing, quartz dumps, spoil hummocks, water races
15	AS	59700	10-20%	Creek flats	Swampy flats adjacent to artificial lake, graded and terraced, water races destroyed by grading
18	KO AS CA	27467	10-20%	Hill slope and creek flats	Graded track at base of steep hill, creek flats have shallow workings, sluiced and reclaimed, probably from sludge deposits.
19	GV	8475	10-20%	Ridge and side gullies	Recently harvested pine plantation, heavily disturbed, water race remnant
20	GV	15662	10-20%	Ridge and side gullies	Recently harvested pine plantation, heavily disturbed, water race remnant
21	GV	17084	10-20%	Hill slope and gully	Forested areas with logging track, heavily disturbed
22	GV	7004	10-20%	Ridge and side gullies	Recently harvested pine plantation, heavily disturbed

Survey Unit	Staff	Survey Area (sq. m)	Ground visibility (%)	Landform	Discussion (shallow workings, dredged and sluiced areas source DPI, water races source La Trobe University)
23	GV LT AS	34748	10-20%	Creek flats, gullies and slopes	Heavily disturbed from hydraulic sluicing with 5 metre high bank near road, shallow workings, sluiced at creek with reclaimed sludge, water races
24	GV	7555	10-20%	Ridge and side gullies	Recently harvested pine plantation, heavily disturbed
25	GV	10681	10-20%	Ridge and side gullies	Recently harvested pine plantation, heavily disturbed
26	GV LT AS	6339	10-20%	Creek flats, gullies and slopes	Downstream of Cosgrove Reservoir, heavily disturbed by earthworks for dam, pipelines, tracks, formerly shallow workings, water races
27	GV LT AS	9932	20-30%	Creek flats, gullies and slopes	Extensively disturbed from shallow workings, sluiced areas, water races and forestry
28	GV	13857	0-10%	Hill slope	Heavily ripped for pine plantation although line of water race visible in parts
31	GV LT	16673	10-20%	Creek flats, gullies and slopes	Heavily disturbed from hydraulic sluicing with 5 metre high bank near road, shallow workings, sluiced at creek with reclaimed sludge
57	GV	25000	0-15%	Gully	Deep creek channel with heavy erosion and sluicing, recent pine plantation
58	GV	21500	20-30%	Ridge and slope	Small forested ridge line leading down to upper gully, scattered gold mining shafts and small mullock heaps, recent reworking.
59	GV	22000	10-20%	Creek flats	Heavily disturbed mining areas, recently cleared of gorse and other scrub, some mullock heaps remain, location of Princess Alexandra Mine identified in historic maps.
61	GV	45000	10-20%	Hill slope	Steep slopes on north side of St Georges Lake, heavily forested with eroded gullies, water races along contour lines Location of St George Mine indicated in historical plans.
62	GV	19800	10-20%	Creek flats,	Heavily disturbed from hydraulic sluicing with 5 metre high bank near road, shallow workings, sluiced at creek

Survey Unit	Staff	Survey Area (sq. m)	Ground visibility (%)	Landform	Discussion (shallow workings, dredged and sluiced areas source DPI, water races source La Trobe University)
				gullies and slopes	with reclaimed sludge, water races. Location of mine identified in historic plans.
63	GV	79700	10-20%	Ridge and gully	Pine plantation along Jackass Creek with remnant native trees along deep sluiced gully, Location of Spence Ruin and puddler sites identified by Turnbull, although not in the position she indicates.
64	GV	2800	10-20%	Gully and slope	Dense native vegetation on sluiced gully and slopes, scattered shafts and small mullock up slope
67	GV & LG	83900	10-20%	Creek banks and flats	Pine plantation, scattered shafts, some mullock, deep sluiced area and native trees to north Location of Chinese mining camp area, identified on historic plans.
68	GV	60000	20-30%	Creek flats	Deeply sluiced gully flanked by native forest with mine shafts and small mullock, numerous water races, breached Eaton's Dam wall, puddlers
69	GV	31800	10-20%	Ridge and gully	Forested ridge with extensive mullock heaps and shafts, possible building sites and tracks – compact mining area
70	GV	57900	10-20%	Ridge and slopes	Forested area above reservoir, water race but no other historic features
71	GV	13200	10-20%	Creek	Dense forest around Bragg's Dam.

3.4 Survey results - Previously recorded places in the study area

There are two main types of heritage places previously recorded in the study area. These have all been identified in Section 2.3.2 above and do not need to be discussed in further detail here, apart from in relation to their locations and extents.

The main group relate to water races, dams and associated features identified in work by La Trobe University (Davis, Lawrence, & Turnbull, 2015). The accuracy of the identified locations and mapping of these places is of variable quality. In most cases the positions and alignments on maps are within 5-10 metres of the actual location, but in some instances, the VHI areas have been based on georeferenced historic maps and cadastral boundaries in the current Victorian property mapping system, which do not always represent the position on the ground. Therefore, the field survey has considered both the mapped and actual position of these historic places and any discrepancy has been taken into account in forming management recommendations.

The second group, which were generally recorded earlier, are mining sites which have a fairly general location provided and a nominal extent based on a buffer to the primary grid reference. Field survey in the present study has been undertaken to determine if any archaeological remains or other features are in the vicinity of the proposed mountain bike trails. The Survey has not assessed the entirety of the recorded site, but only those parts near the proposed mountain bike trails.

Another group of sites are those identified from historical sources. These have been included in the mapping, but again, rather than survey the entire vicinity of the likely locations of these sites, the survey has been confined to areas near the proposed mountain bike trails.

Recent site recording by local people has resulted in four additional sites being added to the Victorian Heritage Register in June 2021.

The following places are within the wider study area, and in some cases will be impacted by the proposed mountain bike trails. An assessment of the impacts is provided in the following Section 6. A brief discussion of these places is given here, but the full Heritage Inventory citation for each place is provided in Appendix 2.

3.4.1 *Pinus jeffreyii* (Jeffrey Pine) (HO560)

Grid Ref: Lat: 37.42532° S Lon: 143.89763° E

Survey Unit 2

Located east of Creswick Football Ground, in Moore Street Creswick this tree is around 140 years old having been planted as part of landscaping around Creswick, possibly associated with the School of Forestry. The tree is about 1 metre in diameter and 28 metres tall. The National Trust has identified it as the largest example of a species in Victoria, and particularly large with the only other known examples at the Creswick Forestry School and the Royal Botanic Gardens.

Mountain bike trails are proposed along the flats beside Creswick Creek about 70 metres to the south west, and will not impact the tree.



Photograph 10 Jeffrey Pine at Creswick Football Ground (HO560)

3.4.2 Creswick State Battery (VHI H7623-0239, HO974) and surrounds

Grid Ref: Lat: 37.42732° S Lon: 143.89692° E

Survey Unit 2

The extent of the Creswick State Battery on the VHI has recently been changed so that it only encompasses the allotment at 2 South Street. Previously it had included an extensive area along the Creswick creek flats to the south east. This area, however, does not have any substantial heritage features, having been rehabilitated former sluiced ground.

The Creswick Battery was established in 1902 as one of a number of Victorian government crushing batteries intended to facilitate small quartz mining. The building comprises a timber framed corrugated iron clad pitched roof structure, with an associated cyaniding tank nearby. (Barnham, 2001).

The land along Creswick Creek has been subject to rehabilitation following alluvial mining, sluicing and sludge build up. It is likely that the tailings and stamper sand from operation of the battery were used to partially reclaim the creek flats to the east. On the north east side of the creek the flat ground has evidence of more recent bulldozing, while some intact natural surface with occasional exploration shafts and costeans are evident on the slopes to the north (Photograph 11). On the west side of the creek has been graded and formed and a recent shared use trail constructed (Photograph 12).

Mountain bike trails are proposed along the flats either side of Creswick Creek, but not within the VHI/HO extent of the battery.



Photograph 11 Creek flats after dredging, sluicing and reclamation of sludge affected ground (Survey Unit 2)



Photograph 12 Existing trail on west side of Creswick Creek (Survey Unit 2)



Photograph 13 Creswick gold stamping battery (Survey Unit 2)

3.4.3 Eaton's Water Race and Dam wall (VHI H7623-0338)

Grid Ref: Lat: 37.44171° S Lon: 143.93042° E

Survey Unit 13, 67, 68

James Robertson constructed a water race along Back Creek in 1857 to bring water from Bullarook Forest to his sluicing claim at Humbug Hill. He sold his shares in the race in the 1860s and it became known as the St Georges race, supplying the St Georges Sluicing Company claims at Humbug Hill. In 1862 the Eaton Brothers built a dam which was leased by John Roycraft from the 1860's to 1930s. The Council acquired part for the town water supply in 1864 with the remainder was utilized by Chinese miners. By 1880 the Council had leased the whole race, presumably to supplement the town water supply.

The stone faced, earth fill dam crosses Creswick/Back Creek aligned north-south. It is buttressed towards the middle (Photograph 16). A breach near the north end has formed a deep channel and so the dam holds no water. At the south end, remnants of a sluice feeding into a race can be discerned. This is not Eaton's race, or one of the other races (Davies, Braggs) to the south but a short race leading to a sluiced area just 50 metres downstream. It is possibly a later feature.

To the south east of the dam wall, immediately adjacent to the Davis water race, are two well preserved Puddlers (Photograph 17), possibly built here to obtain water from the race, although no inlet channel was evident. There are also several other minor water channels, both running parallel to the major races and contours, and some leading down slope. The latter, and possibly the other minor races, are clearly later than the dam's construction as they cut through borrow pit areas where earth for constructing the dam wall may have been obtained (Figure 2).

A mountain bike trail is proposed to the north of the dam but does not impinge on any historic features. The existing Wallaby Track follows part of the water race at the western half, and is proposed to be utilised as part of the mountain bike trail network.



Photograph 14 Eatons race, Breached embankment at small dam



Photograph 15 Eatons Race Existing trail following water race



Photograph 16 Eatons Dam wall, Back Creek (Survey Unit 68)



Photograph 17 Puddling Machine near Eatons Dam (Survey Unit 68)



Figure 2 Features at Eatons Dam with proposed extension to VHI H7623-0338 in green

3.4.4 Smokeytown Water Race (VHI H7623-0334)

Grid Ref: Lat: 37.42759° S Lon: 143.90836° E – west of study area

Lat: 37.43417° S Lon: 143.94834° E – east of study area

Survey Units 19, 20, 57, 63, 64, 70

The Smokeytown Water race has been identified as part of the La Trobe University research and survey and is included on the VHI, based it would appear on historical mapping for the most part. A large part of the race that runs through the study area is within pine plantations that have been recently harvested and replanted. While some section of the race are visible even within the recent plantations, this is probably due to accident as contour ripping tends to follow the line of the race rather than crossing it.

Several mountain bike trails are proposed to cross the Smokeytown race at numerous points and fun beside it or along the embankment in some places.



Photograph 18 Location of Smokeytown race crossed by Loop Road (Survey Unit 20)



Photograph 19 Smokeytown race near Watkins mine (Survey Unit 66)



Photograph 20 Smokeytown race at eastern end of study area (Survey Unit 66)

3.4.5 Roycraft's Water Race (H7623-0328)

Grid Ref: Lat: 37.43488° S Lon: 143.91251° E – western end of VHI recorded race

Lat: 37.44152° S Lon: 143.92325° E - eastern end of VHI recorded race

Survey Units 13, 23, 62

A 2.3 km section of race running on the north side of Creswick (Back Creek) to St Georges Lake., likely operated by John Roycraft during the 1860-1900 to supply miners north of Creswick. Much of the race has been destroyed.

La Trobe University and Heritage Victoria mapping truncates the race east of St Georges Lake. However, additional sections could be followed extending around the north east part of the lake following the 450 metre contour (Figure 3). Further west the race does appear to have been destroyed by a combination of mining, tree plantation work and road construction.

The water race is very faint in some areas, although this is partly due to it being obscured by vegetation.

Mountain bike trails are proposed to cross Roycraft's Water Race at several locations.



Photograph 21 Roycraft's Water Race (H7623-0328)(Survey Unit 62)



Figure 3 Roycraft's Water Race (H7623-0328) showing additional section to the north in green

3.4.6 Braggs Water Race (H7623-0333)

Grid Ref: Lat: 37.44430° S Lon: 143.92298° E – crosses Melbourne Road

Lat: 37.44110° S Lon: 143.94677° E – eastern end of study area

Survey Unit 13, 67, 68

The race was constructed in the early 1850s to service the Humbug Hill Sluicing Companies claims while Bragg's dam was constructed c 1860 to supply additional water. The race is generally about one metre wide and up to 1.2 metres deep and extends into the Slaty Creek area to the south.

At the eastern end, it is one of several races running parallel on either side of Creswick/Back Creek, Near Eaton's Dam at least seven separate races were identified, some as little as three metres apart. The most significant parts of these are proposed to be included in an extension to the Eaton's race and dam VHI place (H7623- 0338)

Bragg's water race is on the south side of Creswick/Back Creek and crosses Melbourne Road near its junction with Jackass Gully road. There are no proposed mountain bike trails impacting Braggs Water Race.

3.4.7 Davis Water Race (H7623-0332)

Grid Ref: Lat: 37.44095° S Lon: 143.91173° E – western end of VHI extent

Lat: 37.44425° S Lon: 143.93261° E – eastern end of VHI extent

Survey Unit 13, 27

The Davis water race comprises a 1.8 km extant section of water race along Back (Creswick) Creek. It was originally constructed by Davis & Mitchell in 1854, G. Russell purchased shares in the race, and by 1857 B. Eaton had taken over Davis & Mitchell's share. The race transported water from dams along Back Creek to ground sluicing and alluvial mines at Georges Diggings, Doctors Lead and Portuguese Flat

The VHI mapping actually has two sections of race separated by about a kilometre. However, these are unlikely to be part of the same water race as the eastern section is above the 470 metre contour while the western section is at about the 450 metre contour. As there are at least seven parallel races near the eastern section close to Eaton's Dam, it is difficult to separate the attribution of the individual sections of races (Photograph 22).

There is no impact from mountain bike trails to the eastern section of Davis race. The existing Wallaby Track runs along part of the western section of Davis race and will be utilised as part of the mountain bike trails.



Photograph 22 Davis and another water race (H7623-0332) near Eaton's Dam (Survey Unit 68)

3.4.8 Back Creek Chinese Garden and Orchard. H7623-0346

Grid Ref: Lat: 37.43961° S Lon: 143.92526° E

Survey Unit 14

An area of deciduous fruit trees and possibly garden beds located on the south side of Creswick Creek and immediately north of Eaton's water race (H7623-0338) has been recorded as possible Chinese market garden and orchard. The area comprises remnant beds, banks, furrows and sumps. And a 2 metre high earth bank possibly part of flood protection. It is believed a house, stable and dam may have been present, although no structural remains or artefacts were identified.

A proposed mountain bike trail will follow the existing Wallaby Track along Eaton's race to the south, but does not impact the Chinese Garden site.

3.5 Survey results - Newly recorded places

Some newly recorded sites have been identified during the survey. Some of these, such as the Spence house site have been previously identified, but not recorded on the VHI. The survey and assessment has considered which if these sites meet the criteria for inclusion on the VHI and site cards will be submitted to Heritage Victoria for the sites. Two mining landscapes were selected as the best representative examples of the main types of mining activity in the study area, comprising the Princess Alexandra Mine which reflects ground sluicing and hydraulic sluicing methods, and the Jackass gully Road mine, which demonstrates shaft mining methods.

There are many other minor surface features relating to mining activity that were evident, during the survey. These comprise mine shafts, mullock heaps, tailings, water storage and tailings dams, sluiced banks and channels and, of course, water races. As these sites did not have an evident archaeological component such as potential buried occupation deposits, surface artefact scatters or other archaeological features, but were confined to surface features and excavations, they were not considered to meet the criteria and thresholds for inclusion on the VHI.

The following are those sites which have been identified as meeting the criteria and thresholds for inclusion on the VHI due to their level of significance and presence of archaeological features or deposits.

3.5.1 W G Spence house (VHI H7623-####)

Grid Ref Lat: 37.43156° S Lon: 143.93082° E

Survey area 63

Description

This site is located between the Wallaby Track and Jackass Gully just south of the East West Road. It sits on a level area at the base of the slope with a steep drop to the east where the ground falls into the deep sluiced gully. It is unclear if the sluicing occurred after or while the building was occupied. A small pile of granite stone is located to the north of the flat, and to the south are a number of remnant fruit trees, with probably self-seeded fruit and other exotic trees in the vicinity. A gully to the north of the stone pile has some glass fragments, possible from a rubbish dump. Otherwise the site is heavily vegetated with little ground visibility. An interpretation plaque mounted on a small stone plinth stands near the Wallaby Track.

History

W. G. Spence (1846-1926) was raised in a cottage on this site in the mid nineteenth century at the time of the Eureka Rebellion. He became a prominent politician and trade unionist, in part due to the impact Eureka had on him as a child. He was a Sunday School superintendent at Creswick and secretary of the Creswick Miners' Union, which he founded in 1874, later becoming the amalgamated Miners' Association. He went on to found the Amalgamated Shearer's Union and member of the first Federal Parliament (Nairn, 2021).

Significance

The site is of local historical for its association with W. G. Spence, and as a rare early goldfields domestic site. It is also of archaeological significance for its potential to reveal evidence of not only a typical gold rush era dwelling in a forest setting, but also for potential archaeological deposits associated with Spence and his family. The site appears relatively intact with a level area and remnant stonework and does not show signs of disturbance. Therefore it has high archaeological potential.

Shire of Creswick Heritage Study statement of significance

The site of the boyhood home of W B Spence shows the isolated valley that became populated during the goldmining days. The site is marked by fruit trees and other exotic planting above the creek. The area also contains remnants of mining activity and water races. John Graham writes about Spence in 'Early Creswick':

"The late Hon. William Guthrie Spence, H.H. R., was born in Scotland in 1846 and arrived in Creswick with his parents in 1853 at the time of the gold rush. When a young man he worked in the deep alluvial gold mines. He was so profoundly impressed with the necessity of improving the conditions under which the miners worked that he organised, for that purpose in 1878, the Creswick Miner' Union, the first President of which was Mr John Sampson, of Creswick, grandfather of the Hon. R. G. Menzies... Under Mr Spence's guidance, this body expanded into the Amalgamated Miners' Association which had branches in all the Australian colonies and New Zealand. Later he founded the Amalgamated Shearers' Union, which evolved into the Australian Workers' Union, the largest and most powerful union in Australia... Mr Spence's association with the Labour party terminated when he and other members left the Party over the Conscription issue during the 1914-19 War."

The site has links to the early years of the important labour figure W. G Spence and shows the isolated areas miners lived in during their Pursuit of gold (Graham, 1986, p. 138). (Lester Tropman & Assoeiate, 1991).

A mountain bike trail is proposed on the opposite side of the creek, but will not impact the Spence house site.



Photograph 23 Spence hut at Jackass Gully James Maxwell Spence (Jr) in doorway

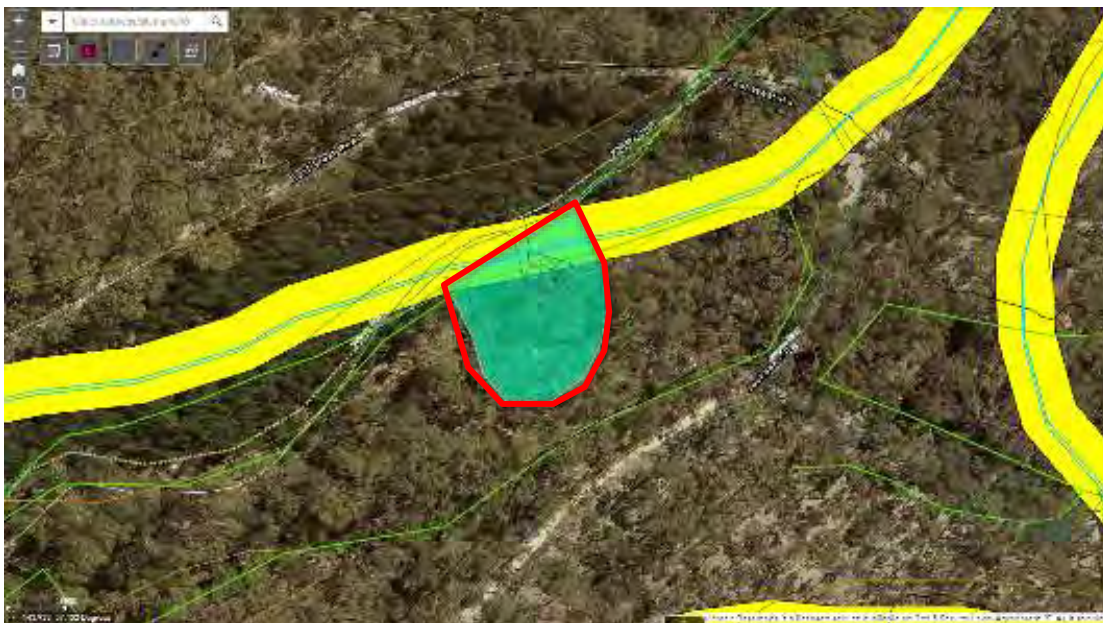


Figure 4 Location of W. G. Spence house site (Red line)



Photograph 24 Location of Spence House from Wallaby Track looking south east. (Survey Unit 63)

3.5.2 Jackass Road mine (VHI H7623-####)

Grid Ref: Lat: 37.43497° S Lon: 143.92915° E

Survey Unit 69

Description

The mining area comprises a number of relatively large mullock heaps and deep shafts – visible to at least 10 metres in one case, as well as a small open cut area and a tunnel or adit leading off into the gully to the north east (Photograph 25). A track is discernible along the gully side to the east, possibly indicating an earlier access route.

Some small areas of levelled ground adjacent to this track indicate possible occupation sites for huts or possibly mine buildings. Apart from the sluicing undertaken along Jackass Gully itself, and some of the side gullies, there is little other mining evidence in the north east of the study area, with the small section at Old School Road (Photograph 35), the exception (see below).

A water race runs along the east side of Jackass Gully west of the road, and turns around the contours at the foot of the mine area, where it peters out at the road crossing. This may have supplied water to the mine (Photograph 26).



Photograph 25 Adit, open cut and mullock heaps, Jackass Road mine (Survey Unit 69)



Photograph 26 Mine shafts and mullock heaps east of Jackass Road (Survey Unit 69)



Photograph 27 Water race near Jackass Gully (Survey Unit 69)

History

In 1872 15 miners were working along Jackass Gully. Records indicate similar numbers in the decade before and after. The area does not seem to have been a particularly rich or long-lived mining area. (Mines Department, 1873) . Mining in the area was still being undertaken in the 1930s, but at a very small scale.

Significance

The Jackass Road mine is of historical and archaeological significance as a good represented example of the smaller reef mining operations that were carried out sporadically throughout the Creswick Forests from the mid nineteenth century to about the 1930s. although found throughout the district, this form of mine involving shaft and occasionally adit sinking, with their associated tailings and mullock dumps, are quite rare in comparison to the more extensive alluvial and sluicing operations along almost all the gullies and creeks. The ridge top location adjacent to a two wheel drive road makes is relatively accessible as well.

A trail runs to the west of the Jackass Road mine and will not impact the site.

3.5.3 Chinese Camp Melbourne Road (VHI H7623-####)

Grid Ref: Lat: 37.44330° S Lon: 143.91840° E

Survey Unit 67

Description

While there were several Chinese camps or townships located around Creswick, this site was proclaimed as a reserve Chinese settlement in the Parish Survey. The area designated, however is only a small part of an extensive area of small oval mine shafts, tracks and possible buildings sites on the north side of the Melbourne Road. The site extends for about 200 metres along the north side of the Melbourne Road extending north to the edge of the sluiced ground along Creswick Creek (Figure 5).

Surface artefacts include handmade bricks, iron stove components, thick dark green bottle fragments and some domestic ceramics (Photograph 29). Some water channels run through the site, but these do not appear to be connected to mining races, and may be related to drainage of the camp site itself.

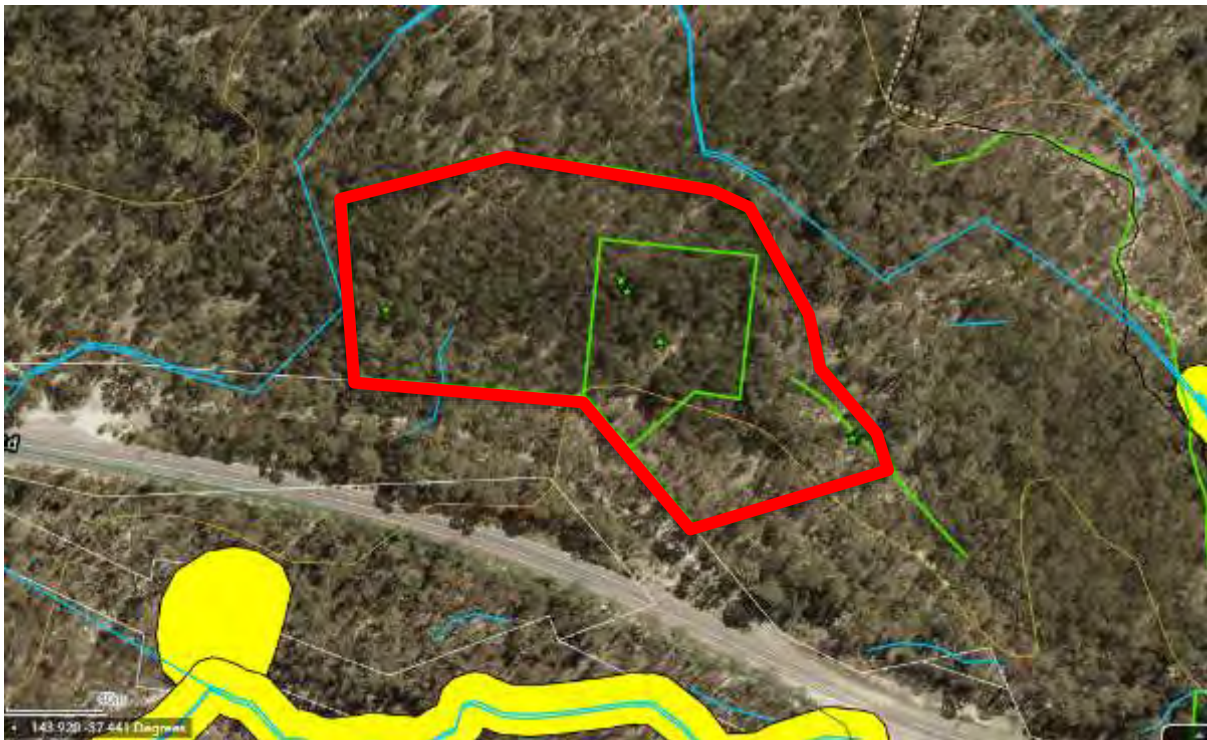


Figure 5 Plan of Chinese miners camp (VHI H7623-####) proposed extent (red line)



Photograph 28 Cart track with building site beyond within Chinese Camp Reserve (Survey Unit 67)



Photograph 29 Gold rush era bottle class in water race bank immediately below Chinese Camp (Survey Unit 67)

History

Ballarat Chinese Protector, W.H. Forster, estimating there were 1100 Chinese in the Creswick area in 1859. The main Chinese community in Creswick was located at Black Lead to the north west of the main settlement. However, other Chinese communities were located at Portuguese Flat, Hard Hills, Clarke's Flat, Bloody Gully, Mopoke and Slaty Creek and in the main street of Creswick. The total Chinese population of the surrounding district fell from a high of nearly 2000 in the early 1860's to less than 1000 in the mid 1870's. All of these Chinese were alluvial miners.

A 1 acre block was set aside for the Chinese camp on Melbourne Road, set back from the road and south of Creswick Creek. The reserve was gazetted in 1857 but later reverted to state forest (Victorian Government Gazette 57.1759). This is likely to have been in response to the introduction of the regulations for the Chinese on the gold fields the previous year, which required all Chinese to erect their tents or huts within areas specifically designated (*Mount Alexander Mail* 28 March 1856:5).

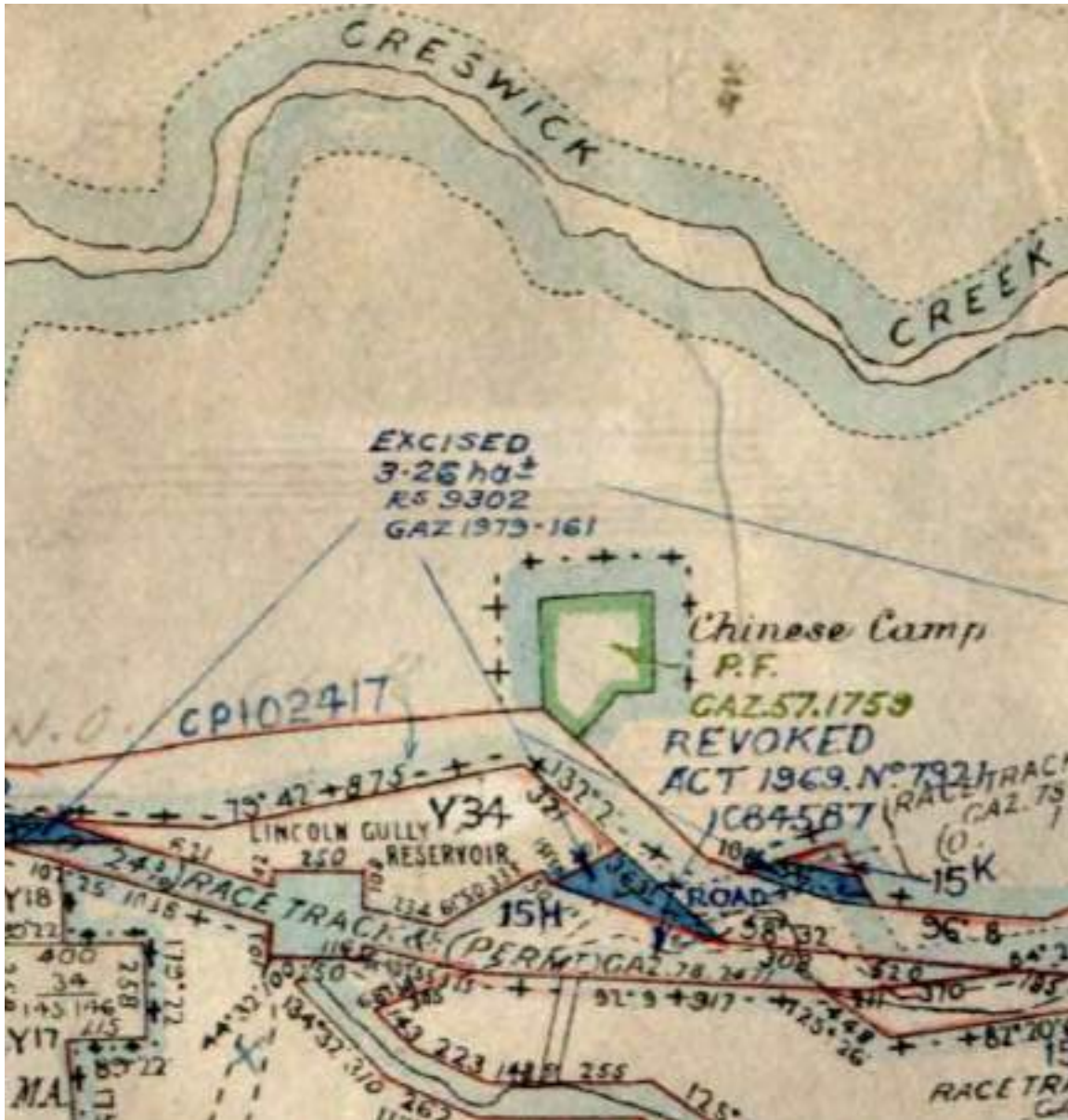


Figure 6 Parish of Creswick, Sheet 2 Crown Allotment Plan, C400A11 Land Victoria

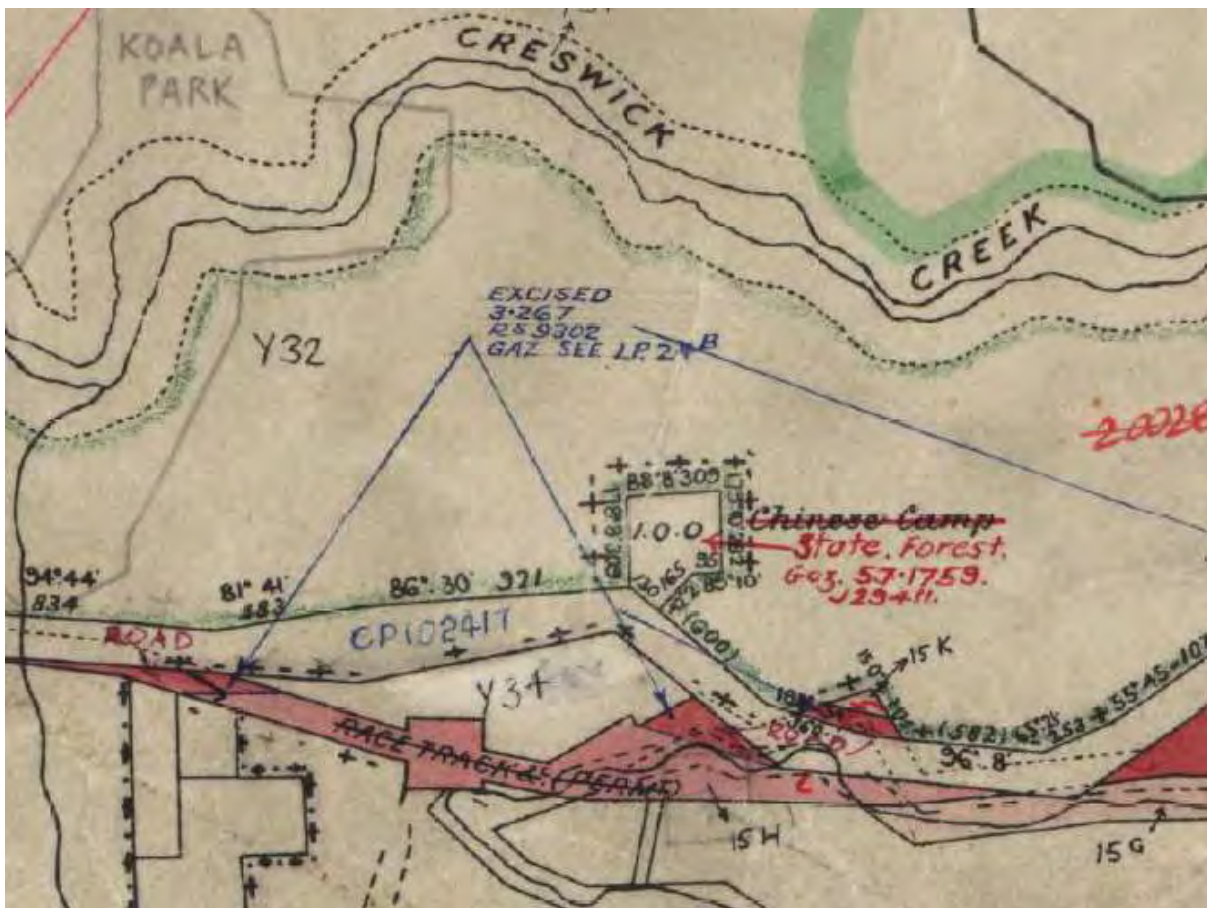


Figure 7 Creswick Parish Plan, Imperial measure 2464 (PROV)

Significance

The Melbourne Road Chinese Camp Creswick is of local historical and archaeological significance as a relatively intact and documented site of Chinese miners' camp from the mid 19th century. The site features evidence of occupation in the form of scattered artefacts of c.1950-1890 date, tracks, water channels, mine shafts, mullock heaps and possible hut platforms. The site represents one of several Chinese settlements on the Creswick goldfields in the period 1854 to about 1890, and as a gazetted land allotment marked on several official plans, can be securely identified as the correct location, which is not the case for most of the other Chinese camps in the district, with the exception of the Black Lead.

There are no trails proposed within the Melbourne Road Chinese Camp site.

3.5.4 Princess Alexandra Mine (VHI H7623-####)

Grid Ref: Lat: 37.43501° S Lon: 143.89904° E

Survey Unit 59

Description

The site of the Princess Alexandra mine is distinguished by extensive quartz boulder dumps near the top of White Hills and a series of mullock and tailings extending down the slopes to the east. While the sluiced surface workings are readily seen, the adit they cut into the hillside is not visible – presumably having been blocked off or blasted to collapse the entrance.

Land either side of Cheney Street has been levelled, possibly with tailings, and further east the alluvial flats along Slaty Creek have been sluiced.



Photograph 30 Extent of workings at Princess Alexandra Mine (VHI H7623-####)

History

Gold was discovered on Creswick Creek in 1852 and at the height of the rush, 25,000 miners were working in the Creswick area. Most leads ran north of the future township site, but one ran southwards, just east of the town centre. A goldfields Commissioner, Walter Brackenbury, was appointed in December 1852, and a township survey was carried out in 1854. Alluvial mining operations occurred in all the gullies and creeks, with quartz gravels mined near some of the ridges. In the late 1850s Chinese miners re-washed the spoil heaps along the entire creek system.

Hydraulic Sluicing was conducted from an early date, as much of the auriferous material was within deep clays and gravels along the sides of the valleys and up various gullies (Davis, Lawrence, & Turnbull, 2015). (Davies, Lawrence, & Turnbull, 2013). The deep mines near Creswick, however, were generally to the north of the township, with the exception of the Princess Alexandra Company which drove an adit about 1200 feet into the White Hills in 1864 (Mining Surveyors Reports June 1864; (Bannear, 1996). The earliest reference to the company seems to be in about January 1863, when it was announced that: "The Princess Alexandra Company, in Samson's Gully, Creswick, having secured

the aid of Mr Richardson's engine for steam puddling, will start this week."³ Reports continued into 1866, but the mine seems to have petered out after that.

Significance

The wider Creswick mining landscape is a significant element in Victoria's gold mining history. While one of the smaller goldfields, it retains significant archaeological features, including the extensive system of water races, dams and hydraulic sluicing landscapes, with many features from earlier mining activities such as the oval shafts of Chinese miners, puddling machines, sluice box channels and hut sites. The larger area should be considered for including in the Heritage Overlay, Heritage Inventory, and possibly the Victorian Heritage Register.

A number of mountain bike trails are proposed within the extent and surrounds of the Princess Alexandra Mine. Some of these utilise existing informal tracks and others will be built from scratch.



Photograph 31 Rock piles from Sluicing Princess Alexandra Mine (Survey Unit 59)

³ NEWS AND NOTES. (1863, August 5). *The Star* (Ballarat, Vic.: 1855 - 1864), p. 2. Retrieved September 30, 2021, from <http://nla.gov.au/nla.news-article72516234>



Photograph 32 Sluice Banks, Princess Alexandra Mine (Survey Unit 59)

3.6 Survey results – non VHI places

A number of historic site references were found which suggested possible places of archaeological potential. These were all investigated in the survey. In addition, other surface features relating to past land uses were recorded during the survey which, while being evidence of modification of landforms through mining and other activities, were not considered to have an archaeological component, and therefore did not meet the criteria for inclusion on the Victorian Heritage Inventory.

Numerous areas of alluvial and quartz mining are evident throughout the Creswick Forests. Generally, ridge and hill slopes have areas of prospecting shafts and costeans scattered widely.

Mining remains comprise mullock heaps, sluiced ground, tailings dumps, large spoil and mullock heaps, trackways, water races, possible buildings sites, and extensive sluiced ground with additional features such as sluiced banks, sluice box positions marked by stone picking dumps, and inlet and outlet races. The wider Creswick alluvial mining landscape includes several separately listed historical and archaeological sites, including, numerous water races.

Surviving areas of mining activity comprise most of the state forest along Creswick Creek and the side gullies. A larger extent of the Creswick mining landscape occurs south of Melbourne Road along Slaty Creek, Lincoln and Long Gullies and surround country. North of the Melbourne Road, the hill slopes have less visible evidence of mining, partly because the steeper country is not as rich and an extensive area has been disturbed or destroyed by forestry activities.

Map 4 shows features identified during the survey and other potential features drawn from background research, including historical plans and the data compiled as part of La Trobe University research by Jodi Turnbull. However, the following places do not meet the criteria and thresholds for inclusion on the Victorian Heritage Inventory, either because they lack evidence of archaeological features or deposits, or because they are considered of low archaeological value.

3.6.1 Georges Diggings

Grid Ref: Lat: 37.43161° S Lon: 143.90934° E

Survey Unit 19, 20, 61

Located around the north side of St Georges Lake this area now is characterised by a deep eroded gully with surrounding pine plantations and some remnant regenerated native forest (Photograph 33). The shape of the sluiced area is evident, but the sides of the sluiced banks have collapsed, or may have been partly rehabilitated as part of the forestry operations. St George's Lake Road cuts across the southern end of the diggings.

The level of disturbance from road construction, forestry and erosion is such that it is very unlikely that any archaeological remains survive in the area.



Photograph 33 Georges Diggings showing recent pine plantation around gully (Survey Unit)

A plaque near the roadside describes the diggings as:

In this area known as the George's Diggings, three attempts were made in the 1860's to find gold by the George's Mine Company, none were successful. In 1910 a new company - the George's Reef Mining Company tried again, always hopeful but also unsuccessful.

In 1862 the papers noted that a Chinese party was puddling the shallow ground obtaining £300 worth of gold.⁴

The Clunes Reef and St George's Reef are identified on historic mining maps in the vicinity, but the scale and accuracy of the maps does not enable their precise location (see Figure 1). They are likely however to refer to the historic diggings in this area.

While the George mine and reef, and the various associations with the St George race and lake are well known, the diggings and company appear to have been short lived and not very successful.

The evident late sluicing activity and erosion of the gully, construction of the lake and pine plantations, have disturbed the area to the extent that there is unlikely to be any remaining archaeological features associated with this mining area. Therefore it is not considered to meet the criteria or threshold to include on the VHI.

Several mountain bike trails are proposed through this area which are unlikely to impact any archaeological or heritage values due to the disturbed nature of the landscape.

⁴ "BAILD HILLS AND CRESWICK." The Star (Ballarat, Vic.: 1855 - 1864) 20 August 1862: 3. Web. 29 Sep 2021 <<http://nla.gov.au/nla.news-article66326504>>.

3.6.2 Watkins Mine

Grid Ref: Lat: 37.42707° S Lon: 143.90929° E

Survey Unit 36

Located to the north of Tourist Road, this area is identified as the Watkin Mine on Department of Minerals and Energy data and mining maps, Watkins & Company are recorded undertaking quartz mining at a place called Treblecock, in the Mining Surveyors Report for the Maryborough district,⁵ and there is a Watkin Mine in Ballarat, but these do not appear to relate to the Creswick site.

The location has extensive evidence of sluicing along Oak Gully, with subsequent erosion collapsing the sides of the sluiced banks. The Smokeytown water race crosses the gully and there is some evidence of an embankment and/or flume having been constructed to carry it across the mined area. Pine plantations have been established around the gully and the ground has been deeply ripped in recent decades as part of the harvesting and replanting cycle. The water race is difficult to find within the plantation area, where contour ploughing sometimes leaves it intact, but mostly it appears to be destroyed.

There was no evidence of archaeological features or deposits, hut or occupation sites or other evidence that would meet the criteria for inclusion on the VHI.

There are no mountain bike trails proposed within this area.



Photograph 34 Watkins Mine sluicing at the head of Oak gully (Survey Unit 66)

⁵ https://www.vgls.vic.gov.au/client/en_AU/search/asset/1286375



Figure 8 Nearmap aerial photo of Oak Gully and Watkins mine site shortly after replanting 28 10 2016.

3.6.3 Old School House Road mines

Grid Ref: Lat: 37.41994° S Lon: 143.93235° E

Survey Unit 58

This area comprises scattered shallow shafts and small mullock heaps to the south of Old School House Road extending down into Jackass Gully. The area appears to have been reworked in the twentieth century with some quite recent disturbance evident. One of the shafts has been closed off with a steel mesh.

No evidence of occupation sites or surface artefacts were noted and the features identified are typical of manual mining operations. The site is not considered to meet the thresholds or criteria for inclusion on the Victorian Heritage Inventory.

A mountain bike trail is proposed along the south edge of the mined area, but as this site is not considered significant it will not have any heritage impacts and so will not be disturbed.



Photograph 35 Shafts and Mullock heaps, Old Shool Road Springmount (Survey Unit 58)

3.6.4 Jackass Gully sluicing area

Grid Ref: Lat: 37.43340° S Lon: 143.92820° E

Survey Unit 14, 57, 63

Jackass Gully was one of a number of areas mined through ground sluicing and hydraulic sluicing in the later nineteenth century. The process has removed up to a depth of five metres of soil extending for about a kilometre up the gully and between 100 and 200 metres wide.

The area was worked extensively in the 1860s, including hydraulic sluicing.

A mountain bike trail is proposed along the east side of the gully above the sluice bank. It crosses the Smokeytown race at the north of the gully but otherwise has no impact on heritage.



Photograph 36 Mining Camp, Jackass Gully, Creswick, Victoria, 1931 (SLV)⁶

⁶ Negative - Mining Camp, Jackass Gully, Creswick, Victoria, 1931A mining camp: sleeping tent on left, store tent on right. The tent in the centre was made out of cut down potato sacks. Timber on the left was used to prop up mining tunnels. The Biggest Family Album in Australia Copied from June Gawley, 19 Mar 1985 Museums Victoria Collections <https://collections.museumsvictoria.com.au/items/765880> Accessed 23 September 2021

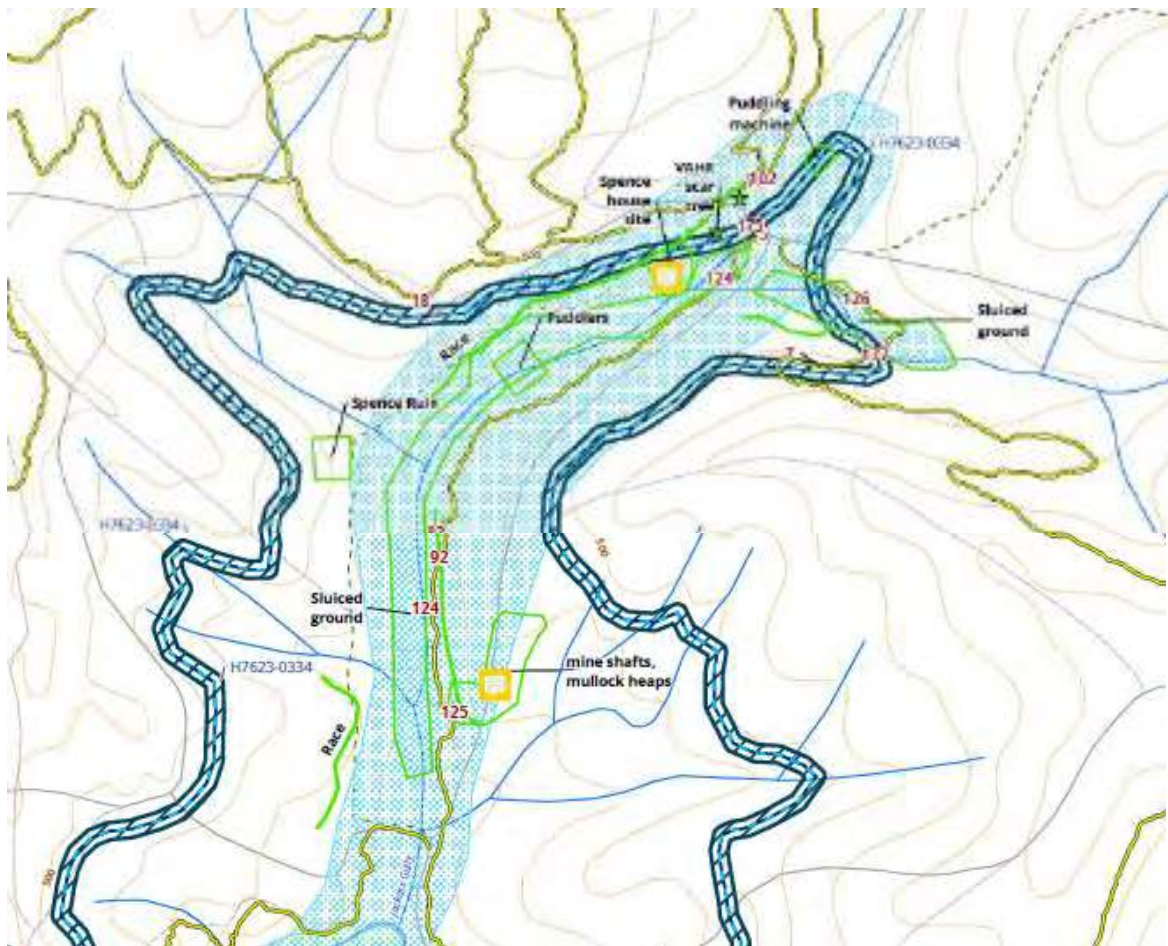


Figure 9 Jackass Gully sluicing area – marked by blue

3.6.5 Koala Park

Grid Ref: Lon: 143.91225° E

Survey Unit 27

The Koala Park was established on the north side of the Melbourne Road south of St George's Lake in the 1940s by the School of Forestry who erected a fence and planted Manna Gums. The fence was not maintained and has mostly disappeared ((Parks Victoria, 2007)). The area has historical significance to the local area as evidence of environmental improvements in the mid twentieth century, and there are remnants of the fence, paths, a picnic shelter and concrete steps, but none of these can be classed as archaeological features. Therefore the area is not considered to meet the criteria for inclusion on the VHI.

While the remaining features are of historical interest and a case may be made in the future for inclusion on the heritage overlay, there are no archaeological components to the site and therefore it does not meet the criteria for inclusion on the VHI.

A mountain bike trail is proposed to follow an existing track through the area, but this will not impact on any features related to the Koala Park.



Photograph 37 Remnant gateposts and fence at Koala Park entrance.

3.6.6 Back Creek Hotel

Grid Ref: Lat: 37.43959° S Lon: 143.92851° E

Survey Unit 14

The Back Creek Hotel was established in around 1860 and located near Jackass Road and Niggil Road. Roberts was the owner in 1859, and John Witcombe may have been proprietor at some stage. He also ran the Bush Inn until his death in 1866.⁷

The location of the hotel has not been precisely determined, but survey in the area revealed a highly disturbed landscape of sluiced ground and mullock suggesting it may have been subsequently destroyed by later mining and creek floods. As no archaeological evidence could be found, this site does not meet the criteria for inclusion on the VHI.

The area does not have any proposed mountain bike trails and so will not be disturbed.

3.6.7 Brackenbury Hill Lookout

Grid Ref: Lat: 37.42775° S Lon: 143.91418° E

Survey Unit 22

A cast iron orientation table or toposcope has been erected on a concrete and stone plinth in a parking area on top of Brackenbury Hill. It is marked "THIS TABLE IS THE GIFT OF THE CRESWICK OLD BOYS 10.4.17", with the years 1835 and 1917, and arrows pointing to a number of nearby local landmarks and their distances in miles.

⁷ Family Notices (1866, September 26). *The Ballarat Star* (Vic.: 1865 - 1924), p. 2. Retrieved September 30, 2021, from <http://nla.gov.au/nla.news-article112865332>

Brackenbury Hill is named after the first Commissioner of the Creswick goldfields, Lieutenant Charles Brackenbury. The disk was installed in 1917, and its details were used in a tourist map of the district. The newspaper at the time noted that:

*Mr Mackay, the Conservator of Forests, has agreed to erect a rustic pavilion over the disc, which is to be embedded in a rock and concrete pedestal. When a view of the forest trees which at present are an obstruction are removed, there will be presented a 'magnificent view of the beautiful forest valley which extends right away to the Great Dividing Range. ...Is the gift of a few Creswick old boys, including the Premier, the funds being collected by Mr J. C. Boyce, manager of the Victorian Tourists' Bureau. Mr J. M. Reed and Mr J. A. Graham, who have been responsible for the organisation and carrying out of the idea to make Brackenbury Hill one of the tourists' attractions of the district.'*⁸

It is assumed the Creswick Old Boys were either from a local school, or early pioneer residents. This is an important local feature which is clearly of historic significance, but does not meet the criteria for inclusion VHI as it does not have an archaeological component. It may be appropriate for inclusion on the Shire if Hepburn Heritage Overlay in the future.

There are a number of proposed mountain bike trails commencing in the vicinity and so the toposcope should be protected from accidental damage.



Photograph 38 orientation table at Brackenbury Hill lookout.

⁸ The Creswick Advertiser (1917, April 17). Creswick Advertiser (Vic.: 1914 - 1918), p. 2. Retrieved September 29, 2021, from <http://nla.gov.au/nla.news-article132685896>

3.6.8 Orr's Store

Grid Ref: Lat: 37.43673° S Lon: 143.90880° E

Survey Unit 31

Orr's store is identified from a historic reference and included in data provided by Jodi Turnbull. The site is located on the north side of Melbourne Road about 2 km east of Creswick. James Orr was in Creswick by at least 1861 when he built a store in Albert Street. Orr was prominent in local affairs and was Mayor in 1880-81 and an original committee member of the Presbyterian Church (Graham, 1986, pp. 96, 162) (Lester Tropman & Assoeiate, 1991).

The site of the store is on private land, but inspected from the road, the location did not appear to have any structural remains or visible features. Therefore it could not be determined if the site met the threshold for inclusion on the VHI.

The site is not within an area proposed for construction of mountain bike trails.

3.7 Conclusions from the survey

The field survey has covered a representative sample of landforms and historic sites, different levels and types of disturbance, and areas with acceptable ground surface visibility. Numerous areas of mining activity and water races were identified during the survey, and have been added to the existing plan of water races.

Four main historical landforms were evident as follows:

- Rehabilitated artificial landforms in developed parts of Creswick and surrounds – these are the result of former mined areas having been levelled and either revegetated with introduced species, including grasses, or allowed to regenerate as a mix of native and exotic bushland vegetation. The stretch of Creswick Creek near the town is the main example of this, but other patches of farmland in the wider study area also show evidence of having been reclaimed. Some parts of the lower creek flats are probably also affected by sludge and mining alluvium.
- Alluvial workings comprising shallow shafts, sluiced ground, paddocking, and other forms of wash dirt processing – these areas are artificially landscaped due to the removal and redistribution of alluvial deposits and topsoil, with most of the original soils having been washed away and remnants of washed quartz gravel, spoil heaps and tailings.
- Relatively natural bushland with extensive water races and other earth works – Most of the southern part of the study area comprises this landform, with extensive networks of water channels, generally following the contours around the slopes. Small earth dams, eroded gullies, and intricate earth features reflecting the use of a variety of alluvial mining techniques are evident. However where auriferous soil was not present, such as the upper slopes and ridges, the intervening landscape is relatively natural in terms of the ground level, soils and native vegetation.
- Plantation and forestry areas – these are comprised of both native and exotic species, the latter being *Pinus Radiata*. Various ages and methods of plantings are evident including natural regeneration after the goldfield era stripping of most usable timber. Late nineteenth and early twentieth century saw log and fire wood harvesting with hand replanting, and more recent clear-felling with ripped ground and machine planting. Most of these more recent planted areas have been heavily disturbed, although some effort appears to have been made to avoid the water races, by contour ripping parallel to them.

The archaeological values of historic sites in the study area have been previously surveyed through the La Trobe University study (Davis, Lawrence, & Turnbull, 2015). This recognised that there is a hierarchy of water channels and mining related landscapes which includes both the operational systems used to transfer water to mining areas, and the resulting mined landscape, with a wide range of features representing these and associated activities. Identifiable archaeological and landscape features include the following (Ritchie & Hooker, 1997):

- Major water races – generally connecting water reservoirs to mining areas.
- Minor water races – used to distribute water to the mining areas, whether for operating ground sluicing devices such as sluicing nozzles, gold tables, sluice box, long toms etc.
- Tail race – drains used to remove water from the mining area, disperse sludge or drain flooded areas and creek beds.
- Working faces – the steep eroded cliffs where sluicing was undertaken.
- Tailings – piles of rock and other solid material left after finer alluvium had been washed away.
- Prospecting works – shallow pits and hummocks, costeans (narrow trenches used to find quartz veins or ore bodies) which are used to test and explore potential auriferous ground
- Alluvial workings – hand excavation in small claims, such as pits, hummocks, trenches, paddocking
- Building sites – generally identifiable by small rectangular flat terraces or occasional handmade bricks or squared blocks of stone.

The extensive nature of these features across the wider Creswick gold field landscape is evident and a large part of the mapping of water races and other hydraulic features has been completed by La Trobe University (see Figure 1).

Within the proposed Stage 1 Mountain Bike trails area, the survey has demonstrated the relative accuracy of the initial predictive model and identified a number of places which meet the criteria for inclusion on the VHI, as well as other places that, because of their low significance and lack of evidence of archaeological features or deposits do not meet the threshold or criteria for inclusion on the VHI. Nevertheless, these places have potential local heritage interest and recommendations are included for avoiding or minimising possible impacts from the mount bike trail development.

As the proposed mountain bike tracks are intended to avoid harm to any significant features, examination of the areas of impact has fed into the design.

Conservation management recommendations are set out for both heritage listed places and other sites of local historical interest but which do not meet thresholds or criteria for protected under statutory heritage listings in Section 7 below.

4 Cultural heritage significance

Assessing the cultural heritage significance of a historical site is undertaken to make decisions about the best way to protect and manage the site. Heritage significance is embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects (Australia ICOMOS Inc, 2013). Understanding the cultural heritage significance of a historical site is essential for formulating management recommendations. In the case of the Creswick forest and gold mining areas, there is also the added layer of the complex mining landscape which is significant in its own right. This area has been assessed in the context of its significance as a cultural landscape (Reeves & McConville, 2011).

There are existing individual statements of significance for a number of heritage places in the study area. The water races and mining areas are described in VHI site records, with extensive statements of significance.

4.1 Significance assessment

Assessment of significance of historic and archaeological places in the study area has considered a number of criteria, both related to heritage values as established under the Heritage Victoria Criteria (Heritage Victoria, 2020), and an assessment of archaeological potential in reference to criteria and thresholds for inclusion on the Victorian Heritage Inventory (Heritage Victoria, 2020). Assessments of individual places has been to some extent derived from a number of individual statements of significance for the various components, and in particular the major water races recorded by La Trobe University (Davis, Lawrence, & Turnbull, 2015).

Table 8 shows the individual places identified within the Creswick Mountain Bike Trails Stage 1 study area along with a summary of factors contributing to historic significance, site condition and archaeological value, rarity, research potential and integrity.

The table includes eight places previously recorded on the Shire of Hepburn Heritage Overlay or Victorian Heritage Overlay, four additional places proposed to be included on the VHI and eight places identified from research and field survey which were considered not to meet the thresholds and criteria for inclusion on the VHI as archaeological sites.

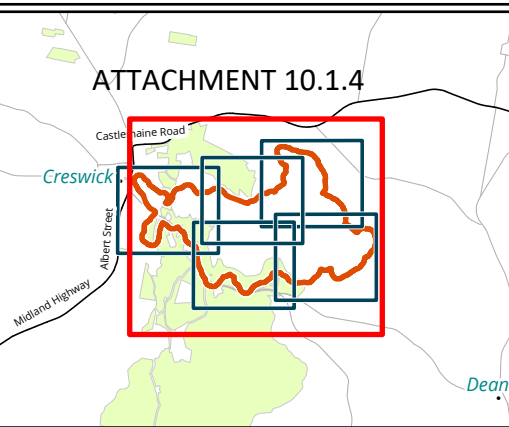
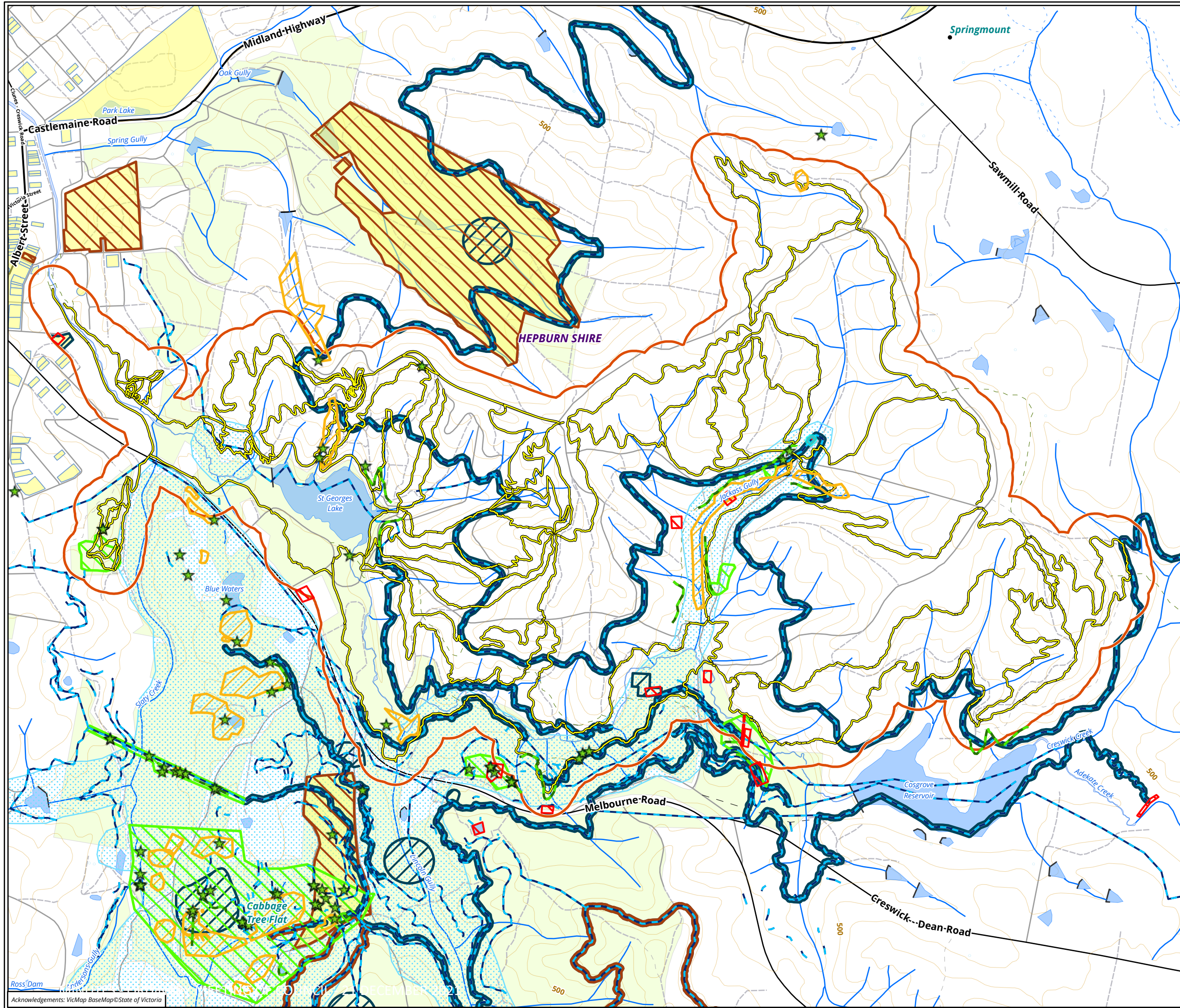
Table 8 Heritage Places in the Study Area

Heritage place/feature	listing	Location	Historic significance	Condition and archaeological value	Rarity	Research potential	Integrity
Pinus jeffreyii (Jeffrey Pine)	HO560	Creswick Football Ground	Very old and distinctive tree related to Forestry School	In poor condition but not of archaeological value	One of very few examples in the state	Limited archaeological potential, but possible scientific value	Healthy and intact
Creswick State Battery	HO974 H7623-0239	Battery Crescent, Edge of Creswick Township	Important built element and one of very few items directly related to mining operations	Good condition, archaeological potential in immediate area but more distant areas disturbed by reclamation	One of 6 state batteries remaining	High potential within and immediately around battery	Highly intact, with fittings and machinery
Eaton's Water Race and Dam Wall	H7623-0338	Creswick-Bungaree Road and Jackass Road Creswick and Slaty Creek Road Cabbage	High significance as long-lived and influential mining development	Complex features – cuts, sediment deposits, diversions, sluice channels, etc.	Rare stone and earth fill dam wall, well preserved representative example	High potential due to complex features	5 metre breach but otherwise substantially intact
Smokeytown Water Race	H7623-0334	Midland Highway Springmount and Castlemaine Road Creswick and Sawmill Road Newlyn	Little information has been obtained and the race does not feature strongly in local history, however, it was a major undertaking of some note	Some parts good, extensive areas in pine forests destroyed, the section within the study area does not have complex features like some of the others	One or numerous races in the Creswick are and Victoria generally, typical of the form	Limited research potential – possible value in detailed recording and measurements	One of longest water races in the district, but large sections lost from forestry
Roycraft's Water Race	H7623-0328	Georges Lake Road Creswick	Little known about its history although important for association with prominent local John Roycraft	Some complex features but limited due to disturbance	One or numerous races in the Creswick are and Victoria generally, typical of the form	Limited research potential – possible value in detailed recording and measurements	Much of the race has been destroyed

Heritage place/feature	listing	Location	Historic significance	Condition and archaeological value	Rarity	Research potential	Integrity
Bragg's Water Race and Dam	H7623-0333	Creswick-Bungaree Road, Melbourne Road, Slaty Creek Road Cabbage Tree	Historically a major development, with early origin (1850s) long life and related to town water supply	Complex features – cuts, sediment deposits, diversions, sluice channels, etc.	One or numerous races in the Creswick are and Victoria generally, typical of the form	Limited research potential – possible value in detailed recording and measurements	Parts in good condition some under modern reservoir
Davis' Water Race	H7623-0332	Creswick Regional Park	One of the earliest races in Creswick (1854)	Complex features – cuts, sediment deposits, diversions, sluice channels, etc.	One or numerous races in the Creswick are and Victoria generally, typical of the form	Limited research potential – possible value in detailed recording and measurements	Some parts impacted by erosion and modern ground works
Back Creek Chinese Garden and Orchard	H7623-0346	Back Creek	Important evidence of Chinese activity in the district and evidence of continuity to later orcharding	Visible evidence in drains and possible beds, no surface artefacts but high potential	Recognisable Chinese sites are very rare in Victoria	If archaeological deposits can be established would be very valuable contribution	Little evidence of disturbance and surfacing later orchard trees
W G Spence's house	H7623-	between the Wallaby Track and Jackass Gully just south of the East West Road	Gold rush settlement site related to prominent person and otherwise characteristic of isolated bush occupation	high archaeological potential for structural remains and occupation deposits	Rare example of bush dwelling with intact archaeology	Potential research on character of goldfields settlement and associations with individuals	Structural features and garden elements evident with potential archaeological preservation
Jackass Road mine	H7623-	East side of Jackass Road	Little known about specific history, but good representative example of reef mining in the district	Archaeological potential for mining methods and occupation sites	Typical of reef mining but with unusual complexity	Potential to reveal character of reef mining and mining settlement	High level of integrity with many surviving features
Chinese Camp Melbourne Road	H7623-	North side of Melbourne Road	Identified in survey plans but otherwise little direct	Complex archaeological features, drains, levelled	Recognisable Chinese sites are	Potential to reveal evidence of Chinese	Intact historical ground surfaces and

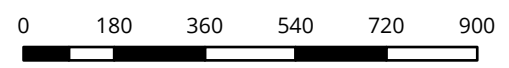
Heritage place/feature	listing	Location	Historic significance	Condition and archaeological value	Rarity	Research potential	Integrity
			historical reference	ground, mine shafts, possible building platforms, surface artefacts	very rare in Victoria	occupation and activity	artefact deposits, little disturbance
Princess Alexandra Mine	H7623-	West of Cheney Street	Limited historical information but representative of phase of local mining history	Archaeological potential for mining methods and occupation sites	Unusual combination of reef mining and sluicing	Potential to reveal character of reef mining and mining settlement	High level of integrity with many surviving features
Georges Diggings		Georges Lake road	Short lived and unsuccessful mine	Erosion and forestry disturbance has removed most archaeological evidence	Typical disturbed alluvial mining area	Limited potential due to poor condition	Heavily disturbed by erosion and forestry
Watkins Mine		Tourist Road,	Little historical information available, typical of alluvial mining and sluicing	Erosion and forestry disturbance has removed most archaeological evidence	Typical disturbed alluvial mining area	Limited potential due to poor condition	Heavily disturbed by erosion and forestry
Old School House Road Mine		Old School House Road	Little historical information available, typical of sporadic reef in district	Intact and disturbed shafts and mullock but no evident archaeological deposits	Common site type,	Limited potential due to lack of features	Disturbed by later fossicking
Jackass Gully sluicing area		Jackass Road	Little historical information available, typical of alluvial mining and sluicing	Erosion and forestry has extensively impacted archaeological potential	Typical disturbed alluvial mining area	Limited potential due to poor condition	Heavily disturbed by erosion and forestry
Koala Park		Melbourne Road	More recent land use reflecting local conservation efforts	No archaeological component	Rare site type but limited evidence	Limited potential due to lack of features	Fragmentary remains
Back Creek Hotel		Jackass Road and Niggel Road	Evidence of early services to goldfields of historical importance	No evidence visible / unknown	Some potential but site location undefined	Unknown potential	Unknown

Heritage place/feature	listing	Location	Historic significance	Condition and archaeological value	Rarity	Research potential	Integrity
Brackenbury Lookout		Tourist Road	Evidence of very early tourist development related to forestry school	No archaeological component	Uncommon in district	Limited potential due to lack of features	Intact but without context
Orr's Store		Melbourne Road	Associated with prominent local person	No evidence visible / unknown	Common site of former structure	Unknown potential	Unknown



- Legend**
- Study area
 - Water race
 - Victorian heritage register
 - Victorian Heritage Inventory
 - Proposed VHI
 - Heritage overlay
 - Sluiced Areas
 - 1 Trail crossing historic feature
- Heritage features**
- ★ Historic reference
 - Water race
 - Mined area
 - Historic place

Figure 4 Overview Heritage place impacts and management

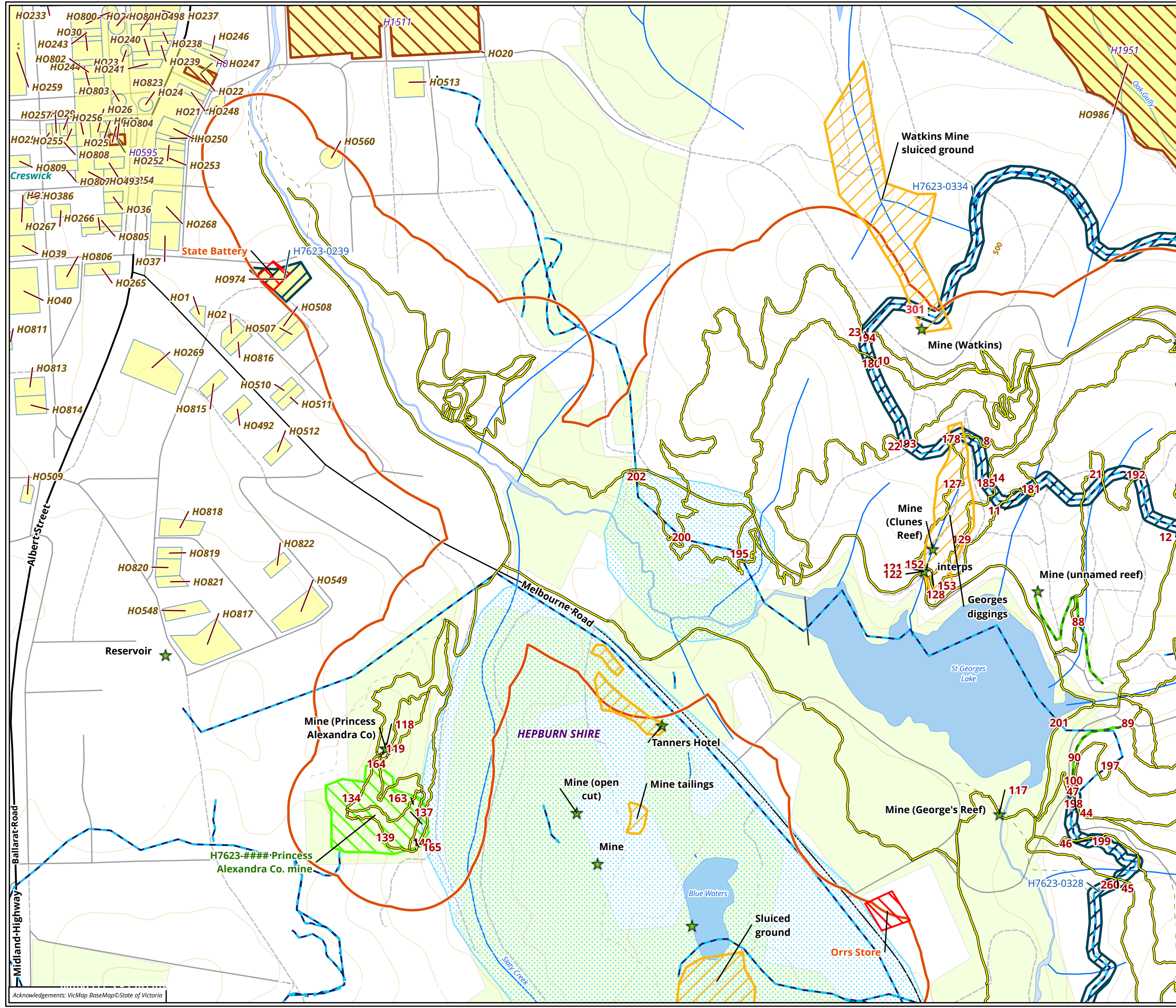
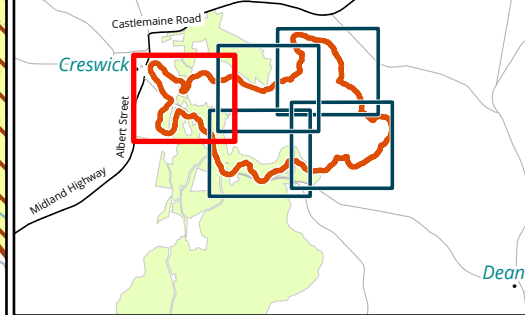


Metres
 Scale: 1:15,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 54



Matter: 35554,
 Date: 30 September 2021,
 Prepared for: GV, Prepared by: DK, Last edited by: dkang
 Layout: 35554_F5_HeritageMgmt
 Project: P:\35500s\35554\Mapping\35554_CreswickMTB.aprx

Acknowledgements: VicMap BaseMap © State of Victoria



Legend

- Study area
- Water race
- Victorian heritage register
- Victorian Heritage Inventory
- Proposed VHI
- Heritage overlay
- Slued Areas
- Trail crossing historic feature

Heritage features

- Historic reference
- Water race
- Mined area
- Historic place

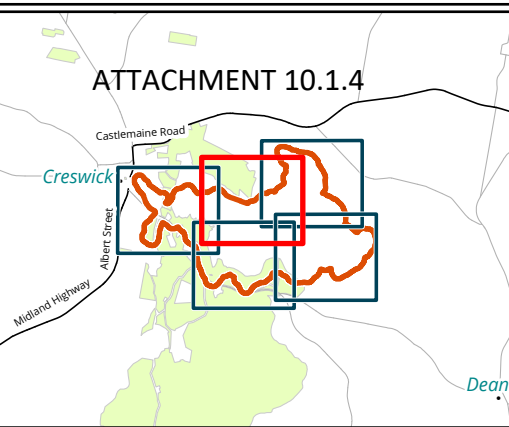
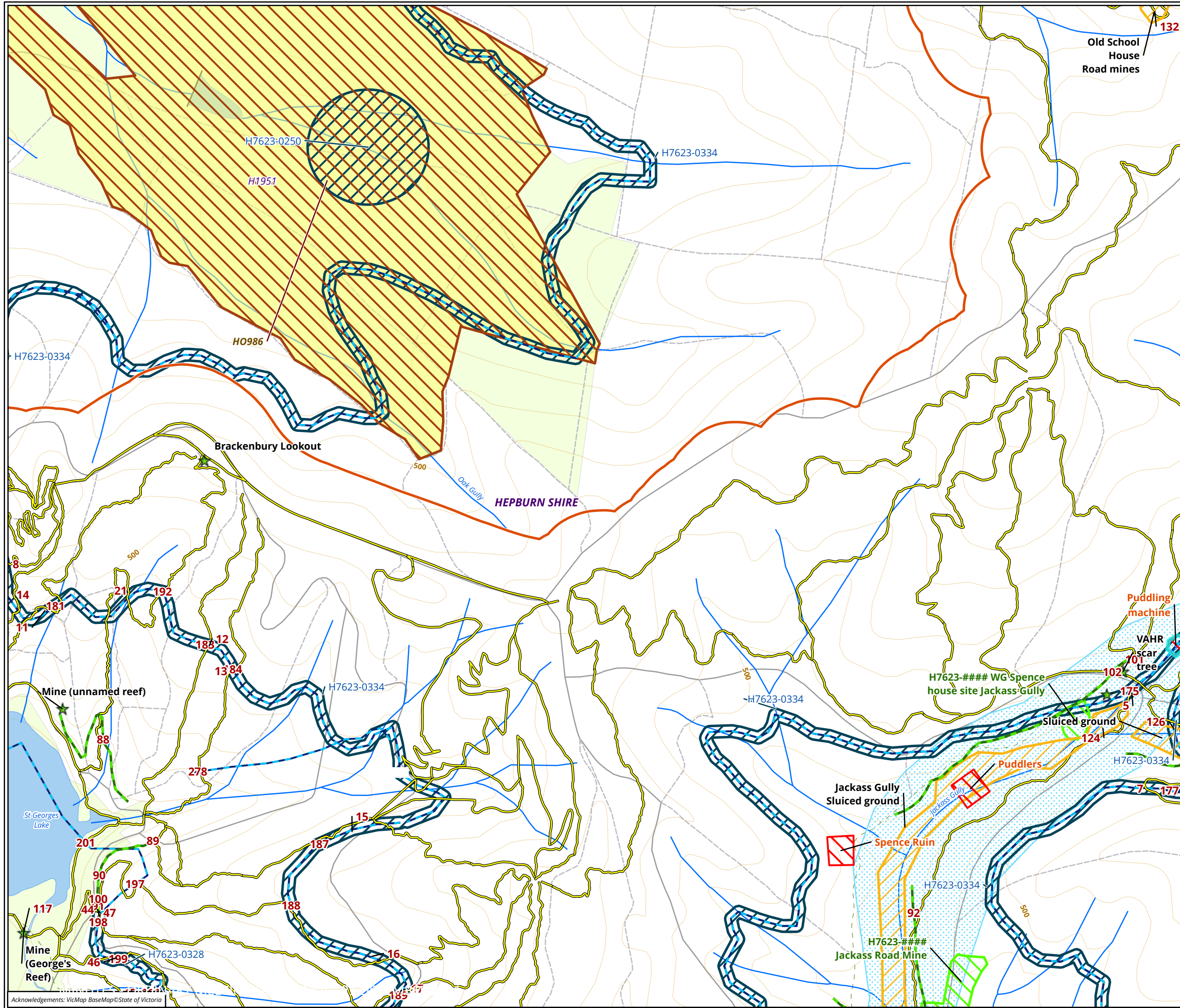
Figure 4.1 Heritage place impacts and management

0 70 140 210 280 350
 Metres
 Scale: 1:6,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 54



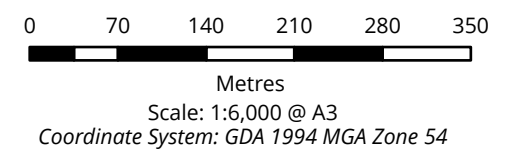
Matter: 35554,
 Date: 30 September 2021,
 Prepared for: GV, Prepared by: DK, Last edited by: dkang
 Layout: 35554_F5_HeritageMgmt
 Project: P:\355500s\35554\Mapping\35554_CreswickMTB.aprx

Acknowledgements: VicMap BaseMap © State of Victoria



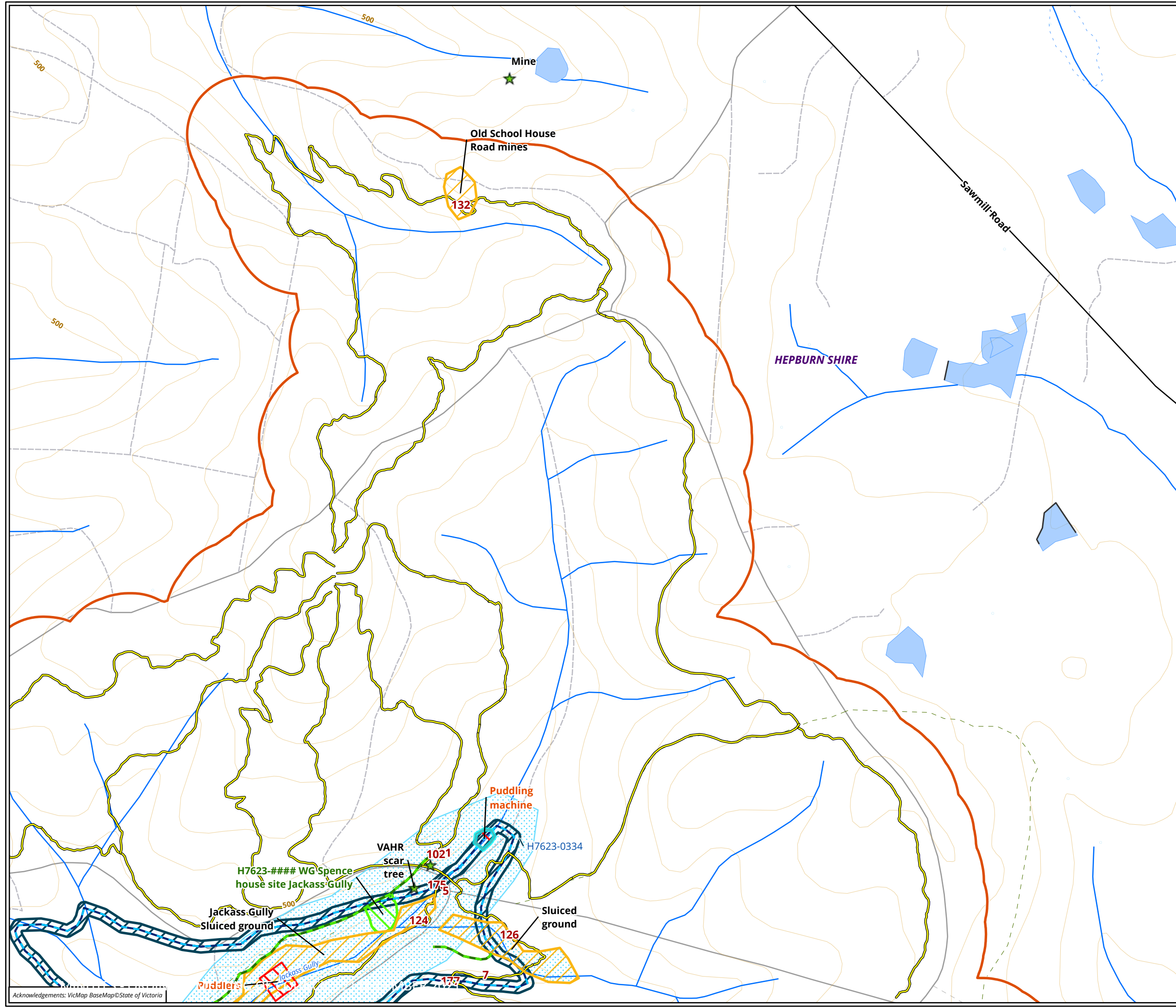
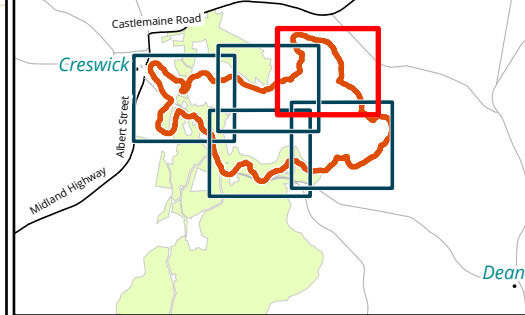
- Legend**
- Study area
 - Water race
 - Victorian heritage register
 - Victorian Heritage Inventory
 - Proposed VHI
 - Heritage overlay
 - Sluiced Areas
 - 1 Trail crossing historic feature
- Heritage features**
- ★ Historic reference
 - Water race
 - Mined area
 - Historic place

Figure 4.2 Heritage place impacts and management



Matter: 35554,
 Date: 30 September 2021,
 Prepared for: GV, Prepared by: DK, Last edited by: dkang
 Layout: 35554_FS_HeritageMgmt
 Project: P:\35500s\35554\Mapping\35554_CreswickMTB.aprx

Acknowledgements: VicMap BaseMap © State of Victoria



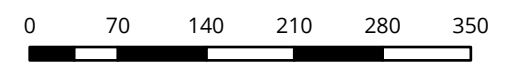
Legend

- Study area
- Water race
- Victorian Heritage Inventory
- Proposed VHI
- Sluiced Areas
- 1 Trail crossing historic feature

Heritage features

- ★ Historic reference
- Water race
- Mined area
- Historic place

Figure 4.3 Heritage place impacts and management



Metres
 Scale: 1:6,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 54



Matter: 35554,
 Date: 30 September 2021,
 Prepared for: GV, Prepared by: DK, Last edited by: dkang
 Layout: 35554_F5_HeritageMgmt
 Project: P:\35500s\35554\Mapping\
 35554_CreswickMTB.aprx

Acknowledgements: VicMap BaseMap © State of Victoria