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Engineering Services



# Creswick Industrial Park and Sustainable Water Project

Planning and Feasibility Study v2.1 **DRAFT**

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4 March 2010

DPS Project Number: DPS200902

GMR Project Number: GMR09012

**This project has been produced with the financial assistance of Regional Development Victoria**

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# Background

The Creswick Industrial Park and Sustainable Water Project (CIP&SWP) has been commissioned to look into the feasibility of developing a 22.92 hectare site within the Creswick Township. The land is owned by the Department of Sustainability and Environment (DSE) and is in three contiguous titles:

P108116 Section 15 CA 6 (10.66 ha.)

P101835 Section 48A CA 46 (9.76 ha.)

P374154 Section NS CA 2007 (2.5 ha.)

The property is a former mining site in the Industrial 1 Zone (IN1Z).

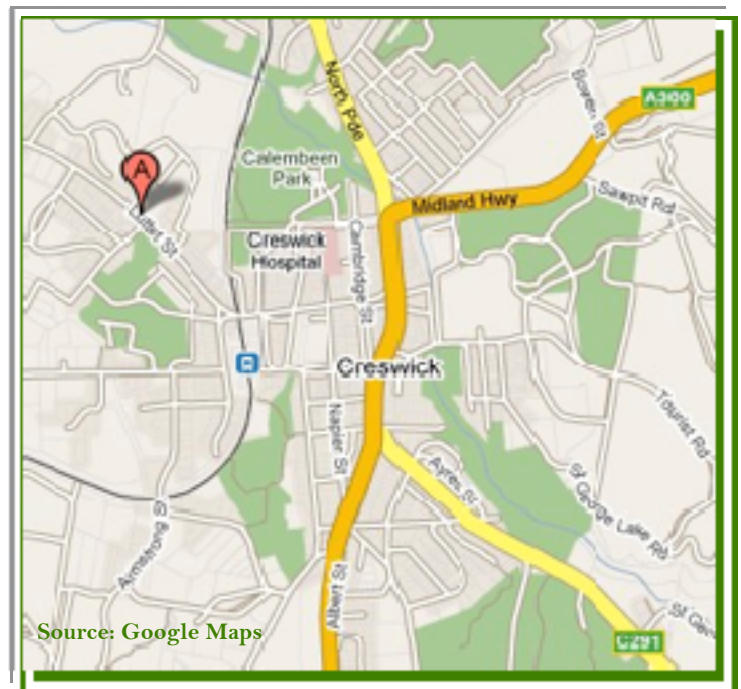
The consultant brief identifies two primary objectives for the site. The first is to obtain a sustainable water source to supplement water supplied for the maintenance of recreation facilities in Creswick. The second is to examine the feasibility of subdividing the site as a whole or in part for industrial or some other use.

The land is constrained by the legacy of earthworks from past dredging and mining activity. A natural waterway (Creswick Creek) runs along the northern boundary of the site.

An Aboriginal Cultural Heritage Assessment of the site was undertaken by Terra Culture Pty. Ltd., Heritage Consultants, in March 2007. Although the site was assessed as being heavily disturbed from an archaeological perspective, the Assessment contained three recommendations for the management of the site should future development take place. These are summarised in the section headed “Aboriginal Affairs Victoria”.

This report is structured into two parts; an assessment of the potential for an industrial park on the site, including a Concept Design, and an evaluation for water capture and re-use on nearby public recreation areas.

The report has been made possible by the generous financial support of Regional Development Victoria – Planning for Growth program.



# Industrial Park Assessment

## Introduction

The study area is within an existing Industrial 1 Zone, surrounded by a mixture of industrial, residential and public recreation uses. The site itself is heavily disturbed by past mining activity that will require on-site works to enable future occupation. This section investigates the physical attributes of the site, planning issues, infrastructure and subdivision design and marketing.

## Site analysis

Plans showing the existing condition of the site are included as Drawings GMR09012.02 and GMR 09012.03. Additional drawings in the series show sections of the site in greater detail. The site is dominated by a heavily dissected landscape including a steep escarpment through the centre of the site. The escarpment is a result of mining activity, which has also resulted in the formation of a dredge pond at the foot of the escarpment. The escarpment effectively divides the property into two parts; the southern part abuts residential properties that have frontage to Luttet and Anne Streets, while the northern part is dominated by Ring Road and Creswick Creek. The Town's waste transfer station is located on an adjoining title to the east, with access from Ring Road, through the northern part of the study area. A capped former land fill site is on part of the land occupied by the waste transfer station, however, this area is not part of the land under consideration in this report.

Vegetation on the site comprises mainly volunteer weeds and shrubs that have established following soil disturbance. Trees (mainly acacia varieties) are located near the dredge pond. A mixture of native and exotic trees are found adjacent to the Creswick Creek. The riparian landscape in the area of the creek is in poor condition and would benefit from restoration.

Ring Road is the main access route to the study area and logically forms the axis for any future development. Constraints on future development activity within the study area include proximity to residential properties to the south and east, the Creswick Creek, the escarpment through the property and the proximity of the waste transfer station.

## Business survey

Part of the consultation process for evaluating development options for the study area included discussion with real estate interests in Creswick and Ballarat.

A synopsis of the conversations with real estate agents is contained in the following points:

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- There is very little enquiry for industrial sites in Creswick (this may be a result of a lack of industrial sites, or a reflection of low demand).
- Ballarat is currently oversupplied with industrial sites, a situation that is expected to continue for at least 2-3 years. At the moment there are over 200 industrial lots available on three major subdivisions in Ballarat.
- Demand for industrial land in Creswick is likely to be represented by local trades and services seeking business premises.
- Attracting business from outside Creswick is only likely to occur if the cost per lot is significantly less than competing centres (\$20.00m<sup>2</sup> was suggested by one respondent). Based on projected development costs, this price would effectively amount to subsidised land.
- The development of residential lots in Creswick is considered a more viable option for the town, which has attracted a proportion of people who work in Ballarat and other centres such as Daylesford or even western parts of Melbourne.
- The prospect of attracting a large industrial company is low, irrespective of land availability.

### Business survey comment

It seems clear that from a marketing perspective, devoting the whole of the study area to industrial use will exceed demand. From the perspective of local agents, a first stage of small industrial lots to provide business opportunities for local trades and services may be the most relevant response to market demand. These lots will need to be priced competitively relative to industrial land in Ballarat.

Residential development within the study area was considered to be a more viable response to the local property market. Affordable residential lots are in good demand and the central location of the study area may prove attractive to Creswick, Ballarat and Daylesford buyers. Some agents believe that affordable residential land may also attract interest from Melbourne buyers.

The physical configuration and size of the study area creates the opportunity to develop both residential and industrial lots without one land use impacting on the other. This is considered in greater detail later in this report.

## Community stakeholder interests

### Creswick community

While the broader Creswick community supports the idea that industrial land should be available for local business investment, or to provide an locational option for new industry, there is not a strong emphasis on industrial development for Creswick in the Hepburn Planning Scheme. This may be a result of the proximity to Ballarat and the heritage and landscape attraction of Creswick as a country town.

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There is only one area zoned for industrial use in Creswick, which comprises the study area for this investigation and a smaller adjoining area east of Anne Street. The Creswick Structure Plan in the Local Planning Policy Framework (Hepburn Planning Scheme) identifies the following objectives for this industrial area:

- To *encourage improvements to amenity and appearance.*
- To *investigate expansion opportunities.*

It can be assumed therefore that the Creswick community sees the opportunity to improve a currently degraded area by attracting industrial development to the site. A primary task of this investigation is to determine if restoring the land through industrial development is practical or viable.

### Local residents

In the southern part of the study area, there is a history of opposition from some local residents to the prospect of industrial activity, due to concerns regarding a perceived loss of residential amenity. This is a valid concern and must be addressed in any of the development options for the site. Matters to be addressed include; appropriate land use, separation distances, landscape, drainage, title boundaries and future traffic management.

### Landscape

Another stakeholder interest is the general condition of the study area, which is not complimentary to the town. In a way, the study area seems to be a ‘forgotten’ part of Creswick, despite being only 700m direct distance and 1.4km driving distance from the centre of town. Part of the benefit to be derived from the development of the study area is an improvement to the landscape. The task of developing the site and achieving the landscape improvements is complicated by the fact that the land within the industrial zone is owned by the Victorian State Government (Department of Sustainability and Environment). This could be both an opportunity (dealing with one public owner with the ability and resources to assist in restoration of the site) and a constraint (Government authorities have complex mechanisms for the management and/or sale of public land that may frustrate or restrain the development process).

### Creswick Creek

Creswick Creek flows along the northern boundary of the site, providing a link to public recreation areas, both upstream and downstream. The Creek is in a Public Purpose and Recreation Zone (PPRZ), not in the Industrial 1 Zone. Any development in the IN1Z near the interface between the two zones will need to be managed to protect the riparian landscape and waterway. It has to be said that this section of the Creek is in very poor condition as a result of weed infestation, bank erosion and uncontrolled access. Any development options for the study area should include improved management of Creswick Creek, however, this may best be achieved by retaining the riparian land along the creek in public ownership.

### Department of Sustainability and Environment

The Department of Sustainability and Environment (DSE) are the owners of the land within the Study area. It is unlikely the DSE will be involved in the development of the site under the current industrial

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zone, therefore the development of the site will require the transfer of the land to another party - either the Hepburn Shire or some other entity. The development cost analysis has assumed that the site will be sold by the DSE at the Valuer General's valuation, as required by the Land Act 1958. The sale of the three titles that comprise the study area will presumably be in accordance with s.99A of the land Act 1958 (refer to Appendix X), which allows the Minister to sell the land by private treaty for a sum not less than the Valuer-General's valuation.

Alternatively, consideration could be given to transferring the land to Hepburn Shire under s.99 for "a public purpose". Clause 6 of s.99 states that "*public purpose includes, in the case of a municipal council, the purpose of housing or decentralized industry*". The transfer of land from the Minister to a municipal council is not conditional upon the Valuer General's valuation.

A further consideration is for DSE to transfer only that part of the land most suited to industrial and/or residential development. DSE could then retain land, for example, adjacent Creswick Creek. This land could then become part of the Public Park and Recreation Zone (PPRZ).

#### North Central Catchment Management Authority

The NCCMA is responsible for the management of Creswick Creek. The future development of the study area will provide an opportunity to improve the riparian environment of the creek in context with the development proposals. This may include, for example, appropriate separation distances between the creek alignment and industrial development, realignment or piping in sections where this is considered appropriate for the long term management of the creek and public access - particularly the creation of links between existing recreational areas.

The Concept Design proposed in this study suggests that land north of Ring Road and north of the waste transfer station access road should not be developed, but instead become part of the PPRZ along Creswick Creek. The proposed development plan also allocates significant areas through the centre of the study area for waterway reserves and separation buffers.

It is suggested that the NCCMA and Council commence on-site discussions using the draft Concept Design as a basis for improving Creswick Creek. This process will also require input from interested community stakeholders; e.g. Landcare.

#### Aboriginal Affairs Victoria

As mentioned in the Introduction, an Aboriginal Cultural Heritage Assessment of the site was undertaken in 2007. The assessment was conducted by Terra Culture Pty. Ltd., Heritage Consultants, and completed in March 2007. The Assessment contained three recommendations, summarised as follows:

1. Due to the highly disturbed condition on the subject land, no further archaeological investigation is recommended.
2. That if any earthworks are proposed for the site, consultation with the North West Regional Cultural Heritage program and the Dja Dja Wurrung Native Title Claimant Group for the purpose of monitoring earthworks and managing any Aboriginal archaeological material or features.

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3. If human skeletal remains are uncovered, work is to stop and Aboriginal Affairs Victoria (AAV) protocols followed.

The above recommendations should be applied when undertaking any works within the study area.

## Environmental and town planning requirements

A requirement of this project is the preparation of a Concept Design for the study area. The Concept Design has identified areas for private development, but also retains areas in public use for water management, recreation and to provide separation buffers between uses. The concept design is to be used to inform a subsequent Development Plan for planning approval. The Development Plan includes both a graphical representation of development and environmental management requirements, such as landscape, public open space and riparian areas that are the responsibility of the NCCMA.

The conventional planning framework for managing the future development of the site under the planning scheme is to introduce a Development Plan Overlay (DPO) over the study area. The DPO sits over the zone(s) on the site (currently the IN1Z). If it is determined that uses other than industry are appropriate, the zones within the study area may include appropriate industrial, residential and public use zones. The DPO then forms the “umbrella” control over these zones. The Development Plan approves the configuration of land use within each zone, enabling each of the stages within the Development Plan to be implemented without further planning approval. Any deviation from the Development Plan will require planning approval.

### Industrial Zones

The concept design proposes two industrial zones for the study area. The predominant zone is the Industrial 1 Zone (IN1Z), to apply to industrial lots 4 to 9, 14 to 17 and 18 to 31, a total of 24 lots. It is also proposed to place industrial lots 1-3 and 10 to 13 in the Industrial 3 Zone (IN3Z). These lots are proposed in the southern portion of the site, adjacent to some residential uses. The IN3Z is designed as a ‘transition’ zone between industrial and residential use, with a restriction on some types of industrial uses.



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The concept design proposes a first stage of 6 lots (Lots 4-9) in the IN1Z. This could be a ‘demonstration stage’ for industrial development and is in an area that presents the least cost due to existing infrastructure and suitable terrain. If successful, returns from this stage could be rolled into the development of subsequent stages.

Stage 1 of the proposed industrial subdivision is approximately 100 metres from the nearest Rural Living Zone and the Residential 1 Zone to the south. This separation distance is sufficient for most general industrial activities to operate within Stage 1.

For example, Stage 1 is suitable for:

- Joinery
- Bakery
- Small goods
- Concert article/stone article
- Plaster works
- Fabricated metal products
- Structural steel metal production
- Depot
- Industrial laundry

### Residential 1 Zone

The south-eastern corner of the study area abuts some existing residential properties that are currently adjacent to the IN1Z. In some cases, the industrial zone is to the rear and frontage (across Anne Street) of the residential land. There is a record of amenity issues associated with some of these residential properties which may be exacerbated should industrial development occur within the study area (i.e. to the west and north of the existing Residential 1 Zone).

The south eastern part of the study area is relatively elevated and suitable for development. There is also good access from existing residential areas in Luttet Street. It is therefore suggested that this part of the study area should be rezoned for residential development. The Concept Design proposes capacity for 33 residential lots of approximately 1000m<sup>2</sup>. This proposal responds to comments received from the real estate industry that well located affordable residential lots are in demand in Creswick. The Concept Design has created a public use buffer around the proposed residential area to provide appropriate separation distance and visual protection (through revegetation) from the industrial land and the waste transfer station. The proposed separation areas also serve to protect existing drainage lines and waterways.

The Concept Design also identifies an existing area of R1Z in Luttet Street as suitable for a possible restructure to create 8 residential lots.

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**Hepburn Planning Scheme: Existing Zones**

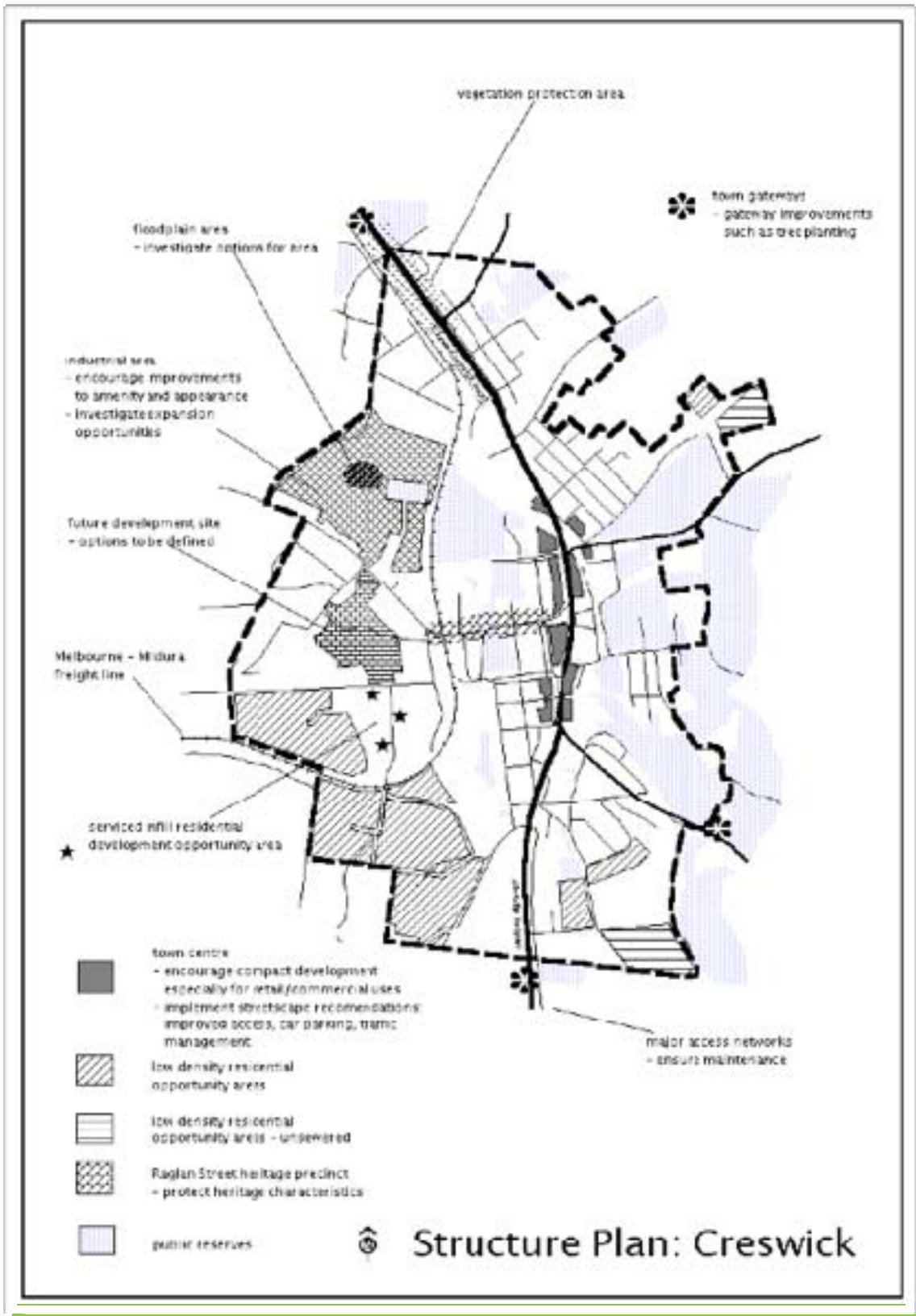
### Public Use Zones

The investigation area is bounded on three sides by public use zones: to the west by the Public Conservation and Resource Zone (PCRZ), to the north by the Public Park and Recreation Zone (PPRZ) and to the east by the Public Use Zone (PUZ4) - Melbourne-Mildura freight line. The extensive areas of PPRZ and PCRZ broadly align with the riparian landscape of the Creswick Creek. The concept design for the investigation area proposes to extend the land in the PPRZ in the north and create a new PPRZ through the centre of the site to link up with existing public recreation and public conservation zones.

The allocation of these areas to public use will require an assumption of management responsibility by an appropriate public authority. The motivation for retaining these areas in public ownership (the whole of the site is currently owned by the Department of Sustainability and Environment) is:

- The protection of Creswick Creek.
- Water quality improvement.
- Recreation links for the Creswick community.

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### Creswick Structure Plan

The Creswick Structure Plan forms part of the Municipal Strategic Statement in the Hepburn Planning Scheme. The plan describes the strategic planning ambitions for the future development of the town. The plan identifies the investigation area as the primary industrial land resource in Creswick. The structure plan seeks to “investigate expansion opportunities”, but perhaps in acknowledgement of the current poor condition of the site, the plan also seeks to “encourage improvements to amenity and appearance”.

This report has addressed both of these strategic objectives by:

- Providing an industrial development design for the site.
- Making provision for residential lots in the vicinity of surrounding residential use.
- Creating more than 7 hectares of additional recreation area to improve the landscape and environmental management of the site.

### Environmental Significance Overlay (ESO1)

The Environmental Significance Overlay in the Hepburn Planning Scheme identifies land that has an environmental constraint. The exact type of constraint is identified in the Schedule to the overlay. In the case of the investigation area, the applicable schedule is ESO1, which refers to:

*Hepburn Shire is situated in the Central Highlands at the source of a number of catchments linked to Port Phillip Bay or the Murray River. Protection of the quality of this water has significant local and regional implications, especially where these catchments provide domestic water supply.  
(Hepburn Planning Scheme).*

The provisions of the ESO means that any earthworks, native vegetation removal or subdivision that may have an adverse impact on catchment water quality will be closely scrutinised, particularly when no reticulated sewerage system is available. In the case of the investigation site, all development is proposed to be connected to a reticulated sewerage system, however, the principles of good environmental management will apply.

The proposed concept plan is intended to establish the design basis for transforming a currently heavily degraded site into a well designed subdivision containing separate areas for industrial and residential development, with significant areas of public land allocated for water quality management.

## Site description

The available land at this site for potential development has a total area of 23.5 hectares.

The site is bounded by Creswick Creek (to the north), Ring Road (to the west), the rear boundary of the residential properties along Luttet Street (to the south) and the former landfill site and residential properties (to the east). The site incorporates the former Dredge Pond and the Transfer Station access road.

### Terrain

The site has been heavily modified; initially by mining and then reshaped or levelled by Council to improve safety, remove banks and fill holes during the 1990's. Most of the site drains freely, however there are some isolated areas where rainwater forms ponds. Council's earthworks also included some erosion control works i.e. sediment fences and surface drainage measures.

The site is traversed by a number of interlinked unpaved tracks, some of which include creek crossings. The creek crossings are fords and do not include culverts or bridges. There are areas of potential instability in the vicinity of steep unsupported embankments around the Dredge Pond. The top of the cliff face at the Dredge Pond was noted as being 14m above the water surface below. The existing terrain is gently undulating with a maximum elevation of 432m and the lowest point having an elevation of 408m. Excluding the waterways and the Dredge Pond, the majority of surface slopes vary from 2% to 5% with a limited area ranging from 10% to 15% (i.e. less than 15%).

### Vegetation cover

On the perimeter of the site there is dense vegetation along the Creswick Creek. Within the site proper there are a few surviving locally indigenous trees along the waterways. There is also a tree buffer plantation along the perimeter of the former landfill site.

The south east part of the site abutting Luttet Street is dominated by a number of large pine trees. Sparse grass cover and light scrub describes the vegetation over most of the site, reflecting the fact that topsoil cover is poor and of variable depth and quality. There is a small number of established indigenous trees and scrub along the watercourse and around the dredge pond. Some sections of the waterway are so densely vegetated as to be inaccessible.

### Hydrology

A portion of the site drains directly to Creswick Creek. The remainder of the site drains to waterways which pass through the site.

The site is traversed by three distinct waterways, described as follows (refer to catchment plan for details):

- An unnamed watercourse which enters the site at the south east corner, via a culvert under Luttet Street, from Lindsay Park and originating south of the rail line.
  - catchment area 175 hectares.
- An unnamed watercourse which enters the site at the south west corner, via an open drain (and dam) through private property, passing under Luttet Street through a culvert from the bushland and pine forests at the south of the residential area south of Luttet Street.
  - catchment area 25 hectares.
- The Dredge Pond, which has no significant upstream catchment.

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The receiving waterway is Creswick Creek. Despite the prevailing dry conditions this creek appears to be a perennial waterway, with readily observable flows estimated at about 0.1 cumecs. The other waterways were noted to be dry and no flows were observed during site inspections. Only the Dredge Pond appeared to have any discharge, with a flow estimated to be less than 0.1 cumecs. The rail line embankment is a significant watershed traversing the east side of the catchment.

### Geotechnical conditions

The project scope does not include any capacity for formal geotechnical investigations. The site is known to have been significantly disturbed as a result of mining and gravel extraction activities over the last 100 years.

No information is available concerning the presence or otherwise of contaminated ground.

There are several open shafts and other excavations within the site that are potentially hazardous and require filling or corrective works. The ground was observed to be dominated by a quartz gravel with an interspersed clay and sand.

## Existing Infrastructure

The existing infrastructure available to or in the general vicinity of the development site is described as follows.

### Water

- The existing mains in Luttet St and Anne Street vary, however the main section is a 100mm AC pipe (laid in 1950).

### Sewerage

- The existing residential area along Luttett Street is drained via an existing sewer which passes through the site. The sewer is a 225mm diameter VC pipe (laid in 1982) and about 2m deep.
- The main town sewer passes along Creswick Creek on the south side. The main sewer is a 450mm diameter VC pipe (laid in 1980) and is estimated to be 2m to 3m deep.

### Power

- There is no electricity infrastructure within the site or the within the immediate vicinity.
- There are no street lights on the Ring Road.
- The nearest available supply is an aerial service along Luttet Street. Powercor advise that it has limited surplus capacity available to service any development without a substantial upgrade.

### Natural gas

- There is no natural gas reticulation within the development site.
- The nearest available gas mains are in Luttet Street and are of limited capacity, i.e. insufficient to meet the needs of any future development of this site.

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## Drainage

- There is minimal drainage infrastructure within the development site. That infrastructure is limited to surface drainage, i.e. unlined open drains.
- The water from the south east upstream catchment passes under Luttett Street via 2 x 1,050mm RCP culverts in Luttett Street and discharges into a highly modified surface drain. The surface drain has several rock drop structures along its alignment.
- The surface drain receives inflows from the dredge pond outfall before passing under the Ring Road via the existing 525mm culvert.

## Roads

- The Ring Road and the Transfer Station access road have a spray sealed surface, the pavement appears to be structurally sound. The road pavements and kerb (at intersection to Transfer Station) drain to open surface drains<sup>1</sup>.
- There are no formal walking paths, cycling paths or shared paths.

# Initial concept design

## Design considerations

An overall industrial development plan was initially prepared on the basis of a staged development to maximise the utilisation of the existing infrastructure in the early stages.

There are significant site constraints that limit the design options.

- The existing infrastructure (i.e. the road and sewer network),
- The terrain (upstream catchments), the Creswick Creek and the Dredge Pond.

The concept design sets aside the Dredge Pond and cliff face for parkland, to be linked back to existing public space via linear park/reserves. An allowance (i.e. increased setbacks) has been made for possible inundation alongside the watercourses during significant storm events.

It is apparent that Creswick Creek has been protected by a buffer that separates the transfer station from the creek and the associated tracks. The concept design continues the application of the buffer, incorporating a setback along the north side of the development, i.e. thereby ensuring creek access for the public is maintained and also providing a buffer between the proposed lots and the creek.

The concept design set out to provide maximum flexibility for industrial development by proposing 2,000m<sup>2</sup> lots, with a super lot option with an average size of 4,000m<sup>2</sup>. This design approach provides the flexibility for consolidation of lots if a large scale industrial development were to materialise.

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<sup>1</sup> Note that the existing road reserve for the Ring Road and the Transfer Station access road do not align with the road pavement.

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The initial concept resulted in a total yield of 71 lots ranging in size from 2,000m<sup>2</sup> to 4,000m<sup>2</sup> to be developed over 8 stages.

#### **Liaison with service authorities**

Discussions were held with Central Highlands Water, Powercor and SP Ausnet (gas). All of the meetings were in Ballarat on Monday 15/6/09. The initial conceptual development layout was presented for discussion purposes.

Telstra declined to engage in the discussion process, preferring an online response.

The feedback and response received from representatives of the authorities has been considered in the preparation of the concept design and cost estimates.

#### **North Central Catchment Management Authority**

Discussions with the North Central Catchment Management Authority in Bendigo (6/8/09) revealed strong views regarding the development of this site, in that the NCCMA will object to any proposals that include piping the watercourse. Disturbance or removal of native vegetation from the creek environment should also be avoided.

## **Revised concept design**

The project steering committee met in July 2009 to review the initial development concept. After considering the likely market (i.e. particularly unsold existing land stocks in Ballarat) and the demand for industrial land in Creswick, the steering committee determined that there would be insufficient demand number of industrial lots proposed in the initial concept design.

It was suggested that feedback from the real estate survey indicated that affordable residential land would find a market in Creswick in the short to medium term. The steering committee concurred with this view and directed:

- b. That the concept design be revised to reduce the total number of industrial lots and include provision for some residential development within the site. The committee determined that the best location for that residential development would be the land to the south east of the site, i.e. abutting the existing residential area.
- c. The land abutting Creswick Creek should be excluded from the proposed subdivision, thereby removing any consideration of piping the watercourse.
- d. A buffer be introduced to protect the buffer plantation along the south side of the landfill site.
- e. Where the industrial sites directly abut existing residential areas, that land use be limited to light industry in the Industrial 3 Zone (IN3Z), thereby creating an effective transitional zone.

See attached plans for details.

After several iterations the revised development layout resulted in the following design;

- An industrial development of 30 lots ranging in size from 2,000m<sup>2</sup> to 3,100m<sup>2</sup> and a super lot of 14,700m<sup>2</sup> (i.e. lot 31, the filled site).
- A residential development of 46 lots ranging in size from 900m<sup>2</sup> to 1,300m<sup>2</sup>.

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The revised development proposal includes provision for the restoration of the watercourse through the residential development area. This work will include realignment of part of the watercourse to favour an improved yield, provide a consolidated services corridor and a more effective drainage outcome.

The existing alignment of the sewer and the existing residential lots fronting Luttet Street would also benefit from this realignment.

## Design components - infrastructure

### *Roads*

The road network is based on the following assumptions:

- The existing road infrastructure is sound and capable of supporting any increased traffic likely to result from this development without any significant upgrades, other than widening of Ring Road and the addition of kerb and channel.
- The Link Road follows the alignment of the existing drainage invert from Luttet Street through the site.
- 25m wide road reserves.
- 12.5m wide pavement (kerb face to kerb face).
- 15m court bowl radii (kerb face to kerb face).
- Modified SM2 kerb profile to avoid kerb crossings.
- Nominal 300mm deep pavement with 30mm type H asphalt surface.
- For convenience, roads have been named generically (see development plan).

### *Electricity*

- Actual electricity demand/loads are unknown, therefore a nominal 20kW & 40 amps/lot is assumed.
- There is limited spare capacity available in the existing reticulation. Assuming initial developments are light industry only, it is estimated that investment in an infrastructure upgrade is likely to be required (by the developer) at the commencement of stage 2 or 3.
- General reticulation to be based upon pole mounted (overhead) aerial bundled cable. The poles will be generally setback about 1.5-1.7m behind kerb. This will allow supply to be readily upgraded to meet any changes in demand.
- Underground cable from poles to service pits at boundaries of adjoining sites.
- Street lighting to be pole mounted, at intersections and every 120m along the street length.
- Up to 3 Kiosk substations are anticipated at locations to be determined by Powercor. Actual requirements will vary with types of development and power load.

### *Sewer*

- The WSA 02 (table 4.1) indicates that a 150mm sewer is acceptable. Some authorities require sewers in industrial areas to be 225mm diameter UPVC pipe.

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- The lots to be developed south of the Dredge Pond will readily drain to the existing Lutttett Street sewer.
- The lots proposed to the north of the Dredge Pond will drain to the main sewer passing along the Creswick Creek.

***Water mains (potable water)***

- The WSA 03 (table 3.1) indicates a 150mm main is necessary to service a light industrial development area of up to 23 hectares.
- The new mains within the estate should be ring mains where practicable, to keep pipe sizes to minimum and allow for pressure equalisation.

***Purple pipe (re-use water)***

- Assume the storm water is treated via WSUD based wetlands systems, to class A standard (as per EPA publication 464.2, 2003), i.e. enabling unrestricted public access.
- Water to be pumped back to Doug Lindsay Recreation Reserve to water the playing fields.
- The supply main will be in a “purple pipe” as per AS.3500 requirements.
- The design proposes to run the pipe within the road reserve alongside the main storm water drain (along the Link Road) on the opposite side of the road to the potable water main.

***Storm water drainage***

- The upstream catchment areas and the proposed sub catchments have been identified within the development.
- The drainage runoff from the main upstream (south east) catchment will be directed along an open unlined watercourse to be restored to simulate a more natural meander geometry and then directed into a new 1,500mm diameter culvert under the Ring Road.
- The drainage from the other upstream catchment will be directed through the site via the existing culvert under the ring road.

***Storm water reuse***

The Hepburn Planning Scheme under clause 56.07-4, Urban Run-off Management Objectives, page 2 of 3 under standard C25 (3<sup>rd</sup> dot point) requires that the urban storm water management system must be designed to meet the current best practice performance objectives for storm water quality as contained in the Urban Storm water – Best Practice Environmental Management Guidelines (Victorian Storm water Committee 1999) as amended.

The “Urban Storm Water – Best Practice Environmental Management Guidelines (BPEMG) 1999” lists the following post construction phase environmental performance objectives for water quality conditions in urban waterways, see table 2.1 page 15.

<b><i>Pollutant</i></b>	<b><i>Receiving Water Objective</i></b>	<b><i>Current Best Practise Performance Objective</i></b>
Suspended solids (SS)	Comply with SEPP (eg. Not exceed the 90 <sup>th</sup> percentile of 80mg/L)	80% retention of the urban annual load.

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Total Phosphorus (TP)	Comply with SEPP (eg. Base flow concentration not to exceed 0.08mg/L)	45% retention of the typical urban annual load.
Total Nitrogen (TN)	Comply with SEPP (eg. Base flow concentration not to exceed 0.9mg/L)	45% retention of the typical urban annual load.
Litter	Comply with SEPP (eg. No litter in waterways).	70% reduction of the typical urban annual load.
Flows	Maintain flows at pre-urbanisation levels.	Maintain discharges for the 1.5 year ARI at predevelopment levels.

The following is a brief outline of our preliminary WSUD and water re-use requirements:

- The BPEMG (fig. 7.3.9) refers to nominal minimum areas as a proportion of the development area.
- The development site is about 23Ha excluding the existing roads.
- Creswick has an annual average rainfall of 742.3mm (BOM June 2009).
- Based on the above, it is estimated an area of about 2% of the development area is required for the wetland (or 5,000m<sup>2</sup>).
- If an allowance for retardation and a permanent storage pond is added to this figure, the following offsite pondage has been estimated.

Wetlands	5,000m <sup>2</sup> (up to 10,000m <sup>3</sup> capacity).
Retardation basin	18,000m <sup>2</sup> (up to 30,000 m <sup>3</sup> capacity for an ARI <sub>100</sub> event, of 2 days duration).
Re-use Storage	3,000m <sup>2</sup> (up to 7,000m <sup>3</sup> capacity).

- The total pondage area, excluding bed and banks etc. will be about 2.6 hectares. The design assumes that the pondage will be sited on the west side of Ring Road and downstream of the existing Dredge Pond outfall, (i.e. just outside the survey extents).
- The wetland and re-use storage may need to be lined with clay to prevent water loss through infiltration.

**Natural gas**

Only a nominal allowance has been made for the reticulation of natural gas. All reticulation costs are to be at the cost of the developer. The agencies do not reticulate gas unless there is a specific need and sufficient load to justify that investment.

## Preferred Concept Design

As described in the preceding sections, the process leading to the selection of a preferred concept design has involved the preparation of a number of development options, informed by:

- 💡 Market evaluation.
- 💡 Environmental constraints and opportunities.
- 💡 Amenity for residents abutting the study area.
- 💡 Amenity for future occupants within the study area.

The preferred design divides the study area into four components:

### Industrial sector

The industrial sector is located in the north of the study area, with access from Ring Road. The industrial use of this road is well established, being the access route to the Waste Transfer Station. The initial stage of the proposed industrial sector is isolated from existing residential areas and buffered by open space. The first stage of the proposed industrial area is on elevated land at the western end of the study area, with lots having direct frontage to Ring Road.

The first stage of industrial development proposes 4–6 lots, ranging in size from 1,518m<sup>2</sup> to 2,200m<sup>2</sup>. The number of lots to be developed in the initial stage will be a determined by demand and development cost.

There is provision in the plan for a second and third stage containing a further 6 lots and 13 lots respectively, generally of similar size to Stage 1, but with some lots exceeding 3,000m<sup>2</sup>. A larger single lot is proposed that is adjacent to the existing transfer station. This lot may be suitable for a future Council depot.

A further Stage (sequence to be determined) is proposed along the south western boundary of the study area, abutting an existing Rural Living Zone. It is recommended that this area, comprising seven industrial lots, be included in the Industrial 3 Zone (IN3Z). The IN3Z is specifically designed for industrial uses close to residential areas.

Any decision to development stages 2 and 3 and the IN3Z stage will depend on the timing and success of stage 1.

### Residential sector

A residential sector is proposed for the south eastern portion of the site, with a separate access from Luttet Street. These lots are proposed as fully serviced residential sites abutting existing residential zone in Luttet and Anne Streets. A total of 33 lots are proposed, with a further 8 lots possible if the existing R1Z in Luttet Street is restructured. The size and configuration of the lots can change to meet demand. The concept design also includes provision for staged development.

### Water capture and public use sector

The concept design allocates approximately 5.2 hectares to a water capture and public use reserve that runs through the centre of the study area and separates the proposed residential zone from the industrial zone. This zone would be used as a community wetland area. This site represents approximately 25% of the site. An additional eastern reserve link and a widening of the PPRZ along the Creswick Creek at the

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northern end of the site are also proposed. These proposed reserves will serve to connect the site with the surrounding public use zones and provide the basis for landscape restoration and water quality improvement.

### **Creswick Creek riparian sector**

As indicated above, the concept design designates all of the land north of the road that links Ring Road with the Waste Transfer Station as a riparian reserve. Responsibility for the management of this land will require consultation with the NCCMA and DSE, however, the purpose in allocating this land is to provide a basis for the restoration of Creswick Creek and the establish a separation distance between the creek and the industrial zone.

## **Cost analysis**

### **Engineers Estimates**

#### ***Basis of estimates***

The engineers estimates relate directly to infrastructure costs. All infrastructure items are based upon the attached drawings which include details of each item of infrastructure. They do not include provision for any contingencies. See the attached schedule for a breakdown of infrastructure costs.

The estimate allows for 4 stages of development and isolates the filled lot (i.e. lot no. 31 to be acquired by Council) as stage 5. Stages 1 and 2 have been costed as separate stages, i.e. as parts A & B.

#### ***Source of costs***

Some items have been costed on recent tender outcomes observed in residential development work (in Shepparton) and industrial development (in Yarrawonga). Other items have been costed from Cordell's Commercial cost guide. Some items of infrastructure have been costed with the direct input of the service authorities.

#### ***Business case analysis - assumptions***

The assessment of the development costs is based upon the following assumptions;

- 🕒 Minimal planning approval costs, i.e. Assuming no significant costs from impact assessments or planning objections.
- 🕒 No land contamination issues; i.e. adopts a uniform undeveloped land cost of \$20,000/lot.
- 🕒 Nominal land values.
- 🕒 No significant geotechnical issues.
- 🕒 No contribution from other benefitting owners.
- 🕒 Average lot size 2,000m<sup>2</sup>.
- 🕒 Target return on capital 20%.

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- Application of a uniform 10% (pa) interest rate to determine the cost of capital, fully funded for a period of 5 years.
- Includes a nominal provision for contingencies.
- All costs based upon present day dollar values.
- Excludes legal fees, stamp duty and titles office fees.
- Excludes fencing costs.
- Nominal allowance for public open space contribution (subject to valuation).

### ***Total development costs - industrial sites***

WHOLE SITE If the entire estate was developed in one stage the likely costs are as follows;

Total lots	30 over a 5 year period
Total development cost (including interest)	\$4,501,315
Development cost per lot before land cost, interest, commissions & profit	\$97,698/lot
Assumed undeveloped land cost	\$20,000/lot
Suggested selling price per lot	\$192,056
Potential net profit after commissions	20% (or \$1.15M)

Stage 1A & B If developed as a separate stage the likely costs are as follows;

Total lots	6 lots
Total development cost (including interest)	\$842,862
Development cost per lot before land cost, interest, commissions & profit	\$90,193/lot
Assumed undeveloped land cost	\$20,000/lot
Suggested selling price per lot	\$179,811
Potential net profit after commissions	20% (or \$0.21M)

Stage 2A & B If developed as a separate stage the likely costs are as follows;

Total lots	11 lots
Total development cost (including interest)	\$2,213,226
Development cost per lot before land cost, interest, commissions & profit	\$117,828/lot
Assumed undeveloped land cost	\$20,000/lot
Suggested selling price per lot	\$257,539
Potential net profit after commissions	20% (or \$0.56M)

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Stage 3 If developed as a separate stage the likely costs are as follows;

Total lots	8 lots
Total development cost (including interest)	\$1,368,308
Dev't Cost per lot before land cost, interest, commissions & profit	\$114,166/lot
Assumed undeveloped land cost	\$20,000/lot
Suggested selling price per lot	\$218,929
Potential net profit after commissions	20% (or \$0.35M)

Stage 4 If developed as a separate stage the likely costs are as follows;

Total lots	5 lots
Total development cost (including interest)	\$1,363,949
Development cost per lot before land cost, interest, commissions & profit	\$193,983/lot
Assumed undeveloped land cost	\$20,000/lot
Suggested selling price per lot	\$349,171
Potential net profit after commissions	20% (or \$0.35M)

Stage 5 If developed as a separate stage the likely costs are as follows;

Total lots	1 x super lots
Total development cost (including interest)	\$1,363,949
Development cost per lot before land cost, interest, commissions & profit	\$256,084/lot
Assumed undeveloped land cost	\$60,000/lot
Suggested selling price per lot	\$426,836
Potential net profit after commissions	20% (or \$0.35M)

### ***Residential development - nominal development estimate***

The brief does not extend to providing a comprehensive analyses of the business case for the residential development. However, recent experience indicates that land development costs for residential land range from \$50,000 to \$70,000/lot.

If this land is acquired at, say \$10,000/lot undeveloped, i.e. \$1.43M in total, the estimated selling price for these lots will be \$150,000 to \$170,000/lot to ensure a 20% real rate of return.

## **Summary of infrastructure development considerations**

### **Apparent incursions**

The field survey detected an apparent unauthorised incursion of fencing and occupation of the development site by an adjoining landholder at the south west corner. It is estimated as much as 8,000m<sup>2</sup> of land may be presently occupied.

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### **Crown land lease**

Council advice is that there is currently a formal crown lease held by an adjoining landholder for the purposes of grazing. The precise extent of the lease and the lease terms are unknown.

### **Vegetation removal**

Should removal of native vegetation be required to implement the concept design, a fauna and flora assessment will be required to determine offset planting and ongoing vegetation management.

### **Storm water re-use**

Development of the site will result in an increase in runoff due to a larger impervious area and drainage infrastructure. It is Council's intention that this additional runoff be captured for reuse as irrigation source for Lindsay Park.

The existing undeveloped site presently sheds approximately 50 megalitres of storm water runoff per annum. If developed, runoff is estimated to increase to about 120 megalitres. The development of a wetland and water storage downstream of the development site will ensure an improved water quality outcome and provide adequate supplies for irrigation of the public open spaces at Lindsay Park. See attached schematic diagram illustrating a suggested arrangement.

There is also further capacity to capture significant quantities of water with the further development of the catchment upstream of the site. The average storm water flow through the site from the upper catchment is estimated to be in the range 500 to 800 megalitres per annum. Further development of land in the upstream catchment will result in a dramatically increased discharge. Council will need to purchase water rights to secure a license to capture and use the increased water supply.

### **Confirmation of cost estimates**

The cost estimates prepared for this report should be considered as preliminary advice. The estimates are based on available information at the time of preparation and from information published Cordell's Industrial & Commercial Cost Guide. It is recommended that quantity surveyors be engaged if more accurate or detailed cost estimates are required. Please also note that construction cost outcomes can vary considerably and are very much dependant upon the prevailing market conditions at the time of construction and the availability of suitable contractors.

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## Funding Opportunities

During the investigation period, discussion with Regional Development Victoria occurred to ascertain funding options for the development of the industrial estate.

Briefing discussions were held with Suzanne Gatz, RDV Business Development Manager for the Grampians Region and Di Barrie, RIDF Program Manager. This report is intended to inform further discussions on funding options for the project.

The Creswick industrial project can be considered under the Small Towns Development Fund and/or the Regional Infrastructure Development Fund. Given the scale of the project, most likely funding opportunity is the RIDF, however, the STDF is restricted to towns of less than 10,000 people and may therefore be a more accessible source for the initial stage of development.

Both funding programs have industrial development as a high priority for funding.

In summary, the pre-requisites required for RDV funding include:

- \$1:\$1 with no 'in kind' component.
- Developed by Council.
- An 'up front' business participant prepared to purchase or lease industrial land - i.e. preferably an 'anchor tenant'.
- A market analysis to identify market interest and to clearly identify the type of businesses being sought.
- Jobs and investment are paramount.
- Prime objective is to sell land ready for industrial use.
- No land banking.

## Small Towns Development Fund

The Small Towns Development Fund is open to towns with less than 10,000 town population. Industrial estates can be considered on a \$1:\$1 basis, excluding land and in kind. Funding can be provided to industrial estates "that will assist in attracting investment and contribute to economic growth."

The constraint is that the maximum grant is \$250,000 per project, which may be insufficient for the scale of the Creswick project. On the other hand, the grant is specifically for land that is municipal property, a Crown reserve, land owned by a public authority, or land held for public purposes by trustees.

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Given that the program excludes the value of the land, this program may be able to assist a ‘stand alone’ stage 1 development.

## Rural Infrastructure Development Fund

*“The objective of the Regional Infrastructure Development Fund is to improve the competitive capacity of regional Victoria and enhance economic development through investment, job creation and the promotion of export opportunities.”*

The program is highly specific to capital works for industrial development, which places the Creswick industrial project firmly within the funding guidelines. For example, the principal example of an eligible project is *“industrial development including physical works to facilitate economic development.”*

## RIDF Eligibility

Submissions need to demonstrate a **significant** number (e.g. more than half?) of the following criteria:

- Economic
- Socio-economic
- State and Regional priority
- Project feasibility and delivery
- Victorian Industry Participation Policy (VIPP)
- Financial

Eligibility criteria	Comment in relation to Creswick
Economic	Improve availability of serviced land for local industry. ‘Anchor’ development or tenant needs to be found.
Socio-economic	Increases local employment. Environmentally sustainable. Respects findings of the Aboriginal Cultural Heritage Assessment.
State and Regional priority	Project is a local priority, but important to balanced regional growth.
Project feasibility and delivery	Lots need to be viable in the local land market. First stage needs to be uncomplicated and timely (maximise existing road and reticulated infrastructure).
VIPP	Only applicable to grants that exceed \$1M.
Financial	Grant funds required to place stage 1 lots on the market with no requirement for recurrent funding for subsequent stages. Financial return from the sale of lots in each stage should be sufficient to ‘seed’ development of next stage.

## Prioritisation

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Projects that get funded are those that increase employment, investment and exports. High priority is also given to projects that are viable, sustainable and are ready to implement.

## Implications for Creswick

Based on the preceding criteria, the Creswick industrial project is likely to attract support from the RIDF if:

- The first stage can be easily and economically implemented.
- An anchor tenant or investor is secured (most likely by incentive).
- The development delivers jobs.
- The project can deliver competitively priced industrial lots.
- The first stage provides a financial return.
- The project is sustainable and improves the local environment.

It is important that the first stage of development provides a return and covers the cost of land. Returns from the first stage can then be applied to subsequent stages, with government grants sought to fund any shortfall. Grant assistance will also be important to realise positive environmental outcomes for the project, particularly water quality.

## Australian Government - Water for the Future

The investigation site is within the catchment of the Creswick Creek at the head of the Loddon sub catchment of the North Central Catchment which forms part of the Murray Darling Basin. Rehabilitation of the site, particularly the drainage lines proposed to be retained in public land, will result in improved water quality within the catchment. Funding may therefore be available from the Australian Government's Water for the Future Program. "Strengthening Basin Communities" is a current program within Water for the Future. As stated in the guidelines: *In this component of the program, local government bodies in the MDB are eligible to apply for funding to systematically assess the risks and implications associated with climate change, with a particular focus on water availability, and then review existing plans or develop new plans to take account of these risks and implications.*

*This funding can be used to prepare plans and business cases for adaptation initiatives which may be eligible for funding under the Water Saving Initiatives component of the Strengthening Basin Communities program.*

# Conclusions

- The investigation site is in a central location in Creswick, with reasonable access to infrastructure services. The Hepburn Planning Scheme provides strategic support of industrial development on the site. There is also a good strategic case for residential use, provided the industrial and residential areas can be separated. The geography of the site will allow this to occur.
- Due to past mining activity, the site is in a degraded condition and does not make a positive contribution to water management in the Creswick Creek catchment.
- An initial development of six industrial lots on Ring Road can be established within the parameters of commercial land development. A decision on the development of subsequent stages can be informed by the performance of the initial stage.
- The development of the whole site for industrial purposes is likely to exceed demand for many years and is unlikely to be viable.
- There is a demand for affordable residential lots in Creswick that could be met by developing land within the south east corner of the investigation site, accessed from Luttet Street. Development of this area for residential purposes would also improve the amenity of existing residences.
- The need to rehabilitate the site, particularly along Creswick Creek and contributing drainage lines, warrants a high priority, although the cost of the rehabilitation work is unlikely to be met from development returns due to the scale and complexity of the rehabilitation works. The environmental rehabilitation of the site may be considered as a separate catchment management project.
- Implementation of the subdivision components of the project (industrial and residential) would be assisted if the land could be transferred from DSE in stages. Alternatively, the sale of the proposed residential component following rezoning to the Residential 1 Zone could fund the purchase of the remainder of the site.
- The concept design proposes retaining a large area in public ownership as a community wetland area through the centre of the site to protect and improve water quality. This land could be placed in the Public Park and Recreation Zone (PPRZ).
- The stage 1 proposal for industrial development on the site appears to meet Regional Development Victoria criteria for grant funds. This will need to be tested on referral of this report to RDV for assessment against program guidelines.
- The residential component of the concept design may be attractive for private investors, which may partially offset industrial development costs.

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- Rehabilitation of the proposed public land component of the site may attract funds from the Australian Government “Water for the Future” program on the basis of revegetation and water quality improvement within the Creswick Creek catchment, which is part of the Murray Darling basin system.

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## References

- AS.3500 - 2003 Australian Standard Plumbing and Drainage (current)
- Australian Bureau of Meteorology – Historic Hydrological Data.
- Guidelines for Environmental Management, Use of Reclaimed Water, (EPA Vic., 2003).
- Hepburn Planning Scheme.
- Integrated Urban Land & Water Management Planning & Design Guidelines, (CRC Freshwater Ecology, 2001)
- Terra Culture: *Aboriginal Cultural Heritage Assessment; an archaeological survey of crown allotments 6, 46 and 2007 in the Parish of Creswick.* March 2007.
- Urban Storm Water Best Practise Environmental Management Guidelines (CSIRO, 1999)