

Clean Coal Victoria

COAL PLANNING WORK: PROCESS & OUTCOMES SUMMARY

CCV was established in 2008, with responsibility for developing a Strategic Plan for Victoria's brown coal resource and consulting the community in the process.

Initially, CCV reviewed the previous work that had been completed on the resource, held community meetings and presentations and developed a perspective on community issues and expectations.

The scope of CCV's work involved:

(1) Understanding the resource and the likely and potential coal development areas and sites

This included the following:

- Developing and enlarging the Coal Mine 3D Model
- Reviewing the Kinhill Study (1982)
- Reviewing the outcomes of key projects on land use and coal development, including the LV2100 Report and follow up reports.
- Providing input to the DPI Policy team, which was responsible for development of the Coal Development & Allocation Strategy (2011).

(2) Completing assessments of current mining costs and considering possible alternative mining costs, including a Value in Use study to ascertain the best coal for future mining

This included the following:

- Strip ratio assessment
- Various technical assessments:
 - Bucket-wheel and conveyor bulk coal mining techniques (Loy Yang, Hazelwood models)
 - Bulldozer push to conveyor feed station costs (Yallourn model)
 - Truck and shovel assessment
 - Dragline assessment
- Value in Use Study

(3) Considering the impact of mining on the environment from a community, biodiversity (fauna and flora), cultural heritage and rehabilitation perspective

These areas which are relevant to future development of the resource were considered by CCV. Key stakeholders (including government agencies and local councils) and communities were engaged in the process, through briefings, conferences etc.

(4) Assessing current land use, zoning and the adequacy of these to enable potential development, considering community needs and rehabilitation of exhausted mining areas

- Engaged with Latrobe City and Wellington Shire on land planning matters
 - Worked with the Regional Planning Manager (DPCD) and RDV on planning matters
 - Contributed to the Gippsland Regional Planning project.
- (5) Considering potential impacts on existing infrastructure of any resource development and also the potential needs of infrastructure to process coal and transport product to market.**
- Worked with the (government) GRIS study team to identify infrastructure needs for the State
 - Worked with the relevant industry group on the GRID Infrastructure Study.
 - Worked with the Victorian and Regional Transport Study teams.
- (6) Considering the potential rehabilitation of worked out (exhausted) mines and the uses that such structures (land forms) can be put to for future generations, taking into account land use, safety and sustainability of land forms.**
- Completed a scoping workshop which defined possible uses and options for mine voids post mining, which recommended that:
 - (i) CCV develop a rehabilitation vision for the future, and
 - (ii) Government's Earth Resources Regulation function develop a safe and stable rehabilitation scenario to apply to the vision for the future.
 - Completed studies around rehabilitation options, including:
 - a Literature Review (by a final year University student) of mine rehabilitation reports to gain an understanding of the work done to date in this area.¹
 - a Water Balance Study at Loy Yang (by a final year student) to assess the potential of mine flooding as a solution to mine rehabilitation.²
 - a Mine Rehabilitation Study (by a Masters student) into the possible use of modern graphics to develop a vision of potential outcomes of applying different rehabilitation planning to future mine voids.
 - Completed a Visioning Study: outcomes of an international competition led by RMIT to create visions for the future of the Latrobe Valley and surrounds (including options for land forms for future uses of mine voids). This project includes visualization of possible outcomes of the options, based on specified parameters and volumes of material to achieve the outcomes.
 - Safe and stable project: Note that DSDBI Earth Resources Regulations (ERR) have commenced a Safe and Stable project that will produce a set of mine planning parameters that will be applied to future mines in an effort to produce a safe and stable long term mine structure.

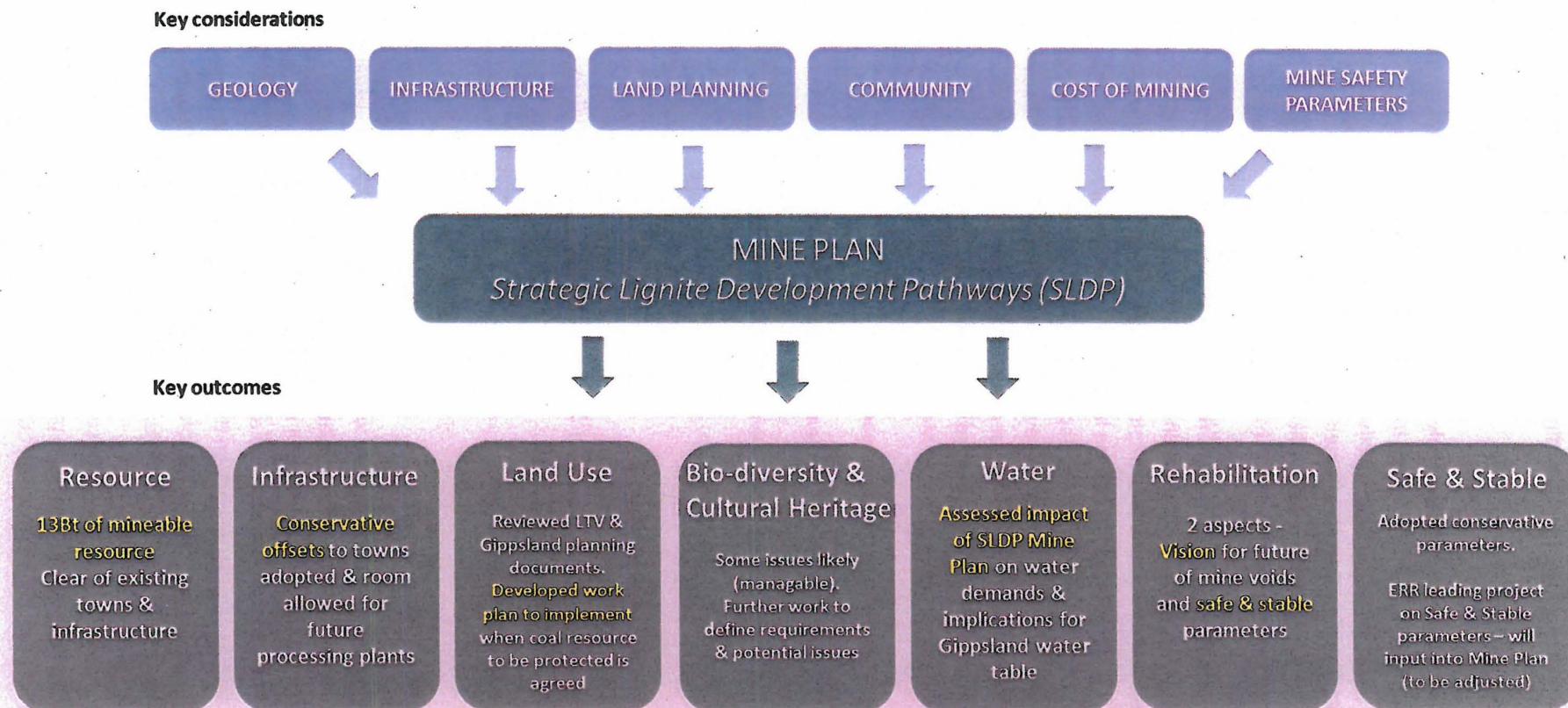
The graphic (flow chart) below shows how these subject areas, various inputs and pieces of work were used to develop a comprehensive Mining Plan (The *Strategic Lignite Development Pathways, or SLDP*) based on the resource, community interactions, cost of mining and resource value, current land planning and land use, existing and future infrastructure and mine rehabilitation scenarios.

¹ Adele Carpenter.

² Adele Carpenter.

CCV - Coal Planning Process and Outcomes

The outcomes from the Mine Plan (outlined below) informed development of a program for the next stage of work required to ensure that the coal resource is available for future development and that mining is sustainable and safe.



Each of the six key areas of work outlined in the diagram above are expanded on below.

THE RESOURCE

The SLDP is a comprehensive analysis of the coal resource and the inputs as outlined in the diagram above. The SLDP brings together a concept of development that compliments the use of the resource and allows the existing community to be involved in resource development but not significantly adversely affected by that development. Its key feature is a Mining Plan that shows how the resource is most likely to be developed over time across five key coal areas, based on three mining scenarios (high, medium, low) that extend over 100 years.

The potential development identifies 13 billion tonnes (Bt) of mineable coal in the Latrobe Valley (in this region, 2Bt has been mined in the past 100 years since development commenced), which does not impinge on the existing town boundaries. This work shows that there is some potential to release land that is currently encumbered by coal protection overlays, but unlikely to be developed in the future. It is noted that there is more coal available than the 13Bt outlined, but the development of these additional areas would require significant community disruption (eg. the area west of Morwell has been left as an infrastructure corridor as the alternate routes to put road and rail infrastructure in are costly and would still require significant work to get access to Morwell).

Relevant Reports (included in package):

Strategic Lignite Development Pathways (GHD, Nov. 2012)

Victorian Coal – A 2006 Inventory of Resources (GHD, Aug. 2007)

LVTV2100 Coal Resources Project (GHD, Sept. 2005)

Value of the Resource:

Economic impact of Brown Coal Drying and Stabilising CTX Projects (Ernst & Young, Nov 2012)

INFRASTRUCTURE

The main focus through the SLDP work has been in the areas of existing infrastructure likely to be affected by potential mining plans. This includes roads, waterways and local features. The expected impacts are minimal and all have alternates that are achievable and allow for a compromise between mining and environmental and community balance. The second activity in this area has been the work on the infrastructure likely to be required to process coal to product. Concept sites are available for this purpose, but need to be finalised once the resource use and processing needs are understood.

A major issue that emerges from coal discussions is that of infrastructure required to get product to market, which reflects market interest in developing potential new (non electricity generation) products from coal. CCV understands that lead responsibility for this work rests

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Summary**

Coal Planning work - Process & Outcomes

with the Coal Development Taskforce. CCV has contributed to early work by the government's GRIS team, and has also engaged with the industry GRID team (both of which developed a plan considering infrastructure needs and options) to ensure that GRID planning was complimentary to the resource planning of CCV. CCV has also been involved and a reviewer of the Regional and State transport studies.

Relevant Reports (included in package)

Victoria, The Freight State - Victorian Freight & Logistics Plan (State Govt. of Victoria, Aug 2013).

Victorian Freight & Logistics Plan (Draft), (Dept. Transport, Oct 2012)

Gippsland Regional Roundtable - Stakeholder Feedback (Draft), (Capire)

LAND USE

The SLDP Mine Plan has been developed with due consideration of existing land uses, however, these have not dictated the outcomes. In developing the Mine Plan, CCV has engaged with local government and the community to understand the issues and develop a plan which does not unduly constrain resource development. Outcomes from such considerations has led to release of land at Newborough, Longford and the Special Use Zone 5 corridor which is no longer suitable for future coal development. However there are some areas of land that community would like released but are located on top of very good coal resources. These areas are identified in the SLDP and recommended for continued protection for future development.

The land use reports (by SKM) completed after the LV2100 Study was published have been refreshed on the basis of the newer (ie. SLDP) Mine Plan. The recommendations outlined in these refreshed reports are ready to implement, once the government decides on the areas of coal that it wishes to develop and therefore protect into the future.

Relevant Reports (included in package)

Strategic Lignite Development Pathways (GHD, Nov. 2012)

Developing the Latrobe Valley Resources Future: Coal Resources Planning Provisions Review (Update), (SKM, May 2013)

Memorandum - Developing the Latrobe Valley Resources Future – Recommendations (SKM, May 2013)

ENVIRONMENT (Water, Bio-diversity, Safe and Stable and Rehabilitation)

Following the (SLPD) Mining Plan, a series of workshops were run to identify the areas of further study to allow/facilitate the implementation of this Plan.

The following is a status report of each area of study.

Water. Coal mining in the Latrobe Valley impacts water systems. A Hydrology Study was initiated in mid 2013 to consider the current status of dewatering of existing mines, the potential new dewatering levels required to meet the proposed Mine Plan and to suggest mitigation strategies if there could be detrimental impacts. This study is complete.

Key findings are that:

- Existing mining in the Latrobe Valley is drawing less water than the licences permit,
- Potential mining would slightly go above existing licences and
- That when future mining gets to the deep coals (ie. below existing mines), the demands for water increase substantially.

The report also notes that the impact of internal dumping (ie. filling mine voids with extracted materials, after coal is removed) can reduce dewatering demands by as much as 15%. Therefore, there is a link between mine dewatering, internal dumping and the value of deep coal. This is an additional area of study that should be scoped and considered for future work in this area. However, the Hydrology Study work indicates that for the initial increase in mine activity to develop the resource the impact on dewatering should be manageable and acceptable for a sustained mining outcome.

Relevant Reports (included in package)

Groundwater Impacts & Management for Lignite Mining in the Latrobe Valley (Draft, GHD, Dec. 2013)

Water Balance at Coal Mine Closure: A Conceptual Model for the Latrobe Valley (A. Carpenter, RMIT, June 2010)

Bio-diversity (native vegetation, flora and fauna) and Cultural Heritage. The Bio-diversity work has been scoped, and is currently in the final stages of an external peer review (to be completed in early January 2014). The Cultural Heritage workscope will follow shortly thereafter. This work will then be ready to go to market, for expert consultants to be appointed to complete the work by April 2014.

Relevant Documents (to be provided once finalised – January 2014)

Draft Workscope - Biodiversity Review (CCV, Jan 2014)

Draft Workscope - Cultural Heritage Review (CCV, Jan 2014)

Safe and Stable land forms and Mine Rehabilitation. The vision for future mines is a lowered land form that is safe and stable and has potential to be used for community recreation, industrial use and development of forests, with land forms visually acceptable to the community. This can be achieved with a balance between internal dumping, mining with the end in mind and the use of water, forests and community assets. It is desirable to incentivise miners to mine in a manner that is safe and stable today, tomorrow and leaves a stable structure for the future.

There are several aspects to ensuring safe and stable land forms both during mining activity and after mining has ceased. Work across DSDBI is exploring these aspects for current and future mining. Earth Resources Regulations (ERR) is commencing a study into the two aspects of mine safety, which will take some time. Hence, CCV has based its work on the SLDP on a conservative set of mining parameters - parameters that have been used in mine planning for many years, with an additional factor of safety applied to ensure that mine designs are safe today and into the future. These conservative assumptions used by CCV can be tested once the researched values for mine safety are concluded by ERR.³

Safe and stable land forms and mining parameters for the final mining voids are also impacted by water issues, whether internal or external dumping is used and the amount of lowered land forms that are to be long term stable structures. The intersection of these factors means that they need to be considered together. It is noted that the more material placed in worked out voids potentially means more stable land forms and lower impacts on water.

Relevant Reports (included in package)

Latrobe Valley Mine Visualisations Report, and Digital Files (CD) (RMIT, Nov 2013)

Mine and Power Station Closure Under Contract Closure - Implications and Costs (URS, June 2012)

Review of Geotechnical Aspects of the Proposed Traralgon By-Pass Road in Relation to Proposed Lignite Developments (Red Earth Geosciences, June 2013)

³ CCV has used the Geotechnical Risk Zone (GRZ) developed by ERR in 2012 and has applied its offset distances from top of mines to towns and infrastructure. This is a conservative approach, as it is usually applied from the base of the mine. The added factor of safety of the mine batters is added into the offset distances. The impact of this is a theoretical assumption of coal in the mine that is lower than the normal GRZ application would yield for a resource development strategy and plan.

The work completed by CCV to date has led CCV to recommend the following:**1. The need to incentivise mining operators to mine responsibly (rehabilitation)**

To achieve this, a bond system is needed that incentivises operators to act appropriately, as operations progress and take into account of the deferred cost of rehabilitation. A balance in mining efficiently should be sought, working towards the long term vision of the use of the void past mining. This is a complex issue but needs consideration in the next few years so that the existing mines and the potential future mines are driven to the best whole of life results.

2. The need to encourage internal dumping of mine waste into mine voids, rather than disposal elsewhere

The areas of land rehabilitation, water and safe & stable land forms are intimately linked. Internal dumping can have an enormous impact on mine stability, mine dewatering and future rehabilitation. Internal dumping can reduce dewatering by 15%. It can reduce the lowered land form by adding weight and material in base of mine & thus improve mine stability. The next study in this area is to determine if the deep coal below existing mines is economic or best left to allow sustainable mining and less costly rehabilitation and mining operations.