Coalspur Mines Limited

The Coalspur Coal Projects, Hinton, Alberta

Project No. 04372 / V1428

NI43-101 Technical Report

31 July 2014

Qualified Persons:

Name: Grant van Heerden, Pr.Sci.Nat.

Name: Murray Lytle, P.Eng., MCIM, MAPEG Alberta

Name: Paul Franklin, P.Eng.

Final

SNOWDEN

www.snowdengroup.com

Office Locations

Perth

87 Colin St, West Perth WA 6005
AUSTRALIA

PO Box 77, West Perth WA 6872
AUSTRALIA

Tel: +61 8 9213 9213
Fax: +61 8 9322 2576
ABN: 99 085 319 562
perth@snowdengroup.com

Brisbane

2 Burke Street, Woolloongabba QLD 4102 AUSTRALIA

PO Box 2207, Brisbane QLD 4001
AUSTRALIA

Tel: +61 7 3249 0800
Fax: +61 7 3249 0111
ABN: 99 085 319 562
brisbane@snowdengroup.com

Johannesburg

Technology House ,Greenacres Office Park, Cnr. Victory and Rustenburg Roads, Victory Park
JOHANNESBURG 2195
SOUTH AFRICA

PO Box 2613, Parklands 2121
SOUTH AFRICA

Tel: + 27 11 782 2379
Fax: + 27 11 782 2396
Reg No. 1998/023556/07
johannesburg@snowdengroup.com

Vancouver

Suite 600, 1090 West Pender St,
VANCOUVER BC V6E 2N7 CANADA

Tel: +1 604 683 7645
Fax: +1 604 683 7929
Reg No. 557150
vancouver@snowdengroup.com

Belo Horizonte

Afonso Pena 2770, CJ 201 A 205
Funcionários, 30.130-007,
BELO HORIZONTE MG BRASIL

Tel: +55 (31) 3222-6286
Fax: +55 (31) 3222-6286
belohorizonte@snowdengroup.com

London

I Kingdom Street, Paddington Central,
LONDON W2 6BD UK

Tel: +44 (20) 3402 3022
london@snowdengroup.com

Website

www.snowdengroup.com

IMPORTANT NOTICE

This report was prepared as a National Instrument 43-101 Technical Report, in accordance with Form 43-101 F1, for Coalspur Mines Limited by Snowden. The quality of information, conclusions, and estimates contained herein is consistent with the level of effort involved in Snowden's services, based on: i) information available at the time of preparation, ii) data supplied by outside sources, and iii) the assumptions, conditions, and qualifications set forth in this report. This report is intended to be used Coalspur Mines Limited, subject to the terms and conditions of its contract with Snowden. That contract permits Coalspur Mines Limited to file this report as a Technical Report with Canadian Securities Regulatory Authorities pursuant to provincial securities legislation. Except for the purposes legislated under provincial securities law, any other use of this report by any third party is at that party's sole risk.

Prepared By:

Grant van Heerden, Pr.Sci.Nat.
SACNASP
Principal Consultant

Ross Broadley
MAusIMM
Principal Consultant

David Warren P.Eng
M.Sc., B.A.Sc.
Principal Consultant

Murray Lytle, P.Eng.
MCIM, MAPEG Alberta
Sr. Principal Consultant

Paul Franklin, P.Eng
MCIM
Principal Consultant

Reviewed By:

David Lawrence
MAusIMM
General Manager – Coal and Mining Engineering

Murray Lytle, P.Eng.
MCIM, MAPEG Alberta
Sr. Principal Consultant

Issued by: Vancouver Office

Doc Ref: V1428_Coalspur_Vista_NI43-101 FINAL Conformed

Last Edited: 31 July 2014

Tables

Figures

1 Summary

This Technical Report prepared by Snowden Mining Industry Consultants Inc. ("Snowden"), describes the Coalspur Coal Projects, a group of mineral exploration development areas located east of Hinton, in the Province of Alberta, Canada. The Coalspur Coal Projects are indirectly owned by Coalspur Mines Limited ("Coalspur").

Coalspur retained Snowden to update the technical report entitled "Coalspur Mines Limited: Updated Resource Estimate for the Vista Coal Project – Hinton, Alberta, Canada" dated September 12, 2012 (prepared by Golder Associates Limited, available on **www.sedar.com**), to include previously announced revised capital expenditure estimates for the Vista Coal Project.

This Technical Report further includes previously, and separately, published estimates for the Vista South Coal Property which has contiguous leases to the Vista Coal Project but occurs in a separate coal sub-basin ("Resource Estimate for the Vista South Coal Property", Moose Mountain Technical Services, 25 June 2012, **www.sedar.com**).

1.1 General

The Coalspur Coal Projects (the "Projects") are situated immediately east of Hinton in Alberta, Canada (Figure 1-1). The Projects are comprised of two separate coal deposits divided into three individual project areas. Two projects are contiguous, these being the main Vista Coal Project and the recently acquired Vista Extension. One project, Vista South, while connected geographically, occurs in a separate sub-basin to the south of the main Vista Coal Project. The consolidated leases are presented in Figure 1-2. All three projects are targeting thermal coal.

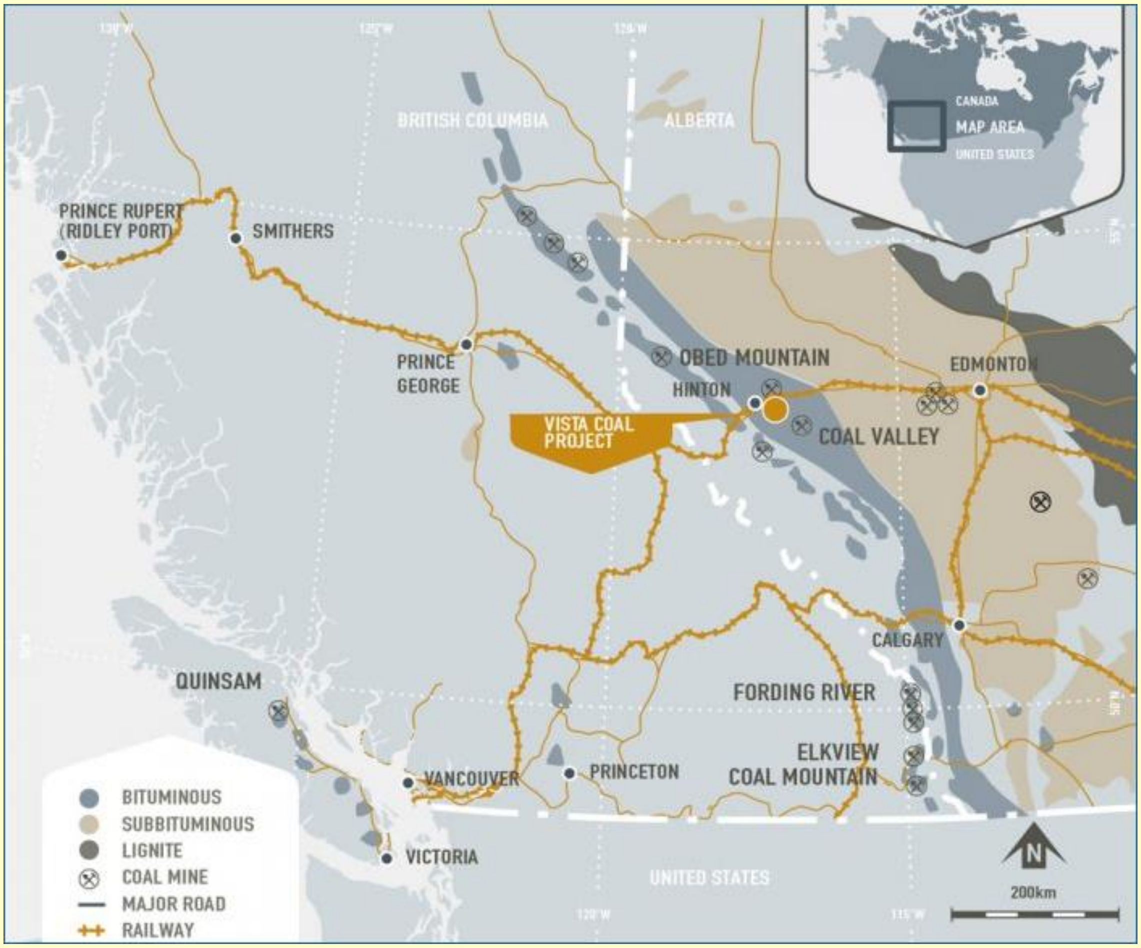
Throughout this Technical Report the terms "Vista Project" and "Vista Coal Project" will refer only to the main Vista Coal Project which has been the subject of a feasibility study and is the only area of the Coalspur Coal Projects for which Mineral Reserves have been estimated and declared. The other two projects, Vista South and Vista Extension, have only had Mineral Resources estimated and declared.

The Vista Coal Project is targeting a gently dipping series of sub-cropping coal measures along a strike length of approximately 20 km at low strip ratio. Coalspur acquired the Vista Project in several stages through the acquisition of various contiguous leases: Hinton West and Hinton East from Consolidated Tanager Limited in early 2009; Z Block and the McLeod River North blocks from Mancal Coal Inc. in June 2010.

The coal bearing strata within the Vista Project areas form part of the upper Saunders Group from the Coalspur Formation. There are four principal seams of economic interest: the Val d'Or; the McLeod; the McPherson, and the Silkstone seams. Several minor seams are also known to occur but these are limited in extent and do not contribute materially to the overall Coal Resource estimates.

The coal is a moderate rank high volatile bituminous coal (High Volatile Bituminous C - ASTM Classification) suited to steam raising. Two products are contemplated: a premium product targeting a calorific value of 5,800 kcal/kg on a gross as received ("GAR") basis; and a secondary product targeting 5,550 kcal/kg GAR.

Figure 1-1 Vista Coal Project Locality Map

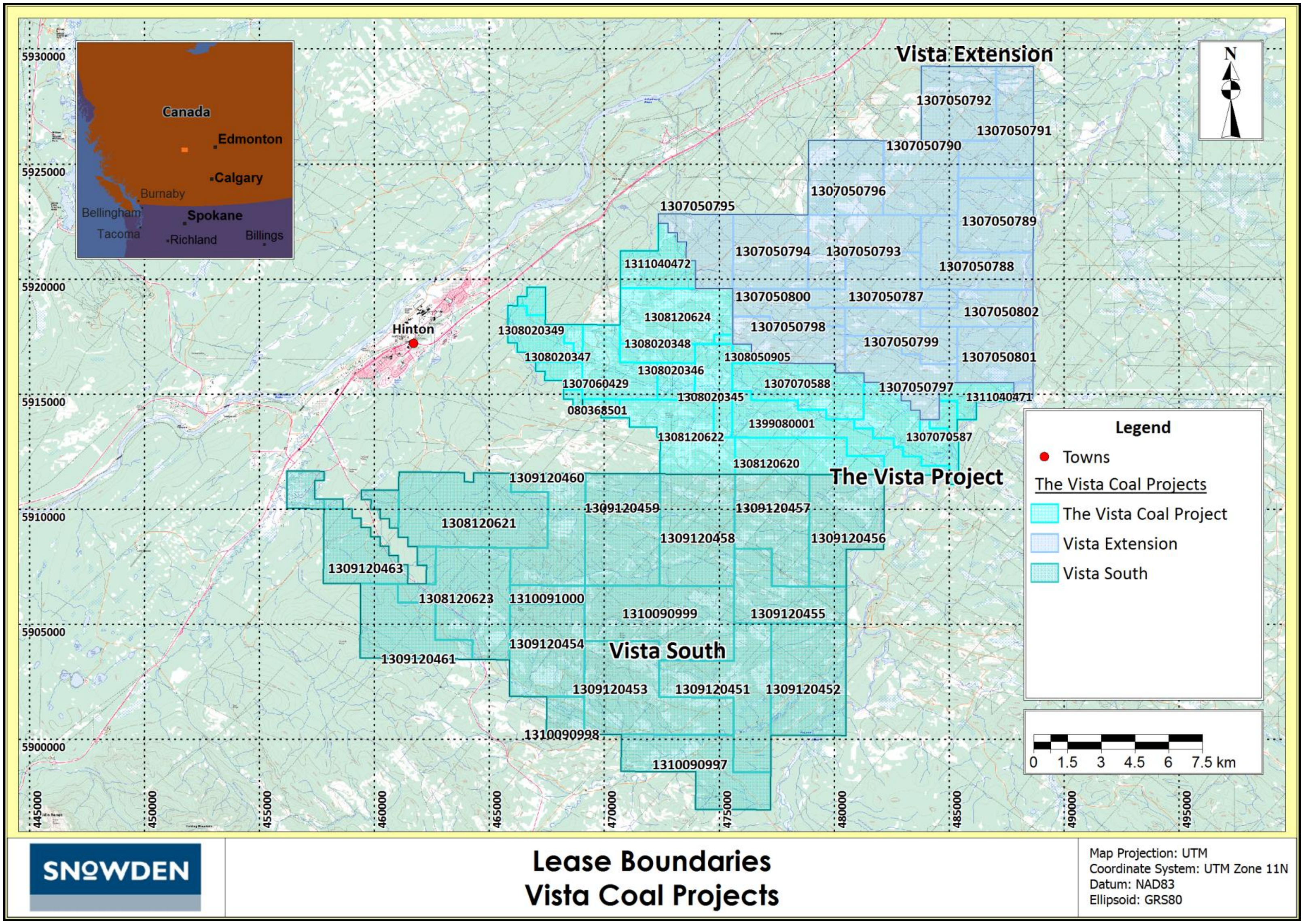


SNOWDEN	Regional Locality The Vista Coal Projects	Source: Coalspur, 2014

1.2 Location and Access

The Coalspur Coal Projects are located east of Hinton in Alberta, Canada, approximately 280 km west of Edmonton. The Vista Coal Project (and Vista Extension) is directly accessible from Hinton via the McPherson Creek logging road (owned and maintained by West Fraser Timber Co. Limited), while Vista South is accessible via the Yellowhead Highway (highway 16) and the Robb logging road (owned and maintained by West Fraser Timber Co. Limited).

Figure 1-2 Vista Coal Project Lease Boundaries (www.energy.alberta.ca), 2014



1.3 Geology, Structure and Hydrogeology

The following summarises the general geological and structural features of the Vista Coal Projects. Figure 1-3 presents the regional geology of the area.

1.3.1 The Vista Coal Project

Coal associated with the Vista Coal Project occurs along the eastern margin of the Rocky Mountain Foothills Disturbed Belt. The most prominent structural feature is the Pedley Fault which trends northwest-southeast along the southwestern boundary of the Vista Coal Project lease and separates the faulted, steeply dipping strata in the west from the gently dipping, monoclinal strata that underlie the Vista Coal Project.

Four stratigraphically continuous and laterally persistent, sub-cropping coal zones have been intersected on the property along a 22 km strike length from the Athabasca Valley (NW) to the McLeod River (SE). The coal zones are named in descending order as the Val d'Or, McLeod, McPherson and Silkstone Zones. Each zone consists of multiple coal plies separated by clastic parting material of variable thickness. The aggregate total coal thickness of the combined zones averages approximately 28 m over some 200 m of vertical stratigraphic interval.

The structural style is a simple monocline trending 300° and dipping gently at 6° northeast at the northern boundary of the property to maximum of 15° at the southern boundary on the McLeod River.

The property is overlain entirely by a mantle of glacial till and alluvium which varies from 5 m to 30 m in thickness. Consequently, all stratigraphic and structural conclusions are based entirely on drillhole data modelling and interpretations.

Investigations indicate that near-surface groundwater flow follows ground surface topography in a south to southeasterly direction towards McPherson Creek. The water table is generally about 5 m below surface except at elevated areas in the northwest and in the southeast areas of the McLeod River Block where the groundwater table is interpreted much deeper at about 12 m to 17 m below the surface.

1.3.2 Vista Extension

Vista Extension is contiguous with the main Vista Coal Project and it represents the down-dip continuation of the geology as described above. Within Vista Extension, the primary seams of potential economic interest are the Val d’Or and McPherson seams.

1.3.3 Vista South

The rocks underlying Vista South form part of a thick sequence of continental sediments from the Saunders Group that overlies the marine Wapiabi Formation of the Alberta Group. The Upper Cretaceous-Tertiary Saunders Group is over 3,600 m thick and is divisible into the Brazeau, Coalspur and Paskapoo Formations. Although all three units include carbonaceous partings and thin coal seams, major coal deposits are restricted to the Coalspur and Paskapoo Formations.

The coal bearing upper part of Coalspur Formation consists of approximately 300 m of interbedded sandstones, siltstones and carbonaceous to bentonitic mudstones and several thick continuous coal zones. True bentonite and tuff layers are present, most commonly associated with the coal zones.

Six persistent and correlatable coal zones have been identified in the Hinton region. In descending order they are identified as the Val d'Or, Arbour, McLeod, McPherson, Silkstone and Mynheer zones. These zones are typically multi ply coal seams interbedded mudstone/bentonite partings and can range in thickness from 1 m to up to 3.5 m. The most significant zones present on Vista South are the Val d'Or, McLeod, McPherson and Silkstone zones.

The Coalspur Formation at Vista South is buried in subcrop along the margins of the Entrance Syncline. This large, asymmetrical fold structure extends from the Athabasca River valley south eastwards to the Lovett River over a strike length of 70 km. The axial hinge is parallel to the Rocky Mountain Front Range. On Vista South, the structure is divided into:

- The Southwest Limb: trending northwest/southeast at steep dip angles ranging from 45° to 65° northeast.
- The Nose Area; extending across the syncline structure from the southwest limb to the northeast limb. A relatively flat bottom syncline structure plunging gently between 8° and 10° southeast.
- The Northeast Limb: extending from the Nose to the Gregg River and truncated to the northeast by the major Pedley reverse thrust fault which separates the Entrance Syncline from the adjacent Prairie Creek Anticline. The dip angle on this limb increases from 20° near the Nose to 35° and finally near vertical where it is directly overthrust by the Pedley Fault. South-eastward from this point, the structure is uncertain. Extreme deformation and structural repeats of the coal seams have been observed in drilling near the Pedley Fault overthrust on the Ski Hill Road which was intensely drilled by Denison in 1981.

The property is overlain entirely by a mantle of glacial till and alluvium which varies from 5 m to 30 m in thickness. Outcrops are limited, and consequently all stratigraphic and structural conclusions are based mainly on drillhole data.

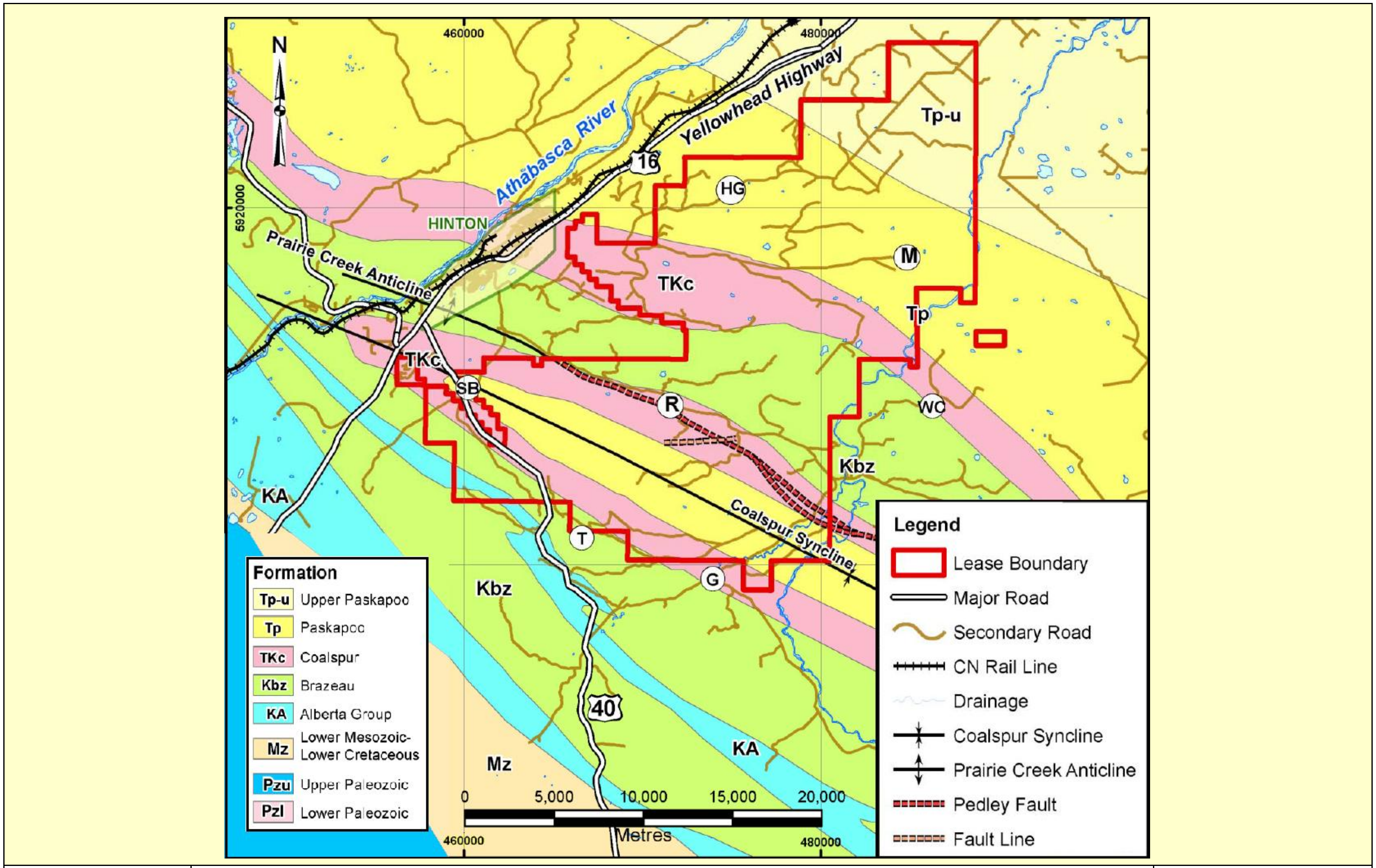
1.4 Adjacent Properties

In December 2013 the Westmoreland Coal Company ("Westmoreland") bought the coal assets of Sherritt International Ltd ("Sherritt") and now owns and operates the nearby Coal Valley mine (located to the south of the Vista Coal Project), which produces export thermal coal from the Coalspur Formation.

Westmoreland also owns the Obed Mountain Mine (currently inactive) 25 km northeast of the Vista Coal Project. The coal at Obed Mountain Mine occurs in the Paskapoo Formation, which is of lower rank and is stratigraphically above the Coalspur Formation.

Sherritt will continue to work with Westmoreland on the Obed Mountain Mine remediation plan, and will continue to meet all financial obligations resulting from the October 2013 Obed Mountain Mine containment pond breach.

Figure 1-3 Regional Geology of the Project Areas (economic targets are hosted in the Coalspur Formation, TKc)



SNOWDEN	Regional Geology The Vista Coal Projects	Source: Golder, 2012

1.5 Status of Exploration and Drilling

The Coalspur Coal Projects have been explored and drilled sporadically by 4 companies since the early 1970's. More than 390 core and rotary holes have been drilled for a total length of over 35,000 m.

The most recent exploration drilling was undertaken by Coalspur and was completed in 2012. The drilling successfully verified previous exploration drilling results and provided more detailed information from in-fill drilling.

Currently there is no exploration underway at any of the Vista Coal Project sites.

1.6 Project Ownership

Coalspur currently holds 55 individual coal lease agreements and three coal lease applications in the Hinton area. Within this area, the Coalspur Coal Projects consist of 22 contiguous leases comprising the Hinton West, Z Block, Hinton East, Vista South, Vista Extension and McLeod River North Coal Resource Blocks. All of these leases are held directly, or in escrow, by Coalspur.

Coalspur purchased the five Hinton East and Hinton West coal leases from Consolidated Tanager Limited ("Tanager") on February 19, 2009. The Tanager leases, held in escrow, are subject to a final payment of C$10 million on the earlier of February 19, 2016, or coal production from the Tanager Leases reaching 90,000 tpm over a three month period, and an ongoing 1% gross revenue royalty for coal sold from those leases only. Coalspur executed an option to purchase agreement with Mancal Coal Inc. ("Mancal") to purchase a 100% interest in the McLeod River North and Z Block leases in October, 2010. The leases were transferred to Coalspur on October 21, 2010. Two additional Crown coal leases inside the Mine Permit boundary were obtained from the Government of Alberta in May 2011 after the Mine Permit was transferred to Coalspur. Coalspur holds additional coal leases to the south of the Vista Coal Project (Vista South) and also to the northeast of the Vista Coal Project (Vista Extension). Nexen sold the Vista Extension leases to Coalspur at the end of March 2012 and the transfer took place on May 8, 2012.

1.7 Coal Resource Estimates[1]

Coal Resources have been estimated from geological models constructed using the exploration drill hole data. Several iterations of the models using various software systems and methodologies have been undertaken recently.

1.7.1 The Vista Coal Project

As part of the Vista Coal Project Feasibility Study, Snowden reported in its Technical Report, dated 26 January 2012, Coal Resources for the Vista Coal Project. These estimates were updated by Golder later in 2012 and are presented in Table 1-1.

[1] *Coal Resources are inclusive of Coal Reserves*

Table 1-1 Coal Resource Estimates for the Vista Coal Project

Description	Measured (Mt)	Indicated (Mt)	*Measured + Indicated (Mt)*	Inferred (Mt)
In Situ Coal Resources	686.0	369.9	***1,055.9***	460.9

1.7.2 Vista Extension

As a part of updating the Snowden (2012) Technical Report, Golder incorporated estimates for Vista Extension in the estimate presented in their Technical Report dated 12 September 2012. The estimates for each (Vista Coal Project and Vista Extension) were not presented separately as the two areas are contiguous. Table 1-2 shows the combined estimates prepared by Golder (2012).

Table 1-2 Coal Resource Estimates for the Vista Coal Project and Vista Extension

Description	Measured (Mt)	Indicated (Mt)	*Measured + Indicated (Mt)*	Inferred (Mt)
In Situ Coal Resources	692.5	537.1	***1,229.6***	1,430.2

Coal Resource estimates for Vista Extension are presented in Table 1-3.

Table 1-3 Coal Resource Estimates for Vista Extension

Description	Measured (Mt)	Indicated (Mt)	*Measured + Indicated (Mt)*	Inferred (Mt)
In Situ Coal Resources	6.5	167.2	***173.7***	969.3

1.7.3 Vista South

Moose Mountain Technical Services ("MMTS"), in 2012, prepared a Technical Report, dated June 25, 2012 (available on www.sedar.com) in respect of Vista South. Estimates presented in that report are summarised in Table 1-4.

Table 1-4 Coal Resource Estimates for Vista South

Description	Measured (Mt)	Indicated (Mt)	*Measured + Indicated (Mt)*	Inferred (Mt)
In Situ Coal Resources	210.6	259.7	***470.3***	604.6

1.8 Coal Reserve Estimates

This section is pertinent to the Vista Coal Project only.

1.8.1 Basis of estimate

An NI41-103 Mineral Reserves Estimate was previously reported for the Vista Coal Project in "September 2012 - Coalspur Mines Limited: Feasibility Study of the Vista Coal Project, Hinton Alberta", (Snowden). The report details the mining evaluation studies conducted to develop a detailed mine plan and financial analysis for the Vista Coal Project project.

Since September 2012, Coalspur has investigated ‘terrace mining’ methods using truck and shovel fleets instead of draglines. Furthermore, contract mining has been adopted as a preferred approach over owner operator. Coalspur has most recently (Q1 2014) been engaged in discussions and studies with Thiess Pty Ltd (mining contractor) to advance the terrace mining alternative.

The principal impact to the mine plan through the use of a contractor is the elimination of a significant sum of start-up capital at the expense of higher operating costs.

The current reserve estimates differs from previous estimates primarily due to changes in coal pricing.

Areas excluded from the Mineral Reserve are included in the Mineral Resource estimates.

The coal processing flowsheet has also been changed since the 2012 NI43-101 report and coal rejects will be dry stacked and blended with mine waste in the mine dumps thus eliminating the requirement for a tailings management facility.

1.8.2 Modifying Factors

In accordance with NI 43-101 at the time of compilation of the original January 2012 Technical Report (Snowden), the definitions of “Mineral Resource” and “Mineral Reserve” as set forth in the updated CIM Definition Standards adopted November 27, 2010 (CIMDS) by the Canadian Institute of Mining, Metallurgy and Petroleum Council were adopted for estimating coal resources and reserves for the Vista project coal deposit.

A Mineral Reserve is defined as “… the economically mineable part of a Measured or Indicated Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified. A Mineral Reserve includes diluting materials and allowances for losses that may occur when the material is mined.”

A Mineral Reserve is subdivided into two classes, Proven and Probable with the level of confidence reducing with each class respectively. The CIMDS provides for a direct relationship between Indicated Mineral Resources and Probable Mineral Reserves, and between Measured Mineral Resources and Proven Mineral Reserves. Inferred Mineral Resources cannot be combined or reported with other categories.

Except as stated herein, there are no modifying factors exogenous to mining engineering considerations (i.e. competing interests, environmental concerns, socio-economic issues, legal issues, etc.) that would be of sufficient magnitude to warrant excluding reserve tonnage below design limitations or reducing reserve classification (confidence) levels from proven to probable or otherwise.

1.8.3 Coal Reserves for Vista Coal Project

The Coal Reserve estimates for the Vista Coal Project are based on the Coal Resources of the Vista Coal Project after waste dilution and coal recovery criteria are applied at every coal : waste interface. The reserves are then those Coal Resources which have been conditioned and are contained within a pit outline and production forecast which is demonstrated to yield both a technically and economically feasible design. The Coal Reserves are shown in Table 1-5.

Table 1-5 Coal Reserve Estimates for the Vista Coal Project

Seam	Coal Reserves (Mt)			Marketable Reserves (Mt)
	Proven	Probable	Total	Total
Val d'Or	204.1	13.0	217.1	119.1
McLeod	63.4	13.9	77.3	41.0
McPherson	131.7	23.2	154.9	101.2
West Extension[1]	*31.5*	*4.0*	*35.5*	*21.5*
East Extension[1]	*34.0*	*2.6*	*36.6*	*21.0*
Total	**464.7**	**56.7**	**521.4**	**303.8**

[1] The West and East extensions were included in earlier feasibility studies and are economic but were omitted from this current study due to logistics related to the current planning exercise. They are correctly included in the Mineral Reserves.

1.9 Mine Design

The previously reported Feasibility Study Mine Design (Golder, 2012) has recently been amended and updated by Thiess Pty Ltd. (Thiess, 2014). This updated mine plan and sequence is based on a hybrid strip/terrace approach that minimises strip ratio and haulage cost in the early years, while maintaining the required coal quality and production volumes, and providing for an orderly transition for mining the remaining coal in the ultimate pit shell.

The mining study and mine design work applies to the Vista Coal Project mine area only and has no application to either the Vista South or the Vista Extension resource areas.

1.9.1 Updated Mine Design Work

In this current report, contract mining is used instead of an owner's fleet and terrace mining using truck/shovel has replaced dragline strip mining. The Vista Coal Project has received certain project approvals for the Phase 1 development and further approvals are in process. Thereafter approvals for the Phase 2 development will be sought.

The mining methods and associated cost estimates were developed by Thiess which is under consideration by Coalspur to provide contract mining services. The Thiess study incorporated only the Vista Coal Project Phase 1 area (Vista 1) and Snowden expanded the planning to incorporate the Vista Coal Project Phase 2 area (Vista 2).

Snowden has reviewed the Thiess mine plan and cost estimates to ensure that the plan is feasible and that the costs are reasonable for this type of mining in this part of the world.

1.9.2 Mining Method

Mining is proposed to be done by contractors using ultra class sized mobile equipment. The study work provided by Thiess Mining provides the basis of the envisioned mining methods and equipment. Snowden concurs that these methods are appropriate and have been adequately thought through and detailed with back up sufficient to warrant contractor performance and confidence in delivery.

1.9.3 LOM Plan

The mine plan for both Phase 1 and Phase 2 is driven by the following criteria:

- The mine is designed to annually produce sufficient ROM coal to maximise the utilisation of the coal processing plant, initially at approximately 11 Mtpa (Phase 1) and subsequently up to 20 Mtpa (Phase 1 and Phase 2)
- In terms of scheduling and sequencing, the key target is initially to mine sufficient Val d'Or Seam coal in order to consistently produce 2 Mtpa of coal with a heating value of 5,800 kcal/kg (CV5800). Note that approximately 65% of the Val d'Or Seam is of sufficient quality to produce a CV5800 product at a yield of approximately 58.4%. The remaining coal processing plant capacity is applied to the remaining ROM to produce the CV5550 product.
- To minimise LOM haulage costs and provide realistic LOM dump balances and landforms by logical and efficient development of the hybrid strip/terrace mine plan being utilised to generate lower strip ratios and haulage costs during the first five years.
- The pit progression, and the LOM schedule uncovers the Val d'Or seam at a constant rate in order to meet coal production requirements, while the development of the up-dip and the down-dip McLeod and McPherson seam areas are sequenced to balance the provision of adequate in-pit dump space and overall minimisation of haulage.

An exhaustive and detailed scheduling and haulage simulation is used to achieve this outcome and is seen as both necessary and practical through Snowden's review.

1.10 Coal Quality, Preparation Plant Design and Product Shipping

1.10.1 The Vista Coal Project CPP

The coal preparation plant ("CPP") was designed based on pilot plant test results and using a coal quality database consisting of:

- approximately 1,200 proximate sample results across the full geographic extent of the project,
- detailed washability test results including yield, ash and calorific value by density on approximately 300 working sections,
- detailed clean coal analysis on some 200 working section simulated product samples,
- approximately 200 attrition tests (drop shatter and wet tumble) on both coal and stone samples to support CPP design studies.

The CPP yields anticipated in meeting the average gross calorific value ranges targeted from the deposit (5,550 kcal/kg to 5,800 kcal/kg) are expected to range from slightly more than 50% to slightly less than 60%.

In the most recent CPP design by Sedgman, the design approach was to have larger processing units, to simplify maintenance and operational practices, and deliver an overall better processing efficiency.

The plant arrangement is based on a single 1500 t/h module and includes tailings filters for tailings dewatering.

The arrangement for feeding the preparation plant eliminates feed bias to separate modules through having a single sump with pumps feeding the CPP.

Management of the adverse effect of higher clay content ROM is important and recognised. When feeding the raw coal into the plant by a pump it disperses the clays present in the raw feed, but introduces a higher volume of water to the beginning of the circuit with about a 35% solids feed. The clays also impact on the amount of recycle streams normally designed into a preparation plant with a view to minimising the recycle of these clays. This has been considered in the thickener size, water circuit and desliming screen size.

The plant coarse circuit will consist of two large 1,300 mm diameter dense medium cyclones processing the 50 mm x 1.7 mm fraction with medium being drained on separate product and reject drain and rinse screens. The drain and rinse section lengths will be designed to achieve the lowest moisture possible with a screen to assist in both reducing the overall product moisture and improving the handle ability of the rejects in the cold weather.

The medium recovery circuit will consist of proven counter-current style magnetic separators to concentrate and return the medium to the correct medium circuit.

The undersize of the desliming screen will be pumped through classifying cyclones and then screened over sieve bends to remove the high ash ultrafines and clays prior to the 1.7 mm x 0.25 mm fraction being processed in reflux classifiers.

Tailings from the process will all report to a high-rate thickener and the thickened underflow will be pumped to the tailings filter plant where the tailings will be dewatered using belt filters with discharge onto the coarse rejects conveyor. Combined rejects will be co-disposed in the mining waste dumps.

1.10.2 The Vista Project Coal Transportation

The marketable export products will be transported by rail to the 24 Mtpa[2] Ridley Coal Terminal, at Port of Prince Rupert in British Columbia, for shipment to international markets. To date, Coalspur has secured up to 10.7 Mtpa export allocation through two separate agreements with Ridley Terminals Inc. The agreements are in place for 14 years with an option to extend for seven years.

[2] *Expected maximum capacity on completion of the current upgrades, current capacity is 12 Mtpa.*

Coalspur has also signed a transportation agreement and a siding construction agreement with Canadian National Railways under which they will develop a high-quality logistics supply chain to transport export thermal coal from Coalspur's Vista Coal Project to western Canadian ports.

1.10.3 Vista Extension

Insufficient exploration has been conducted over Vista Extension (predominantly Inferred Resources) to confidently comment on *in situ* and clean coal qualities. However, given that the property is contiguous with the Vista Coal Project, it can be reasonably expected that the qualities and washability characteristics are not dissimilar to its neighbour.

1.10.4 Vista South

Vista South is an exploration property with limited results for coal quality currently available.

Currently, the coal quality information available for Vista South is comprised of:

- historic Denison Mines Limited data, and
- detailed work performed by Bob Leach Pty Ltd in 2011 on three cores drilled by Coalspur

The clean coal results show calorific values ranging from 7,312 kcal/kg - 7,518 kcal/kg (dry ash free basis) which confirms the coal rank as High Volatile Bituminous C; similar to the rank confirmed on the nearby Vista Coal Project.

1.11 Marketing

According to Wood Mckenzie Consultants, there is a general expectation that the worldwide demand for thermal coal will exceed supply capabilities due to the expected future coal demand from China, India, Japan and South Korea.

Global demand for coal to fuel electricity generation is forecast to grow from about 4.9 Bt currently to about 8.3 Bt in 2035. Coal demand for non-power purposes is expected to mirror the growth in demand for electricity generation, and combined, the total demand for thermal coal will grow to 11.9 Bt in 2035 from its current level of 7.2 Bt.

Declining coal self-sufficiency in regions with increasing demand provides a basis for growing imports, the majority of which will be seaborne. Seaborne thermal coal demand is expected grow by 1.13 Bt, from approximately 0.95 Bt currently to an estimated 2.08 Bt in 2035. The demand for thermal coal will be increasingly focused in Asia, the target market for Coalspur.

In 2035, supply is forecast to have increased significantly reaching 2.1 Bt. A large amount of the supply expansion is expected from low cost mines. Much of this low cost increase is a result of growth in the low rank seaborne coal market sourced from Indonesia, and later, from the US. Cost of mining operations is estimated to increase in real terms over the forecast period.

Pricing is generally directly proportional to the calorific value relative to a reference coal. This approach has been adopted in the Feasibility Study price forecast. For example the price of Product 1, Vista Coal Project premium product (Val d'Or Seam), is calculated as follows:

$$Forecast\ FOB\ Price, US\$ = \frac{5{,}800}{6{,}300} * Newcastle\ Reference\ Price$$

1.12 Economic Analysis

This section is pertinent to the Vista Coal Project only.

- A cash flow model was developed by Snowden in 2012 to allow an after tax economic evaluation of the Vista Coal Project project. The model was subsequently reviewed by BDO Canada LLP to ensure that the taxation considerations were entirely consistent with current Revenue Canada regulations. For the current work Snowden updated the model with new cost and coal pricing data and recalculated the economic results are shown in Table 1-6.

Table 1-6 Economic results

Item	Value
Internal rate of return	10.6%
Net present value at 8%	$182.2 million
Supply cost	96.6% of base case price
Payback	19.5 years
Mine life	25 years

The supply cost of a project is that flat commodity price which reduces the net present value at a given discount rate to $0. In other words it is that commodity price for which the project rate of return is equal to the hurdle rate. In the case of the Vista Coal Project, it will have an 8% rate of return when the average LOM coal price is reduced to 92.1% of the base case coal price forecast.

The coal price used was energy adjusted based on the forecast for benchmark thermal coal as developed by Wood Mackenzie coal consulting and published November 2013. A deduction of CAD $33.69 was applied to the Export coal price for rail transport and port costs based on negotiated contracts and all coal is assumed to be sold into the international seaborne market. An adjustment to the selling price for each coal product was based on the actual calorific value from the mine model compared to the calorific value assumed by Wood Mackenzie for their benchmark price as illustrated below:

$$Forecast\ price\ \ Product\ 1 = \frac{Actual}{5{,}800} \times Wood\ Mackenzie\ Price$$

$$Forecast\ price\ \ Product\ 2 = \frac{Actual}{5{,}500} \times Wood\ Mackenzie\ Price$$

The capital and operating costs that had been derived by Coalspur were consistent with the change in operating strategy were checked and validated and entered into the model.

These NPV results are impaired relative to the 2012 economics largely due to the drop in coal price forecast. Coalspur has significantly reduced capital costs and capital risk through solid contracts and have held benchmarked operating costs while developing into largely a contractor operation.

It is seen from this analysis that the project economic results are very sensitive to changes in the operating cost, plant operating hours, coal price and the US$ exchange rate.

1.13 Conclusions

1.13.1 The Vista Coal Project

On the basis of the results of the feasibility study and this review of the additional work completed to date it is concluded that:

- The Vista Coal Project has sufficient (quantity and quality) open pit Coal Resources to yield 11.5 Mtpa of saleable thermal coal products to the international coal market at full production, with a mine life of 25 years.
- There are sufficient Proven Coal Reserves to cover the capital investment payout period of 19.6 years.
- The project, with all related infrastructure requirements included, is technically and economically feasible at the coal price assumptions used in this technical report.
- The revised operating and contracting strategy has significantly de-risked the project to capital and operating cost exposure.

1.13.2 Vista Extension

On the basis of the limited exploration available for Vista Extension but considering that the project represents the down-dip continuation of the Vista Coal Project, it represents a worthwhile target for continued exploration.

1.13.3 Vista South

On the basis of the results of the historical exploration and the limited recent exploration undertaken by Coalspur, this property remains a target for continued exploration and mining studies.

1.14 Recommendations

1.14.1 The Vista Coal Project

The following recommendations are for refinement and optimisation during detailed design. The conclusions of this technical report are not contingent upon positive results of the recommendations below.

It is recommended that:

- a more detailed mine plan across all areas be completed to;
  - address the AER recommendations and conditions
  - evaluate optimised mining and allow more rapid reclamation, smaller out of pit waste dumps, more flexible mining for product optimisation, and reduce mining costs
- further fines flotation tests are carried out to support the decision not to install a flotation circuit

- a groundwater management plan should be instituted prior to construction to understand and design the system

The estimated costs of this proposed program of work is shown on Table 1-7.

Table 1-7 Recommended additional programs

Item	Cost
Detailed mine plan for the LOM	$250,000
Fines flotation testwork	$50,000
Groundwater management plan	$100,000
Total	$400,000

1.14.2 Vista Extension

On the basis of the results and interpretations for Vista Extension, Snowden recommends a detailed and phased exploration programme for this property. It is unlikely that this project will be advanced contiguously with the Vista Coal Project and so this exploration can be delayed until well beyond the start up of the Vista Coal Project.

This phased exploration should concentrate on the areas immediately north of the Vista Coal Project where the down-dip extension of the target coal seams can be potentially exploited by underground mining methods accessing the coal from highwall portals.

1.14.3 Vista South

It is recommended that continued exploration is carried out at this site. There is a significant potential to define both surface and underground mineable coal within this project. It is unlikely that this project will be advanced contiguously with the Vista Coal Project and so this exploration can be delayed until well beyond the start up of the Vista Coal Project.

2 Introduction

This Technical Report has been prepared by Snowden Mining Industry Consultants Inc. ("Snowden") for Coalspur Mines Limited ("Coalspur"), in compliance with the disclosure requirements of the Canadian National Instrument 43-101 ("NI43-101") and the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the "JORC Code" 2004 Edition[3]).

2.1 Terms of Reference

This Technical Report is an update to the previously filed Technical Report dated March 31, 2014.

This report largely summarises the body of work completed by others in progressing the Vista Coal Project. Snowden has adopted the approach that the diligence and qualified sign off throughout previous reports in areas that have been substantially unchanged is sufficient to provide the basis for this Technical Report.

This Technical Report contemplates and summarises material changes to the cost structure of the Vista Coal Project, namely the change from owner operations to contractor operations, a reduction in capital required, and improvement in capital efficiency through process design and contracting strategy. There are many minor improvements and refinements to the project and at this time Coalspur are continuing to improve and optimize such that future enhancements to the project can be expected. The changes incorporated in this report relative to the preceding NI43-101 Technical Report, are indicated in Table 2-1.

Table 2-1 Change elements from preceding NI43-101 technical report

Item	2012 FS	Current 2014 NI 43-101
Coal Price	$125	$92
Mine Capex	Owner fleet	Contractor fleet
Mine Opex	Owner operated	Contractor operated
Plant Capex	QCC/CWA	Forge EPC
Plant Opex	QCC/CWA	Forge / Taggart
Thermal dryers	In design	Removed, no value seen
Infrastructure	CWA	Forge EPC
Tailings	Tailings pond	Filters and co-disposal

[3] *This information was prepared and first disclosed under the JORC Code 2004. It has not been updated since to comply with the JORC Code 2012 on the basis that the information has not materially changed since it was last reported.*

Another significant new item is the approval of the Vista Coal Project by the Alberta Energy Regulator (AER) body. This milestone event has reduced the risks regarding obtaining permits. The approval comes with certain recommendations and conditions of which two are noteworthy as far as the longer term operations are concerned. The permit limits the tailings pond height and thus capacity to approximately 5 years' worth of production and the permit expires after 10 years of operation. Therefore within the 10 year time frame, ongoing amendments and extensions to the permits will be required.

2.2 Sources of Information and Data

Unless otherwise stated, all information and data contained in this Technical Report and used in its preparation has have been supplied to Snowden by Coalspur, and where applicable, accessed from public domain sources *e.g.* SEDAR.

Several previously published NI43-101 Technical Reports have formed the primary basis for this current Technical Report, namely:

- Moose Mountain Technical Services, December 15, 2010: *Resource Estimate for the Vista Coal Property, West Central Alberta*
- Snowden Mining Industry Consultants, January 26, 2012: *Coalspur Mines Limited: Feasibility Study of the Vista Coal Project, Hinton, Alberta*
- Moose Mountain Technical Services, June 25, 2012: *Resource Estimate for the Vista South Coal Property, West Central Alberta*
- Golder Associates, September 12, 2012: *Coalspur Mines Limited: Updated Resource Statement for the Vista Coal Project – Hinton, Alberta, Canada*
- Thiess, June 20, 2014: *Coalspur – Vista Coal Project, Life of Mine Planning*
- Sedgman Canada Limited, July 14, 2014: *Vista CHPP Project, Coal Handling and Preparation Plant*

Various independent reports have prepared and published previously related to the Vista Coal Projects. This Technical Report compiles all relevant data and information from the previous reports and studies to present a consolidated update and summary for the Vista Coal Projects.

2.3 Current Personal Inspections

The Qualified Persons responsible for preparation of the report are Grant van Heerden, Murray Lytle and Paul Franklin. Murray Lytle undertook a personal inspection of the site on June 13, 2014. Neither Grant van Heerden nor Paul Franklin has recently visited the site.

The Vista Coal Project has been the focus of exploration drilling and feasibility level studies recently with all work being completed in 2012. Snowden prepared a Technical Report on behalf of the issuer in January 2012, and this was updated by Golder in September 2012. Both Technical Reports have been released in the public domain (**www.sedar.com**) where necessary disclosure has been made by the relevant Qualified Persons responsible for the work. Included in those disclosures were references to the then current personal inspections carried out. With reference to those inspections, and the recent personal inspection carried out by Murray Lytle, no new material issues were revealed that would need to be accounted for, and the Qualified Persons validate the conclusions and findings expressed within this report.

A number of technical specialists have contributed to various sections of this Technical Report. Where these specialists are not deemed Qualified Persons, their contributions have been supervised by relevant Qualified Persons. The responsibilities of each author are provided in Table 2-2.

Table 2-2 Responsibilities of each Co-author and Qualified Persons

Author	Responsible for section/s	Qualified Person
Grant van Heerden, Pr.Sci.Nat.	Supervising preparation of complete Technical Report, Items 1 through 14 inclusive, and Items 23 through 27 inclusive.	Grant van Heerden, Pr.Sci.Nat
David Warren, P.Eng Ross Broadley, MAusIMM	Items 15 & 16	Murray Lytle, P. Eng.
Colin Gilligan, David Lawrence, MAusIMM	Items 17 – 20	Murray Lytle, P. Eng.
Paul Franklin, P. Eng,	Items 21 & 22	Paul Franklin, P. Eng,

3 Reliance on Other Experts

Snowden has relied upon data and information provided by: Wood Mackenzie Inc. - Coal Consulting (Coalspur Coal Price Forecast, November 2013) in respect of coal price and market forecasts for Section 19.

Snowden has reviewed the Alberta Department of Energy information regarding coal permits, licenses and applications held by Coalspur but a legal review was not undertaken.

The discussion of environmental and social issues has been excerpted from the Snowden Mining Industry Consultants, January 26, 2012: *Coalspur Mines Limited: Feasibility Study of the Vista Coal Project, Hinton, Alberta* as there have been no further studies undertaken since the publication of this report.

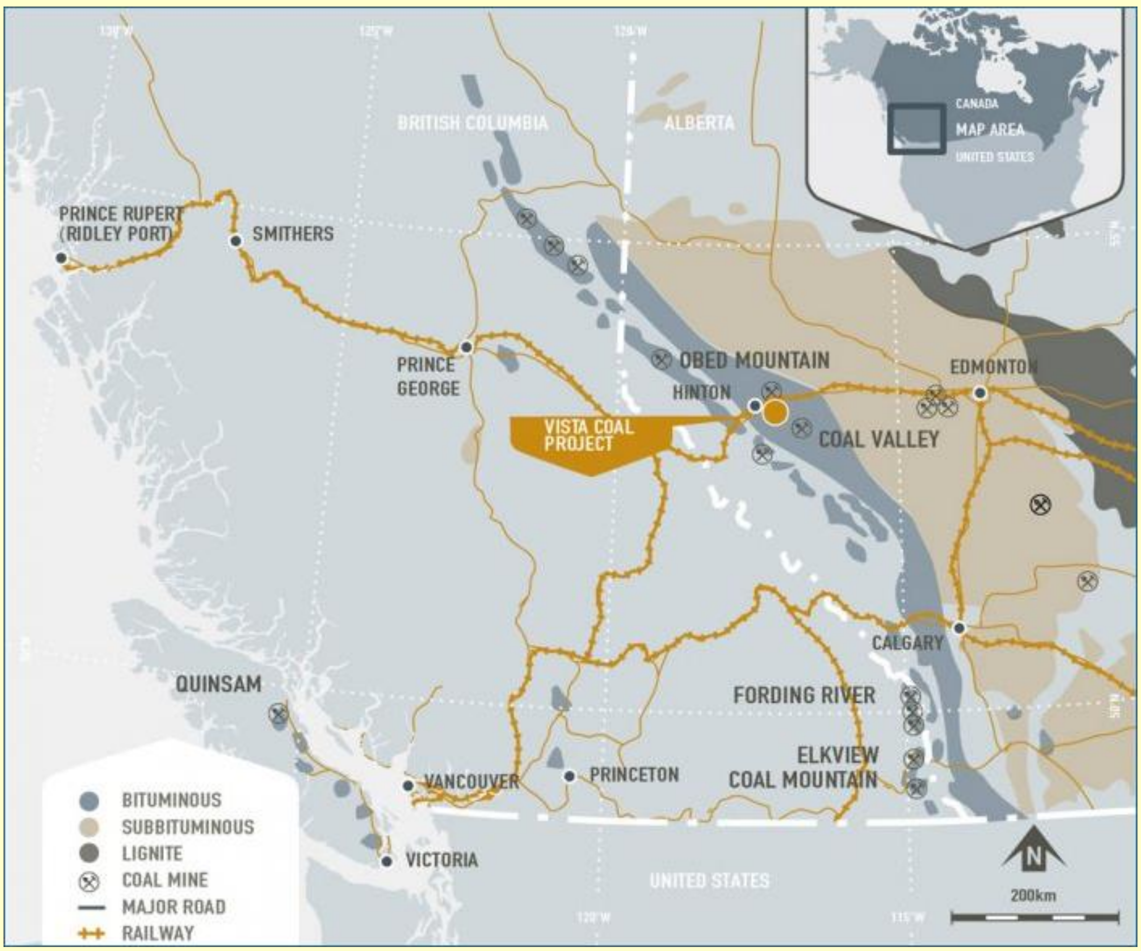
Snowden is not aware of any other significant factors and risks that may affect access, title, or the right or ability to perform work on the property.

4 Property Description and Location

The Coalspur Coal Projects (Vista Coal Project, Vista Extension and Vista South) are located east of the town of Hinton in west central Alberta, Canada (Figure 4-1). Primary road access to the area is via the Yellowhead Highway (Highway 16), which is a major all-weather divided, paved highway, which connects Hinton with Edson, Alberta, 85 km to the east, and Edmonton, Alberta, 280 km to the east. The Athabasca River flows parallel to and north of Highway 16 and the town of Hinton. Highway 40 runs north from Highway 16, approximately 7 km southwest of Hinton and connects to Grande Cache, 138 km to the northwest.

The CNR's main rail line runs parallel to the Athabasca River and Highway 16, approximately 8 km north of the Vista Coal Projects. The railway provides direct access for coal delivery to the Port of Vancouver and to the Ridley Island Terminal at Prince Rupert.

Figure 4-1 Project Location Map



SNOWDEN	Regional Locality The Coalspur Coal Projects	Source: Coalspur, 2014

The coal leases are located south of Highway 16, the CNR rail line and the Athabasca River, all of which run parallel (SW-NE) to each other in the area along the northwestern margin of the Vista Coal Projects. The projects lies approximately 4 km east of the town of Hinton, 60 km southwest of the town of Edson and 40 km northeast of the Jasper Park boundary on Highway 16. The projects are centred on approximately 5,914,735 North and 475,550 East (UTM11N, NAD83) and consist of several tracts of land extending over 22 km eastward from Hinton in the west to the McLeod River in the east. The projects extend some 30 km in a N-S domain. The total area covered by the Coalspur Coal Projects amounts to approximately 490 km^2.

Coalspur currently holds 55 individual coal lease agreements and three applications in the Hinton area[4,5]. Within this, the Coalspur Coal Projects consist of 22 contiguous leases comprising the Hinton West, Z Block, Hinton East, Vista South, Vista Extension and McLeod River North coal resource blocks. All of these leases are held directly, or in escrow, by Coalspur. The locations of these properties are shown in Figure 4-2, Figure 4-3, and Figure 4-4.

Coalspur purchased the five Hinton East and Hinton West coal leases from Consolidated Tanager Limited ("Tanager") on February 19, 2009. The Tanager leases, held in escrow, are subject to a final payment of C$10 million on the earlier of February 19, 2016, or coal production from the Tanager Leases reaching 90,000 tpm over a three month period, and an ongoing 1% gross revenue royalty for coal sold from those leases only. Coalspur executed an option to purchase agreement with Mancal Coal Inc. ("Mancal") to purchase a 100% interest in the McLeod River North and Z Block leases in October, 2010. The leases were transferred to Coalspur on October 21, 2010. Two additional coal leases inside the Mine Permit boundary (see Section 20.3 and Figure 14-3 for explanation) were obtained from the Government of Alberta in May 2011 after the Mine Permit was transferred to Coalspur. Coalspur holds additional coal leases to the south of the Vista Coal Project (Vista South) and also to the north and east (Vista Extension). Nexen sold the Vista Extension leases to Coalspur at the end of March 2012 and the transfer took place on May 8, 2012.

Alberta Crown Coal Leases are granted for a term of 15 years and are renewable for additional terms on application. The Coalspur Coal Projects leases are listed in Table 4-1.

---

[4] *Information sourced from the Alberta Government's online interactive map (**https://gis.energy.gov.ab.ca/Geoview/Viewer.aspx?Viewer=StandaloneCoalSLExt**)*

[5] *This information is current as at the Effective Date of this Technical Report, sourced from the Government of Alberta Energy website, **www.energy.gov.ab.ca***

Figure 4-2 Individual Coal Lease Agreements comprising the Vista Coal Projects

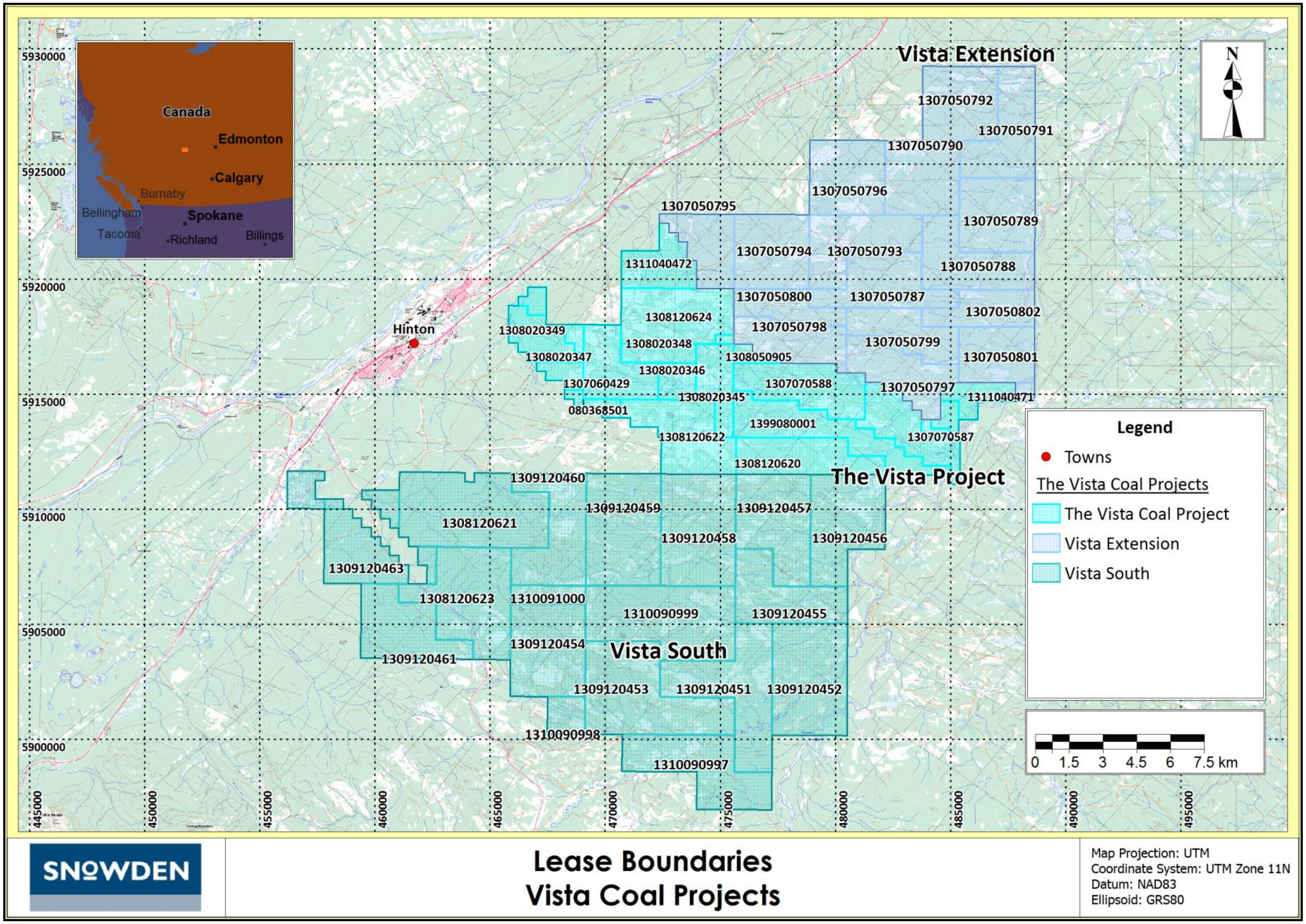


Figure 4-3 Key Resource Block Nomenclature for the Vista Coal Project

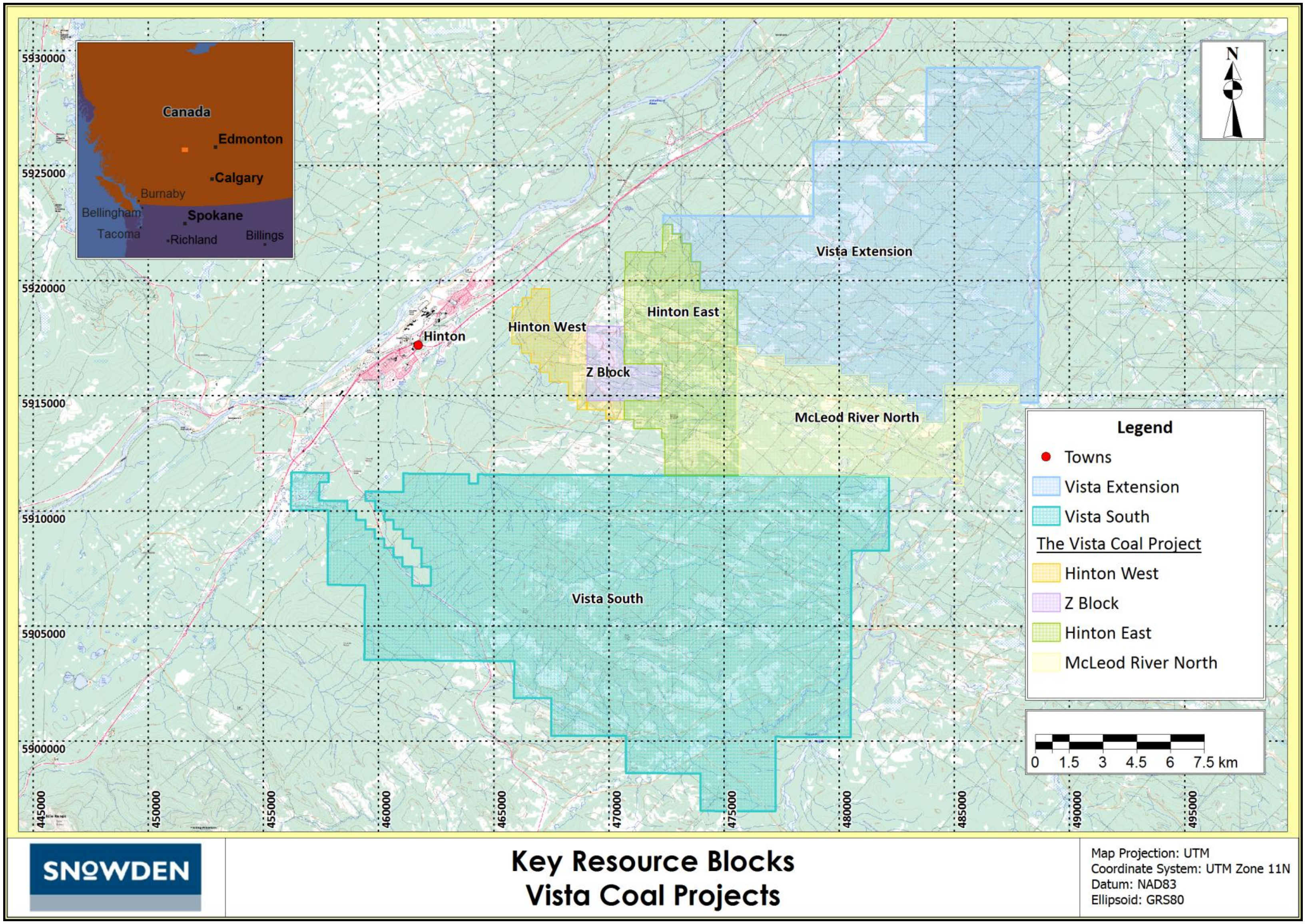


Figure 4-4 Leases and Applications within the Vista Coal Project

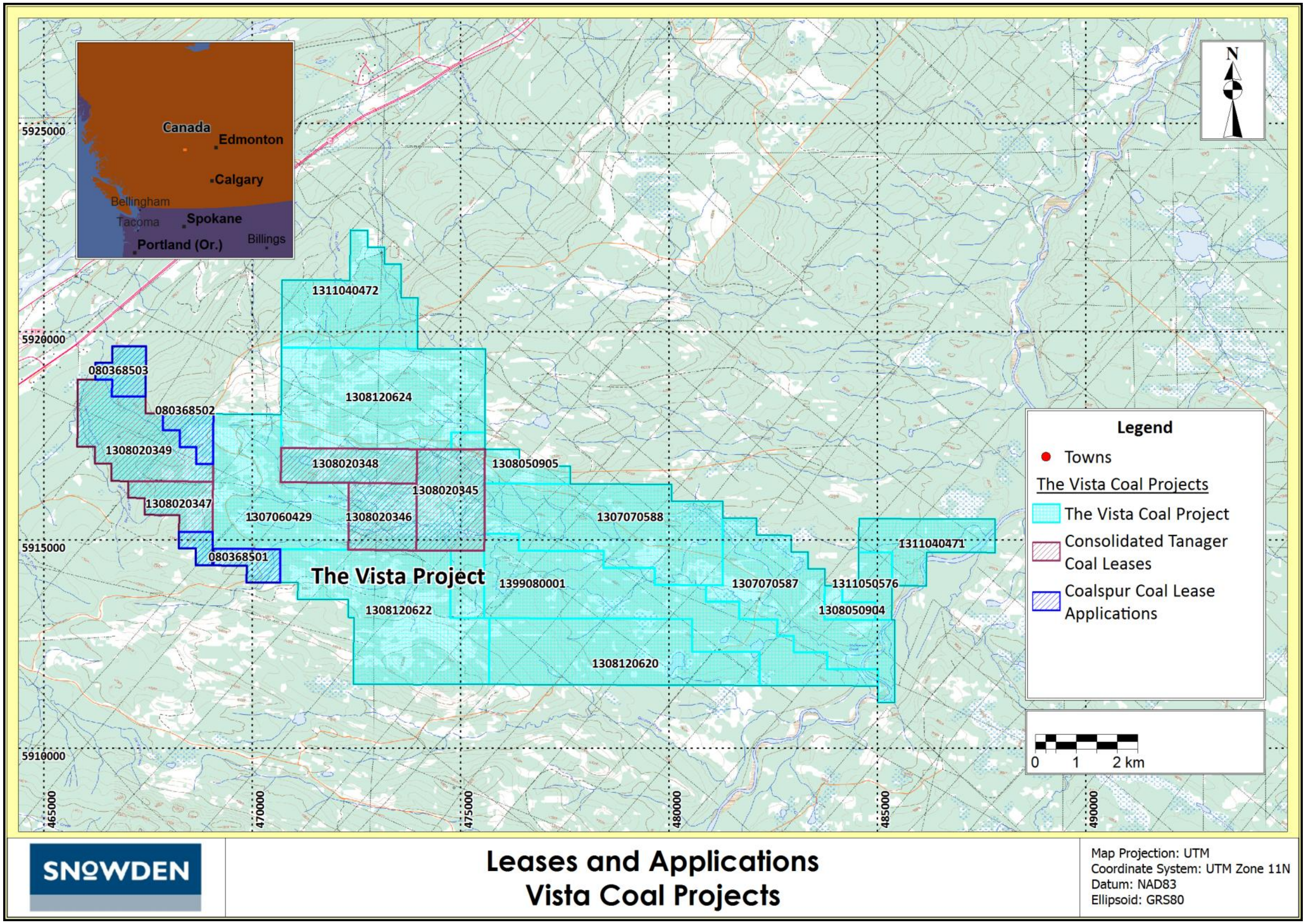


Table 4-1 Coalspur Tenure (www.energy.alberta.ca)

Block	Agreement #	Type	Holder	Status	Expiry	Area (ha)
Hinton West	1308020347	LEASE	CONSOLIDATED TANAGER LIMITED	ACTIVE	22-Feb-23	179.652
	1308020349	LEASE	CONSOLIDATED TANAGER LIMITED	ACTIVE	22-Feb-23	480.559
	80368501	APP	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	-	145.220
	80368502	APP	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	-	97.045
	80368503	APP	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	-	113.192
	Sub-total	**5**				**1,015.669**
Hinton East	1308020345	LEASE	CONSOLIDATED TANAGER LIMITED	ACTIVE	22-Feb-23	396.604
	1308020346	LEASE	CONSOLIDATED TANAGER LIMITED	ACTIVE	22-Feb-23	262.017
	1308020348	LEASE	CONSOLIDATED TANAGER LIMITED	ACTIVE	22-Feb-23	268.332
	1308120622	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	4-Dec-23	1,096.072
	1308120624	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	4-Dec-23	1,145.403
	1311040472	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	7-Apr-26	613.176
	1311050581	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	31-May-26	130.619
	1311050582	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	31-May-26	32.316
	Sub-total	**8**				**3,944.539**
Z Block	1307060429	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	16-Jun-22	789.059
	Subtotal	**1**				**789.059**
McLeod River North	1307070587	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	20-Jul-22	779.636
	1307070588	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	20-Jul-22	1,017.806
	1308050904	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	8-May-23	67.462
	1308050905	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	8-May-23	119.694
	1308120620	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	4-Dec-23	904.032
	1311040471	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	7-Apr-26	329.490
	1311050576	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	31-May-26	127.573
	1399080001	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	28-Aug-14	1,136.050
	Sub-total	**8**				**4,481.743**
Vista Extension	1307050787	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	27-May-22	1,055.169
	1307050788	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	27-May-22	1,056.347
	1307050789	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	27-May-22	1,059.564
	1307050790	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	27-May-22	1,051.414
	1307050791	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	27-May-22	1,050.704
	1307050792	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	27-May-22	1,052.974
	1307050793	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	27-May-22	1,051.090
	1307050794	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	27-May-22	1,053.088
	1307050795	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	27-May-22	704.963
	1307050796	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	27-May-22	1,058.196
	1307050798	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	27-May-22	757.332
	1307050799	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	27-May-22	755.520
	1307050800	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	27-May-22	588.998

Block	Agreement #	Type	Holder	Status	Expiry	Area (ha)
	1307050801	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	27-May-22	799.649
	1307050802	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	27-May-22	657.794
	Sub-total	**15**				**13,752.802**
Vista South	1308120621	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	4-Dec-23	1,937.996
	1308120623	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	4-Dec-23	1,575.550
	1309120451	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	3-Dec-24	1,573.263
	1309120452	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	3-Dec-24	1,580.838
	1309120453	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	3-Dec-24	1,844.253
	1309120454	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	3-Dec-24	1,306.489
	1309120455	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	3-Dec-24	1,048.224
	1309120456	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	3-Dec-24	1,313.909
	1309120457	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	3-Dec-24	1,315.425
	1309120458	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	3-Dec-24	1,580.620
	1309120459	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	3-Dec-24	1,580.119
	1309120460	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	3-Dec-24	1,183.486
	1309120461	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	3-Dec-24	1,059.935
	1309120462	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	3-Dec-24	97.972
	1309120463	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	3-Dec-24	1,073.200
	1309120464	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	3-Dec-24	164.647
	1310090997	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	2-Sep-25	1,314.288
	1310090998	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	2-Sep-25	265.037
	1310090999	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	2-Sep-25	1,834.837
	1310091000	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	2-Sep-25	260.900
	1310091001	LEASE	COALSPUR MINES (OPERATIONS) LTD.	ACTIVE	2-Sep-25	34.614
	Sub-total	**21**				**23,945.602**
GRAND TOTAL		**58**				**47,929.414**

Surface rights are held by the Alberta Government, and logging and timber management are granted to West Fraser Timber Co. Limited under a Forest Management Area agreement. Tourmaline Oil Corporation has three natural gas wells (two of which are active) in the Mine Permit area including associated pipeline infrastructure. As per Coalspur's news release dated December 9, 2013[6], Tourmaline and Coalspur have made an agreement on developing their respective mineral interests and Tourmaline's wells pose no undue impediment to Coalspur's mine project. There are no private land owners on the Coalspur Coal Properties.

Certain types of exploration activity require a Coal Exploration Permit ("CEP"), issued by the Alberta Government, prior to conducting the work on Crown land within a coal property. The current or future operations of Coalspur, including development and commencement of production activities on this property require other permits and approvals governed by laws and regulations pertaining to development, mining, production, taxes, labour standards, occupational health, waste disposal, toxic substances, land use, environmental protection,

[6] *Coalspur News Release; December 9, 2013; "Coalspur Reaches Agreement with Tourmaline Oil Corp Ahead of Alberta Energy Regulator Hearing".*

mine safety and other matters, under the jurisdiction of the Government of Alberta and/or the federal government of Canada.

The Alberta Energy Regulator (AER) approved the Phase 1 development of the Vista Coal Project on 27 February 2014. This approval includes various requirements or conditions relating to the coal processing plant, mine plan and end-pit lake, geotechnical investigations, fines management, surface water quality, wetlands, wildlife, and noise mitigation. Permits are also required under the Environmental Protection and Enhancement Act ("EPEA") and Alberta Water Act ("WA"). These applications are currently under review by the AER. Coalspur has also applied for surface dispositions under the Alberta Public Lands Act, which are currently under consideration by the AER.

Based on the site visit, there are no outstanding environmental liabilities or commitments on the Coalspur Coal Properties. The operation of the mine and plant facilities, when built, will require the completion of such environmental activities as are stipulated in the mine development approvals.

Snowden understands that besides Alberta Government Coal Royalties, the only royalty, back in right or other encumbrance to which the Coalspur Coal Properties are subject is the Tanager royalty referenced above.

Snowden is not aware, following reasonable discussions with Coalspur senior-management, of any legal, social, environmental, technical or other facts or risks that may affect access, title of the right or ability of Coalspur to perform work on any of the Coalspur Coal Projects.

5 Accessibility, Climate, Local Resources, Infrastructure and Physiography

5.1 Access

The Coalspur Coal Project properties (Vista Coal Project, Vista Extension and Vista South) are primarily accessible from Hinton via the Yellowhead Highway (Highway 16), which is an all-weather divided paved major highway which connects Hinton with Edson, Alberta 70 km to the east, with Edmonton, Alberta 276 km to the east. The Athabasca River flows parallel to and north of the highway and the town of Hinton.

The Canadian National Railway (CN) main rail line runs parallel the Athabasca River and Highway 16, approximately 12 km north of the Vista South coal property. The railway provides direct access for coal delivery to the Port of Vancouver and to the Ridley Island Terminal at Prince Rupert. Paved landing strips are available at both Hinton and Edson for light jet aircraft.

The Vista Coal Project and Vista Extension are accessible via the McPherson Creek logging road (owned and maintained by West Fraser Timber Co. Limited). This all-weather gravel road, which is open year round, bisects the Z Block, then runs through the Hinton East Block, and then runs southeast along the northern boundary of the McLeod River North property to the McLeod River.

Vista South is accessible via Highway 40, which runs south from Highway 16 approximately 4 km southwest of Hinton and essentially follows the southwest border of the property. The property is directly accessible driving southeast from Hinton along the Robb logging road which is owned and maintained by West Fraser Timber Co. Ltd. This all-weather gravel road follows the north eastern margin of the property. It intersects the Gregg River Road at the south-eastern margin of the property. The Gregg River Road connects with Highway 40 on the south-western boundary. Secondary logging trails branch off of the main Robb and Highway 40 access routes and afford additional access to the interior of the property

Figure 5-1 shows the primary and key access routes for the Vista Coal Projects.

5.2 Topography, Elevation and Vegetation

The Coalspur Coal Projects are situated in the northwest trending outer foothills physiographic region of the Rocky Mountains which is characterized by relatively low, rounded hills with local muskeg in low lying areas. The highest elevation in the area is 1,600 metres above sea level ("masl"), and the average elevation of the valley floors is approximately 1,195 masl (Figure 5-2).

The Coalspur Coal Projects are generally covered with second growth forests with pine and mixes of white spruce and poplar on the hillsides and ridges; alders, while willows and black spruce occur in low lying areas. The region is part of the West Fraser Forest Management Area ("FMA"), which is actively being logged and contains large areas that have been commercially logged and re-planted in the past.

5.3 Surface Rights and Mineral Tenure

All surface rights are held by the Government of Alberta while West Fraser Timber Co. Limited is responsible for timber management under a Forest Management Area agreement. There is no private land holding over areas under Coalspur-managed Coal Lease areas.

Tourmaline Oil Corporation has three active natural gas wells on the Vista Coal Project property including associated pipeline infrastructure. There are no other mineral tenures held over other Coal Leases.

5.4 Climate

The local climate is typical for the region and has little to no material impact on mining operations with other nearby mines operating year round. Minor delays are, however, experienced but these are typically of short duration, particularly in the winter months. Key components temperature and precipitation are covered in more detail in this section.

5.4.1 Regional Temperatures

Alberta has a dry continental climate with warm summers and cold winters. The province is open to cold arctic weather systems from the north, which often produces extremely cold conditions in winter. As the fronts between the air masses shift north and south across Alberta, temperature can change rapidly. Arctic air masses in the winter produce extreme minimum temperatures varying from −54°C in northern Alberta to −46°C in southern Alberta. In the summer, continental air masses produce maximum temperatures from 32°C in the mountains to 40°C in southern Alberta.

Mean annual temperature in the project area is 2.8°C with a maximum daily average of 14°C in July/August and a minimum daily average of -11.0°C in January. Extreme temperatures have been recorded ranging from a maximum of 35°C to a minimum of minus 42°C.

Table 5-1 shows the mean monthly temperatures prevalent at the project area compared to the national averages.

Figure 5-1 Primary Access Routes into the Vista Coal Projects

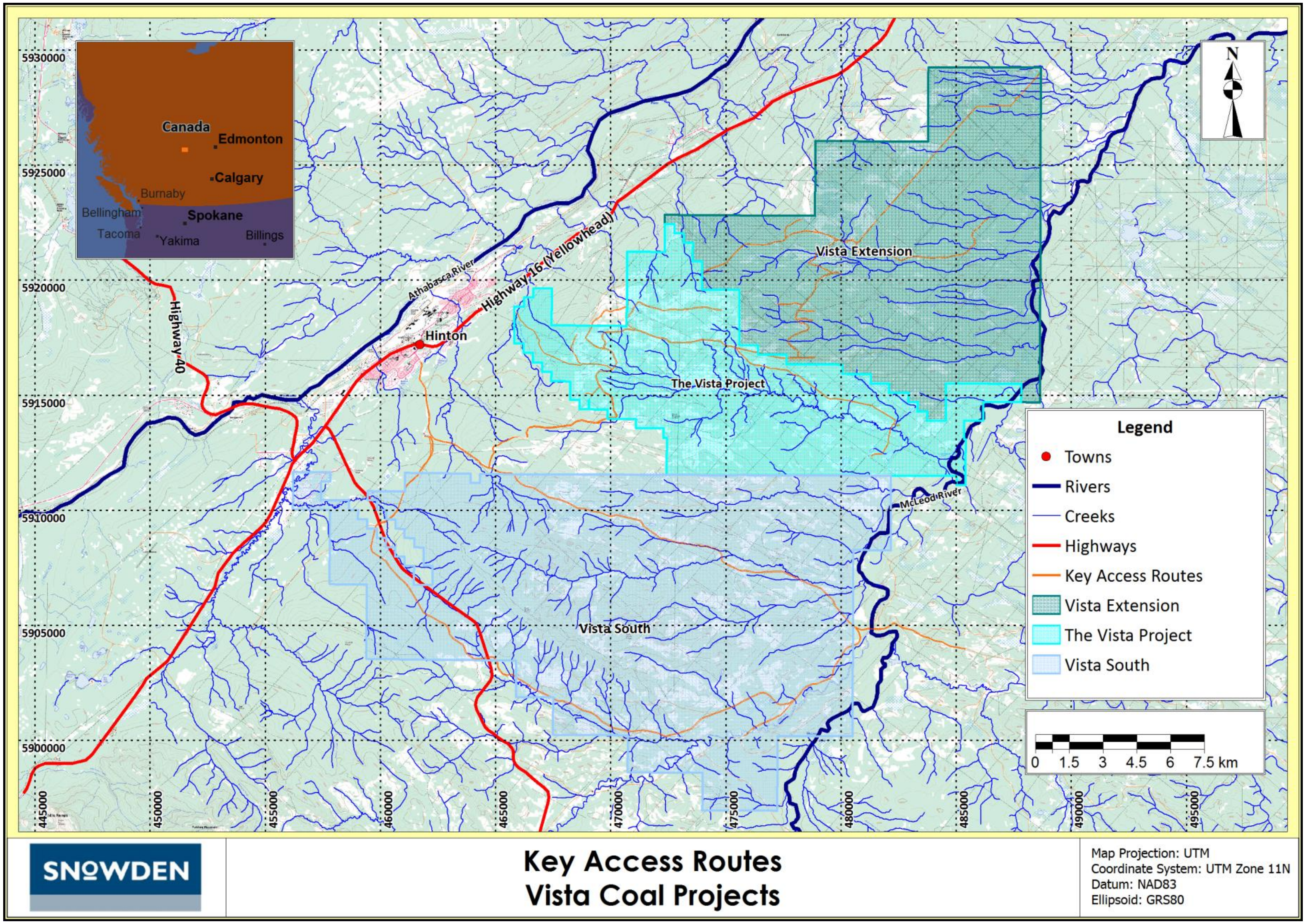
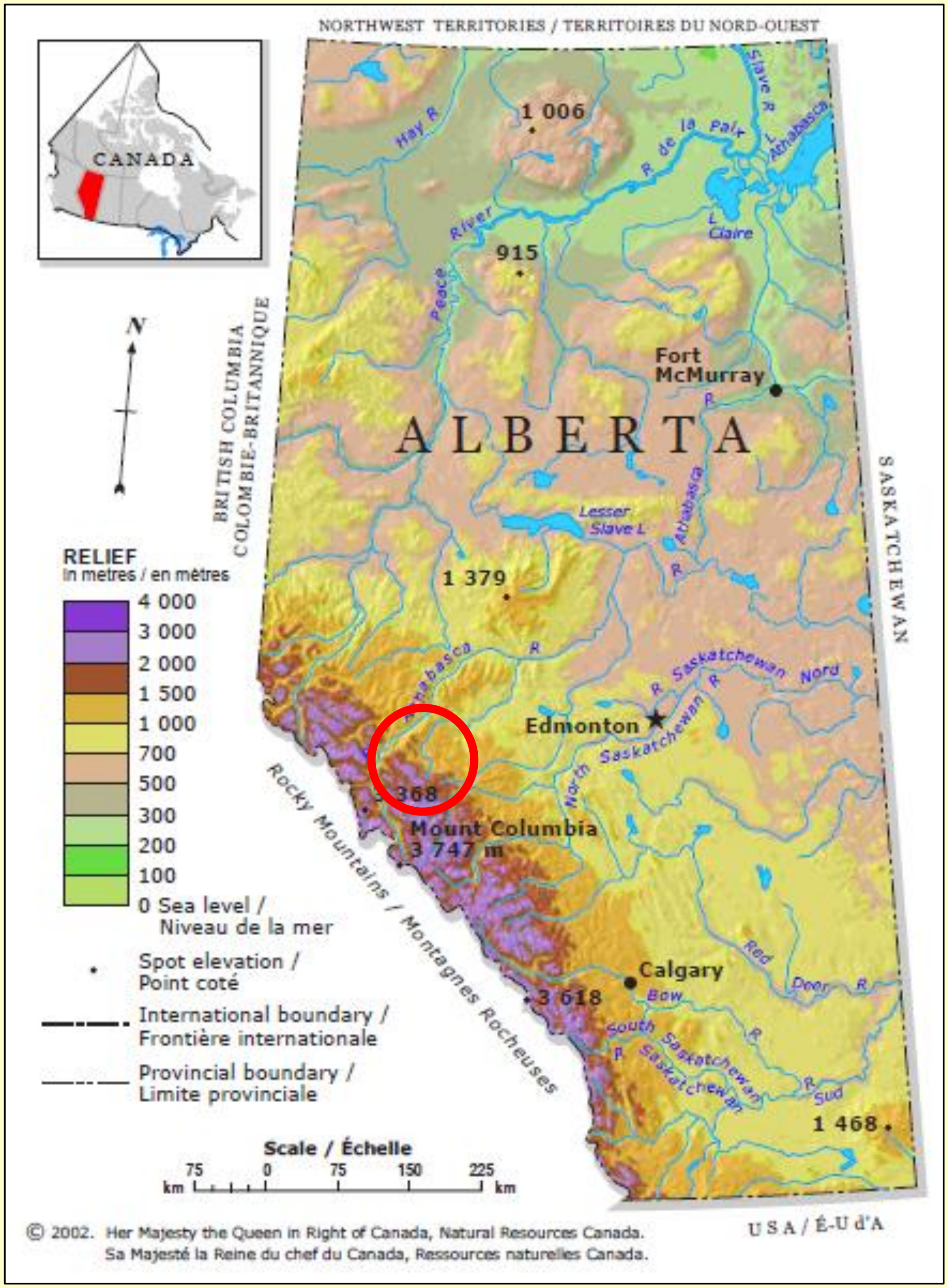


Figure 5-2 Regional Topography over the Vista Coal Projects



SNOWDEN	**Regional Topography** **The Vista Coal Projects**	Source: Alberta Geological Survey, 2014

Table 5-1 Monthly Temperatures

Temperature	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily Avg (°C)	-11	-7	-2	4	9	12	14	14	9	4	-4	-8
Daily Max (°C)	-5	0	5	11	16	20	22	21	17	11	1	-2
Daily Min (°C)	-17	-14	-10	-4	1	5	6	6	1	-2	-10	-13
Canada Daily Avg (°C)	**-10**	**-8**	**-3**	**4**	**11**	**15**	**18**	**17**	**12**	**6**	**-1**	**-8**

5.4.2 Regional Precipitation

The Rocky Mountains cast a "rain shadow" over much of Alberta. As the moist air from the Pacific Ocean rises to pass over the mountains on its way to Alberta, it is cooled, and rain or snow fall on the Pacific side of the mountains. As the air descends on Alberta, it gains heat and produces warm, dry winds. The driest weather is in December and February when an average of 15-17 mm of snowfall is typically recorded. The wettest weather is from June to August, when an average of 81 mm of precipitation (snow and rain) is typical. The average annual relative humidity is 66.3% and average monthly relative humidity ranges from 50% in May to 84% in January and December.

Precipitation in Alberta ranges from 30 cm in the southeast to 45 cm in the north, except from the foothills region, where accumulations can reach up to 60 cm annually. The eastern slopes of the Rocky Mountains (where the project area is located) receive considerably less annual rainfall. Table 5-2 presents monthly averages for recorded precipitation.

Table 5-2 Monthly Precipitation

Precipitation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall (mm)	1	0	1	14	61	78	93	72	46	16	2	0
Snowfall (mm)	29	15	21	8	4	0	0	0	3	12	20	17
Total (mm)	**30**	**15**	**22**	**22**	**65**	**78**	**93**	**72**	**49**	**28**	**22**	**17**

5.5 Local Resources and Infrastructure

The town of Hinton lies immediately west of the Vista Coal Project. The town is home to approximately 10,000 inhabitants. The vast majority of the labour force is employed, predominantly in the trades associated with the agriculture industry[7].

Transmission lines (138 kV) to supply electrical power to the area are located along Highway 16 and along the southern boundary of the Vista Coal Project.

The Hinton area is home to several operating and inoperative coal mines so there is a large pool of highly trained personal from which to draw for planned operations by Coalspur. Additionally there is adequate water resources for coal processing as well as area for mine development infrastructure including the coal processing plant, associated warehouse and maintenance facilities mine waste rock dumps and other required facilities.

7 http://www.citystats.ca/city/Alberta/Hinton.html

6 History

The first geological investigations in the region of the Coalspur Coal Projects were undertaken by the Geological Survey of Canada. Rutherford (1923, 1924) carried out reconnaissance mapping of the Embarrass, McLeod and Athabasca Rivers. Later, Lang (1944) and Irish (1945) published more detailed maps of the Entrance and Pedley areas.

In the late 1920s, a small scale mining operation began at Drinnan, immediately west of the Hinton West property, by Jasper Coal Ltd. Underground mining took place periodically from that time to the mid-1940s when the operation was abandoned due to declining demand for domestic coal.

The exploration and development of the areas currently underlying the Vista Coal Projects has been carried out by a number of separate companies, including more recently, Coalspur directly.

6.1 The Vista Coal Project

6.1.1 Consolidated Tanager Limited

In 1963-64, Imperial Oil Ltd. drilled 60 test holes in the area. However, these holes were not properly surveyed, the geophysical logs were of poor quality and most of the original data is poorly documented.

In 1971, Associated Porcupine Mines Ltd (“APM”) acquired the coal rights to the areas that are now Hinton East and Hinton West. In partnership with Granby Mining Co. Ltd. (“Granby”), APM carried out exploration on their Hinton properties from 1972-1974. Exploration consisted of geological mapping, prospecting of the cuttings from seismic boreholes, an induced polarization survey, shallow backhoe trenching and two drilling programmes. Seven rotary holes (594 m) in the eastern part of the Hinton East block were drilled in 1972. Eight diamond holes (661 m) in the Hinton West block were drilled in 1974. All drill holes were geophysically logged with a density, gamma ray and neutron suite. However, none of the drill holes or trenches were surveyed. Only two trenches located bedrock and none of the recovered core was kept or photographed. Granby subsequently relinquished their interest in the properties.

In 1981, Esso Minerals Canada (“Esso”) signed an agreement with APM whereby Esso would earn an interest in the property.

In 1981, Esso drilled nine rotary holes (2,782 m) and one cored drill hole (400 m) on the Hinton East property. All drill holes were geophysically logged and sampling and analyses were carried out on the core. New aerial photography was also undertaken to construct high quality topographic maps of the area.

In 1982, 44 rotary holes (6,126 m) and 10 cored drill holes (1,222 m) were drilled and geophysically logged on Hinton East. Three of the drill holes were also geotechnically logged.

In 1983, 13 rotary holes (1,305 m) were drilled and geophysically logged on Hinton East. A geological model based on work from 1981-1983 was generated for Hinton East and West that correlated the seams from both areas. An application was made to the Alberta government to reclassify 922 ha of Hinton West from Category I, which prohibits exploration, to Category II.

The Alberta government reclassified the 922 ha of Hinton West into Category II in 1984 (Category II allows for limited exploration under strict control but commercial development by surface mining will not normally be considered). Exploration in 1984 concentrated on Hinton West and consisted of nine rotary holes (1,272 m). The holes were geophysically logged and drill cuttings were analysed.

The 1985 exploration program consisted of four cored drill holes (469 m) and four rotary holes (567 m). All holes were geophysically logged and the cored drill holes were geotechnically logged. The coal core was sampled and analysed in detail.

In 1983 a Coal Resource for Hinton East was estimated at 438 Mt of which 90 Mt were considered surface resources and 348 Mt were classified as underground resources. A Coal Resource was estimated for Hinton West in 1985 at 47 Mt clean coal at a 12:1 stripping ratio. These resources for Hinton are considered historic in nature.

During their four year option period, Esso completed, in addition to its exploration programmes, an Engineering Feasibility Study and submitted a Preliminary Application for a Mine Permit to the Alberta government.

Esso terminated their option agreement in 1985 and the property reverted to APM.

In early 1989, Consolidated Tanager Limited (“Tanager”) was formed by APM to hold the coal leases. In 1989, Tanager hired LAS Energy Associates Limited (“LAS”) to do a thorough evaluation of the Hinton properties in order to determine an optimum development strategy. With selective mining of the coal at moderate stripping ratios, LAS estimated a 46 Mt “reserve” (non-compliant to NI 43 101) of clean coal. The actual strip ratios were not provided although LAS states that the average ratio is 4.0:1 and the wash plant recovery is estimated at 55%. Many coal companies report strip ratios as bank cubic metres (“BCM”) waste to clean tonnes of coal.

6.1.2 Manalta Coal Limited

Manalta Coal Limited (“Manalta”) acquired the current McLeod River North and Z Block leases in 1971 and conducted a major coal exploration drilling programme on the McLeod River North property in 1981/82. A total of 148 rotary drill holes including 45 till holes (LOX[8] holes), and 17 cored drill holes were completed during this period along nine cross sectional access lines spaced between 800 m to 1,100 m apart. The drilling programme was designed to intersect the two major mineable coal zones (Val d’Or and McPherson) on the property and quantify resource estimates to a high degree of accuracy.

The core samples were analysed on individual coal seam plies to forecast *in situ* coal quality. Subsequent washability studies were undertaken to determine clean coal quality and product yield factors. Manalta extracted two 600 t bulk samples from the Val d’Or and McPherson zones for detailed washability studies and plant design purposes.

[8] *LOX – Line of Oxidation. Drilling undertaken to determine depth of weathering / fresh rock interface*

This work and subsequent mining, civil engineering and environmental studies were compiled and submitted as formal Mine Development application to the Government of Alberta in 1982.

The Alberta government issued a Mine Development Permit in early 1983.

The project remained dormant until 1992 when Manalta initiated a 17-hole exploration drilling programme on the Z Block lease. The purpose was to define mineable resources on this lease. Eight of the holes were cored to confirm coal quality.

All of the 1981/1982 and subsequent 1992 drilling was geophysically logged. HQ diameter core samples were obtained by continuous wire line methods with acceptable core recovery in the main coal sections. All of the sampling and analytical procedures were assessed to be in line with accepted industry practice.

Manalta proceeded with an updated Mine Feasibility Study which incorporated both the Z Block and McLeod River North leases. The study was completed in 1995 but Manalta decided not to proceed with development.

Manalta was converted into an Income Trust in 1997 and subsequently sold all of its operating assets in 1998. Some of the non-operating assets did not become part of the Manalta Income Trust and were retained by Mancal Coal Inc. ("Mancal") and its predecessor companies.

6.1.3 Coalspur Mines Limited

Coalspur purchased the Hinton East and Hinton West coal leases from Tanager on February 19, 2009. In February 2010, Coalspur conducted a core drilling programme (total 10 drill holes) on the property to validate coal quality and resource expectations. In February 2010, Coalspur published a scoping level Technical Report on the economics of mining the Hinton East and West properties, which showed positive returns.

In June 2010, Mancal and Coalspur entered into an option agreement for Coalspur to acquire 100% interest in the McLeod River North and Z Block leases. Final payment was made and the leases were transferred to Coalspur in October, 2010.

In September 2010 Coalspur started a major drilling programme on the property to infill between the historic Manalta holes for resource confirmation and collect coal quality samples for product washability studies.

The combination of the four properties Hinton East, Hinton West, McLeod River North, and Z Block were renamed the Vista Coal Project.

In January, 2012 Coalspur reported the results of a Feasibility Study for the Vista Coal Project, which showed positive returns.

From 2014 to present, Coalspur has been advancing the permitting and financing of the project along with further enhancements and optimisation initiatives. No further drilling, test work or other material changes affecting the data have taken place.

There has been no mine production from the Vista Coal Project.

6.2 Vista Extension

6.2.1 Nexen Inc.

Canadian Occidental Petroleum Ltd. (the predecessor of Nexen Inc.) and Irving Industries (Irving Wire Products Division) Ltd., in a 50/50 partnership, agreed to have Halferdahl drill two core holes in 1978 on what they called the Corral Creek Property, and prepare a report. Subsequently, in 1981, they contracted Canadian Island Creek Coal Ltd. (Red Deer) to drill a proposed 11-hole, including two diamond core holes, programme to further delineate the resources. The programme encountered extremely difficult drilling conditions, changed drilling contractors between each hole, and did not achieve its objectives. It was ultimately successful in drilling only two holes and taking two cores in four locations. None of the cores were used for quality modelling in the current exercise. These holes are the only six drilled with the specific intent of exploring the Coal Resources within this lease area. There are other wells that penetrate the coal strata but continue onto the gas-bearing horizons below.

Irving Industries (Irving Wire Products Division) Ltd. maintained its share until May 2005, at which time it surrendered its working interest to Nexen Inc. Nexen Inc., in turn, sold its interest to Coalspur at the end of March 2012, and the transfer occurred on May 8, 2012.

6.3 Vista South

6.3.1 Denison Mines Limited

Denison Mines Limited ("Denison") initially acquired coal leases in the area in 1969 and undertook an initial geological reconnaissance program of the region. This led to an initial 11-hole exploration drilling programme in 1971. However, these holes were not properly surveyed, the geophysical logs were of poor quality and most of this data is considered unreliable.

Between 1980 and 1982, Denison commenced a major exploration program in the area which included leases in what are now the Vista South Property as well as lands near Mercoal and Robb which are currently held by Sherritt International. A total of 164 drill holes, including 6 diamond core holes, totalling some 26,000 m were completed over this period of time on all of the Vista South lease areas to identify the best prospects for development.

Work on the properties ceased in 1985 and they remained dormant until the Robb and Mercoal interests were purchased by Luscar Ltd in the early 1990s. and then subsequently acquired by Sherritt International in 2001. The unsold lease interests in what is now Vista South were allowed to expire and the rights reverted back to the Alberta Government.

6.3.2 Coalspur Mines Limited

In December 2008, Xenolith Resources, the predecessor company to Coalspur Mines Limited acquired 3,416 hectares of Alberta Crown Coal Leases in the Vista South area through open public tender. In 2009, Xenolith was renamed Coalspur Mines Limited. An additional 13,943 hectares of Crown Coal Leases was successfully acquired by Coalspur in December 2009, followed again by another 3,616 hectares in September 2010. Both acquisitions were through open public tender.

Coalspur now controls a total of 23,287 hectares (232.9 square kilometres) of coal leases in the Vista South property.

Historic drill records (geophysical logs) from prior exploration by Denison, Manalta, and Luscar were acquired from the Alberta Energy Resource Conservation Board and have been incorporated in a MineSight digital computer model to facilitate resource estimation for the property.

In August 2010, Coalspur completed a 19-hole exploration drilling programme on the northern part of the property. The second of three programs, in the spring of 2011, comprised 29 rotary holes and 3 diamond core holes, and concentrated on the northeastern flank of the Entrance Syncline. The third programme, in the late fall of 2011 and spring of 2012, added 49 holes and expanded the model area over 10 km southeast parallel to the axis of the Entrance Syncline, compared to the area that was the subject of the previous 2010 Resource Estimate.

7 Geological Setting and Mineralisation

7.1 Geological Setting

The coal deposits associated with the Coalspur Coal Projects (Vista Coal Project, Vista Extension and Vista South) occur along the eastern margin of the Rocky Mountain Foothills Disturbed Belt, southeast of the town of Hinton, Alberta. The coal-bearing horizons consist of continental clastic sediments of the Paskapoo and Coalspur Formations of Palaeocene Age. The most prominent structural feature is the Pedley Fault which trends northwest/southeast along the southwestern boundary of the Vista Coal Project and separates the faulted, steeply dipping strata in the west from the gently dipping, monoclinal strata that underlie the property (Figure 7-1).

Four stratigraphically continuous coal zones have been intersected on the property along a 22 km strike length from the Athabasca Valley (NW) to the McLeod River (SE). They are identified in descending order as the Val d'Or, McLeod, McPherson and Silkstone Zones. Each zone consists of multiple coal plies separated by clastic parting material of variable thickness. The aggregate total coal thickness of the combined zones averages 28 m over a 200 m stratigraphic interval.

The structural style is a simple monocline trending 300° and dipping gently at 6° northeast at the northern boundary of the property to a maximum 15° at the southern boundary on the McLeod River.

7.2 Regional Geology

The Coalspur Coal Projects are located on the eastern margin of the outer foothills of the Rocky Mountain thrust belt. The rocks form part of a thick sequence of continental sediments from the Saunders Group that overlies the marine Wapiabi Formation of the Alberta Group. The Upper Cretaceous-Palaeocene Saunders Group is over 3,600 m thick (Jerzykiewicz and McLean, 1980) and is divisible into the Brazeau, Coalspur and Paskapoo Formations (

Figure 7-2 and Figure 7-3). Although all three units host carbonaceous members and thin coal seams, the major (potentially economic) coal deposits are restricted to the Coalspur and Paskapoo Formations.

Strata of the Saunders Group were deposited mainly within lacustrine and alluvial environments. The Brazeau and Coalspur Formations were deposited as a series of five cyclotherms, each consisting of a lower part that comprises mainly channel sandstones and an upper part, consisting mostly of mudstones with coaly shales and/or coal beds, and lacustrine rythmites (Jerzykiewicz and Sweet, 1988). The fifth cyclothem is the Coalspur Formation (Jerzykiewicz, 1985). The thickest coal beds are associated with alluvial deposits in the upper part. The Coalspur Formation is up to 600 m thick and includes seven major seams, which range up to 22 m in thickness (Engler, 1983; Jerzykiewicz and McLean, 1980). This formation contains the vast majority of identified Coal Resources in the outer foothills.

The Paskapoo Formation, which overlies the Coalspur Formation, is a continental alluvial plain deposit and includes thick successions of poorly indurated mudstones and sandstones. Economically important coals are restricted to the Paskapoo Formation north of Hinton, in the Obed Mountain Coalfield, where a coal-bearing interval about 140 m thick contains up to six seams of high volatile bituminous coal, with individual seams up to 5 m thick (Horachek, 1985).

7.3 Local Geology

7.3.1 Coalspur Formation

The coal bearing upper part of Coalspur Formation consists of approximately 300 m of interbedded sandstones, siltstones and carbonaceous to bentonitic mudstones, and several thick continuous coal zones. True bentonite and tuff layers are present, most commonly associated with the coal zones.

A distinct, resistive conglomerate, known as the Entrance Conglomerate, marks the base of the Coalspur Formation and is approximately 275 m below the lowermost coal zone. Thick cross bedded sandstones of the Tertiary (Cenozoic) Paskapoo Formation conformably overlie the Coalspur Formation throughout the region.

Six persistent and correlated coal zones have been identified in the Hinton region. In descending order they are identified as the Val d'Or, Arbour, McLeod, McPherson, Silkstone and Mynheer zones (Figure 7-4). These zones are typically multi-ply coal seams with interbedded mudstone/bentonite partings and can range in thickness from 1 m to up to 35 m. The most significant zones encountered at the Vista Coal Projects are the Val d'Or, McLeod and McPherson zones.

7.3.2 Structural Geology

The Vista Coal Project (including Vista Extension)

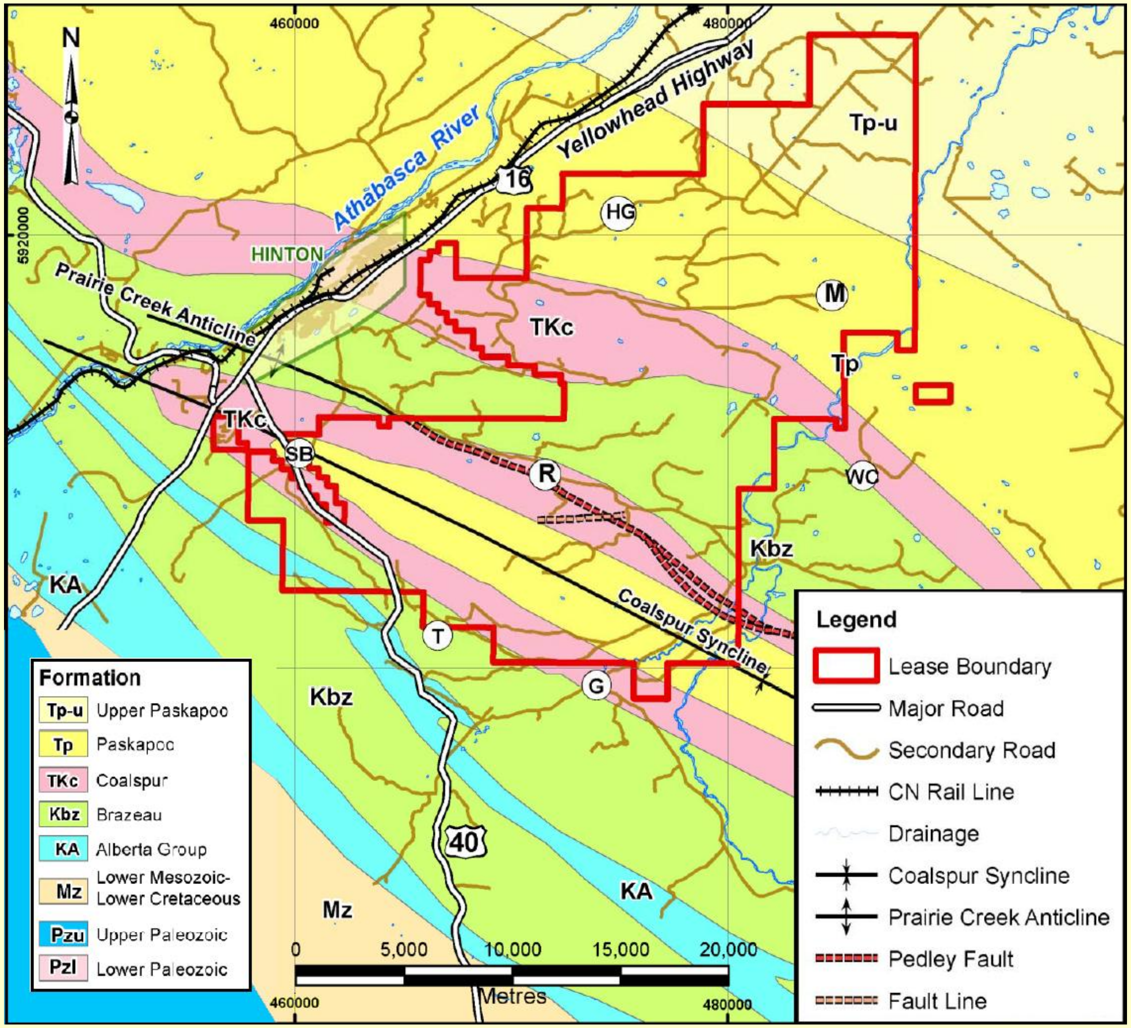
The Coalspur Formation at the Vista Coal Project is exposed in subcrop along the erosional eastern margin of the Prairie Creek Anticline. This margin area is bounded to the west by the Pedley Fault, a major reverse fault, which separates the folded and deformed strata of the Foothills Belt from the undeformed Alberta Syncline strata.

The structure is a simple monocline, trending 300° northwest/southeast. The beds dip gently northeast from 6° in the western part of the property up to 15° at the McLeod River on the eastern boundary.

No significant faulting has been identified on the property. Glacial ice deformation has been observed locally along the subcrop margins of the coal zones.

The property is overlain entirely by a mantle of glacial till and alluvium which varies from 5 m to 30 m in thickness. Consequently, all stratigraphic correlation and structural interpretation is based entirely on the geological modelling of drill hole data.

Figure 7-1 Regional Geology of the Vista Coal Projects



SNOWDEN	Regional Geology The Vista Coal Projects	Source: Golder, 2012

Figure 7-2 Regional Stratigraphic Correlation across the Interior Plains

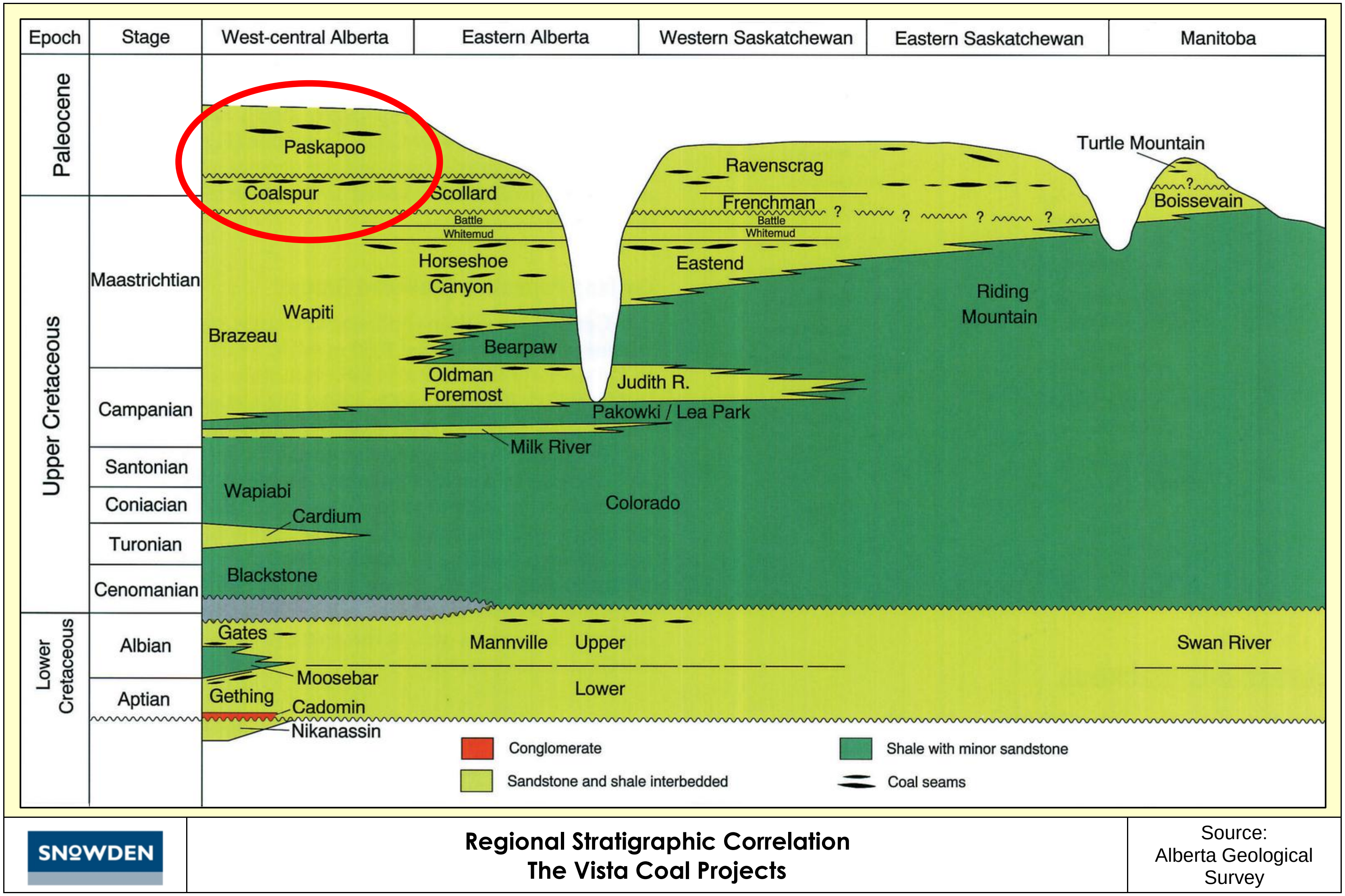
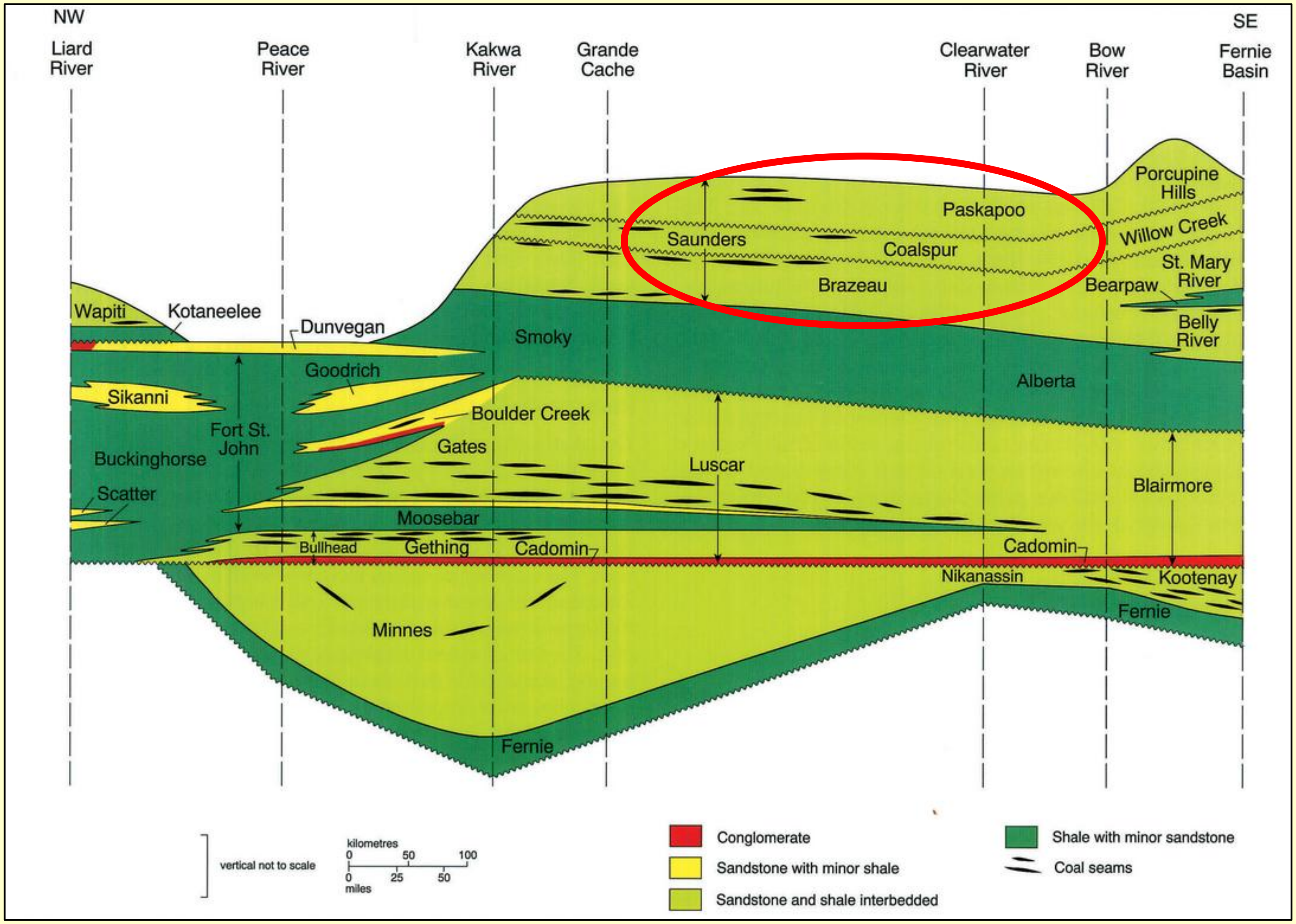
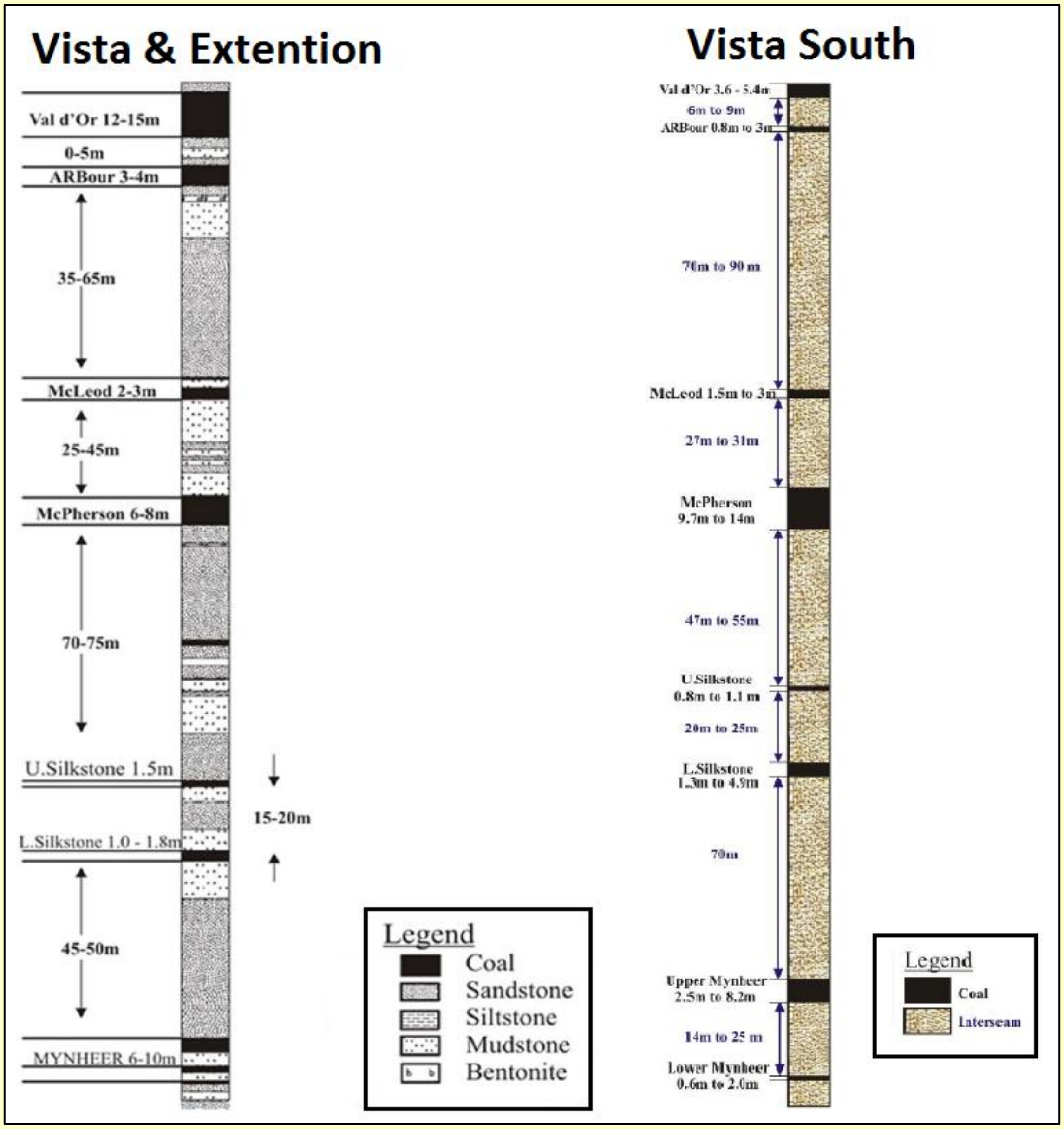


Figure 7-3 Regional Schematic Section



SNOWDEN	Regional Schematic Section The Vista Coal Projects	Source: Alberta Geological Survey

Figure 7-4 Generalised Stratigraphic Column of the Coalspur Formation at the Vista Coal Projects



SNOWDEN	Generalised Stratigraphic Column The Vista Coal Projects	Source: MMTS, 2010

Vista South

The Coalspur Formation on the Vista South coal property is buried in subcrop along the margins of the Entrance Syncline. This large, asymmetrical fold structure extends from the Athabasca River valley south eastwards to the Lovett River over a strike length of 70 km (Figure 7-1). The axial hinge is parallel to the Rocky Mountain Front Range. On the Vista South Property, the structure is divided into:

- The Southwest Limb, trending northwest/southeast at steep dip angles ranging from 45° to 65° northeast.
- The Nose Area, extending across the syncline structure from the southwest limb to the northeast limb. A relatively flat bottom syncline structure plunging gently between 8° and 10° southeast.
- The Northeast limb, extending from the Nose to the Gregg River, and truncated to the northeast by the major Pedley reverse thrust fault which separates the Entrance Syncline from the adjacent Prairie Creek Anticline. The dip angle on this limb increases from 20° near the nose to 35°, and finally near vertical where it is directly overthrust by the Pedley Fault. South-eastward from this point, the structure is uncertain. Extreme deformation and structural repeats of the coal seams have been observed in drilling near the Pedley Fault overthrust on the Ski Hill Road, which was intensely drilled by Denison in 1981.

The property is overlain entirely by a mantle of glacial till and alluvium which varies from 5 m to 30 m in thickness. Outcrops are limited and consequently, all stratigraphic and structural conclusions are based mainly on drillhole data.

7.4 Mineralisation

7.4.1 The Vista Coal Project (including Vista Extension)

The nomenclature used for identifying coal zones and individual seam plies has been adopted from Manalta. Esso applied a different nomenclature for the Hinton East and Hinton West coal deposits and this nomenclature been changed to correspond with that applied by Manalta.

Of the six recognised coal zones encountered within the Coalspur Formation, only the Val d'Or, McLeod, McPherson and Silkstone zones maintain a persistent mineable thickness throughout the Vista lease areas and constitute the majority of the potentially mineable resource. The Arbour Zone is locally present only in the Hinton West Block, while the Mynheer Zone is usually too deep and too thin to be considered surface mineable.

The relative stratigraphic position and average thicknesses of the coal zones (seams/plies) are shown in Figure 7-5.

The Val d'Or Zone consists of seven correlated sub-seam plies numbered from the base up from V1 through V7 (see Figure 7-5). Some of these plies are further divided into lower and upper units by thin partings. The individual plies maintain relatively constant thickness over the strike length of the property, while most of the variation takes place in the interbedded clastic parting material. The average zone thickness is approximately 32 m, of which some 15 m is coal. The zone thickness increases from 20 m along the eastern boundary along the McLeod River to over 60 m in the Hinton West Block. This is almost entirely due to increases in the interbedded sandstone sequence in the upper part of the zone, as the total coal thickness remains relatively constant.

The McLeod Zone consists of three correlated plies, numbered from the base up L1 to L3. These plies are typically high ash coal. The zone has an average thickness of approximately 5 m, of which some 3.7 m is coal.

The McPherson Zone consists of four plies, identified, from the base up, as P1 through P4. The McPherson plies are the most consistent in terms of thickness and continuity. The average zone thickness is nearly 7 m, of which 6 m is coal.

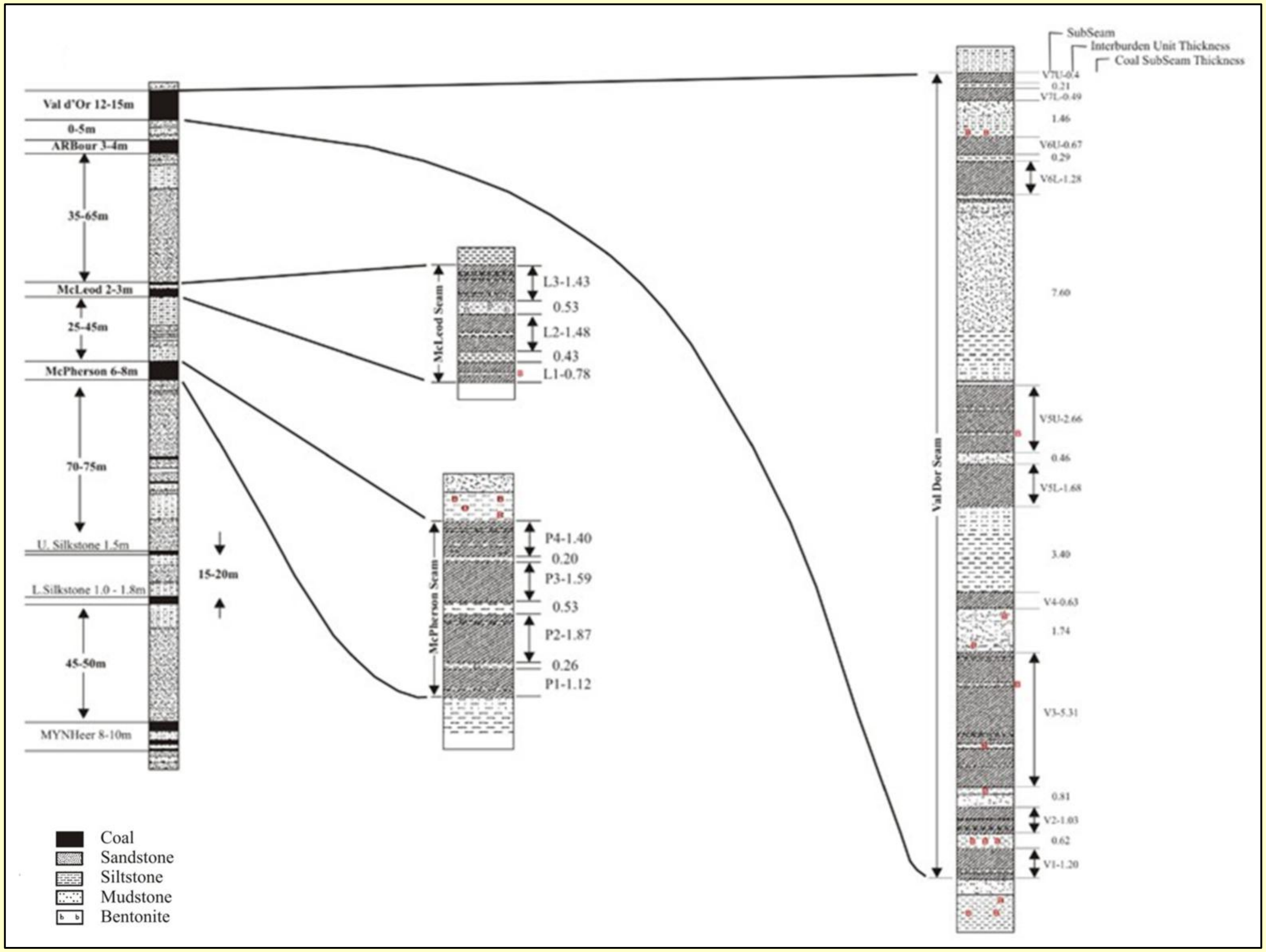
The Silkstone Zone is located 70 m below the McPherson Zone and consists of two distinct coal seams: the Upper Silkstone and the Lower Silkstone seams. The Upper Silkstone Seam ranges in thickness from 0.3 m to 1.0 m, while the Lower Silkstone Seam, 10 m below, consists of two coal plies separated by a thin parting. This seam ranges in thickness from 3.0 m to 3.5 m.

7.4.2 Vista South

The terminology used for identifying coal zones and individual seam plies has been adopted from Denison Mines Limited and the Alberta Geological Survey. There are six continuous coal zones recognized within the upper 300 m of the Coalspur Formation identified in descending order as the Val d'Or, Arbour, McLeod, McPherson, Silkstone and Mynheer. While these individual zones maintain relatively constant thicknesses and stratigraphic positions within Vista South, the proportion of coal plies to rock partings in each zone is variable.

The Val d'Or Zone consists of two major sub-seams separated by a distinct 0.3 m parting. The total zone thickness ranges from 5.5 m to 3.7 m with the net coal thickness ranging from 2.9 m to 3.6 m. The geophysical log signature is distinct and looks very similar to the V3 Upper and Lower ply section on the adjacent Vista Coal Project. In the southeastern half of the Entrance Syncline the Val d'Or geophysical trace looks completely normal compared with the northern property and includes all the plies from V1 to V6. A 40 m to 50 m thick wedge of sandstone cuts out the top few plies of the Val d'Or in the main Vista property and it seems to continue into Vista South.

Figure 7-5 Detailed Stratigraphic Column of the Target Coal Zones at the Vista Coal Projects



SNOWDEN	Detailed Ply Nomenclature The Vista Coal Projects	Source: MMTS, 2010

The Arbour Zone, between 6 m and 9 m below the Val d'Or Zone, consists of one to three coal plies interbedded with mudstones. The total zone thickness ranges from 0.8 m to 3.0 m and the net coal thickness ranges from 0.6 m to 1.5 m. The Arbour Zone is typically underlain by a persistent bentonite bed which provides a correlation marker.

The McLeod Zone is 70 m to 90 m below the Arbour Zone. The geophysical signature typically shows up to three coal/carbonaceous shale plies with a characteristic low density value. The zone varies in thickness from 1.5 m to 3.0 m with net coal thickness from 0.9 m to 2.5 m. In certain circumstances, the McLeod Zone shales out completely.

The McPherson Zone is 27 m to 31 m below the McLeod Zone. This is the thickest and most consistent zone on the Vista South Property. It consists of four plies, identified as P1 through P4 in ascending order. The McPherson Zone ranges in total zone thickness from 9.7 m to 14.0 m with net coal thickness ranging from 6.0 m to 9.5 m. The zone appears best developed along the northeast limb of the structure and there is evidence of three-fold fault repetition certain drill holes where this limb is impacted by the Pedley Fault.

The Silkstone Zone consists of an Upper and Lower Silkstone Zone 47 m to 55 m below the McPherson Zone. The Upper Silkstone Zone is typically a single ply ranging in thickness from 0.8 m to 1.1 m. The Lower Silkstone is 20 m to 25 m below the Upper Siltstone and consists up to four thin coal plies in a total zone ranging from 1.3 m to 4.9 m. The net coal thickness ranges from 0.4 m to 1.3 m. This seam is highly variable and not considered mineable.

The Mynheer Zone is typically 70 m below the Silkstone Zone and also consists of an upper and a lower zone. It has not been intersected by drilling within the Entrance Syncline and is thus not considered in resource estimations.

For each zone/ply the following criteria for inclusion in resource estimation applies:

- Minimum mineable seam thickness is 0.6 m; rock partings 0.3 m or greater are considered removable.
- A coal zone is considered mineable if it has a cumulative thickness greater than or equal to 1.0 m *e.g.* an upper ply of coal 0.4 m thick, a rock parting 0.3 m thick, and a lower coal ply 0.4 m thick.

8 Deposit Types

The mineral deposit that is the subject of this Technical Report is coal. The coal deposits associated with the Coalspur Coal Projects (Vista Coal Project, Vista Extension and Vista South) are considered to be surface mineable, as defined in the Geological Survey of Canada Paper 88-21 (“GSC 88-21”).

In the Coalspur lease areas, the coal zones occur at depths from sub-outcrop (below the base of the overlying till material) extending down dip to over 250 m deep. The targeted Coal Resources, in terms of deposit type, are therefore defined as surface mineable.

Data acquired through standard coal exploration drilling methods and techniques are then collated and used to construct three dimensional, computer generated, digital geological models of structure and coal quality (grade).

In terms of structure, the target area can be described as being an area with low tectonic disturbance, the only main feature being the eastern monocline, resulting in strata dips of up to 10°. No major faults have been identified within the defined resource blocks notwithstanding major boundary faults. The geology type, as defined by geological complexity, is classed as moderate.

9 Exploration

The following describes the exploration activities across all of the Coalspur Coal Projects conducted by Coalspur.

9.1 The Vista Coal Project and Vista Extension

Coalspur's exploration has built on the previous work and has been aimed at improving overall structural and coal quality confidence while at the same time increasing the areal coverage of the definable Coal Resources.

All exploration activities undertaken by Coalspur at Vista and Vista Extension have been through drilling activities, and this is described in the next section.

9.2 Vista South

Coalspur's exploration has built on the previous work and has been aimed at improving overall structural and coal quality confidence while at the same time increasing the areal coverage of the definable Coal Resources.

All exploration activities undertaken by Coalspur at Vista and Vista Extension have been through drilling activities, and this is described in the next section.

9.3 Summary

The entire Coalspur Coal Properties are overlain with a blanket of glacial till and alluvium which varies from 5 m to 30 m in thickness, and as a consequence, exploration has been conducted using primarily exploration drilling methods. There appears to be little in the way of exploration data derived from other methods *e.g.* airborne geophysical surveys, seismic surveys etc.

The exploration and development of the Coalspur Coal Properties, as they are currently defined, has been carried out by six separate companies: APM; Esso; Manalta, Denison, Luscar; and most recently Coalspur.

10 Drilling

10.1 The Vista Coal Project

10.1.1 Hinton West and Hinton East

Associated Porcupine Mines Ltd carried out initial exploration between 1971 and 1974. A total of 15 drillholes, with downhole geophysical logging and minor sampling, were completed. Density, gamma ray and neutron logs were run on all holes and coal samples were taken from two holes.

Exploration by Esso on the Hinton properties was carried out continuously between 1981 and 1985. Their work included the drilling of 94 drill holes on the property for a total of 14,145.3 m. There were 182 core samples taken. Drill holes were geophysically logged with a full suite of geophysical logs, including gamma ray, calliper, long-spaced density, bed resolution density, focused beam electric, and sonic.

Coalspur conducted a drilling programme on the lease areas in February 2010 to collect samples for coal thickness and coal quality verification and validation. Five holes were drilled on Hinton West and seven holes were drilled on Hinton East. In the 2011/2012 season, Coalspur drilled a further four drill holes (three cored and one rotary) totalling 1,126 m. In total, Coalspur drilled 1,978.2 m.

Table 10-1 provides specific details regarding all drilling undertaken on the Hinton properties to date.

Table 10-1 Summary Drilling Statistics for Hinton West and Hinton East

Company	Year	Rotary Holes	Depth (m)	Core Holes	Depth (m)	Total Holes	Total Depth (m)
APM / Tanager	1972	7	594.0	0	0	7	594.0
APM / Tanager	1974	0	0	8	661.0	8	661.0
Esso	1981	9	2,782.2	1	400.0	10	3,182.2
Esso	1982	44	6,126.7	10	1,222.4	54	7,349.1
Esso	1983	13	1,305.0	0	0	13	1,305.0
Esso	1984	9	1,272.4	0	0	9	1,272.4
Esso	1985	4	567.0	4	469.6	8	1,036.6
Coalspur	2010-2012	1	341.0	15	1,637.2	16	1,978.2
Grand Total		**87**	**12,988.3**	**38**	**4,390.2**	**125**	**17,378.5**

10.1.2 McLeod River North and Z Block

Manalta initiated a major exploration programme on the McLeod River North property in 1980, and continued through calendar 1981. The programme was designed to define the surface mineable coal resources of the Val d'Or and McPherson zones within 100 m of the surface. A closely spaced drilling pattern was laid out on nine cross sectional drill access lines spaced between 800 m and 1,100 m apart along strike of the coal bearing zone. A total of 148 rotary drill holes (7,677 m), including 45 till holes, and 17 continuous wire line HQ cored drill holes (937 m) were completed and geophysically logged.

In addition, two 600 tonne bulk samples were extracted from the site in 1981 for pilot scale washability testing.

Manalta completed a 17 drill holes (1,505 m) on the Z Block lease in 1992 to define surface mineable Coal Resources. Eight of these holes were cored (702 m) to provide samples for coal quality analyses.

The drilling was undertaken with Mayhew 1000 and Failing 1250/1500 type rotary drills mounted on trucks or Nodwell tracked vehicles. These types of drills normally have a maximum drilling depth limitation of 120 m. The coring was conducted with a Cyclone TH100 truck mounted drill rig equipped with a 3 m Christensen triple tube core barrel. This allowed for continuous retrieval of a 6.99 cm diameter core inside a plastic liner. The reported core recovery ranged from 85% to 100% with an average value of 95%.

Coalspur conducted an extensive exploration drilling programme from September 2010 through February 2011 to verify coal quantity and quality expectations, and to infill between the historic Manalta drill lines for detailed resource definition. Three cored drill holes were completed on the Z Block and 55 rotary plus 26 core holes on the McLeod North zone for a total of 84 holes and 8,127 m. Table 10-2 summarises the drilling on the McLeod and Z Block leases.

The equipment used consisted of two Ingersoll Rand TH60 truck mounted drill rigs. Coring was performed with a Christensen wireline system using a split inner barrel to facilitate on site sampling. Both 7.62 cm and 15.6 cm core was cut; the larger diameter specifically for attrition testing (drop shatter) to model washability performance.

All holes were geophysically logged running a full suite of gamma, density, single point resistance and calliper. Core recovery was excellent, averaging over 90% for the 7.62 cm core and 100% for the larger 15.6 cm core. In addition, ten closely spaced 15.6 cm cores were collected from a single drill site from the Val d'Or Seam to provide enough volume for bulk sample washability testing and follow up combustion tests.

Table 10-2 Summary Drilling Statistics for McLeod River North and Z Block

Company	Year	Rotary Holes	Depth (m)	Core Holes	Depth (m)	Total Holes	Total Depth (m)
McLeod River North							
Manalta	1980	31	1,984.0	7	310.0	38	2,294.0
Manalta	1981	72	5,050.0	10	627.0	82	5,677.0
Manalta	Till holes	45	643.0	0	0	45	643.0
Coalspur	2010/2011	55	4,948.0	26	2,867.0	81	7,815.0
Sub-total		***203***	***12,625.0***	***43***	***3,804.0***	***246***	***16,429.0***
Z Block							
Manalta	1992	9	803.0	8	701.5	17	1,504.5
Coalspur	2011	0	0	3	312.1	3	312.1
Sub-total		***9***	***803.0***	***11***	***1,013.6***	***20***	***1,816.6***
Grand Total		**212**	**13,428.0**	**54**	**4,817.3**	**266**	**18,245.6**

All of the available survey, lithological and geophysical log, and core sample data (including laboratory analytical data) from all of these programmes has been reviewed and compiled by Moose Mountain Technical Services (“MMTS”). The validated information has formed the basis of the geological models used in subsequent Coal Resource and Coal Reserve estimation exercises. Table 10-3 summarises the drilling undertaken on all of the Vista Coal Project leases to date.

Table 10-3 Summary of Drilling at the Vista Coal Project

Company	Year	Rotary Holes	Depth (m)	Core Holes	Depth (m)	Total Holes	Total Depth (m)
APM / Tanager	1972	7	594.0	0	0	7	594.0
APM / Tanager	1974	0	0	8	661.0	8	661.0
Manalta	1980	31	1,984.0	7	310.0	38	2,294.0
Esso	1981	9	2,782.2	1	400.0	10	3,182.2
Manalta	1981	117	5,693.0	10	627.0	127	6,320.0
Esso	1982	44	6,126.7	10	1,222.4	54	7,349.1
Esso	1983	13	1,305.0	0	0	13	1,305.0
Esso	1984	9	1,272.4	0	0	9	1,272.4
Esso	1985	4	567.0	4	469.6	8	1,036.6
Manalta	1992	9	803.0	8	701.5	17	1,504.5
Coalspur	2011	56	5,289.0	44	4,816.3	100	10,105.3
Grand Total		**299**	**26,416.3**	**92**	**9,207.8**	**391**	**35,624.1**

10.2 Vista South

Drilling campaigns in the 1970s were limited and served to confirm the presence of the Coalspur Formation in the area of the Entrance Syncline.

More aggressive exploration commenced in the 1980s with Denison drilling 164 rotary holes on the northern and southern limb of the syncline, as well as in the Nose area. Manalta and Luscar continued on this trend into the 1990s.

Coalspur commenced its first campaign in 2010, drilling 19 rotary holes, infilling earlier positions in the Nose to better define the structure, and along both limbs of the syncline.

Two subsequent campaigns were completed, drilling a total of 78 rotary holes (21,482 m) and three core holes (300 m).

Table 10-4 presents a summary of all exploration drilling completed on the Vista South Coal Property.

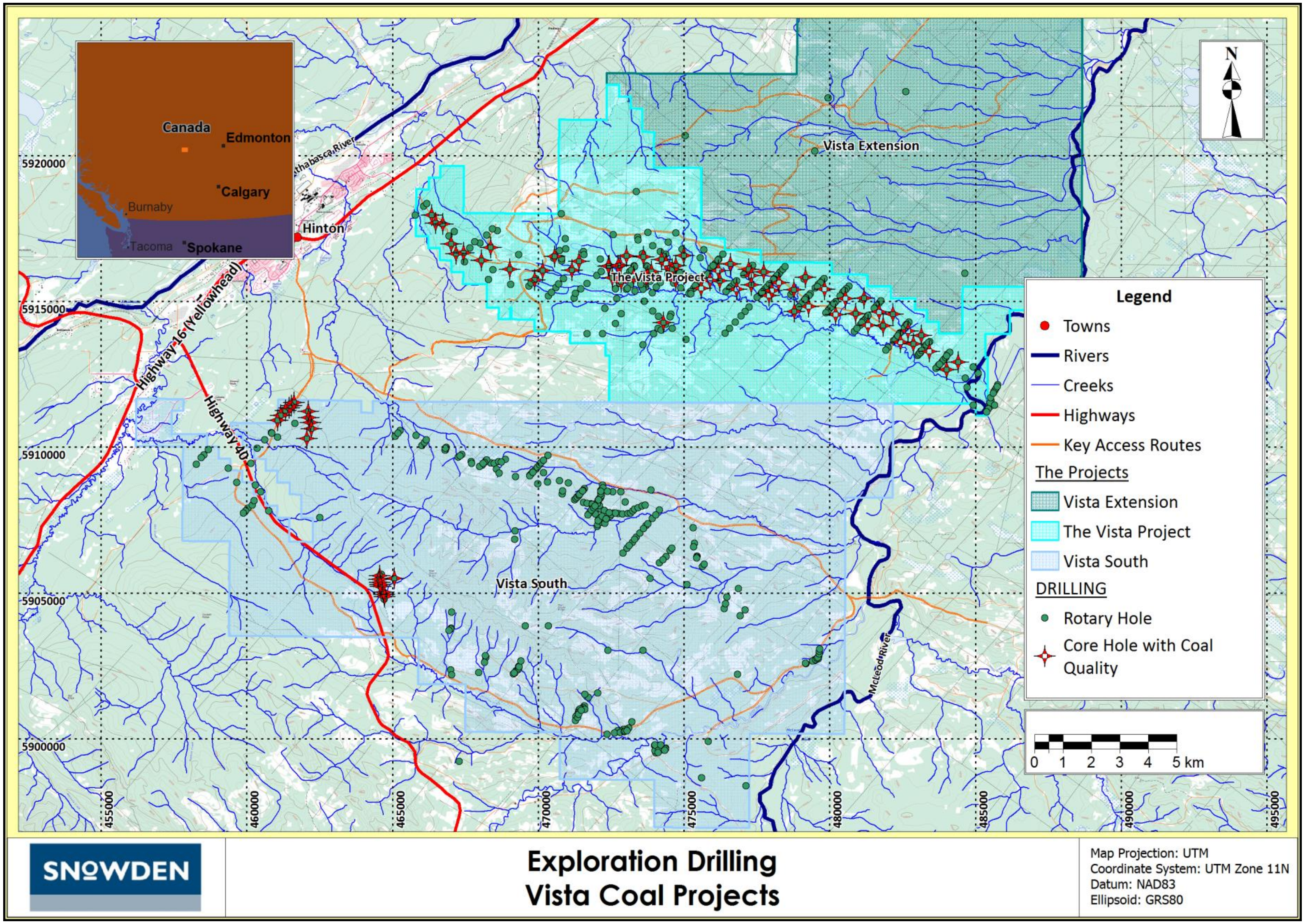
The Coalspur exploration has resulted in a better definition of structure, with a previously undetected fault being encountered (interpreted) along the northeast limb of the syncline. This thrust fault is approximately 13 km in length with an interpreted throw of up to 100 m in place, causing local seam repetition in some drill holes.

Table 10-4 Summary of Drilling at the Vista South Coal Property

Company	Year	Rotary		Core		Total	
		# holes	m	# holes	m	# holes	m
Manalta Coal Ltd	1971	1	93			1	93
Denison Mines Ltd	1971-73	13	1,373			13	1,373
Union Oil	1978	5	619			5	619
Denison Mines Ltd	1980	71	10,095	3	933	74	11,028
Denison Mines Ltd	1981	82	12,920	3	1,141	85	14,061
Denison Mines Ltd	1982	11	1,305			11	1,305
Manalta Coal Ltd	1992	13	1,673	3	188	16	1,861
Luscar Coal Ltd	1994	15	2,103			15	2,103
Coalspur Mines Ltd	2010	19	3,627			19	3,627
Coalspur Mines Ltd	2011	45	10,033	3	300	48	10,333
Coalspur Mines Ltd	2012	33	11,449			33	11,449
Grand Total		**308**	**55,290**	**12**	**2,562**	**320**	**57,852**

Figure 10-1 shows the positions of all drilled holes over the Vista Coal Project.

Figure 10-1 Drill Hole Locations in Coalspur Coal Projects



10.3 Core Recovery, Handling, and Sampling

Snowden has not been directly involved in any of the exploration and drilling programmes undertaken to date. MMTS, however, have been directly involved in the recent Coalspur exploration drilling programmes and have previously signed off as Qualified Persons (Snowden, 2012 and Golder 2012) for Item 4 through Item 12 (inclusive). For the purposes of this Technical Report, Snowden accepts responsibility for the data and information previously reported by MMTS for Item 10.

MMTS was not involved in the historical work undertaken by Esso and Manalta, though all of this work was reportedly completed (and later verified by MMTS) under the direct supervision of an experienced geologist.

The sampling procedures used by Manalta for sampling coal in core included:

- surveying of drill hole locations (X, Y, and Z)
- systematic sampling of coal by collecting the entire coal interval (ply sampling)
- systematic core logging and down hole geophysics completed to better define coal intersections
- sealing coal samples in plastic bags and shipping them to a certified laboratory for analysis
- archiving analysis certificates for future inspection.

Core recovery was aided with a plastic liner inside a split barrel of an HQ wireline core barrel system. Once filled, the core tubes were capped, labelled and set in snow to freeze. Down hole geophysics was completed on all holes. Coal core tubes were then sent to Birtley Laboratories in Calgary. The core tubes remained frozen until they were sampled in individual plies. All coal plies greater than 0.2 m were sampled. Parting material less than 0.2 m was included with the coal samples. Partings from 0.2 m to 0.5 m were analysed. Partings greater than 0.5 m were not sampled.

Work conducted by Esso at Hinton West and Hinton East used the same wireline coring methodology and system. All coal plies greater than 0.3 m were sampled. Parting material less than 1.0 m was included with the coal samples. Partings from 0.3 m to 1.0 m were analysed. Partings greater than 1.0 m were not sampled. After logging, geophysical logs were compared to obtain final depths and thicknesses of coal seams. Sample plies were then chosen, bagged and sent for analysis. Core recovery was generally excellent to good, ranging from 80% to 100% and averaging 95%.

In Snowden's opinion, both Esso and Manalta exercised great care and diligence to maintain sample integrity.

No records for the Manalta work conducted at Vista South appear to have been located or made available for review. Only limited records and information was available for the Denison exploration drilling. While this information indicates that the procedures and protocols used by Denison appear technically sound, none of the actual base data (drill hole logs, sample increments, and individual laboratory test results) actually survives so this information cannot be relied on as definitive data.

The core logging and sampling procedures applied by MMTS during the Coalspur exploration programmes followed closely the ASTM Standard, D5192, 'Standard Practice for Collection of Coal Samples from Core'. The collection of coal samples from recovered core was handled according to the following procedures:

- To identify the coal intervals and their host rock material, each completed core hole was geophysically logged using a four function downhole tool recording borehole diameter, rock density, natural gamma, and resistivity of the formation.
- The coal cores, retrieved from the 3 m long split barrel, were first cleaned of any mud or contaminants, marked with the top and bottom run intervals, and then photographed for permanent visual identification.
- The top and bottom depths of the cored interval, as recorded by the driller, were then compared to the measured recovered core interval to determine overall recovery. Using the geophysical log record, the recovered coal intervals were also compared to the true in situ coal thickness. In drill holes where any recovered coal core thicknesses were less than 85% of in situ thicknesses, the drill hole was re-drilled to obtain a better recovery. If after several attempts the recovery remained less than 85%, the recovered coal core with the best recovery was used for sample analysis.
- Using the best-recovered coal core interval, the core was then subdivided into separate lithologic units. These were then measured and described using standard geological terms to identify and record amongst others, lithology, colour, hardness, grain size, contacts, and contamination, as well as to record core loss and any coal sample intervals extracted for analysis.

Samples taken for analysis were extracted according to the following procedures:

- The minimum thickness for a coal sample interval was 60 cm (2.0 ft.).
- Intra-seam partings, up to a maximum thickness of 15 cm (6 in.) were included in the sampled coal intervals.
- Where the intra-seam parting is less than the maximum parting thickness i.e. <15 cm, the adjacent coal beds must individually be at least 2 times the parting thickness to allow the coal and parting material to be sampled together. The total sample thickness must be greater than the minimum thickness for a coal sample interval i.e. >60 cm.
- Carbonaceous shale, bone (impure coal) and rock partings greater than 15 cm were sampled separately to determine their dilution effect. If the carbonaceous material, when combined with the coal, meets the minimum requirements for coal quality, they may be included with the overall coal sample interval.
- A 15 cm roof and floor sample was taken from each major coal zone.

The samples collected from core were then placed in individual plastic bags marked on the outside with the drill hole number and sample number, and then carefully sealed to prevent excessive moisture loss. The samples were then placed together in one larger collecting bag and marked on the outside with the drill hole number.

11 Sample Preparation, Analyses, and Security

Snowden has not been directly involved in any of the sampling activities and analytical programmes undertaken to date on the Coalspur Coal Projects (Vista Coal Project, Vista Extension and Vista South). MMTS, however, have been directly involved in the recent Coalspur exploration drilling programmes and have previously signed off as Qualified Persons (Snowden, 2012 and Golder 2012) for Item 4 through Item 12 (inclusive). For the purposes of this Technical Report, Snowden accepts responsibility for the data and information previously reported by MMTS for Item 11.

MMTS was not involved in the historical work undertaken by Esso and Manalta, though all of this work was reportedly completed (and later verified by MMTS) under the direct supervision of an experienced geologist.

All exploration work conducted by Coalspur was under the direct supervision of MMTS.

11.1 Esso Sampling and Analysis

The Esso sampling protocol for cores collected in 1981, 1982, and 1985 was developed by Esso/DB Engineering to isolate individual coal and rock parting plies within each of the six seams for proximate analysis and washability (float/sink) testing. The plies could then be recombined into logical mining units and washability performance could be modelled.

Continuous 7 cm diameter core intervals were collected inside PVC plastic core liners in 3 m intervals. The liner ends were sealed and the sequenced core was sent to Calgary for logging and sampling. The cores were correlated to the geophysical log record for each hole to determine recovery and identify any lost core sections. Generally, all coal plies greater than 0.3 m were sampled. Parting material less than 1.0 m thick was included with the adjacent coal samples as it was deemed not feasible to selectively mine by surface mining methods. Partings greater than 1.0 m thick were not sampled as they were considered to be able to be selectively mined by surface mining methods. . In total, 135 plies were sampled from 11 cored drill holes in the 1981-83 programme and an additional 47 plies were sampled from four cored drill holes in the 1985 programme.

Birtley Coal and Minerals Testing (Calgary) conducted standard proximate analysis (moisture, ash content, volatile matter) and sulphur on each of the 182 individual ply samples. The samples were tumbled and screened at 19 mm x 6 mm, 6 mm x 0.5 mm, and 0.5 mm x 0 mm size fractions. The 19 mm x 6 mm and 6 mm x 0.5 mm fractions were floated at relative densities of 1.4, 1.5, 1.6, and 1.7, with proximate analysis performed on each float and the final sink fraction.

11.2 Manalta Sampling and Analysis

The Manalta sampling protocol for cores collected in 1980, 1981, and 1992 was developed by Manalta to isolate individual coal and rock parting plies within each of the three main coal zones (Val d’Or, McLeod, and McPherson) for proximate analysis and washability (float/sink) testing. The plies could then be recombined into logical mining units and washability performance could be modelled.

Continuous 7 cm diameter core intervals were collected in 3 m intervals in PVC liners. The liner ends were sealed and the sequenced core was sent to Calgary for logging and sampling. The cores were correlated to the geophysical log record for each hole to determine recovery and identify any lost core sections. Generally, all coal plies greater than 0.2 m were sampled. Parting material less than 0.2 m thick was included with the adjacent coal samples as it was deemed not to be selectively mineable by surface mining methods. Partings greater than 0.5 m thick were not sampled as they were deemed selectively mineable by surface mining methods..

Coal ply samples with less than 90% recovery were rejected from the analytical programme.

Birtley Coal and Minerals Testing (Calgary) conducted limited proximate analysis (moisture and ash content), calorific value, equilibrium moisture, and specific gravity on each of the individual ply samples. Manalta combined these individual plies into logical mining units. The samples were crushed and screened at 9.5 mm x 0.5 mm, and 0.5 mm x 0 mm size fractions. The 9.5 mm x 0.5 mm fractions were floated at relative densities 1.4, 1.5, 1.6, and 1.8, with proximate analysis performed on each float and the final sink fraction. The 0.5 mm x 0 mm was not processed.

11.3 MMTS Sampling and Analysis

The MMTS sampling and analytical programme was developed by Bob Leach Pty Ltd. Individual coal seam and rock ply core samples were shipped to ALS Laboratories in Vancouver with a corresponding sample manifest to insure receipt.

On the 7.62 cm diameter core samples the following protocol was followed:

- Each sample was weighed and Apparent Relative Density ("ARD") tests were undertaken prior to sample crushing. Instructions were provided to composite ply samples into logical mining units (coal and non-removable parting material). Each ply was crushed to -19 mm and combined on the basis of ARD and thickness.
- One quarter of the combined sample was tested for Proximate Analysis, Calorific Value, Total Sulphur, Chlorine and Specific Gravity.
- The remaining three quarters of the composite samples was screened at 0.5 mm. The minus 0.5 mm fraction was analysed for Proximate Analysis and Calorific Value.
- The +0.5 mm material was subjected to washability testing at relative densities of 1.4, 1.5, 1.6, 1.7, 1.8 and 2.0. Proximate Analysis and Calorific Value were performed on all floats and the final sink fraction.
- Instructions were provided to create further clean coal composites.

On the 15.6 cm large diameter core, the following protocol was followed to generate attrition data for wash plant design:

- Each sample was weighed and ARD determined prior to sample crushing. Instructions were provided to composite individual ply samples into logical mining units (coal and non-removable parting material).
- The combined sample was subjected to a Drop Shatter Test. The sample was dropped twenty times from 2 m and screened at -50 mm. Any oversize was hand-knapped to pass 50 mm. The broken sample was dry sized at 32, 16, 8, 4, and 2 mm. The dry size distribution and any coal losses were calculated for material reporting below 2 mm.

- A wet tumble sample was prepared according to instructions. The sample was wet tumbled for 5 minutes with cubes. Wet sizing was performed at 32, 16, 8, 2, 1, 0.25 and 0.125 mm fractions.
- Float/sink samples of +16 mm, 16 mm x 4 mm, 4 mm x 2 mm, and 2 mm x 0.25 mm were prepared. Each increment was washed at relative densities 1.30, 1.35, 1.40, 1.45, 1.50, 1.60, 1.70, 1.80 and 2.0. Each float and the final sink fraction was analysed for Proximate Analysis and Calorific Value.
- The 0.25 mm x 0.125 mm and -0.125 mm fractions were analysed for Proximate Analysis.
- Clean composite samples from both sets of core data were further analysed for Ash Chemistry, Ash Fusion and Petrographic Analysis.

Snowden is satisfied that the sample collection, preparation, chain of custody and analytical procedures used in the coal exploration programs is adequate for the estimation of a Coal Resource for a Technical Report that is compliant with the NI43-101 standards.

12 Data Verification

This section references work undertaken on the Coalspur Coal Projects including the Vista Coal Project, Vista Extension and Vista South.

12.1 Snowden Validation

Snowden undertook to perform certain validation exercises on the data contained in this Technical Report. The Coalspur database and resource model was prepared by MMTS. Snowden reviewed and validated the work and verification procedures undertaken by MMTS including:

- geological interpretation of all available drill holes and geophysical logs;
- database construction and entry of sample intervals, individual ply analysis and composite assays; and
- checking drill hole collar coordinates against topography to eliminate any obvious errors in location.

MMTS constructed all drillhole data lithology and coal quality database files, which were in turn uploaded into MineSight® software to create a 3D resource block model for three dimensional verification. MMTS believes that the database files are accurate and presents no major threat to the resource estimate.

While it is not possible to physically verify the historical sampling procedures and analytical processes, it is Snowden's opinion that the sampling and analytical protocols were sound and the reported results appear reasonable based on knowledge of similar coal mining operations nearby.

Essentially two main data sets were received by Snowden:

- Drill Hole Data
  - Collar positions
  - Basic lithology
  - Ply-by-ply proximate coal qualities
- MineSight Block Model
  - Various grid files exported in ASCII (CSV) format from the Coalspur block model
  - Grids include surfaces of roof and floor (depth and elevation), as well as unit thickness, for various lithological interfaces and units (coal, overburden, till etc.), and a range of coal quality parameters (proximate analyses)

These data sets have been reviewed and interrogated in specialised software appropriate to each data type. Drill hole data has been assessed in Supervisor (geostatistical software) while block model data has been assessed in Vulcan (3D geological modelling software). The exported block model grids have also been compared with the drill hole data in Supervisor.

12.1.1 Exploration and Drill Hole Data

Vista Coal Property and Vista Extension

The drill hole database (in spreadsheet format) named '*Coalspur Mine Plan_RAWdb_20110502-old.xls*' was interrogated in the geostatistical software programme Supervisor.

A number of edits were made prior to processing in Supervisor, including but not limited to:

- Ply recorrelation:
  - Plies named "Unknown" in the spreadsheet received were recoded to the Ply Name (coal ply or stone ply) deemed most appropriate based on the reported air dry ash content and stratigraphic position. An example is presented in Figure 12-1.
  - Obvious errors were identified and corrected as appropriate. An example is presented in Figure 12-2.
- Relative Density ("RD") calculations:
  - Where air dry RD values were absent in the original data, an RD was previously calculated using the Moose Mountain Technical Services (MMTS, 2010) formula based on the air dry ash content. The formula is:

$$RD\ ad\ = 1.26 + \frac{(1.75 - 1.30) * 50}{Ash\%\ (ad)}$$

Snowden is of the opinion that the formula is appropriate for the rank and type of coal.

  - Snowden undertook several correlation exercises to validate the MMTS formula and is comfortable that the MMTS formula produces reliable results.

In Figure 12-1 the upper Unknown Ply has a similar ash content to the Val d'Or 3 Upper ("V3U") Ply immediately above the 0.09 m Stone Ply separating the two, therefore it was recoded to V3U. The lower Unknown Ply has a much lower ash content and is separated from the upper coal ply by a stone parting of 0.25 m, therefore is was recoded to Val d'Or 3 Lower ("V3L").

Figure 12-1 Recorrelation of plies based on stratigraphy and ash content

From	To	Thick	Seam	Ply	M% ad	Ash% ad
57.58	57.61	0.03	Val D'Or	Stone	0.80	86.83
57.61	57.76	0.15	Val D'Or	V3U	3.54	9.14
57.76	57.96	0.20	Val D'Or	V3U	2.52	42.97
57.96	58.05	0.09	Val D'Or	Stone	1.39	91.45
59.56	59.70	0.14	Val D'Or	Unknown	2.60	49.20
59.70	59.95	0.25	Val D'Or	Stone	0.73	92.36
59.95	60.24	0.29	Val D'Or	Unknown	3.70	16.78
60.24	60.59	0.35	Val D'Or	Stone	1.26	91.83
57.58	57.61	0.03	Val DOr	Stone	0.80	86.83
57.61	57.76	0.15	Val DOr	V3U	3.54	9.14
57.76	57.96	0.20	Val DOr	V3U	2.52	42.97
57.96	58.05	0.09	Val DOr	Stone	1.39	91.45
59.56	59.70	0.14	Val DOr	V3U	2.60	49.20
59.70	59.95	0.25	Val DOr	Stone	0.73	92.36
59.95	60.24	0.29	Val DOr	V3L	3.70	16.78
60.24	60.59	0.35	Val DOr	Stone	1.26	91.83

SNOWDEN
Database Correlation Corrections
Vista Coal Project

Figure 12-2 Data entry error correction

From	To	Thick	Seam	Ply
51.31	54.20	2.89	Val D'Or	V1_V2
100.60	104.80	4.20	McLeod	Stone
129.15	136.05	6.90	McP1_2_3_4	Unknown
51.31	54.20	2.89	Val DOr	V1_V2
100.60	104.80	4.20	McLeod	Stone
129.15	136.05	6.90	McPherson	McP1_2_3_4

SNOWDEN
Database Correlation Corrections
Vista Coal Project

It is clear in Figure 12-2 that the Seam and Ply entry for the McPherson Seam was initially entered incorrectly. The code "McP1_2_3_4" is a Ply Code and was initially entered into the Seam field, with "Unknown" then being captured as the Ply Code. The correction as shown was made.

The data were then interrogated and basic statistics and correlations were determined for certain coal quality parameters. The key coal quality parameters are considered to be:

- Air Dry Moisture Content (M_{ad})
- Air Dry Relative Density (RD_{ad})
- Air Dry Ash Content (Ash_{ad})
- Air Dry Calorific Value (CV_{ad})

It is from these qualities that the *in situ* values are calculated using basic formulae. The only parameter that is assumed is *In Situ* Moisture ("M_{is}"). Although both Total Moisture ("TM") and Equilibrium Moisture ("EQM") tests have been conducted on a range of samples collected during the various phases of exploration, M_{is} has been assumed to be one percentage point greater than the assumed EQM, which is fixed for each ply dependent on the geographic location of the sample *i.e.* all coal plies from East Block are assigned an EQM of 10.0%, and therefore a M_{is} of 11.0%.

Equilibrium and *In Situ* Moisture

Snowden has assessed the analysed results for TM and EQM, and is comfortable that the assumptions regarding M_{is} as applied are reasonable. Figure 12-3 to Figure 12-5 present comparatives between the assumed regional EQM and the laboratory determined EQM from actual samples.

Figure 12-3 Regional EQM for West Block Coal (assumed left, laboratory right)

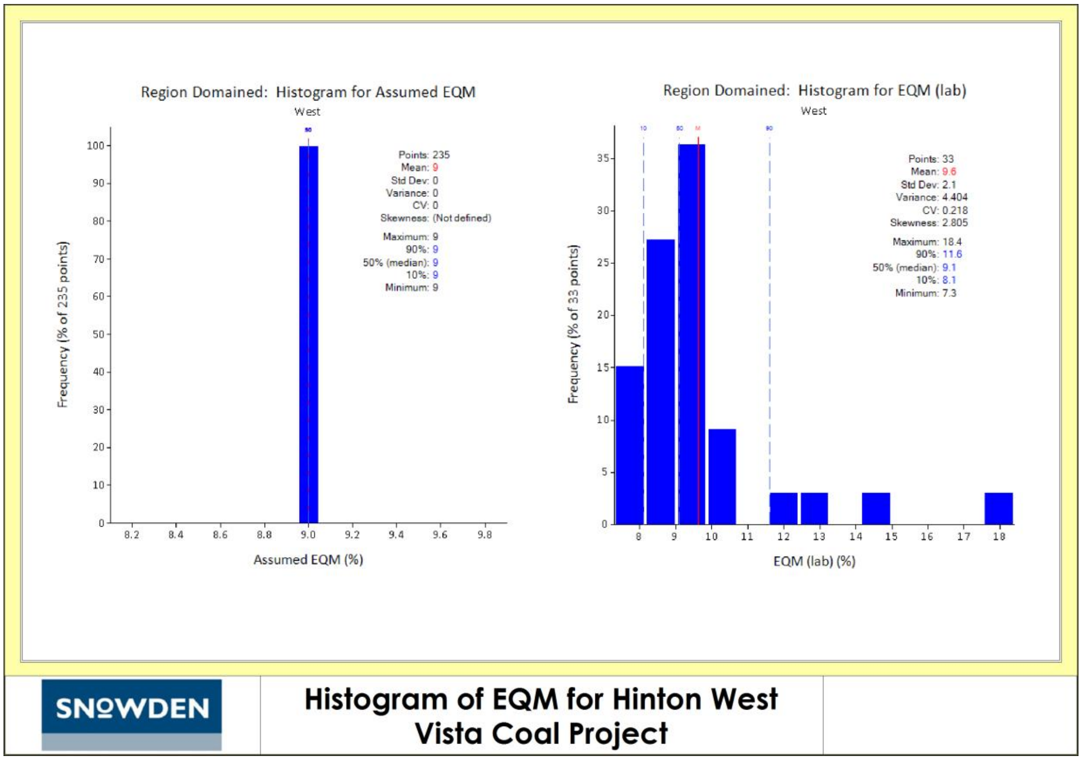


Figure 12-4 Regional EQM for East Block Coal (assumed left, laboratory right)

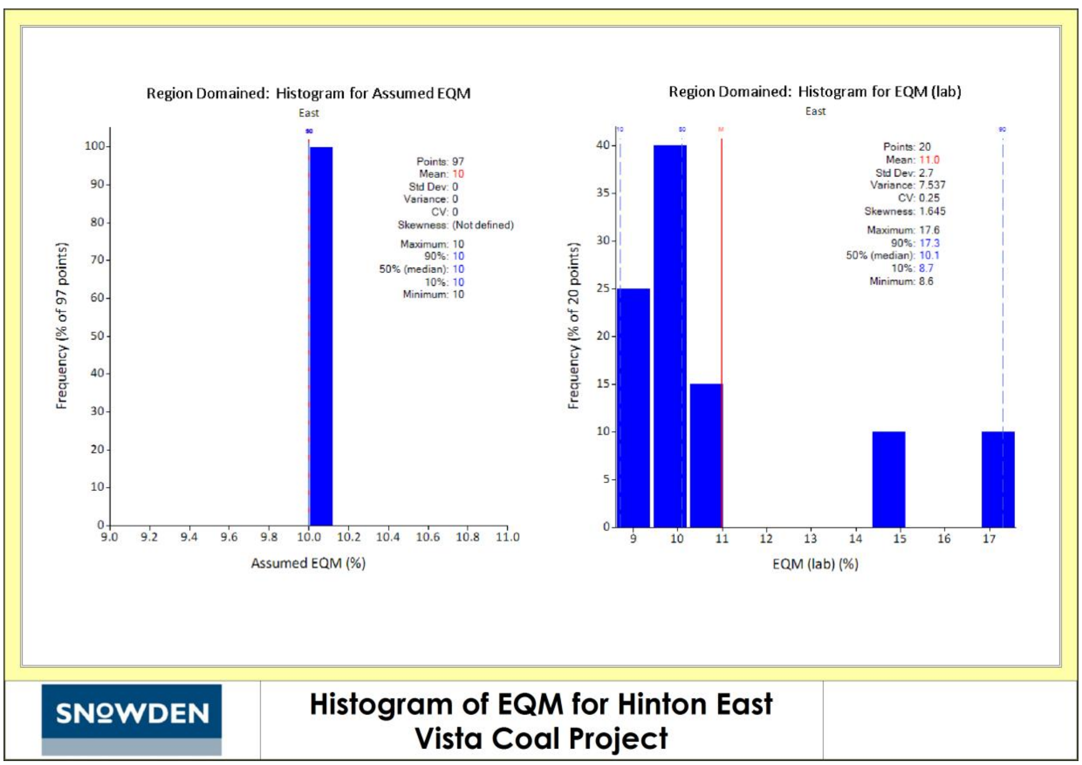
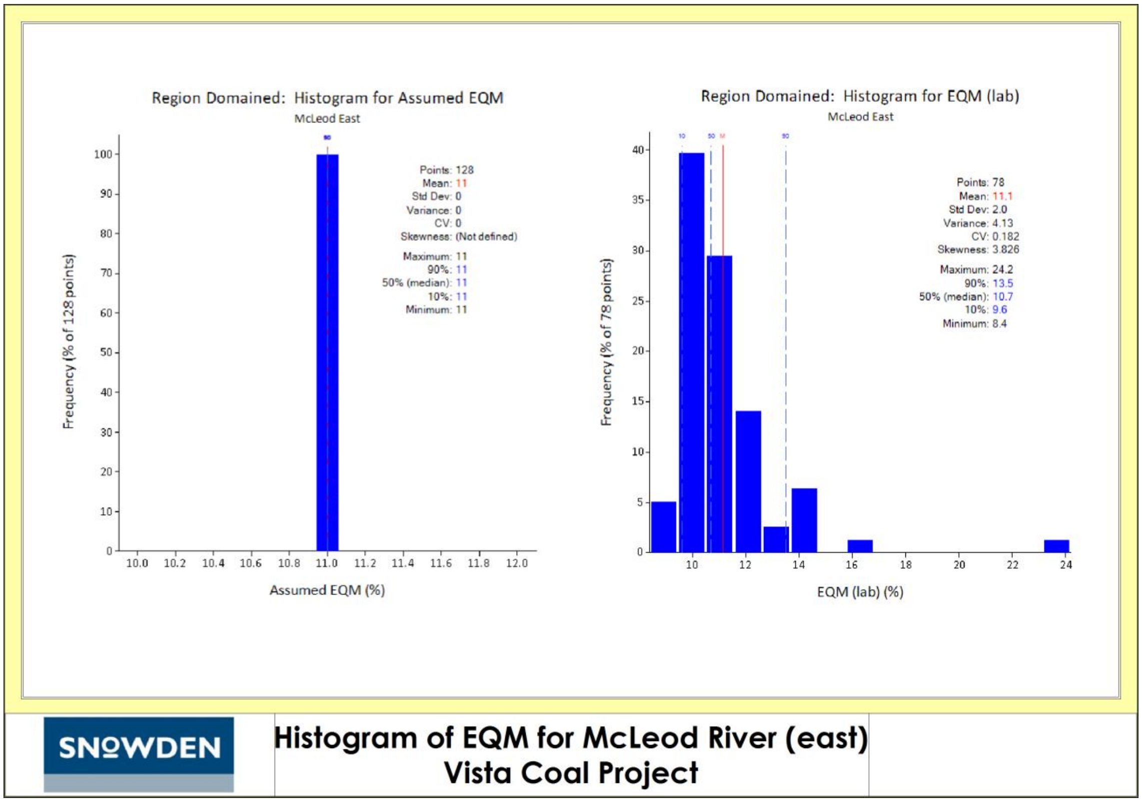


Figure 12-5 Regional EQM for McLeod (east) Coal (assumed left, laboratory right)



The addition of one percentage point to the EQM to estimate the regional *in situ* moisture is in line with previous studies for northern hemisphere coals that suggest that EQM slightly underestimates M_{is} *e.g.* Selvig and Ode (1953), Ode and Gibson (1960), and Luppens and Hoeft (1991) in Fletcher and Sanders (2003).

Air Dry Moisture, M_{ad}

Distributions for M_{ad} are presented in Figure 12-6 and Figure 12-7 (coal only and non-coal respectively). The distributions are log normal, indicating a slight positive skew resulting from several anomalous high moisture values recorded for the Val d'Or Seam (coal and non-coal samples) in the McLeod East region for borehole MR81-17C.

Figure 12-6 Distribution of M_{ad} for coal samples across the Vista Coal Project

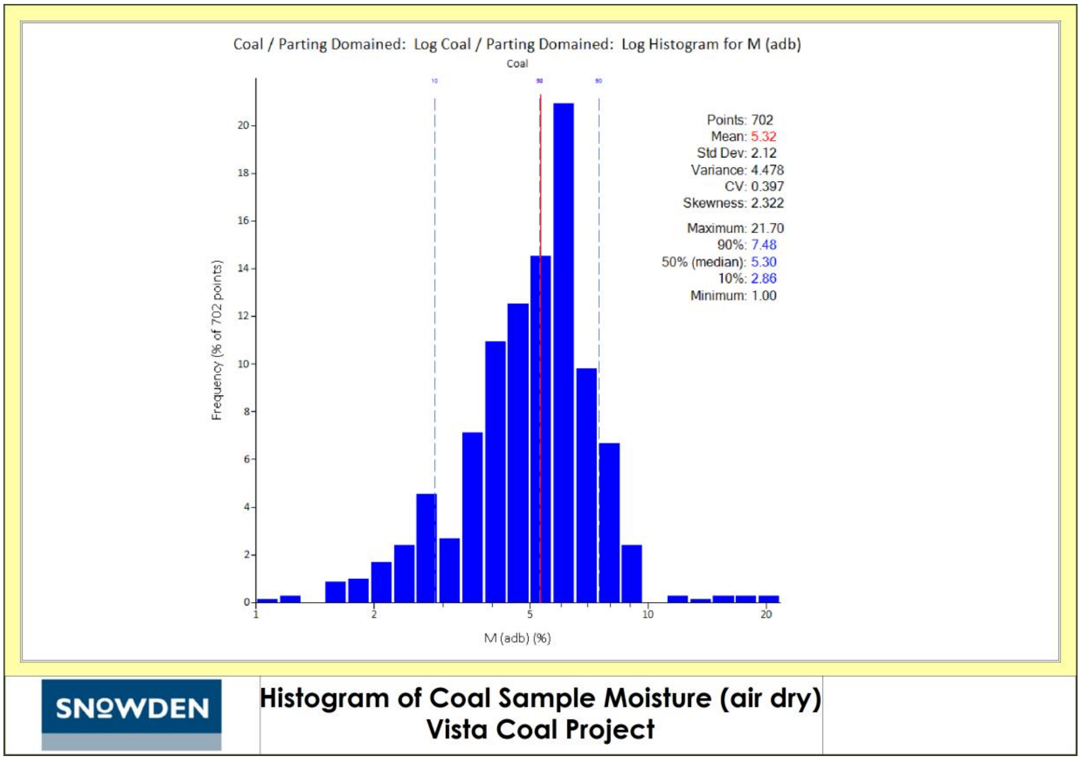
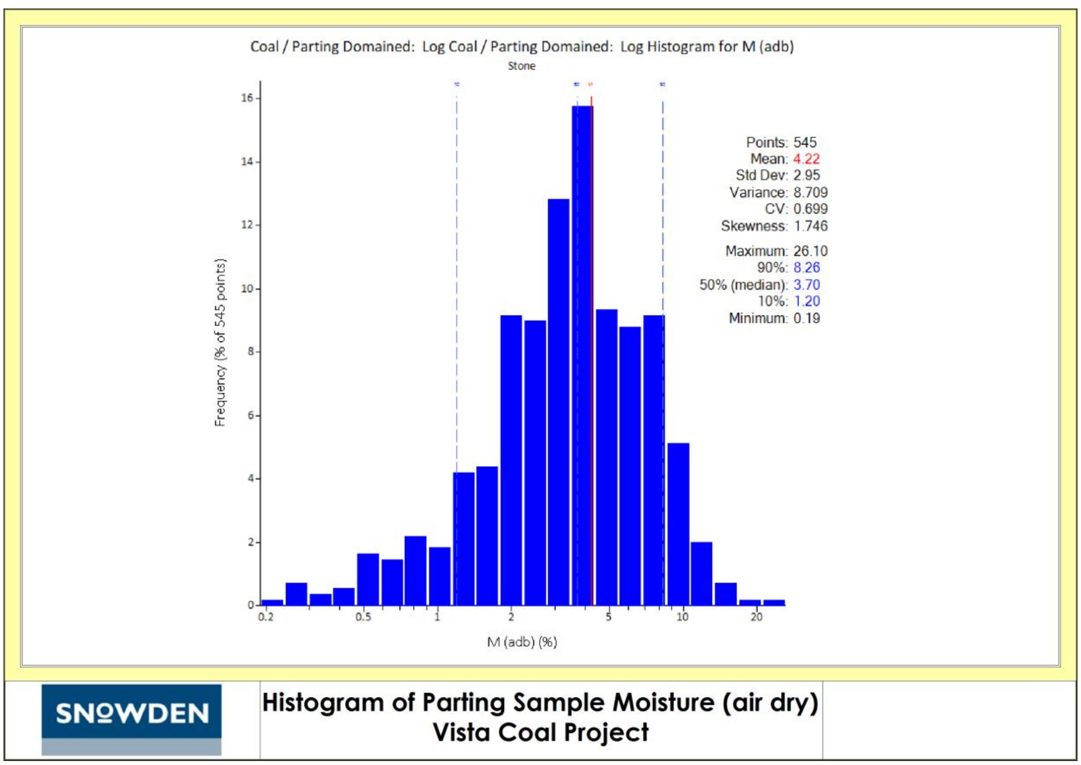
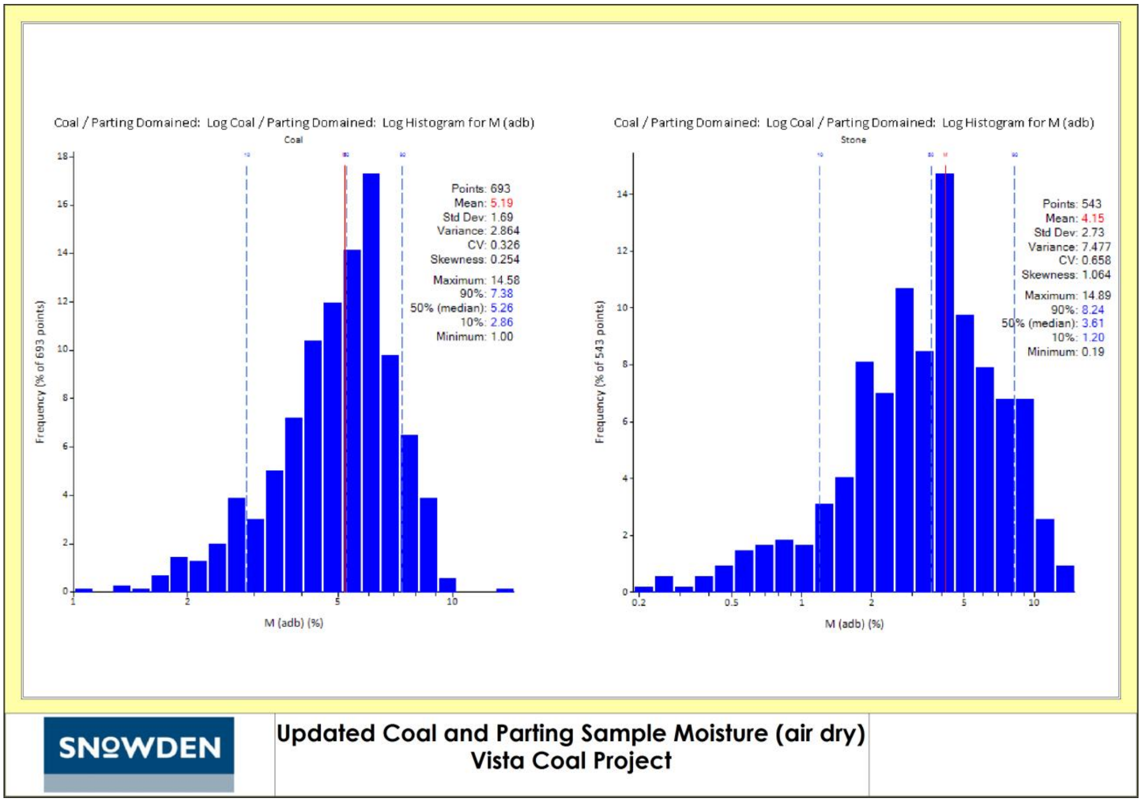


Figure 12-7 Distribution of M_{ad} for parting samples across the Vista Coal Project



Given that all the anomalously high M_{ad} values are derived from only one borehole, Snowden has assumed these values to be incorrect and deleted them from the edited data set. The updated distributions are presented in Figure 12-8 (coal left, non-coal right).

Figure 12-8 Edited and updated distribution of M_{ad} for coal and parting samples across the Vista Coal Project

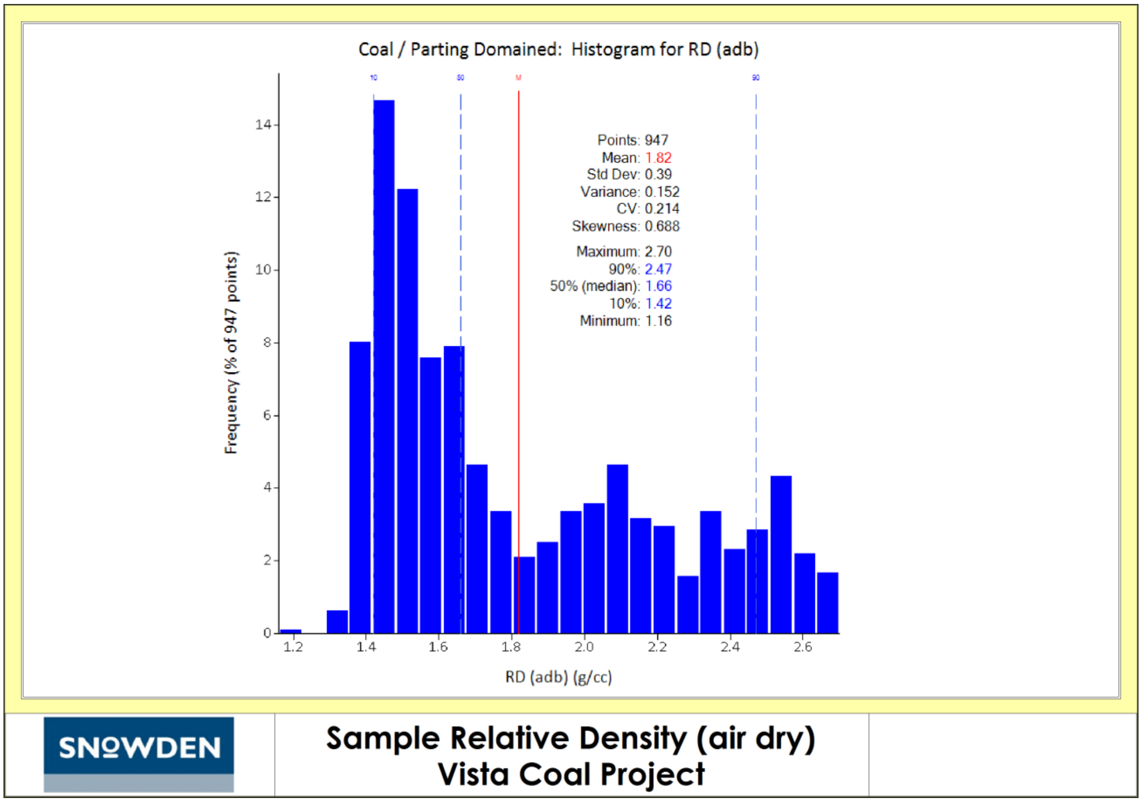


Although visually the distributions do not look materially different, the skewness has decreased, especially for the coal only distribution. The coal only distribution is now practically a normal distribution with a skewness of less than one.

Air Dry Relative Density, RD_{ad}

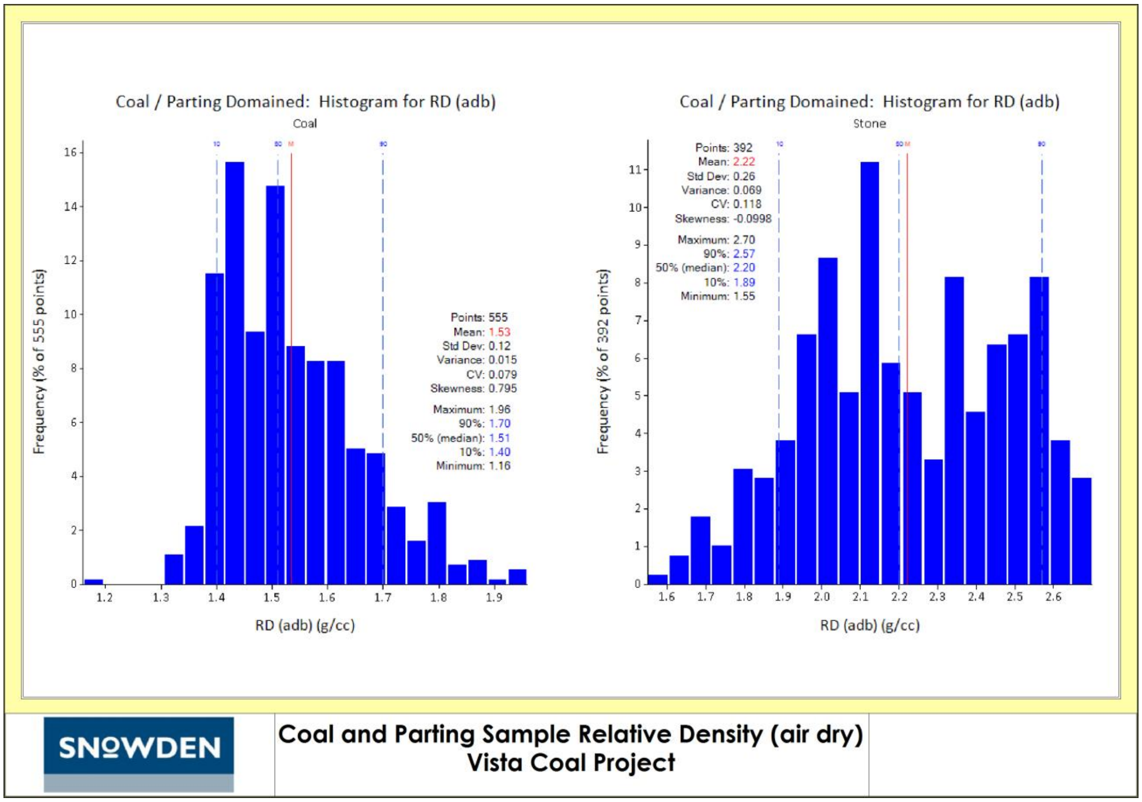
The global RD_{ad} distribution for the Vista Project is presented in Figure 12-9. It is clear that at least two distinct populations exist in the data, and this stands to reason as the coal (RD<1.8) and non-coal (RD>1.8) ply samples were sampled together as part of the parent seam.

Figure 12-9 Distribution of RD_{ad} for all samples across the Vista Coal Project



Once domained, the RD_{ad} distributions for coal and non-coal can be properly assessed. Figure 12-10 presents the domained distributions for coal (left) and non-coal (right). These distributions are what could reasonably be expected for thick interbedded coal seams as encountered at the Vista Project. In fact, the non-coal RD_{ad} distribution shows potentially two populations: this may be a function of the non-coal ply lithologies being undifferentiated between carbonaceous mudstones (lower density range) and truly clastic partings (higher density range).

Figure 12-10 Distribution of RD_{ad} for coal and parting samples across the Vista Coal Project



Air Dry Ash, Ash_{ad}

It is well understood that RD and Ash are well correlated in coal seams, with RD being the dependent (y) variable while Ash is the independent (x) variable. Therefore, as expected, the global Ash distribution shows at least two populations across the Vista Project samples (Figure 12-11). Once domained according to sampled lithology ply *i.e.* coal or non-coal (parting), the distributions appear as single populations with close to normal distributions (Figure 12-12).

A measure of the veracity of proximate analytical data is the correlation between Ash_{ad} and RD_{ad}. Figure 12-13 shows the correlation scatter plot for the mixed data set. It is clear that two regressions are presented: one for Ash_{ad} between ±10% and ±55%; and one for Ash_{ad} between ±55% and ±95%. The domained regression cross plots are presented in Figure 12-14 and Figure 12-15.

Figure 12-11 Distribution of Ash_{ad} for coal and parting samples across the Vista Coal Project

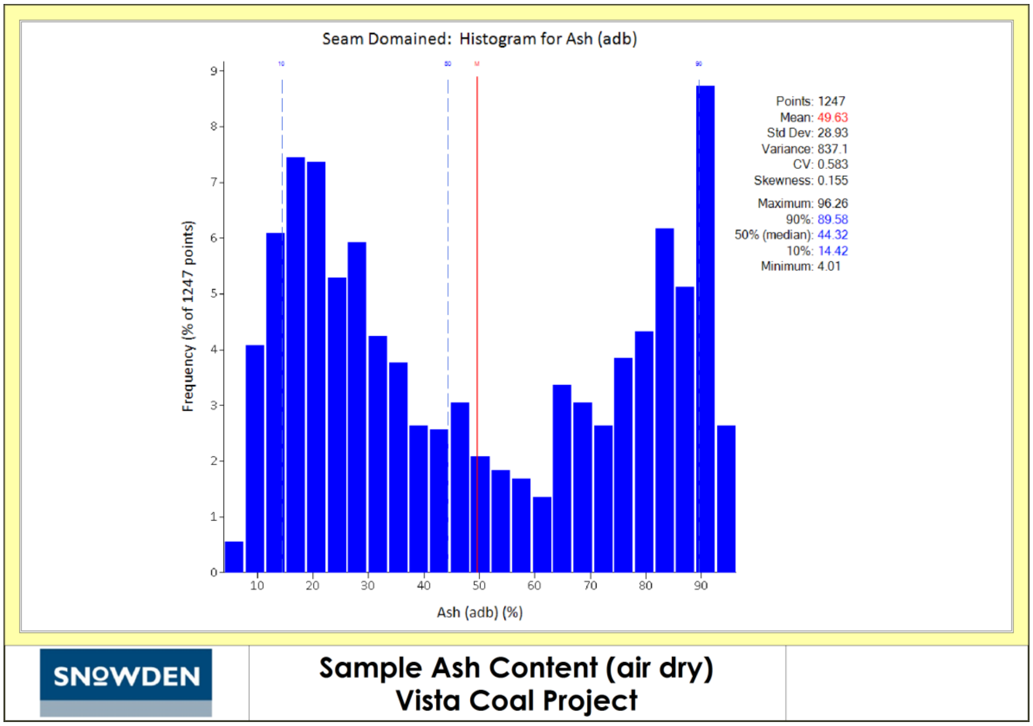


Figure 12-12 Coal / Parting domained distribution of Ash_{ad} for samples across the Vista Coal Project

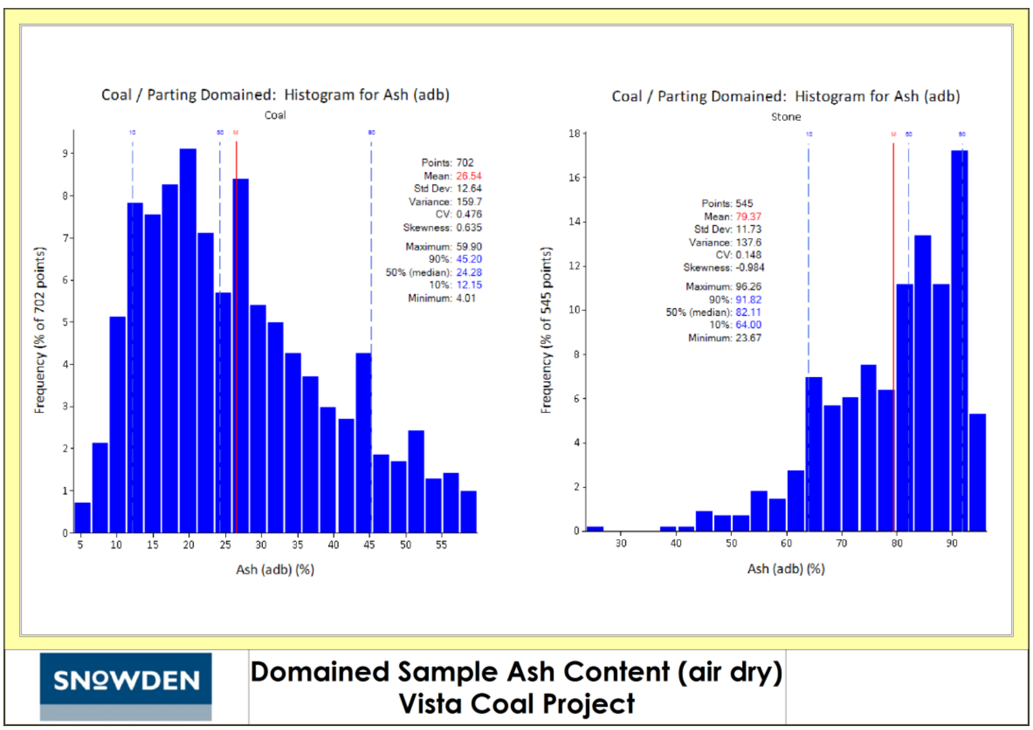


Figure 12-13 Coal / Parting correlation of Ash_{ad} and RD_{ad} for samples across the Vista Coal Project

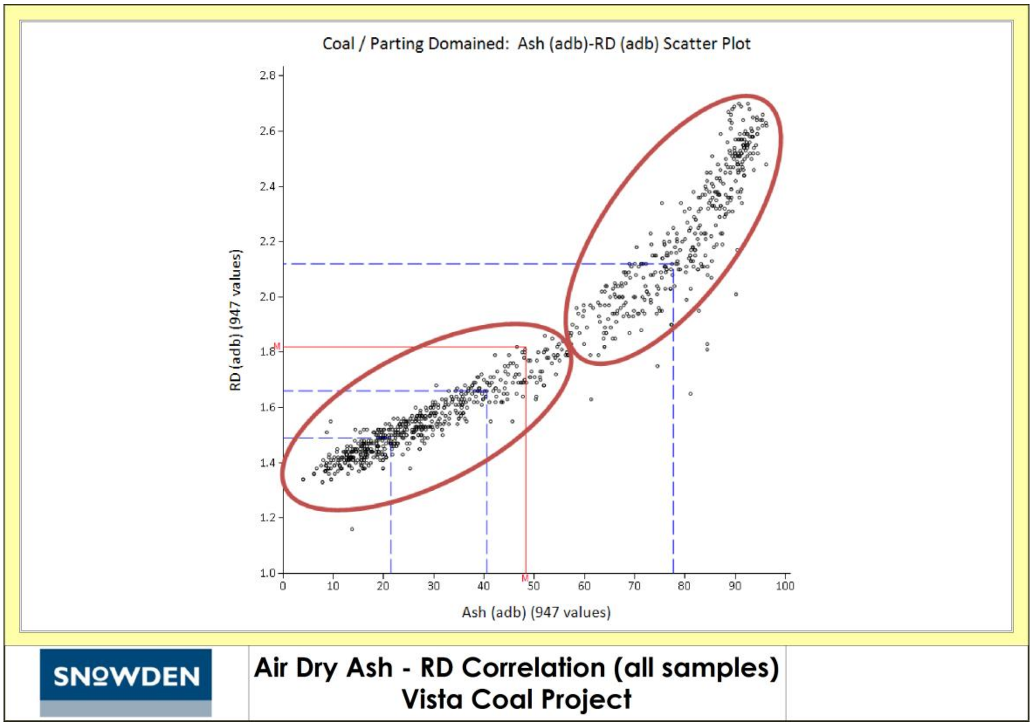


Figure 12-14 Ash_{ad} – RD_{ad} for coal samples across the Vista Coal Project

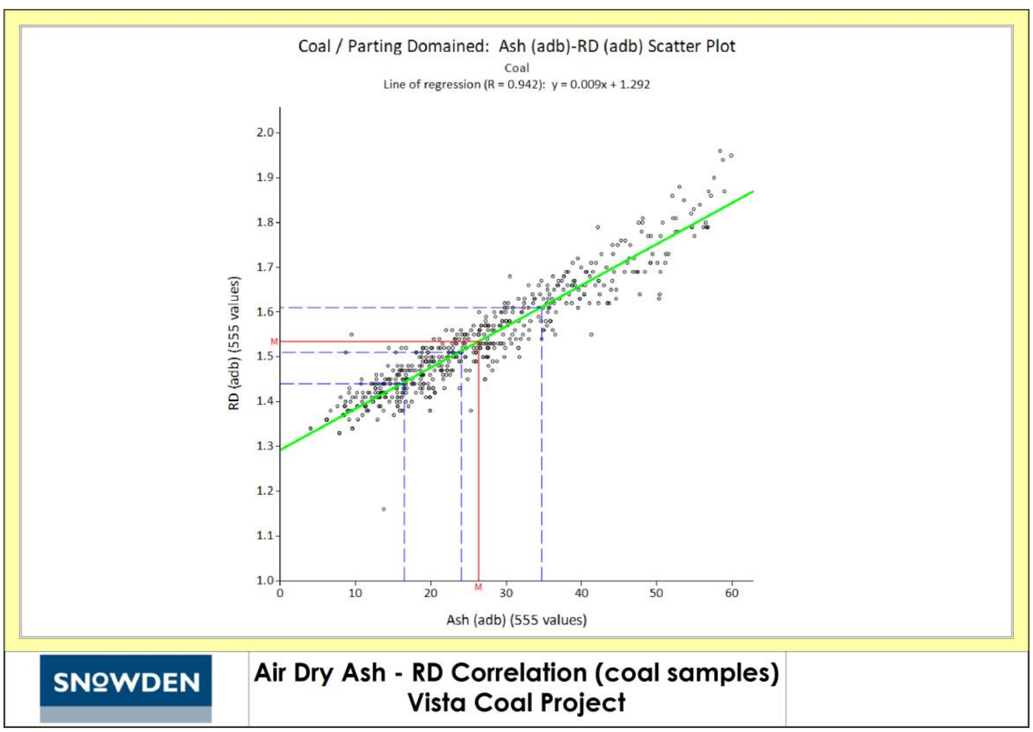
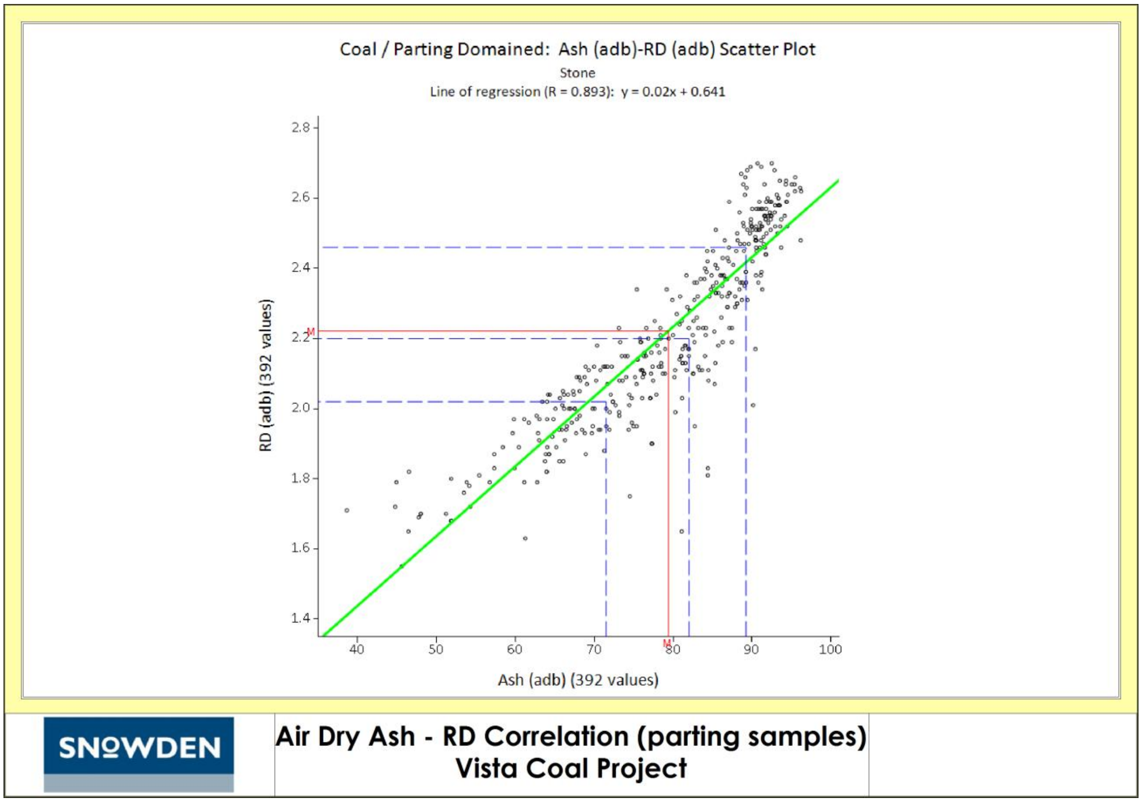


Figure 12-15 Ash_{ad} – RD_{ad} for parting samples across the Vista Coal Project

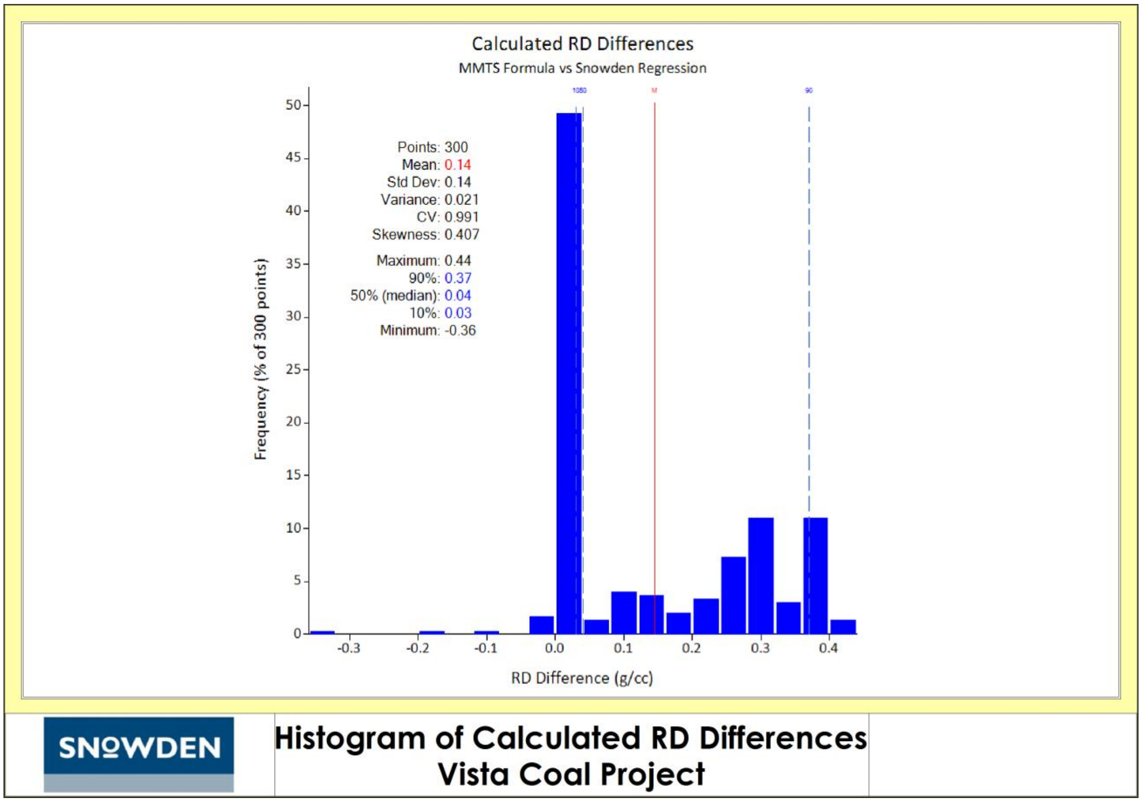


As can be expected, the regression is very good with correlation coefficient, R, approaching unity (0.942). The non-coal correlation is slightly weaker with an R-value of 0.893. However, this is still a strong enough correlation indicating robust sample and analytical data.

It will be noticed that the total number of RD analyses (947) is significantly less than the total number of Ash analyses (1,247). RD analyses are often not performed on all samples. In this case, a sufficient number of results for RD_{ad} are available to produce reliable correlation cross plots to allow for the determination of missing RD values for both coal and non-coal samples.

The final correlation formula for coal is compared with the formula applied by MMTS by evaluating the differences in calculated RD values (Figure 12-16). Snowden is comfortable that both formulae are applicable for the Vista Project, and Snowden is satisfied that the MMTS formula is reliable.

Figure 12-16 Differences in calculated RD (MMTS vs Snowden regression)

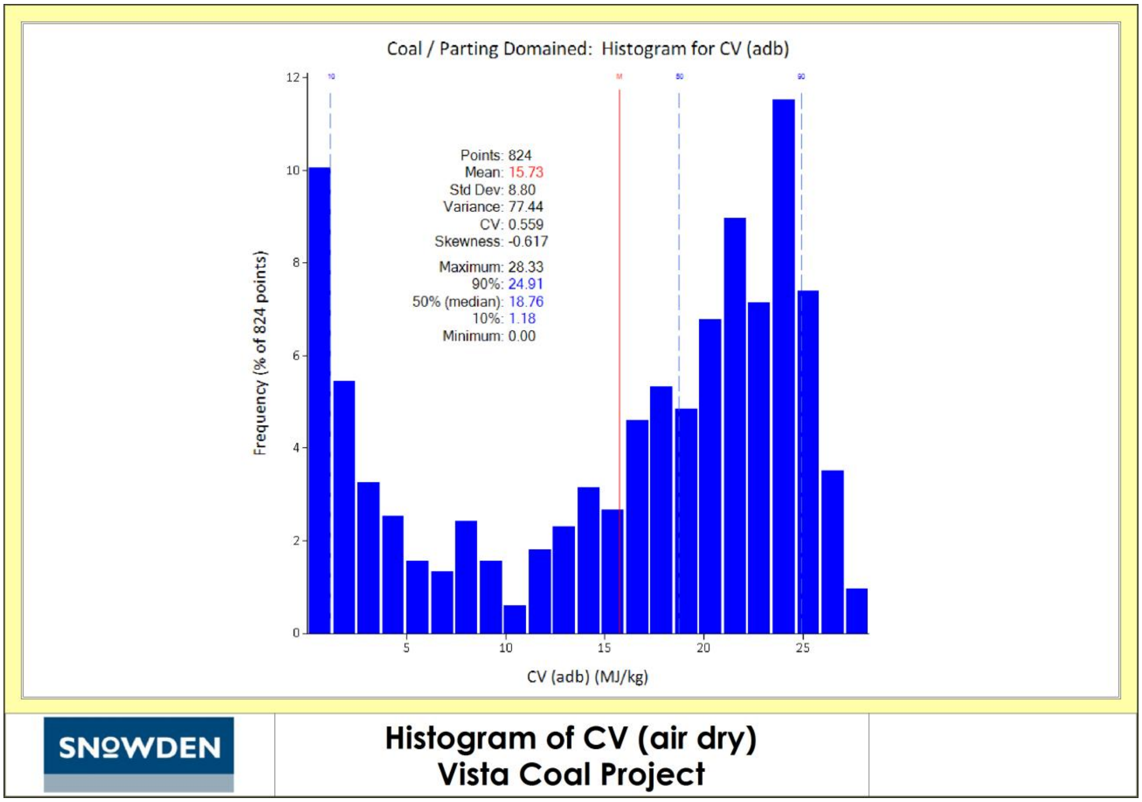


The Snowden-derived regression formula (Figure 12-14) calculates a higher RD than the MMTS formula. The significant differences are due to the underestimation of RD for true clastic parting using the MMTS formula as compared to the Snowden-derived non-coal correlation formula. This is to be expected as the MMTS formula is only valid for material with a real RD of less than 1.75 g/cc (MMTS, 2010).

Air Dry Calorific Value, CV_{ad}

The global distribution of CV_{ad} across the Vista Project is presented in Figure 12-17. Similar to RD_{ad}, CV_{ad} is strongly correlated to Ash_{ad}, albeit negatively, and clearly two populations are present: coal; and non-coal.

Figure 12-17 Global distribution of CV_{ad} across the Vista Coal Project



Appropriately domained, the distributions are presented in Figure 12-18. The distributions show opposite skews (coal negative and non-coal positive). This implies certain level of misclassification of coal into non-coal plies and vice-versa. This is also apparent in the Ash_{ad} distributions. The degree of misclassification is not considered to be material as, in the case of the non-coal (stone) distribution, less than 10% of the samples have a CV_{ad} of greater than *ca.* 9.5 MJ/kg

Coal and non-coal correlations are presented in Figure 12-19. Where missing CV_{ad} values are encountered in the data received, Snowden have calculated the appropriate CV_{ad} based on the particular regression formula as a function of the coded ply *i.e.* either coal or non-coal (stone).

Summary

A detailed statistical review has been undertaken for the drill hole data received, in particular the proximate analytical data have been investigated.

The as-received drill hole data (physicals and coal qualities) are suitable for the current Coal Resource estimate exercise and level of mining study being undertaken.

The current review has highlighted the opportunity to interrogate the data set and improve its overall integrity through re-correlation and application of appropriate regression formulae.

Figure 12-18 Coal and parting domained CV_{ad} distributions for theVista Coal Project

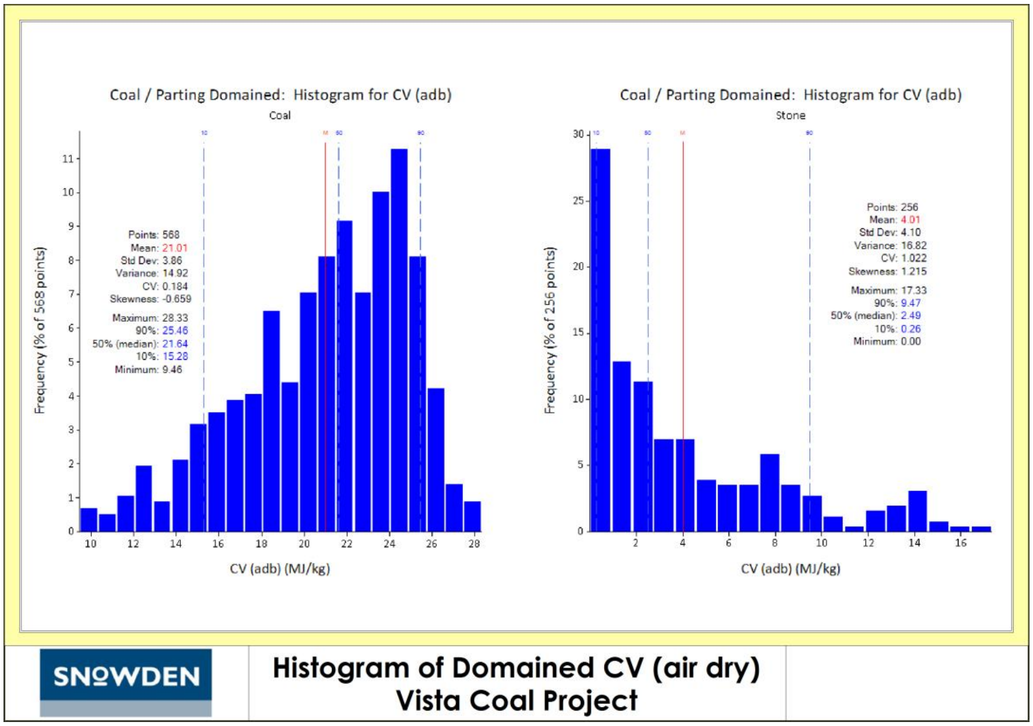
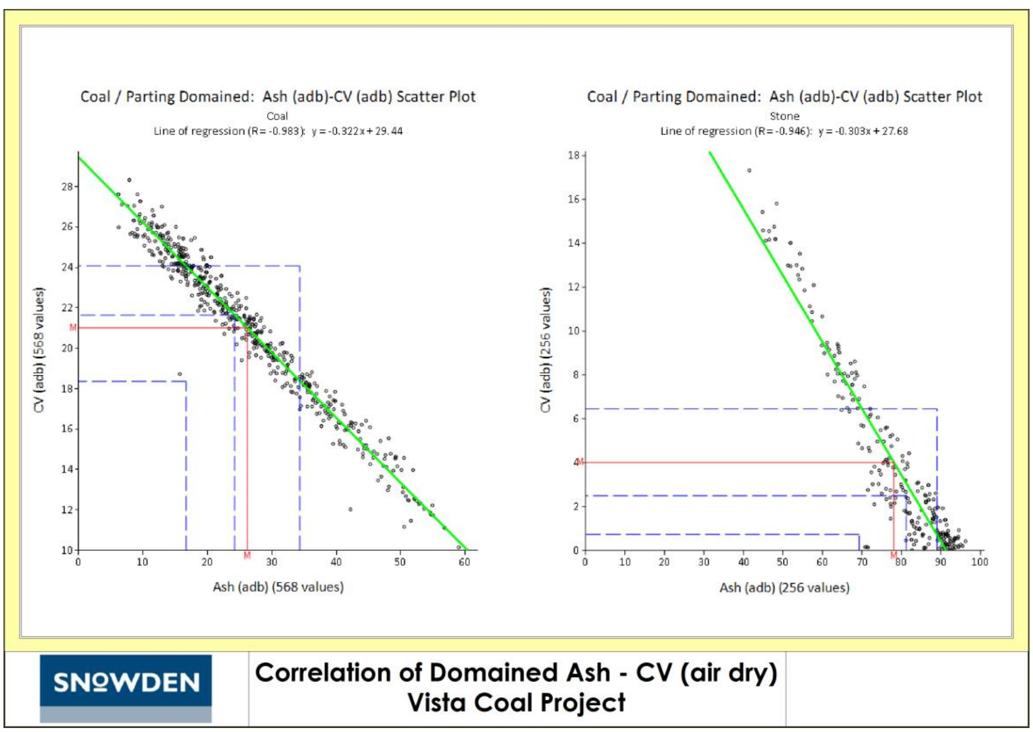


Figure 12-19 Domained Ash_{ad} – CV_{ad} correlation cross plots for the Vista Coal Project



Vista South

Snowden received a MineSight model for Vista South. This model is the work of MMTS based on their data verification and assessment work undertaken in 2012. Snowden has accepted the model and resultant Coal Resource estimates and is satisfied that the model and estimates are reliable.

Only nine boreholes appear to have been sampled and analysed (six historic Denison drill holes and three Coalspur drill holes).

The lithological data received in raw format represents the “as logged” data and is not corrected for seam dip and/or drill hole inclination. Processing of this data in this format is not appropriate.

No post-processing of data has been undertaken by Snowden.

12.1.2 Resource Model (Vista and Vista Extension only)

The Coal Resource block model, developed by Coalspur using MineSight geological modelling software, has been supplied to Snowden in ASCII text format.

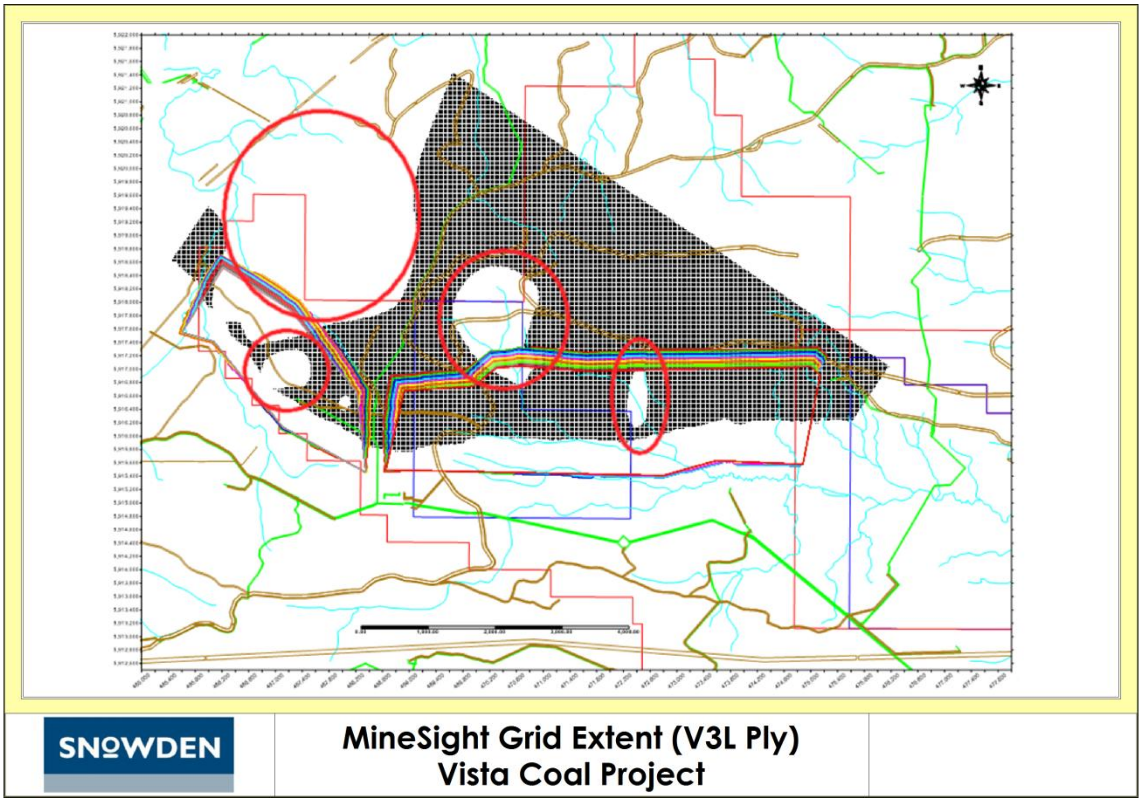
The grids of ply physical (from, to, thickness) and coal quality (proximate analyses) data have been assessed.

Grid Validation

Initially, the grids were loaded into Snowden’s preferred coal geological modelling software, Vulcan, and displayed for visual interrogation.

Certain anomalies have been identified in the grid files as received. The primary anomaly is that certain grids have ‘holes’ in them *i.e.* the grids does not extend continuously across the modelled area. Figure 12-20 shows the distribution of grid points for the floor elevation (structure floor grid, SFG) for the Val d’Or 3 Lower ply.

Figure 12-20 Grid extent of the Val d'Or 3 Lower ply highlighting data gaps (holes)



Basic statistics were determined from the various grids, particularly from grids with and without gaps for the same parameters. Figure 12-21 shows the comparison of the Ash grids in term of spatial coverage, while Figure 12-22 presents the distribution histograms of Ash values within the individual grids.

Figure 12-21 Comparison of grid coverage (Ash) for the V3L ply

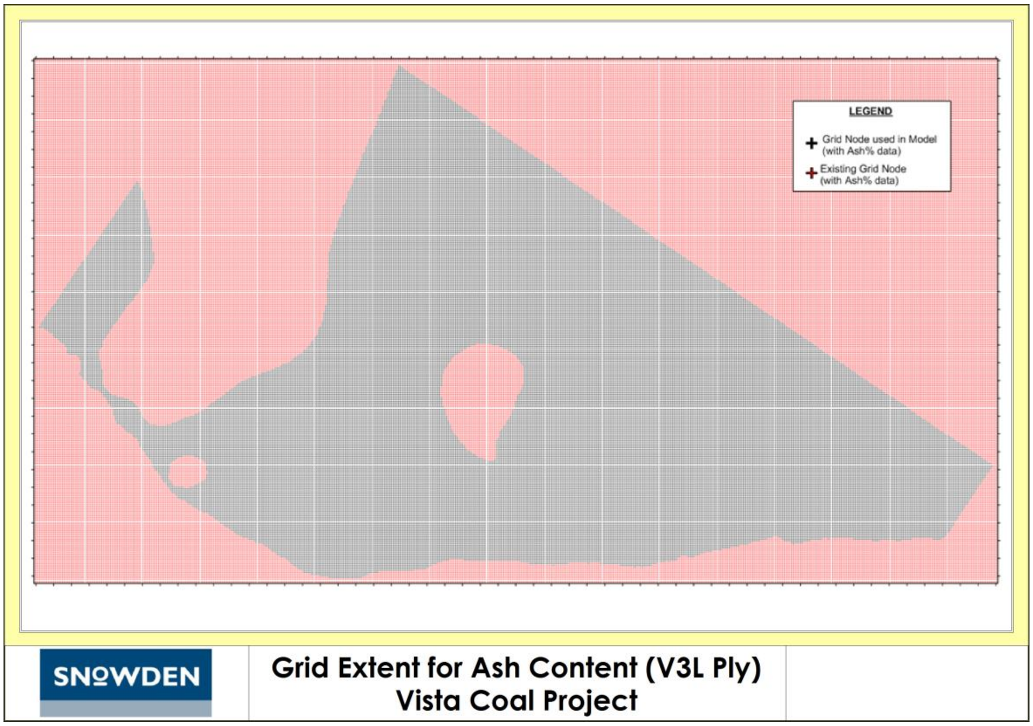
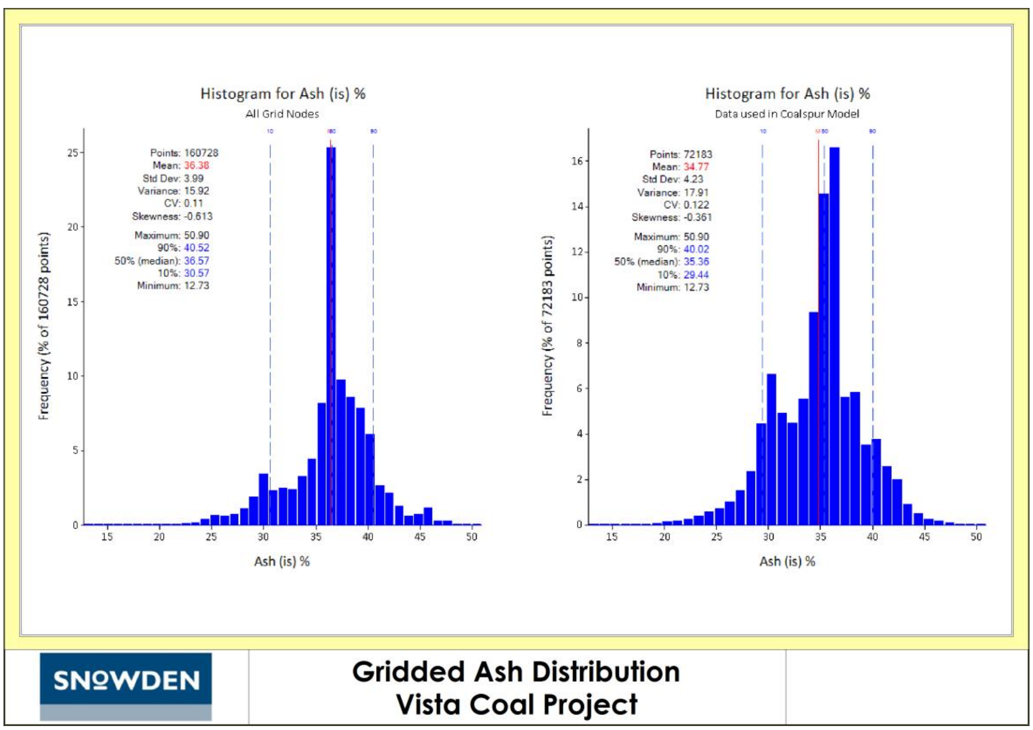
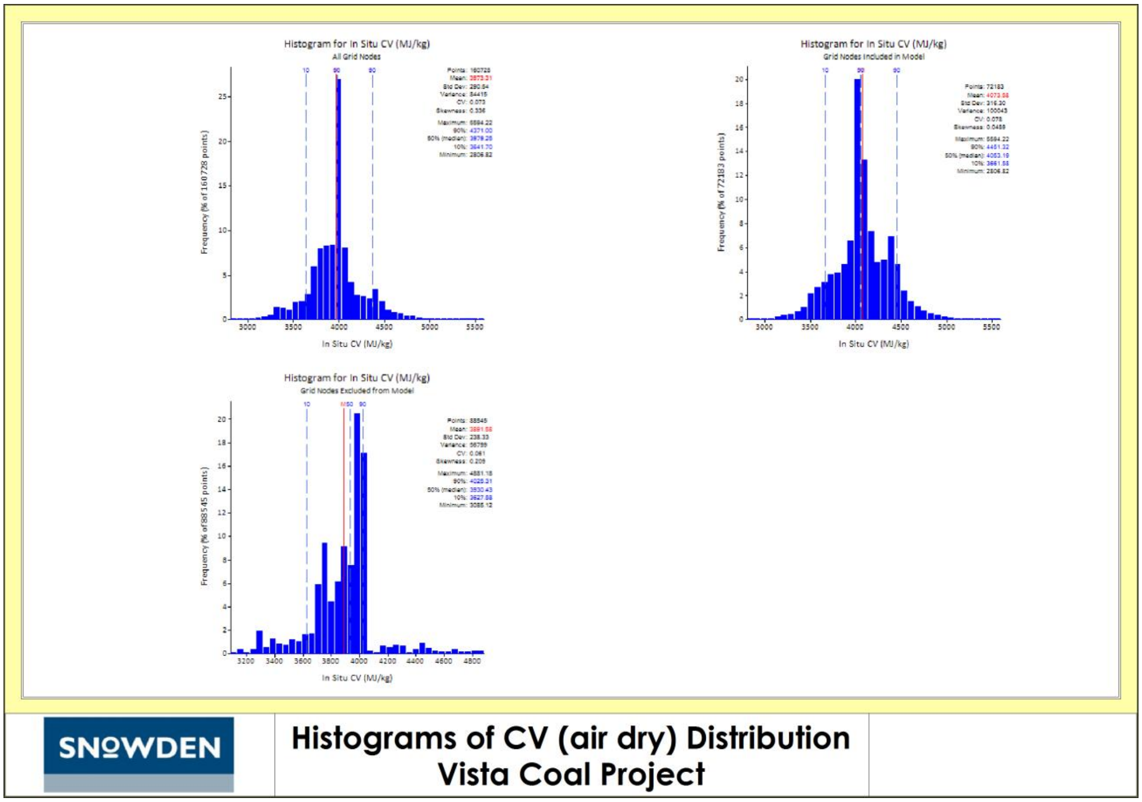


Figure 12-22 Histogam of Ash distribution for grids received



It is clear in the example presented that there is little difference in ash distribution between the two grids in terms of minima, maxima, and nature of distribution (normal). A similar comparison was performed for the Calorific Value ("CV"), and the distribution histograms are presented in Figure 12-23.

Figure 12-23 Comparison of CV distribution between grids received for V3L



Although the general trends for the histograms for 'All Grid Nodes' and "Grid Nodes Included in Model' do not appear too dissimilar, the histogram for the 'Grid Nodes Excluded from Model' clearly shows a bias to the lower energy nodes. The implication is that the data used in the model will be slightly biased to the higher energy end of the data range. This is supported by the slightly higher data average for the 'Grid Nodes Included in Model' data set compared to the 'All Grid Nodes' data average.

Summary

Although Snowden did not set out to validate the Coal Resource estimates by way of re-engineering the MineSight block model to a Vulcan grid model, Snowden did review the resultant model grids and is comfortable that they are suitable for the purposes of volumetric estimation and for transferring to a mining model for coal seam aggregation and mine planning at this level of study.

The full extent and reasons for the gaps in the supplied grids has not been fully investigated but Snowden does not expect these to impact materially on either Coal Resource or Coal Reserve estimates but does suggest the gaps are rectified in future studies.

In Snowden's opinion, the drilling, sampling and modelling data are adequate for the purposes of estimating mineral resources as described in this Technical Report.

13 Mineral Processing and Metallurgical Testing

13.1 Disclosure

This section has previously been reported by Snowden (2012) and MMTS (2012) and is reproduced here on the understanding that there have been no changes to the data and no additional data generated that may influence the discussions and interpretations presented previously. Snowden takes responsibility for the information and interpretations now presented in this Technical Report.

13.2 Core Quality Testing Programme

13.2.1 Background

The coal-bearing strata at the Coalspur Coal Projects are part of the upper Saunders Group within the Coalspur Formation. The two major mineable seams present are the Val d'Or and the McPherson seams, though one other seam, the McLeod Seam, is also targeted for mining (the Vista Coal Project only).

The coal is a moderately low rank bituminous coal (ASTM[9] Class: High Volatile Bituminous C) suited to thermal coal production targeting clean coal product CVs in the range:

- 5,700 kcal/kg – 5,800 kcal/kg GAR (Product 1 – Val d'Or Seam), and
- 5,150 kcal/kg – 5,550 kcal/kg GAR (Product 2 – McLeod, McPherson, and minor seams).

13.2.2 Coal Quality Databases

Vista and Vista Extension

A preliminary coal quality evaluation on the Hinton West and East blocks, 'Coal Quality Report: Vista Coal Project East and West Blocks' (2010 Vista Coal Quality Report), was completed in July 2010. A second report, 'Coal Quality Report: Vista Coal Project Feasibility Study' was completed in September 2011.

The Feasibility Study assessment on coal quality has been completed on a series of exploration programmes undertaken to date, in addition to historical information retrieved from Esso's programmes in the Hinton West and East blocks, and Manalta's work in the Z Block and McLeod River North Block. The results were transcribed into raw coal, washability, clean coal, and yield databases for use in the Feasibility Study.

The databases consist of:

- ±1,200 raw coal entries encompassing all regional areas in the Project
- detailed washability reporting yield, ash and CV by density on 300 working sections
- detailed clean coal analysis on 200 working section simulated product samples; and

[9] ASTM = American Society for Testing and Materials (now known as ASTM International)

- 200 attrition tests (drop shatter and wet tumble) on both coal and stone samples to support CPP design studies.

The work conducted to date has established clear trends in rank, moisture, energy and yield across the deposit and is of sufficient quality and quantity for Coal Resource estimation and for mining studies as contemplated in this Technical Report.

Vista South

The Vista South coal quality data is, at this stage, limited to the results from three coal cores sampled by MMTS in 2011 (reported in 2012). Two samples were for the Val d'Or Seam while only one was for the McPherson Seam.

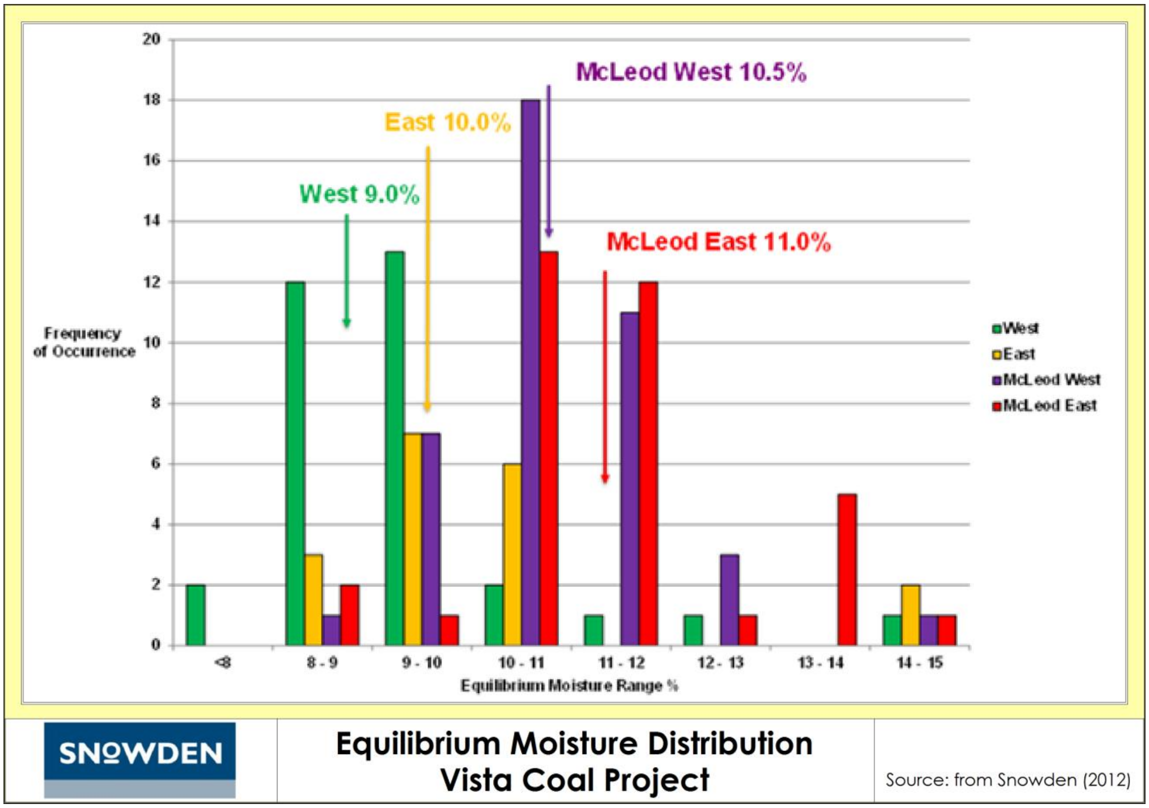
The analytical procedure employed was similar to that for the Vista Coal Project samples. Following sampling into coal and stone plies, samples were crushed to pass 19 mm with a raw coal subsample from the crushing phase subjected to a range of analyses including Proximate Analysis, CV, RD and Total Sulphur "TS"). Working sections were created from further subsamples and subjected to washability testing (-9 mm+0.5 mm fraction) at densities ranging from 1.40 to 2.00. Clean coal composites from the washability phase were subjected to a range of analyses including Proximate Analysis, CV, TS, Ultimates, Ash Fusion characteristics, Ash Chemistry, Hargrove Grindability (HGI), Trace Elements, and Petrographics.

13.2.3 Coal Quality (Vista and Vista Extension)

Moisture

Based on equilibrium moisture, (EQM), results, which range from 9% in the west to 11% in the far eastern extent of the McLeod River North Block (designated as McLeod East here), the *in situ* moisture, M_{IS}, will range from 10% in the west to 12% in the east (Figure 13-1).

Figure 13-1 EQM distribution across the Vista Coal Project



Calorific Value

Dry ash free calorific value, CV_{DAF}, ranges from approximately 7,600 kcal/kg in the west (McPherson Seam) to slightly less than 7,350 kcal/kg in the east (Val d'Or Seam). Table 13-1 shows the average heat content for the various seams per resource block.

Table 13-1 Dry Ash Free CV per Seam across the Vista Coal Project (after Snowden, 2012)

Block	CV_{DAF} (kcal/kg)				
	Val d'Or	Arbour	McLeod	McPherson	Silkstone
Hinton West	7,514	7,514	7,534	7,581	
Z Block	7,477		7,530	7,593	
Hinton East	7,431		7,500	7,518	
McLeod West	7,383		7,444	7,430	7,503
McLeod East	7,327		7,392	7,362	

Combined, the EQM and CV_{DAF} results confirm there is a rank decrease from west to east in the deposit and stratigraphically from the upper Val d'Or Seam to the lower Silkstone Seam.

Ash and Sulphur

Raw ash varies considerably between the various seams and plies due to the presence of occasional thin stone bands (intra-seam partings). All seams are low to moderate in total sulphur content.

Table 13-2 Air Dry Coal Qualities per Seam and Ply (after Snowden, 2012)

Val d'Or Seam			
Ply	Thick (m)	Ash% (ad)	TS% (ad)
V7	0.7	29.0	0.60
V6U	0.6	10.0	0.60
V6L	1.5	16.0	0.45
V5U	3.0	28.0	0.35
V5L	2.0	13.0	0.25
V3	0.6	17.0	0.30
V3U	2.0	24.0	0.20
V3L	1.0	34.0	0.30
V2	1.0	33.0	0.30
V1	1.2	30.0	0.25

Arbour Seam			
Ply	Thick (m)	Ash% (AD)	TS% (AD)
A1	1.0	35.0	0.25

McPherson Seam			
Ply	Thick (m)	Ash% (AD)	TS% (AD)
P4	1.0	27.0	0.30
P3	2.0	22.0	0.20
P2	2.5	27.0	.25.3
P1	1.0	24.0	

McLeod Seam			
Ply	Thick (m)	Ash% (AD)	TS% (AD)
L3	1.0	36.0	0.30
L2	1.5	30.0	0.25
L1	0.8	36.0	0.25

Silkstone Seam			
Ply	Thick (m)	Ash% (AD)	TS% (AD)
SK2U	0.6	40.0	0.45
SK2L	0.7	38.0	0.35
SK1	1.5	22.0	0.25

Val d'Or Seam

The Val d'Or Seam (primary economic interest) varies in thickness from approximately 8 m in the west to over 16 m in the east. The seam generally presents as seven plies (V7 to V1) of quite variable thickness. Often, the plies contain intra-seam partings which split the plies into upper and lower sub plies *e.g.* V5U and V5L. In the west, the upper plies, V7 to V4, tend to thin out, reducing the total seam thickness. Most of the plies are moderate in ash though some sub-plies (V6U, V5L and V4) are quite low in ash. All plies would be classed as low to moderate in total sulphur, though there is a tendency for the upper plies to have moderate results.

Arbour Seam

The Arbour Seam is present in the west only. It has moderate to high raw ash and low sulphur.

McLeod Seam

The McLeod Seam generally presents as three plies with a total coal thickness up to 4 m. All of the plies are moderate to high in raw ash. Total sulphur is low.

McPherson Seam

The McPherson Seam is the second seam of economic interest and generally presents with a total seam thickness of 6 m to 7 m throughout the deposit. The four coal plies comprising the seam are moderate in ash and low in sulphur.

Silkstone Seam

Little is known of the quality in the Silkstone Seam due to a lack of reliable intersections and analytical data. Based on the scant results, it presents as three sub-plies, of which the upper two are high in ash. The seam has low to moderate total sulphur.

13.2.4 Clean Coal Yield, Product Ash, Moisture, and Calorific Value (Vista and Vista Extension)

The Val d'Or and McPherson seams constitute the majority of the mineable resource. The Val d'Or will be processed to produce an export quality product with a gross calorific value, GCV[10] in the range of 5,700 kcal/kg to 5,800 kcal/kg. Due to the rank decrease to the east, the most easterly regions of the deposit will likely realise 100-200 kcal/kg lower GCV than the more central or western regions. However, while there is a rank decrease to the east, the eastern coals tends to wash to lower product ash, particularly the Val d'Or Seam.

The McPherson and McLeod seams, and the other lesser seams, are to be processed to produce a marketable product with a GCV in the range 5,250 kcal/kg to 5,550 kcal/kg.

The following conditions have been assumed in assessing yield, product ash, and product CV:

- Run of Mine ("ROM") feed moisture has been assessed to be identical to the estimated *in situ* moisture on a regional basis:
  - West = 10.0%
  - Z = 10.5%
  - East = 11.0%
  - McLeod West = 11.5%
  - McLeod East = 12.0%
- Base CV data for product energy calculations have been derived from the washability result averages and applied on a regional and seam basis.
- Projected product moisture during washing has been assessed from non-centrifuge moistures studies:
  - +16 mm product ex centrifuge = *In Situ* Moisture
  - -16+2 mm product ex centrifuge = *In Situ* Moisture + 1%
  - -2+0.25 mm product ex centrifuge = *In Situ* Moisture + 7%
- A dense medium cyclone / hindered bed spirals combination for the CPP configuration has been assumed, similar to the feasibility design concept. The simulation design assumed a crushed coal top size of 50 mm.

[10] GCV is the equivalent of GAR

Excluding the impacts of coal loss and dilution, the Val d'Or Seam has the potential to realise 56-69% wet yield at a cut-point density of 1.55. The McLeod and McPherson seams will realise a lower quality product of approximately 5,400 kcal/kg GCV with yield of 40- 50%. Table 13-3 and Table 13-4 present simulated product qualities for the Val d'Or and McPherson seams.

Table 13-3 Val d'Or Seam Product Qualities at Cut Point RD 1.50 (after Snowden, 2012)

Block	Seam	ROM Ash %	ex- Centrifuges			
			Yield %	TM %	Ash %	CV kcal/kg
West	Val d'Or	30.3	58.0	11.9	11.3	5,768
Z		24.9	67.6	12.4	9.2	5,861
East		26.1	61.7	12.9	9.3	5,784
McLeod West		21.6	70.3	13.4	9.1	5,723
McLeod East		21.9	69.4	14.0	9.6	5,597

Table 13-4 McPherson Seam Product Qualities at Cut Point RD 1.50 (after Snowden, 2012)

Block	Seam	ROM Ash %	ex- Centrifuges			
			Yield %	TM %	Ash %	CV kcal/kg
West	McPherson	26.9	61.9	11.9	12.2	5,750
Z		26.0	65.6	12.6	11.8	5,736
East		26.8	57.3	12.9	11.6	5,677
McLeod West		23.5	67.7	13.4	12.3	5,517
McLeod East		24.0	66.7	14.1	11.3	5,494

13.2.5 Target Energy Specifications (Vista and Vista Extension)

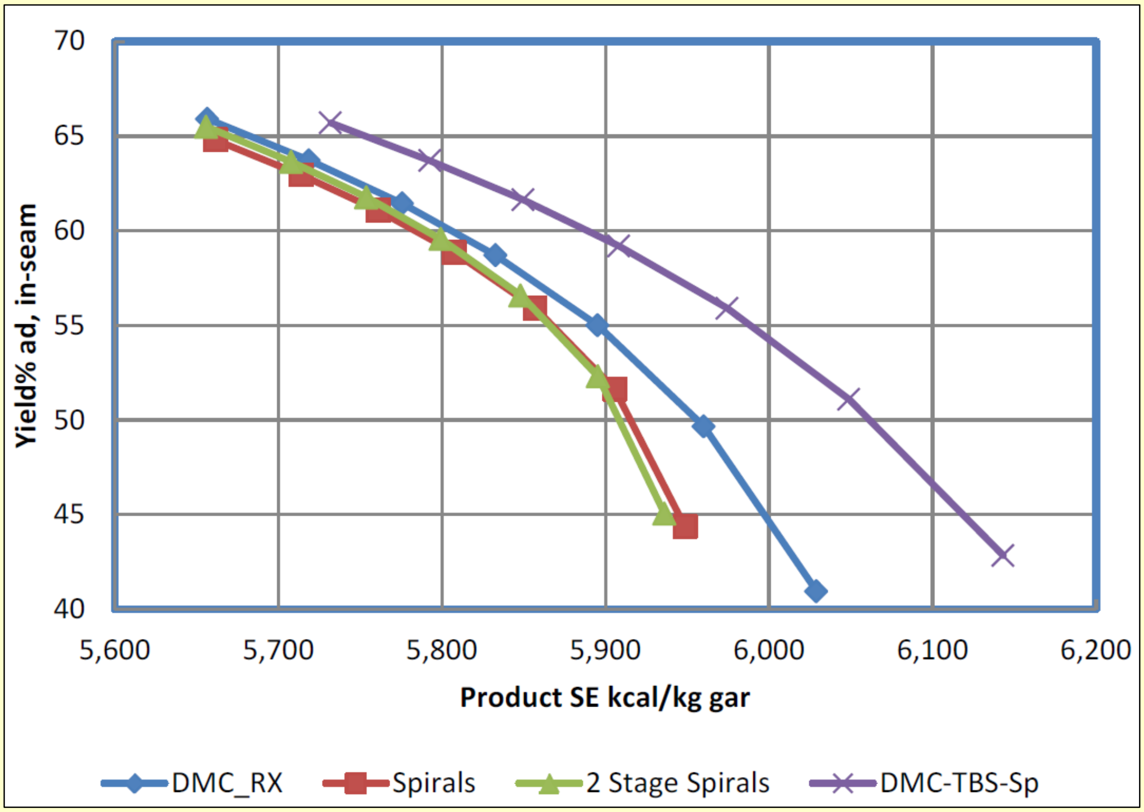
The projected yield (no coal loss or contamination) at a CV_{GAR} of 5,800 kcal/kg is approximately 60% at a wash RD in the order of 1.55 for the Val d'Or Seam (excluding lower rank coal from the most easterly portion of the deposit). The Val d'Or Seam outperforms the McPherson Seam, due mainly to lower product ash in the Val d'Or. Figure 13-2 shows the relationship between product CV and theoretical yield for the Val d'Or Seam for various combinations of coarse coal / fine coal beneficiation processes.

Up to a 7% improvement on gross yield may be obtained if an average gross energy specification of 5,700 kcal/kg was accepted in comparison to 5,800 kcal/kg. The lower energy scenario would increase the washing density from approximately 1.55 to approximately 1.60 to 1.65.

13.2.6 Clean Coal Properties and Potential Product Quality Ranges (Vista and Vista Extension)

Aside from a GCV of between 5,700 kcal/kg and 5,800 kcal/kg, the clean coal product from the Val d'Or Seam will be of low TS_{AD} content (average 0.35%) and moderate to low nitrogen (average 1.1% DAF). The product is relatively hard (HGI 40-41) and occasional samples reported initial deformation ash fusion temperatures slightly below 1,200°C. Combustion tests however, have indicated that the coal has excellent combustion properties. The McPherson and McLeod seams will produce a secondary product with a CV_{GAR} of between 5,300 kcal/kg and 5,550 kcal/kg. Figure 13-2 provides the predicted clean coal product specifications.

Figure 13-2 Yield vs CV for various process combinations (Val d'Or Seam)



SNOWDEN	Yield vs CV The Vista Coal Project	Source: Sedgman, 2014

Table 13-5 Clean Coal Product Specifications

Product Summary	Val d'Or Seam	McPherson / McLeod Seams
Total Moisture %	11.5 - 12.5	11.5 - 12.5
ASH_{GAR} %	9 - 11	15 - 17
CV_{GAR} kcal/kg	5,700 - 5,800	5,250 - 5,550
CV_{DAF} kcal/kg	7,200 - 7,500	7,150 - 7,500
Proximates % (AD)		
Moisture	6 - 7	6.5 - 7.5
Ash	10 - 12	16 - 18
VM_{AD}	32 - 35	30 - 33
VM_{DAF}	39 - 42	38 - 41
TS	0.35 - 0.45	0.35 - 0.45
AFT		
Initial	1,180 - 1,250	1,180 - 1,240
Flow	1,400 - 1,500	1,440 - 1,500
Ultimates % (DAF)		
C	77 - 79	77 - 79
H	4.8 - 5.2	4.8 - 5.2
N	1.05 - 1.15	1.05 - 1.15
O	14.0 - 15.5	14.0 - 15.5
S	0.35 - 0.45	0.35 - 0.45
Ash Oxides % (DRY)		
Silicon	55 - 62	60 - 67
Aluminium	18 - 21	15 - 20
Iron	3 - 6	3 - 6
Calcium	6 - 9	4 - 8
Sodium	1.9 - 2.5	1.9 - 2.5
Specials		
HGI	40 - 41	38 - 39

13.2.7 Coal Quality (Vista South)

As has been previously mentioned, Vista South has very limited data in terms of coal quality and only a basic level of assessment has been carried out to date.

Rank Assessment

Assessments for the Vista Coal Project have shown that rank increases with stratigraphic depth *e.g.* the McPherson Seam is a higher rank than the Val d'Or Seam, and there is a regional rank decrease west to east. The rank at Vista South has been assessed by comparing the rank parameters for the Val d'Or Seam at Vista South to the Vista Coal Project.

There are a number of coal quality parameters which may be used to assess rank, including:

- Raw coal Equilibrium Moisture, EQM
  - Provided that the ash content of compared data sets is similar, EQM increases as rank decreases.
  - Correspondingly, the actual *in situ* moisture, which is slightly higher than EQM, also increases as rank decreases.
  - Air dried moisture may also increase as rank decreases, however, this parameter is partly dependent on atmospheric conditions in the laboratory undertaking the test and hence the results may vary over time and between laboratories. Air dried moisture thus gives an indicative understanding only of rank change.
  - In the Vista South case, there is currently insufficient EQM data to form an assessment of the parameter. Air dried moisture averaged 5.7% in clean coal for the Val d'Or Seam (Table 13-6) compared to 6.5% to 7.4% respectively moving easterly from the West Block in Vista, to the easterly portion of the McLeod East Block.
- Volatile Matter, VM (dry ash free basis, DAF)
  - Generally VM_{DAF} increases as rank decreases provided ash chemistry remains similar in compared data sets.
  - Vista South averaged 42.3% compared to 39.6% to 41% across Vista west to east (Val d'Or Seam).
- Calorific Value, CV (dry ash free basis, DAF)
  - CV_{DAF} decreases as rank decreases.
  - Vista South averaged 7,400 kcal/kg compared to 7,514 kcal/kg to 7,327 kcal/kg across Vista west to east (Val d'Or Seam).
- Vitrinite Reflectance (Ro_{MAX})
  - Obtained from petrographic data, this parameter decreases as rank decreases.
  - Vista South averaged 0.57 compared to 0.60 to 0.58 across Vista west to east (Val d'Or Seam).

The rank comparisons are inconclusive at this early stage of data collection from Vista South with air dried moisture indicating a possible rank increase while the CV results suggest similar rank to Hinton East and McLeod West. Volatile Matter and Vitrinite Reflectance suggest a possible decrease in rank compared to Vista. Of the rank parameters, the most important from a practical perspective is CV_{DAF} as this provides the base line energy for the clean coal product. On this basis, at this stage, Vista South appears similar in rank to the Hinton East and McLeod West blocks.

Table 13-6 Rank Parameter Comparison (Vista and Vista South, Val d'Or Seam)

Region	Block	Raw Coal	Clean Coal			
		EQM %	Moisture% AD	VM% DAF	CV kcal/kg DAF	VR Ro_{MAX}
Vista	Hinton West	9.0	6.5	39.6	7,514	0.60
	Hinton East	10.0	6.5	40.2	7,431	0.59
	McLeod West	10.5	7.3	41.0	7,383	0.58
	McLeod East	11.0	7.4	40.6	7,327	0.58
Vista South		**n/a**	**5.7**	**42.3**	**7,400**	**0.57**

Yield and Gross CV Assessment

Yield and CV on a gross as received (wet) basis (CV_{GAR}) have been estimated from simulations completed on the Vista South washability data.

Some basic conditions have been assumed to assess yield:

- ROM feed moisture has been assumed to be 11% for both the Val d'Or and McPherson seams.
- The yield and CV_{GAR} assessment has been completed on a zero dilution and zero coal loss basis.
- Potential working sections with ROM Ash% >50% have been rejected in the assessment as too poor in quality for consideration.
- Stone plies <30 cm thick have been included in working sections

  Where partings are >30 cm thick, it has been assumed that these will be removed during mining.
- Base CV data for product energy calculations have been derived from the washability result averages from the three cores.

A coarse coal dense medium cyclone / hindered bed and fines spirals combination for the CPP configuration has been assumed (base line case for the Vista Coal Project FS). This plant type (or similar) is now most commonly used for washing thermal coals where ultrafine particles are rejected to waste un-beneficiated due to their high ash and potential high product moisture. The simulation design assumes a crushed coal top size of 50 mm.

Assumptions on product moisture have been made based on test programs completed for the Vista Coal Project, including:

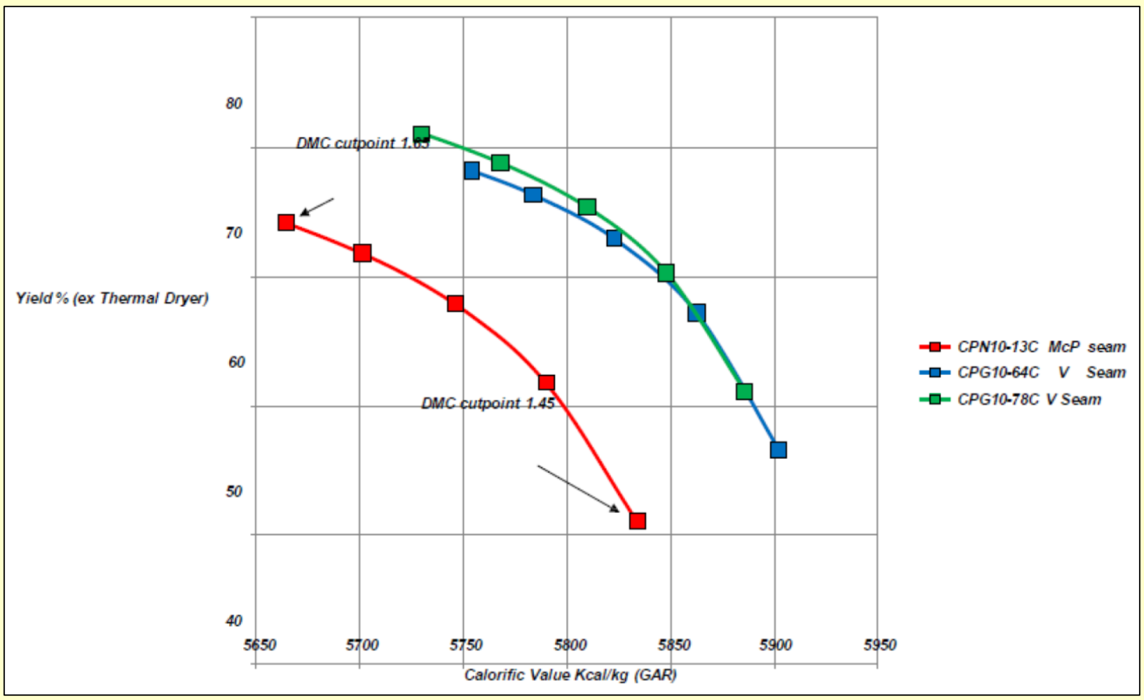
- For centrifuging wet coal, the discharge moisture was:
  - 11% for the +16 mm product,
  - 12% for the -16 mm+2 mm product, and
  - 18% for the -2 mm+0.25 mm product.
- Following thermal drying of finer product coal, the discharge moisture on total product will be 1.5% less than centrifuge moisture, or a minimum of 11.5%.

Each working section has been simulated for yield, product ash and product CV at dense medium cut-points of 1.45, 1.50, 1.55 and 1.60, 1.65 and 1.70.

The raw ash in all three cores was significantly lower than observed in averages reported in the Hinton West and East blocks, with a resultant yield increase of approximately 10% under similar washing conditions (1.55 dense medium cut-point, zero coal loss and zero dilution). Product energy in the Vista South cores was similar.

Simulations on yield and CV as density varies indicated there may be approximately a 10% yield gain to be made on decreasing the baseline energy specification from 5,800 kcal/kg (nominal 1.55 density cut-point case) to 5,700 kcal/kg (nominal 1.65 density cut-point case), (Figure 13-3). Results of this type are encouraging, however attention to market expectations on CV must be considered.

Figure 13-3 Yield vs CV Curve – Vista South



SNOWDEN	Yield vs CV The Vista South Coal Property	Source: MMTS, 2012

Clean Coal Properties

Clean coal analyses on the Vista South samples were similar to previous results observed for Hinton West and East blocks for most parameters:

- Total Sulphur: 0.35% to 0.40% air dry basis
- Nitrogen: 1.1% to 1.2% dry ash free basis
- HGI: 37 to 41
- Initial Ash Deformation Temperature: 1,200°C to 1,250°C

- Iron Oxide in Ash: 4% to 5%

Preliminary results indicate average Calcium Oxide in Ash of 12% (almost double the Vista average). High Calcium Oxide may have an adverse impact on boiler performance.

A significant amount of work remains to be done in order to adequately characterise the Vista South coal products.

14 Mineral Resource Estimates

14.1 Summary

As part of the Vista Coal Project Feasibility Study, Snowden reported in its Technical Report, dated 26 January 2012, Coal Resources for the Vista Coal Project. These estimates were updated by Golder later in 2012 on the acquisition of the Vista Extension Property (immediately north and contiguous with Vista). These estimates are presented in Table 14-1.

Table 14-1 Coal Resource Estimates for the Vista Coal Project

Description	Measured (Mt)	Indicated (Mt)	*Measured + Indicated (Mt)*	Inferred (Mt)
In Situ Coal Resources	686.0	369.9	***1,055.9***	460.9

14.1.1 Vista Extension

As a part of updating the Snowden (2012) Technical Report, Golder incorporated estimates for Vista Extension in the estimate presented in their Technical Report dated 12 September 2012. The estimates for each (Vista and Extension) were not presented separately as the two areas are contiguous. Table 14-2 shows the combined estimates prepared by Golder (2012).

Table 14-2 Coal Resource Estimates for the Vista Coal Project and Vista Extension

Description	Measured (Mt)	Indicated (Mt)	*Measured + Indicated (Mt)*	Inferred (Mt)
In Situ Coal Resources	692.5	537.1	***1,229.6***	1,430.2

Coal Resource estimates for Vista Extension are presented in Table 14-3.

Table 14-3 Coal Resource Estimates for Vista Extension

Description	Measured (Mt)	Indicated (Mt)	*Measured + Indicated (Mt)*	Inferred (Mt)
In Situ Coal Resources	6.5	167.2	***173.7***	969.3

14.1.2 Vista South

Moose Mountain Technical Services ("MMTS"), in 2012, prepared an Technical Report, dated June 25, 2012 (available on **www.sedar.com**) in respect of the Vista South Coal Property. Estimates presented in that report are summarised in Table 14-4.

Table 14-4 Coal Resource Estimates for the Vista South Coal Property

Description	Measured (Mt)	Indicated (Mt)	*Measured + Indicated (Mt)*	Inferred (Mt)
In Situ Coal Resources	210.6	259.7	***470.3***	604.6

14.2 Disclosure

Coal Resources reported in this Technical Report were prepared by:

- Mr Jim McQuaid, P.Eng., of Golder Associates for Vista and Vista Extension, and
- Mr Robert Morris, P.Geol., of Moose Mountain Technical Services, for Vista South.

The estimates have been reviewed by Mr Grant van Heerden, Pr.Sci.Nat., a full time employee of Snowden. Mr van Heerden takes full responsibility for the estimates presented herein.

Mr van Heerden is a Qualified Person as defined in NI43-101 (June, 2011). Snowden is independent of Coalspur Mines Ltd.

Coal Resources that are not Coal Reserves do not have demonstrated economic viability.

Due to the uncertainty that may be attached to Inferred Mineral Resources, it cannot be assumed that all or any part of an Inferred Mineral Resource will be upgraded to an Indicated or Measured Mineral Resource as a result of continued exploration.

14.2.1 Known Issues that Materially Affect Coal Resources

Snowden is unaware of any issues that may materially affect the Coal Resources in a detrimental sense. The preceding statement is based on the following:

- The recently completed and reported 'Feasibility Study of the Vista Coal Project, Hinton, Alberta', Snowden (2012), and the 'Updated Resource Estimate for the Vista Coal Project – Hinton, Alberta, Canada' (Golder, 2012) did not highlight any potential issues.
  - Given that there have been no material changes to available information since 2012 it is reasonable to assume that there remain no known issues that could potentially have a material detrimental impact on the project.
- Coalspur continues to hold valid Coal Leases and Coal Lease Agreements covering the Vista Coal Project.
  - Coalspur also holds Mine Permit C2011-5A and Coal Processing Plant Approval C2011-3A
- Coalspur has represented that there are no outstanding legal issues; no legal actions, and injunctions pending against the Project.
- There are no known marketing, political, or taxation issues.
- Coalspur has represented that the Project has local community support.
- There are no known infrastructure impediments.

14.3 Assumptions, Methods and Parameters – Snowden Resource Estimates

The basis of the Coal Resource estimates for the Vista Coal Project is discussed in this section and is based on the following:

- Data Verification and Validation –undertaken by MMTS, reviewed by Snowden (Item 12)
- Data sources and databases – undertaken by Golder and MMTS, reviewed by Snowden
- Geological interpretation and modelling – undertaken by Golder and MMTS, reviewed by Snowden
- Establishment of block/grid models – undertaken by Golder and MMTS, reviewed by Snowden
- Compositing of sample intervals (working section analysis) – undertaken by Golder and MMTS, reviewed by Snowden
- Classification of estimates with respect to confidence limits – undertaken by Golder and MMTS, reviewed by Snowden
- Resource tabulation and reporting – undertaken by Golder and MMTS, reviewed by Snowden.

14.3.1 Data Sources and Databases

Vista and Vista Extension

Golder (2012) prepared stratigraphic and coal quality models for the Vista Coal Project based on information provided by Coalspur. The data included the results of modelling completed by Coalspur during previous estimations. The models were updated to include additional exploration and analytic results from 2010/2011 drilling programmes.

All data used in the preparation of the structural and coal quality models were provided by Coalspur.

The following data were supplied in digital formats:

- Areal (maps and plans) data in CAD (DWG or DXF) format
- Lithology log and analytical records in ASCII or spreadsheet format.

Topography data were obtained from a triangulation export from Coalspur's MineSight block model. The triangulation was based on data points with a nominal spacing of about 12 m, with gaps in the data where lakes were encountered.

Planimetric data, or feature data, were obtained from CAD drawing files. These files included property boundaries, roads, rights-of-way, drainages etc. The Coalspur property lies within the bounds of the NAD83 geographic 2D coordinate reference system, UTM Zone 11N (Transverse Mercator) projection.

Drill hole data were obtained from two sources. The majority of the holes were provided by Coalspur in two comma-separated-value (CSV) files, created from data exports from a MineSight model. Drill hole collar survey data for 331 locations were contained in the file '*dhcol.csv*', while a total of 8,609 records of depth and lithology information from 326 holes were provided in '*dhlith-110324.csv*'.

Coal quality data were provided by Coalspur in the file '*Coalspur Mine Plan _RAWdb_20110502-old.xls*'. The file contained 1,247 proximate analysis results from 66 drill holes.

Vista South

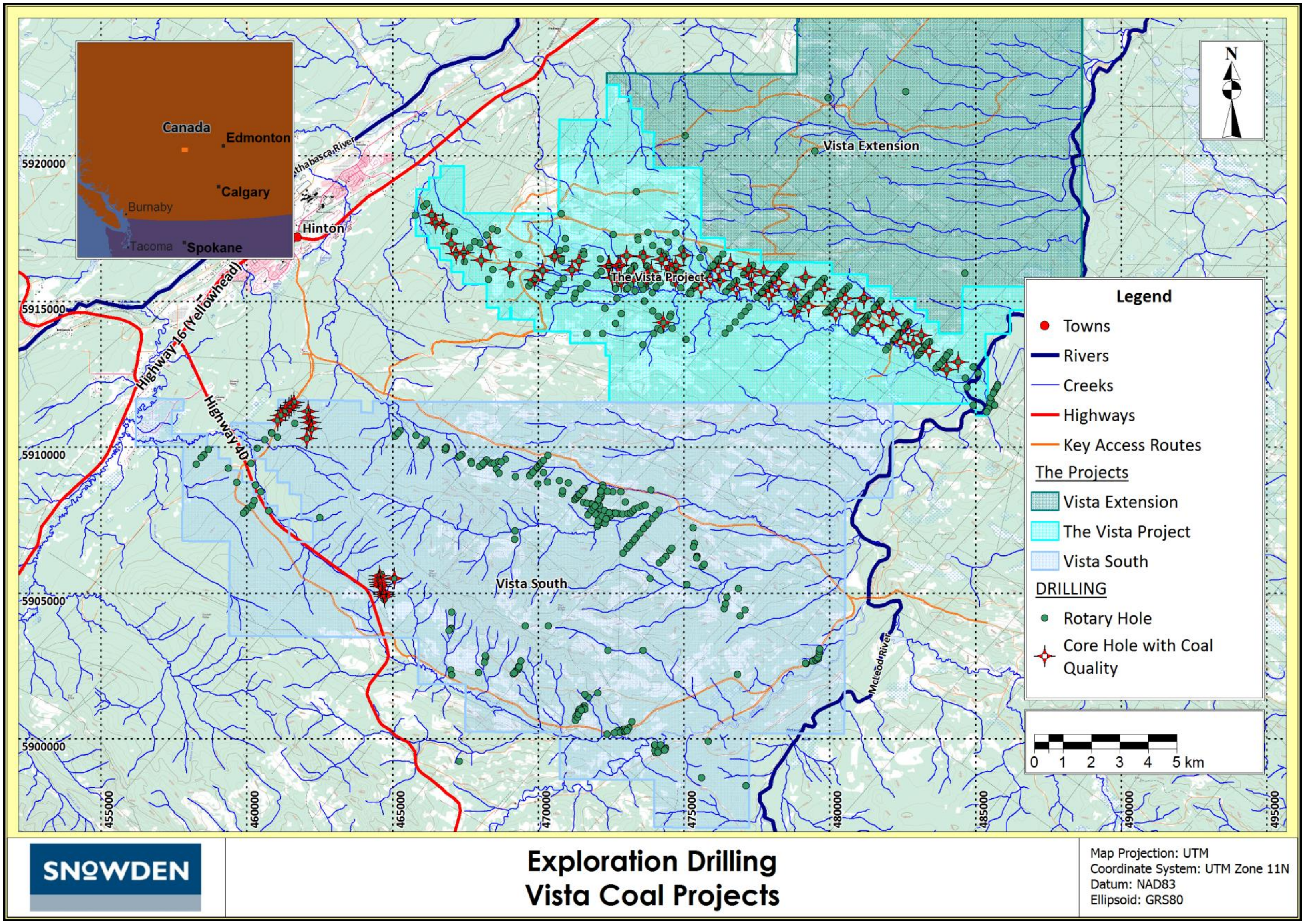
MMTS (2012) prepared stratigraphic models for the Vista South Coal Property based on information provided by Coalspur in respect of historical data (previous exploration) and gathered by MMTS during the execution of Coalspur's own exploration campaigns managed by MMTS.

The geological database compiled by MMTS includes 309 drill holes with a total of 54,654.6 m (although Table 10-4 indicates 320 holes and 57,852 m, eleven of the drillholes were outside of the immediate project area and have not been used). Of the 309 drill holes, 12 are core holes (with coal quality) for a total of 2,562 m. No trench or outcrop data has been used for modelling. The geologic structure considers bedding to core angles logged in drill core where available.

A digital elevation model for the project area was obtained from the Alberta Government, 1:20,000 DEM, which included an elevation datum on a 100 m grid with accuracy within 5 m, surface feature break lines, and general infrastructure. The drillhole data was draped to the digital data and the drill hole collar elevations were adjusted to fit the topography

Figure 14-1 shows the relative positions of all categorised drill holes in the various databases received.

Figure 14-1 Plan of Drill Holes used in the Vista Coal Project Geological Models



14.3.2 Geological Modelling and Interpretation

Vista and Vista Extension

Golder (2012) prepared stratigraphic and coal quality grid models for the Project based on the survey, lithology and coal quality data sets in tandem with the topographic digital terrain model ("DTM"). Base data included digital topographic triangulation data, drill hole survey and lithology records and coal quality ply sample data. The models generated consisted of regular arrays of data, or grids, distributed over the project area.

Base data for the generation of the topography model consisted of digital triangulation segments exported from a previous model of the area. The grid surface for the topography was created using a regular 10-m grid cell interval.

In the January 2011 Technical Report, Wardrop states that "drillhole collars were adjusted to fit the topography." A comparison of drill hole collar elevations to projected elevations from the topography grid confirms this, as the differences are typically within 0.25 m. This type of "draping" of drill holes on topography is typically done when collar survey elevations are questionable; and it is recommended that the databases for the project include original collar survey data as well as adjusted data, to provide a complete data set.

The stratigraphic model for the area was created by Golder (2012) using MineScape Stratmodel software. The initial step in the process was the definition of the coal seams to be modelled and the modelling parameters within the project "schema". The schema defines the interpolators, modelling limits and the coal seams included in the geologic reserve model. Drill hole data were imported to MineScape to create a database of graphical drill hole objects. Utilizing the drill hole objects and topography model as base data, the stratigraphic model was created according to the modelling parameters and seams defined in the schema. The coal seam horizons included in the stratigraphic model are shown in Table 14-5.

The primary seam groups include the Val d'Or, McLeod and McPherson plies. Coalspur requested that the V7 ply of the Val d'Or Group and 4 additional minor seams (A, SLK2, SLK1 and MYN) be included with the models. Table 14-5 includes information regarding the inclusion of estimated tonnages from each seam or ply in the mine development plan.

Base data for the model included 315 drill holes (66 core holes) along 17 major drill lines, containing data for 23 component seam splits, as well as 2 parent seam intervals. Two modelling horizons (TILL and TREND) were included to establish a till floor boundary and to control structural trends, respectively. Database statistics for the drill holes used for the Vista model are shown Table 14-6.

During modelling, the coal seams logged in the drill hole data are used to build roof, floor, seam thickness and interburden thickness surfaces for each coal seam defined in the schema. All of the coal seams in the model were limited by a surface representing the bottom of the till material. The resultant three-dimensional representation of the Vista Coal Project coal measures contains all the coal seams defined in the schema modelled to show the effects of the regional structural trends and the effects of clipping by the base of till material.

Table 14-5 Vista Coal Project stratigraphic model horizons

Elemental Seam	Compound Seam	Seam Group	Included in Mine Plan
V7U	V7	Val d'Or	No
V7L			No
V6U			Yes
V6L			Yes
V5U			Yes
V5L			Yes
V4			Yes
V3U			Yes
V3L			Yes
V2			Yes
V1			Yes
A1		Arbour	No
L3		McLeod	Yes
L2			Yes
L1			Yes
P4		McPherson	Yes
P3			Yes
P2			Yes
P1			Yes
SLK2U	SLK2	Silkstone	No
SLK2L			No
SLK1			No
MYN			No

The stratigraphic model was reviewed by visual examination of cross sections and plan mapping created from the model. Cross sections were created between drill holes along and between each drill line. Coal structure contours and isopach maps were created for each coal seam defined in the schema. The cross sections and maps were compared to the drill hole data and visually analysed for continuity and logical interpolations and extrapolations. Inconsistencies between modelled surfaces and surrounding drill hole data were reviewed. Modifications to either the drill hole correlations or modelling parameters were made where necessary. The stratigraphic model and the model graphics were recreated for subsequent review. This process was repeated until the final version of the model was developed.

Table 14-6 Summary of Vista Coal Project drill hole lithology database statistics

Seam	# Intercepts	Average Thickness (m)	Minimum		Maximum		Standard Deviation (m)
			Hole	Thickness (m)	Hole	Thickness (m)	
V7U	19	0.38	MR80-20	0.20	MT81-7	0.60	0.09
V7L	43	0.64	MR80-20	0.20	MR81-17C	1.05	0.21
V6U	83	0.70	81-02	0.30	MR81-17C	2.55	0.30
V6L	95	1.28	MR80-20	0.30	MR81-17C	3.42	0.47
V5U	105	2.48	CO8106	0.19	MT81-4	4.00	0.76
V5L	103	1.65	SO83-61	0.10	CO8106	3.72	0.48
V4	111	0.64	CO81-05	0.35	CO7802	1.37	0.14
V3U	126	4.28	CO8106	1.43	CPW10-03	6.15	0.76
V3L	119	1.24	MT81-2	0.25	84-79	4.10	0.78
V2	127	1.07	10-34-51-23	0.30	CPE10-01	2.80	0.34
V1	128	1.31	CPE10-01	0.25	CPW10-02	3.20	0.36
A1	35	1.42	MN92-08	0.18	CPW10-01	4.35	1.17
L3	90	0.85	10-34-51-23	0.22	CPZ10-02C	2.19	0.35
L2	91	1.65	MN92-15C	0.53	82-47A	2.20	0.33
L1	92	0.81	MN92-03	0.26	CPM10-17A	1.80	0.26
P4	128	1.19	84-75	0.20	MR82-35	2.05	0.42
P3	134	1.78	84-77	0.63	82-54	2.80	0.35
P2	135	2.06	82-35	0.90	CPE10-04	3.60	0.49
P1	136	1.10	TPL81-2	0.35	84-77	3.20	0.35
SLK2U	10	0.64	SO82-53	0.50	CPM10-50	0.80	0.12
SLK2L	10	0.75	SO83-63	0.30	CPM10-60	1.20	0.28
SLK1	46	1.78	MR81-188	0.70	SO83-66	3.30	0.63
MYN	8	1.05	MR81-186	0.35	82-12	2.30	0.66
V7	35	0.95	MN92-16	0.31	MR80-15	1.40	0.28
SLK2	35	1.92	MR81-182	0.30	MR81-186	2.55	0.54

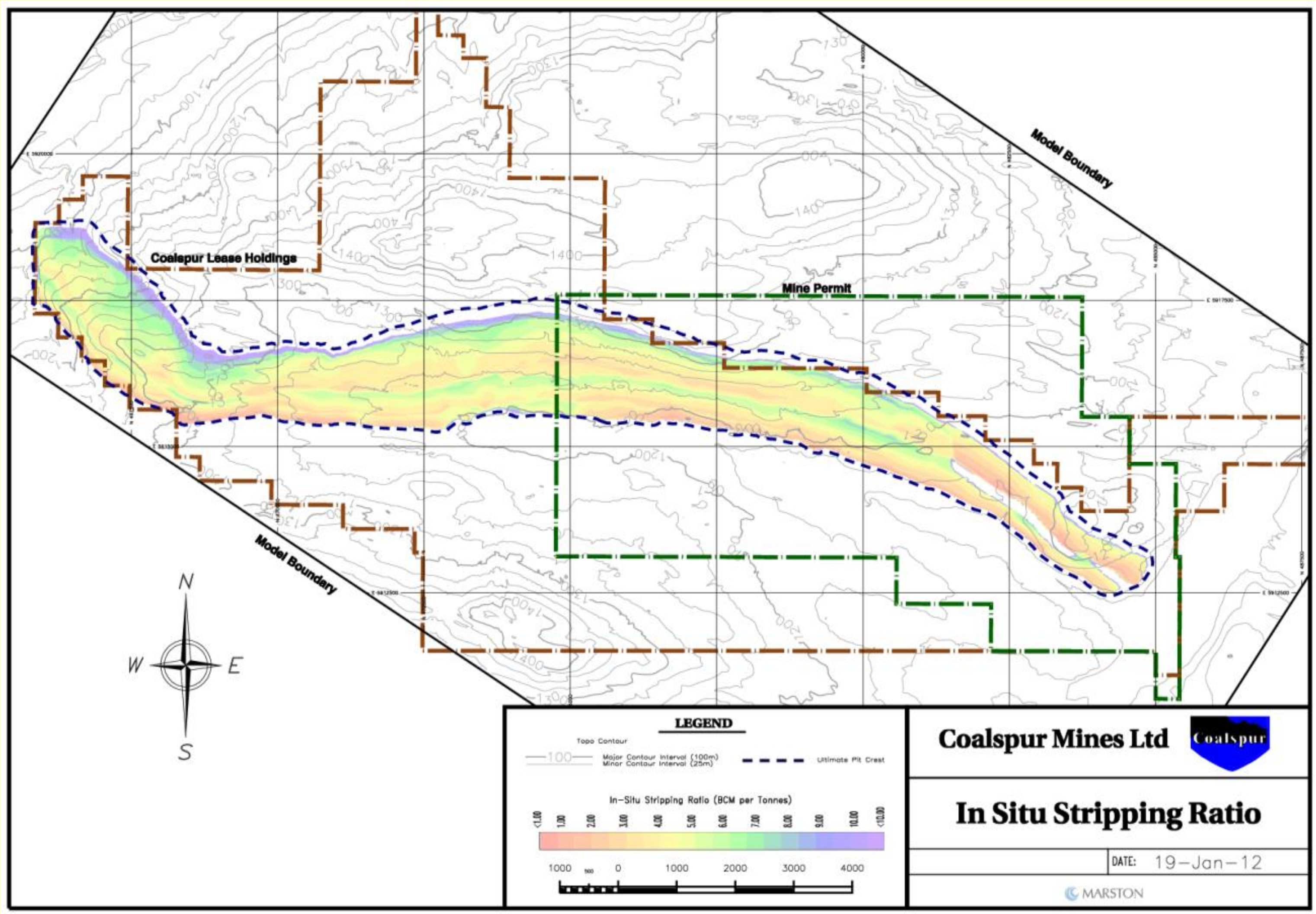
The final stratigraphic model contains 21 modelled coal horizons. Seam splits were modelled in two of these coal seams. The stratigraphic model is based on a rotated, regular 20 m grid cell interval. The geometric base point, grid extents and rotation angle are:

- Lower left corner coordinates: E 463,997.16 N 5,917,638.00
- Extents along axes: 22,300 m 12,500 m
- Number of columns and rows: 1,116 626
- Rotation of grids: -34°

In line with accepted practice for Canadian coal deposits, the cumulative *in situ* strip ratio was calculated and modelled. The 20:1 strip ratio margin was used as a guide to the Coal Resource Block limits. The ultimate pit shell falls within the 12:1 strip ratio limit (Figure 14-2).

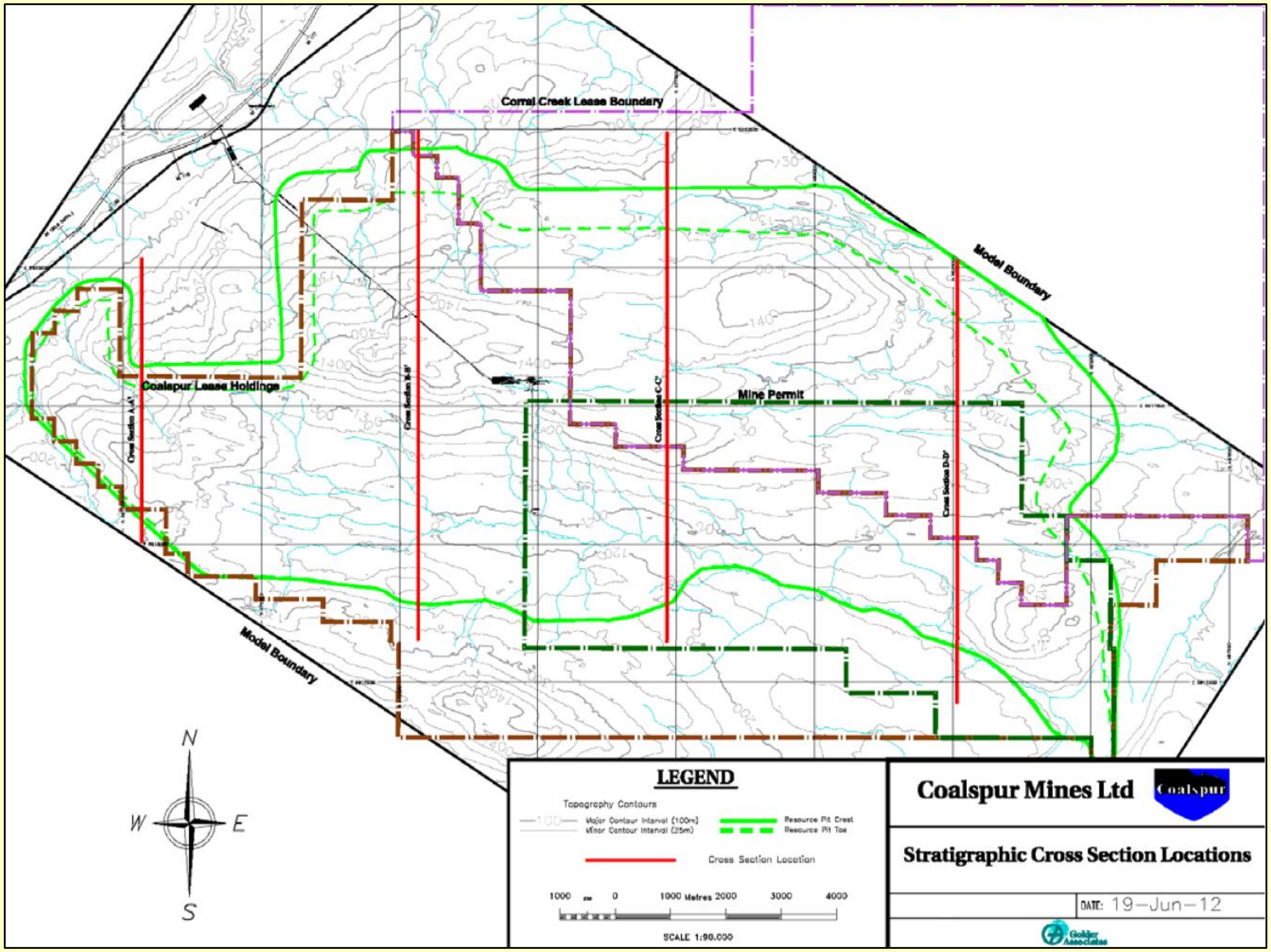
Figure 14-3 shows the locations of cross sections through the southeast, central and northwest regions of the deposit. The cross sections are shown in Figure 14-4 to Figure 14-7. All plies and the final pit highwall are shown on the cross sections.

Figure 14-2 Modelled Cumulative *In Situ* Strip Ratio (12:1) defining the Ultimate Pit Boundary



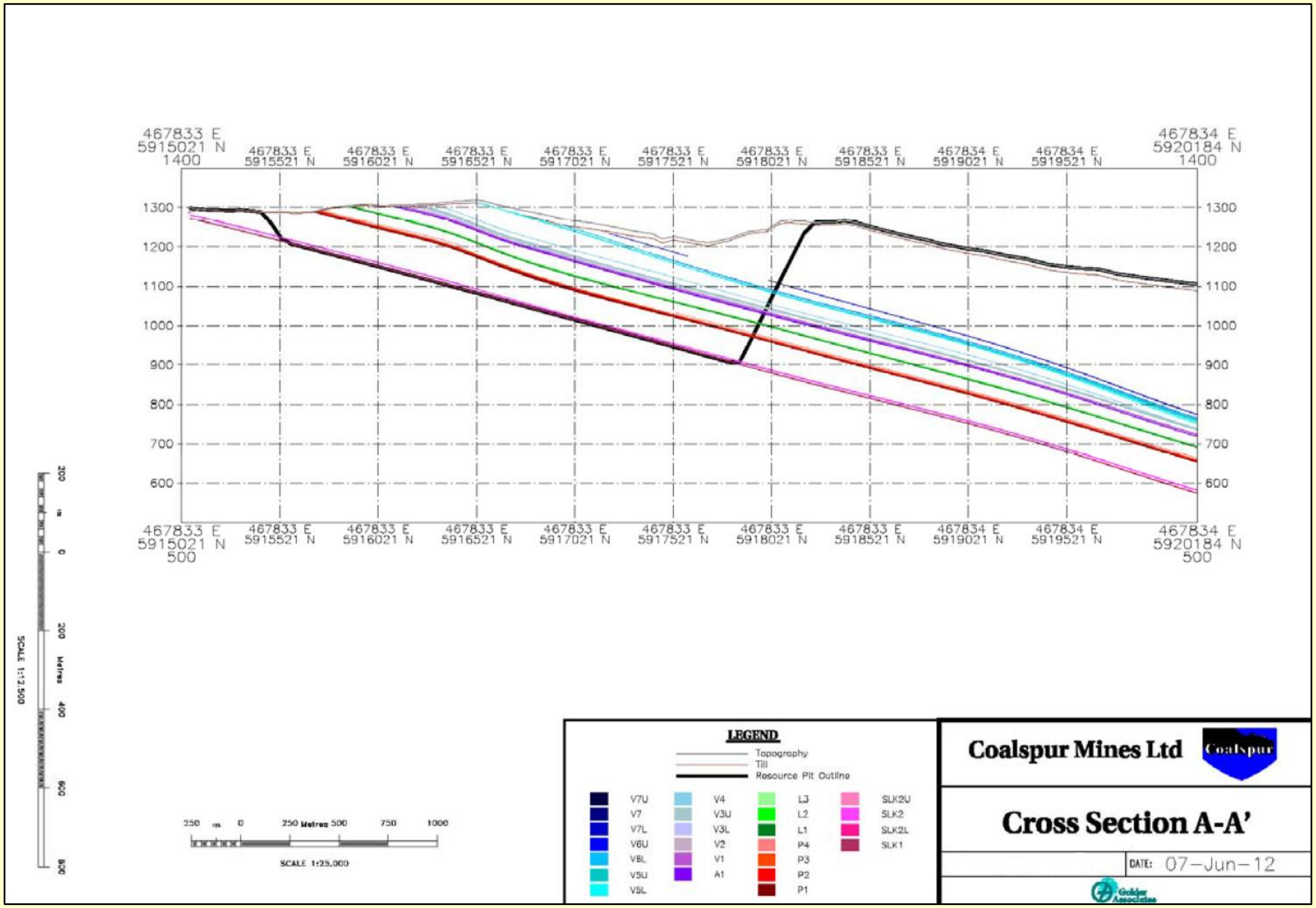
SNOWDEN	*In Situ* Strip Ratio The Vista Coal Project	Source: Snowden, 2012

Figure 14-3 Map indicating position of cross-section lines



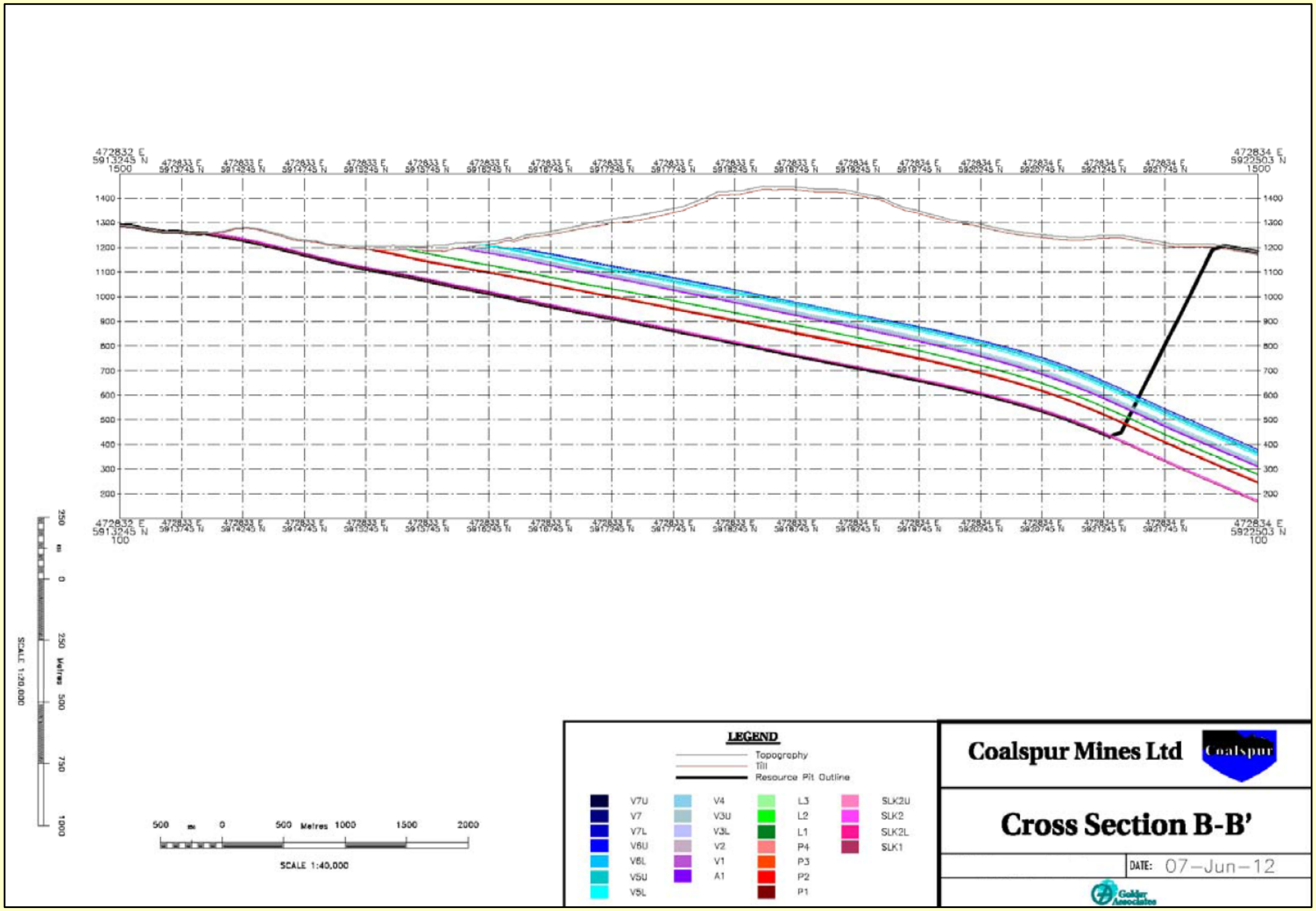
SNOWDEN	**Stratigraphic Cross Sections** **The Vista Coal Project**	Source: Golder, 2012

Figure 14-4 Section AA ***(approximate 2:1 vertical exageration)***



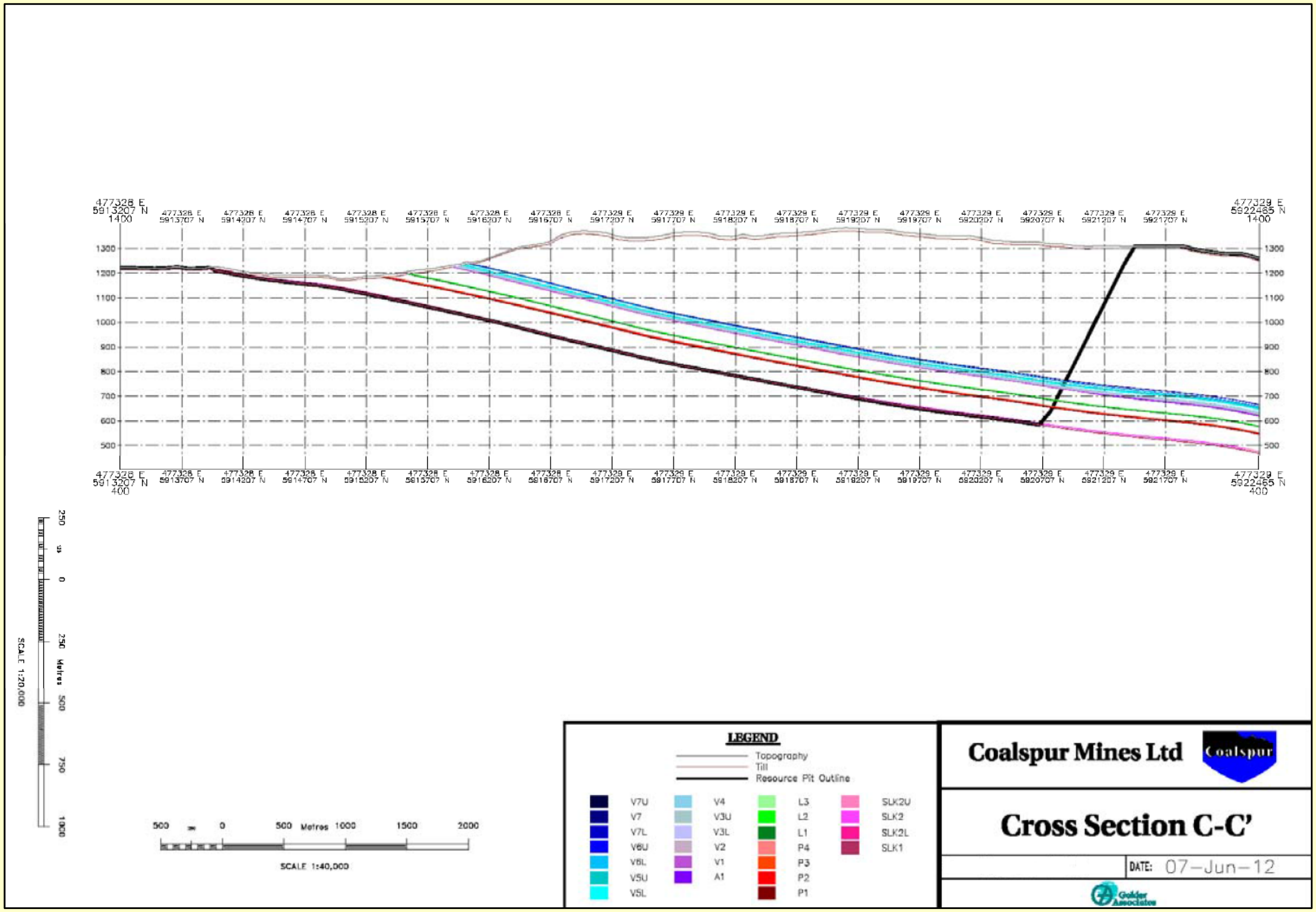
SNOWDEN	Stratigraphic Cross Sections The Vista Coal Project	Source: Golder, 2012

Figure 14-5 Section BB ***(approximate 2:1 vertical exageration)***



SNOWDEN	Stratigraphic Cross Sections The Vista Coal Project	Source: Golder, 2012

Figure 14-6 Section CC ***(approximate 2:1 vertical exageration)***

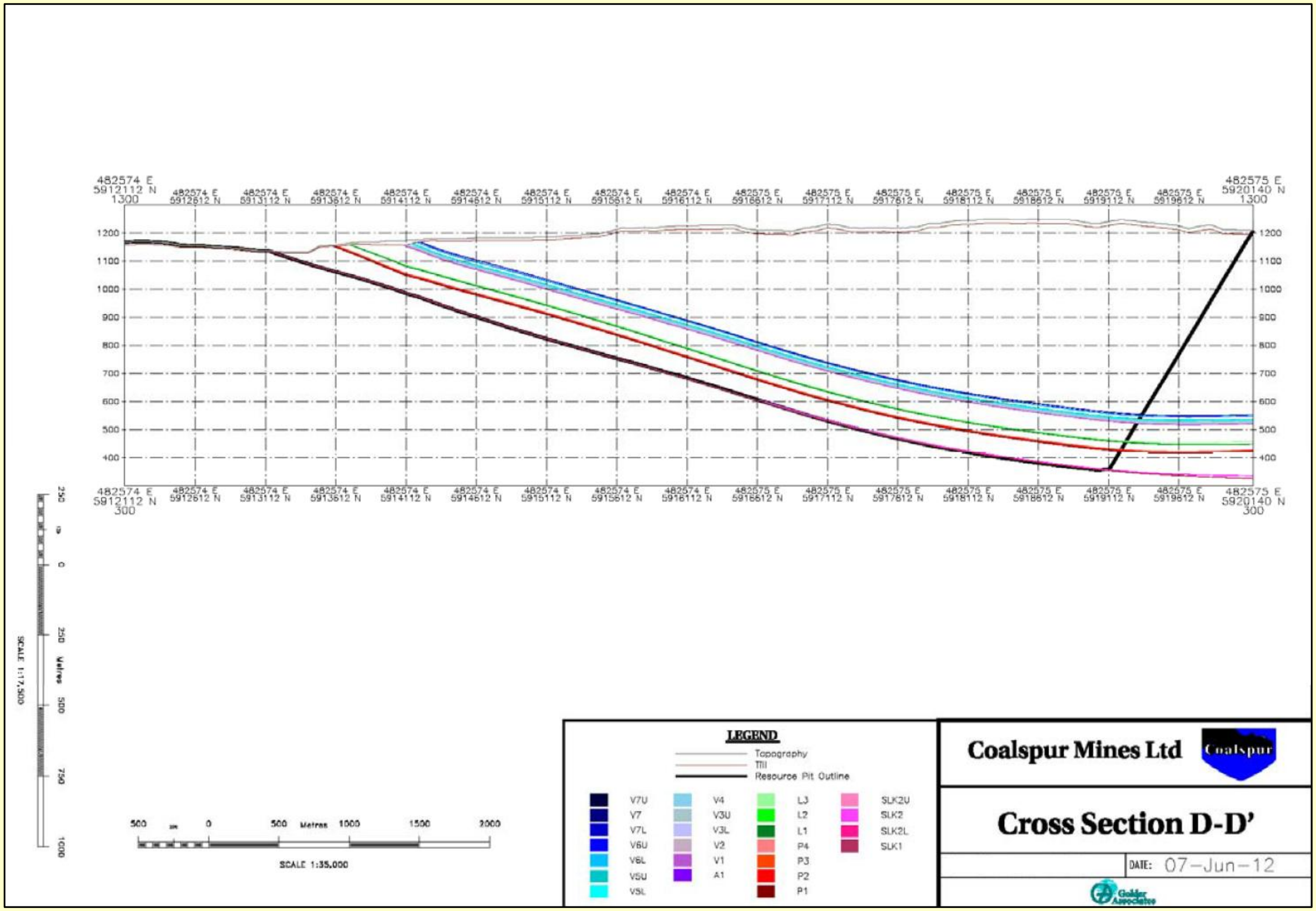


SNOWDEN

Stratigraphic Cross Sections
The Vista Coal Project

Source: Golder, 2012

Figure 14-7 Section DD ***(approximate 2:1 vertical exageration)***



SNOWDEN

Stratigraphic Cross Sections
The Vista Coal Project

Source:
Golder, 2012

Vista South

The geological modelling undertaken includes a review of the available data, formatting and treatment of data to support model development, an update of the geological interpretation, and the construction of the 3D resource model. Interpretation and modelling has focused on the Coalspur Formation within the Entrance Syncline.

Model Extent

The resources documented with this report represent the entire Vista South Property with the exception of portions of the complex limb in the northeast. The strike length of the modelled area is 24.7 km while the width is 12.8 km (Figure 14-8).

Model Geometry

Model geometry follows the Coalspur Formation along the Entrance Syncline. Block dimensions are 25 m by 25 m, and 10 m in elevation.

The model measures 988 blocks (24,700 m) in length and 512 blocks (12,800 m) across and examines resources between 400 m and 1,700 m in elevation (130 blocks). The model has a –45° rotation (west of north, an azimuth of 315°).

Figure 14-9 to Figure 14-11 display cross sections drawn across strike from the northwest to the southeast.

Overburden (till) Surface

The base of overburden surface defines the extent of glacial-fluvial cover over in situ materials. No coal seams are modelled above the base of overburden surface. The depth of overburden was reported in the drillhole logs. An interpolation, using inverse distance to the power of two with a 9,500 m search, and a maximum of 100 points, was completed. Overburden thickness greater than 20 m was limited to a distance of 300 m. The overburden thickness was then subtracted from the topography surface to make the base of overburden surface.

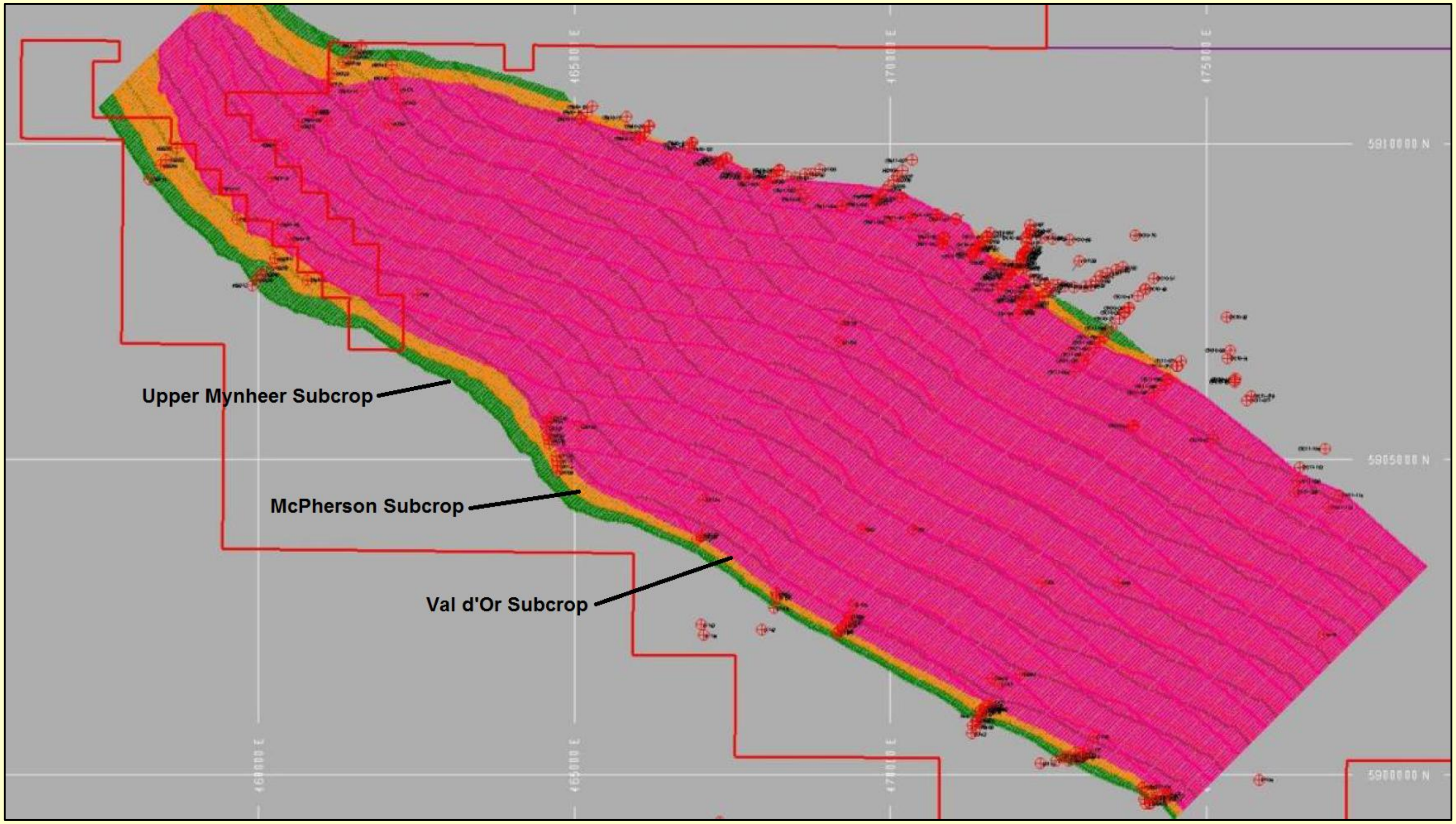
Oxide Horizon

As the coal is to be used as a thermal product, an oxidation horizon has not been modelled.

Mineable Thickness

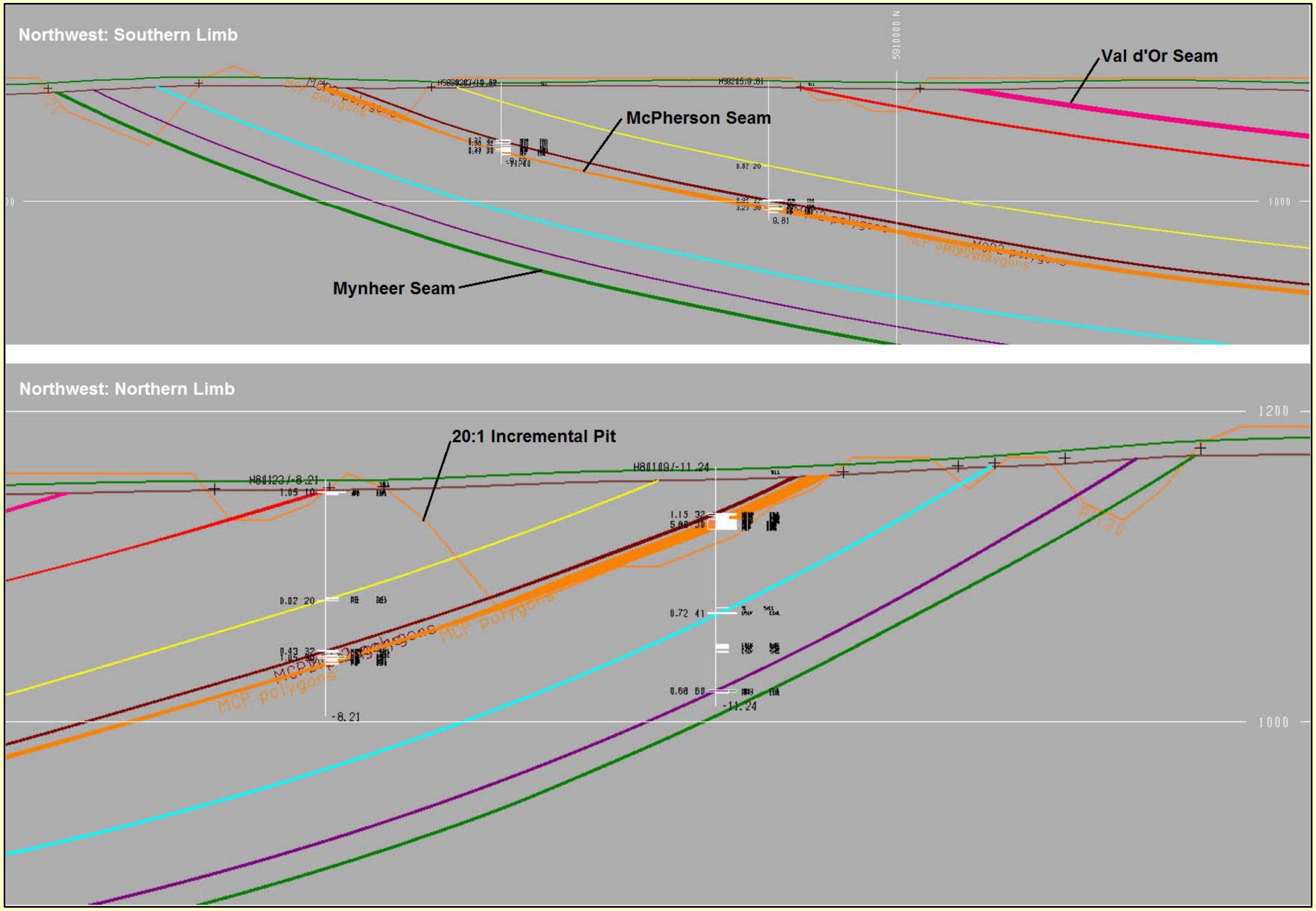
Coal seam thicknesses from exploration drillholes are measured along the length of the hole (from geophysical logs) and because the angle of intersection between the hole and the seam is often less than perpendicular, these intersections represent an ‘apparent’ rather than ‘true’ thickness of the seam. Adjustment from apparent to true seam thickness is, therefore, a critical step in the modelling of *in situ* coal resources. The resource model is based on true seam thickness, as defined mathematically through the relationship between drill hole geometry and interpreted bedding geometry. The true thickness interpolation used a 4,000 m x 4,000 m search and an inverse distance power of three.

Figure 14-8 Modelled Extent of Vista South



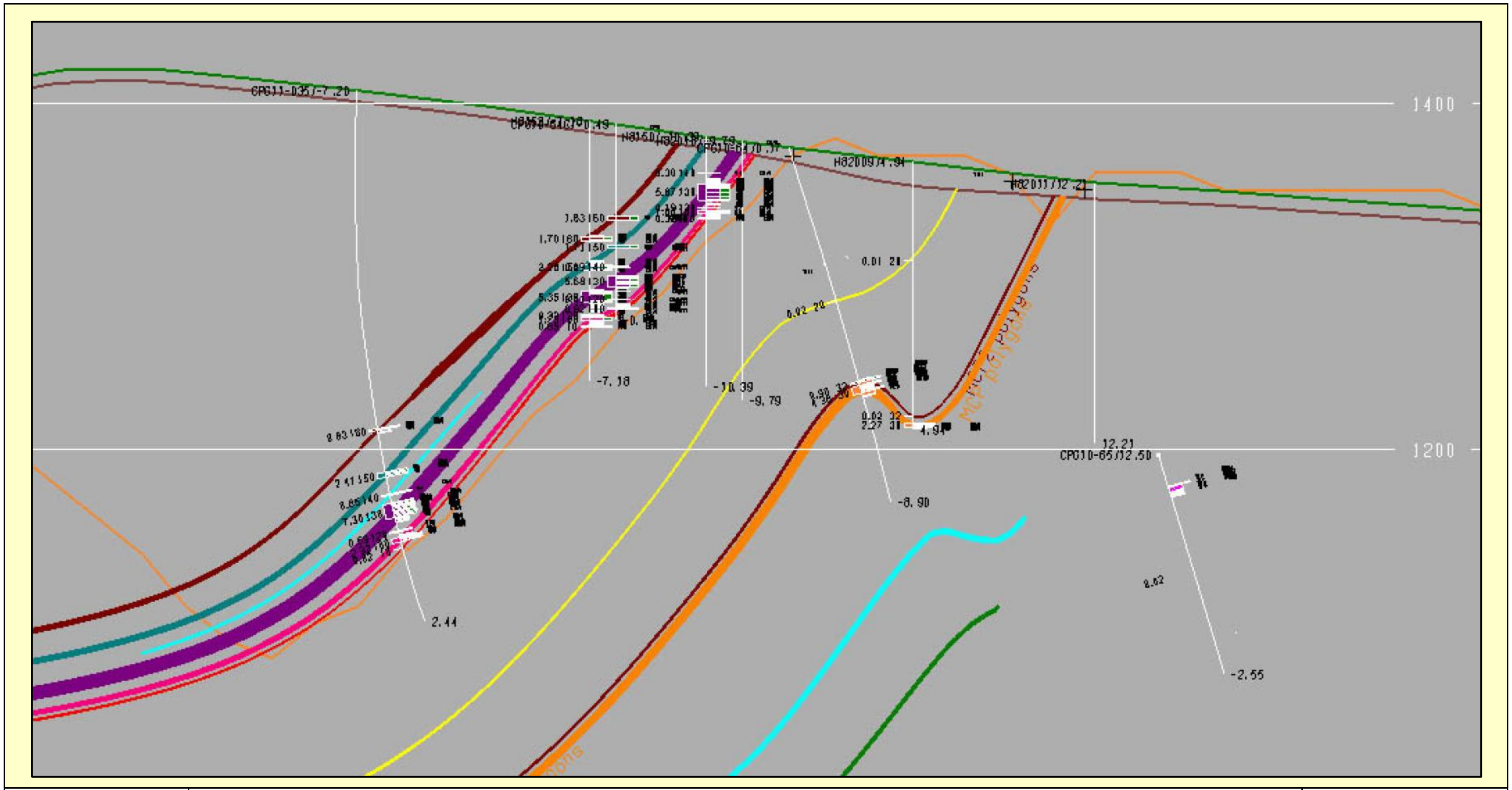
SNOWDEN	**Model Extent** **The Vista South Coal Property**	Source: MMTS, 2012

Figure 14-9 Cross Sections through Northwest Sector (cut SW-NE, looking NW)



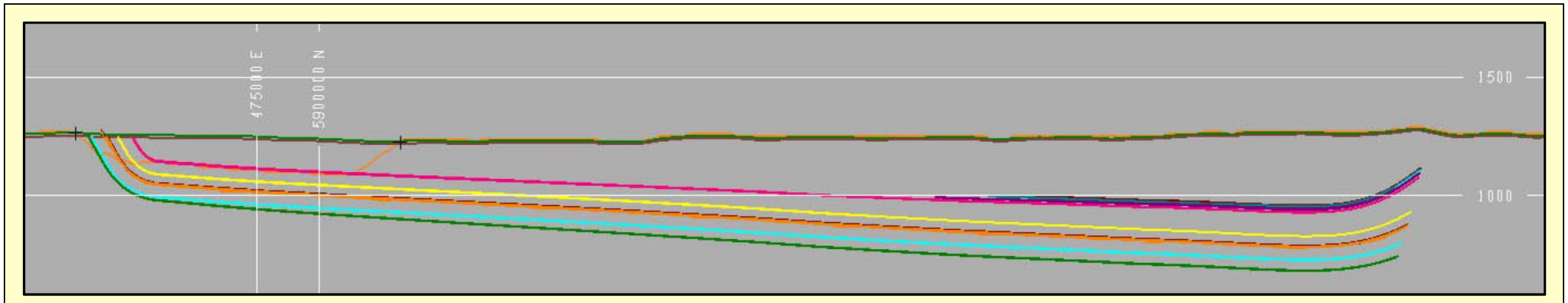
SNOWDEN	**Cross Section Interpretation** **The Vista South Coal Property**	Source: MMTS, 2012

Figure 14-10 Cross section (looking NW) through northern limb of suncline highlighting local structural complexity



SNOWDEN	Cross Section Interpretation The Vista South Coal Property	Source: MMTS, 2012

Figure 14-11 Cross section through entire synclive in the southern sector (looking NW)



SNOWDEN	Cross Section Interpretation The Vista South Coal Property	Source: MMTS, 2012

On the basis of the current interpretation, the Vista South is classified as both a moderate, potentially surface mineable deposit, and an underground resource of immediate interest. Sample analyses indicate that the coal is low sulphur, high volatile bituminous C rank thermal coal. Resource assumptions for mineable thicknesses conform to GSC Paper 88-21 guidelines at 0.6 m for potentially surface mineable resources and 1.5 m for potentially underground mineable resources. Seam thickness is shown in Table 14-7.

Table 14-7 Vista South Seam Thicknesses

Seam	Block / Zone	Intercepts	Min	Max	Average
Seam C		3	0.64	1.19	0.95
Val d'Or	Southern Limb	16	1.10	4.50	3.06
Val d'Or V6	Northern Limb	23	0.83	4.66	2.04
Val d'Or V5	Northern Limb	26	0.60	5.29	2.79
Val d'Or V4	Northern Limb	18	0.60	0.97	0.72
Val d'Or V3	Northern Limb	37	2.19	7.00	5.54
Val d'Or V2	Northern Limb	11	0.64	2.12	0.92
Val d'Or V1	Northern Limb	32	0.65	2.50	1.37
Arbour		11	0.65	1.27	0.88
McLeod		28	0.82	4.00	2.71
McPherson P2	Upper Ply	42	0.69	3.00	1.40
McPherson P2	Lower Ply	54	0.60	12.00	5.92
McPherson	Fault Block	4	5.74	17.70	13.42
Upper Silkstone		17	0.64	3.00	1.44
Marker 1		3	0.68	1.02	0.84
Upper Mynheer		13	0.73	2.46	1.36

14.3.3 Coal Quality Model

Vista Coal Project and Vista Extension

The analytical data provided included '*As Analysed*' and '*Raw*' values for various measured and calculated parameters (Table 14-8). The '*Raw*' parameter is equivalent to the *In Situ* value as calculated by application of suitable formulae using the equilibrium moisture (very close to the *in situ* moisture).

The coal quality data for the Vista Coal Project were utilised as base data for subsequent compositing and modelling. The parameters included in the coal quality model include relative density, equilibrium and total moisture contents, ash content, sulphur content, volatile matter content, fixed carbon content, and calorific value. At the direction of Coalspur, the coal quality model was based on the *in situ* parameters as supplied.

The initial step in the creation of the coal quality models was to compare the positional data in the quality ply database to the seam positions in the stratigraphic resource model. In this fashion, the ply samples are combined to determine composite quality values for each seam in drill holes containing coal quality data. Because the major seam groups contain multiple plies, and the thickness of waste between these plies varies from non-separable to separable, this exercise had several goals, namely:

- to adjust the seam depth data in the quality database to match to the values in the lithology database
  - this included pro-rata adjustment of ply thicknesses within a given seam intercept, as required;
- to identify removable and non-removable parting horizons through appropriate lithology codes
  - this has two effects: first, to eliminate the use of quality values for removable parting horizons in seam composite quality estimates; and secondly, to enable the estimation of removable parting quantities within a given seam;
- to establish the quantity of removable partings in any given seam
  - this value is required to enable accurate accounting of coal loss and dilution values for estimates of ROM quantities and qualities

Golder reviewed the results of the compositing exercise to assess the quantity of data available per seam and general statistics calculated from those data. A summary listing of the available data for modelling for each seam resulting from the compositing exercise is shown in Table 14-9.

Table 14-8 Summary of available proximate analysis data

Item	Description	Units	# Samples	Comment
As Analysed Values				
A	Equilibrium Moisture Content (EQM)	(Wt. %)	214	
B	Total Moisture Content (TM)	(Wt. %)	319	
C	Air Dried Moisture Content (M_{ad})	(Wt. %)	1,247	
D	Relative Density (RD)	(g/cc)	948	Air dried moisture basis
E	Ash Content (Ash_{ad})	(Wt. %)	1,247	Air dried moisture basis
F	Volatile Matter Content (VM_{ad})	(Wt. %)	907	Air dried moisture basis
G	Total Sulphur Content (TS_{ad})	(Wt. %)	908	Air dried moisture basis
H	Calorific Value (CV_{ad})	(Wt. %)	882	Air dried moisture basis
Raw Values (In-Situ Moisture Content Basis)				
I	Equilibrium Moisture Content (EQM)	(Wt. %)	1,247	Assigned value
J	In-Situ Moisture Content (ISM)	(Wt. %)	1,247	EQM +1 (I + 1)
K	In-Situ Density (IRD)	(g/cc)		From ash: density regression curves
L	Ash Content (Ash_{is})	(Wt. %)	1,247	Ash adjusted to ISM basis – E * (100-K)/(100-C)
M	Volatile Matter Content (VM_{is})	(Wt. %)	907	VM adjusted to ISM basis – F * (100-K)/(100-C)
N	Total Sulphur Content (TS_{is})	(Wt. %)	908	Sulphur adjusted to ISM basis – G * (100-K)/(100-C)
O	Calorific Value (CV_{is})	(kcal/kg)	882	CV adjusted to ISM basis and to kcal/kg – H * 238.8 * (100-K)/(100-C)
P	Calorific Value (CV_{daf})	(kcal/kg)	882	Dry, ash free CV – O * 100/ (100-J-L)

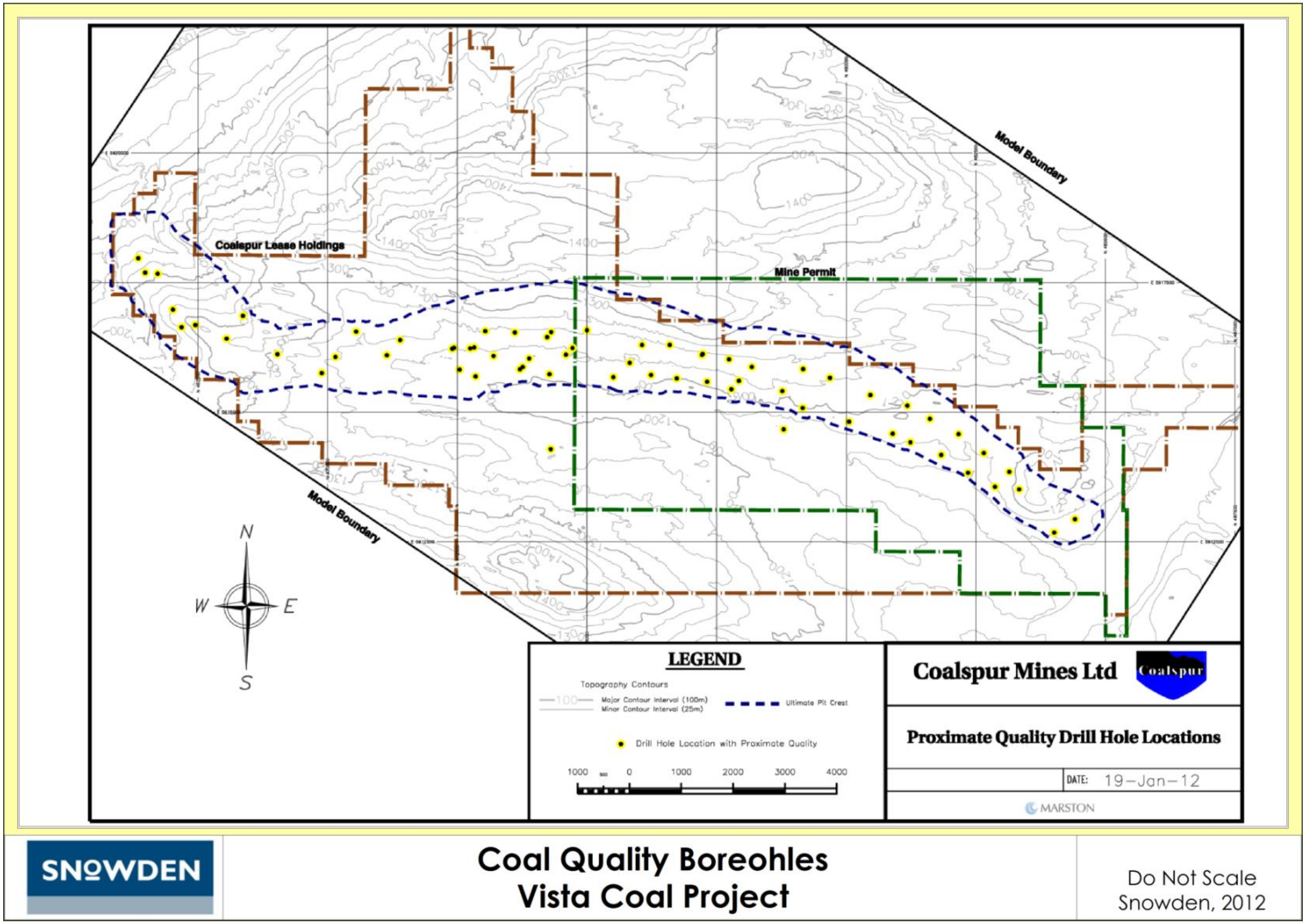
Table 14-9 Summary of coal quality composite database entries by seam/ply

Seam	Quantity of Composite Quality (Drill Holes) Available for Modelling						
	Ash	CV	EQM	TM	RD	VM	TS
V7U	*2*	*2*	*2*	*2*	*2*	*1*	*1*
V7	*6*	*6*	*6*	*6*	*6*	*5*	*5*
V7L	*4*	*3*	*4*	*4*	*4*	*2*	*2*
V6U	20	15	20	20	20	13	13
V6L	23	16	23	23	23	15	16
V5U	28	20	28	28	28	17	17
V5L	24	19	24	24	24	15	15
V4	23	21	23	23	23	15	15
V3U	36	28	36	36	36	25	25
V3L	25	22	25	25	25	16	16
V2	34	26	34	34	34	25	25
V1	35	27	35	35	35	25	25
A1	*10*	*9*	*10*	*10*	*10*	*9*	*9*
L3	20	12	20	20	20	19	19
L2	21	14	21	21	21	20	20
L1	21	14	21	21	21	20	20
P4	33	24	33	33	33	25	25
P3	33	24	33	33	33	25	25
P2	34	25	34	34	34	26	26
P1	33	24	33	33	33	25	25
SLK2U	*2*	*2*	*2*	*2*	*2*	*2*	*2*
SLK2L	*2*	*2*	*2*	*2*	*2*	*2*	*2*
SLK1	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Totals	**471**	**357**	**471**	**471**	**471**	**349**	**350**

Note: Only highlighted seams / plies have been included in mine planning

The modelling technique for the coal quality parameters consisted of the creation of grid based surfaces representing projected *in situ* qualities using the composited ply quality values as base data. The gridded coal quality surfaces were created using the same rotated, regular 20 m grid as was used for stratigraphic modelling. Grid surfaces created from data sets with less than four data points generally do not provide reasonable estimates of quality over an area the size of the Vista property. Typically, the spatial distribution of sample populations of this size localises the effects of known data points, and can produce misleading extrapolations. This was not an issue for Vista, as all seams included in estimation and subsequent mine planning had a sufficient quantity of data for the modelling of grid-based surfaces. The locations of drill holes with associated proximate coal qualities used for quality modelling are shown in Figure 14-12.

Figure 14-12 Plan of drill holes with coal quality used in modelling



Vista South

No coal quality model has been developed at this stage. There is insufficient data available for a model to be generated although a coal quality assessment has been undertaken and is covered in Section 13.

14.3.4 Model Validation

Vista and Vista Extension

Notwithstanding the grid validation exercise undertaken as a part of the initial validation of data (Item 12), Snowden undertook a further validation exercise specifically aimed at the geological model.

Snowden validated by the Vista structural model by:

- Preparing several grids from first principles using the same raw data as supplied in the CSV datasets
  - Snowden used its preferred software, Vulcan, for this exercise.
- Estimating volumes for several seams / plies
- Estimating volumes using the as received gridded data for the same seams / plies
- Comparison of the Snowden-derived volumes with the volumes derived from the as received gridded data.

The results of the brief model validation (Table 14-10) show that the estimates presented by Snowden (2012) as derived by Golder/Marston (2012) are reliable. Snowden is comfortable to continue to report these estimates and takes full responsibility in reporting the estimates in this Technical Report.

Table 14-10 Comparisons between as received and Snowden-derived estimates of volume and tonnage for several coal seams / plies

SEAM	As Received		Snowden		% Diff (t)
	V (Mm^3)	Mt	V (Mm^3)	Mt	
V3U	96.074	144.111	91.394	137.090	5%
L2	41.934	62.901	38.750	58.125	8%
P3	52.980	79.470	54.857	82.286	-4%
Total	**190.988**	**286.483**	**185.001**	**277.501**	**3%**

Vista South

The Vista South geological (stratigraphic) model has not, at this stage, been validated in detail by Snowden. Vista South currently represents less than 30% of the total Measured and Indicated Coal Resources estimated for Coalspur across the Vista Projects. Furthermore, this project is still in the early stages of exploration and development and is only suitable for, at best, a scoping level study or preliminary economic assessment.

Snowden is comfortable to accept the MMTS estimates as presented in their 2012 technical report and takes accountability for these estimates as presented in his Technical Report.

14.3.5 Mineral Resource Classification

Coal Resource Classification has been determined through the application of the drill hole spacing criteria presented in the Geological Survey of Canada's Paper 88-21, '*A Standardized Coal Resource/Reserve Reporting System for Canada*' for Surface Mineable, Moderate Geology Type deposits. The drill hole spacing is as follows:

- Measured Resources – 450 m
- Indicated Resources – 900 m
- Inferred Resources – 2,400 m

For the Vista Coal Project, Coal Resource Classifications for the Val d'Or 3 Upper Seam, the McLeod 2 Seam, and the McPherson 3 Seam are presented in Figure 14-13, Figure 14-14 and Figure 14-15.

For the Vista South property, Coal Resource Classifications for the Val d'Or, McPherson and Mynheer seams are presented in Figure 14-16 to Figure 14-18.

14.3.6 Mineral Resource Reporting

Vista Coal Project and Vista Extension

Coal has been estimated to a physical boundary representing the 20:1 incremental in situ strip ratio. The defined coal resource block is this boundary limited by the subcrop of the seam and the Vista Coal Project lease boundary. As part of the Vista Coal Project Feasibility Study, Snowden reported in its Technical Report, dated 26 January 2012, Coal Resources for the Vista Coal Project. These estimates were updated by Golder later in 2012 on the acquisition of the Vista Extension Property (immediately north and contiguous with Vista). These estimates are presented in Table 14-15.

Table 14-11 Coal Resource Estimates for the Vista Coal Project

Description	Measured (Mt)	Indicated (Mt)	*Measured + Indicated (Mt)*	Inferred (Mt)
In Situ Coal Resources	686.0	369.9	***1,055.9***	460.9

Vista Extension

As a part of updating the Snowden (2012) Technical Report, Golder incorporated estimates for Vista Extension in the estimate presented in their Technical Report dated 12 September 2012. The estimates for each (Vista and Extension) were not presented separately as the two areas are contiguous. Table 14-16 shows the combined estimates prepared by Golder (2012).

Table 14-12 Coal Resource Estimates for the Vista Coal Project and Vista Extension

Description	Measured (Mt)	Indicated (Mt)	*Measured + Indicated (Mt)*	Inferred (Mt)
In Situ Coal Resources	692.5	537.1	***1,229.6***	1,430.2

Coal Resource estimates for Vista Extension are presented in Table 14-17.

Table 14-13 Coal Resource Estimates for Vista Extension

Description	Measured (Mt)	Indicated (Mt)	*Measured + Indicated (Mt)*	Inferred (Mt)
In Situ Coal Resources	6.5	167.2	***173.7***	969.3

Vista South

Moose Mountain Technical Services ("MMTS"), in 2012, prepared an Technical Report, dated June 25, 2012 (available on **www.sedar.com**) in respect of the Vista South Coal Property. Estimates presented in that report are summarised in Table 14-18.

Table 14-14 Coal Resource Estimates for the Vista South Coal Property

Description	Measured (Mt)	Indicated (Mt)	*Measured + Indicated (Mt)*	Inferred (Mt)
In Situ Coal Resources	210.6	259.7	***470.3***	604.6

Vista South

Coal has been deemed to fall into two categories or Vista South:

1. Surface Mineable, Moderate Complexity, Immediate Interest
2. Underground Mineable, Moderate Complexity, Immediate Interest

Surface Mineable Coal Resources

For the surface mineable resources, the coal, as defined, is within a pit with 45° walls and a strip ratio of less than 20:1 BCM/tonne (a pit delineated resource with an incremental strip ratio of 20 bank cubic metres of waste to one tonne of *in situ* coal). With an incremental strip ratio, each block of coal within the pit must have twenty blocks of waste, or less, above it.

The overall strip ratio for the surface mineable resource is 14.6:1 (Figure 14-19). The Measured Resources represent 38% of the total; Indicated Resources represent 34%, while inferred Resources make up the remaining 28% of the total surface mineable Coal Resource (Table 14-16).

Table 14-15 2014 Coal Resource Estimates for the Vista Coal Project

Seam Ply	Resource Category			*In Situ* Quality Parameter		
	Measured Mt	Indicated Mt	Inferred Mt	Ash %	CV MJ/kg	TS %
V7	11.6	5.0	7.6	34.4	3,998	0.56
V6U	6.7	3.4	3.8	10.5	5,773	0.58
V6L	22.9	11.6	11.7	16.8	5,179	0.41
V5U	50.3	24.1	25.6	28.5	4,443	0.30
V5L	29.5	12.7	12.7	19.9	5,072	0.24
V4	12.1	5.1	3.6	17.7	5,472	0.27
V3U	116.2	42.4	44.5	25.4	4,791	0.16
V3L	35.9	11.7	7.6	37.7	4,010	0.31
V2	31.3	11.5	9.9	32.3	4,185	0.23
V1	34.3	13.2	12.6	26.2	4,721	0.20
A1	4.6	2.3	6.2	35.5	3,825	0.22
L3	19.5	11.1	8.3	40.1	3,892	0.22
L2	40.7	24.1	19.2	35.1	4,186	0.19
L1	20.3	10.0	4.9	37.7	3,843	0.20
P4	29.8	16.8	11.0	31.5	4,383	0.25
P3	58.3	29.2	21.7	25.1	4,985	0.16
P2	67.8	33.8	23.3	30.4	4,592	0.18
P1	37.1	16.6	9.6	25.2	4,917	0.23
S2	32.2	32.0	27.1	39.1	3,622	0.41
S1	26.9	26.3	19.8	20.9	5,073	0.23
Total	**688.0**	**342.9**	**290.7**			

Table 14-16 Vista South Surface Mineable Coal Resources

Area	Category	In Situ Tonnage (kt)	% of Total
Vista South	Measured	117,600	38
	Indicated	105,800	34
	Measured + Indicated	***223,400***	***72***
	Inferred	86,700	28

Underground Mineable Coal

For the underground mineable coal, the coal, as defined, is within 600 m of surface. The Measured Resources represent 12% of the total; indicated resources represent 20%, while Inferred Resources are 68% of the total coal (Table 14-17).

Table 14-17 Vista South Underground Mineable Coal Resources

Area	Category	In Situ Tonnage (kt)	% of Total
Vista South	Measured	117,600	12
	Indicated	105,800	20
	Measured + Indicated	***223,400***	***32***
	Inferred	86,700	68

Vista South Global Resource Estimates

The global estimates of Coal Resources for the Vista South Coal Property are presented in Table 14-18.

Table 14-18 Combined Coal Resource Estimates for Vista South

VISTA SOUTH	Measured kt	Indicated kt	*Measured + Indicated kt*	Inferred kt
Open Pit	117,600	105,800	***223,400***	86,700
Underground	93,000	153,900	***246,900***	517,900
Total	**210,600**	**259,700**	***470,300***	**604,600**
% Category of Total	*20%*	*24%*	***44%***	*56%*

Figure 14-13 Coal Resource Classification for the Val d'Or Seam, Vista Coal Project

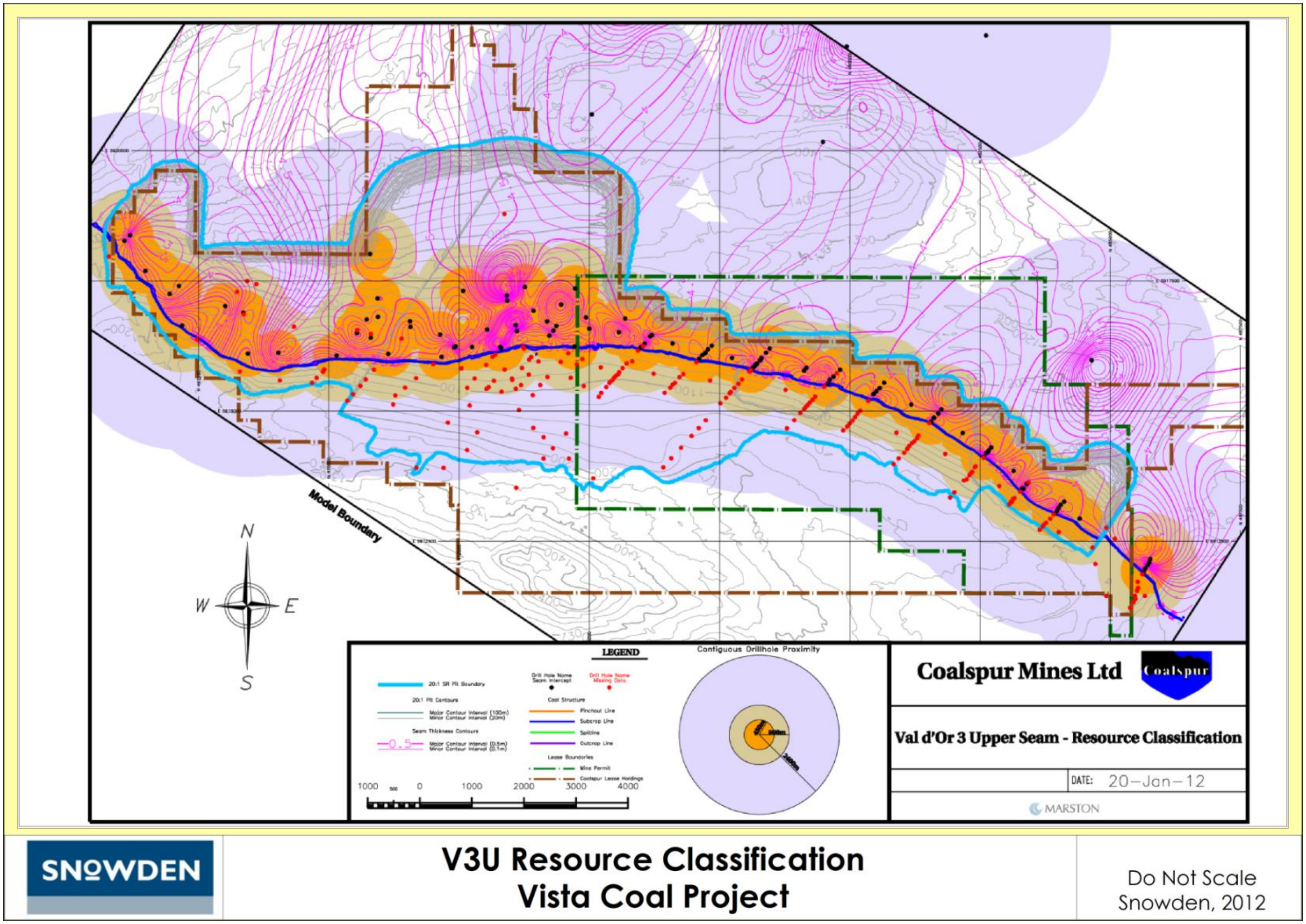


Figure 14-14 Coal Resource Classification for the McLeod 2 Seam, Vista Coal Project

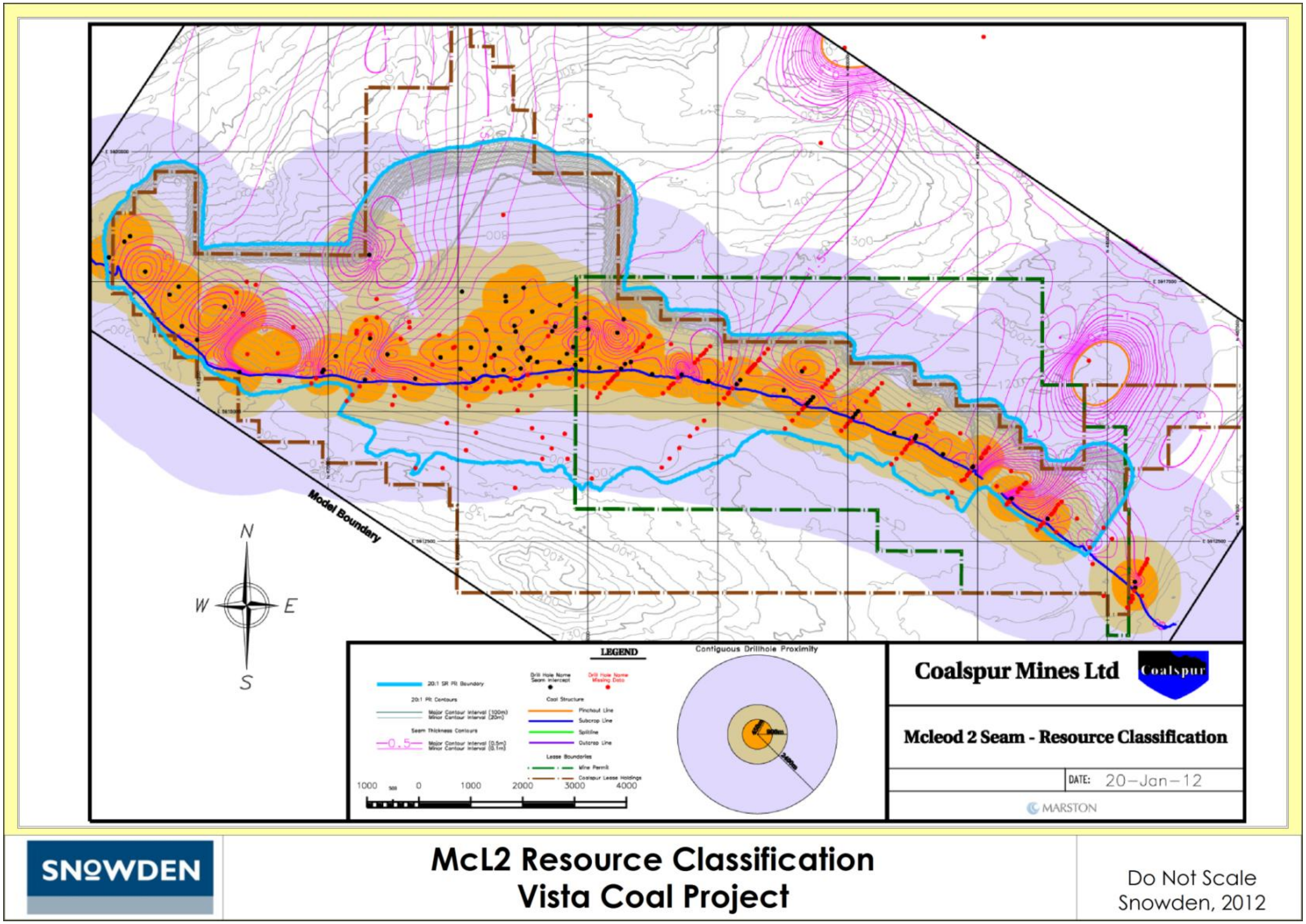


Figure 14-15 Coal Resource Classification for the McPherson 3 Seam, Vista Coal Project

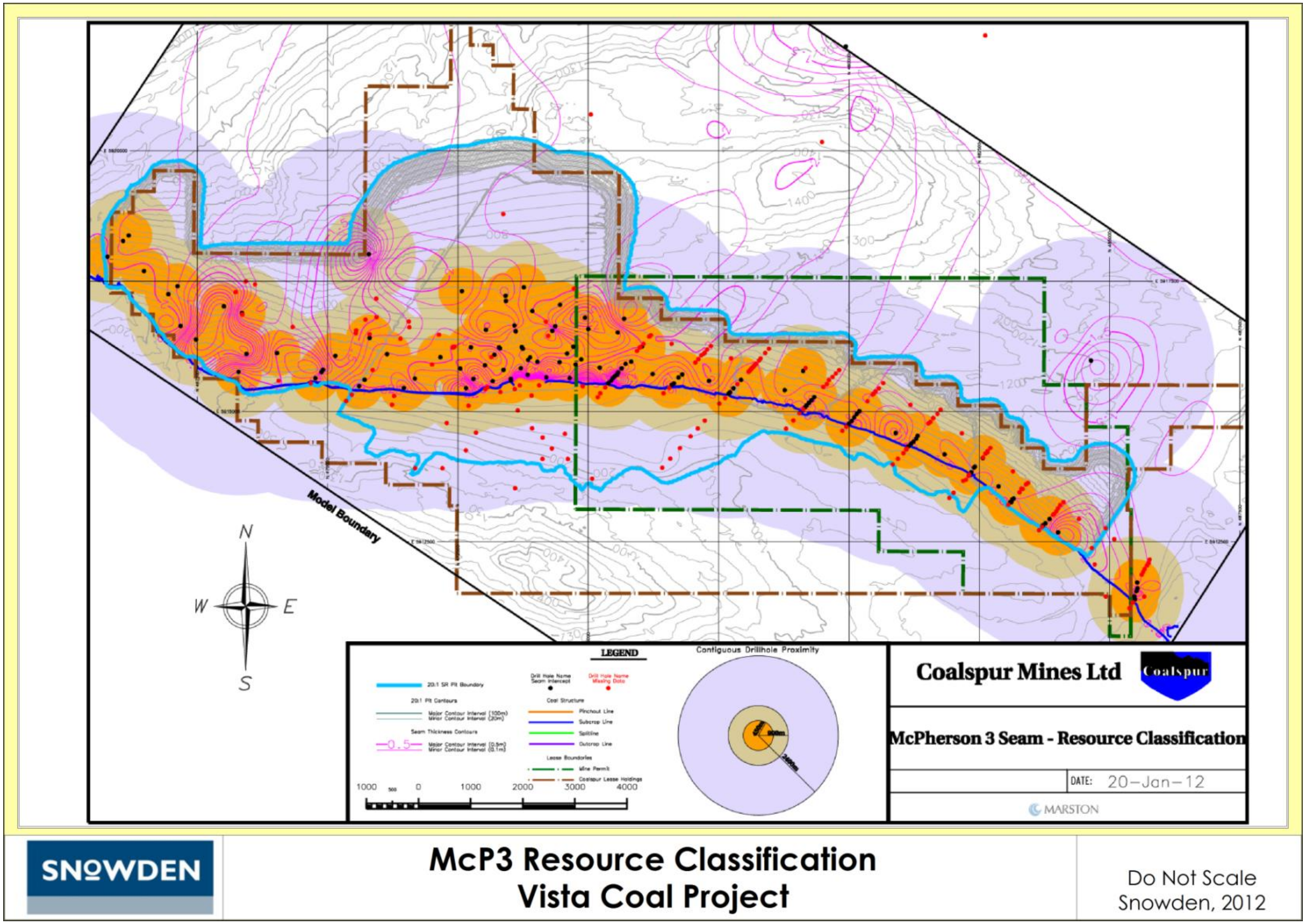
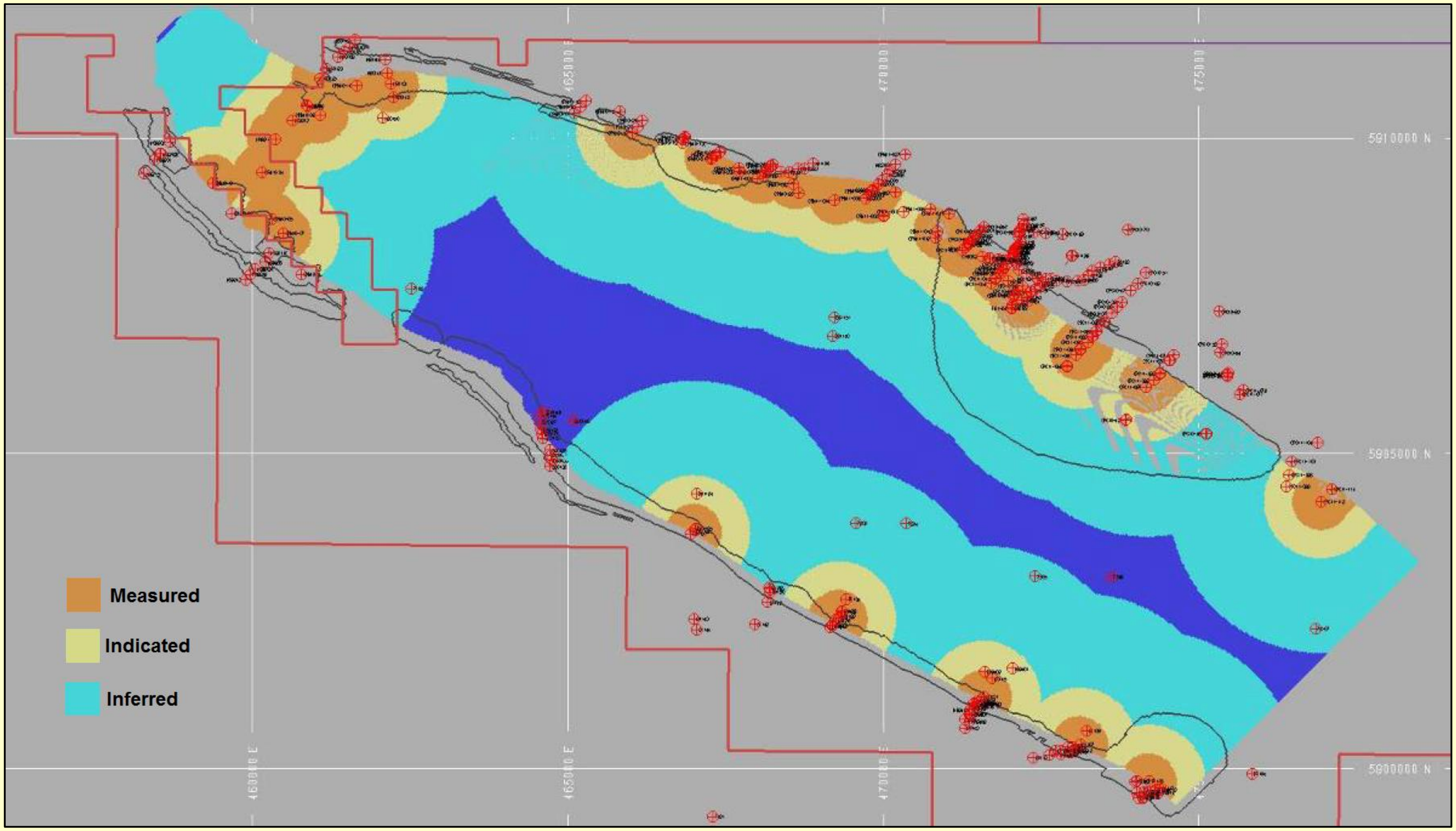
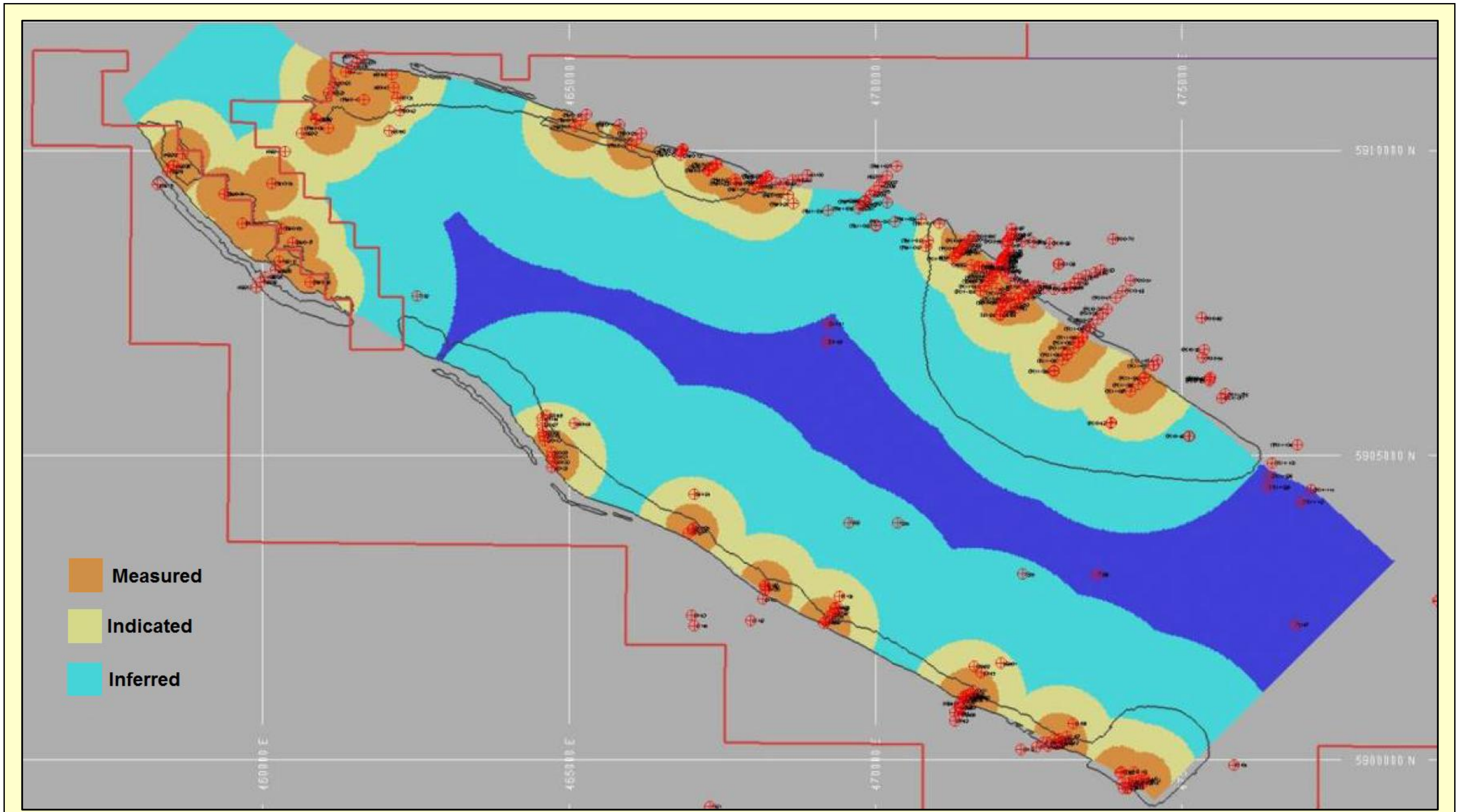


Figure 14-16 Coal Resource Classification for the Val d'Or Seam, Vista South Coal Property



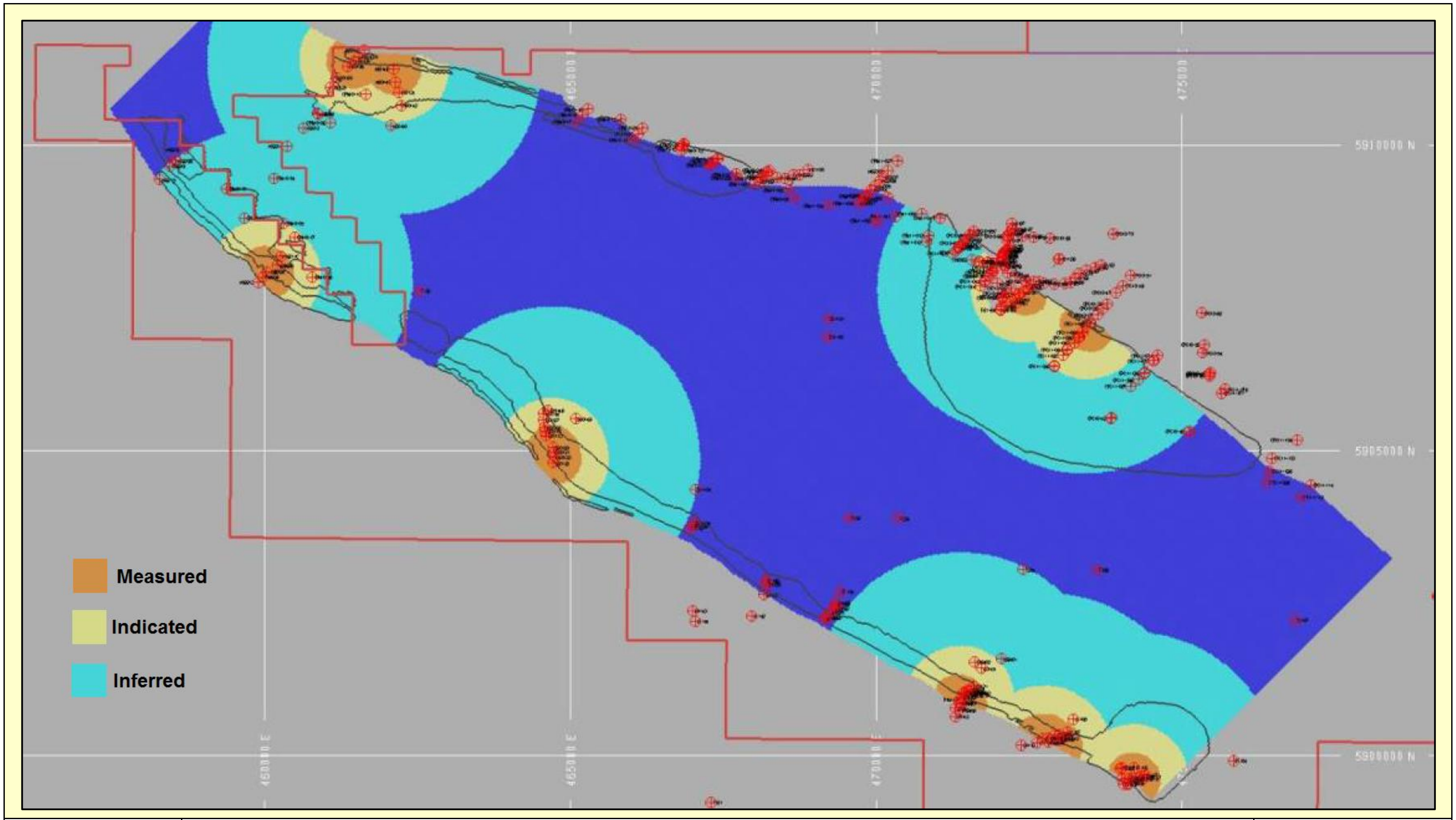
SNOWDEN	Val d'Or Resource Classification The Vista South Coal Property	Source: MMTS, 2012

Figure 14-17 Coal Resource Classification for the McPherson Seam, Vista South Coal Property



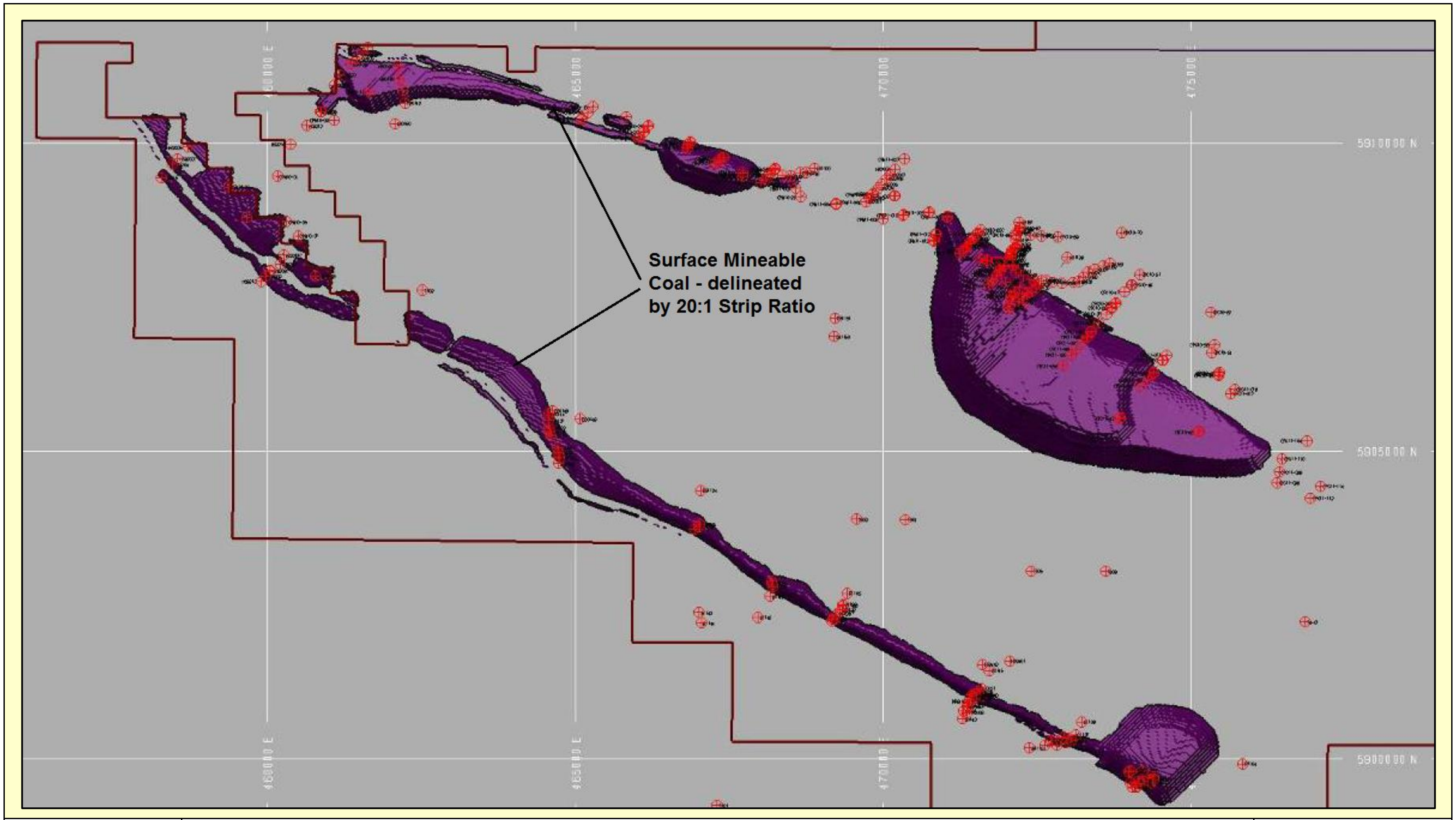
SNOWDEN	McPherson Resource Classification The Vista South Coal Property	Source: MMTS, 2012

Figure 14-18 Coal Resource Classification for the Mynheer Seam, Vista South Coal Property



SNOWDEN	Mynheer Resource Classification The Vista South Coal Property	Source: MMTS, 2012

Figure 14-19 Plan showing relative extent of surface mineable resources over Vista South



SNOWDEN

Surface Mineable Coal Areas
The Vista South Coal Property

Source:
MMTS, 2012

15 Mineral Reserve Estimates

Disclosure relating to the Mineral Reserve estimate is not included with respect to Vista Extension and Vista South as these are early stage projects and no detailed mine design work has been undertaken to this point in time.

15.1 Introduction

An NI41-103 Mineral Reserves Estimate was previously reported in "September 2012 - Coalspur Mines Limited: feasibility Study of the Vista Coal Project, Hinton Alberta", (Snowden). The report details the mining evaluation studies conducted to develop a detailed mine plan and financial analysis for the Vista project. Since September 2012, Coalspur have investigated 'terrace mining' methods using truck and shovel fleets instead of draglines. Furthermore, contract mining has been adopted as a preferred approach over owner operator. Coalspur has most recently (Q1 2014) been engaged in discussions and studies with Thiess Pty Ltd (mining contractor) to advance the terrace mining alternative. Coalspur will manage the mine operations and the Contractor will provide all mining services which includes appropriate earth moving equipment and ancillaries, labour, supervision and maintenance services. The principal impact to the mine plan through the use of a contractor is the elimination of a significant sum of start-up capital at the expense of higher operating costs. The following information on the mining approach has been sourced from the new Thiess work.

The current reserve estimate differs from previous estimates primarily due to changes in coal pricing.

The areas excluded from the Mineral Reserve are included in the Mineral Resource estimates.

The coal processing flowsheet has also been changed since the 2012 NI43-101 report and coal rejects will be dry stacked and blended with mine waste in the mine dumps thus eliminating the requirement for a tailings management facility.

15.2 General

In accordance with NI 43-101 at the time of compilation of the original January 2012, the definitions of “Mineral Resource” and “Mineral Reserve” as set forth in the updated CIM Definition Standards adopted November 27, 2010 (CIMDS) by the Canadian Institute of Mining, Metallurgy and Petroleum Council were adopted for estimating coal resources and reserves for the Vista project coal deposit.

A Mineral Reserve is defined as “… the economically mineable part of a Measured or Indicated Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified. A Mineral Reserve includes diluting materials and allowances for losses that may occur when the material is mined.”

A Mineral Reserve is subdivided into two classes, Proven and Probable with the level of confidence reducing with each class respectively. The CIMDS provides for a direct relationship between Indicated Mineral Resources and Probable Mineral Reserves, and between Measured Mineral Resources and Proven Mineral Reserves. Inferred Mineral Resources cannot be combined or reported with other categories.

Except as stated herein, there are no modifying factors exogenous to mining engineering considerations (i.e. competing interests, environmental concerns, socio-economic issues, legal issues, etc.) that would be of sufficient magnitude to warrant excluding reserve tonnage below design limitations or reducing reserve classification (confidence) levels from proven to probable or otherwise.

15.3 Estimated coal reserves

15.3.1 Criteria for determination of ROM coal

The estimation of ROM coal qualities was completed using the same modifying factors applied in the mine scheduling database to estimate ROM coal quantities. These factors are based on the blasting, coal cleaning and coal mining techniques and equipment selected as shown on Table 15-1.

Table 15-1 Minimum mining thicknesses

Item	Value
Minimum mineable coal thickness	0.5 m
Minimum removable parting thickness	0.3 m
Coal seam roof loss (except V2 Seam)	
Out-of-seam rock dilution (OSD) at seam floor	
OSD per removable parting	0.15 m
Coal loss per removable parting	0.15 m

Mining loss and dilution parameters are shown on Table 15-2.

Table 15-2 Seam loss and out of seam rock dilution factors

Seam	Coal Loss at Roof Thickness (m)	OSD at Floor Thickness (m)
V6U	0.15	0.10
V6L	0.15	0.10
V5U	0.15	0.05
V5L	0.15	0.10
V4	0.15	0.15
V3U	0.15	0.15
V3L	0.15	0.15
V2	0.10	0.15
V1	0.15	0.15
L3	0.15	0.15
L2	0.15	0.15
L1	0.15	0.15
P4	0.15	0.10
P3	0.15	0.10
P2	0.15	0.10
P1	0.15	0.10

Available proximate analyses for parting, roof and floor rock material were used to establish average quality values for all dilution materials for use in calculations of ROM quality impacts. The average dilution rock material qualities used for ROM quality calculations are shown on Table 15-3.

Table 15-3 Dilution parameters

Item	Value
equilibrium moisture content (Wt. %)	6%
in situ moisture content (Wt. %)	7%
specific gravity (g/cc)	2.10
ash content at in situ moisture (Wt. %)	76.7%
sulfur content at in situ moisture (Wt. %)	0.12%
calorific value at in situ moisture (kcal/kg)	867

15.3.2 Plant yield and clean coal quality model

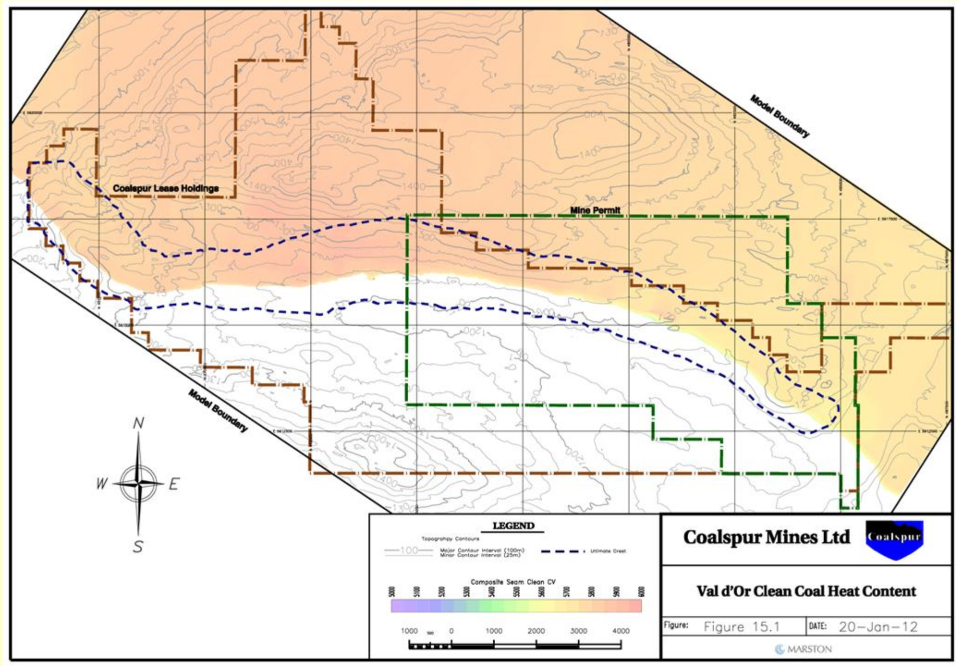
The proximate quality composite data was further utilized for the projection of clean coal qualities by seam through the use of plant simulation software. The in situ composites were modified by coal loss and waste dilution factors to estimate likely ROM coal qualities by seam in each drill hole. This approach starts with an estimate of the likely preparation plant coal feed quality by seam, with subsequent process simulation or analysis to estimate clean coal yield and qualities.

The in situ coal composite qualities were each adjusted for coal losses and rock dilution additions, resulting in projected diluted coal feed qualities to the proposed preparation plant facilities. The results of the preparation plant process simulation consisted of projected yield and clean coal quality values for the 1.50, 1.55, 1.60 and 1.65 gravity cut points. Clean coal quality parameters included in the model were yield, total moisture content, ash content and calorific value. These were available for all seams in drill holes that had proximate analysis data.

The projected seam yield and clean coal quality values were utilized in the same fashion as the proximate analyses for the preparation of grid-based surfaces. For the purposes of mine planning, clean coal results at all 4 cut points were available in the mine scheduling database. This provides flexibility during estimates of clean coal yield level and blended quality results during sequencing.

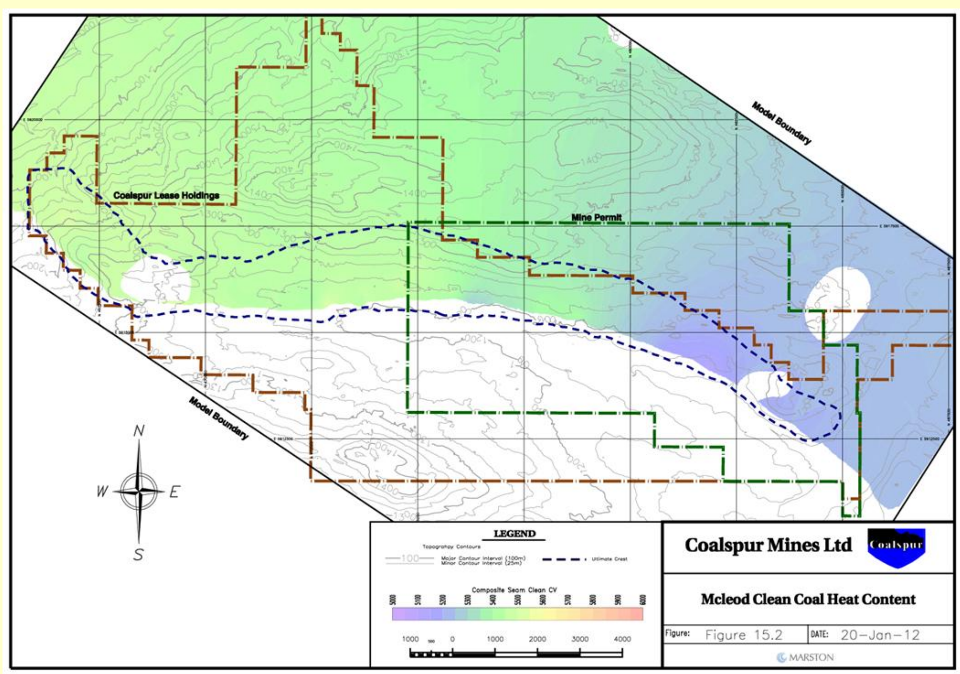
Mapping of the average calorific value of clean coal by seam group (Val d'Or, McLeod, and McPherson) illustrates a difference of approximately 200 kcal/kg from low to high values as locations vary from the southeast of the project area to the northwest. These trends, which are based on the 1.55 gravity cut point cut-off, are shown in Figure 15-1 to Figure 15-3 for each of the seam groups. The Val d'Or group clean coal calorific value ranges from 5,600 kcal/kg to 5,800 kcal/kg, the McLeod seam from 5,200 kcal/kg to 5,400 kcal/kg, and the McPherson seam from 5,500 kcal/kg to 5,700 kcal/kg. This impacts mine development sequencing as a result of the need to blend the seam group coals to achieve target product quality characteristics.

Figure 15-1 Val d'Or clean coal heat content



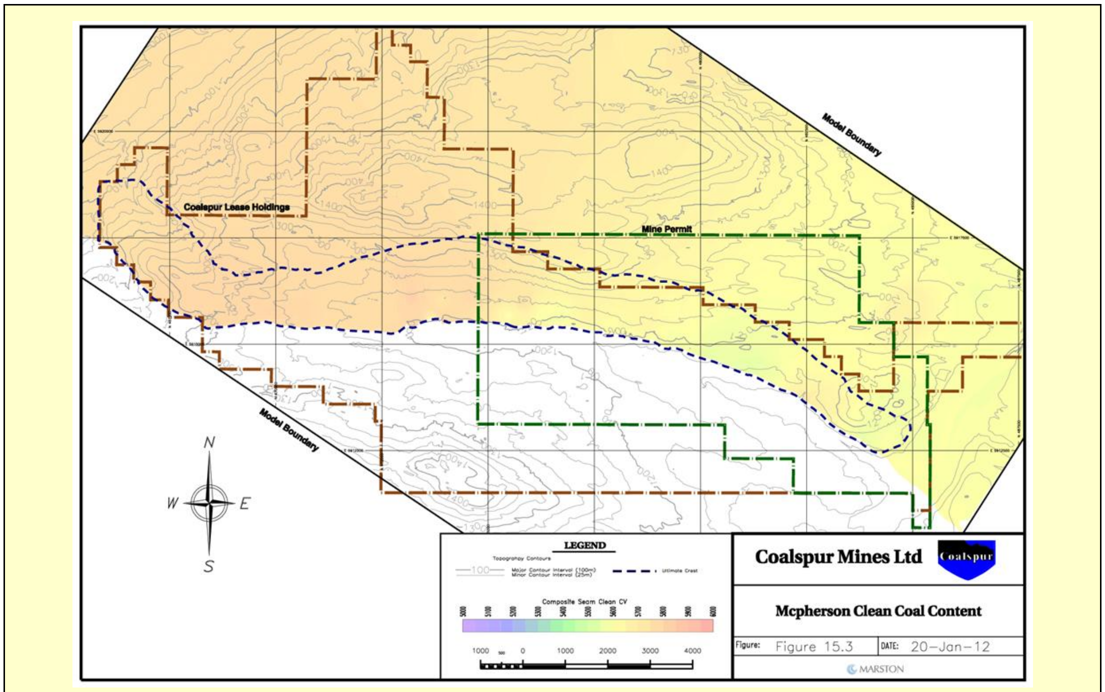
SNOWDEN	Calorific Value Vista Coal Project	Source: Snowden, 2012

Figure 15-2 McLeod seam clean coal heat content



SNOWDEN	Calorific Value Vista Coal Project	Source: Snowden, 2012

Figure 15-3 McPherson seam clean coal heat content



Calorific Value
Vista Coal Project

Source: Snowden, 2012

15.3.3 Vista Coal Project reserve estimates

The assessment of surface mineable coal reserves for the Vista project was based on pit designs which adequately represent the effects of highwall and end wall laybacks on the estimated mineable reserve.

Pit designs were optimized with a Lerchs-Grossman algorithm and the optimized pits were altered to account for intermediate pit walls, road access and inpit dump requirements. The pit boundary assessments were completed over a range of unit revenue values for product coal with unit costs of waste stripping and haulage, and coal mining and haulage. The stratigraphic, proximate and clean coal quality models formed the basis of volume estimates for a block model created over the extent of the project area. Using the modifying factors and plant performance yield and quality predictions, the blocks were populated with expected total revenue and cost levels.

The final pit configuration was based on unit pricing of C$80/t clean coal. The pit shell provided by this optimization was the basis for final pit designs, which included detailed highwall and endwall configurations as well as provision for pit access.

The design criteria for final pit configurations are shown on Table 15-4.

Table 15-4 Pit design criteria

Design item	Value
face angle – competent rock	65°
face angle – coal	80°
face angle – till	30°
overall highwall/endwall angle	45°
truck/shovel bench height	15 m
safety bench width	16 m every other bench
offset from McPherson Creek (crop limit)	100 m
offset from McLeod River escarpment (southeast limit)	100 m

coal recovery limited to the lease boundary

waste removal may occur outside of the lease boundary.

For the Vista coal project the total estimated Proven and Probable Mineral Reserves are 521.49 Mt yielding 303.8 Mt of product as shown in Table 15-5.

Table 15-5 Vista Coal Project Reserves

Seam	Coal Reserves (Mt)			Marketable Reserves (Mt)
	Proven	Probable	Total	Total
Val d'Or	204.1	13.0	217.1	119.1
McLeod	63.4	13.9	77.3	41.0
McPherson	131.7	23.2	154.9	101.2
West Extension[1]	*31.5*	*4.0*	*35.5*	*21.5*
East Extension[1]	*34.0*	*2.6*	*36.6*	*21.0*
Total	**464.7**	**56.7**	**521.4**	**303.8**

1 The West and East extensions were included in earlier feasibility studies and are economic but were omitted from this current study due to logistics related to the current planning exercise. They are correctly included in the Mineral Reserves.

The design pits containing these reserves are shown in Figure 15-4.

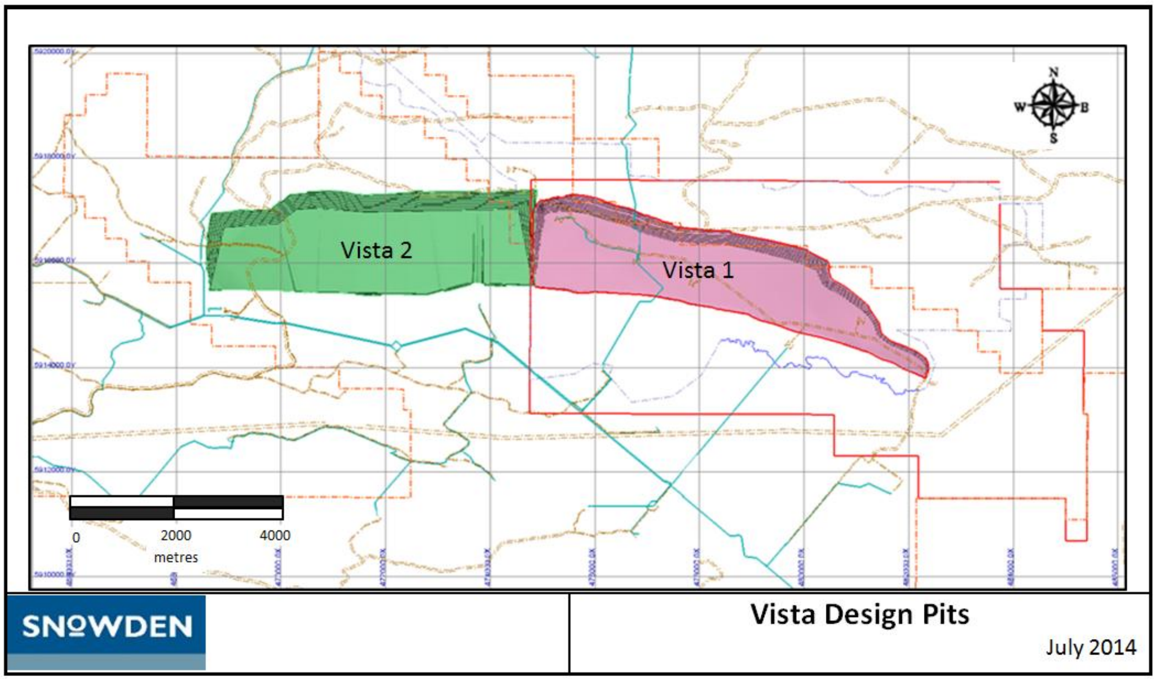
15.3.4 Discussion of potential impacts of relevant factors on Mineral Reserve estimate

The Mineral Reserves stated in this technical report are sensitive to changes in the input variables shown on Table 15-6. Also shown are an assessment of the degree to which the Mineral Reserves are sensitive and the probability of changes in the input variables.

Table 15-6 Impact on Mineral Reserves

Variable	Sensitivity	Probability of change
Coal price	High	High
Operating cost	Med High	Medium
Capital cost	Medium	Medium
Changes in modifying factors	Low	Low

Figure 15-4 Reserve Pits



16 Mining Methods

Disclosure relating to the mining methods is not included with respect to Vista Extension and Vista South as these are early stage projects and no detailed mine design work has been undertaken to this point in time.

A previous feasibility study on the Vista Coal Project was completed in 2012 and resulted in an NI43-101 Technical Report by Golder Associates dated September 2012. In this current report, contract mining is used instead of an owner's fleet and terrace mining using truck/shovel has replaced dragline strip mining. The mine plan and schedule relies on timely regulatory approvals for mine development. The project has received certain project approvals for the Phase 1 development and further approvals are awaited. Thereafter, approvals for the Phase 2 development will be sought.

Three items are important to bear in mind while reading this section:

- The mining study applies to the Vista Coal Project mine area only and has no application to either the Vista South or the Vista Extension resource areas.
- The mining methods and associated cost estimates were developed by Thiess which is under consideration by Coalspur to provide contract mining services. The Thiess study incorporated only the Vista Vista Coal Project Phase 1 area (Vista 1) and Snowden expanded the planning to incorporate the Vista Coal Project Phase 2 area (Vista 2).
- Snowden has reviewed the Thiess mine plan and cost estimates to ensure that the plan is feasible and that the costs are reasonable for this type of mining in this part of the world.

16.1 Geotechnical parameters

The geotechnical analysis and assumptions are based on the geological and geotechnical data from previous feasibility studies undertaken by Coalspur. The following points are noted:

- The factor of safety (FOS) for in-pit waste dumps on floor gradients from below 10 per cent up to greater than 25 per cent is acceptable along strike and down dip except under highly unlikely conditions of high groundwater level and seismic events.
- The majority of bedrock above and between coal seam sequences is sandstone, therefore roads and the dump floor in general will be trafficable (small bands of bentonite should be manageable in the mine design).
- On high dumps it is expected that particle size segregation will occur to a certain extent with coarse sandstone blocks rolling to the base of the dump and forming an under-drain.
- Two dominant joints are identified, therefore soft-wall batter is recommended for the advancing face.

- For the in-pit dump in the McPherson and McLeod pit (where the floor dip ranges from 8 per cent up to approximately 25 per cent at the far western end) the plan is to place mostly sandstone from the McLeod seam overburden in the front section of the dump (critical region for FOS analysis). This will be managed operationally. The till and McPherson seam overburden will be dumped on the low wall side of the initial dump lift. Note that the McPherson seam overburden is comprised of a mixture of mudstone/siltstone with sandstone bands and so this zone also offers some suitable material for this dump location. However, large amounts of mudstone should not be dumped in the critical zone on the front of the lower dump.
- The mining contractor, Thiess, developed a terrace mine plan for the purpose of estimating the contractor cost for the mine operation. During the geotechnical analysis for the stability of the advancing face (eastern side of the terrace) in that plan, it was determined that some of the jointing was potentially unfavourable for the planned alignment of the advancing faces. This unfavourable jointing resulted in Thiess deciding to adopt a soft wall approach in the advancing face. This provides safety and operational advantages by reducing the likelihood of material spilling from benches/blasts above onto the workings below.

16.1.1 Pit geotechnical design parameters

The mine plan is based on the pit geotechnical design parameters summarised in the Table 16-1.

Table 16-1 Geotechnical design parameters

Pit Design Parameter	Highwall	Endwall	Advancing Face
Overall slope angle – bedrock	45º	45º	45º
Overall highwall/endwall angle – till	27º	27º	27º
Inter-bench batter angle	65º	65º	65º
Bench height	30m	30m	30m
Bench berm width	16m	16m	16m
Presplit	Yes	Yes	No

The dump geotechnical parameters, dump footprints and dump shells parameters are summarised in Table 16-2.

Table 16-2 Dump design parameters

Dump Design Parameter	North Dump	South Dump	In-Pit Dump
Overall active dump slope, external dumps	27º	27º	27º
Final overall reclaimed slope, external dumps	2:1	2:1	2:1
Min. offset distance – pit crest to dump	100m	100m	
Min. offset distance – dump toes to McPherson Creek	100m	100m	
Min. distance from mining area	5m	5m	5m
Swell factor for waste rock	27%	27%	27%

16.1.2 Geotechnical Implications for Mining

Based on the stratigraphy data, bentonite may occur in the mudstone approximately 2 m below the V1 floor. In order to manage the potential stability issue, especially the ramp access on V1 floor, ramps in the advancing face are designed about 2m above the V1 floor.

The advancing faces are designed at an overall 25 degree batter from the floor to the topography. The 25 degree batter allows for a ramp in the advancing face and for a 16 m catch berm. All face batters are 45 degrees.

The same approach is also used to deal with the steep section of the McPherson Seam floor where the overall batter angle for the advancing face is also 25 degrees.

16.2 Modifying factors for mine design optimization

16.2.1 Coal Loss and Dilution

Reserves are based on the loss and dilution parameters and tonnage factors shown on Table 16-3.

Table 16-3 Seam loss and dilution factors

Seam	Coal Loss at Roof (m)	Coal dilution at floor (m)	Tonnage factors
V6U	0.15	0.10	1.50
V6L	0.15	0.10	1.48
V5U	0.15	0.05	1.54
V5L	0.15	0.10	1.46
V4	0.15	0.15	1.54
V3U	0.15	0.15	1.50
V3L	0.15	0.15	1.60
V2	0.15	0.15	1.58
V1	0.15	0.15	1.53
L3	0.15	0.15	1.68
L2	0.15	0.15	1.68
L1	0.15	0.15	1.68
P4	0.15	0.10	1.56
P3	0.15	0.10	1.49
P2	0.15	0.10	1.50
P1	0.15	0.10	1.53

16.2.2 Minimum Mineable Thickness

Previous mining studies contemplated a minimum mining thickness of 0.5 m which is slightly lower than the recommended coal thickness as stated in GSC Paper 88-21 of 0.6 m. Given the seam dips and continuity, it is considered that this minimum mineable seam thickness is appropriate for the Vista project. A minimum separable parting assumption of 0.30 m was assumed in the mine plan.

16.2.3 Coal Quality

Coal quality data was extracted from the resource block model and used for creating a quality grid model. The gridded models were used in the mine planning work. A comparison of the gridded model to the original block model indicates an agreement accuracy of ±1%.

16.2.4 Material Types and Density

The reserves and productivity rates are based on the maximum bulk, *in situ*, wet density of materials shown on Table 16-4.

Table 16-4 Material densities

Material type	Density
Till	2.20 t/m^3
Overburden	2.35 t/m^3
Interburden, Parting and Wedges	2.35 t/m^3
ROM Coal	1.57 t/m^3
Rejects	1.80 t/m^3

16.3 Pit Optimization

For the purposes of this technical report, Snowden has reviewed and concurs with the Lerchs-Grossman incremental economic pit limit analysis using Whittle software. Table 16-5 summarizes the unit costs used for the analysis. Several optimized pits were developed by changing the expected coal prices.

Table 16-5 Cost parameters for mine optimization

Item	Units	Cost
Truck/Shovel Mining	$/BCM	$ 2.76
Rolling capital charge	$/BCM	$ 0.20
Total Truck/ Shovel Mining	$/BCM	$ 2.96
Coal Mining	$/RMT	$ 2.66
Rolling capital charge	$/RMT	$ 0.15
Total Coal Mining	$/RMT	$ 2.81
Coal Processing	$/CMT	$ 3.99
G&A	$/CMT	$ 0.62
Ex-Mine (rail & port)	$/CMT	$ 26.00
Revenue Assumptions	$/CMT	Variable

The reported ROM tonnes for each seam were divided by the reported in-situ volumes in order to calculate a tonnage factor. The Whittle software applied this factor to the in-situ coal volumes in the block model in order to calculate ROM tonnes. Table 16-6 contains the calculated tonnage factors for the various seams.

Table 16-6 Tonnage Factors

Seam	Horizon	Tonnage Factor
Val d'Or	V6U	1.50
	V6L	1.48
	V5U	1.54
	V5L	1.46
	V4	1.54
	V3U	1.50
	V3L	1.60
	V2	1.58
	V1	1.53
McLeod	L	1.68
McPherson	P4	1.56
	P3	1.49
	P2	1.50
	P1	1.53

Weighted average plant yields by seam group were derived in order to generate clean tonnes. These and other design assumptions are shown on Table 16-7.

Table 16-7 Pit design parameters

Item	Value
Val d'Or seam yield	54.7%
McLeod seam yield	34.5%
McPherson seam yield	55.0%
Exchange rate	Par
Overall wall slope	45°
Base case coal price	$79.75 ($80)

The results of the pit finding exercise are contained in Table 16-8. Shell 11 corresponds to the base case coal price.

Table 16-8 Whittle LG Pit Results

LG Pit Shell	Price ($/tonne)	Total Waste (BCM)	ROM Coal (t)	Clean Coal (t)	ROM Strip Ratio	Clean Strip Ratio
1	$43.50	10,914.970	7,823,303	4,280,735	1.4	2.5
2	$47.13	63,184,739	35,846,289	19,598,347	1.8	3.2
3	$50.75	144,911,904	66,148,195	36,162,426	2.2	4.0
4	$54.38	245,109,213	94,696,430	51,748,879	2.6	4.7
5	$58.00	359,391,118	120,795,027	65,987,490	3.0	5.4
6	$61.63	532,049,704	164,213,591	87,289,054	3.2	6.1
7	$65.25	1,109,558,219	271,295,238	140,222,683	4.1	7.9
8	$68.88	1,576,352,694	349,303,786	180,240,152	4.5	8.7
9	$72.50	2,097,716,337	428,960,077	220,294,088	4.9	9.5
10	$76.13	2,419,250.777	473,757,360	243,303,124	5.1	9.9
11	$79.75	2,886,859,468	534,401,073	274,336,864	5.4	10.5
12	$83.38	3,576,985,303	621,301,642	317,982,114	5.8	11.2
13	$87.00	4,228,262,532	691,838,373	354,316,508	6.1	11.9
14	$90.63	4,888,866,872	755,587,134	387,187,721	6.5	12.6
15	$94.25	5,749,104,916	826,785,736	423,924,838	7.0	13.6
16	$97.88	6,395,918,210	875,654,431	449,112,303	7.3	14.2
17	$101.50	7,187,181,559	931,475,837	477,931,648	7.7	15.0
18	$105.13	7,990,005,176	982,959,913	504,511,913	8.1	15.8
19	$108.75	8,770,198,970	1,026,285,995	526,912,543	8.5	16.6
20	$112.38	9,689,705,609	1,075,128,344	552,188,910	9.0	17.5
21	$116.00	10,391,309,408	1,111,951,164	571,233,313	9.3	18.2
22	$119.63	11,471,569,860	1,168,875,112	600,667,818	9.8	19.1
23	$123.25	14,554,708,228	1,350,731,711	694,386,851	10.8	21.0
24	$126.88	16,486,059,195	1,447,275,946	744,383,966	11.4	22.1

Figure 16-1 charts the pit shell volumes against coal price indicating that clean coal tonnage increases almost linearly with coal price.

Figure 16-1 Cumulative clean tonnes vs. selling price

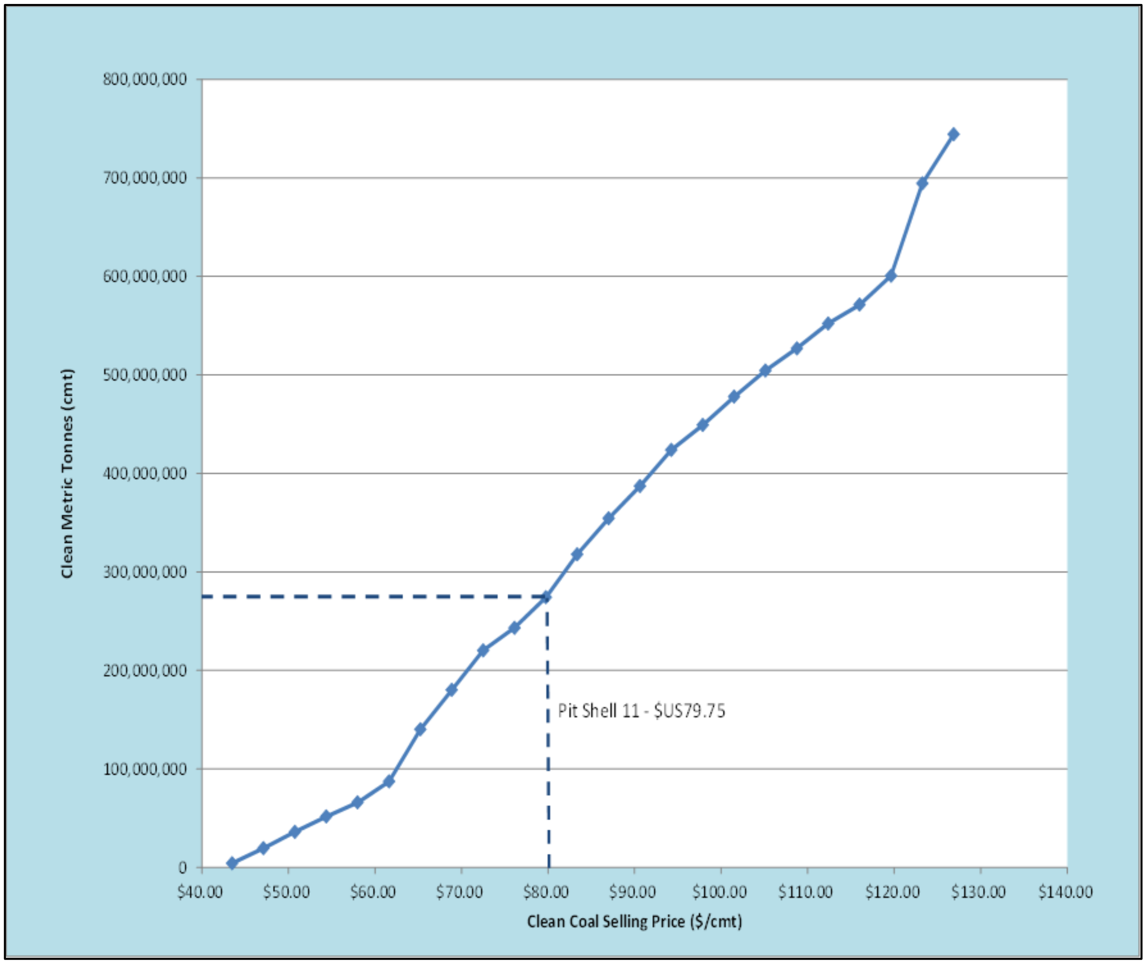


Figure 16-2 to Figure 16-3 contain plan and sectional views of the Whittle pits. Also contained in the drawings is the location of the ultimate pit from the pre-feasibility study (dashed cyan line) which closely aligns with the chosen Shell 11.

Figure 16-2 Pit shell plan view

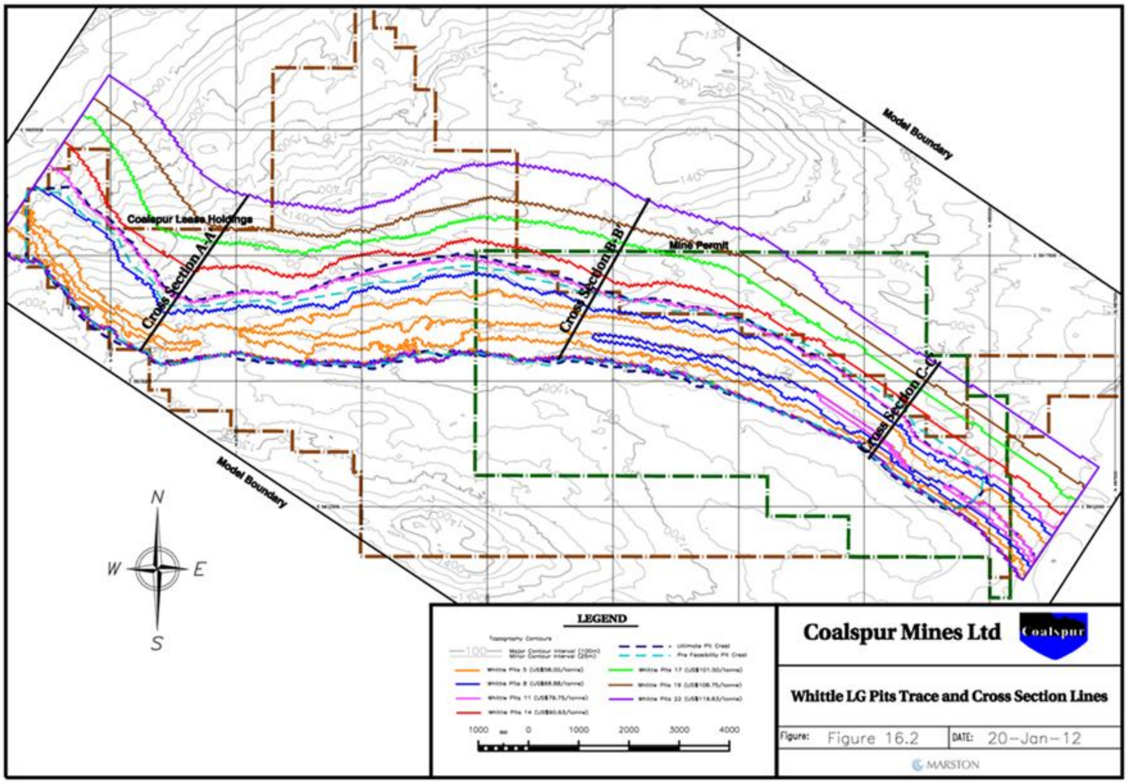
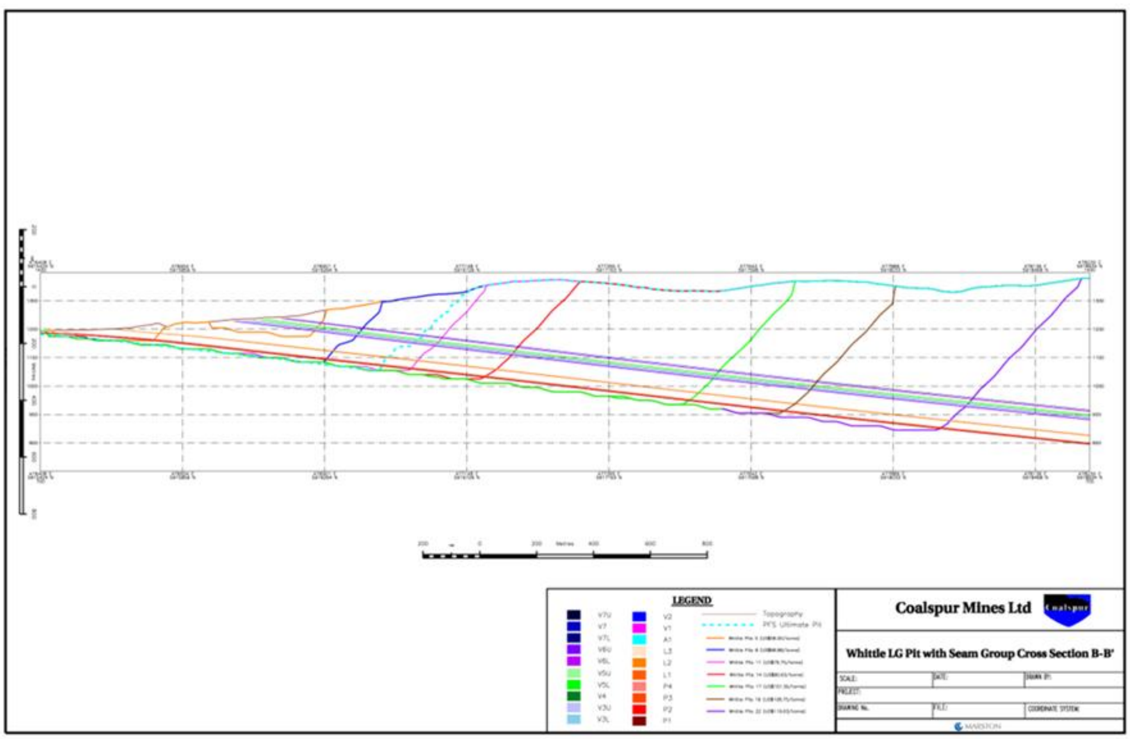
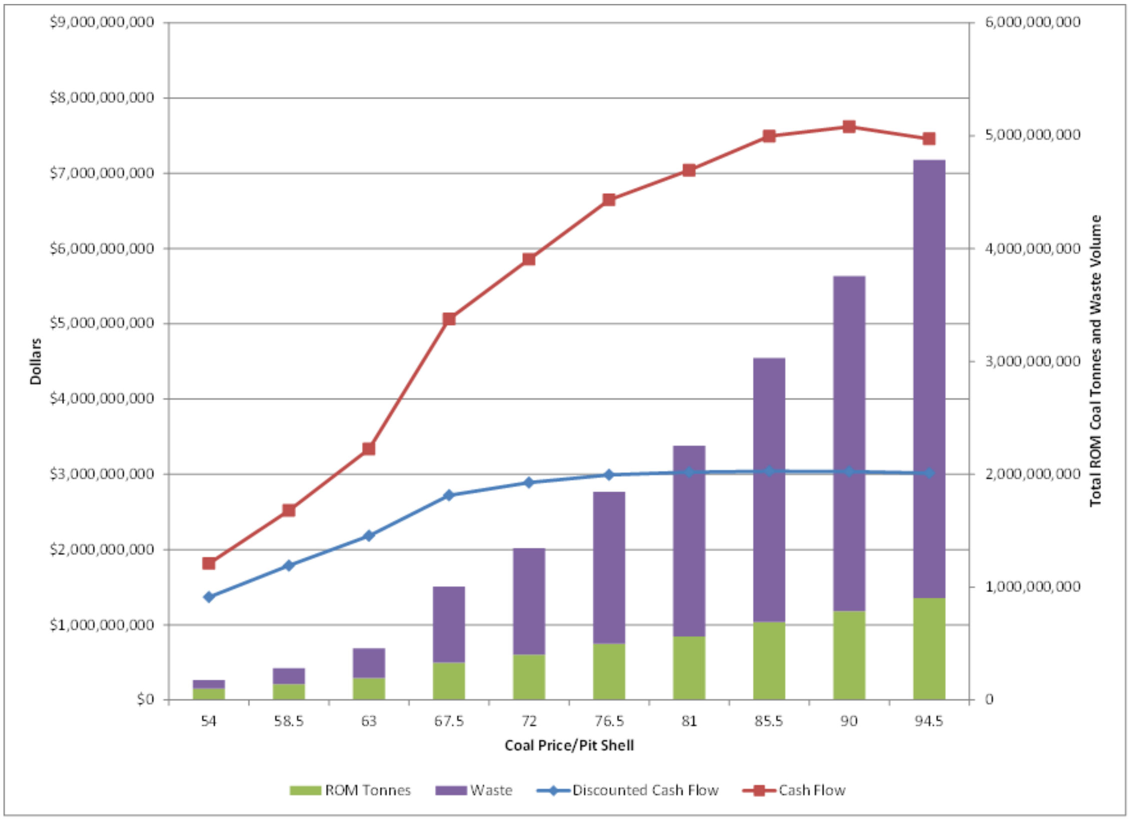


Figure 16-3 Pit shell section B – B'



A discounted cash flow analysis using a discount rate of 8% was undertaken in order to assist with the selection of the ultimate pit shell for use in the feasibility study. The analysis compared the discounted cash flows from the pits that were generated from pricing levels of $70, $80, $90 and $100. The resultant graph for the pit generated at the $90 pricing level for a 10 Mtpa production rate has been included in Figure 16-4. During the time of the analysis Coalspur believed that a conservative long term selling price of $90 was a reasonable assumption. A review of the results revealed that the discounted cash flows began to flatten off between the $76.50 and $81.00 pit shells. The decision was made to use the $80 pit shell as the basis for the ultimate pit.

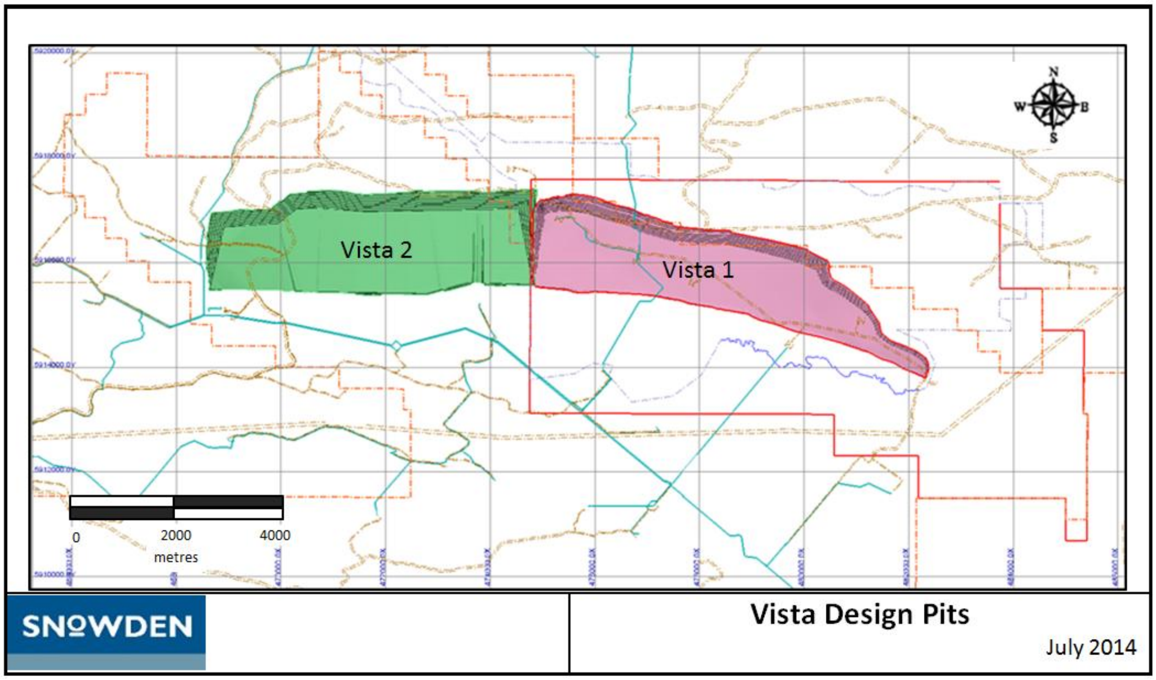
Figure 16-4 DCF optimal pit for a 10 Mt/a product rate with $90 coal



16.4 Ultimate Pit Design

An ultimate pit was designed based on the results of the pit finding exercise using the previously mentioned design parameters. A number of iterations have been made but the current scenario consists of two separate pits known as Vista 1 and Vista 2 (see Figure 16-5). These pits conform to the $80 pit optimisation shell with additional constraints. The principal constraint is the Mine Permit boundary (red line). Vista 1 pit remains entirely within this boundary and is ended on the east by McPherson Creek. The Vista 2 pit is designed as a stand-alone pit immediately to the west of Vista 1 pit but it is entirely outside of the current Mine Permit boundary. It is bounded on the west by a gas pipeline right of way and on the east by a narrow pillar of ground which is left to provide an access corridor to the process plant and other infrastructure.

Figure 16-5 Vista Ultimate Pit Designs



A summary of the ultimate pit volumes is given in Table 16-9.

Table 16-9 Ultimate Pit Statistics

Seam	Coal Reserves[1] (ROM tonnes)			Marketable Coal
	Proven	**Probable**	**Total**	**Total**
Val d'Or	204,090,000	13,027,000	217,117,000	119,115,000
McLeod	63,447,000	13,927,000	77,374,000	40,984,000
McPherson	131,676,000	23,237,000	154,913,000	101,157,000
Total	399,213,000	50,191,000	449,404,000	261,256,000
Waste (bcm)			2,042,392,000	

The V7 Upper and V7 Lower seams were excluded from the mine plan due to limited quality sampling. The Arbour seam was excluded due to its low tonnage and that almost half the samples had raw % ash values >50%. The Silkstone seams were excluded due to the decision to leave the McPherson Creek intact at this time.

16.5 Mine Schedule

16.5.1 Preproduction Requirements

Major applications, permits and approvals required to begin operations and commence first production of coal are discussed in Section 20. The mine operations pre-production phase will consist of building the coal wash plant, coal handling facilities, mine infrastructure (access, power, water, communications, water management and drainage, etc.) and installation of the mining contractor facilities and equipment. Additionally there will be the requirement to develop suitable access to the initial working areas; providing power to the property; and miscellaneous mine site development such as timber salvage, topsoil salvage, overburden stripping and drilling/blasting for the initial mining area.

Tourmaline Oil Corp has gas wells and pipelines in the mine area and Coalspur has made arrangements to work around these obstructions. The details are not known to Snowden but it is understood that the wells and pipelines cause no material impact to the project feasibility.

16.5.2 Mine Development Phases

The Vista Mine will be developed in two principal phase pits known as Vista 1 and Vista 2. Vista 1 is further separated into an initial 5 year development scheme and a second final pushback stage. Vista 2 is scheduled to come on stream in 2021 and effectively double the production rate of the project from 6 Mt/a product to 12 Mt/a.

Further mine expansions to the east of Vista 1 and west of Vista 2 are possible but these areas are not included in the current Mineral Reserves of mine production schedule.

In general, the upper Val d'Or (V) seam is exposed and mined in an upper mine pass and then the lower two seams McLeod (L) and McPherson (P) exposed and mined in a second pass. A box cut is established at one end of the pit down dip to the ultimate pit limit. This slot is then expanded along strike in blocks of roughly 300 m long.

Waste materials including plant rejects will be stored in waste dumps located both externally and internally of the mine pits. Initially, dumping will mostly be ex-pit but as room becomes available in the excavation, dumping will progressively expand in-pit. In-pit dumping not only allows progressive rehabilitation of the disturbed areas back closer to the original landscape; it also reduces haul costs and thus enhances the economics of the operation.

16.6 Mine Schedule

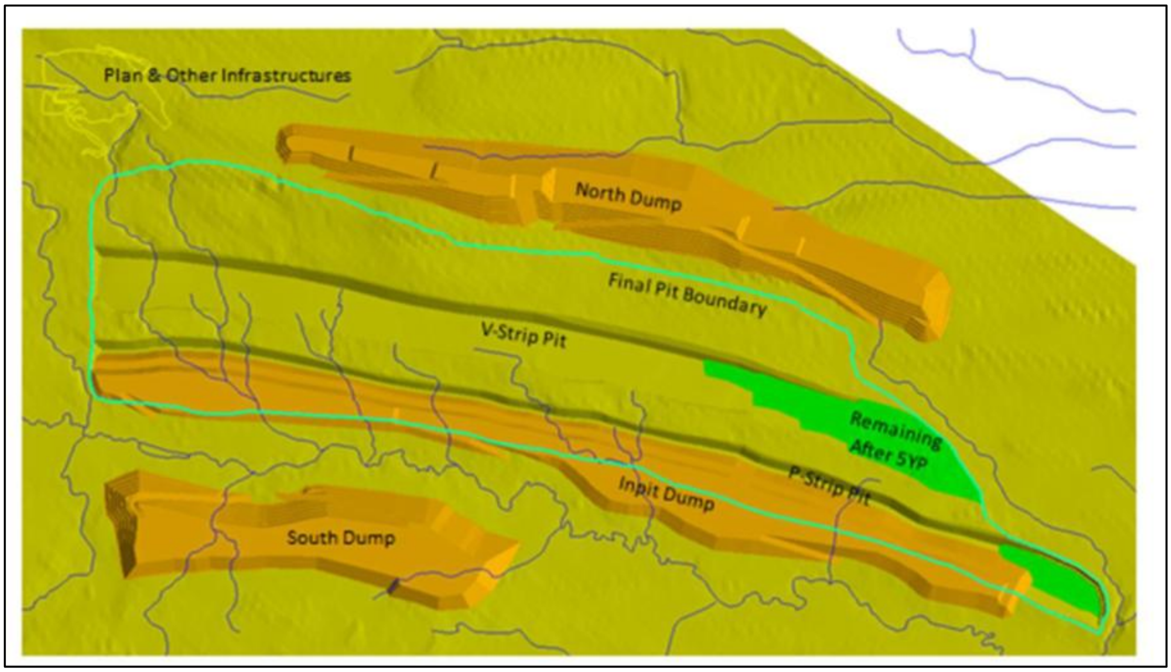
16.6.1 Vista 1

The production target is to mine approximately 11 Mt of ROM coal per annum utilising the full capacity of the coal processing plant. All coal is washed to produce two types of products, namely CV5800 and CV5550. The maximum yearly product for CV5800 is 2 Mtpa, so the remaining product will be CV5550. Note that approximately 65 per cent of the Val d'Or seam is of sufficient quality to produce a CV5800 product at a yield of approximately 58.4 per cent. Therefore, 5.3 Mt of Val d'Or seam coal is required to be mined annually with the remaining coal processing plant capacity applied to the McLeod and McPherson seam coal (approximately 5.7 Mtpa). Other general scheduling considerations include:

- mining and blasting methodology (strip/terrace mining with though seam blasting)
- plant configuration (type, mixture of excavators)
- excavator commencement and end times
- productivities, availabilities and utilisation
- access and mining progress
- excavator density
- fleets associated with free-digging materials

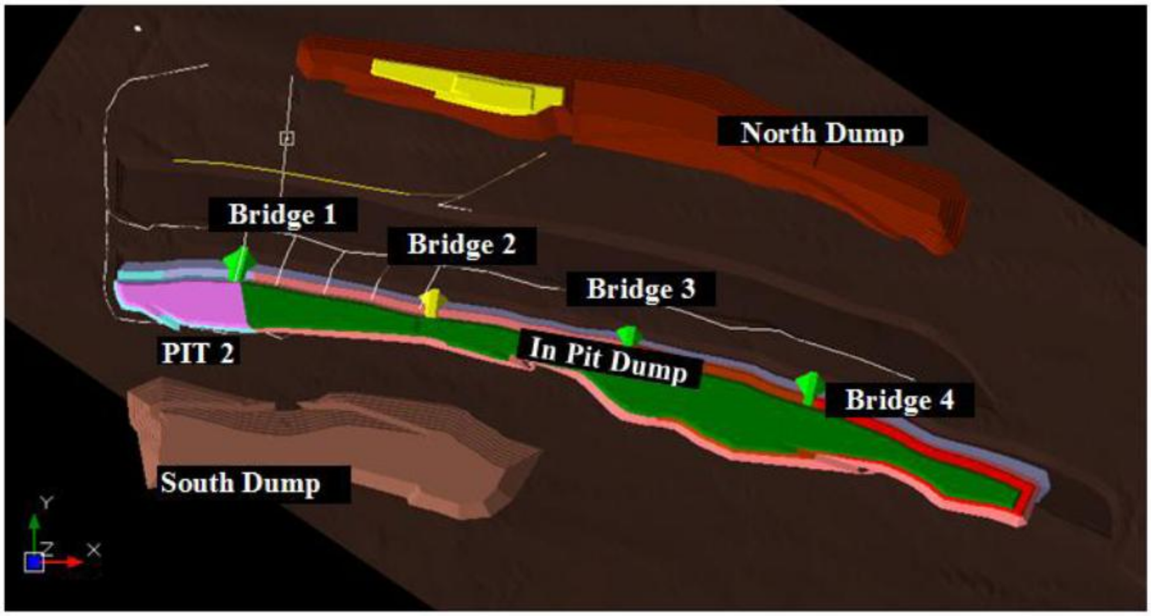
The 5 Year Mine Plan Pit is designed inside the 4:1 ROM coal strip ratio contour. The Val d'Or seam and the McLeod and McPherson seams hybrid strip/terrace approach is based on developing both pits at the sub-crop along strike in parallel. This enables the opening of the up-dip McPherson seam floor and hence provides early in-pit dumping. This results in short hauls in the first five years.

Figure 16-6 Five year pit and dump layout



Waste dumping occurs strategically to optimize haulage costs in ex-pit dumps and then as soon as practical in-pit. Access to the south dump across the creek is via a single crossing. The in-pit dump receives material from the Val d'Or stripping (upper mine) as well as the lower McLeod and McPherson seams. The upper waste crosses the gap and high wall of the lower mine via fill viaducts or 'bridges' as shown in Figure 16-7.

Figure 16-7 Five year plan dump location



The LOM plan following the 5 year stage is a second pass taking the pit down to the final pit limits from the 4:1 strip ratio first pass mining stage.

Sequencing the mine development in the LOM plan is based upon a combination of achieving the required coal blend targets for as long as possible (48% minimum Val d'Or seam required to produce 2 Mtpa CV5800 product) while also opening the McPherson seam pit floor for in-pit dumping as early as possible, leading to haul distance optimisation. It is not possible to sustain the target Val d'Or seam to McLeod/McPherson seam ratio over the LOM as the overall ratio is approximately 44% Val d'Or seam. The McLeod and McPherson seam waste and coal is split into up-dip and down-dip terraces to optimise haulage.

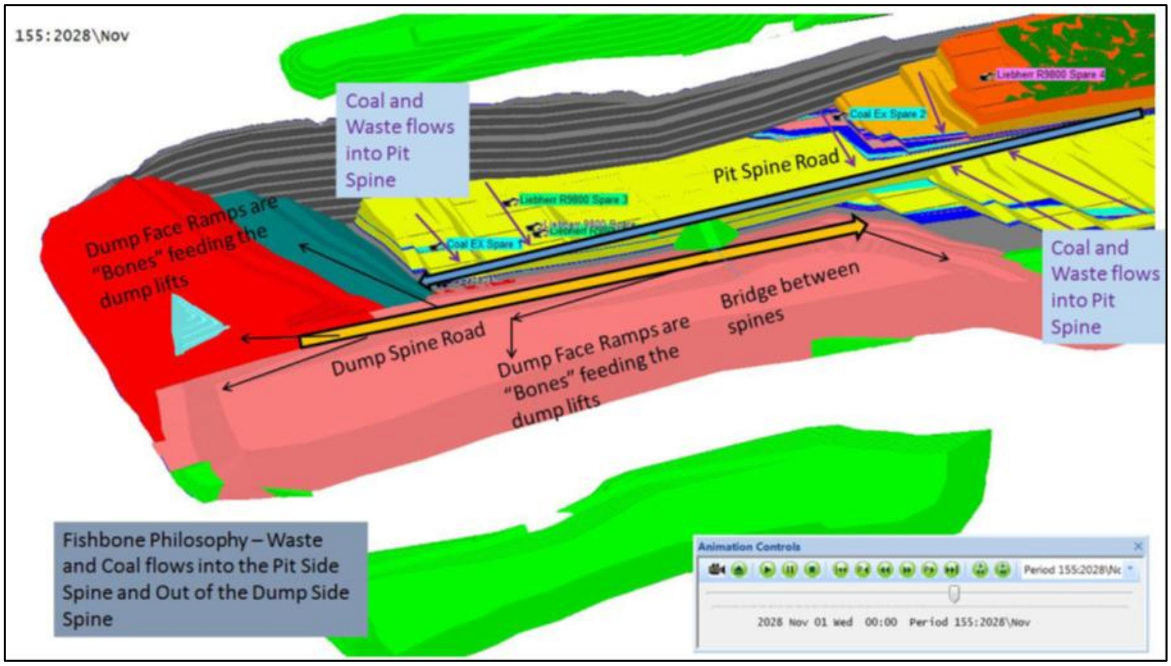
The LOM plan requires the introduction of 2 x extra 9800 fleets (total 4 Ultra-Class fleets) at the start of Year 6 to develop this next stage of the plan. Thin parting and coal is still mined by 1 x 9400 and 1 x 9250 fleets (as per the 5 Year Plan). Through seam blasting is employed throughout the mine plan.

While the initial terraces are being established in the western end of the pit (including the stripping of the Val D'Or seam overburden) the McLeod and McPherson seams are extracted from the up-dip zone adjacent to the western end wall. During the initial months of Year 6, there is not enough McLeod and McPherson seams available to maintain target ratios and still achieve monthly coal targets resulting in more Val D'Or seam being mined during this period. The up-dip McPherson seam floor is opened up as much as possible to enable maximisation of in pit dumping and hence reduced hauls as early as possible

Various LOM plans for years 6 – 20 were created in order to determine the most cost effective sequence that minimised haul distances and elevations.

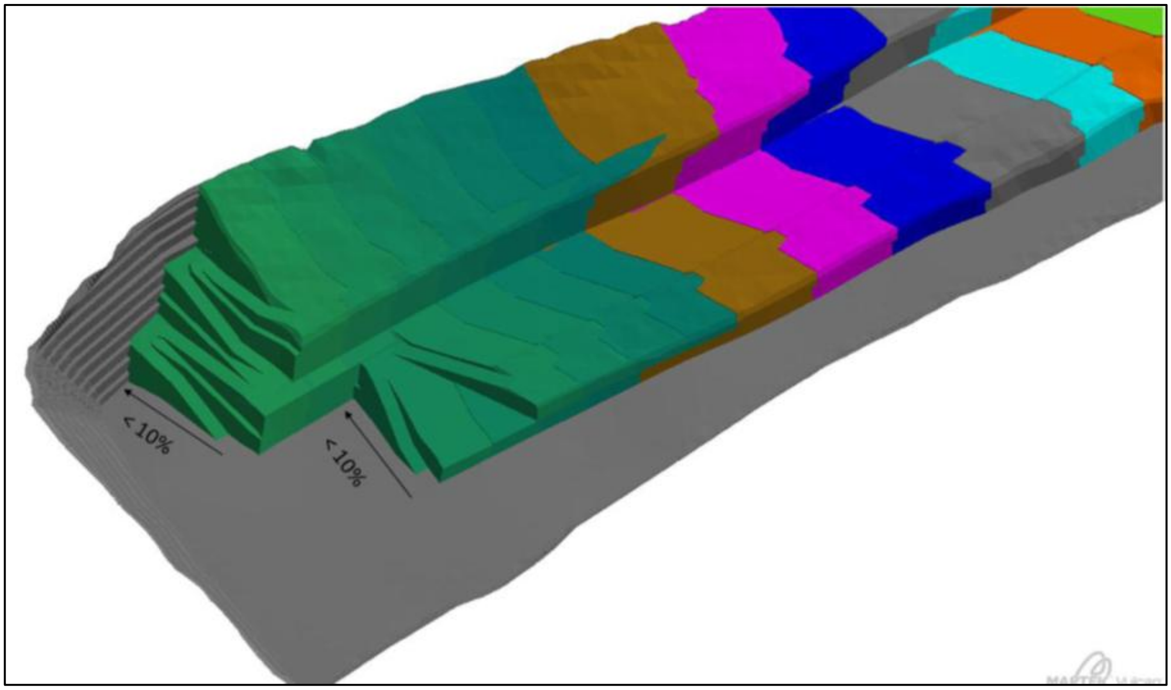
The most effective sequence for the LOM plan utilises an innovative fish bone layout which maintains two spine roads running parallel along the strike, connecting the mining face and the dumping faces. The spine roads enable the movement of material from the up/down dip mining face to move along short hauls with reduced changes in elevation. Figure 48 shows the fish bone mining concept. The waste and coal flows into the pit spine road across a series of bridges and out of the dump spine road to the dump or the ROM pad.

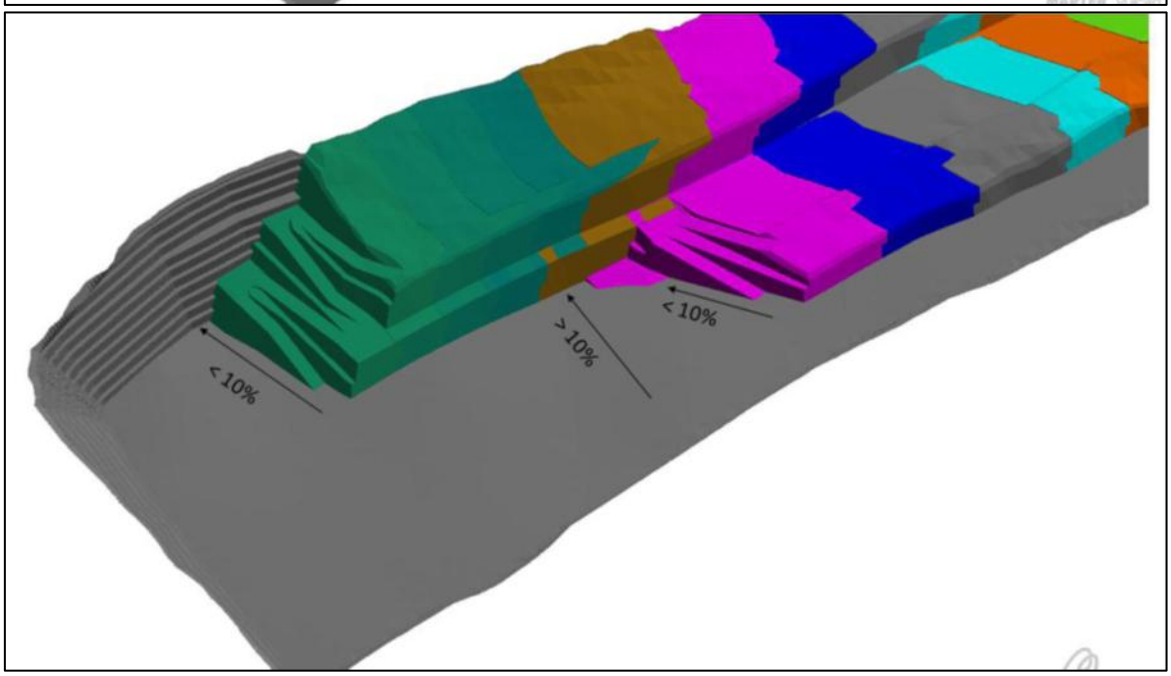
Figure 16-8 "Fish-Bone" mining concept



The LOM plan utilizes mining terraces to create up-dip and down-dip mining areas. "Up" dip refers to mining the McLeod and McPherson seams above the central "spine" while "down" dip refers to mining the seams below (down dip of) the spine. The width of the strips varies to accommodate a volumetric balance and the timing of floor release for in-pit dumping. Figure 16-9 shows the LOM pit divided into strips with different widths. The mining terraces are also designed to align with the 10 per cent dip of the pit floor. The terraces change orientation to account for the change in pit floor slope and the change in apparent angle. This enables achievable haul roads on the pit floor. The mining sequence for the LOM plan focuses on moving waste material from and to similar elevations using short hauls.

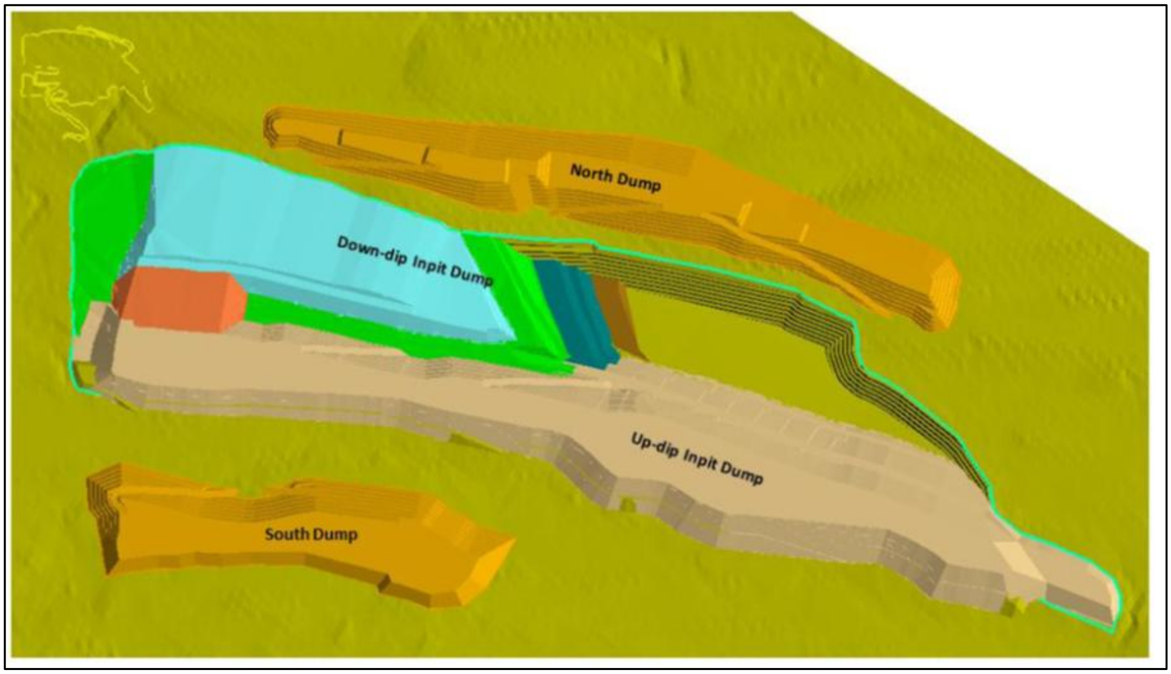
Figure 16-9 Face orientation of 'strips' at 10 per cent pit floor dip





The advancing face of the McLeod and McPherson seam terrace will open up the pit floor in 2023 for the commencement of in-pit dumping in the up-dip dump. Before this date, all waste material will be hauled to the North and South out of pit dumps. The South dump will be used until the beginning of March 2023, but total capacity is not reached. In Q3 2025 the Val D'Or seam terrace floor will be exposed allowing for construction of the down-dip in-pit dump. Material will be initially placed on the pit floor from the V seam terrace face ramp. Once the appropriate elevation is reached, the down-dip in-pit dump will be constructed off the dump spine road. The North dump will be utilised until 2028, after which all waste material will be moved to the in-pit dumps. Throughout the LOM Plan, plant rejects will be blended with the waste material and placed in the in-pit and external dumps. The final Vista 1 pit situation with dumps is shown in Figure 16-10.

Figure 16-10 LOM final position with dump locations



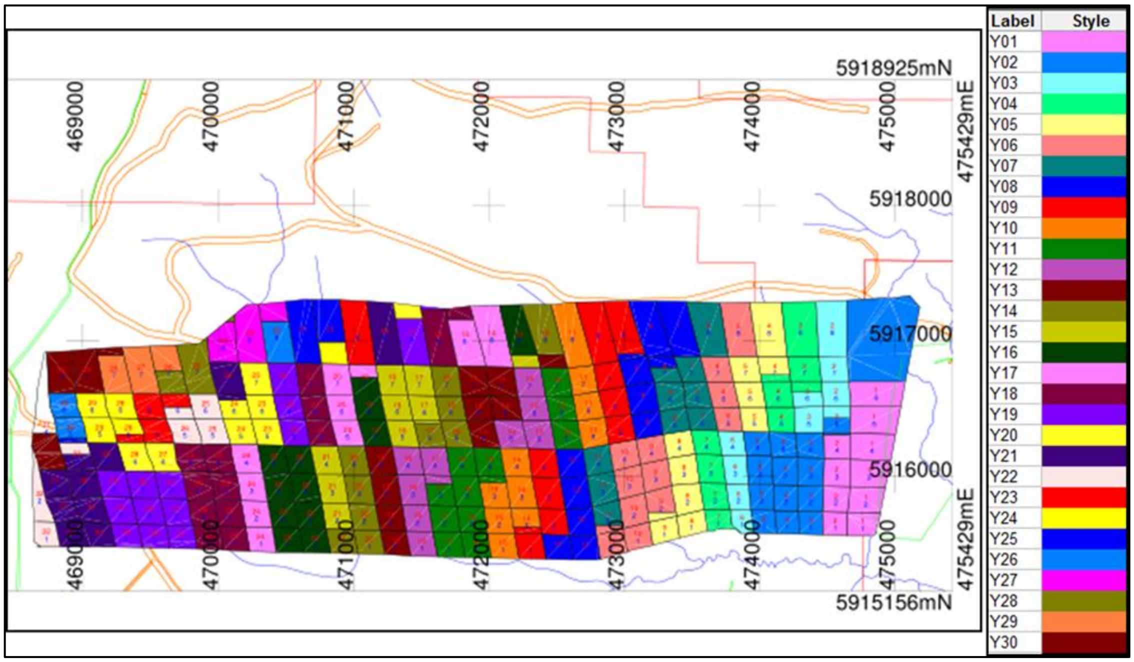
The LOM production Table 16-10 details the quantities by material and coal type including coal product. Note that the schedule is run to achieve the minimum material movement at the required ratio of coal types balanced on a monthly basis. The delivery of raw coal by seam is shown graphically on Figure 16-12.

16.6.2 Vista 2

The Vista 2 pit has been designed with less detail than the Vista 1 pit. The mining method and approach for Vista 2 is the same as for the Vista 1 pit. Mining will commence at the eastern end of the pit next to Vista 1 and progress westward. The Vista 2 pit is designed as a standalone pit with no direct connection to the Vista 1 pit and a pillar or ore and material is left between the two pits. Further work will study the timing and approach to recovering the coal contained in the pillar between the two pits but this recovery will occur at the end of the mine life and is not material to this technical report.

The Vista 2 pit was divided up in to panels in a similar fashion as the Vista 1 pit for mine scheduling as shown on Figure 16-11. These panels were scheduled in a manner to provide the desired product targets. However the panels are more generalized and extend down through the entire pit (from topo to bottom of basal seam) in the form of a sloping parallelopiped.

Figure 16-11 Vista 2 pit development



Similar to the Vista 1 pit, ex-pit waste dumps are required until there is sufficient space available for in-pit dump development.

The production rate, equipment and all mining parameters are similar to the Vista 1 pit. The Vista 2 pit is scheduled start production in 2021 and will double the total project capacity from 11 Mtpa product to 20 Mtpa.

Table 16-10 Life of Mine production schedule

Year	2016	2017	2018	2019	2020	2021	2022	2023 - 2032	2033 - 2043
Raw coal mined									
Val DÒr Seam Delivered ('000 rmt)	4,139	6,236	6,199	5,937	6,145	8,795	9,680	101,766	53,443
McPherson Seam Delivered ('000 rmt)	1,596	3,920	4,068	4,070	3,747	6,080	7,250	68,853	49,727
MCL (McLeod Seam) Delivered ('000 rmt)	805	1,045	1,000	993	1,108	2,814	4,560	42,849	20,739
Total ROM Production ('000rmt)	6,540	11,202	11,267	11,000	11,000	17,689	21,489	213,468	123,909
Clean coal produced									
Export Thermal Coal (high heat value)	1,167	2,000	2,000	2,000	2,000	3,080	3,620	36,033	15,291
Calorific Value (CV)	5,765	5,765	5,765	5,765	5,765	5,765	5,765	57,650	63,415
Export Thermal Coal (low heat value)	2,650	4,587	4,593	4,594	4,578	7,485	8,765	87,703	56,694
Calorific Value (CV)	5,407	5,407	5,407	5,407	5,407	5,407	5,407	54,070	59,477
Total Clean Coal Production ('000 t)	3,816	6,587	6,593	6,594	6,578	10,565	12,385	123,736	71,985
Waste material mined									
ROM Rehandle (25 % of ROM production) ('000rmt)	1,635	2,801	2,817	2,750	2,750	4,422	5,372	53,367	30,977
Rejects Hauling ('000t)	2,943	5,041	5,070	4,950	4,950	7,960	9,670	96,061	55,759
Waste Stripping:									
Clearing and Grubbing (Hectares)	264	172	179	155	184	267	325	3,073	1,482
Topsoil (BCM)	401,450	392,279	437,932	267,743	222,221	377,385	258,310	2,221,103	1,442,268
Till (BCM)	8,670,736	8,413,865	9,598,582	9,913,872	10,396,127	12,445,839	7,625,121	88,236,472	48,921,880
Bulk Waste (BCM)	12,745,182	15,903,064	12,707,581	13,653,204	13,225,756	50,933,644	90,043,178	820,497,446	483,494,514
Parting (BCM)	4,167,108	6,577,086	4,459,839	3,605,899	3,197,000	5,506,674	7,208,398	64,743,287	35,638,866
Total Waste (BCM)	25,984,476	31,286,294	27,203,934	27,440,718	27,041,104	69,263,542	105,135,007	975,698,309	569,497,528

Figure 16-12 Plant feed by seam

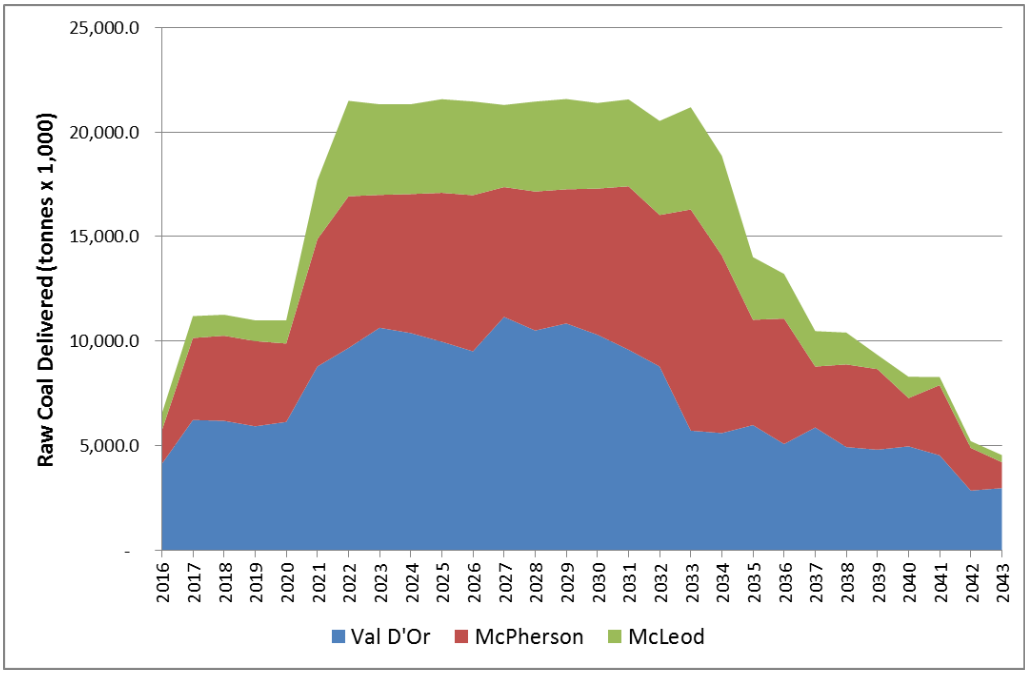
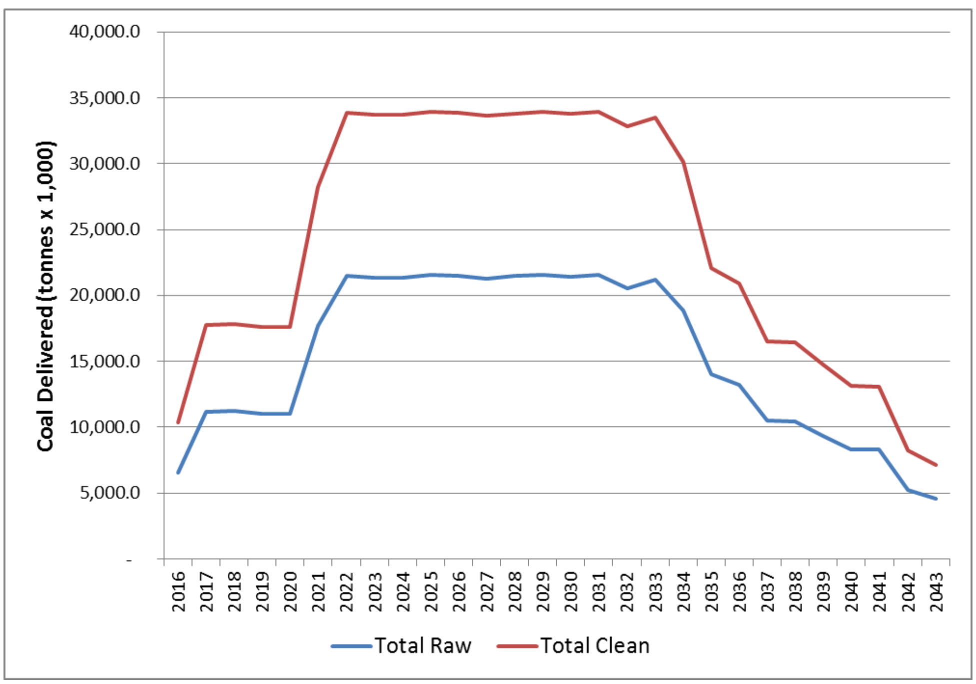


Figure 16-13 compares the raw coal tonnes to the clean coal tonnes. The two main product coals are a McPherson/Val d'Or high calorific value blend and a lower calorific value McLeod seam product.

Figure 16-13 Raw and clean coal delivery



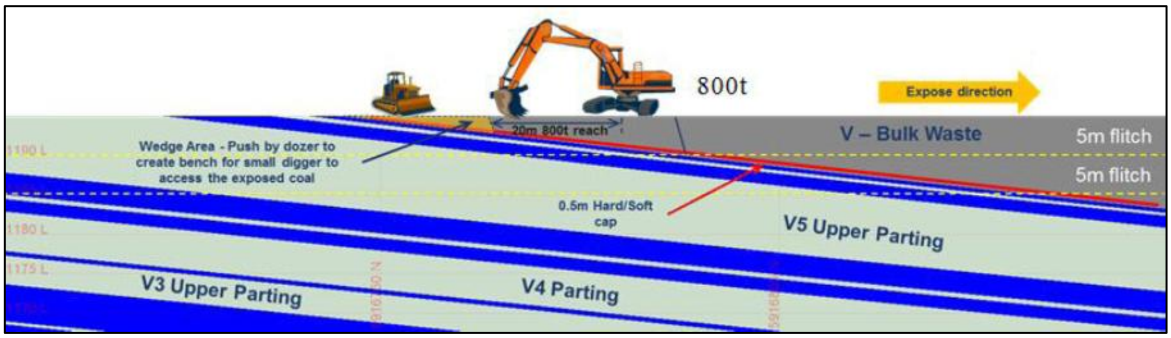
16.7 Mining Method

Mining is proposed to be done by contractors using ultra class sized mobile equipment. The study work provided by Thiess provides the basis of the envisioned mining methods and equipment. Snowden concurs that these methods are appropriate and have been adequately thought through and detailed for this FS work.

Mining progresses as follows:

- 800 t excavators are prioritised to dig till and bulk waste. However, 800 t excavators can also be used to dig thick parting material
- Small excavators, 400 t and 250 t, dig coal and parting material
- Coal can only be mined by either of the small excavators
- Excavator density constraints are applied
- The excavators mine the blocks in 5 m benches.

Figure 16-14 Bulk waste mining



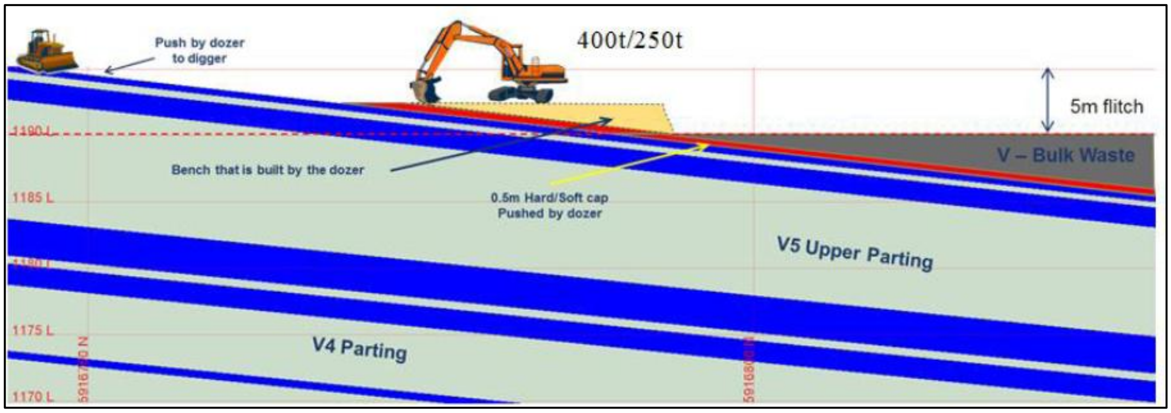
Bulk waste is mined by the 800 t excavators in 5 m benches working to an elevation rather than following the seams. As a seam is encountered, the remaining wedge is pushed by dozer to create a bench for 400 t and 250 t excavators to expose the coal.

To minimize dilution there is a 0.5m cap (soft/hard cap) left above the coal initially. The cap is then pushed up by dozer before being loaded out. The above assumptions apply to all bulk waste (above Val D'Or, McLeod and McPherson seams.

Parting mining

Thick parting is mined along strike by the 800 t or 400 t excavators in 5 m benches. Wedge material is pushed to the excavators by dozers. The upper section of each flitch of thin parting (thickness less than or equal to 1.5 m) is ripped and pushed by dozer down onto the lower half of the flitch, forming a bench for the smaller excavators to load along strike. Productivity is assumed to be lower in the wedge areas.

Figure 16-15 Coal removal



Similar to the thin parting, most of the coal in the upper portion of the flitch is pushed down onto the lower part of the bench, forming a bench for the smaller excavators to load the coal out along strike. To minimise dilution, approximately the bottom 0.2 m of coal is cleaned up with the dozer rather than digging to hard floor. There is no allowance for in-pit blending of coal.

16.7.1 DRILLING AND BLASTING

Both conventional and though-seam blasting methodologies are utilised in the mine plan. Conventional blasting is used in the bulk waste areas where coal seams are not intersected, and through seam blasting is used for the coal intercepts in order to maintain the required mining intensities and productivities.

The through seam blasting methodology includes drilling through the coal in and blasting the interburdens and the wedge of material below the coal floor. This removes the inefficiencies of mining and drilling on sloping floors and stopping to blast interburdens between coal sequences.

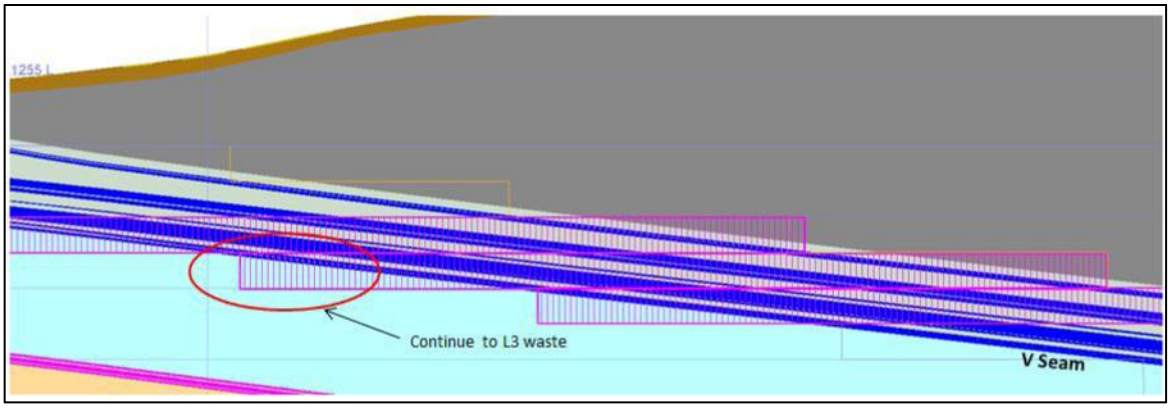
The drill pattern design is based on the optimal passing size, and suits the method of excavation by implementing 15 m bench height. A fragmentation model was developed which assists in determining the optimal blast hole size and parameters for Coalspur. P80 (80 per cent passing) fragmentation targets have been set for bulk waste and through seam blasting at 500 mm and 400 mm respectively.

Assumptions for blasting:

- Pre-split blasting is only required in the end wall / final wall.
- Through-seam blasting to is employed for the Val d'Or and McLeod seams. For the Val d'Or seam, the through-seam blasting is used down to the V3 Upper only.

Figure 16-16 shows an example of the through seam blasting technique employed. The purple pattern depicts the area where the technique is used in the Val d'Or Seam.

Figure 16-16 Through seam blasting



16.7.2 Productivities

Productivities are based on work hours and include truck matching based on the current mine plan. Vista project will use 800 t excavators with ultra-class trucks to access economies of scale and provide efficient removal of waste. The utilisation of both 400 t and 250 t excavators with 190 t trucks for the removal of coal and interburden will provide flexibility and efficiency as well as a proven ability to mine coal cleanly.

Table 16-11 Excavator- Truck productivities

Excavator	Truck	Unit	Till	Bulk Waste	Parting	Coal
R9800	Cat 797F	Bcm/work hr	2,681	2,650	2,061	-
R9400	Cat 789D	Bcm/work hr	-	-	1,199	1,284
R9250	Cat 789D	Bcm/work hr	-	-	929	907

16.7.3 Truck Payload, Work Area, Working Bench Height

The Caterpillar 797F trucks have a 375 metric tonne payload and will be used to remove till and blasted overburden. The Caterpillar 789D trucks have a 177 metric tonne payload and will be used to remove parting and coal.

The mine plan and extraction rates allow for minimum operating bench widths as follows:

- R9800 Excavator > 100 metres
- R9400 Excavator > 60 metres
- R9250 Excavator > 60 metres

The preferred mining methodology for the nominated fleets is bench mining of waste and coal in 4-5 metre lifts.

16.7.4 Coal Mining

The majority of coal will be mined by the R9250 excavator with some R9400 excavator time. There is an allowance for maximising coal recovery and minimising dilution assuming normal industry practice for clean-up and mining standards. To maximise recovery of thin coal seams, the coal will be ripped and piled by track dozer for loadout by the excavator.

16.8 Equipment Selection

Equipment for the life of the operation will be supplied, operated and maintained by a contract miner engaged by Coalspur. Thiess have developed a mine plan and cost estimate based on the equipment fleet described in Table 16-12.

The large mining equipment was selected to facilitate the efficient mining of the Vista property and to allow for the logical transitioning to the desired 20.4 Mtpa ROM coal mining rate. The selection of the primary mining equipment will be based on ramping up to the maximum mining rate over the first five years of production as well as considering the long-term needs of the operation. Large capacity hydraulic excavators have been chosen as the primary loading units to provide maximum mobility and operational flexibility in terms of separating the coal from the waste partings.

To achieve the production requirements, dozer push stripping will be employed using 634 kW class bulldozers. Dozer-assist stripping above the L seam accounts for approximately 27% of waste stripping volume and the downhill and level dozer pushes are very cost effective even after accounting for the re-handle cost. The alternatives to dozer push stripping would be stripping all the L seam waste material utilizing a higher cost truck-shovel operation.

The equipment productivities shown on Table 16-12 are a function of numerous variables including: performance-based factors such as availability and operational usage; material characteristics (swell factors); machine characteristics *e.g.* bucket fill factors and cycle times; operating configurations; and, for truck-serviced loading machines, truck saturation. The values shown are in standard machine units (SMU) which represent the hours accumulated on the equipment clock.

Table 16-12 Mine heavy equipment list

Equipment type	Size	Productivity bcm/SMU	Avg annual SMU	Capacity
R9800 excavator – overburden	800 t	2,550	25,000	42 m^3 (loose)
R9800 excavator – partings	800 t	1,900		42 m^3 (loose)
R9400 excavator - partings	400 t	1,160	6,200	22 m^3 (loose)
R9400 excavator - coal	400 t	1,230		22 m^3 (loose)
R9250 excavator - coal	250 t	930	3,700	15 m^3 (loose)
30t excavator	30 t		2,900	2 m^3 (loose)
Cat 789D with R9250	177 t		2,200	105 m^3 (loose)
Cat 789D with R9400	177 t		133,900	105 m^3 (loose)
Cat D11T dozer	634 kW		12,100	

Equipment type	Size	Productivity bcm/SMU	Avg annual SMU	Capacity
Cat D10T dozer	433 kW		17,600	
Cat 854 RT dozer	597 kW		3,300	
Cat 24M grader	397 kW		44,000	
Cat 16M grader	221 kW		13,100	
Cat 777G water truck	90 t		20,000	90,000 litres
Sandvik D75KS drill	567 kW		12,400	280 mm

Large tracked dozers will be used on waste dumps, for the ripping thin partings and for pit support and assorted topsoil and reclamation work.

Removal of parting waste material found in all three seam groups will be accomplished with 22 m^3 hydraulic shovels used in combination with 177 t haul trucks. Smaller backhoes will be used for handling unconsolidated topsoil for direct placement on reclamation areas or into the topsoil stockpile for reclamation activities later in the mine life. Coal is primarily recovered using a 22 m^3 hydraulic backhoe in combination with 177 t haul trucks.

Roads used in the mine design will change by period. The low-wall roads at the McPherson and Val d'Or seam outcrop will be available throughout but will be developed / extended progressively as the pits progress to the east. The access to the north dump will only be required during the initial years. Access to the south dump over the creek will be continuously utilised initially for carrying most of the out of pit waste and then intermittently used when there is insufficient room on the in-pit dump.

Upper waste from the Val d'Or seam pit will be prioritised to move to the north dump in the initial strips. Initial waste from the McPherson and McLeod Seam pit will be moved to the South dump. For the in-pit dump, waste from the McLeod and McPherson seam pit will be prioritised to fill the lower lifts. Waste from the Val d'Or seam pit will be used to fill the dump from the level of the bridge or higher.

Haul roads will be built with competent material for road surfaces; hence a rolling resistance of 3 per cent was used on these roads. Surface roads along the outcrop are also assumed to be constructed for long term traffic flow and a rolling resistance of 3 per cent was used.

Truck dumps are predominantly constructed from a mixture of till, sandstone and siltstone/mudstone. While sheeting with competent rock will improve the road, it may still offer higher resistance than a normal road; hence a rolling resistance of 4 per cent was used.

In-pit roads will run mostly on coal floor / ramps excavated in blasted material. Hence a rolling resistance of 4 per cent was used on these roads. Dig and dump zones are the first and last 50 m of a haul road and a rolling resistance of 5 per cent has been used in these areas.

16.9 ROM Stockpile Management Summary:

Approximately 25 per cent of the ROM coal will be rehandled for blending purposes. The blending will be done to produce CV5800 and CV5550 products. Val d'Or, McLeod and McPherson seam faces are always open in addition to the ROM stockpile to enable blending.

Initially, the ROM Stockpile will be maintained at or under approximately 600 kt. However, it will increase up to approximately 2 Mt at one point in the LOM schedule to enable pit floor release in order to optimise the haulage costs while achieving the required coal targets.

16.10 Manpower Estimates

The Vista mine will be largely staffed by contract personnel both in the mine and the coal washing plant.

17 Recovery Methods

Disclosure relating to recovery methods is not included with respect to Vista Extension and Vista South as these are early stage projects and no detailed metallurgical plant design work has been undertaken to this point in time.

17.1 General

Coal process design thinking and coal recovery method has been refined from previous reports, specifically Snowden 2012 FS study. This refinement has been as a result of additional work completed by Sedgman and presented as part of their EPC contract to complete the works and provide an operating Coal Handling and Preparation Plant with guaranteed performance against modelled coal resource parameters and product quality expectations.

The Coal Handling and Preparation Plant will be integral in enabling the upgrade and handling of coal through to product from the Vista Coal Project resource, a large scale, surface minable, thermal coal deposit with an ultimate export capacity of 12 Mtpa. The Project is multi-phased with Phase 1 of the Project including construction of a Coal Preparation Plant (CHPP) with a throughput capacity of 1,500 t/h capable of producing 6 Mtpa. Phase 1 will also include clean coal handling infrastructure with an installed capacity to handle 12 Mtpa. Phase 2 of the Project will increase the ROM handling and coal processing capacity to 3,000 t/h with extended clean coal handing stockyards to accommodate additional storage needs. Phase 2 will enable the operation to produce 12 Mtpa. Phase 1 of the Project shall be designed to allow for the required future expansions with a minimal impact on operations.

Key differences compared to previous reports, and the Snowden 2012 FS study are that the thermal coal dryers have been removed from the project, and reflux classifiers are used in the process design for more efficient finer coal recovery.

The Work under the Contract for Phase 1 includes a ROM, Coal Preparation Plant and ancillary structures, Clean Coal Storage, Overland Conveyor and Loadout, and all work necessary and ancillary to complete Phase 1 of the Project. The facilities as delivered that have been reviewed in this Technical Report will be capable of producing product coal with specifications in line with modelled product qualities specifically for Phase 1, and are to be replicated where specified to incorporate ROM tonnage from Phase 2 as per the specified LOM plan.

17.2 Process Selection

A process selection study was initially undertaken as part of the prefeasibility study in 2010, and in the ensuing feasibility study, this work was revisited to better encompass the large amount of exploration drill samples that were available for test work. The results were further refined and modelled for optimum yield / ash / energy results. Sedgman compared process circuitry for Vista ad showed that the use of TBS, spirals or reflux classifiers to be the best technology for the fines processing. Sedgman have selected the dense medium cyclone and reflux classifier option on the basis that it provides the highest potential to achieve the product specification.

17.2.1 Available Data

Approximately 100 coal samples and 100 non coal samples were sourced from the "attrition" cores. These samples were subjected to a pre-treatment process which is generally in line with accepted industry practice aimed at providing 'process' or 'in-plant' sizing suitable for plant design purposes, namely:

- drop shatter – 20 drops (on the high end for open cut mining)
- top size reduction to 50 mm
- wet tumbling
- wet sizing at 32, 25, 16, 8, 4, 2, 1, 0.25 and 0.125 mm
- float and sink testing by size
- ash of the -0.25 mm fraction
- raw and washed composite analysis.

17.2.2 Sizing and Washability Curves

The sizing and washability curves which have formed the basis for design are presented below. The revised coal loss and dilution assumptions (circa June 2011) were applied to generate expected working sections for processing in the CPP.

The logic for the assumed dilution and coal loss parameters is discussed in detail in the mining chapter, but are summarised below:

- V6U/L 15 cm roof loss, 10 cm floor dilution
- V5U 15 cm roof loss, 5 cm floor dilution
- V5L 15 cm roof loss, 10 cm floor dilution
- V4 15 cm roof loss, 15 cm floor dilution
- V3 15 cm roof loss, 15 cm floor dilution
- V2 10 cm roof loss, 15 cm floor dilution
- V1 15 cm roof loss, 15 cm floor dilution
- McL 15 cm roof loss, 15 cm floor dilution
- McP 15 cm roof loss, 10 cm floor dilution

The non-coal, or dilution samples, varied widely in size distribution highlighting the variable nature of the roof, floor and parting material encountered in the resource. ROM coal sections for simulation were prepared by combining floor material to each coal seam (after coal loss) in the correct proportions, weighted on a length times density basis. From the available data, 78 feed samples were prepared from the available ply data. The proportion of dilution in ROM ranged from around 2% for thick sections up to around 40% for thin sections. Coal sections less than 0.4 m will not be selectively mined, and any non-coal parting greater than 0.30 m will be selectively removed.

17.2.3 Yield Envelopes

Table 2-1 shows yield envelopes to be used for equipment sizing and selection. The values listed below are preliminary estimates for design purposes.

Table 2-1: Equipment yield envelopes for clean coal and middlings

Size Range (mm)			Yield		
Upper	Lower	Unit	Maximum	Nominal	Minimum
50	1.7	Heavy Media Cyclone	75	65	40
1.7	0.25	Reflux Classifier	75	65	40

Table 2-2 shows the plant feed envelope (dry sized) to be used for equipment sizing and selection. Additional allowances will be made for degradation that will occur within the CPP as shown in Table 2-3 the process sizing.

Table 2-2: Plant Feed Sizing Envelope

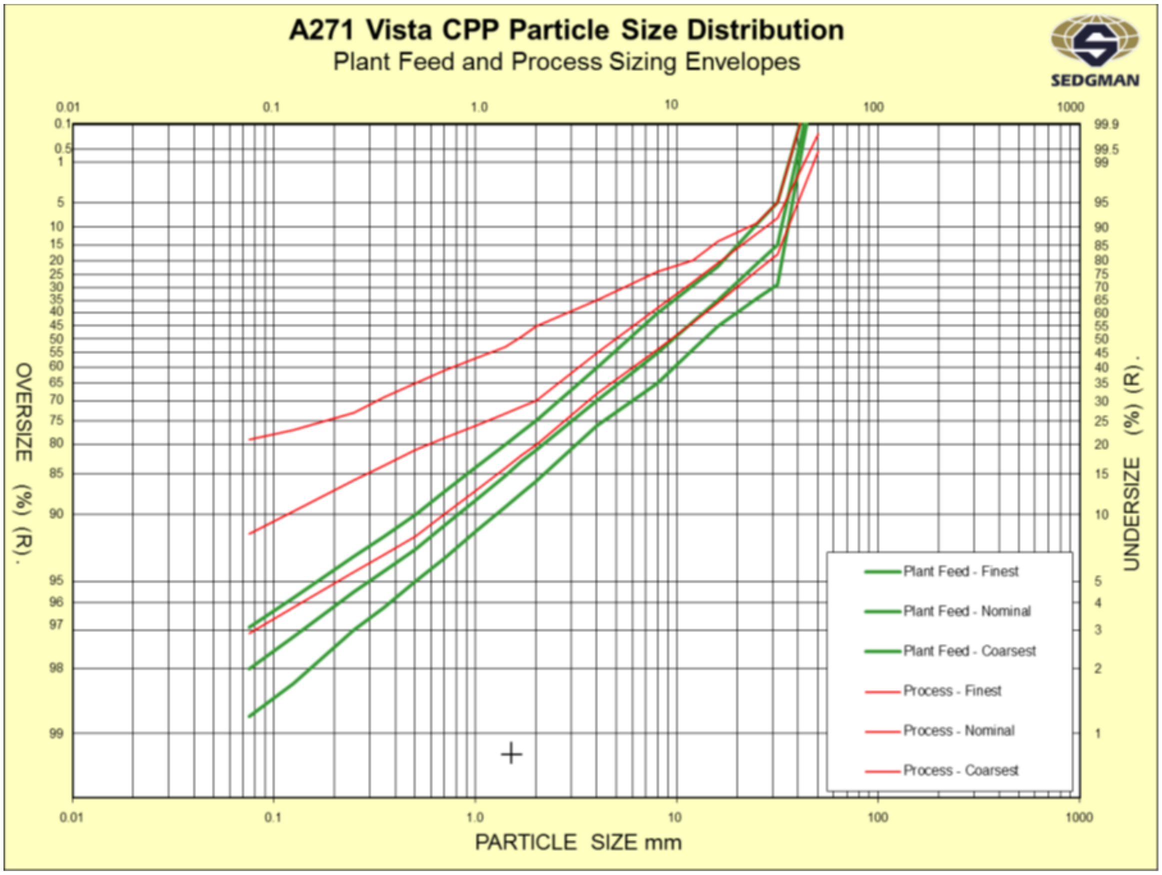
Size Range (mm)		Plant Feed Sizing Mass %		
Upper	Lower	Finest	Nominal	Coarsest
50	1.7	77.4	83.0	87.6
1.7	0.25	16.1	12.5	9.4
0.25	0	6.5	4.5	3.0
Total:		**100.0**	**100.0**	**100.0**

Table 2-3: Process Sizing Envelope

Size Range (mm)		Process Sizing Mass %		
Upper	Lower	Finest	Nominal	Coarsest
50	1.7	49.0	71..5	82.0
1.7	0.25	24.0	14.4	12.5
0.25	0	27.0	14.1	5.5
Total:		**100.0**	**100.0**	**100.0**

The combined view of feed and plant operational distribution is presented below.

Figure 17-1 Rosin-Rammler Partical Size Distribution



17.2.4 Reflux Classifier versus Spirals, TBS

Figure 17-2 to Figure 17-4 compare process circuitry considered for the Vista CPP showing the use of TBS, spirals or reflux classifiers as the technology for the fines processing. Sedgman have selected the dense medium cyclone and reflux classifier option on the basis that it provides the best theoretical yield and therefore highest potential to achieve the product specification.

Sedgman analysed the TBS and spiral options for both single and two-stage flowsheets as the two-stage spiral gives a better overall efficiency relative to the single stage, but still doesn't enable the cut point for the fines circuit to go as low as the reflux classifier.

The graphs below show that the reflux classifier circuit achieves higher yields across all situations of ash, energy and feed type. This is a result of the reflux classifier's ability to operate at low cutpoints in line with the dense medium cyclone circuit.

Figure 17-2, Figure 17-3 and Figure 17-4 Process circuitry comparisons demonstrate the reflux classifier's consistently higher efficiencies.

Figure 17-2 Comparison of yield based on process equipment for Val D'Or seam

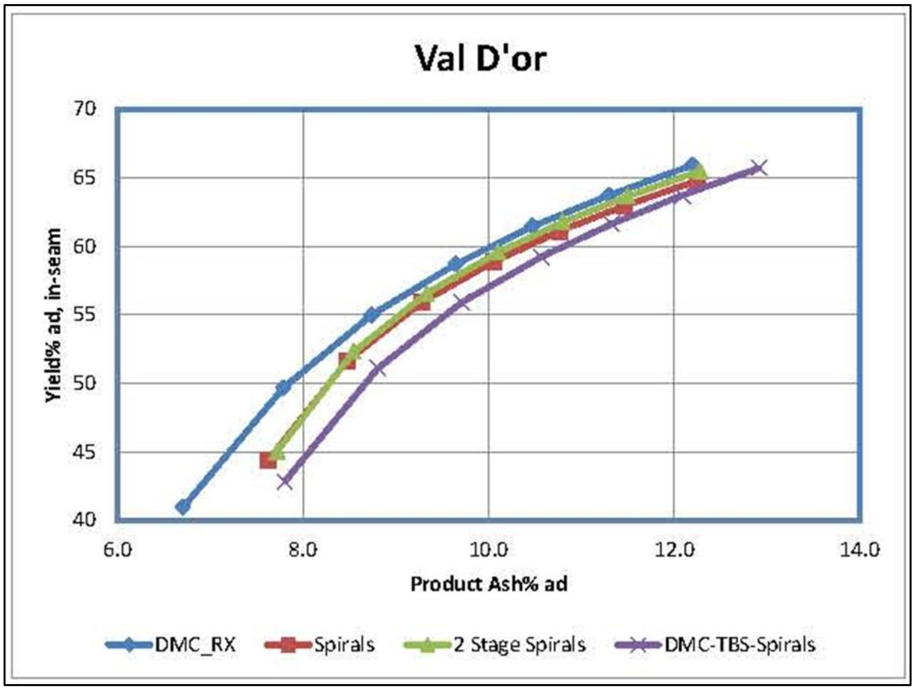


Figure 17-3 Comparison of yield based on process equipment for McPherson seam

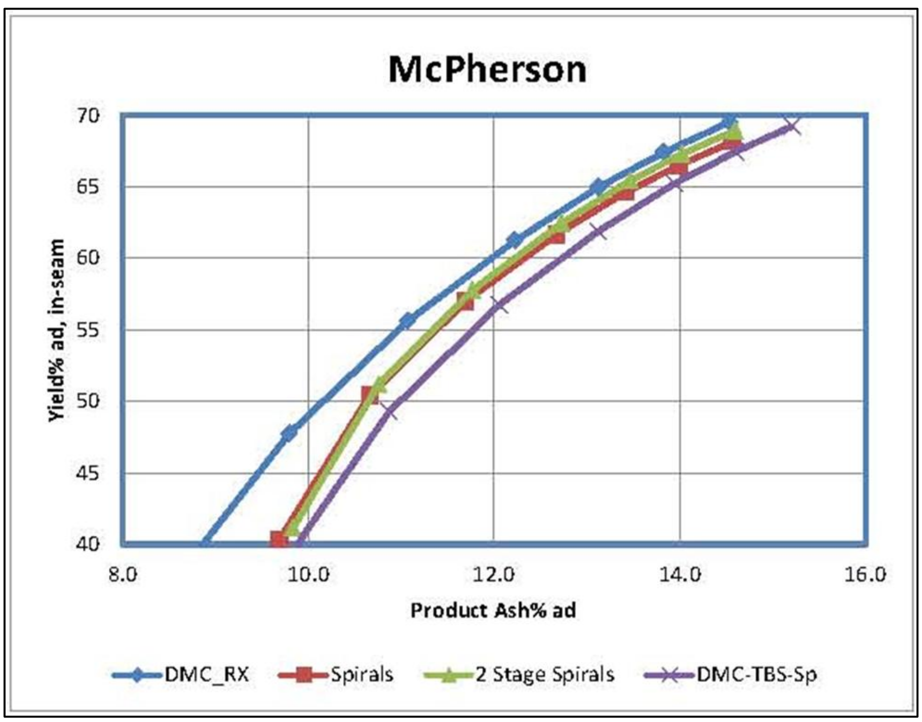


Figure 17-4 Comparison of yield based on process equipment for McLeod seam

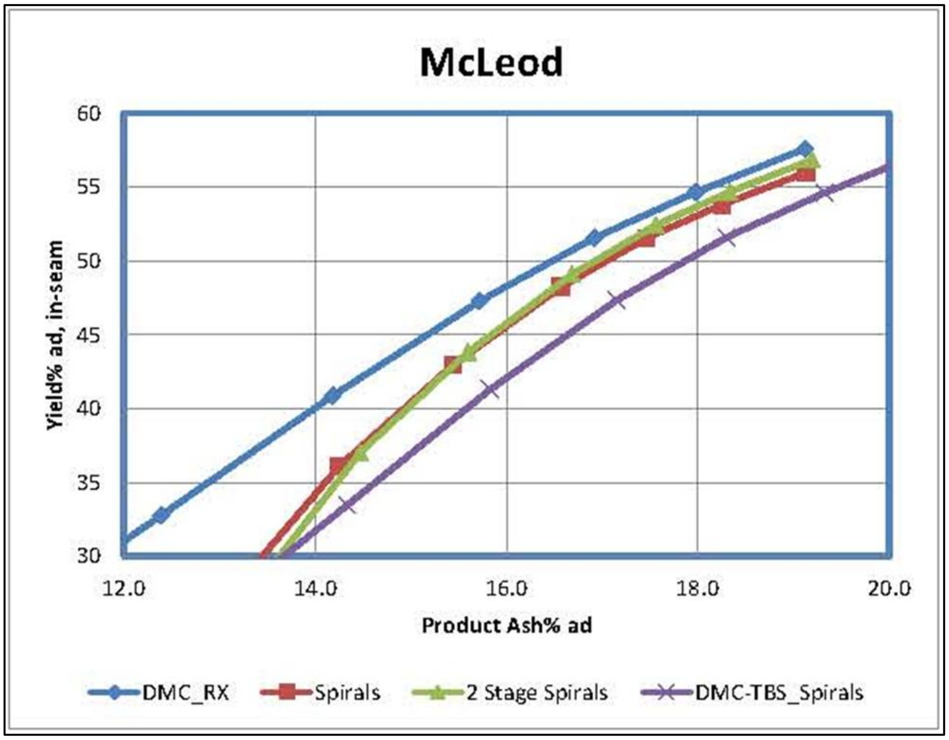
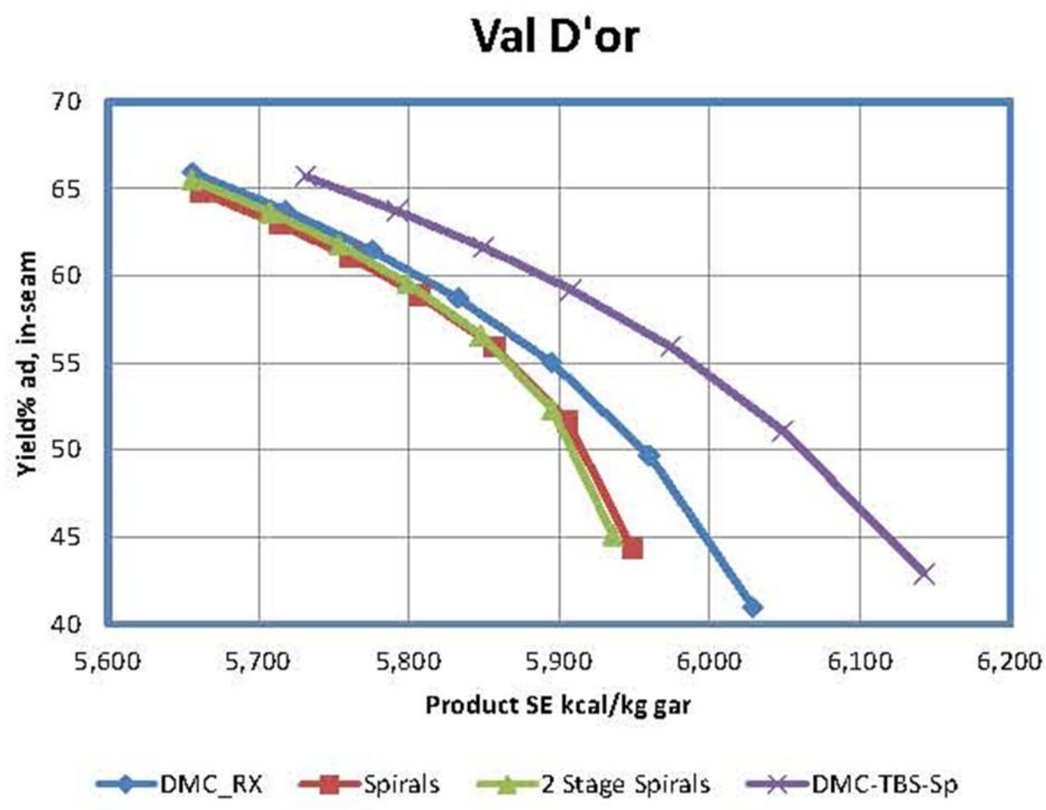


Figure 17-5 shows the Val d'Or only wash results. Sedgman have plotted the Yield versus product energy without thermal drying for Val d'Or, showing that 5,800 kcal/kg gar can be readily met at ashes of approximately 10% and yields around 60% ad. The yield difference between reflux classifier and spirals circuits is 1.1% for Val d'Or, but about 2% or more for the other higher ash seams.

Figure 17-5 The yield difference between reflux classifier and alternate circuits for the Val d'Or seam only



Flotation Tests

In June 2011 Nalco prepared a report from flotation testwork undertaken on a sample of Vista coal, entitled "A flotation study on -0.25 mm coal sample received from Canada". The primary objective of the test program was to investigate the floatability of the sample in terms of recovery and product quality. The flotation feed sample was very fine in sizing and had high ash content. It contained approximately 48% -0.030 mm material and had an overall ash of 70%. The laboratory-scale flotation tests showed that due to the large amount of fine particles, yield was very low (<10%) and product ash was high (greater than 38%). To minimise the effects of the ultra-fines, the sample was screened at -0.149 mm +0.044 mm and then floated. The results showed that as high as 75% combustible recovery could be achieved at 17% to 18% product ash when the -0.044 ultrafines were discarded. However, at this product ash level and at the expected total moisture of around 30%, it is unlikely to see a net energy improvement with the addition of flotation product.

Review of all data from the attrition cores shows that the -0.20 mm size fraction "flotation feed" will typically be greater than 65% ash and similar outcomes would be expected as per the Nalco testwork. However, some of Val d'Or coals may be better flotation targets, with lower ashes of the -0.2 mm material.

The significant capital outlay associated with addition of a flotation circuit for treating a small proportion of the feed coals was not warranted given significant unknowns. It is noted though that during execution, flotation site testwork could be then undertaken to improve the knowledge of the floatability of the coals and ensure an informed decision is made.

17.3 Coal Preparation Plant (CPP)

17.3.1 Key features of the CPP design include:

Sedgman has kept the preparation plant relatively simple to ensure the best operational consistency and product outcome. After reviewing the coal quality data as noted in the separate coal quality simulation report (from 2012 Snowden BFS) the most efficient plant arrangement for the Vista coal can target a 5,800 kcal/kg gar product is dense medium cyclone and reflux classifier processing units.

- A simple process will enable consistent settings/operation and maximises product outcomes
- Large capacity single streams that simplify maintenance and operation
- Sedgman has nominated a combined sump and two pumps for the single module minimising feed bias and assisting with liberation of clay
- A coarse circuit that adopts proven Dense Medium Cyclone technology
- Reflux Classifier in the mid-size circuit allowing a high level of flexibility
- Minimising the clay's impact on recycle streams and thickener size.

17.4 Process Description

Sedgman's design approach is to have larger processing units, to simplify maintenance and operational practices, and deliver an overall better processing efficiency.

The plant arrangement is based on a single 1500 t/h module and includes tailings filters for tailings dewatering.

The arrangement for feeding the preparation plant eliminates feed bias to separate modules through having a single sump with pumps feeding the CPP.

When feeding the raw coal into the plant by a pump it disperses the clays present in the raw feed, but introduces a higher volume of water to the beginning of the circuit with about a 35% solids feed.

The clays also impact on the amount of recycle streams normally designed into a preparation plant with a view to minimising the recycle of these clays. This has been considered in the thickener size, water circuit and desliming screen size.

The plant coarse circuit will consist of two large 1,300mm diameter dense medium cyclones processing the 50 x 1.7mm fraction with medium being drained on separate product and reject drain and rinse screens. The coarse product will be dewatered in four coarse coal centrifuges and the rejects will be transferred directly to the rejects conveyor. The drain and rinse section lengths will need to be carefully designed to achieve the lowest moisture possible with a screen to assist in both reducing the overall product moisture and improving the handleability of the rejects in the cold weather.

The medium recovery circuit will consist of proven counter-current style magnetic separators to concentrate and return the medium to the correct medium circuit.

The undersize of the desliming screen will be pumped through classifying cyclones and then screened over sieve bends to remove the high ash ultrafines and clays prior to the deslimed 1.7 x 0.25 mm fraction being processed in reflux classifiers. The feed will be pumped to the reflux classifiers for density separation with the product then being thickened through cyclones before being dewatered in screenbowl centrifuges. The effluent from the screen bowl centrifuges will be combined with sieve bends undersize and high frequency screen undersize and directed to the tailings thickener to ensure that any clays misplaced to the fines product are not recirculated. The rejects from the reflux classifier units will be dewatered through high frequency screen to reduce the moisture and enable the material to be handled throughout the rejects system.

Tailings from the process will all report to a high-rate thickener and the thickened underflow will be pumped to the tailings filter building. The filters operate independently however the rejects material is batch prepare in groups of 4. The tailings will be dewatered using 16 filters which discharge the dewatered cake material back onto the coarse rejects conveyor which then combined and transports to the rejects bin for pickup by the mining trucks. Water captured from the filter building will be pumped to clarified water tank and re-used in CPP.

Maintenance considered

As with any appropriate preparation plant design, the operation and maintenance considerations must be the primary focus. The plant will have maintenance access with an overhead crane and lifting bay inside the sheeted building. There will also be drive through access to the pumps so that maintenance can be undertaken with small mobile jib cranes.

17.5 Product Handling

Key design features incorporated in the product handling system include:

- Product coal directed to either the stockpile or the overland conveyor and train loadout system.
- A minimum product stockpile size of 5% of annual production.
- A telescoping luffing style radial stacker to a 100,000 t stockpile with push out by dozers to 300,000t total capacity for Phase 1, then duplicated for Phase 2.
- A product reclaim at 2,000 t/h via two dozers to ground mounted reclaim feeders.
- Reclaim feeders with light duty breather heads hydraulically driven to assist with smooth blending.
- Two 10,000 t silos at the train loadout for operational security for train loading.

- A flood loading bin, which has a lower bin profile and reduced capital/operating costs compared to batch weigh systems.

17.5.1 Product Coal System Surge and Storage

The size of the product stockpile depends on the following:

- The number of coal products that need to be stored.
- The storage capacity required for blending washed products to achieve the required export coal product specification.
- The storage capacity required to interface with the proposed product export system, e.g. rail.
- The storage capacity required to cover force majeure situations, including loss of the rail through track fault or derailment on the output side, or alternately on the input side, loss of production through major mining machine failure or weather conditions.

Sedgman has allowed a product stockpile capacity equivalent to 5% of the annual product coal production and Snowden agrees that this is adequate to cover these requirements

For the Vista project, Sedgman have recommended:

- Phase 1 Product Stockpile Working Stockpile Capacity = 100,000 t
- Phase 2 Expanded Stockpile Capacity = 200,000 t

This capacity should comprise working storage and expanded storage, and split in the ratio of one third to two thirds. The working storage will be easily accessible to place new coal product from the plant and reclaim product from the stockpile, the expanded storage will be where coal can be pushed out and reclaimed as required, to cover non-scheduled events, or spread, compacted and stored for longer durations.

Sedgman’s have allowed for two zones in the product stockpile for quality management, and design for each zone with its own reclaim point to permit blending into the trains and ensure the required product specification can be maintained.

17.5.2 Product Stockpile Equipment

Sedgman have included a telescoping and luffing style radial stacker, sized to be able to directly place most of the working stockpile capacity in a single stockpile. This is practical for up to a 100,000 t stockpile, but no larger capacity. We therefore recommend providing separate machines for both phases of the project, so as to not to burden the initial phases with the substantial cost of Phase 2.

To reclaim from the pile, have included two strategically placed-in dozer traps, located at the edges of the placed working stockpile. Two points will provide a product blending capability.

Two bulldozers will be required to manage coal movement in the product stockpile. These machines will be primarily used for reclaiming, but will also push out coal into the expanded storage area and back when required. Two reclaim points and dozers will help overcome any drop off of capacity as push distances become extended and allow reclaim rates to be maintained.

Sedgman have included provision to bypass plant production past the product stockpile and go direct to the reclaim or train loading system.

17.5.3 Train Loading System

Vista's train loading system has operational requirements, to interface with large train capacities, 17,500 t and a loading rate of 4,000t/h. The actual train loading station will be located closer to the town of Hinton, some 6.5 km from the site so an overland conveyor has been included to link the plant product stockpiles with the train loading station.

Sedgman have recommended and included a conventional troughed belt conveyor system over a rope conveyor as the most cost-effective for the Vista project.

A live surge capacity of 20,000 t will be provided at the head off the overland conveyor, ensuring a degree of operational security for loading trains, in case of failure of the overland conveyor. This surge capacity is provided by two 10,000 t concrete silos with the overland conveyor discharging directly into the silos. Coal transfer from the mine can therefore take place independently of the train movements, providing operational flexibility.

A train loading bin capacity of 300 t is recommended for this application based on the capacity of two wagons, 2 x 110 t + 50 t over the loading gate = ~ 300 t. Throughout the Vista Project development phases, this train loading system would essentially be adequate to load out the final projected tonnage of 12 Mt/a clean coal.

17.6 Plant Description

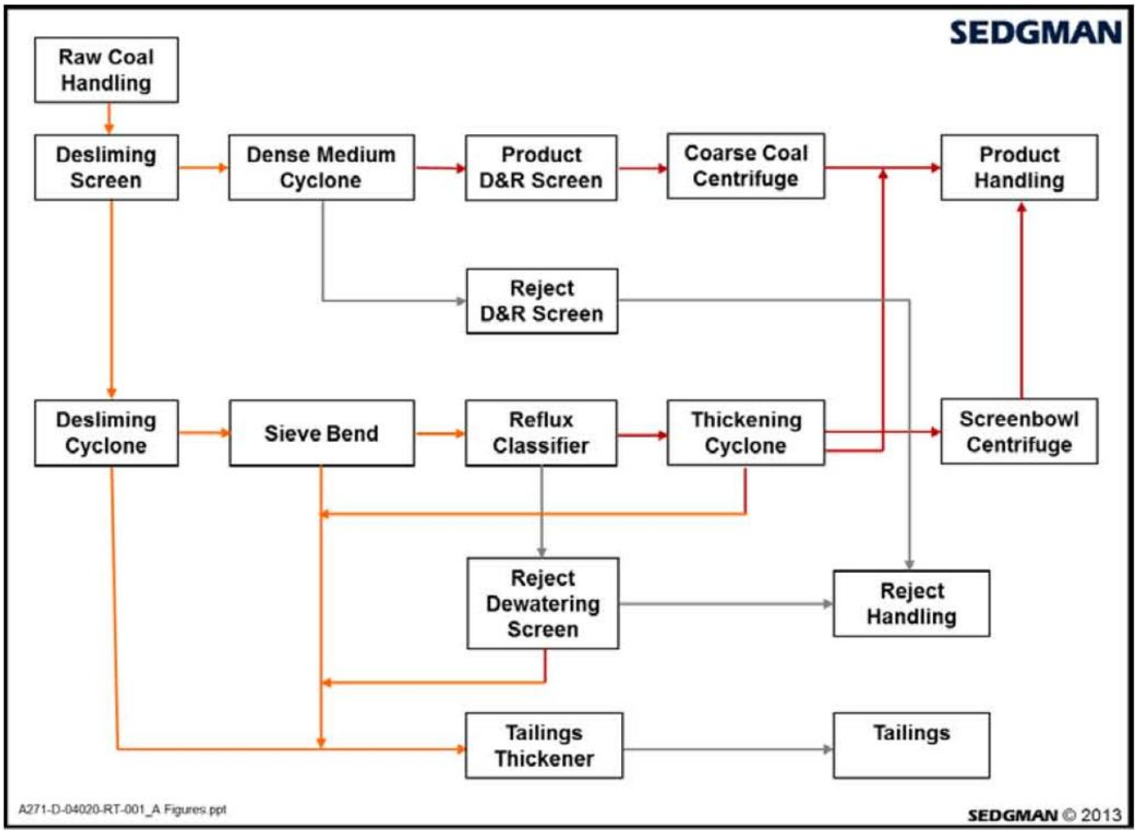
17.7 Coal Preparation Plant

17.7.1 CPP Process Overview

Sedgman have proposed a CPP process the incorporates;

- A Wet plant system to begin early liberation of clays prior to deslime screen.
- A dense medium cyclone (DMC) circuit for the coarse material (50 + 1.2 mm ww) (NB 1.2mm ww corresponds to 1.7 mm on a square mesh basis) with product dewatering by horizontal, vibratory centrifuges.
- Single stream equipment screens will be used in the coarse circuit, with a single desliming screen, single DMC and associated product and reject screens.
- Sizing to the mid-size circuit will be performed by a combination of classifying cyclones and sieve bends, and the mid-size material will be processed by reflux classifier (1.2 mm ww +0.25 mm), with product dewatered by screenbowl centrifuges, and fine reject dewatered by high frequency vibrating screen.
- Ultrafine tailings will be combined in a high rate thickener and dewatered by tailings filters, Figure 17-6 provides a process overview.

Figure 17-6 Sedgman CPP process overview



17.7.2 CPP Layout

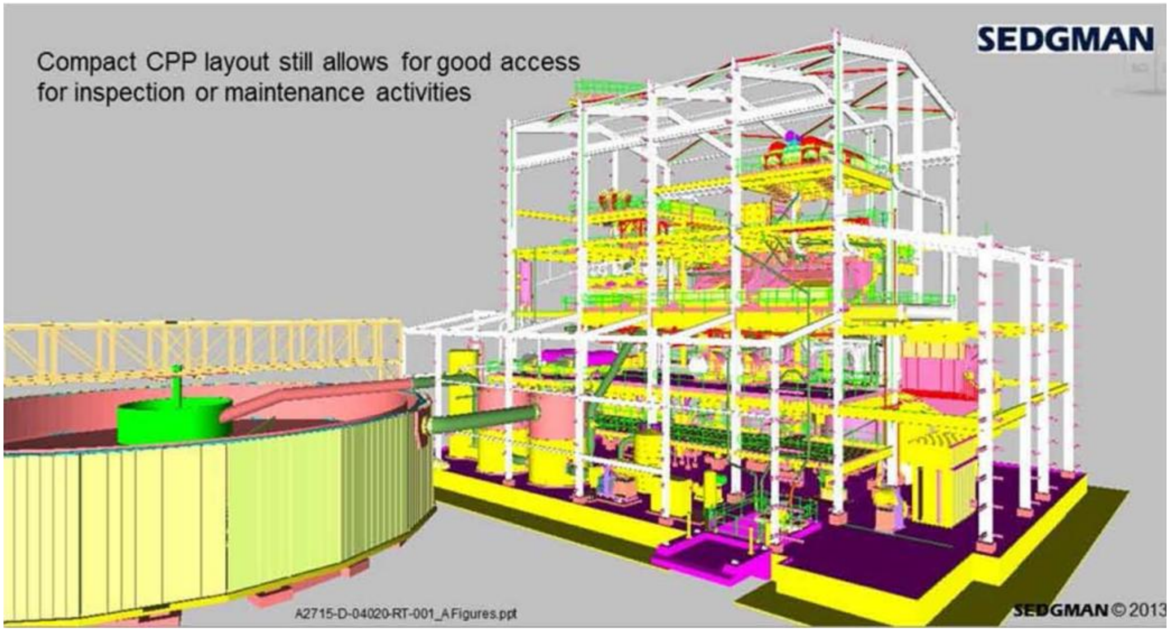
The plant layout will be designed for a single stream 1,500t/h module.

Whilst compact, the CPP layout still allows good access for inspection or maintenance activities. The overhead 10t travelling crane within the CPP will provide maintenance access to components on the larger screens, cyclones and magnetite separators. Use of a drive-through in the CPP structure improves maintenance access to the pumps.

The compact design reduces the overall CPP building volume resulting in significant CAPEX, insulation and heating savings.

The CPP building configuration allows for partial modularisation of the structure thus enabling a considerable proportion of the overall structural fabrication and preassembly labour to be located off site. This has a flow on effect of reducing the installation durations on site. Figure 17-7 shows the compact design of the CPP building.

Figure 17-7 Sedgman CPP layout – compact design



17.7.3 Plant Feed and Desliming Circuit

The raw coal from the surge bin will be discharged onto a weigh feeder, which will discharge onto the plant feed sizing screen via a feed box. The feeder will provide a smooth feed to the screen. Minus 50 mm material processed through the screen will fall directly into a plant feed sump. Oversize material will discharge into the tertiary sizer for reduction down to 50mm nominal topsize. The tertiary sizer will operate as a wet crusher and will be a low speed high torque centre sizing machine. The crusher will discharge into the desliming screen feed sump and combine with plant water to begin the early liberation process.

The plant feed and recirculating streams will be pumped to the desliming screen feed box of the desliming screens with 1.2 mm wedge wire aperture decks. Undersize material will be collected in the desliming screen underpan and will flow to a desliming cyclone feed sump. Screen oversize will be discharged into a chute and sluiced with correct medium into the DMC feed sumps. There will then be two streams of coarse coal processing each will be equipped with the following.

17.7.4 Dense Medium Circuit

The DMC feed sump will be a wing-tank type design, with constant level maintained through overflow of excess medium into the correct medium sump. Mixed dense medium and coarse coal will be pumped to a 1,300 mm diameter DMC.

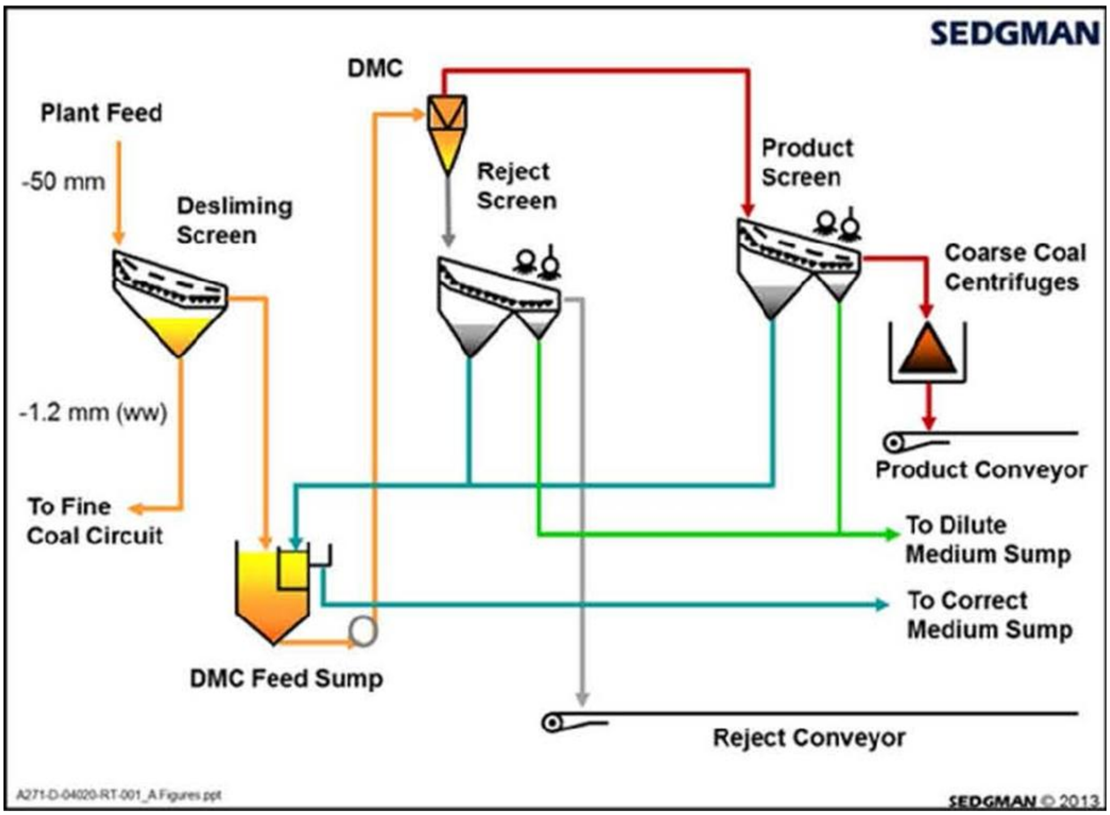
Product coal and medium will discharge from the DMC overflow outlet into a tile lined product screen feed box and directed onto the product coal drain and rinse screen. Product coal from the screen will then be dewatered via two coarse coal centrifuges prior to being discharged onto the product conveyor.

Reject material and medium will discharge from the DMC underflow outlet into a reject screen feed box and directed onto the multislope reject drain and rinse screen. Reject material will then be discharged onto the reject conveyor.

Medium drained from the product and reject drain and rinse screens will be returned directly to the correct medium sump to be recirculated. Adhering medium will be rinsed by sprays on the rinse section of the screens, and the rinsed material will be directed to the dilute medium sump.

A simplified circuit configuration is shown in Figure 17-8.

Figure 17-8 Sedgman Simplified dense medium circuit



17.7.5 Coarse Product Dewatering Circuit

Coarse product coal from the product drain and rinse screen will report to two centrifuges. The centrifuges will be horizontal basket type and will discharge product onto the product conveyor. The centrifuge effluent will be pumped to the dilute medium sump for recovery of any adhering magnetite.

17.7.6 Correct Medium and Magnetite Recovery Circuit

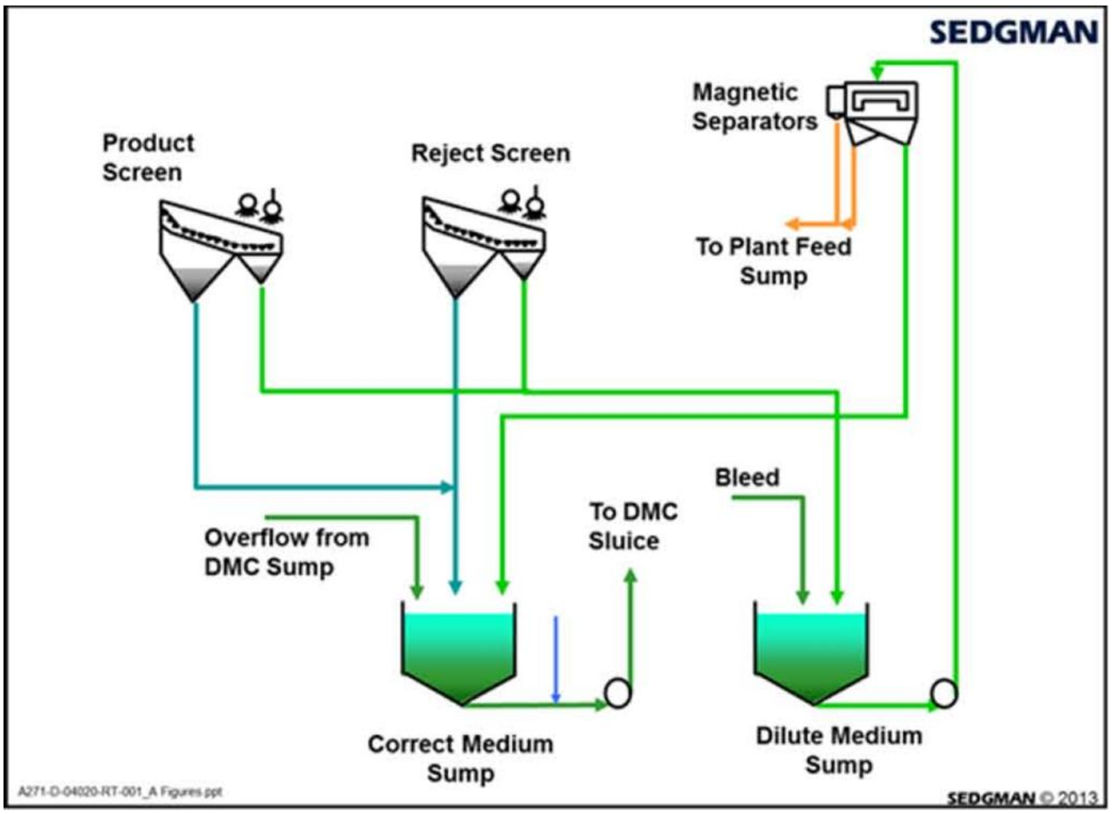
Medium drained from the product and reject drain and rinse screens will be collected in the drain section of the drain and rinse screen underpans and piped to the correct medium sump. Adhering medium rinsed from the product and reject will be collected in the rinse section of the drain and rinse screen underpans and piped to the dilute medium sump.

The correct medium will be pumped from the sump to a correct medium distribution box and as sluice for the coarse raw coal from the desliming screen to the DMC feed wing tank. This box will provide distribution control between the medium to sluice and return medium to the wing tanks. Excess medium will overflow from each DMC feed sump to correct medium sump. The correct medium distribution box will also provide a bleed stream of medium to the dilute medium sump for density control.

Dilute medium from the screen rinse section, correct medium bleed and coarse coal centrifuge effluent will be combined in the dilute medium sump and pumped to the magnetic separators for efficient recovery of a high density concentrate. Magnetic separator concentrate will be piped back to the correct medium sump. Magnetic separator effluent will gravitate to the plant feed recirculation sump.

A simplified circuit configuration is shown in Figure 17-9.

Figure 17-9 Sedgman Simplified medium and magnetite recovery circuit



Density control will be achieved by maintaining 'overdense' medium in the correct medium sumps and injecting water in the correct medium pump suction line to the required density. Density will be monitored on the correct medium pump discharge line, and feedback control will be used to control the water injection.

For overall circuit density control, a bleed line will take a portion of correct medium from the correct medium distribution box to the dilute medium sump. This will allow the accumulated non-magnetics in the medium stream to be managed and removed through the magnetic separators and for overall medium stability to be maintained.

When the correct medium sump level drops due to magnetite losses, magnetite will be added to the correct medium sump. Fresh magnetite will be stored in a magnetite concrete sump and made up using a magnetite addition pump. The magnetite will be slurried by a controlled hose monitor before being pumped to the correct medium sump.

17.7.7 Fines Circuit

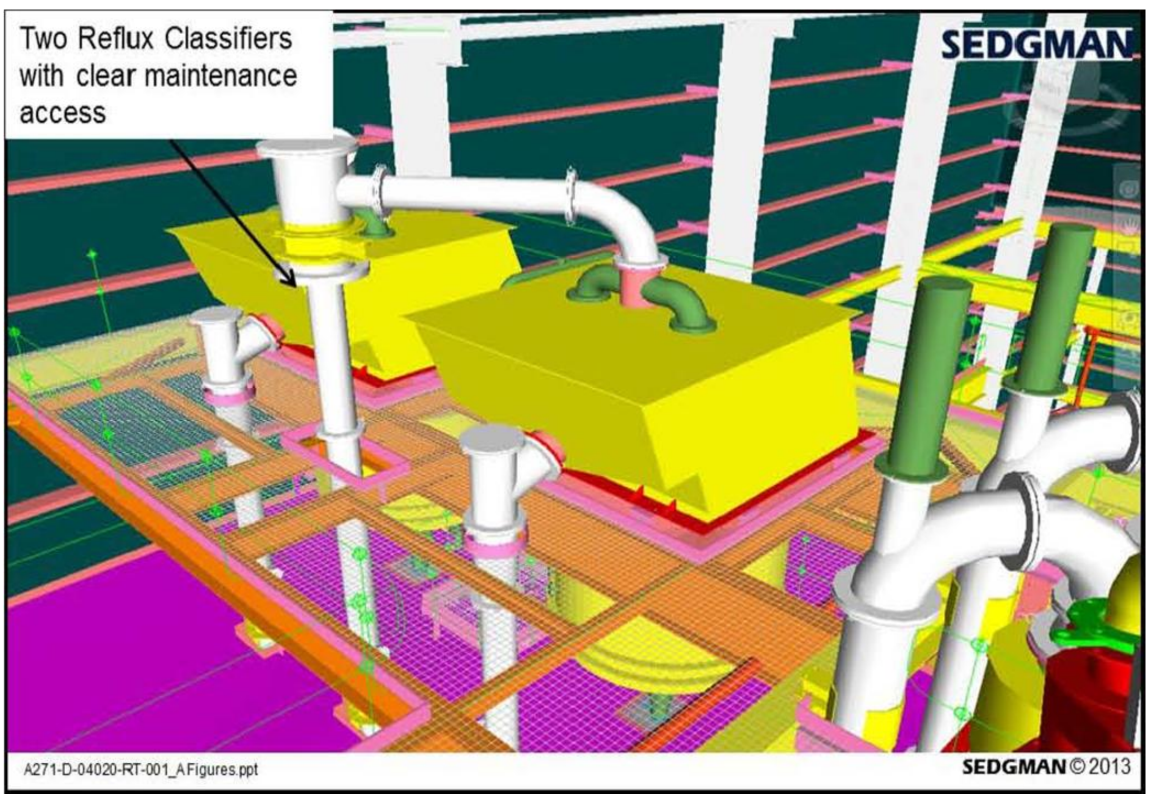
Undersize material from the desliming screen will be fed into the desliming cyclone feed sump, then pumped to two clusters of 660 mm diameter desliming cyclones. The desliming cyclones will classify material at a d50 of 0.15 mm, with the underflow gravitating to sieve bends and overflow reporting to the de-aeration box before cascading to the tailings thickener.

The sieve bends will remove misplaced ultrafines from the desliming cyclone underflow, and the overflow from the sieve bends will gravitate to the fines feed sump. The underflow from the sieve bends will be piped to the fines effluent sump.

Material from the fines feed sump will be pumped to four reflux classifiers, shown Figure 17-10. Product from the reflux classifiers will be directed to the thickening cyclone feed sump, before being pumped to two clusters of 380 mm diameter thickening cyclones. The thickening cyclones will classify material at a d50 of 0.080 mm.

Underflow from the thickening cyclones will gravitate to a distribution box, before being fed to three screen bowl centrifuges. Overflow from the thickening cyclones will be piped to the de-aeration box.

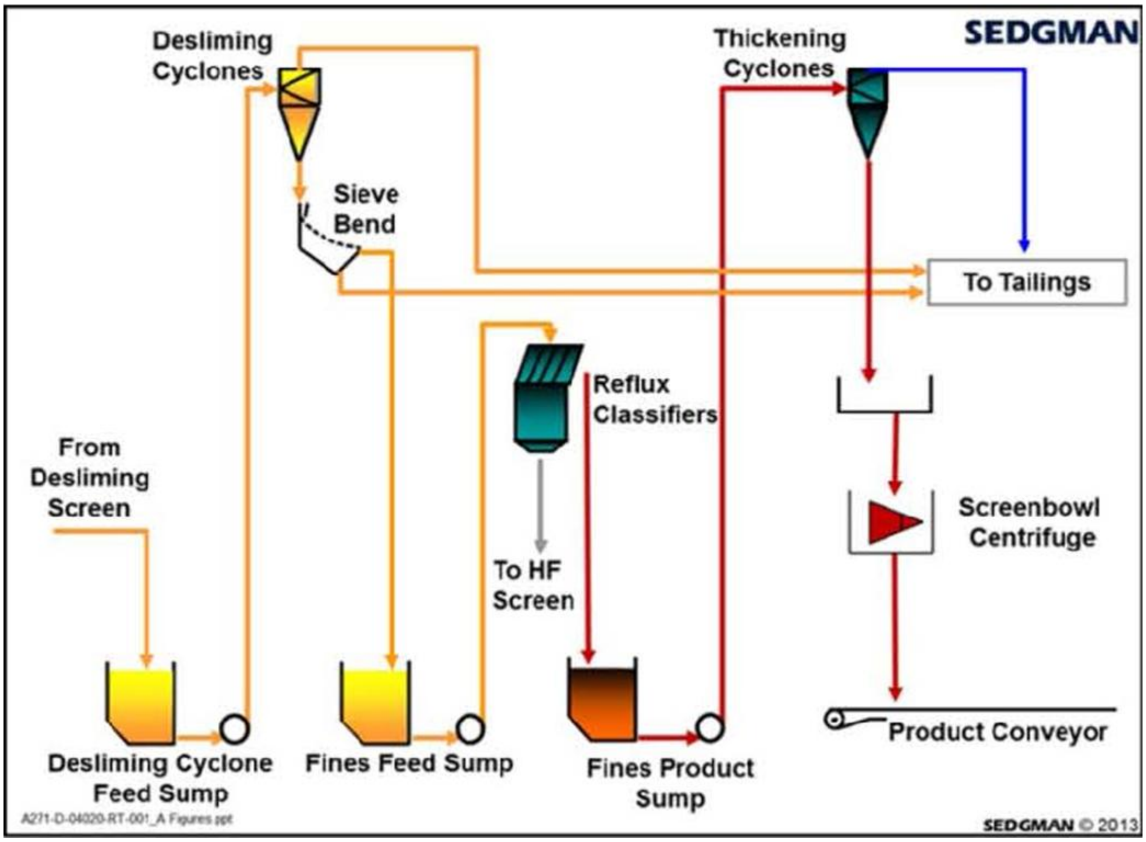
Figure 17-10 Sedgman Reflux classifier arrangement



Reject from the reflux classifiers will gravity feed two 1.8 m x 3.6 m high frequency dewatering screens. The dewatered rejects will then be discharged onto the CPP reject conveyor. Underflow from the reject dewatering screens will be piped to the fine coal effluent sump and combined with sieve bends

The simplified circuit is shown in Figure 17-11.

Figure 17-11 Sedgman Simplified fine coal circuit



17.7.8 Fine Coal Dewatering Circuit

Three screenbowl centrifuges will dewater thickened reflux classifier product. The dewatered product will be discharged onto the product conveyor.

17.7.9 Tailings Filtration Circuit

Tailings from the desliming cyclones overflow combined with fines effluent pump discharge from both modules will be fed to a 50 m diameter tailings thickener. Clarified water from the thickener will overflow into a clarified water sump and be recirculated around the plant.

Thickened tailings will be raked to the centre well of the thickener and pumped to the filter feed tank. The tailings material will be agitated in the filter feed tank and then pumped to the belt press filters. Each belt press filter will be individually pump fed from a dedicated pump. Anionic flocculant will be dosed into the discharge line of each mono pump, which will pump the filter feed slurry into the filter feed where cationic flocculant will be added prior to feeding each filter.

Dewatered tailings filter cake will discharge onto the rejects conveyor for transfer to the rejects bin. Filtrate from the filters will be collected in the tailings filtrate sump, and pumped to the back into the CPP thickener for clarification.

18 Project Infrastructure

Disclosure relating to the project infrastructure is not included with respect to Vista Extension and Vista South as these are early stage projects and no detailed infrastructure design work has been undertaken to this point in time.

Infrastructure, has both evolved from the previous Snowden 2012 FS report, and been substantially incorporated in the scopes of work for both Sedgman and Thiess. The change in engineering firms has precipitated changes in the design basis for a number of infrastructure items. These changes have improved the economics and reduced the risks. Importantly, the designs are more optimised and detailed and supported by firmer cost quotations. The changes are incorporated into the current financial models used in this report. All of the discussion in this section references the Vista Coal Project only although there may be shared infrastructure with the Vista Extension and Vista South project areas should production expand into those areas.

18.1 Civil Infrastructure

18.1.1 Civil Construction Materials

Backfill materials for the construction of the civil works will be obtained locally.

Bulk earthworks, such as those used for road construction, plant grading, and the rail siding, will primarily consist of cut-fill material obtained at the source of construction. Generally, the geotechnical conditions indicate that the local materials will be suitable for bulk fill.

Structural fills and road base will be manufactured at a local quarry. A number of private local quarries are available and there is opportunity for Coalspur to develop a quarry near the site.

18.1.2 Structural Construction Materials

Concrete supply will be contracted to local producers who have available capacity in the township of Hinton.

Steel will be sourced from overseas suppliers that are qualified and have obtained the required certifications to be able to export steel fabrications into Canada. A quality control program will be implemented by the EPC to ensure fabrication meets design requirements.

18.1.3 Access Roads

The primary access to the plant site will be by a new road approximately 8 km long originating at Highway 16. The plant site access road will intersect Highway 16 adjacent and to the west of the Hinton Gun club and will follow an alignment approximately due south to the mine and plant site. The road will consist of a two lane gravel surfaced road designed to provide an all-season, all-weather access with a maximum grade of 8%.

A new intersection at the Highway will be required. The intersection is designed to also accommodate access to the Hinton Gun Club. The existing Gun Club intersection will be removed.

Access to the plant site currently exists along the McPherson forest service road. This road will only be used during the initial stages of construction until the new access road is constructed.

Access to the Train Load Out (TLO) area will also originate from the new intersection at Highway 16. A short section of road running north from the Highway intersection will provide access to the TLO area.

Access to the Train Load Out (TLO) area will also originate from the new intersection at Highway 16. A short section of road running north from the Highway intersection will provide access to the TLO area.

18.1.4 Train Load Out Rail Siding

A new rail siding will be constructed to accommodate unit coal trains. The siding will be constructed to the south and immediately adjacent to the CNR mainline. The siding will be approximately located between CNR mile marker 176 (east) and 180 (west).

The design unit train will consist of 175 gondola cars with 3 locomotives, for a total train length of approximately 3 km. The total coal carrying capacity of the unit train is 18,550 t.

The rail siding will be configured with the TLO located at the siding mid-point. The siding will extend approximately 3.5 km to the west and 3.5 km to the east of the TLO for a total length of 7 km. Initially on the main line, a single switch will be provided just to the east of the TLO for the train to crossover to the siding and a switch will be provided at the East end to allow locomotives to move around to the Western end of the train to return to the port. Trains will arrive heading east bound and will enter the siding to the east of the TLO. The train will then be scaled as it moves through the TLO towards the west and will then reverse direction to the east as it is loaded with coal.

A contract has been signed between CNR and Coalspur for the coal haul contract from the mine TLO to sea ports on the west coast.

The present agreement has facilitated CNR to purchase the land and allow Coalspur to develop the siding for primary use by Coalspur. CNR will deliver empty trains and take them away once they are full. Coalspur personnel will operate the rail loading system including the train during loading.

18.1.5 Plant Site Civil Development

The plant site has been located to the north of the pit on a plateau that is situated just to the south of the prevailing ridge that runs east-west. The area is relatively flat and can accommodate all of the plant facilities and the clean coal storage yard. The ridge forms a natural visual barrier between the plant site and the communities around Hinton including Highway 16.

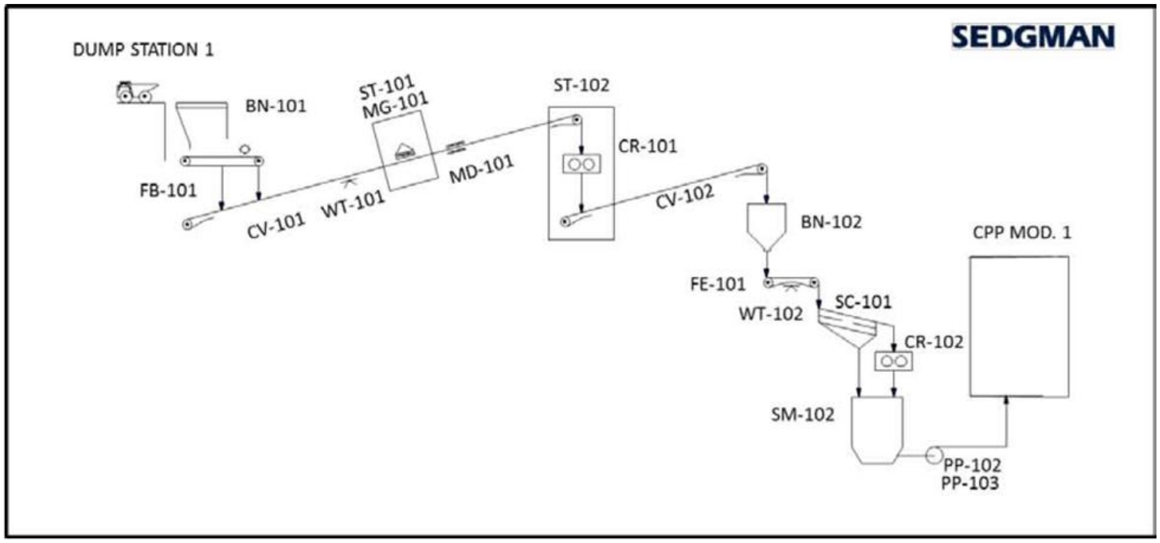
The civil works for the plant site and clean coal storage area will require the development of approximately 39 ha. Generally the site will be levelled and compacted to accommodate the facilities.

18.2 Raw and Clean Coal Handling Systems

18.2.1 Raw Coal Process

The raw coal handling system simplified flowsheet is shown in Figure 18-1.

Figure 18-1 Sedgman Raw coal handling system simplified flowsheet



18.2.2 Raw Coal Process Description

Run of Mine (ROM) coal will be delivered by rear dump trucks (up to Cat 793 size) to the 400 t ROM dump hopper BN 101 which has an opening width of 10 m. The hopper will be fitted with a slotted static grizzly with a nominal aperture of 1000mm.

A feeder breaker FB 101 will be installed under the dump hopper to extract ROM coal and reduce it to a nominal top size of 250 mm. The feeder breaker will be capable of processing the ROM coal stream at a nominal rate of 1,650 t/h, suitable for Phase 1, and will incorporate a return path fines discharge chute to relieve the chain, essential on high clay coals. The dimensions of the dump hopper have been optimised to reduce the ROM wall height and still achieve good flow characteristics through the bin with minimum wear.

Discharge from the feeder breaker will be directed to the 1200 mm wide, 3.4 m/s, 1650 t/h raw coal conveyor CV-101 and elevated to the sizing station ST-102. A ±1% accuracy weigh scale will be located on this conveyor and used to control the feed rate of the ROM feeder. A tramp iron magnet MG-101 and metal detector MD-101 located along the conveyor will remove ferrous tramp and stop the conveyor on detection of non-ferrous tramp in the coal stream. The magnet will be located over the belt of the raw coal conveyor and will be supported from a motorised trolley which will remove the magnet from its operating position for tramp discharge. The magnet will be an electro magnet with a permanent retention feature. Discharge from the magnet will be into a tramp skip to be located within the magnet station ST-101.

CV-101 will discharge into the secondary sizer CR-101, which will reduce the raw coal nominal top size to 125 mm. CR-101 will be capable of processing the raw coal at a nominal rate of 1650 t/h. The sizer will be mounted on retractable wheels, which allow it to be rolled out from its operating position for maintenance purposes. Raw coal from the secondary sizer will be directed to the 1,200 mm wide, 3.4m/s, 1,650t/h plant feed conveyor CV-102 and elevated to the 200 t plant feed surge bin BN-102.

A multi-stage sample system ST-103 will be installed on CV-102 to provide representative coal samples for plant performance testing and physical samples for feed sizing tests (not shown in Figure 2-1).

BN-102 will provide surge capacity between mining and processing operations, so that raw coal can be fed at a constant rate to the preparation plant. Raw coal will be drawn from the plant feed surge bin via a 2,000mm wide, 1500t/h raw coal weigh feeder FE-101. The weigh feeder will be ±1% accuracy and will be used to control the feed rate to the CPP, as well as record instantaneous plant feed and cumulative tonnes.

Raw coal will discharge from the belt feeder and be mixed with water before being fed onto a vibrating screen SC-101. SC-101 will be capable of wet screening plant feed at a nominal rate of 1,500 t/h. Assisted by high pressure water sprays along the screen deck, minus nominal 50 mm material processed through the screen will fall directly into the plant feed sump SM-102. Oversize from the screen will be mixed with more water and discharged into the tertiary sizer CR-102 for reduction down to 50 mm nominal topsize. CR-102 will be capable of processing the raw coal at a rate suitable for up to the rate required for the complete Phase 1. The sizer will be mounted on retractable wheels, which allow it to be rolled out from its operating position for maintenance purposes. Slurried discharge from the sizer will fall directly into the plant feed sump.

18.2.3 Cold Weather and Dust Containment Considerations

The feeder breaker and discharge conveyor levels of the ROM hopper will be clad and heated.

The raw coal conveyor CV-101 and plant feed conveyor CV-102 will consist of low level, ground mounted modules and elevated open gantries. The conveyor will have curved covers over the carry belt portion of the conveyor only.

The magnet station ST-101 will be clad to belt level.

The sizing station ST-102 will be clad, insulated and heated.

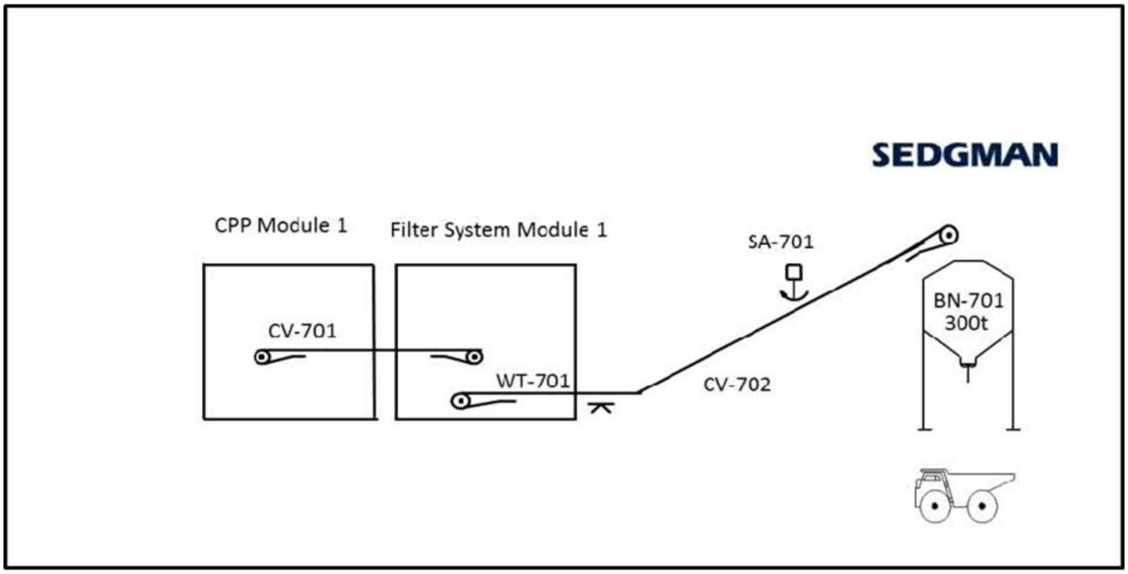
The raw coal crushing and screening equipment under the plant feed surge bin BN-102, consisting of FE-101, SC-101 and CR-102 will be housed in a clad, insulated and heated annex off the main CPP structure.

18.2.4 CPP Reject Handling

Process Overview

The reject handling system simplified flowsheet is shown in Figure 18-2.

Figure 18-2 Sedgman Reject handling system simplified flowsheet



Sedgman have proposed that the coarse and fine reject from the CPP will discharge onto a 1000 t/h conveyor CV-701 and transferred to the tailings filtration building where it will discharge onto the tail of conveyor CV-702 also rated at 1000t/h. Conveyor CV-702 will collect the discharge of the tailing filters and transfer the combined coarse/fine and filter coke reject up into the reject bin BN-701.

A cross belt sampler SA-701 will be installed on conveyer CV-702 to enable sampling of the reject stream when checking plant efficiency.

The reject bin BN-701 will be 300 t capacity and will have an emergency discharge to ground on one side. The bin supports will be designed to allow access from a CAT 793 rear dump truck to collect reject from the bin, with drainage from the gate piped to grade.

18.2.5 Reject Handling Cold Weather Considerations

The reject conveyors CV-701 and CV-702, where external to buildings, will be enclosed with a single walkway. The conveyor galleries shall be insulated.

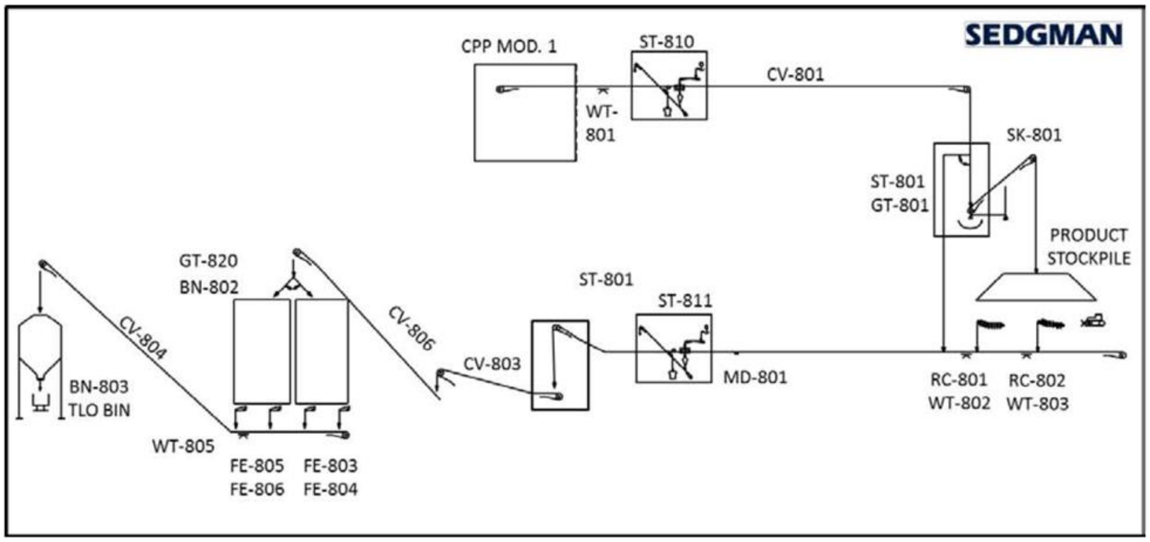
The transfer of CV-701 and CV-702 will be incorporated into the heated tailing filtration building. The reject bin will be clad and heated in the lower cone and gate area. The reject bin access slab will be heated to prevent freezing of water on the slab during cold conditions.

18.2.6 Clean Coal Storage and Reclaim and Train Load Out

Process Overview

The product handling and train load out system simplified flowsheet is shown in Figure 18-3.

Figure 18-3 Sedgman Product handling and train load out system simplified flowsheet



Description

Product will discharge onto the 1300t/h rated product conveyor CV-801 and elevated to the product transfer station ST-801. A ±1% accuracy weighscale will be located on this conveyor to record instantaneous product rate and cumulative tonnes.

A cross belt sampler will be located on the product conveyor CV-801. Primary sample increments discharged from the sampler will be directed to a sample feeder and elevated to a sampler crusher. Crushed sample will be directed to another cross belt sampler where secondary sampler increments will be taken. The sample system will be a proprietary designed unit and will be used to monitor product quality.

ST-801 will house a flop gate chute which can direct product from the discharge of CV-801 onto the product stockpile via the stacker SK-801, or directly onto product reclaim conveyor CV-802, effectively bypassing the product stockpile.

When stockpiling coal, CV-801 will discharge onto the slewing, luffing, telescopic, radial stacker SK-801, which will form a kidney shaped stockpile, with 100,000 t live capacity. The stockpile pad will be sized to provide an additional 200,000 t of push-out capacity.

The 2000t/h product reclaim conveyor CV-802 will receive product coal from two reclaim feeders (dozer traps) RC-801 and RC-802, each capable of reclaiming 2000 t/h with dozer(s) assistance. Two ±1% accuracy weighscales will be located on this conveyor and used to control the feed rate of the individual reclaim feeders.

The 2000 t/h overland conveyor CV-803 transfer to a high angle conveyor CV-806 that will be used to elevate to two 10,000t silos. Product will be distributed to either one of the silos by a flop gate and small transfer conveyor CV-805. Product will be drawn out of the bottom of each of the silos by two mass flow gates and directed to the train load conveyor CV-804. The use of two vibrating feeders for each of the 10,000t silos will provide adequate live reclaim volume out of the flat bottom silos.

The 4000 t/h rated train loadout conveyor CV-804 will cross the highway and elevate to the 300t volumetric train loadout bin BN-803. A ±1% accuracy weighscale will be located on this conveyor and used to control the feed rate of the mass flow gates.

18.2.7 Product Handling and Train Loadout Cold Weather Considerations

Sedgman proposes that the product conveyors CV-801 will be elevated and enclosed and insulated with a single walkway. The transfer station ST-801 will be clad, insulated and heated.

The radial stacker will be of an open gantry construction, but capable of slewing and luffing to reduce the effects of wind and dust control.

CV-802, CV-803 and CV-804 will consist of low level, ground mounted modules and elevated open gantries with covers over the belts. CV-805 and CV-806 will be a cladded structures with heated chutes.

The cross-belt samplers and crushers for the two stage sample systems will be housed in heated, insulated enclosures, as well as the the mass flow gates, lower bin cone and discharge conveyor levels on the 10,000t silos BN-802 will be clad, insulated and heated.

The feed conveyor level on the train load out bin BN-803 will be clad, insulated and heated. The train loading gate level will also be clad, insulated and heated. The sump will be clad. The exposed bin shell will be heat traced and insulated.

18.3 Ancillary Facilities

The Sedgman EPC contract for Vista Phase 1 encompasses the design, procurement and construction of the coal handling and processing infrastructure and supporting utilities. In addition to the CHPP, the MIA, General Services and Ancillary Structures are in scope for the EPC in Phase 1

The scope of work is clearly defined in the contract battery limits and includes as examples;

- Operations facilities
- Heavy Vehicle Workshop
- mine dry
- warehouse
- CHPP workshop
- Light vehicle workshop
- Magnetite shed

- CHPP control room
- staff car park
- all required washroom, lunch facilities for administration and CHPP areas.

18.3.1 Offices and Mine Dry Facility

The Sedgman EPC contract incorporates construction of the offices and mine dry facilities which will initially be designed to accommodate approximately 300 hourly and 45 staff personnel. A future expansion to accommodate an additional 300 hourly personnel has been considered for Phase 2.

The personnel facility will consist of a main office and mine dry facility attached to the primary site warehouse and workshop facilities.

18.3.2 Shops and Warehousing

The Sedgman EPC contract incorporates a steel building structure to house the heavy truck shop, the warehouse, mine rescue and first aid bay, the fire truck bay, as well as plant maintenance shops. Separate truck bays will also be provided for truck washing as well as tire service.

The initial installation will accommodate four heavy truck bays and the facility will be designed for future expandability to add truck bays if the mine haul fleet increases in size.

18.3.3 Fuel Storage

Two fuel storage facilities will be installed: one at the plant site and one at the mine closer to the pit. The plant site fuel storage facility will hold 200,000 litres at each location. The tanks will all be double walled for spill protection and installed on engineered pads with appropriate liners.

Coalspur has negotiated fuel supply and delivery from several providers for both construction and operations needs. During construction a cardlock system will be installed with on site tanks while larger tank farms will be installed during the operations phase. This agreement includes dyed diesel, clear diesel and regular unleaded gasoline.

18.3.4 Power Supply

Power to the site will be provided by AltaLink. A 138 KV power line will be installed to deliver power to the plant site from the high voltage line running along the south side of Highway 16. Two (2) discrete connections to the main electricity grid will be established; one for the main site and one for the train load out and silo's present beside Highway 16.

The estimated power demand for the entire project site is 18 MW for 6Mtpa and up to 42MW depending on final electrical equipment loads in the mining area for 12Mtpa. AltaLink will terminate their power supply on the downstream side of a transformer station located at the plant site. From that point, all power distribution systems will belong to Coalspur.

18.3.5 Fresh and Potable Water Supply

Fresh and potable water will be required for process water as well as water for personnel use. All water will be obtained from ground water wells located around the plant and mine sites. It is estimated that 8 wells will be required for initial start-up. An outdoor fresh water pond with 450 Million litre capacity will be constructed for the storage of water to be used for process. The main process water feed tank will be directly fed from the fresh water pond. A separate potable water tank will be located near the personnel complex.

Total annual process water requirements are 930 ML – 1020 ML depending on moisture results thereby providing that a fresh water pond at full capacity can store up to 6 months of process water.

18.3.6 Raw Water System

Raw water will be pumped from the raw water dam (approximately 2 km) to the 2 x 250,000 litre raw water tanks located close to the plant. These tanks supply the following services

- Fire water through a secured reserve capacity
- CPP make-up water
- Raw water feed to the potable water system
- Raw water to the gland water system.

18.3.7 Fire Water

Fire water will be supplied from the fresh water wells and stored in a dedicated Fire Water Storage Tank. The tank will be located on the hill side to the north of the plant at an elevation sufficient to provide adequate hydraulic head without the need for pumps. The tank will be insulated and heated.

18.3.8 Sewage Treatment Plant

A sewage treatment plant will be located at the plant site to service the grey and black water systems facilities. Treated effluent from the plant will be discharged into the fresh water pond and recycled for use as process water.

Toilets at smaller remote plant locations such as the ROM, the gatehouse, and the TLO will be serviced with local septic fields or portable toilets.

19 Market Studies and Contracts

Disclosure relating to the market studies is not included with respect to Vista Extension and Vista South as these are early stage projects and no detailed understanding of coal quality has been undertaken to this point in time.

Coalspur has not signed coal sales contracts at this time and all pricing is based on forecasts adjusted to industry norms for heating value and ash content.

19.1 Product(s) specification

A description of the five quality parameters of the coal to be produced is provided below:

Total moisture is the total amount of moisture contained in an untreated sample of coal. It consists of the free moisture, which is the moisture on the surface of the coal, and the inherent moisture, which is the moisture held within the molecular structure of the coal.

It is important to note that the moisture increases the transportation cost of the coal and also consumes heat during combustion in the furnace.

The **ash content** of coal is the non-combustible residue that is left after the coal is burnt. There is an inverse relationship between the calorific value and the ash content. Also, the higher the ash content the higher the ash disposal cost.

Sulphur in coal is liberated in the form of sulphur dioxide into the atmosphere which is a major cause of acid rain. For this reason, most countries regulate the amount of sulphur dioxide discharged into the atmosphere.

The **calorific value** (CV) is the amount of heat released during combustion. The gross calorific value (GCV) refers to the amount of heat released when coal is combusted under standard conditions in the laboratory. This energy is not achieved in practice in boilers since some of the products of combustion, mainly water, are lost in the gaseous state with the associated heat of vapourisation. The maximum achievable CV is the net CV.

The **Hardgrove grindability index** (HGI) is an empirical measure of the difficulty of grinding a specific coal to the particle size necessary for effective combustion in a pulverised coal fired boiler. The lower the figure the more difficult it is to grind.

The quality of each of the two products to be produced by Coalspur is provided in Table 19-1. Product 1 is produced from the Val d'Or seam and Product 2 is a blend of the McPherson and McLeod seams. The qualities of Products 1 and 2 are compared against the benchmark Australian Newcastle coal index which has published pricing and a forward pricing market. The pricing is transparent and represents the pricing of competitors to Vista in the Pacific basin. For comparison purposes, a high quality Indonesian coal, Adaro Envirocoal, is also listed.

Table 19-1 Vista's product quality

Product	Product 1	Product 2	Newcastle (Typical)	Adaro Envirocoal
Total moisture (AR) (%)	11.5 – 14%	11.5 – 14%	9	26
Ash (AD) (%)	9 – 11 %	10 – 12%	15	1.2
Sulphur (AD) (%)	0.35 – 0.45%	0.35 – 0.45%	0.60	0.1
Gross CV (AR) kcal/kg	5,750 - 5,800	5,550 – 5,660	6,322	5,200
HGI	40 – 41	39 – 40	55	50

The Vista coal products have higher total moisture than the Newcastle type but significantly lower than the Indonesian Adaro Envirocoal.

All products have a lower ash content compared to Newcastle. The Coalspur products have higher ash content than the Indonesian Adaro Envirocoal.

All Coalspur products have lower sulphur content when compared to the benchmark Australian Newcastle coal but are higher than that of the Indonesian Adaro Envirocoal.

19.2 Competitor description

Direct competition comes from Australia and Indonesia as the largest supply nations in the Pacific seaborne thermal coal market.

The ten largest producers account for 74% of Australia's coal production due to active consolidation in Australia's coal industry. Glencore continues to be the largest producer of coal in Australia, followed by BHP Billiton. They are expected to remain the two largest producers until 2020.

Glencore is Australia's largest coal producer: we expect marketable output of 65.2 million tonnes in 2013, estimated to be 16% of Australia's 2013 coal production. Glencore owns a share in 24 Australian operations and projects; the largest number of any company in Australia. Mangoola in the Hunter Valley of New South Wales will become Glencore's largest operating mine, ramping up to 9.5 million tonnes of saleable product in 2014.

BHP Billiton is the second largest coal producer in Australia by production with production of approximately 53 million tonnes. BHP Billiton will remain one of Australia's largest coal producers into 2020. Forecasted annual production of 64.6 million tonnes by 2017 due to expected expansions at Mt Arthur and significant expansions as part of BMA's Bowen Basin Coal growth.

Adaro Energy and Bumi Resources are Indonesia's equal largest coal producers in terms of annual production volume. Both companies produce approximately 50 million tonnes on an attributable (share of asset ownership) basis. Bumi and Adaro together are expected to account for a quarter of the country's total marketable production. Both companies have a good pipeline of greenfield and expansion projects that will ensure they remain Indonesia's largest coal producers for the foreseeable future.

Indonesia's ten largest coal producers account for two-thirds of total marketable production. All of Indonesia's ten largest producers have plans for expansion over the next five years and they will account for a large proportion of Indonesia's production growth over that period.

Source: Wood Mackenzie Global Thermal Coal Long-Term Outlook 15 November 2013

19.3 Supply/demand Outlook

19.3.1 Demand forecast

Global demand for coal to fuel electricity generation is forecasted to grow from about 4.9 Bt now to about 8.3 Bt in 2035. Demand for coal for non-power purposes is expected to mirror the growth in demand for electricity generation; 1.3 Bt of growth will occur by 2035 when total non-power demand for thermal coal will reach 3.6 Bt. Combined, total demand for thermal coal will grow to 11.9 Bt in 2035 from its level of 7.2 Bt today. Demand for thermal coal will be increasingly focused in Asia, the target market for Coalspur. Thermal coal of desired quality, location and cost is not available in sufficient amounts to fuel demand, especially in Asia. This situation is expected to get worse over time, not better.

Indigenous resources of low cost coal encourage developing nations to use it to fuel growth. However, the pace of growth in most of Asia will require rapid increases in all energy fuels. It is expected that the amount of coal required in Asia to fuel expected growth will exceed the capability of each nation to provide it economically from its own resource, even if the physical resource, with proper quality, is in place

Elsewhere in the world, coal self-sufficiency will either remain steady or improve. Self-sufficiency in the US is expected to remain at 95% levels. In EMEA countries, paradoxically, self-sufficiency will improve but solely because demand is expected to weaken. In both North America and Europe coal self-sufficiency is aided by policy decisions that favour the use of other energy sources at the expense of coal.

Declining coal self-sufficiency in regions with increasing demand provides a basis for growing imports, the majority of which will be seaborne. All told, seaborne thermal coal demand will grow by 1.13 Bt, from about 0.95 Bt now to about 2.08 Bt in 2035.

19.3.2 Thermal Coal Long-Term Outlook[11]

Major suppliers in today's thermal market are expected to be the major suppliers into the foreseeable future; the bulk of global seaborne thermal coal supply will be sourced from Indonesia (396 Mt or 42%) and Australia (196 Mt or 21%). Most of the remainder will be provided by Russia (98 Mt or 10%), Colombia (80 Mt or 8%) and South Africa (79 Mt or 8%). Ten countries share the remaining supply led by the US, which will maintain a high thermal export level for yet another year (44 Mt or 5%). The remaining countries will provide 102 Mt or 11% of total 2013 thermal coal supply.

[11] *Source: Wood Mackenzie Global Thermal Coal Long-Term Outlook 15 November 2013*

In 2035, supply is forecasted to have increased significantly reaching 2.1 Bt. A large amount of the supply expansion is expected from low cost mines. Much of this low cost increase is a result of growth in the low rank seaborne coal market sourced from Indonesia, and later, from the US. Cost of mining operations is estimated to increase in real terms over the forecast period.

19.4 Price strategy

The price strategy for traded thermal coal is to follow world market pricing based on quality parameters; these are the gross calorific value, total moisture, volatile matter, sulphur content, ash content, hardness measured by the hardgrove grindability index (HGI) and ash fusion temperature.

Pricing is generally directly proportional to the calorific value relative to a reference coal. This approach has been adopted in the study price forecast. For example the price of Product 1 is computed as follows:

$$Product\ price = \frac{product\ GCV}{reference\ product\ GCV} \times Reference\ price$$

So, for Product 1, the forecast price is $\frac{5800}{6300} \times Newcastle\ reference\ price$

Of the remaining quality parameters, the HGI is the only parameter that may attract a price penalty.

19.5 Market and price forecast by product

Figure 19-1 shows the Coalspur prices for Products 1 and 2 as derived from the Newcastle 6300kcal/kg forecast prices provided by Wood Mackenzie. The two Vista Coal Project coal products shown in the table are the premium quality export coal (Product 1) and the lower quality export coal (Product 2).

Figure 19-1 Vista forecast coal prices

2013 US$ Real	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2030	2035	2040
Vista Product 1 (5,800 kcal/kg)	72.91	75.03	78.67	79.08	75.01	73.69	77.88	76.63	78.03	79.43	80.06	83.46	94.99	102.64	113.32
Vista Product 2 (5,550 kcal/kg)	69.76	71.80	75.28	75.67	71.78	70.51	74.52	73.33	74.67	76.01	76.61	79.86	90.90	98.22	108.44

19.6 Product shipping

The Vista Coal Project export products will be transported by rail to the Ridley Coal Terminal at the Port of Prince Rupert in British Columbia for shipment to the international markets. Ridley Terminals Inc. has announced an expansion of facilities to increase annual shipping capacity from 12 Mtpa to 24 Mtpa by 2015.

Coalspur has reached an agreement with Ridley Terminals Inc. for port allocation that entitles Coalspur up to 10.7 Mtpa on an agreed ramp-up schedule. The term of the agreement is 14 years, with an option to extend 7 years, and will commence in January 2015. Ridley Terminals Inc. is a Canadian federal crown corporation based in Prince Rupert that operates the terminals.

Coalspur has also signed a contract with CN Rail under which they will develop a high-quality logistics supply chain to transport export thermal coal from Coalspur's Vista Coal Project near Hinton, Alberta, to Western Canadian ports starting in January 2015. The contract has a 7 year duration with agreed rail rates and escalations.

19.7 Opportunity for market growth

There is a general expectation that the worldwide demand for thermal coal will exceed supply capabilities due to the expected future coal demand from China, India, Japan and South Korea.

The expected main exporters of thermal coal in the foreseeable future include Indonesia, Australia, China, South Africa, Russia, Columbia and the USA. China is in the process of modernising the coal mining industry and will continue to increase its imports of thermal coal until modernisation of the industry is completed, following which there is the likelihood that China will reduce thermal coal imports. The Chinese government's restrictions on exports are expected to remain for the foreseeable future. Russia is unlikely to increase its contribution to the export market due to the high transport costs. South Africa is not expected to significantly increase its export supply. Colombia and Venezuela are expected to increase export supply; however this will be constrained by current infrastructure. The USA could potentially increase its supply but like Russia, will be constrained by high transportation costs, lack of port capacity and opposition from environmental groups.

Of all suppliers, Australia and Indonesia are expected to see the most significant growth in export supply. The use of coal for power generation in the Asian region is expected to increase with the increase in goods production and economic wealth within the region. It is expected that there will not be significant barriers to entry into the thermal coal export sector for new suppliers of high quality coal products. Strong economic growth in emerging Pacific basin economies, especially in China and India, will ensure that the centre of gravity for thermal trade will become increasingly Asian. In 2008, 62% of seaborne thermal coal was headed to Asia; today, that has become 79%. By 2035, 93% of seaborne thermal coal is expected to be destined for Asia. The impact of this continued shift will be significant on the ocean vessel fleet where trade volume increases will require more vessels and where vessel routing will be impacted. It is expected that an average annual increase in seaborne thermal trade of 34 Mtpa which will result in 2035 levels being 1.1 Btpa greater than those of today. To place this in context, Vista's annual output at 12Mtpa will contribute 0.1% to thermal seaborne trade. In the near and medium term, this increase is almost completely supplied by Asian producers. But, in the long term, increasing amounts of US and Colombian coal will be required as well as other nations. Thus, inter-basin trade flow will increase in the long term.

19.8 Upside opportunities

The rapid industrialisation of China and India and the electrical supply shortfalls that have resulted, coupled with the current perceived risks associated with nuclear power generation, have created an opportunity for alternative sources of power generation such as that from coal. There is continued use of coal for power generation, in particular due to low capital cost for new power plants and low cost of thermal coal relative to other energy sources. However, there continue to be associated environmental concerns.

With the increase in world population and the current increase in the demand for energy, there is the expectation that the demand for all means of electricity generation, including that through coal, will continue to increase at a rate higher than the supply.

20 Environmental Studies, Permitting, and Social or Community Impact

Disclosure relating to the environmental, social and permitting studies is not included with respect to Vista Extension and Vista South as these are early stage projects and no detailed work has been undertaken regarding these topics to this point in time. Everything that follows in this section references the Vista Coal Project only and does not include the Vista Extension or Vista South areas of the project.

20.1 Introduction

In February 2014, the Alberta Energy Regulator ("AER") granted approval for Coalspur's applications under decision 2014 ABAER 004, for an amended coal mine permit, an amended coal processing plant approval and coal mine pit and waste dump licences.

In accordance with this approval, in May 2014 the AER issued amended Coal Mine Permit No. C2011-5A, amended Coal Processing Plant Approval No. C2011-3A, Coal Mine Licence No. C2014-5 to operate a surface mine pit, and Coal Mine Licence No's. C2014-4, C2014-6 and C2014-7 for waste rock dumps. In March 2014, Coalspur's applications under the Environmental Protection and Enhancement Act ("EPEA") and Alberta Water Act ("WA") were transferred to the AER. These applications are currently under review by the AER. Coalspur has also applied for surface dispositions under the Alberta Public Lands Act, which are currently under consideration by the AER.

20.2 Summary of Results of Environmental Studies

A comprehensive set of environmental studies was conducted in the Project area commencing in Q4 2010 and completed in Q1 2012. The objective of these studies was to determine baseline environmental and socio-economic conditions, and then to assess potential impacts of the Project, on its own and in combination with other existing and proposed local development. Fourteen environmental and social aspects were assessed, including noise, air quality, hydrology, surface water quality, aquatic systems (e.g. fisheries, benthics), groundwater, soils and terrain, vegetation and wetlands, wildlife, human health, socio-economic, land uses, traditional uses and historic resources.

The studies consistently concluded that baseline conditions were similar to that of the general area, and there were no unique or critical environmental sites or values. Further, with effective mitigation and environmental management systems in place, the Project would not result in any environmental or social impacts that could materially impact the viability of the Project. These studies were submitted to provincial regulatory agencies, stakeholders and First Nations for review in April 2012. In June 2013 the Provincial regulator concluded that the EA was complete, in January 2014 the last Intervener withdrew their statement of concern on the project, and in February 2014 the Alberta Energy Regulator approved the Project.

20.3 Project Permitting Requirements

20.3.1 Current Permits and Applications

The Vista Coal Project has a regulatory history extending back over 30 years. The eastern portion of the Vista Property in an area that was originally part of the McLeod River Coal Project, received approval from the Government of Alberta in 1983, following the completion of an extensive regulatory process that included an environmental assessment (EA), technical applications to the Energy Resources Conservation Board (ERCB), and a public hearing held by the ERCB. The Provincial approval included a Coal Processing Plant Approval and a Mine Permit to produce 4.2 Mtpa saleable export thermal coal. The Coal Processing Plant Approval and the western half of the Mine Permit were transferred to Coalspur by the Alberta Government in May 2011, as Approval C2011-3 and Permit C2011-5.

In May 2012, Coalspur applied to the ERCB and the Alberta Environment and Sustainable Resource Development (AESRD) for: the amendment of the Mine Permit and Coal Processing Plant Approval and the grant of coal mine pit and waste dump licences under the Alberta Coal Conservation Act (CCA); approval for the construction, operation and reclamation of the Project under the Alberta Environmental Protection Act (EPEA); and approval for construction of water management works and licences for diversion of surface water and groundwater under the Alberta Water Act (WA).

In June 2013, Coalspur's applications under the CCA were transferred to the ERCB's successor, the Alberta Energy Regulator (AER). In February 2014, the AER granted approval for Coalspur's applications under decision 2014 ABAER 004, for an amended coal mine permit, an amended coal processing plant approval and coal mine pit and waste dump licences. In accordance with this approval, in May 2014 the AER issued amended Coal Mine Permit No. C2011-5A, amended Coal Processing Plant Approval No. C2011-3A, Coal Mine Licence No. C2014-5 to operate a surface mine pit, and Coal Mine Licence No's. C2014-4, C2014-6 and C2014-7 for waste rock dumps. In March 2014, Coalspur's applications under the EPEA and WA were transferred to the AER. These applications are currently under review by the AER. Coalspur has also applied for surface dispositions under the Alberta Public Lands Act, which are currently under consideration by the AER.

In June 2013, Canadian National Railway Company (CN) obtained authorization under the Fisheries Act for the construction of culverts over some of the streams that may be impacted by the railway siding. In August 2013, the Canadian Transportation Agency (Agency) granted an approval to CN under the Canada Transportation Act, to construct a railway siding to support and service the Project.

20.3.2 Future Permit Applications

The Vista Coal Project is planned to be developed as two sequential phases – Phase 1 and Phase 2. Phase 1 will use Coalspur's existing Mine Permit (C2011-5A) and Coal Processing Plant Approval (C2011-3A) as a regulatory base to obtain the approvals described above for the construction, operation and reclamation of a 5.0 Mtpa operation. The Vista Project Phase 1 designs and plans do not require any Federal permits or approvals that would necessitate initiating the EA process defined by the Canadian Environmental Assessment Act.

Subsequent to obtaining all approvals/permits for Phase 1, Coalspur will initiate the regulatory process for Phase 1 of the Vista Coal Project. Phase 2 will involve expanding the Mine Permit and increasing the mining rate, adding a second module to the coal processing plant and expanding ancillary facilities as necessary. It is anticipated that Phase 2 will require applications to the AER to amend Mine Permit C2011-5A to include the remaining Vista coal leases to the west of the existing Mine Permit; amend the Coal Processing Plant Approval C2011-3Ato include the additional processing module to increase coal processing capacity up to 11.2 Mtpa; and grant the necessary coal mine pit and waste dump licences for a second mining area in the expanded Mine Permit. Phase 2 of the Project will also require a new EA and applications to amend the EPEA and WA approvals and permits issued for Phase 1 of the Vista Coal Project.

Coalspur and its consultants will identify specific Project aspects where Federal agencies have regulatory authority and where the potential exists for authorisations and/or permits. Terms of reference documents will be prepared to address the requirements of the Federal EA Act, in order to assist Federal agencies to make a decision regarding their regulatory involvement in the Project. The primary areas of interest include the Fisheries Act, the Navigable Waters Protection Act and the Explosives Act. The technical review will also include the Species At Risk Act. Similar to Phase 1, Coalspur will work diligently to minimize environmental impacts, but given recent changes to the federal process requiring Comprehensive Studies for any coal project producing greater than 3,000 metric tonnes per day, Coalspur believes that Phase 2 of the Project will trigger the requirement for regulatory approvals from Federal agencies.

20.3.3 Mine Financial Security Program (MFSP)

Upon receipt of an approval under the EPEA, Coalspur will be required to post reclamation security as determined by the Mine Financial Security Program (MFSP). A fundamental principle of the MFSP is that the EPEA approval holder is responsible to carry out suspension, abandonment, remediation and surface reclamation work to the standards established by the Province of Alberta and to maintain care-and-custody of the land until a reclamation certificate has been issued. The approval holder must have the financial resources to complete these obligations.

Assets under the MFSP represent the estimated financial capability of an approval holder’s project to address its future obligations. The approval holder will be required to submit its financial security estimate to the AENV Director no later than June 30 of each year. The amount of the financial security will be based on the MFSP liability calculations. The approval holder’s Chief Executive Officer, Chief Financial Officer or Designated Financial Representative must certify the MFSP liability calculation data provided by the approval holder in respect of the MFSP. The initial liability calculation will be based on forecast disturbance to the end of the first year following EPEA approval.

20.3.4 Social or Community Related Requirements and Plans

Regulatory processes for coal mines in Alberta require extensive public involvement and Aboriginal consultation programmes. These programmes were initiated in the Fourth Quarter of 2010 and have continued since then. Coalspur has held four sets of formal open houses in Hinton in addition to a significant number of informal meetings and discussions to keep the public informed about the progress of the Project. The community input has been used to assist Coalspur with selection of various options for the design of infrastructure facilities and locations. In addition, the AER held a public hearing related to Coalspur's applications for approval under the CCA, which was held in two parts: the first in Calgary, and the second in Hinton. Public involvement will continue throughout the regulatory process and subsequent operational life of the Project.

Aboriginal consultation activities were initiated in the Fourth Quarter of 2010 and have continued since then. The emphasis has been to work with potentially affected communities to complete traditional use studies for the proposed Project area to assist Coalspur in the preparation of its EA. Consultation will continue throughout the development and operational life of the Project with an emphasis on developing better understanding of impacts, accommodation and mitigation actions, and other programmes and commitments needed to fully address Aboriginal issues. Coalspur has entered into binding agreements related to the Project with six Aboriginal groups, each of which has given its written support for the Project. In July 2014, the Aboriginal Consultation Office of the Government of Alberta determined that First Nations consultation for Phase 1 of the Project was adequate.

20.3.5 Requirements and Plans for Waste and Tailings Disposal, Site Monitoring and Water Management

Mining and waste rock sequencing will be integrated to ensure efficient waste rock removal and to maximize back-filling of mined out areas. Waste rock will be removed by large off road haul trucks and initially hauled to external rock dumps located along the south side across McPherson Creek, along the McPherson subcrop, and to the north of the pit. Once sufficient exposed pit floor is available, the waste rock will be dumped back in the pit. Upon completion of the initial cuts, a backfill waste disposal plan will be used in order to keep waste haul distances short, minimize the area disturbed by mining, and enable progressive reclamation so as to reduce overall reclamation costs and to reduce final reclamation efforts. On the north side of the pit, the toe of the dump will be offset from the pit crest by a minimum distance of 100 m. Waste dumps located on the south side will be offset from McPherson Creek by a minimum distance of 100 m. These offset distances are preliminary and may be increased upon further geotechnical evaluations in future studies.

A conveyor will collect all of the coarse refuse material from the wash plants and send it to the rejects bin located east of the plant location. A haul truck will transport this material from the rejects bin to one of the mine waste dumps.

Coalspur has now incorporated belt press systems to facilitate co disposal of CPP fines into the normal waste stream, thus eliminating the need for the fines settling pond systems discussed in earlier permitting.

The following permits and licences have been received; Coal Mine Permit No. C2011-5A, amended Coal Processing Plant Approval No. C2011-3A, Coal Mine Licence No. C2014-5 to operate a surface mine pit, and Coal Mine Licence No's C2014-4, C2014-6 and C2014-7 for waste dump licences, contains a number of conditions or requirements with which Coalspur will comply, in addition to the requirements of existing regulations and guidelines relating to surface and groundwater management and testing, as well as to the construction, management and monitoring of the end pit lake and waste rock dumps.

20.3.6 Mine Closure Requirements

A comprehensive land reclamation plan has been prepared for the Vista Project, and approved by AER. Reclamation will be progressive throughout operations of the Project and, as the mine plan is revised, the reclamation plan will be updated in conjunction with the mine plan. The primary reclamation goal of the Project is to return the lands to a capability that is equivalent to predevelopment conditions and consistent with end land use objectives. The key components of the reclamation plan that will ensure these goals are met include:

- a soil conservation plan to ensure the Project has sufficient coversoil to achieve equivalent land capability. This plan includes salvaging and replacing both upland soils and organic soils, adding diversity to the reclaimed mine soils
- the reclamation plan emphasizes productive upland forest ecosystems and landforms, with the inclusion of interspersed small wetlands and an end pit lake
- a significant amount of direct coversoil replacement is a key aspect of re-establishing ecological diversity on the reclaimed landscape
- vegetation patterns will be self-sustaining and similar in ecological function and species assemblage to what existed prior to disturbance, commencing with early seral stages that are capable of ecological succession
- progressive reclamation allows for approximately two thirds of the disturbance area to be reclaimed by the time of mine closure
- an end pit lake will outflow to McPherson Creek and will provide enhanced fish habitat
- input from stakeholders and Aboriginal communities has been used to develop and refine reclamation objectives; and
- an extensive monitoring and assessment program will support the incorporation of adaptive management into all development and reclamation activities.

21 Capital and operating costs

Disclosure relating to the capital and operating costs is not included with respect to Vista Extension and Vista South as these are early stage projects and no detailed mine design work has been undertaken to this point in time.

21.1 Capital cost summary

The estimated capital costs for the Vista Coal Project are shown on Table 21-1. Construction begins in 2014 and is completed by the end of 2017 to coincide with mine start up. Direct construction costs for the Coal Preparation Plant (CPP) and related facilities are covered by a lump sum EPC contract negotiated by Coalspur with Sedgman and other costs are as shown.

The initial and sustaining mine equipment will be procured by the contract mining company (Theiss) as part of their contractual requirements and is not included in the capital costs of the project. The estimated cost of adding Phase 2 is $ 258 Million to which a 15% contingency was added.

Table 21-1 Total Capital Costs ($ thousands)

	2014	2015	2016	2017	2018	2019	2020
Site prep		45,744	22,908				
Infrastructure		9,004	15,065				
CPP	31,245	198,410	82,174	1,562		100,000	158,000
Load out		17,245	11,567				
Owners cost	836	5,395	5,364	475			
Contingency			60,958	6,773		15,000	23,700
Total Capital	32,081	275,798	198,036	8,810		115,000	181,700

21.2 Basis of estimate

The capital costs are estimated in 1st quarter 2014 Canadian Dollars and no allowances have been made for escalation. Equipment and materials pricing was sourced in Canadian, US, and in some instances Australian dollars. An exchange rate of 1$CDN =0.89$US=1$AUS has been assumed.

Contingencies have been assigned to each cost area on the basis of pricing confidence and cost risk. The total average contingency for the project is 15 %.

Labour costs were based on local union agreements and allocations for LOA and travel have been included. It has been assumed that construction will proceed on the basis of a 70 hour work week and overtime premiums have been included.

21.3 Mine operating costs

This technical report is based on all mining and related maintenance activities being carried out by Theiss in a mine contract which has been negotiated by Coalspur. The contract costs for mining are based on a cost per unit (tonne, cubic metre, length etc) basis as demonstrated on Table 21-2. There is a potential for Coalspur to change this contractual arrangement in the future by taking over the mining activities from Theiss but this potential is not included in the technical report. An estimate of post-mining final rehabilitation costs on an annual basis according to the work effort required was also included.

Theiss completed a detailed mine plan which has been reviewed by Snowden in order to estimate the mine operating costs used in this technical report.

Table 21-2 Mining unit contractor rates

Item	Units	Cost
Waste stripping	BCM t	$2.04
Ore load	t	$1.63
Waste load and haul	BCM	$ 1.92
Ore hauling	t	$1.87
Drill and blast	BCM	$0.73
Maintenance and supervision	month	$18,500,000
Rejects haul	t	$0.74
Haulroad construction	km	$1,441,823

21.4 Plant operating costs

The operating cost for the designed coal preparation and handling plant for the life of mine have been estimated in Canadian dollars and is based on all mill operation and maintenance being carried out by Sedgmann in a mill operations contract negotiated by Coalspur. Total processing cost for coal through the CPP is approximately $7.79 / clean metric tonne (CMT) incusive of a 10% contingency.

21.5 Vista Coal Project total operating costs

The total annual operating costs by year up until the end of 2022 is shown on Table 21-3. After 2022 the annual costs remain level for the remainder of the mine life with minor variations due to quantities mined and milled.

Table 21-3 Annual operating costs

	2016	2017	2018	2019	2020	2021	2022
Coal processing	29,729	51,312	51,361	51,369	51,243	82,299	96,482
Mining cost	164,995	167,088	150,323	149,726	148,185	308,565	441,468
Mine environmental		357	3,450	2,724	4,026	1,966	1,220
General and Admin	7,260	14,979	17,765	23,090	22,942	22,978	22,819
Operating supplies	9,025	15,459	15,548	15,180	15,180	24,411	29,655
Total	201,984	233,736	222,899	226,909	226,396	415,808	561,989

22 Economic Analysis

Disclosure relating to the project economics is not included with respect to Vista Extension and Vista South as these are early stage projects and no detailed cash flow analysis work has been undertaken to this point in time.

22.1 Cash flow model

A cash flow model was developed by Snowden in 2012 to allow an after tax economic evaluation of the Vista Coal Project. The model was updated to ensure that the taxation considerations were consistent with current Revenue Canada regulations. For the current work Snowden updated the model with new cost and coal pricing data and recalculated the economic results are shown in Table 22-1.

Table 22-1 After tax royalty economic results

Item	Value
Internal rate of return	10.6%
Net present value at 0%	$ 1,971 million
Net present value at 5 %	$ 548 million
Net present value at 8%	$ 182 million
Net present value at 10%	$ 35 million
Supply cost	96.6% of base case price
Payback	10 years
Mine life	29 years

The internal rate of return before taxes and royalties is 12.6%.

The supply cost of a project is that flat commodity price which reduces the net present value at a given discount rate to $0. In other words it is that commodity price for which the project rate of return is equal to the hurdle rate. In the case of the Vista Coal Project, it will have an 8% rate of return when the average LOM coal price is reduced to 92.1% of the base case coal price forecast.

The coal selling price that was used is the Base Case price as developed by Wood Mackenzie coal consulting (published November 2013) and adjusted for calorific value to a product price was used along with all the other input assumptions. A deduction of $33.69 was applied to the Export coal price for rail transport and port costs based on negotiated contracts with the rail line and port facility. For the purposes of this study, it is assumed that all coal will be sold on the international market. An adjustment to the selling price for each coal price was made based on the actual calorific value from the mine model compared to the calorific value assumed by Wood Mackenzie for their study as illustrated below.

$$Forecast\ price\ \ Product\ 1 = \frac{Actual}{5800} \times \text{Wood Mackenzie Price}$$

$$Forecast\ price\ \ Product\ 2 = \frac{Actual}{5550} \times \text{Wood Mackenzie Price}$$

The capital and operating costs that had been derived by Coalspur consistent with the change in operating strategy were checked and validated and entered into the model. The average annual cash flow forecast is shown in Table 22-2.

These NPV results are impaired relative to the 2012 economics largely due to the drop in coal price forecast. Coalspur has significantly reduced capital costs, and capital risk through an EPC contract approach and have held benchmarked reasonable operating costs while developing into largely a contractor operation.

Federal income taxes and Alberta income taxes were calculated at 15% and 10% of taxable income respectively. No inflation, interest or financing costs were applied to this analysis.

The economic modelling for this project was both deterministic, and based on a Monte Carlo approach used to evaluate the impact of variability in some of the key input parameters to the mine economics.

22.2 Discount rate

The cash flows in the cash flow model were discounted at 0% (Constant Dollar rate), 5% and 8%. Coalspur is a project development company at this time and so the 8% discount rate does not represent a corporate or operating cost of capital but rather is considered to be a risked rate of return suitable to an investment of this magnitude.

22.3 Fiscal terms/taxation

The exchange rate in the financial model was assumed to be US $0.90 to Canadian $1.00 based on a projection of long term exchange rates.

Alberta Coal Royalties were expensed as 1% of the project Gross Revenue each year plus 13% of the Net Revenue after the capital payback period. The 13% is calculated on the Net Revenue after the Gross royalty is deducted. The project specific Tanager Royalty was applied as 1% of gross sales from the Hinton East and Hinton West claim blocks. All capital expenditures were assigned to their appropriate capital cost allowance pools and the pools were depreciated at the appropriate declining rate to arrive at the annual taxable income for the project.

Federal income taxes and Alberta income taxes were calculated at 15% and 10% of taxable income respectively.

No interest or financing costs were applied to this analysis.

22.4 Inflation

No inflation factor was applied to the analysis. The escalation of costs and revenues were assumed to be equal throughout the life of the project.

Table 22-2 Vista Coal Project cashflow forecast ($,000)

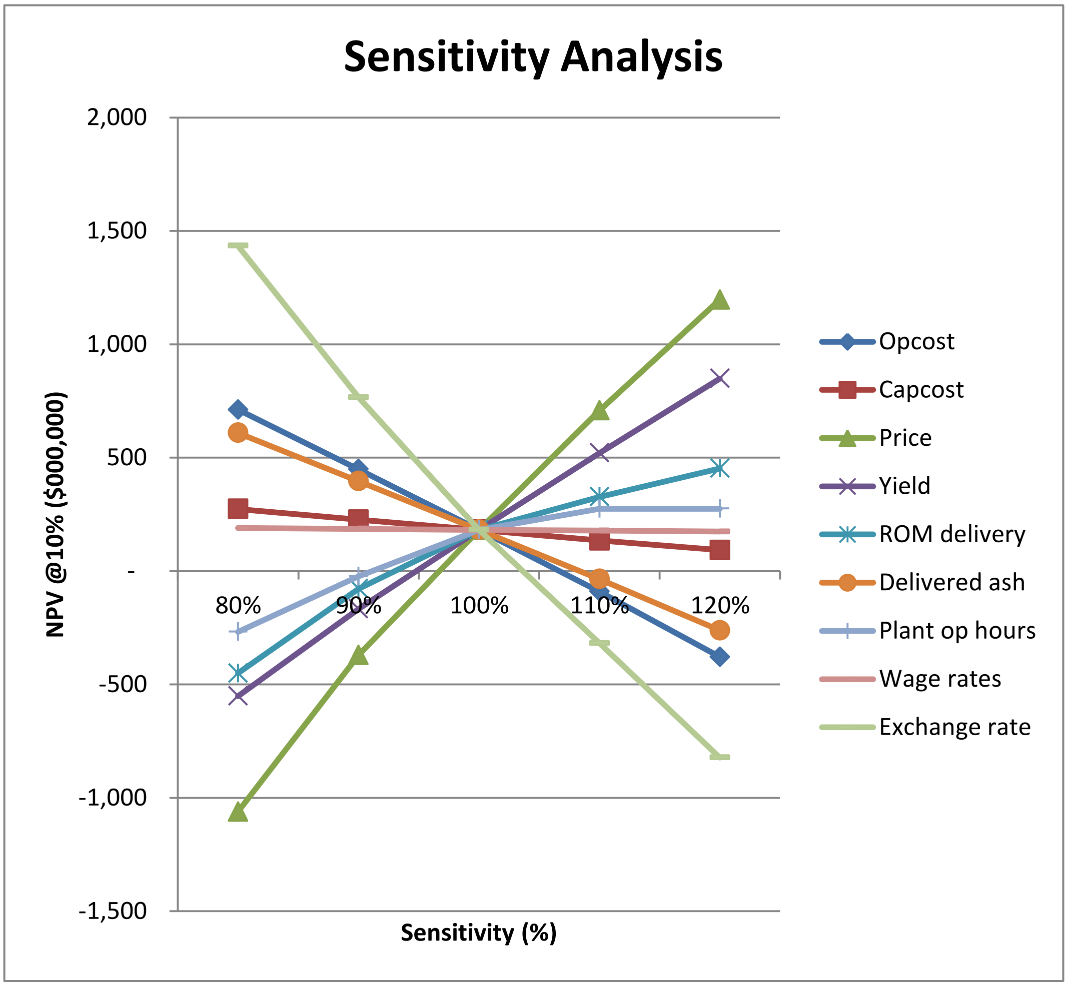
	2,014	2,015	2,016	2,017	2,018	2,019	2,020	2,021	2,022	2023 - 2032	2033 - 2043
+ Revenue	-	-	140,341	325,812	296,643	284,238	318,212	487,857	571,583	7,081,561	5,056,928
- Operating costs	-	-	201,984	233,736	222,899	226,909	226,396	415,808	561,989	5,378,266	3,429,658
- Interest	-	-	-	-	-	-	-	-	-	-	-
- Bonding costs	-	-	-	-	-	-	-	-	-	-	-
- Capital costs	32,081	275,798	198,036	8,810	-	100,000	158,000	-	-	-	-
- Accounts receivable/payable	-	-	3,234	13,939	1,952	1,184	2,813	6,159	874	21,157	37,068
- Annual change to supplies and stores	-	5,000	-	-	-	-	-	-	-	-	5,000
= Cash flow before taxes	32,081	280,798	262,914	69,326	75,697	41,487	68,997	65,889	8,720	1,682,137	1,664,339
Cumulative Cash Flow before Taxes and Royalties	32,081	312,879	575,792	506,466	430,769	472,256	541,254	475,364	466,644	1,874,417	26,519,825
- Income tax	-	-	-	-	-	-	-	-	-	239,361	332,786
- Project Specific Tanager royalty	-	-	-	-	907	1,926	1,394	2,101	2,006	38,263	59,600
- Alberta Coal Royalty	-	-	-	931	726	555	904	751	117	152,457	185,365
= Cash flow after tax	32,081	280,798	262,914	68,595	74,971	42,042	69,902	65,138	8,603	1,290,319	1,146,187
+ Loan: Principal received	-	-	-	-	-	-	-	-	-		-
- Principal repayments	-	-	-	-	-	-	-	-	-	-	-
= Total cash flow	32,081	280,798	262,914	68,595	74,971	42,042	69,902	65,138	8,621	1,290,319	1,146,187

22.5 Sensitivity of changes to input parameters analysis

It is important to determine the sensitivity of the economic results to variations in input parameters in order to understand the conditions under which the project will not be economic. A deterministic sensitivity analysis was carried out by varying the input values and calculating a new net present value. The results of this analysis are shown in Figure 22-1.

It is seen from this analysis that the project economic results are very sensitive to changes in the operating cost, plant operating hours, coal price and the US$ exchange rate.

Figure 22-1 Sensitivity of economic variables



22.6 Monte Carlo analysis

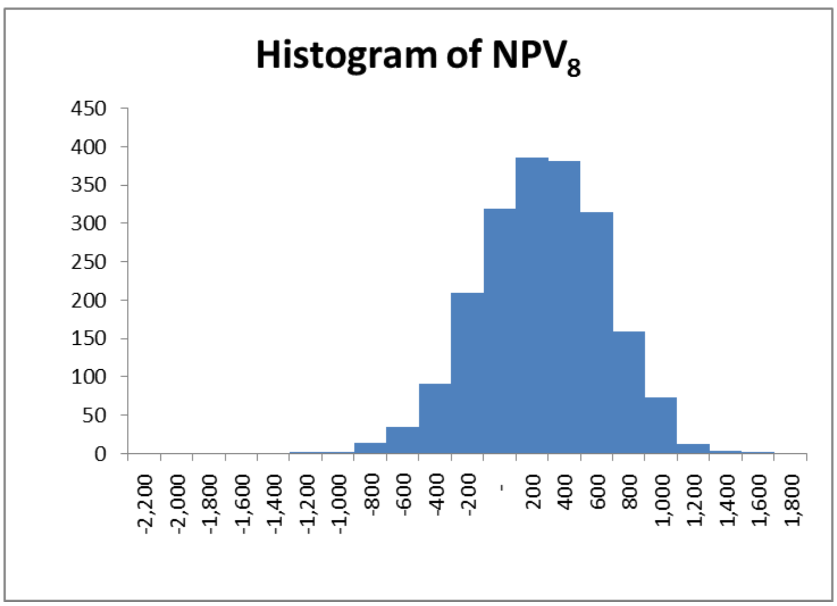
A Monte Carlo probabilistic assessment was made of the economic results to test the robustness of the project when key input variables are allowed to change simultaneously. Each of the selected input variables shown in Table 22-3 was defined by a triangular frequency distribution whose values were determined during an all-party discussion at a three day project workshop held during the Feasibility Study period.

Table 22-3 Monte Carlo Factors

Input Factor	Basis	Probability that real value is less than…		
		10%	50%	90%
Opcost sensitivity	times base case	0.80	0.90	1.00
Capcost sensitivity	times base case	0.90	1.00	1.50
Price sensitivity	times base case	0.85	1.00	1.10
Yield sensitivity	times base case	0.85	1.00	1.05
ROM delivery	times base case	1.10	0.98	0.85
Loss/dilution	times base case	1.10	1.12	1.15
Delivered ash	times base case	0.97	1.00	1.09
Exchange rate	times base case	0.90	1.00	1.06
Plant Production	Mtpa	11.5	11.0	10.0
Plant operating hours	times base case	1.06	1.00	0.985
Wage rates	times base case	0.90	1.00	1.15
Thickener underflow	solids % density	0.40	0.35	0.25
Return water	% of available	0.35	0.40	0.50
Clean coal conveyor	Mtpa	15	13	11

The Monte Carlo Results are shown in Figure 22-2.

Figure 22-2 Monte Carlo results



From this analysis it can be seen that, on a risked basis, the median project NPV_8 drops from \$182 million to \$174 million and there is a 34% probability that the project will earn a negative net present value (rate of return is less than 8%).

22.7 Discussion of economic results

The deterministic assessment of the project indicates that it has an internal rate of return which is above the 8% risked project rate of return and the annual net cash flows are sufficient to meet the project's cash requirements.

The project economics are elastic in reference to changes in the exchange rate, coal price, operating cost and plant hours. The economic return is less sensitive to changes in the other variables.

The supply cost value of 96.6% of base case coal prices suggests that relatively small disturbances in coal markets may have dramatic impacts on the project economics and the project return can slip below the hurdle rate of eight percent. The Monte Carlo analysis is designed to test the sensitivity of the project economics under the assumption that it is difficult, if not impossible, to determine the important project input values with a high degree of accuracy.

It can be seen from this frequency distribution that the deterministic net present value is higher than the median Monte Carlo value which not surprising given that the frequency distributions of the variables which were chosen to be tested are all skewed towards having a higher probability of a more negative result. The important information to be derived from this analysis is that based on the assumptions herein, there is a 21% probability of the project not meeting the 8% hurdle rate.

By definition, Marketable Reserves must be sourced from Measured and Indicated Resources over which the mine plan has been cast and have been included into the technical and financial evaluation and resulted in an NPV greater than zero. The production estimates contained herein include projected production tonnes sourced entirely from Proven and Probable Marketable Reserves in line with NI43-101 requirements.

23 Adjacent Properties

Coal at the Coalspur Coal Properties is within the Coalspur Formation of the Upper Cretaceous-Tertiary Saunders Group in west central Alberta. The Coalspur Formation continuously underlies the area from north of Hinton, south-eastward to Coal Valley, about 100 km away. In the Coal Valley area, the coal seams dip between 20° and 40°. Following the Coalspur trend to the northwest, the dip angle varies from 6° in the Hinton East area to 16° near the McLeod River.

Sherritt International Corp. (Sherritt) produced 3.7 Mt of thermal coal from its Coal Valley mine in 2008 which was publically disclosed in the Sherritt 2008 Annual Report. The majority of Sherritt’s coal is sold on the world export market. An on-site processing plant crushes, cleans and dries the coal before it is shipped by rail to port. The seams mined at Coal Valley correlate to those at the Vista Coal Property, although seam terminology is different. Sherritt is applying to develop three more areas near Coal Valley: Mercoal West, Yellowhead Tower, and Robb Trend.

Sherritt also owned and operated the Obed Mountain Mine 25 km northeast of Hinton. The coal at Obed Mountain is in the Paskapoo Formation, which is lower rank and stratigraphically above the Coalspur Formation.

Per a Marketwired news release issued by Sherritt on December 24, 2013, it was announced that Westmoreland Coal Company (“Westmoreland”) will acquire Sherritt's operating coal assets, currently described as the Prairie and Mountain Operations, for total consideration of $465 million. The $465 million is comprised of $312 million in cash and the assumption of capital leases presently valued at $153 million, subject to closing adjustments. This transaction has since closed.

The parties are seeking to close the coal transaction in 2014. It is being effected pursuant to a plan of arrangement, pursuant to the Business Corporations Act (Alberta). The transaction is subject to customary closing conditions and consents, including applicable Competition Bureau, Investment Canada Act and court approvals. Post-closing, Sherritt will continue to work with Westmoreland on the Obed Mountain Mine remediation plan, and will continue to meet all financial obligations resulting from the October Obed Mountain Mine containment pond breach.

The authors of this technical report have not verified the information in Sherritt’s 2008 Annual Report and the information therein is not necessarily indicative of the mineralization on the Vista Coal Property. As well, no information derived from Coal Valley was used exclusively to derive design or costs for Vista.

24 Other Relevant Data and Information

There is no other relevant data or information that needs to be added to complete this Technical Report.

25 Interpretation and Conclusions

25.1.1 The Vista Coal Project

On the basis of the results of the feasibility study and this review of the additional work completed to date it is concluded that:

- The Vista Coal Project has sufficient (quantity and quality) open pit Coal Resources to yield 11.5 Mtpa of saleable thermal coal products to the international coal market at full production, with a mine life of 25 years.
- There are sufficient Proven Coal Reserves to cover the capital investment payout period of 19.6 years.
- The project, with all related infrastructure requirements included, is technically and economically feasible at the coal price assumptions used in this technical report.
- The revised operating and contracting strategy has significantly de-risked the project to capital and operating cost exposure.

25.1.2 Vista Extension

On the basis of the limited exploration available for Vista Extension but considering that the project represents the down-dip continuation of the Vista Coal Project, it represents a worthwhile target for continued exploration.

25.1.3 Vista South

On the basis of the results of the historical exploration and the limited recent exploration undertaken by Coalspur, this property remains a target for continued exploration and mining studies.

26 Recommendations

26.1.1 The Vista Coal Project

The following recommendations are for refinement and optimisation during detailed design. The conclusions of this technical report are not contingent upon positive results of the recommendations below.

It is recommended that:

- a more detailed mine plan across all areas be completed to address;
  - the AER recommendations and conditions
  - evaluate optimised mining and allow more rapid reclamation, smaller out of pit waste dumps, more flexible mining for product optimisation, and reduce mining costs
- further fines flotation tests are carried out to support the decision not to install a flotation circuit
- a groundwater management plan should be instituted prior to construction to understand and design the system

The estimated costs of this proposed program of work is shown on Table 26-1.

Table 26-1 Recommended additional programs

Item	Cost
Detailed mine plan for the LOM	$250,000
Fines flotation testwork	$50,000
Groundwater management plan	$100,000
Total	$400,000

26.1.2 Vista Extension

On the basis of the results and interpretations for Vista Extension, Snowden recommends a detailed and phased exploration programme for this property.

This phased exploration should concentrate on the areas immediately north of the Vista Coal Project where the down-dip extension of the target coal seams can be potentially exploited by underground mining methods accessing the coal from highwall portals.

26.1.3 Vista South

It is recommended that continued exploration is carried out at this site. There is a significant potential to define both surface and underground mineable coal within this project.

27 References

Fletcher, I.S. and Sanders, R.H., 2003	Estimation of *In Situ* Moisture of Coal Seams and Product Total Moisture, ACRAP Project No. C10041 (**www.acarp.com.au**)
Moose Mountain Technical Services, 2012	Resource Estimate for the Vista Coal Property, West Central Alberta (**www.sedar.com**)
Wardrop (a TetraTech Company), 2011	Vista Coal Project Prefeasibility Study, JORC/NI43-101 Technical Report – Hinton, Alberta, Canada (**www.sedar.com**)
Snowden Mining Industry Consultants, 2012	Feasibility Study of the Vista Coal Project, Hinton, Alberta (**www.sedar.com**)
Golder Associates, 2012	Updated Resource Estimate for the Vista Coal Project – Hinton, Alberta, Canada (**www.sedar.com**)
Coalspur Mines Limited, 2014	BMO 23rd Global Metals and Mining Conference (**www.coalspur.com**)
Coalspur Mines Limited, 2014	Coalspur Announces Alberta Energy Regulator Approval of Vista Project (**www.coalspur.com**)

28 Certificates of Qualified Persons

CERTIFICATE of QUALIFIED PERSON

a) I, Grant van Heerden, Principal Consultant – Coal, of Snowden Mining Industry Consultants Pty Ltd, 2 Burke Street, Woolloongabba, Brisbane, QLD, 4102, Australia, do hereby certify that:

b) I am the co-author of the technical report titled "The Coalspur Coal Projects, Hinton Alberta" dated 31 July 2014 (the 'Technical Report') prepared for Coalspur Mines Limited.

c) I graduated with the following degrees: BSc Geology & Chemistry; BSc Chemistry (Honours); GDE (Mining Engineering).

I have worked as a geologist continuously for a total of 18 years since my graduation from university. I have recent relevant experience in Coal Geology and Exploration, Coal Mining Engineering, Coal Resource and Coal Reserve Estimation and Classification, Coal Beneficiation and Washability Analysis, and Public Reporting.

As an exploration and mining geologist, I have been responsible for:

- Planning, execution, and management of coal exploration programmes
- Run of Mine Production Grade Control
- Grade Control through Coal Beneficiation Plants
- Contributions to Mining Feasibility Studies as a function of Geology (structure and grade)

I am a Registered Professional Geologist, Pr.Sci.Nat. in good standing with the South African Council for Natural Scientific Professions (SACNASP) registration number 400073/03 and I am member in good standing of the Geological Society of South Africa (GSSA), and the Australasian Institute of Mining and Metallurgy (AusIMM).

I have read the definition of 'qualified person' as set out in National Instrument 43-101 ('the Instrument') and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfil the requirements of a 'qualified person' for the purposes of the Instrument. I have been involved in Coal Resource evaluation (exploration and mining) practice for 18 years.

d) I have not made a current visit to the Coalspur Coal Projects site.

e) I am responsible for the compilation of the entire Technical Report, and in particular the technical information pertaining to Items 1 through 14 inclusive, and 23 through 27 inclusive, of the Technical Report.

f) I am independent of the issuer as defined in section 1.5 of the Instrument.

g) I have not had prior involvement with the property that is the subject of the Technical Report.

h) I have read the Instrument and Form 43-101F1, and the Technical Report has been prepared in compliance with the Instrument and Form 43-101F1.

i) As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all the scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signed at Brisbane, Australia, this 31st day of July, 2014.

[Grant van Heerden]

Grant van Heerden, Pr.Sci.Nat, MGSSA, MAusIMM

CERTIFICATE of QUALIFIED PERSON

a) I, Paul Raymond Franklin, Principal Consultant of Snowden Mining Industry Consultants Pty Ltd., 600 - 1090 West Pender St., Vancouver, British Columbia, Canada, do hereby certify that:

b) I am the co-author of the technical report titled "The Coalspur Coal Projects, Hinton Alberta" dated 31 July 2014 (the 'Technical Report') prepared for Coalspur Mines Limited.

c) I graduated with the following degree: Bachelor of Geological Engineering, from the University of Saskatchewan (1974).

I am a Member in good standing of the Association of Professional Engineers and Geoscientists of Saskatchewan member No. 04998.

I have worked as an engineer continuously for a total of 39 years since my graduation from university. I have particular experience in open pit mine design and economics.

I have read the definition of 'qualified person' set out in National Instrument 43-101 ('the Instrument') and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfill the requirements of a 'qualified person' for the purposes of the Instrument. I have been involved in mining and Coal Resource and Coal Reserve evaluation consulting practice for 22 years.

d) I have not made a current visit to the Coalspur Coal Projects.

e) I am responsible for the preparation of Sections 21 and 22 of the Technical Report.

f) I am independent of the issuer as defined in section 1.5 of the Instrument.

g) I have had prior involvement with the property that is the subject of the Technical Report.

h) I have read the Instrument and Form 43-101F1, and the Technical Report has been prepared in compliance with the Instrument and Form 43-101F1.

i) As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all the scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signed at Saskatoon, Saskatchewan, this 31st day of July, 2014.

[Paul Franklin]

Paul Franklin, P. Eng.

CERTIFICATE of QUALIFIED PERSON

a) I, Murray Lytle, P.Eng. of Snowden Mining Industry Consultants Pty Ltd., 600 - 1090 West Pender St., Vancouver, British Columbia, Canada, do hereby certify that:

b) I am a co-author of the technical report titled "The Coalspur Coal Projects, Hinton, Alberta" dated 31 July 2014 (the 'Technical Report') prepared for Coalspur Mines Ltd.

c) I graduated with a Bachelors degree in Mineral Engineering from the University of British Columbia (1976), a Masters degree in Mineral Engineering (Resource Economics) from the University of British Columbia (1984) and a PhD in Mineral Engineering (Corporate Social Responsibility) from the University of British Columbia (2014, pending).

I am a Member in good standing of the Association of Professional Engineers and Geoscientists of Alberta (#31308).

I have worked as a engineer continuously for a total of 38 years since my graduation from university. I have particular experience in coal mining having worked at 4 mines in Canada and South America.

I have read the definition of 'qualified person' set out in National Instrument 43-101 ('the Instrument') and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I have been involved in mining and reserve evaluation and fulfil the requirements of a 'qualified person' for the purposes of the Instrument.

d) I made a visit to the Vista Coal Projects site near Hinton Alberta on June 13, 2014.

e) I am responsible for the preparation of Sections 15 to 20 of the Technical Report. I also assisted with Sections 1, 25 and 26.

f) I am independent of the issuer as defined in section 1.5 of the Instrument.

g) I was involved in the development of the Bankable Feasibility Study for the Vista Coal Project in 2012 and since that time have not had any involvement with the property that is the subject of the Technical Report.

h) I have read the Instrument and Form 43-101F1, and the Technical Report has been prepared in compliance with the Instrument and Form 43-101F1.

i) As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all the scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signed at Calgary, Alberta, this 31 day of July 2014.

[Murray Lytle]

Murray Lytle, P.Eng.,

29 Date and signatures

[Grant van Heerden]	[Murray Lytle]
Grant van Heerden, Pr.Sci.Nat, MGSSA, MAusIMM	Murray Lytle, P.Eng.
31 July 2014	31 July 2014
Date	Date

[Paul Franklin]	
Paul Franklin, P.Eng.	
31 July 2014	
Date	

COMPETENT PERSON'S CONSENT FORM

Pursuant to the requirements of ASX Listing Rules 5.6, 5.22 and 5.24 and
Clause 8 of the JORC Code 2004 Edition (Written Consent Statement and
Clause 9 of the JORC Code 2012 Edition (Written Consent Statement)

Report name

The Coalspur Coal Projects, Hinton, Alberta

(*Insert name or heading of Report to be publicly released*) ('Report')

Coalspur Mines Limited

(*Insert name of company releasing the Report)*

Coalspur Coal Projects

(Insert name of the deposit to which the Report refers)

31 July 2014

(Date of Report)

STATEMENT

I,

Grant van Heerden

(*Insert full name(s)*)

confirm that I am the Competent Person for the Report and:

- The information pertaining to this report was first disclosed under the JORC Code 2004. It has not been updated since to comply with JORC Code 2012 on the basis that the information has not materially changed since it was last reported.
- I have read and understood the requirements of the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code, 2012 Edition).
- I am a Competent Person as defined by the JORC Code, 2012 Edition, having five years' experience that is relevant to the style of mineralisation and type of deposit described in the Report, and to the activity for which I am accepting responsibility.
- I am a Member in a good standing of the Geological Society of South Africa, I am a Registered Professional Geologist, Pr. Sci.Nat., with the South African Council for Natual Scientific Professioins, registration number 400076/03 and I am a member in good standing of the Australasian Institute of Mining and Metallurgy.
- I have reviewed the Report to which this Consent Statement applies.

I am a full time employee of

Snowden Mining Industry Consultants Pty Ltd

(Insert company name)

and have been engaged by

Coalspur Mines Limited

(Insert company name)

to prepare the documentation for

The Coalspur Coal Projects

(Insert deposit name)

on which the Report is based, for the period ended

31 July 2014

(Insert date of Resource/Reserve statement)

I have disclosed to the reporting company the full nature of the relationship between myself and the company, including any issue that could be perceived by investors as a conflict of interest.

CONSENT

I consent to the public release of the Report and this Consent Statement by the directors of:

Coalspur Mines Limited

(Insert reporting company name)

[Grant van Heerden]	31 July 2014
Signature of Competent Person:	Date:
Geological Society of South Africa	**964585**
South African Council for Natural Scientific Professions	**400076/03**
Australasian Institute of Mining and Metallurgy	**316391**
Professional Membership: *(insert organisation name)*	Membership Number:
[David Lawrence]	David Lawrence, Brisbane, Australia
Signature of Witness:	Print Witness Name and Residence: (eg town/suburb)

COMPETENT PERSON'S CONSENT FORM

Pursuant to the requirements of ASX Listing Rules 5.6, 5.22 and 5.24 and
Clause 8 of the JORC Code 2004 Edition (Written Consent Statement and
Clause 9 of the JORC Code 2012 Edition (Written Consent Statement)

Report name

The Coalspur Coal Projects, Hinton, Alberta

(*Insert name or heading of Report to be publicly released*) ('Report')

Coalspur Mines Limited

(*Insert name of company releasing the Report)*

Coalspur Coal Projects

(Insert name of the deposit to which the Report refers)

31 July 2014

(Date of Report)

STATEMENT

I,

Murray Lytle

(*Insert full name(s)*)

confirm that I am the Competent Person for the Report and:

- The information pertaining to this report was first disclosed under the JORC Code 2004. It has not been updated since to comply with JORC Code 2012 on the basis that the information has not materially changed since it was last reported.
- I have read and understood the requirements of the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code, 2012 Edition).
- I am a Competent Person as defined by the JORC Code, 2012 Edition, having five years' experience that is relevant to the style of mineralisation and type of deposit described in the Report, and to the activity for which I am accepting responsibility.
- I am a Member in a good standing of *The Association of Professional Engineers and Geoscientists of Alberta (#31304)*.
- I have reviewed the Report to which this Consent Statement applies.

I am a full time employee of

Snowden Mining Industry Consultants Pty Ltd

(Insert company name)

and have been engaged by

Coalspur Mines Limited

(Insert company name)

to prepare the documentation for

The Coalspur Coal Projects

(Insert deposit name)

on which the Report is based, for the period ended

31 July 2014

(Insert date of Resource/Reserve statement)

I have disclosed to the reporting company the full nature of the relationship between myself and the company, including any issue that could be perceived by investors as a conflict of interest.

CONSENT

I consent to the public release of the Report and this Consent Statement by the directors of:

Coalspur Mines Limited

(Insert reporting company name)

[Murray Lytle]	31 July 2014
Signature of Competent Person:	Date:
Association of Professional Engineers and Geoscientists of Alberta	**31304**
Professional Membership: *(insert organisation name)*	Membership Number:
[David Lawrence]	David Lawrence, Brisbane, Australia
Signature of Witness:	Print Witness Name and Residence: (eg town/suburb)

COMPETENT PERSON'S CONSENT FORM

Pursuant to the requirements of ASX Listing Rules 5.6, 5.22 and 5.24 and Clause 8 of the JORC Code 2004 Edition (Written Consent Statement and Clause 9 of the JORC Code 2012 Edition (Written Consent Statement)

Report name

The Coalspur Coal Projects, Hinton, Alberta

(*Insert name or heading of Report to be publicly released*) ('Report')

Coalspur Mines Limited

(*Insert name of company releasing the Report)*

Coalspur Coal Projects

(Insert name of the deposit to which the Report refers)

31 July 2014

(Date of Report)

STATEMENT

I,

Paul Franklin

(*Insert full name(s)*)

confirm that I am the Competent Person for the Report and:

- The information pertaining to this report was first disclosed under the JORC Code 2004. It has not been updated since to comply with JORC Code 2012 on the basis that the information has not materially changed since it was last reported.
- I have read and understood the requirements of the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code, 2012 Edition).
- I am a Competent Person as defined by the JORC Code, 2012 Edition, having five years' experience that is relevant to the style of mineralisation and type of deposit described in the Report, and to the activity for which I am accepting responsibility.
- I am a Member in a good standing of *The Association of Professional Engineers of Saskatchewan*
- I have reviewed the Report to which this Consent Statement applies.

I am a full time employee of

Snowden Mining Industry Consultants Pty Ltd

(Insert company name)

and have been engaged by

Coalspur Mines Limited

(Insert company name)

to prepare the documentation for

The Coalspur Coal Projects

(Insert deposit name)

on which the Report is based, for the period ended

31 July 2014

(Insert date of Resource/Reserve statement)

I have disclosed to the reporting company the full nature of the relationship between myself and the company, including any issue that could be perceived by investors as a conflict of interest.

<u>**CONSENT**</u>

I consent to the public release of the Report and this Consent Statement by the directors of:

Coalspur Mines Limited

(Insert reporting company name)

[Paul Franklin]

Signature of Competent Person:

31 July 2014

Date:

Association of Professional Engineers of Saskatchewan

Professional Membership:
(insert organisation name)

04998

Membership Number:

[David Lawrence]

Signature of Witness:

David Lawrence, Brisbane, Australia

Print Witness Name and Residence:
(eg town/suburb)