NOTES ON THE VIABILITY OF QUINTETTE AND BULLMOOSE PAST 1998

Barry Ryan 11/97

This is a discussion note. I do not pretend to have all the facts and have inserted a lot of opinion and speculation. Information comes from the Tex reports (that we no longer get luckily the write up for the contract details was in a May issue; we stopped getting Tex in July), Tex annual mining report, Coal Week International, International Coal Report and various industry and conference sources. I can add this note over time as I have the opportunity to talk to friends in industry. I do not make a concerted effort to track coal prices and I suggest that for an analysis of future coal price trends you employ an outside consultant such as AEC Resource Consultants.

PRESENT MANAGEMENT ARRANGEMENT FOR QUINTETTE

Based on reading the Tex report this is my understanding of Tecks relationship to Quintette coal limited (QCL). Teck took over management of Quintette in 1991 with the obligation (on behalf of QCL) of reducing mine costs such that it could make an initial payment of 50m$ to the lenders followed by a commitment to repay 200m$ before 1998 at a 10% interest rate. This has probably been achieved based on reducing mining costs to the 40$ range. In 1998 QCL will form an un incorporated joint venture with QCL 55% and Teck Bullmoose 45%. The 45% Teck Bullmoose share comes at a cost of 18$m. Teck has 33% interest in QCL and a 60% interest in Bullmoose and therefore will be left with a majority if not controlling interest in QCL obtained at a cost of 18$m. This is much less than the management fee of 1.09$/tonne collected from 1992 to 1998 (about 30m$). It is not clear if the management fee of 1.09$ continues after 1998, probably not. If this is correct, in 1998 Teck returns to QCL a company it controls 18m$ (less than it has charged over 6 years of management) and continues to manage the company for an additional 5 years. If QCL folds Teck still controls the assets on the ground for disposal. This scenario is confused by the sale of debt by the banks to vulture companies. It is not clear now who will have a majority share of QCL past 1999.

PRESENT COSTS

I have estimates of mining costs for southeast BC mines that include equipment replacement costs (depreciation). These costs are derived from a number of sources and there is no guarantee that they are accurate. The government tracts productivity on a ROM tonne and clean tonne basis and there is a good relationship between productivity and mining costs for most southeast BC mines for 1997. This allows mining costs for northeast BC mines to be estimated for 1997 based on data for the first 8 months. The estimate range from 35$ to 36$ for Quintette and 34$ for Bullmoose. In a 1996 at the mineral north conference, Bullmoose transportation costs were said to be more than mining costs this would indicate a mining cost in the low 30$ range. If the transportation costs included clean coal trucking then this implies a cost of less than 35.5$, or if not included, less than 33$. The first agrees with productivity estimates which indicate a cost in the range of 34$. There is very little data for Bullmoose mining costs however the Teck annual reports do give Quintette mining costs (assumed to be basic operating costs plus depreciation). These costs can be plotted against strip ratio or productivity. In both cases the improved productivity and lower strip ratio implied for 1997 indicate costs in the 36$ range for 1997. It must be remembered that unlike mines in southeast BC, Quintette has a substantially larger conveyor cost (estimated at 1$ increase /tonne clean coal) and Bullmoose has the extra clean coal trucking costs estimated to be 2$ to 2.5$/tonne clean coal.

When transportation costs are added the costs FOBT are (36.5+33)=69.5$ for Bullmoose and (36+27.5)=63.5$ for Quintette. International Coal Report (ICR) May 1997 reports costs at

Quintette of 41.65$ can this may be an over estimate of 1997 costs. It appears to be high and may have been inflated by Teck as part of a negotiating position. The mine has improved productivity this year by reducing the work force and increasing output. Port costs are 5.5$ to 6.5$ (compared to about 5.5$ to 6$ at Roberts Bank) rail is 8$ BCR and 14$ CN. Bullmoose has an extra clean coal trucking cost of about 2.5$ and appears to pay a surcharge on BC rail of about 2.5$.

PRESENT PRICES

Present average price is about 90$ can (Quintette 85$ Bullmoose 93$). Bullmoose gets a somewhat higher price but this is offset by the price of the 400 000 tonnes shipped as part of the Quintette contract, which has a price that is 8$ less than the Quintette price.
At the moment QCL is making about 85-(36+27.5+1.09+0.3) = 20$
Bullmoose is making about 93-(36.5+2.5+30) = 24$ on 1.6 mt and 78-(36.5+2.5+30)=9$ on 400 000 tonnes up to 1997. In 1997 the 400 000 tonnes will be provided by Elkview not Bullmoose. This will be a premium price for Elkview.

TONNAGES PAST 1997

This year Quintette is on track to ship about 3.8 mt and Bullmoose appears to be on target at about 1.67 mt for the year. It is also interesting to note that according to government numbers Quintette has apparently sold 100 000 tonnes more coal than it mined this year. Bullmoose sales and mined totals match.

At present the Quintette contract expires in April 1998 and the Bullmoose contract in March 1999. The new agreement with the JSM allows for an interim period in 1998 so that the new contract starts at the same time for both mines. This also gives Quintette the opportunity to ship some of the cumulative +3 mt that it has not shipped under the terms of the original contract. The mills have agreed to take up to 3mt at present prices, if shipped prior to end of FY 1998. Obviously it is in Quintettes advantage to ship the maximum tonnage this year as it is its last chance to maximize sales under the 15 year contract.

From 1999 to 2003 the mines talk about producing 3 mt and 1.6 mt respectively (4.6 total) the JSM talk about taking 4 mt with the rest being sold elsewhere. If the extra 600 000 tonnes are not sold then the JSM will buy the tonnage at a considerable discount (or the mines may choose not produce it). At present there have been no confirmed sales of Bullmoose or Quintette coal to anyone other than the JSM. There have been marketing efforts but Teck does not have the marketing resources of the other coal companies. The buyers option to reduce the 4 mt/yr. take in subsequent years has been set at 5%, which means that the guaranteed tonnage is actually 3.8 mt/yr. cumulative from both mines. The ICR report stated that Teck agreed to shut the mines after the next 5 year contract this has been denied by one source in Teck and is not mentioned in any Tex reports. Realistically Teck would not be giving up much if it did shut both mines in 2003. Quintette, if not mining underground, would almost certainly be loosing money and Bullmoose on its own with a small met reserve in the west fork may not be viable on its own. The reserve base at Quintette is not good and unless they consider underground mining the mine will be nearly out of economically surface mineable coal by 2003 based on the 3mt/yr. for 5 years 1998 to 2003 (6 years).

The JSM have reduced the contract to Elkview and at the same time initiated the temporary 400 000 tonne switch from Bullmoose for 1997. This gives them the flexibility to take more coal from the northeast in the future. This has a political advantage but is probably done at a cost to quality, because Elkview quality is better than northeast BC quality.

At a worst case scenario, in which Quintette is having difficulty keeping costs below about 36$/tonne and cumulative up take is only 3.8 mt it might be better to mine 2mt/yr. at

Bullmoose and 1.8 from Quintette. This would bring the west fork area into production earlier and because it ensures the development of the west fork area extend the life of Bullmoose.

Quintette has started mining at Babcock ahead of the original schedule planning to extract 0.5 mt in 1997 and probably 1 to 2 mt in 1998. Based on the reserves, which in QDP4 are 10 mt there is not enough coal to sustain this production through to 2003. In the project proposal 1997 report a tonnage of 12 mt is mentioned (at a slightly higher strip ratio) for Babcock but this is still not enough coal for the period 1997-2003.

RAIL AND PORT CONSIDERATIONS

Northeast coal is about 22% of BC Rail revenue and 30% of their business. Based on the contract at the moment a conservative but not overly pessimistic estimate of coal on the BC Rail Anzac line is:

1997	5.4 mt
1998	4.6 mt
1999-2003	3.8 mt
2003--	0 mt

i.e. a drop of about 2 mt/yr. from present tonnages.

There is a reasonable chance that Ridley will see no net drop in tonnage if Telkwa (1 to 1.5 mt/yr.) and Pine Valley Coal (0.6-0.9 mt/yr.) both start production. CN Rail may pick up tonnage from Alberta mines. BC Rail is by far the most exposed in terms of loss of freight because it is already heavily dependent on coal tonnage and cannot replace all the loss with Pine Valley coal.

It is not clear when the rail contracts will be renegotiated probably the Quintette rail contract ends with the coal contract (April 1998). There is not much insentive to give QLC a break in rates when in 1998 they will be shipping 3 mt at the old inflated price. Certainly at the moment Teck feels that the negotiations are proceeding very slowly.

QUALITY DATA

In order to confuse the uninitiated the seam numbering systems at Bullmoose and Quintette are reversed. At Quintette seams are numbered as A at the top to K at the bottom with D, E, F and J being the thicker seams. At Bullmoose seams are numbered A at the base to E at the top with B seam being the thickest. Based on the quality at both mines the coal does not match the best coal from southeast BC.

Bullmoose coal has low ASTM stability factor and has a problem with CSR for one of their seams, which is a major component of the blend in the south fork pit. This problem cannot be overcome until coal is released from the west fork. The West fork area differs from the south fork in that there is a thick sandstone above the B seam which thickens the stratigraphic section with out adding any additional coal. As an side CSR is becoming the single most important coking coal quality parameter followed by pressure, which is much more difficult to predict and is usually not specifically mentioned in contracts. The reflectance at Bullmoose varies from 1.07% to 1.2%, which is on the low side for a good coking coal. There is very little data for coal from the west fork but based on comparing VM data there appears to be no change in rank.

The quality at Quintette is reasonable but CSR factor values are on the low side and stability factor values are marginal for good coking coals. Average fluidity is moderate but individual values vary widely. In general higher values would help offset the negative marketing image of low CSR and stability factor values, consequently fluidity is raised by the JSM as a marketing issue. Base-acid ratios are higher than for similar coals in southeast BC, which is part of the reason for lower CSR values. Rank at Quintette varies from about Rmax = 1.15% to 1.36% in the present pit areas. I have not located data on average product rank but in 1989 a sample had a Rmax value of 1.18% so I suspect it is in the 1.20% range.

The quality at Babcock is generally similar to that at Mesa with the possibility that the seams wash better so that the plant recovery should be higher. Stability factors may be a bit better and fluidity values similar to those at Mesa. Sulphur contents are generally low. Phosphorus contents are moderate with 2 seams above world average and 2 below. Rank varies from 1.14% to 1.24% and is probably a bit lower than at Mesa. In general there are no major changes in quality from Mesa to Babcock.

The quality at Mesa Extension is similar to that at Mesa with rank higher than that at Babcock. Fluidity is variable and base-acid ratios moderate.

MINE PLAN DETAILS QUINTETTE

Surface mineable reserves remain in 3 areas; Babcock, Mesa and Mesa Extension. The Shikano pit will be mined out in 1997. Some coal has been temporarily sterilized in the Mesa phase 2 pit because of geotechnical problems. The coal will probably be eventually recovered but there may be an increase in strip ratio. The 1996 annual report states that as of end 1996(?) there was 8.7 mt in existing pits. 1997 production will be about 3.8 mt with 0.5 mt coming from Babcock. It is not known how much of the remaining 3.3 mt in 1997 will come from Shikano, but at a guess if it is 1 mt this leaves 6.4 mt in the Mesa pits at the end of 1997. Based on the geometry the strip ratio in the phase 2 Mesa pit will probably decrease as it is mined out. The strip ratio in the phase 1 Mesa pit will remain fairly constant as it extends westward and becomes part of the Mesa Extension area.

Teck provided the government a copy of a mine plan that was submitted to the JSM in 1994 (QDP4). It provides a basis for estimating reserves and stripping ratios, but could be out of date based on additional exploration and reworked plans. There is also the Babcock April 1997 report submitted to the ministry as a requirement for the change in mine plan.

The QDP4 report mentions highwall mining (automated underground mining where large diameter holes are punched into coal seams outcropping in the highwall) this is not mentioned in the 1997 report. Reserve and strip ratio data in the QDP4 report are confused by the addition of underground mined coal into the ROM coal before calculating strip ratios. This is, to say the least, an unusual procedure and it distorts the apparent surface mining costs. I have recalculated tonnages and strip ratios without highwall mined coal. Highwall mined coal is probably not available until the end of the pit life and therefore only available if the pit is already economic to mine. The alternative is to mine for 4 years at a loss on the understanding that, when the highwall mined coal becomes available at low cost, the losses will be made up. Mining costs quoted in QDP4 are 30.25$ for a production rate of 3mt/yr. for 5 years based on using strip ratios calculated including highwall coal. If the highwall miner coal is removed the average strip ratio jumps to 8/1 for a total reserve of about 10 mt and based on the graph in QDP4 mining costs are increased to about 39$/clean tonne.

The 1997 Babcock report quotes reserves of 11.5 mt at a strip ratio of 8.8/1 for Babcock. This agrees with the surface mineable coal in QDP4. It is apparent that they have increased both the reserves and strip ratio slightly. The haul road to the plant is 11 kilometres with a considerable change in elevation and the round trip will take about 1 hour for haul trucks. Based on the QDP4 report reserves are 3.7 mt at a strip ratio of 8/1 for Little Windy pit and 6.3 mt at a strip ratio of 10/1 for Big Windy pit. This ratio is calculated assuming a plant recovery of 70%, which is somewhat high but reasonable because it is expected that there will be less dilution in coal mined at Babcock.

Mesa Extension is on the west slopes of Mesa mountain and therefore distant and down slope from the conveyor. The pit is at elevations ranging from 1314 to 930 metres. the breaker station and conveyor are located at 1600 metres. Mining costs will be higher than inferred from strip ratios alone. Reserves are 7 mt at a strip ratio of 6.1/1 based on a plant recovery of 40%-50% which is in line with experience at Mesa.

In summary there is enough coal to provide 3 mt/yr. for 6 years. Tonnages are approximately: Babcock 10+, Mesa 5+, Mesa Extension 7: gives a total of 21mt against 6 x 3 = projected maximum mined 18 mt). It is planned to take 2 mt/yr. from Babcock and 1 mt/yr. from Mesa and Mesa Extension. The geometry of the individual Babcock pits is such that the strip ratios probably increase as pits develop. There will be no low ratio coal at the end of the 5 years. Mining costs will be in the 36$ to 39$ range (there may be some lower ratio coal at the start of mining). The only way that the life of Quintette can be extended is to start underground mining either on a small scale using highwall miners or as a new capitalized room and pillar operation on Babcock.

MINE PLAN DETAILS BULLMOOSE

The Bullmoose contract was for 1.7 mt/yr. x 15 years. This was reduced by buyers option to 1.615 mt/yr. and only 0.6 mt was shipped in the first year. The present strip ratio for the south fork is about 6.5/1 bcm/cmt. This ratio will improve as the reserves are depleted and is projected to be 3.5/1 in 2003. The reserve left at the end of 1997 are estimated to be 9.3 mt, which is sufficient for production of 1.6 mt/yr. through to 2003. However it is probable that the seam mix will cause a deterioration in quality. If production is greater than 1.6 for any year 1998 to 2003 then there are probably not enough reserves. The 1997 tonnage is aimed at 1.6 mt because the extra 400 000 tonnes is being picked up by Elkview.

The west fork has reserves of 14.3 mt met and 7.8 mt thermal at a combined strip ratio of 6.2/1 bcm/mtc (Tex report). If the thermal coal can not be sold then the strip ratio for the met coal rises to 9.6/1; the real ratio for met coal is probably between these two numbers. This data compares to preliminary calculations in 1977, which indicated 15.4 mt in place with a strip ratio of 5.6/1. At a plant+inpit coal recovery of 70% this is equivalent to 11 mtc at a strip ratio of 8/1. Either recent studies have increased estimates of reserves in the West Fork or inplace e and clean tonnage numbers are being confused.

If the west fork is developed prior to 2003 then the higher strip ratio in the west fork will be offset by the very low strip ratio in the south fork. The mine plan has to release met rather than thermal coal because, if as is probable it can not be sold or can only be sold at a loss, then the effective cost of mining the met coal will increase. Generally it costs between 1.5$ to 2$/bcm for waste rock removal so that if the strip ratio increases by 1 and clean coal production remains constant costs will increase by 1.5$ to 2$. West fork mining costs will probably be in the range of 34$ to 37$.

VIABILITY PAST 1998

There are rumors in the industry that QCL is prestripping during the term of the present 15 year contract rock to expose coal to be mined in the future 5 year contract. This in effect transfers costs from the future to the present contract. The only way that this is possible is, if a shovel can be moved into an area where no coal release is planned for more than a year. An example would be if QCL had moved a shovel onto Babcock in 1996. This did not happen and they will probably not get a large shovel onto Babcock till spring 1998. Though QCL has excess equipment they have had a lot of problems with availability. Generally it is a major job to lay on high voltage power and improve roads so that a large cable shovel can be used. The only area where extra rock could have been moved is in the Mesa phase 1 and 2 pits but there is only limited potential without forcing release of coal. If there is a harvest situation in the future it is probably largely natural outcome of the geometry of the Mesa phase 2 pit which will release coal and little rock in the final few benches. There is a contract to pre strip 3 million bcm by the end of this year on Babcock. This would expose at a 6/1 strip ratio about 500 000 tonnes of coal which is the amount the hope to mine this year.

An interactive excel spread sheet has been constructed to aid in modeling various

scenarios. Costs are estimated from strip ratio using one of two curves fitted to strip ratio versus cost data in the annual reports. This is a dangerous and naive approach but does at least vary costs based on strip ratio. There are other ways of relating costs to strip ratios or estimated productivity all suffer from a fundamental lack of detailed cost data, but if required can easily be built into the spread sheet. Initial costs, coal release and strip ratios by year are entered. The spread sheet then calculated mining costs and profit on a yearly basis and documents reserve drawdown. Two scenarios are demonstrated. It is not implied that they are the most likely. **They should be considered as examples of the process not estimates of fact.**

The first assumes production of a 4.6 mt/yr. Costs are assumed to have been renegotiated and the price is low reflecting sale of the 600 000 tonnes at a low price. At Quintette most of the coal from Babcock all of the coal from Mesa and some of the coal from Mesa extension are mined. Strip ratios are estimated to reflect this. Quintette mining costs from Babcock will be in the range widely based on the possibility of a very low initial strip ratio but may generally be in the range 37-39. Costs from Mesa Extension are difficult to estimate because of the long haul distances but they are probably lower than Babcock possibly in the range 35$ to 37$. The unknown factor is the effect of mining out the Mesa phase 1 and 2 pits. If Quintette mines at 3mt/yr. the blended mining cost will be about 36$ to 31$C (coal from Babcock, Mesa and Mesa Extension) and if rail and port costs are deceased by about 3$ then the mine will make a small operating profit. At Bullmoose all of the south fork is mined and some coal from the west fork. Costs are similar to the 3.8 mt/yr. case and range from 32$ to 27$, but transportation costs are lower so the mine makes more money. Costs will increase if more coal is mined from the west fork area.

The 3.8 mt/yr. scenario assumes no renegotiation of transportation costs. A higher coal price and most of the coal is taken from Babcock and Mesa. Because not all the coal is taken from Babcock strip ratios are lower than in the 4.6 mt/yr. case. Quintette mining costs range from 30$ to 35$ and even with no reduetion in transportation costs the mine makes a small operating profit. Bullmoose makes a small operating profit.

The spread sheet can be run for many combinations of conditions and the cost versus strip ratio curves can be adjusted. It should not be assumed that the two examples are the best. All this provides is a rough answer to the what if questions. It does not help predict what world coal coking coal prices will be in 1998 or what the real mining costs for the two mines will be past 1998.

The 1998 to 2003 contract with the Japanese specifies that the price will be world price based on averaging Fording mid-vol+ Elkview+Luscar minus 3$ for quality problems. In May the average of these three coals was 52.7$ US and the average Quintette+Bullmoose price was 65$ US. The 3$ discount is not mentioned in the press but I have heard it mentioned in industry a few times. In 1999 when both mines switch to world prices it is unlikely they will be getting more than 48$ US. If the exchange rate is 0.73 this equates to about 66$ CAN

CONCLUSIONS

Based on the numerous assumption outlined above both mines can make a small operating profit at a combined production rate of 3.8 mt/yr. to 2003 (cumulative total 90m$). Quintette will have 12 mt of surface mineable coal remaining and Bullmoose coal in the west fork area.

With decreased transportation rates, both mines will make a similar combined profit in the 4.6 mt/yr. case (116 m$). This scenario would employ more people for the 6 years. Quintette

would have 7 mt of high ratio surface mineable coal left at the end of the contract. Bullmoose would have started mining the west fork.

It is unlikely (unless the exchange rate is very low) that surface mining will be viable at Quintette. Under either scenario the south fork at Bullmoose will be mined out leaving some met coal in the west fork at a ratio that is hard to define because of the thermal coal component that might not be salable.

The only scenario that is possible for the continuation of the two mines past 2003 is for underground mining at Quintette possibly with additional coal coming from the Monkman property and continued mining at the west fork at about 1mt/yr. This implies capital expenditure, without it the mines will be closed.

Any attempt by the government to support the mines either directly or via BC rail or by loans may only delay the inevitable for 6 years.

Barry Ryan with apologies 11/97

DRAFT PROVISIONAL ESTIMATES OF COSTS, RESERVES AND STRIP RATIOS AS OF 11/97 B RYAN

nebcprod.xls — 4.6 mt/yr MINING SENERIO USING COAL FROM ALL AVAILABLE PITS BOTH MINES

exchange rate 0.73 — ADD DATA INTO HEAVILY OUTLINED BOXES CHECK FOR CONSISTENCY IN GREY BOXES

QUINTETTE mined	fixed costs	1996 coal	1996 strip	1997 coal	1997 strip	1998 coal	1998 strip	1999 coal	1999 strip	2000 coal	2000 strip	2001 coal	2001 strip	2002 coal	2002 strip	2003 coal	2003 strip	average	
Babcock		0	0.0	0.5	6.0	1.0	6.5	2.0	7.5	1.8	8.5	1.0	9.5	0.5	11.0	0.5	12.0	8.329	average strip ratio
Mesa		2	11.0	2.3	9.0	2.0	8.0	1.0	7.5	1.0	7.0	1.0	6.0	1.0	4.0	0.4	2.0	7.85	average strip ratio
Mesa Ext		0	6.0	0.0	6.0	0.0	6.0	0.0	6.0	0.2	6.0	1.0	6.0	1.5	6.0	2.1	6.0	6	average strip ratio
Shikano/other		1.4	8.1	1.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.824	average strip ratio
total mt | av strip R		3.4	9.8	3.8	7.6	3.0	7.5	3.0	7.5	3.0	7.8	3.0	7.2	3.0	6.2	3.0	6.5	7.538	average strip ratio
cost$/cmt			46.8		35.1		34.9		34.9		36.1		33.8		31.3		32.0		
BC rail can$	7		7.0		7.0		7.0		7.0		7.0		7.0		7.0		7.0		
CN rail can$	13		13.0		13.0		13.0		13.0		13.0		13.0		13.0		13.0		
port can$	5		5.0		5.0		5.0		5.0		5.0		5.0		5.0		5.0		
sale price US $	46		65.0		46.0		46.0		46.0		46.0		46.0		46.0		46.0		
operating profit can$/cmt			17.2		3.0		3.1		3.1		2.0		4.2		6.7		6.0	75.5	profit m$ 1998-2003 (6 years)
Babcock	RESERVES at end of 1996	12	8.8	11.5		10.5		8.5		6.7		5.7		5.2		4.7		7.3	reserves mined Babcock
Mesa		8.7	8.0	6.4		4.4		3.4		2.4		1.4		0.4		0.0		8.7	reserves mined Mesa
Mesa Ext		7	6.0	7.0		7.0		7.0		6.8		5.8		4.3		2.2		4.8	reserves mined Mesa Ext
Other																		0.0	reserves mined Other
total remaining		28		24.9		21.9		18.9		15.9		12.9		9.9		6.9		20.8	reserves mined

BULLMOOSE mined	fixed costs	1996 coal	1996 strip	1997 coal	1997 strip	1998 coal	1998 strip	1999 coal	1999 strip	2000 coal	2000 strip	2001 coal	2001 strip	2002 coal	2002 strip	2003 coal	2003 strip		
south fork		2	7.3	1.6	6.5	1.6	6.0	1.6	6.0	1.6	5.5	1.6	4.5	1.6	3.5	1.3	3.0	5.403	average strip ratio
west fork		0	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.3	7.5	7.5	average strip ratio
total mt | av strip R		2	7.3	1.6	6.5	1.6	6.0	1.6	6.0	1.6	5.5	1.6	4.5	1.6	3.5	1.6	3.8	5.451	average strip ratio
cost$/cmt			34.2		32.0		30.9		30.9		30.0		28.5		27.5		27.8		
clean coal trucking	2.5		2.5		2.5		2.5		2.5		2.5		2.5		2.5		2.5		
BC rail can$	9		9.0		9.0		9.0		9.0		9.0		9.0		9.0		9.0		
CN rail can$	13		13.0		13.0		13.0		13.0		13.0		13.0		13.0		13.0		
port can$	5		5.0		5.0		5.0		5.0		5.0		5.0		5.0		5.0		
sale price US $	46		65.0		46.0		46.0		46.0		46.0		46.0		46.0		46.0		
operating profit can$/cmt			25.3		1.5		2.6		2.6		3.5		5.0		6.0		5.7	40.7	profit m$ 1998-2003 (6 years)
south fork	RESERVES at end of 1996	10.9	7.3	9.3		7.7		6.1		4.5		2.9		1.3		0.0		10.9	reserves mined south fork
west fork		7.8	7.5	7.8		7.8		7.8		7.8		7.8		7.8		7.5		0.3	reserves mined west fork
total remaining		19		17.1		15.5		13.9		12.3		10.7		9.1		7.5		11.2	reserves mined
TOTAL COAL MINED		5.4		5.4		4.6		4.6		4.6		4.6		4.6		4.6		27.6	TOTAL RESERVES MINED 1998-2003
																		116.2	TOTAL PROFIT 1998-2003

reserves are tonnages left at end of year

based on the amount of reserve used the average strip ratio of coal mined should approach the strip ratio of the reserve base prior to 1997

this senerio assumes that the 800 000 tonnes are sold at the same price as the base 3.8 mt providing a blended price that is 1$ less than the 3.8 base senerio

BC rail and CN rail rates dropped 1 $ port dropped to 5$

Note BC rail for bulloomse estiamted to be 10$ at present

DRAFT PROVISIONAL ESTIMATES OF COSTS, RESERVES AND STRIP RATIOS AS OF 11/97 B RYAN

nebcprod.xls — 3.8 mt/yr MINING SENERIO USING LOW RATIO COAL

exchange rate 0.73 — ADD DATA INTO HEAVILY OUTLINED BOXES CHECK FOR CONSISTENCY IN GREY BOXES

QUINTETTE mined	fixed costs	1996		1997		1998		1999		2000		2001		2002		2003		average	
		coal	strip	coal	strip	coal	strip	coal	strip	coal	strip	coal	strip	coal	strip	coal	strip		
Babcock		0	0.0	0.5	4.5	1.0	5.5	1.0	6.0	1.0	7.0	0.5	8.0	0.5	9.0	0.5	10.0	6.85	average strip ratio
Mesa		2	11.0	2.3	9.0	1.2	8.0	1.2	7.0	1.2	6.0	1.7	5.0	1.1	4.0	0.0	2.0	7.551	average strip ratio
Mesa Ext		0	6.0	0.0	6.0	0.0	6.0	0.0	6.0	0.0	6.0	0.0	6.0	0.6	7.0	1.7	7.0	7	average strip ratio
Shikano/other		1.4	8.1	1.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.824	average strip ratio
total mt | av strip R		3.4	9.8	3.8	7.4	2.2	6.9	2.2	6.5	2.2	6.5	2.2	5.7	2.2	6.0	2.2	7.7	7.231	average strip ratio
cost$/cmt			46.8		34.4		33.0		32.2		31.9		30.3		30.9		35.5		
BC rail can$	8		8.0		8.0		8.0		8.0		8.0		8.0		8.0		8.0		
CN rail can$	14		14.0		14.0		14.0		14.0		14.0		14.0		14.0		14.0		
port can$	5.5		5.5		5.5		5.5		5.5		5.5		5.5		5.5		5.5		
sale price US $	47		65.0		47.0		47.0		47.0		47.0		47.0		47.0		47.0		
operating profit can$/cmt			14.7		2.5		3.9		4.7		4.9		6.6		6.0		1.4	60.6	profit m$ 1998-2003 (6 years)
Babcock	RESERVES at end of 1996	12	8.8	11.5		10.5		9.5		8.5		8.0		7.5		7.0		5.0	reserves mined Babcock
Mesa		8.7	8.0	6.4		5.2		4.0		2.8		1.1		0.0		0.0		8.7	reserves mined Mesa
Mesa Ext		7	6.0	7.0		7.0		7.0		7.0		7.0		6.4		4.7		2.3	reserves mined Mesa Ext
Other																		0.0	reserves mined Other
total remaining		28		24.9		22.7		20.5		18.3		16.1		13.9		11.7		16.0	reserves mined

BULLMOOSE mined	fixed costs	1996		1997		1998		1999		2000		2001		2002		2003			
		coal	strip	coal	strip	coal	strip	coal	strip	coal	strip	coal	strip	coal	strip	coal	strip		
south fork		2	7.3	1.6	6.5	1.6	6.0	1.6	6.0	1.6	5.5	1.6	4.5	1.6	3.5	1.3	3.0	5.403	average strip ratio
west fork		0	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	7.5	#####	average strip ratio
total mt | av strip R		2	7.3	1.6	6.5	1.6	6.0	1.6	6.0	1.6	5.5	1.6	4.5	1.6	3.5	1.3	3.0	5.403	average strip ratio
cost$/cmt			34.2		32.0		30.9		30.9		30.0		28.5		27.5		27.1		
clean coal trucking	2.5		2.5		2.5		2.5		2.5		2.5		2.5		2.5		2.5		
BC rail can$	10		10.0		10.0		10.0		10.0		10.0		10.0		10.0		10.0		
CN rail can$	14		14.0		14.0		14.0		14.0		14.0		14.0		14.0		14.0		
port can$	5.5		5.5		5.5		5.5		5.5		5.5		5.5		5.5		5.5		
sale price US $	47		65.0		47.0		47.0		47.0		47.0		47.0		47.0		47.0		
operating profit can$/cmt			22.8		0.3		1.4		1.4		2.4		3.9		4.9		5.3	29.4	profit m$ 1998-2003 (6 years)
south fork	RESERVES at end of 1996	10.9	6.5	9.3		7.7		6.1		4.5		2.9		1.3		0.0		10.9	reserves mined south fork
west fork		7.8	7.5	7.8		7.8		7.8		7.8		7.8		7.8		7.8		0.0	reserves mined west fork
total remaining		19		17.1		15.5		13.9		12.3		10.7		9.1		7.8		10.9	reserves mined
TOTAL COAL MINED		5.4		5.4		3.8		3.8		3.8		3.8		3.8		3.5		22.5	TOTAL RESERVES MINED 1998-2003
																		90.0	TOTAL PROFIT 1998-2003 million dollars

reserves are tonnages left at end of year

based on the amount of reserve used the average strip ratio of coal mined should approach the strip ratio of the reserve base prior to 1997

BC rail CN rail and port costs similar to todays rates

note bullmoose BC rail assumed to be 2$ more than Quintette

y=1/(a*(x+B)^2+c)

curve in use

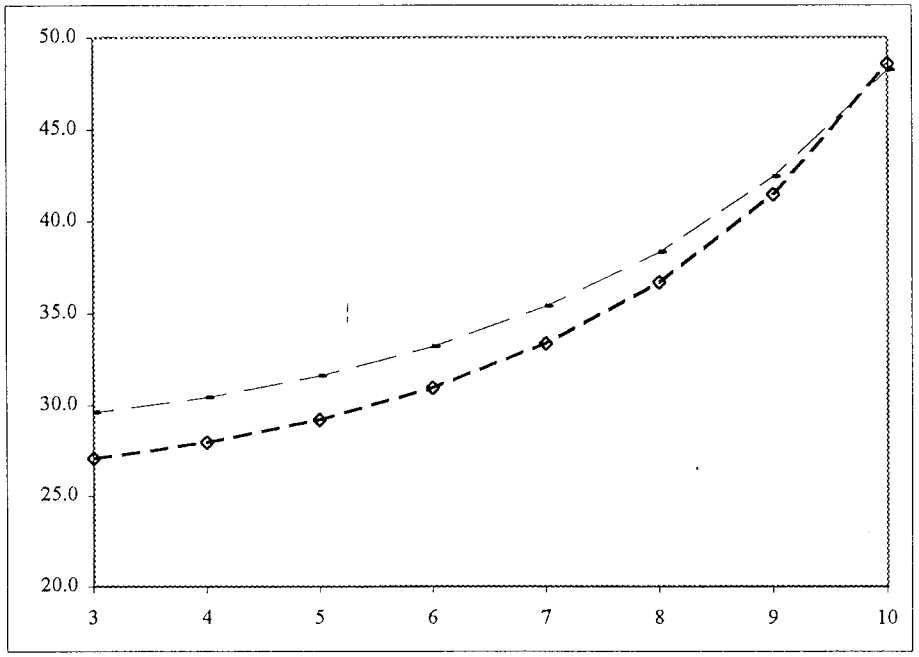
-0.00020	a=
-0.67000	b=
0.03800	c=

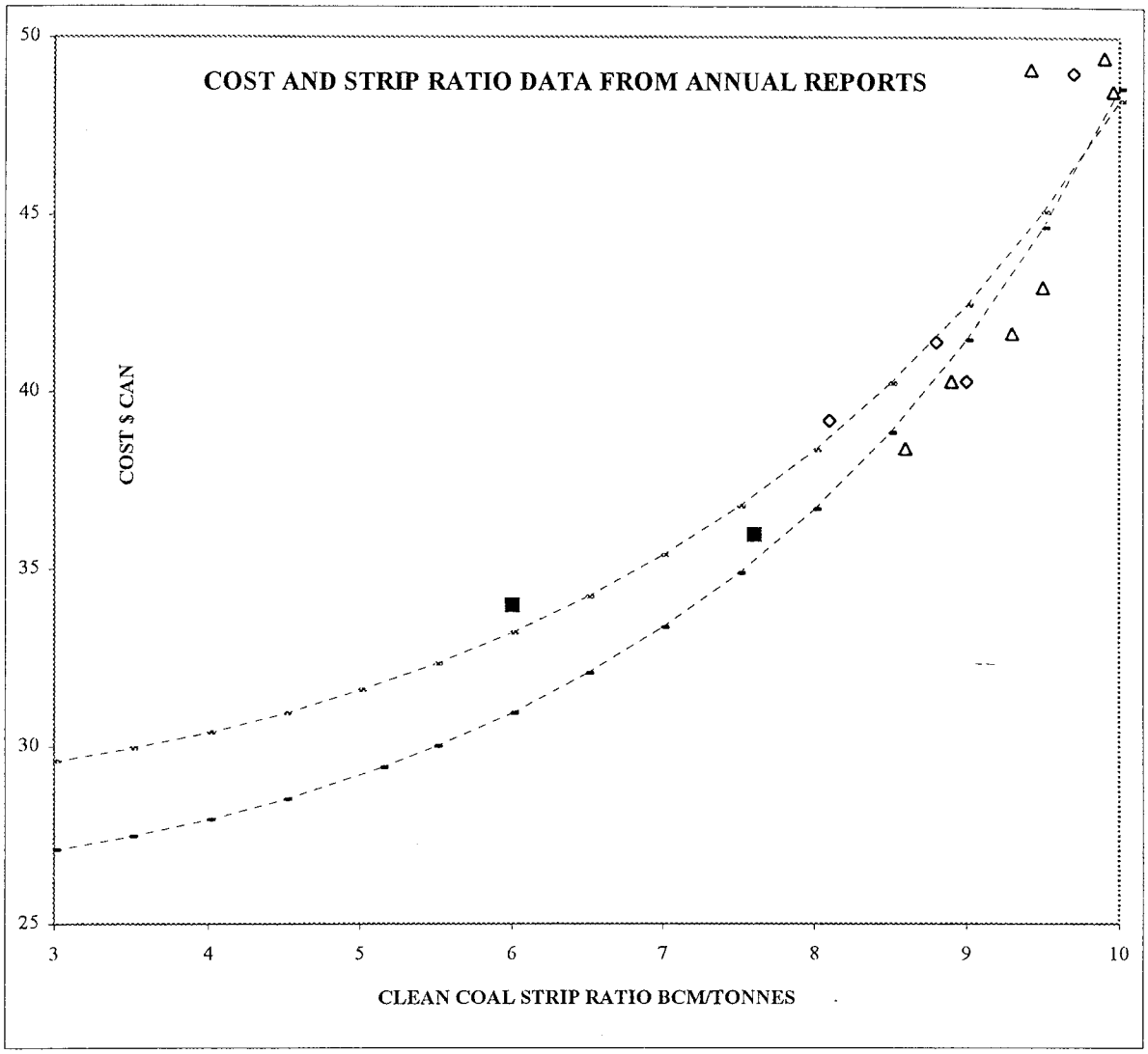
lower curve

-0.00020	a=
-0.67000	b=
0.03800	c=

upper curve

	LOWER		UPPER	
	x	y	X	Y
-0.00016	3	27.1	3	29.6
-0.67012	4	27.9	4	30.4
0.03467	5	29.2	5	31.6
	6	30.9	6	33.2
	7	33.3	7	35.4
	8	36.7	8	38.4
	9	41.5	9	42.4
	10	48.6	10	48.2




COST AND STRIP RATIO DATA FROM ANNUAL REPORTS
COST $ CAN
50
45
40
35
30
25
3
4
5
6
7
8
9
10
CLEAN COAL STRIP RATIO BCM/TONNES