Proposed Tenas Coal Project: Critical Review of the Socio-Economic Assessment

1.0 Introduction

In June of 2022, the Northwest Institute and What Matters in Our Valley, both based in Smithers BC, asked Watrecon Consulting[1] to undertake a critical review of the socio-economic components of the environmental impact assessment prepared for the proposed Tenas coal project, which would be located seven kilometres southwest of Telkwa. The Telkwa Coal Company (TCL) is applying for approval to construct a mine and processing facility that would produce between 775,000 and 825,000 metric tonnes of metallurgical coal per year over a 26.5-year life of mine. TCL submitted a comprehensive environmental assessment of the project to the BC Environmental Assessment Office and the BCEAO has asked for comments on the application to be submitted by early July of 2022. For this analysis, Watrecon agreed to:

- Review the sections of the application dealing with project need and benefits (Part A and K of the Overview)
- Review the sections of the application dealing with economic issues (Section 5.1 and 5.2)
- Review selected sections of the application dealing with demographic and infrastructure issues (Sections 6.1 and 6.3)
- Identify any data gaps and any problems with the analyses and associated conclusions
- Identify a limited number of "major" issues that the group may want to submit to BCEAO
- Help the group prepare documentation for submission to BCEAO

This report was prepared by Watrecon following the review of the above-noted documents.

It should be noted that there is a very specific flow to doing socio-economic analysis. The analysis typically starts with an analysis of labour demand and supply, with the understanding that labour will come from three sources:

- The local area, which means local residents who are unemployed or underemployed and will need training in order to take advantage of the jobs being offered, but whose employment on the project may create job vacancies elsewhere in the local area that would be filled by others.

- People living outside the areas who will commute to the project area and will need temporary accommodation, such as a work camp or commercial accommodation, while they are employed and will thereby put some pressure on local infrastructure.

[1] Watrecon Consulting is an Edmonton-based company that has 45 years of experience assessing the economic and social dimensions of economic development in western and northern Canada. An overview of company experience is provided in Appendix A.

- People who choose to permanently relocate to the local areas, often bringing family with them, thereby causing population growth and an associated increase in demand for housing, infrastructure or services.

Thus, it is necessary to understand the assumptions about labour sourcing in order to understand the anticipated effects on demography, infrastructure and services.

2.0 Assessment

2.1 PROJECT NEED AND BENEFITS

2.1.1 Project Need

The assessment of project need is addressed in Section 7.0 of the Overview, which is titled "Alternatives to the Project". Project need is only discussed in terms of how the project would help address global demands for seaborne metallurgical coal (defined as hard coking coal, semi-soft coking coal (SSCC) and PCI coal). It is argued that coal from the project would allow Asian steel mills to diversify their supply away from Australian coal mines and Canadian mines are seen as a more reliable source of supply. At the time the application was written, project need was based on the observation that no other mines were producing medium volatile SSCC in Canada and that there was growing global demand for seaborne metallurgical coal in the near future, especially in China and India. It should be noted, however, that the demand projections for metallurgical coal were based on 2018 data and market conditions have changed substantially since then.

KEY OBSERVATION: The discussion of Project need is based on 2018 coal market projections and this needs to be revisited in the context of current global demands.

2.1.2 Project Benefits

Section 3.0 of the Overview contains a description of Project Benefits which is described in terms of employment and labour income during all four phases of the project: construction, operation, decommissioning and reclamation, and closure. The analysis looks at direct project employment as well as indirect and induced effects. The analysis also describes benefits in terms of cumulative government revenues over the life of the project (Section 3.8).

The analysis of project need is couched in terms of the ability to produce coal from the proposed Tenas project at a very low cost. Figure 7.2-4 shows a production cost per tonne for the Tenas Project ranging between $50 and $100 US per tonne over the life of the project and Section 3.0 shows the annual construction and operating costs over the proposed life of mine. It should be noted that the analysis is based on 2019 estimates (with some inclusion of 2020 cost information although this is not specified). With global financial conditions having changed over the last two years, it must be questioned whether the project cost estimates can still be considered reliable. For example, Table 3.10-1 notes that the financial analysis assumed an average price of $0.80

per litre of diesel fuel, while the current prices of diesel in BC is currently more than $2 per litre (a 250% increase). And with direct purchases of diesel fuel and lubes accounting for 8% of annual operating costs, the much higher cost of diesel could have a huge effect on the projects' financial viability and revenue requirements. To ensure the validity of the discussion of project benefits, it is essential that a revised cost estimate be provided that factors in current (not 2019) prices.

KEY OBSERVATION: The discussion of Project benefits is based on 2019 input prices, some of which have changed significantly in recent years, so a revised assessment based on current costs is required to ensure the discussion of relevant project benefits is still valid, as this will affect a public interest decision.

What is missing from the application, however, is a discussion of the expected revenues and coal prices that would be needed to make the mine profitable. The government revenue estimates are derived from a financial feasibility study, which is not publicly available, but without knowing the coal price assumptions used in the model it is not possible to determine, with any certainty, whether these revenue estimates are in any way reliable. If BCEAO is expected to make a public interest determination that compares the project's adverse environmental and socio-economic effects to its public benefits, then knowledge of the coal prices required to make the project economically viable are essential.

KEY OBSERVATION: It is not possible to test the validity of the estimates of project benefits without knowing what coal prices were assumed in assessing financial feasibility. This is a significant deficiency in the application and the Applicant must provide these coal price assumptions in order to be able to truthfully and transparently understand the economic merits of then proposed project.

2.1.3 Project Expansion

In a 2021 presentation by Allegiance Coal Limited, the production plan for the Tenas mine was described as being 750,000 clean metric tonnes per annum (ctpa) ramping up to 1.35 million ctpa by year 5. While the application by TCL is for an annual production rate of between 750,000 and 825,000 metric tonnes per year, a production rate of 1.35 million metric tonnes is clearly beyond the scope of the existing application. Furthermore, Section 7.4 of overview specifically states:

> As part of the alternative review process, various production rates were reviewed and as per 6.4.3, the final selected rate for the Project was 775,00 to 825,000 metric tonnes of processed coal produced per annum which was based on a consideration of:
>
> - cost effectiveness;
> - community effects and input including human health; and.
> - minimize or avoiding effects on the natural environment.
>
> The production rate alternatives were not expected to have effects on the following performance objectives:
>
> - be technically applicable, with system integrity, and reliability.

> In summary a production rate of approximately 800,000 metric tonnes of processed coal per annum, was selected as the preferred option.

Thus, ant TCL plans to expand production to 1.35 million tonnes per year directly contravenes the conclusions of the application with respect to an 800,00 tonne per year operation having the preferred levels of socio-economic and environmental impacts.

KEY OBSERVATION: Expanding production to 1.35 million tonnes per year directly contradicts the Company's conclusions about the preferred option in terms of environmental and socio-economic effects.

2.2 METHODOLOGICAL ISSUES

There are two fundamental methodological issues associated with the assessment of the project's economic and social effects. These relate to the boundaries of the LSA and RSA and related analysis, and the outdated socio-economic baseline data upon which the application was based.

2.2.1 LSA Boundaries

For both the analysis of both the economic (Section 5) and social/infrastructure (Section 6) parts of the application, the Local Study Area (LSA) was defined as:

> The LSA comprises the Village of Telkwa, Town of Smithers, the District of Houston, and the community of Witset (formerly Moricetown).

These communities are shown in Figure 1 and were considered to be part of the LSA because of their relatively close proximity to the project such that commuting to the project would involve a one-way travel time of half an hour or less. As described in Table 4.25 of Section 6.1 of the Application, these communities had a combined population of 10,352 people in 2016.

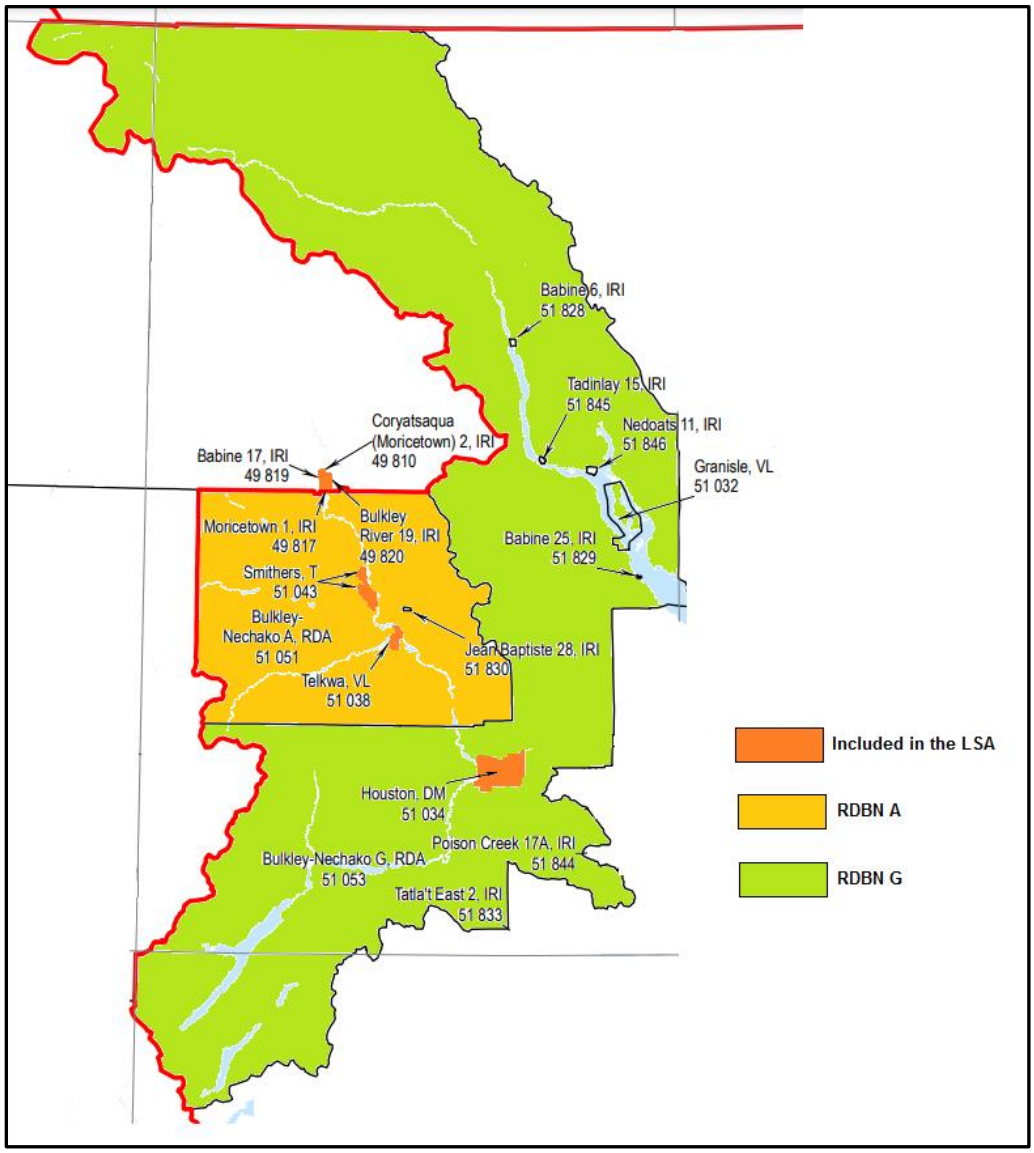
There are two problems with the LSA boundaries. The more important problem is that the communities included in the LSA definition are only the urban communities, such that residents of the rural population of the area (people living in the Bulkley-Nechako A Regional District [RDBN A] outside the listed communities and also shown in Figure 1) appear to have been precluded from most of the analysis. Based on the LSA definition, this means that someone who could live adjacent to the mine site, but outside the Village of Telkwa, was omitted from the LSA and subsequent analysis of project impacts,

However, as per page 34 of Section 5.1 (Labour Market Valued Component), it is noted that 90% of operational workers would be sourced from the LSA (including RDBN A and RDBN G, which is also shown in Figure 1). This is very inconsistent and confusing. The labour force analysis includes the assumption that some rural residents (RDBN A and RDBN G) would be

KEY OBSERVATION: The choice of LSA is significantly flawed because it excludes people who live in rural areas in the vicinity of the proposed mine site and only includes residents of the four nearby urban communities, yet those people were included in the assessment of labour effects but excluded from the analysis of other socio-economic VCs.

hired for operations but those people are not included in the assessment of impacts on demography or infrastructure because they are not part of the LSA definition used in the analysis.

Figure 1: LSA Boundaries and Rural Areas Precluded from the LSA Definition



A second problem with the LSA definition is the statement that the LSA includes boundaries that are within a half hour commute from the mine site. A Google maps analysis indicates that people living in Witset (Moricetown) face a 38-minute commute to Telkwa while Houston residents face a 32-minute commute to Telkwa. This does not include travel time from Telkwa to the mine site. Thus, according to their definition, Smithers and Telkwa are the only two urban communities that should fall within the LSA.

The failure to properly define the LSA is not a fatal flaw in the assessment because drawing available human and other resources from a larger baseline population could reduce the

magnitude of the effect in relative terms. The problem is that the assessment paints an incorrect picture of the region and cannot be relied as the basis for the analysis.

2.2.2 Out of Date Socio-Economic Information

The analysis of project effects was undertaken using a socio-economic baseline that was based largely on the 2016 census. This information is very out of date and, although the full results of the 2021 census have not yet been released, the 2021population counts that have been released show some important trends that need to be factored into a revised assessment of socio-economic effects.

Table 1 shows the population counts for 2021 as well as 2011 and 2016 for the communities in the LSA and the corrected LSA (with RDBN A) as well as the rate of population change. It shows that the population of Smithers and Witset declined between 2016 and 2021 while there were small population increases in Telkwa and Houston. The overall effect was a slight population increase (146 people) in the LSA, with most of this increase occurring in Telkwa. When the LSA boundaries are amended to include the rural population in RDBN A, there was a net population increase of 477 people between 2016 and 2021with population change in RDBN A accounting for nearly 755 of the increase. Overall, the population of the LSA did not change much between 2016 and the data in Table 1 by themselves are not expected to have a significant impact on the conclusions of the socio-economic assessment of the Project.

Table 1: LSA Population 2011 to 2021

	Population			Population Change		
Community	**2011**	**2016**	**2021**	**2011-2016**	**2016-2021**	**2011-2021**
Telkwa	1,350	1,327	1,474	-1.7%	11.1%	9.2%
Smithers	5,404	5,401	5,378	-0.1%	-0.4%	-0.5%
Houston	3,147	2,993	3,052	-4.9%	2.0%	-3.0%
Witset	560	631	594	12.7%	-5.9%	6.1%
LSA	**10,461**	**10,352**	**10,498**	**-1.0%**	**1.4%**	**0.4%**
RDBN A	5,391	5,256	5,587	-2.5%	6.3%	3.6%
Revised LSA	**15,852**	**15,608**	**16,085**	**-1.5%**	**3.1%**	**1.5%**

However, the important question to ask is: in what way is the population changing? Part of the answer can be found in Table 2. It shows that, based on the limited 2021 census data available at the present time, much of the observed small increase in the LSA population is due to a growing aging population that more than offset a decline in the number of people of normal working age (aged 15 to 64 years). Between 2016 and 2021 there was a net loss of 270 people in that age group in the LSA, with much of the decline occurring in Smithers. For the corrected LSA, which includes the rural population in RDBN A, the net decline in people of normal working age was lower (185 people) because there was an increase in the number of people of working age in RDBN A.

Table 2: Changes in the Age of the LSA Population 2016 to 2021

Community	Number of People Aged 15 to 64			Percent of the Population			
				Ages 15 to 64		Ages 65 and Older	
	2016	2021	Change	2016	2021	2016	2021
Telkwa	965	935	-30	67.3%	63.4%	10.2%	12.9%
Smithers	3,595	3,415	-180	66.0%	63.5%	15.8%	18.3%
Houston	1,930	1,945	15	65.1%	63.7%	14.0%	16.0%
Witset	450	375	-75	67.7%	63.6%	9.4%	14.4%
LSA	**6,940**	**6,670**	**-270**	**66.1%**	**63.5%**	**14.2%**	**16.7%**
RDBN A	3,440	3,515	75	62.9%	62.9%	13.8%	16.5%
Revised LSA	**10,380**	**10,185**	**-195**	**66.2%**	**63.3%**	**13.8%**	**16.6%**

Table 2 also shows that the percentage of people in the LSA and revised LSA aged 65 and older increased from about 14% of the population in 2016 to about 16.5% in 2021.

All of the predictions of project impacts on employment, population and infrastructure in the LSA are predicated on the assumption that there is sufficient capacity in the local labour force to account for 61% of direct construction labour (83.4 FTEs) and up to 131 of the 145 total operational jobs. While it is not clear how the capacity determination was made based on available 2016 information, it is important that this assumption be tested to account for changes in the age and composition of the local labour force as of 2021. It should be noted that the release date for the 2021 census related to employment and labour force is November 30, 2022.

It is essential that a re-evaluation of the assumptions related to the labour force be undertaken when the 2021 census results are released. While federal and provincial governments have continued to provide labour force and unemployment data since 2016, the data are reported for the North Coast and Nechako Region which is a very large area such that the results may not be applicable to the communities in the LSA. The only source of employment data for an area the size of the LSA is the census.

KEY OBSERVATION: The conclusions about the impacts of the project on socio-economic conditions in the LSA were based on conditions at the time of the 2016 census and there have since been important changes in the overall size and age structure of the LSA population. The validity of the conclusions about project effects need to be re-examined using the results of the 2021 census.

2.2.3 Failure to Address Job Losses as a Result of Mine Closure

A very significant omission from the assessment of labour market impacts is that there is no mention of the potential adverse effects of mine closure. The discussion of the effects of the decommissioning and reclamation phase of the project (Section 5.2.1.4 of Section 5.1 of the Application) describes the positive effects in terms of labour (30.6 FTEs in year 22) for decommissioning and 18.2 FTEs during years 23 to 25 for reclamation. No where in the assessment is there a discussion of what the loss of 145 operational jobs would have on the local

or regional labour market, nor is there a discussion of potential options that the company would be prepared to take to mitigate for these losses.

It is ironic that the application promotes the project on the basis of the new, long-term operating employment at the mine but fails to address the question of what happens to that employment when the mine ceases operation. It is the very nature of the mining industry that mine closure is inevitable. While it may not possible to establish a list of specific mitigative actions in the application that will ultimately prove to be effective when the mine closes some 22 years in the future, the mining industry and various governments around the world have accepted the concept of "planning for closure"[2]. Various objectives and principles have been developed to guide this process. One of the key principles is communication and consultation with stakeholders to ensure that the interests of all potentially-affected parties are considered in mine closure plans. Another key principle is the establishment of a set of indicators that can be used to assess the successful completion of the closure process. A third principle is that closure planning requires regular and critical review to ensure that the plan reflects changing circumstances.

The failure to discuss the adverse effects of mine closure and an associated mine closure mitigation strategy is a major deficiency in the application and needs to be addressed before the application can be deemed complete. The Applicant should be required to amend its application to properly address mine closure before the regulatory process can continue.

KEY OBSERVATION: The application fails to address the adverse effects of mine closure on the labour market VC or the demography and infrastructure VCs, nor does it provide a strategy or show a commitment for mitigating these effects. The application should be deemed incomplete until this omission is adequately addressed.

2.3 ECONOMIC ISSUES

2.3.1 Cost of Labour

The project economics and benefits were developed using various assumptions about the average cost of labour for all four phases of the project. As shown in Table 3.4-1 of the Overview, an average cost of $94,613 (average all-in salary) was assumed for the operations phase. Additional information on operational labour costs is provided in Table 3.4-6 of the Overview which shows the number of direct FTE jobs created in the RDBN and the associated wages and salaries. Analysis of this information shows an average of 138.4 FTEs per year over the 22 years of operation with average wages and salaries of $94,400. It is assumed that labour costs are expressed in 2019 Canadian dollars.

There are some questions about these numbers, however. The numbers show the average wages and salaries per FTE as being $94,400 while the average all-in salary, which typically includes benefits, was only slightly higher ($94,613), which suggests average benefits per FTE of only $213 per FTE or 0.2% of wages and salaries. For comparison, Statistics Canada produced

[2] Australian and New Zealand Minerals and Energy Council. 2000. Strategic Framework for Mine Closure. Access April 10, 2008 at http://www.doir.wa.gov.au/documents/environment/Shed_env_guide_closure.pdf.

economic multipliers for 2018 which showed that, for the BC coal mining industry, for every $1.0 million in revenues, wages and salaries accounted for $121,000, with employers' social contributions being another $21,000 (equivalent to 17% of wages and salaries) and this would result in 0.915 FTE jobs. Thus, the average remuneration for workers in the BC coal industry in 2018 was $132,240 without benefits and $155,191 with benefits.

The difference between the numbers in the analysis is quite striking, with average wages and salaries to be paid at the Tenas mine being 71% of the provincial average for people employed in the coal mining industry. This drops to 61% when the employer's social contributions (benefits) are included. The reasons for these differences are unknown. Part of the difference may be due to how the labour costs were calculated. If the BCIOM was used to estimate labour, wages and salaries per unit of output (sales revenues) based on projected revenues, this should not result in large differences because the BCIOM and the Statistics Canada models use the same data sets. The other approach to calculating labour income and employment is to override the models and input project-specific data, in which case Telkwa Coal Limited is claiming that it can operate its mine by paying wages that are only 60% to 70% of the provincial average. It may be that regional workers are willing to mine coal at wage rates that are well below the provincial average; this issue has not been discussed in the socio-economic assessment. However, if workers demand wages and benefits that are closer to the provincial average, this will have a significant effect on the project's financial viability because, as calculated, direct labour costs will account for 29% of total operating costs.

KEY OBSERVATION: Project operating labour costs are projected to be about 60% to 70% of average labour for coal mines in BC. There is no indication that regional workers will work at these rates. If the company has to pay labour costs that are more in line with the provincial average, this will adversely affect its financial feasibility.

2.3.2 Sourcing of Labour

2.3.2.1 Construction Phase

There is conflicting information about construction phase employment. Both Section 3.4.1 of the Overview Section and Section 5.2.1.2 of Section 5.1 talk about 127.9 FTEs of construction labour during the first two years of construction, consisting of 118.3 FTEs of contractor labour and 9.6 FTEs of TCL employees) with another 9.0 FTEs of construction labour during Year 1 of operation. However, the direct employment impact in BC during construction, based on the BC input/output model (BCIOM) as per Table 5.2-1 of Section 5.1 shows 295.8 FTEs, consisting of 160 FTEs in the Regional District of Bulkley Nechako (the RSA) and 135.8 FTEs in the rest of BC. Both numbers cannot be correct. The problem may lie in the interpretation of direct effects, with the definition (page 31 of Section 5.1) including "the direct TCL employees and direct Project contractors, as well as other direct positions that the BC IOM estimated for direct supplier industries". Based on this, it would appear that BCIOM is estimating 167.9 FTEs of other direct employment to arrive at a total of 295.8 FTEs. This problem carries over into the estimates of labour income during employment with Section 5.2.1.2 reporting a total of

$13.6 million ($12.4 million for contractors and $1.2 million for TCL employees) while the BCIOM results (Table 5.2-1) shows a total of $25.4 million, a difference of $11.8 million.

The information contained in the assessment raises serious doubts about the validity of the construction labour and labour income estimates. The observed differences may be an attempt to reconcile actual direct employment and labour costs estimates provided by the company with an estimate generated by the BCIOM which is for an "average" construction project for the base year of the model. If the BCIOM model results are being used as the basis for describing project benefits, then all of the benefits numbers may be suspect because of how the project was modelled. Consequently, the contents of Table 5.2-1 be ignored completely.

KEY OBSERVATION: There is a major inconsistency between the direct construction labour and labour income reported by the company and the results of the BCIOM that raises serious questions about how the construction phase of the project was actually modelled. The proponent must be asked to explain those differences or alternatively the results of the BCIOM need to be ignored.

According to Section 5.2.2.1 of Section 5.1 of the Application (the Labour Market analysis), during construction "Close to 60% of these positions are expected to be filled by local workers (from the LSA, RDBN A, and RDBN G)". After a review of the educational and employment characteristics of LSA residents, using 2016 data (which is now out of date), the analysis concludes that there is "a sufficient pool of unemployed workers in the LSA, RDBN A and RDBN G to fill Project construction jobs designated for the local workforce" (page 43). However, there is no discussion of how the 60% "**designation**" for residents of the LSA (plus RDBN A and RDBN G) was actually determined.

Section 6.1 further elaborates on the percentage of the local residents that would be hired during construction. It examines three scenarios, including a base assumption of 60% local, but also considers options of 30% or 90% local. This is problematic because the analysis concludes in Section 5.1 that there would be no potential for wage inflation with 60% local hiring but does not contain any observations about potential impacts for the 30% and 90% local hiring scenarios assumed in Section 6.1. Consequently, the analysis of labour effects in Section 5.1 is incomplete and inconsistent with the analysis contained in Section 6.1

KEY OBSERVATION: The assessment of impacts on the labour market VC (Section 5.1) only examines the effects of 60% local hiring during construction but the assessment of impacts on the demographic VC (Section 6.1) considers the effects of 30%, 60% and 90% local hiring. This is inconsistent such that Section 5.1 needs to be redone to examine all three scenarios used in Section 6.1.

There is another problem with the analysis, however. The analysis correctly observes that the number of people to be directly working on the project (jobs) will be higher than the actual amount of labour required to complete construction (FTEs). However, the analysis of what that will mean in terms of changes in number of local residents to be hired (including the associated effects on demographics and infrastructure) is focused on FTEs when it should be based on the number of people actually employed in construction. The assumptions about residency are based

on 137 FTEs whereas, as shown in Figure 5.2-1, the number of workers could be as low as 40 during the first quarter of Year 0 and between 160 and 186 during the third quarter, with the typical number of workers being 70 (Section 5.2.2.1 of Section 6.1).

Overall, the analysis of the number of LSA residents to be employed during construction is very confusing. The application says 60%, and, based on the FTEs (over the entire construction period), this would be 82 residents of the LSA (and RDBN A and RDBN G). However, using the two additional scenarios in Section 6.1, this could actually range from 41 to 140 FTEs (see Table 3). But, in terms of jobs at any one time, the number could range from 21 to 63 under typical conditions to 56 to 167 people under peak conditions.

Table 3: Possible Number of LSA Residents Employed during Project Construction

	FTEs		Jobs	
Scenario	**Low**	**High**	**Typical**	**Peak**
60% Local	82	n.a.	42	112
30% Local	41	60	21	56
90% Local	123	140	63	167

So, as shown in Table 3, the number of construction workers to be hired from the local area could range from 21 to 167 at any point in time, depending on the monthly construction schedule, and the analysis of impacts on labour markers needs to be revised to consider this range.

KEY OBSERVATION: The analysis of potential project requirements for labour during construction needs to be recalculated in terms of numbers of jobs, rather than in terms of FTEs, in order to gain a clearer understanding of requirements for local labour and the associated impacts on labour markets and wage inflation and to provide a better understanding of potential effects on demography and infrastructure.

2.3.2.2 Operation Phase

Section 5.2.1.3 of Section 5.1 of the application notes that an average of 145 people will be employed at the mine during operations with 60 people working on site during any one shift. It also notes that 90% of operational workers (131 of 145) are expected to be hired from the LSA, including RDBN A and RDBN G. It then speculates that, over time, all workers will be expected to relocate to the LSA in order to reside closer to the project. It also notes that an additional 17 contractors could be employed for coal haul and load out/

There is no rationale for how the 90% estimate was selected. Given the absence of anyone in the RDBN having been employed in the coal mining industry in 2016 (see Table 4.2-5), this assumption appears optimistic. And, while some of the operational jobs do not require specialized skills, such as trucking (see Figure 5.2-3 in Section 5.1 of the Application for the mix of operational employment), other jobs, such as mine support, technical and supervisory and plant operations, are quite specialized. Given that one of the labour market VCs selected for analysis is the potential for increased competition for skilled local and regional workforce, it is

reasonable to assume a worst-case scenario (a high percentage of local hires) for the analysis. However, for the basis of the rest of the analysis, a more in-depth assessment of the potential for local hiring should have been presented.

Again, the analysis of demographic effects (Section 6.1 of the Application) uses different assumptions about local hiring during operations. According to Section 5.2.2.2 of Section 6.1, 75% of the workforce will be withdrawn from the LSA, not 90%, and there is no mention of workers being drawn from RDBN A or RDBN G. Curiously, the number of local hires (130) is the same in both Sections 5.1 and 6.1 of the Application, suggesting that, according to Section 6.1, there will be 173 operational workers, about 30 more than stated in Section 5.1, but perhaps this includes indirect and induced employment in the LSA. This inconsistency in numbers is confusing, especially since TCL will have no control over where indirect and induced employment is sourced. Furthermore, the demographic analysis uses local employment scenarios that are not found in the labour market analysis. It assumes a conservative estimate of 60% local hires (or 102 workers) as well as a 90% option (153 workers). So, according to Section 6.1, the number of local residents hired for operations could range from 102 to 153, but Section 5.1 uses 130 workers. Thus, in assessing the potential for increased competition for skilled local and regional workforce as part of the labour force VC, the worst-case scenario should have been 153 not 130.

Clearly, there are inconsistencies between Sections 5.1 and 6.1 of the Application in terms of assumptions about the number of workers to be hired locally and it could be concluded that using a more modest assumption about local hires in the labour force analysis could have specifically been done to ensure that there would be no significant adverse effects. Given that baseline labour markets in the region have changed since the 2016 census, is recommended that both Sections 5.1 and 6.1 be redone to use consistent assumptions and to confirm that there would be sufficient local residents interested in mine-related employment to support those assumptions.

KEY OBSERVATION: Sections 5.1 and 6.1 of the Application use different assumptions about the percentage and number of local residents to be hired during operations. The analysis needs to be redone to eliminate this inconsistency and in the context of current labour market conditions to ensure that the assumptions about local hiring are realistic.

2.3.2.3 Decommissioning and Reclamation Phase

As noted previously, the analysis focuses on the number of people and labour income that would be hired to undertake decommissioning and reclamation but does not address the loss of 145 to 173 operational jobs when the mine closes.

2.3.2.4 Cumulative Effects

Section 6.0 of Section 5.1 of the Application identifies numerous proposed projects that could, if underway at the same time as this project, result in cumulative effects. This list is likely out of date, but also contains no information whatsoever on the potential labour demands associated with any of these projects. This makes it impossible to conclude as to whether the employment

demands of the Tenas project could lead to adverse cumulative effects on local or regional labour market conditions. This is a major deficiency that could be addressed by using the current BC Major Projects Inventory to update the list of projects and to undertake investigations as to the labour (construction and operational) associated with each one, especially for those projects that would be targeting the same portions of the labour force (mining and construction projects).

KEY OBSERVATION: The assessment of cumulative effects arising from competing demands for local and regional labour is out of date and incomplete and needs to be revisited to ensure that there will be no adverse cumulative effects on the local or regional labour force.

2.4 DEMOGRAPHIC AND INFRASTRUCTURE ISSUES

Many of the problems inherent in the assessment of project effects on demography and infrastructure have already been identified. These include the definition of the LSA excluding the rural population and baseline socio-economic conditions having changed substantially since 2016. However, there are additional problems.

2.4.1 Construction Phase

The biggest issue for the construction phase is that workers brought in from outside the LSA will require accommodation. According to Section 5.2.2.1 of Section 6.1, "The Project plans to contract a block of up to 70 short-term accommodation rooms available in the LSA communities of Smithers and Houston during the 1.5 year Construction Phase, thereby eliminating the need for a Project work camp or Fly-In-Fly-Out (FIFO) arrangements." And, according to Section 6.3 of the Application, TCL has confirmed that there are 13 establishments with 197 rooms in Houston and Smithers such that their workers would require 33% of available rooms.

There are two problems with the analysis. First, the analysis in Section 5.2.2.1 of Section 6.1 of Application is misleading because it describes effects in terms of FTEs over the entire construction period whereas demographic effects need to be assessed in terms of numbers of people. Table 4 describes the number of non-resident workers during a typical month of construction as well as during peak periods, for each of the three scenarios used to assess demographic effects. Based on this information, it would appear that 70 rooms would be adequate to support non-resident workers under the 60% and 90% local workforce scenarios. But, under the 30% scenario, as many as 130 rooms would be required, and this would represent 66% of the available supply. It is noteworthy that the assessment of significance of effects only considered the 60% scenario.

Table 4: Possible Number of Non-Residents Employed during Project Construction

	LSA Residents		Non-Residents	
Scenario	Typical	Peak	Typical	Peak
60% Local	42	42	28	74
30% Local	21	21	49	130
90% Local	63	63	7	19

The second problem relates to project timing. Figure 5.2-1 of Section 5.1 of the Application shows the month by month demand for construction workers, with the peak demands occurring in the summer months of Year 0. This means that TCL would be requiring between 33% and 66% of total available rooms during peak tourist season. This is not insignificant, because commercial accommodation typically relies heavily on summer bookings for revenues so any limitations on availability of that accommodation to tourists in one year could result in adverse effects on regional tourism that could last for years. This effect could be mitigated by shifting the peak season of construction to the winter months if possible. But more discussions with owners of commercial properties about the seasonality of the project's accommodation demands are required if the true effects on temporary accommodation are to be fully understood.

If those discussions reveal that providers of commercial accommodation are unlikely or unable to provide the 70 to 130 rooms during the peak summers season of construction, TCL will have to develop an alternative strategy for accommodating its non-resident workforce. This may require the provision of a camp, and the potential implications of this, in terms of possible effects on the community and on the financial feasibility of the project, are not addressed in the current application.

KEY OBSERVATION: The assessment of demands for commercial accommodation during construction needs to be revised since project demands could require as much as 66% of the available supply during the peak tourism season.

2.4.2 Operation Phase

For the operations phase, the most important consideration is the number of workers who will choose to move into the LSA from outside the region, potentially bringing family members, and their demands for housing, infrastructure and services. As stated in Table 5.2-2 of Section 6.1, the population of the LSA could increase by between approximately 50 to 200 people. According to Section 6.3 of the Application, this could result in demands for up to 68 residential units in a housing market that, at the time of the assessment, was considered "limited". Furthermore, the anticipated arrival of up to 30 children under the age of 15 could stress school capacity in Telkwa (but not Smithers or Houston) and could stress the provision of child care services. There is presumed to adequate capacity in the water and sewage infrastructure to accommodate such a population increase and there was also believed to sufficient health care capacity in Smithers. The Application also notes that taxes paid to various levels of government should assist in paying the costs of additional demands for services.

In general, the picture painted in the Application for the operations phase seems reasonable based on the baseline conditions at the time the application was prepared. However, much of the housing information was based on the 2016 census and could be considerably out of date by now. However, the biggest question, and it is impossible to answer, is where incoming workers and their families will choose to live. If they distribute themselves throughout the LSA, then the description of project effects may be correct. On the other hand, if the workers choose to locate in one specific community, their demands could exceed the capacity of that community. There can also be concerns that, if the demand for new housing results in the creation of a new

subdivision that consists almost entirely of project workers and their families, this can lead to polarization of the community (old houses versus new, mine workers versus non-mine workers, younger population versus older population) which has happened in other communities and is not healthy. This problem can be addressed by including a provision in the mitigation section for housing (Section 5.3.3 of Section 6.3) that commits the proponent to work with developers and local governments to ensure that new workers and their families are distributed throughout the LSA and not concentrated in a single subdivision in single community.

KEY OBSERVATION: While the assessment of effects during operation on demographics and infrastructure may be reasonable if the incoming workers and their families choose to locate throughout the LSA, issues could arise if all the demands are placed on one or two of the urban communities. TCL needs to work with local governments and developed to ensure this doesn't happen.

The comments that taxes paid to governments by TCL will held address the extra costs that incoming workers and their families of will impose on communities in the LSA is not entirely true. According to Table 3.8-1 of Section 1.0 Overview, TCL expects to pay a total of $13.7 million in property taxes to the Regional District of Bulkley Nechako. While this may offset some of the increased costs faced by the Regional District, TCL will not be paying any form of taxes to the individual urban communities in the LSA which typically are saddled with the costs of providing services to both urban and rural residents. This situation has caused major issues related to oil development in Alberta where rural communities get the money and the urban communities bear the costs.

2.4.3 Decommissioning and Reclamation Phase

Section 5.2.2.3 correctly observes that mine closure could result in a small population loss with this would be small in the context of population forecasts for the RSA. There is no mention of the effect of a population decline on conditions in the LSA. In addition, there is no discussion of how mine closure and an associated population decline might affect on housing or housing prices in the LSA or RSA.

KEY OBSERVATION: The assessment fails to consider how mine closure could result in out-migration from the LSA and the resulting changes in housing availability or demands on infrastructure.

3.0 Overall Observations

Overall, the socio-economic assessment of the proposed Tenas Project provides a reasonable, but sloppy and dated picture of how the project could affect the community. It is sloppy in that:

- Although the LSA boundary precludes the rural portion of the regional population (residents of RDBN A), the analysis often includes the rural populations of both RDBN A and RDBN G.

- The scenarios used in the assessment of demographics and infrastructure are not the same as was used in the assessment of effects on labour force. The assessment looks at labour effects in terms of FTEs when it should be assessing impacts in terms of jobs and number of workers.

It is dated because the baseline assessment for the project and for the cumulative effects assessment is based on old information. The baseline relies primarily on the results of the 2016 census and what little 2021 census information that has been released shows that there have been some important changes in the demographic make up of the LSA and surrounding rural population. Furthermore, the list of reasonably foreseeable projects upon which the cumulative effects assessment was based is also out of date and incomplete. Consequently, it is questionable as to whether all the conclusions in the socio-economic components of the assessment can still be considered accurate and a reinvestigation should be undertaken to see if anything has significantly changed. This does not mean that the assessment needs redoing, it just means that some of the key baseline data and related assessment conclusions need to be double checked once the full census results are released at the end of November.

The biggest problem with the entire socio-economic assessment is that there is almost no mention of the adverse effects of mine closure on labour, demography or any of the other socio-economic VCs. It has been standard practice in all of the mine-related EIAs that I have done to discuss the adverse effects of closure and to commit to working with the local community to build a mine closure plan to address foreseeable circumstances. This is "best practice" in the mining industry and the omission of a discussion of the adverse effects of closure is a major deficiency of the application. If mine employment is touted as a major benefit of the project then mine closure would represent a significant adverse effect of the project and it needs to be addressed in the overall mitigation plan.

However, the greatest overall problem with the entire application is that no proof has been offered that shows the project is financially viable. While there is considerable information on costs, there is no information on markets, expected prices or revenues. And, with recent increases in world oil prices and fuel costs and the shift away from coal, the conditions that made this project seem viable back in 2019 may no longer exist. It makes no sense for regulators to be deciding on the conditions under which a project should proceed without them knowing that the proposed project was and remains financially viable given changing world economic conditions.

SUMMARY OF KEY OBERVATIONS

PROJECT NEED AND BENEFITS

- The discussion of Project need is based on 2018 coal market projections and this needs to be revisited in the context of current global demands.
- The discussion of Project benefits is based on 2019 input prices, some of which have changed significantly in recent years, so a revised assessment based on current costs is required to ensure the discussion of relevant project benefits is still valid, as this will affect a public interest decision.
- It is not possible to test the validity of the estimates of project benefits without knowing what coal prices were assumed in assessing financial feasibility. This is a significant deficiency in the application and the Applicant must provide these coal price assumptions in order to be able to truthfully understand the economic merits of then proposed project.
- Expanding production to 1.35 million tonnes per year directly contradicts the Company's conclusions about the preferred option in terms of environmental and socio-economic effects.

METHODOLOGICAL ISSUES

- The choice of LSA is significantly flawed because it excludes people who live in rural areas in the vicinity of the proposed mine site and only includes residents of the four nearby urban communities, yet those people were included in the assessment of labour effects but excluded from the analysis of other socio-economic VCs.
- The conclusions about the impacts of the project on socio-economic conditions in the LSA were based on conditions at the time of the 2016 census and there have since been important changes in the overall size and age structure of the LSA population. The validity of the conclusions about project effects need to be re-examined using the results of the 2021 census.
- The application fails to address the adverse effects of mine closure on the labour market VC or the demography and infrastructure VCs, nor does it provide a strategy or show a commitment for mitigating these effects. The application should be deemed incomplete until this omission is adequately addressed.

ECONOMIC ISSUES

- Project operating labour costs are projected to be about 60% to 70% of average labour for coal mines in BC. There is no indication that regional workers will work at these rates. If the company has to pay labour costs that are more in line with the provincial average, this will adversely affect its financial feasibility.
- There is a major inconsistency between the direct construction labour and labour income reported by the company and the results of the BCIOM that raises serious questions about how the construction phase of the project was actually modelled. The proponent must be asked to explain those differences or alternatively the results of the BCIOM need to be ignored.
- The assessment of impacts on the labour market VC (Section 5.1) only examines the effects of 60% local hiring during construction but the assessment of impacts on the

demographic VC (Section 6.1) considers the effects of 30%, 60% and 90% local hiring. This is inconsistent such that Section 5.1 needs to be redone to examine all three scenarios used in Section 6.1.

- The analysis of potential project requirements for labour during construction needs to be recalculated in terms of numbers of jobs, rather than in terms of FTEs, in order to gain a clearer understanding of requirements for local labour and the associated impacts on labour markets and wage inflation and to provide a better understanding of potential effects on demography and infrastructure.
- Sections 5.1 and 6.1 of the Application use different assumptions about the percentage and number of local residents to be hired during operations. The analysis needs to be redone to eliminate this inconsistency and in the context of current labour market conditions to ensure that the assumptions about local hiring are realistic.
- The assessment of cumulative effects arising from competing demands for local and regional labour is out of date and incomplete and needs to be revisited to ensure that there will be no adverse cumulative effects on the local or regional labour force.

DEMOGRAPHIC AND INFRASTRUCTURE ISSUES

- The assessment of demands for commercial accommodation during construction needs to be revised since project demands could require as much as 66% of the available supply during the peak tourism season.
- While the assessment of effects during operation on demographics and infrastructure may be reasonable if the incoming workers and their families choose to locate throughout the LSA, issues could arise if all the demands are placed on one or two of the urban communities. TCL needs to work with local governments and developed to ensure this doesn't happen.
- The assessment fails to consider how mine closure could result in out-migration from the LSA and the resulting changes in housing availability or demands on infrastructure.

Watrecon
Consulting

JOHN P. THOMPSON, B.A., M.E.S.

Mr. Thompson has 45 years of experience assessing and evaluating the economic and social effects of natural resource management projects, programs and policies in western and northern Canada. Most of this time has been spent as a consultant but he also spent 14 years working for the Government of Alberta as Senior Economist for Alberta Environment and as Senior Economist/Social Scientist for an Alberta environmental regulatory agency (the Natural Resources Conservation Board).

For the last 20 years John has focused on three main areas of practice:

- socio-economic impact assessment;
- ecological economics in support of land use and river basin planning; and
- water management.

During his career, John has completed social and economic impact assessments for a wide variety of projects across Canada, including mines, pipelines, oil sands plants and LNG facilities. These projects include:

Mines:	British Columbia: Blackwater gold mine, Mount Milligan copper mine, Kitsault molybdenum project, Raven coal project, Sukunka coal project Alberta: Teck's Cardinal River Operations Saskatchewan: Star Diamond project Ontario: Marathon PGM-Cu Project, Barrick-Hemlo's open pit expansion, Rainy River Gold Project.
Pipelines:	Northern Gateway Pipeline; Prince Rupert Gas Transmission Project
LNG Projects:	Pacific NorthWest LNG Project; LNG Canada (Kitimat)
Heavy Oil:	Carmon Creek Project (Shell Canada); EnCana Borealis In-Situ Oil Sands Mining Project
Natural gas	Suffield In-Fill Natural Gas Drilling Program
Petrochemicals	Methanex, Pembina Pipeline Corporation and Field Upgrading Limited applications under Alberta royalty reduction programs
Other:	Various assessments for hydroelectric, water, highway and casino projects.

These assessments have been undertaken to meet the requirements set out in provincial legislation (BC, Alberta, Saskatchewan and Ontario) , the Canadian Environmental Assessment Act, and/or the National Energy Board. In some cases, John has used input/output analysis and/or economic multipliers to estimate the provincial and national impacts of many of these projects to demonstrate potential project benefits.

He has participated in hearings before numerous regulatory boards, and has been recognized as an expert socio-economic witness by the NEB (Northern Gateway Project). It should be noted that John has also participated in project reviews as an employee of the Alberta Natural Resources Conservation Board (including being seconded to the Alberta Energy and Utilities Board) on various projects, including the Dunvegan Hydroelectric Project, the Little Bow Project/Highwood Diversion Plan, and the Rossdale power project.

His recent experience in ecological economics involved completing five studies in the NWT for Aboriginal Affairs and Northern Development and Parks Canada related to the potential creation of protected areas. All of the studies involved assessing the benefits of creating protected areas (environmental and economic) against the costs (lost opportunities for non-renewable resource development), to help identify appropriate protected area boundaries. This has entailed working with Aboriginal communities to identify and classify areas of cultural, historical, social and economic importance. John has also undertaken ecological economic studies related to the value of fish and wildlife resources, wetlands, recreational resources, ecological goods and services, and national and provincial parks and protected areas.

John has undertaken various consulting projects related to Alberta's Water for Life policy, including assessments of current and future water in all of Alberta's major river basins and for sub-basins in the North Saskatchewan watershed, an inter-jurisdictional review of policies related to inter- and intra-basin transfers, and several cost accounting assessments for government-funded water management infrastructure. As senior economist for Alberta Environment, he was involved in river basin planning and water conservation and helped draft the Alberta Water Act. He has also prepared socio-economic assessments of the Special Areas Water Supply Project on three separate occasions and has undertaken peer reviews of economic studies of other proposed water management projects, including the Meridian Dam.

Education

B.A. (Economics), University of British Columbia, 1973.

M.E.S. (Natural Resource Management/Welfare Economics), York University, 1977.

Professional History

Principal, Watrecon Consulting	2003 to date
Senior Resource Economist, Stantec	2013 to 2017
Senior Resource Economist, AMEC Earth & Environmental	2005 to 2013
Director, Board Reviews; Senior Economist/Social Scientist, Natural Resources Conservation Board	1997 to 2003
Senior Manager, Strategic Management Division, Alberta Environmental Protection	1994 to 1997
Head, Economics and Water Use Section, Planning Division, Alberta Environment, Edmonton, Alberta, Acting Head Water Conservation Section, Planning Division, Alberta Environment, Edmonton, Alberta	1990 to 1994
Principal, Thompson Economic Consulting Services, Calgary, Alberta	1986 to 1990
Resource Economist, Reid Crowther & Partners Ltd., Calgary, Alberta.	1983 to 1986
Senior Resource Economist, Canadian Resourcecon Ltd., Vancouver, B.C.	1977 to 1983
Environmental Planner, Environmental Assessment Team, Land-Use Coordination Branch, Ontario Ministry of Natural Resources.	1976
Researcher, Inquiry Appraisal Team, Berger Commission on the Mackenzie Valley Pipeline, Ottawa.	1975