

The Sullivan Mine: A Case Study on Mining and Sustainability

Mineral Councils of Australia Environmental Workshop
October 2001

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Overview

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- Evolution of the Sullivan Mine in phases
- Measuring social and economic contributions
 - The Kimberley Community Sustainability Indicators
- Conclusions & Commitments

Discoverers of the Sullivan Mine (1892)



E.C. Smith

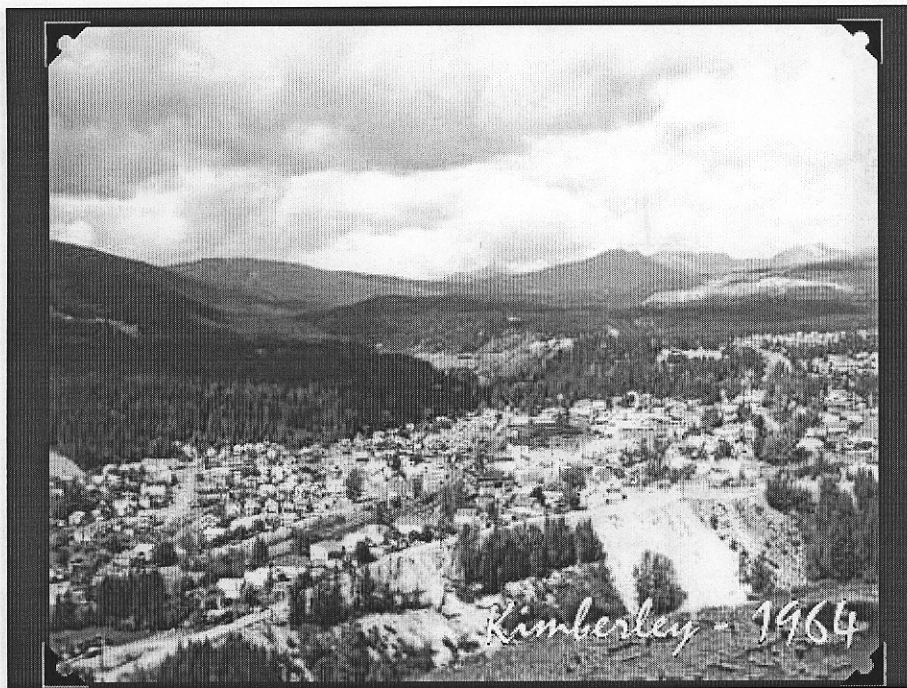
John Cleaver

Pat Sullivan

Walter C. Burchett



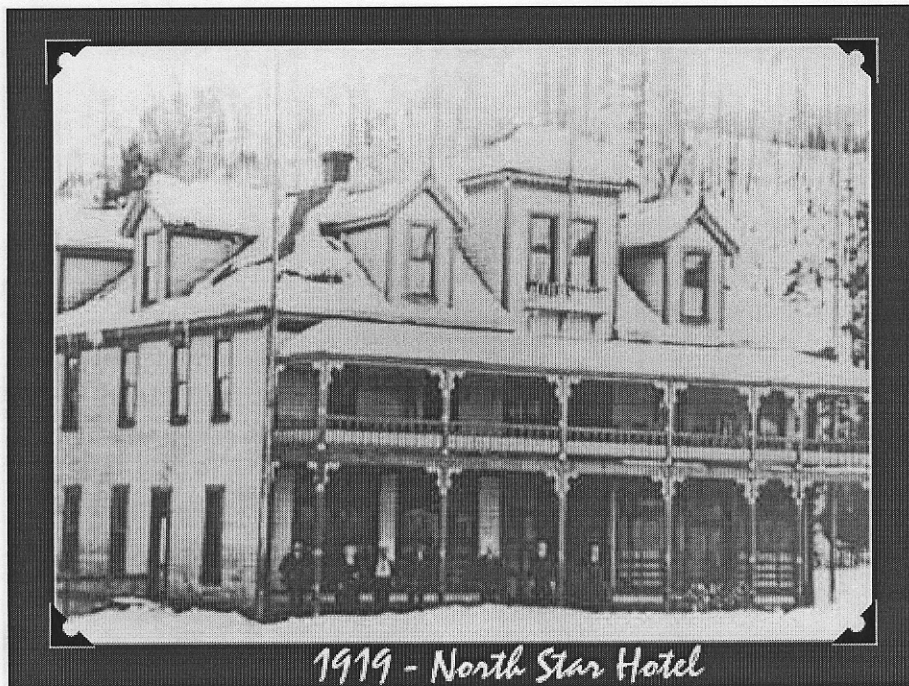
Kimberley - 1948



Phase I:
Kimberley as Company Town
1909 to 1944

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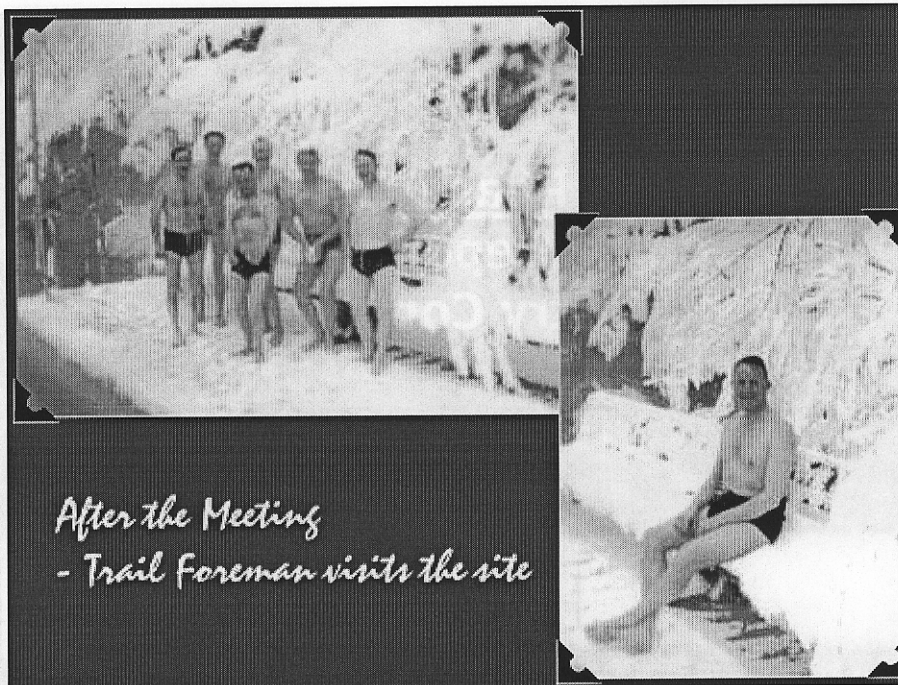




Phase II:
**Resource Dependent Single
Industry Community**

1944 to 1990

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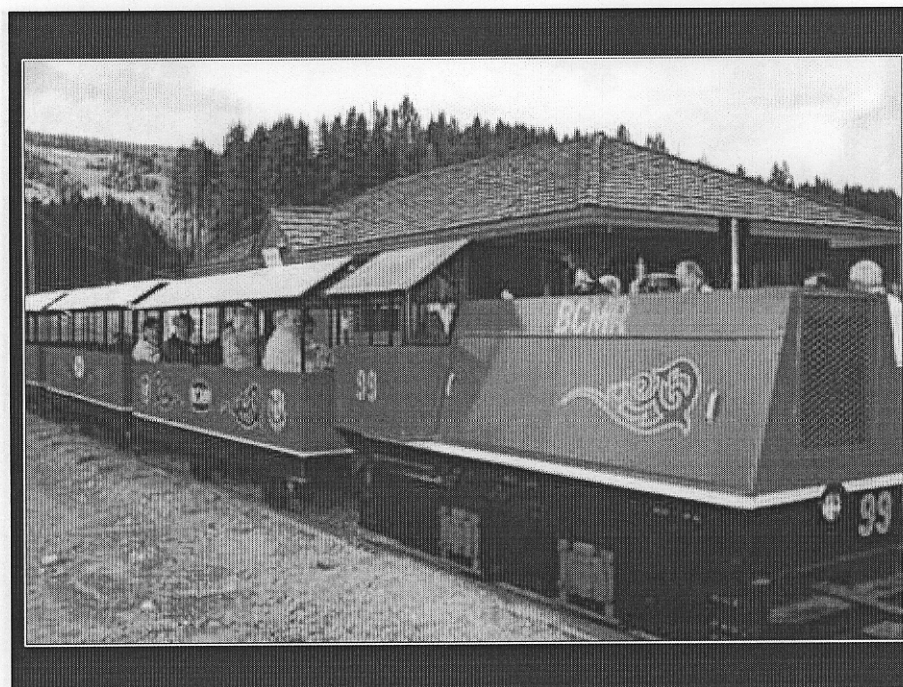


Phase III:
Diversified Economy and Resort
Destination

1990 to present

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Measuring Social & Economic Contribution

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- To develop a basic set of indicators, many sources were reviewed, such as:
 - Canadian Mining Association Guidelines for Sustainable Development
 - Australian Minerals Industry Code for Environmental Management
 - Global Reporting Initiative
 - World Business Council for Sustainable Development

The Kimberley Community Sustainability Indicators

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- Performance indicators were developed and broken into 3 sections:
 - Economic
 - Environment
 - Social
- Each section has individual components

The Kimberley Community Sustainability Indicators

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Economic

- **Labour Force**
 - I.e. Employment / Unemployment, income levels
- **Sustainability**
 - I.e. Multiplier effects for Suppliers and Services
- **Investment**
 - Local infrastructure, restoration activities

The Kimberley Community Sustainability Indicators

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Environment

- **Ecosystem Health**
 - I.e. Soil erosion, species diversity
- **Natural resources**
 - I.e. Availability of minerals
- **Ecological amenity**
 - Effects the company has had on the ecosystem
- **Sustainability**

The Kimberley Community Sustainability Indicators

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Social

- Education
 - I.e. Skill development, training
- Health & Safety
 - I.e. Social health (adult literacy), occupational health (injuries, lost days)
- Civic leadership
 - I.e. Sponsorships, community participation

Economic Performance

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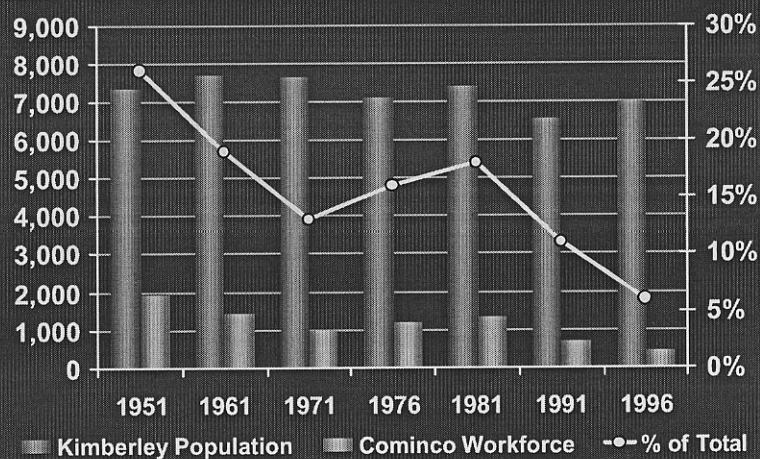
Traditional Economic Indicators

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- 1909 to 2000, the Sullivan has produced ore containing 9 million tonnes of zinc, 9+ million tonnes of lead and 280 million ounces of silver.
- Over the mine's 91-year life, average number of employees has exceeded 1,000 people.
- Annual salary plus benefits estimated to average CDN \$68,000 per employee in today's terms.

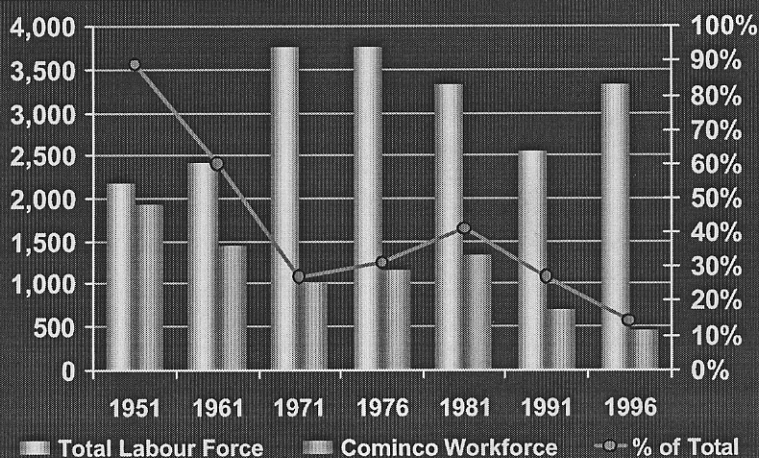
Comparison of Cominco Workforce to Total Population of Kimberley

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Proportion of Total Labour Force in Kimberley Employed by Cominco

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Environmental Performance

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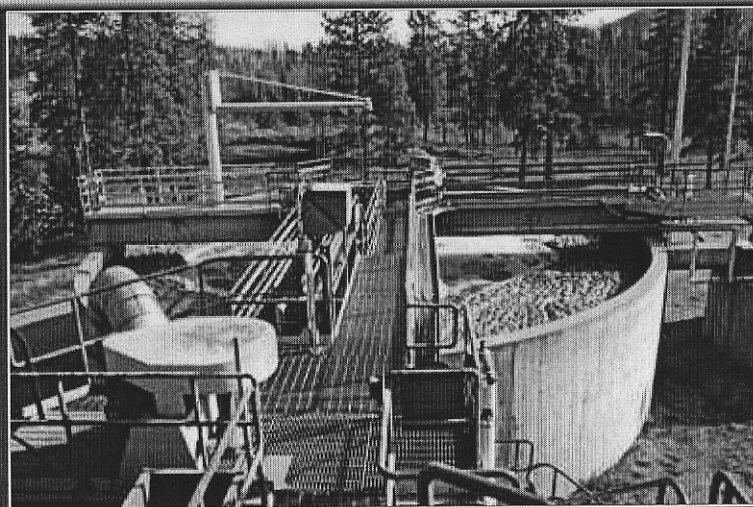
Tailings Pond Reclamation

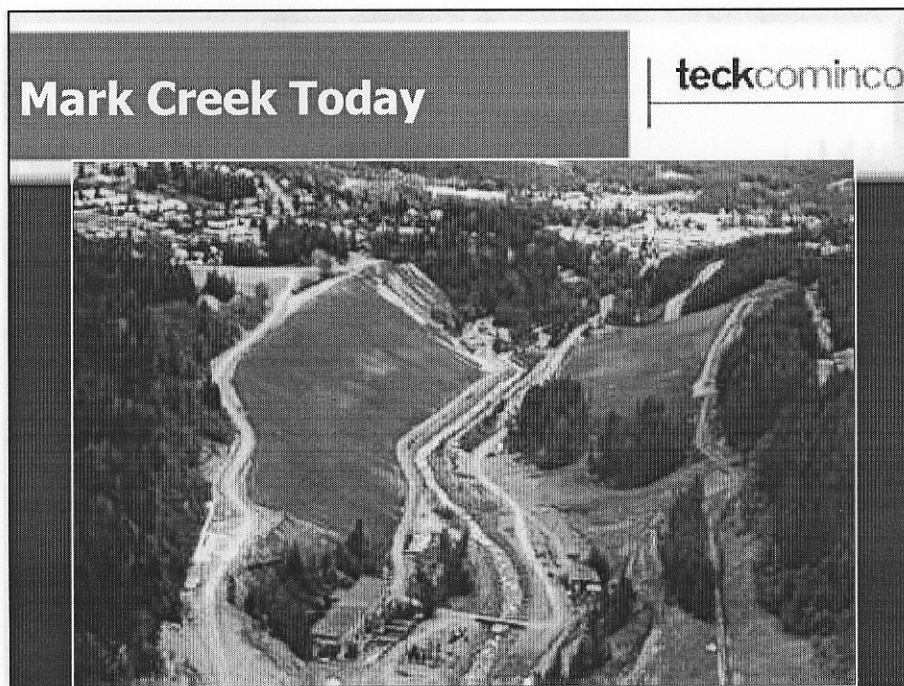
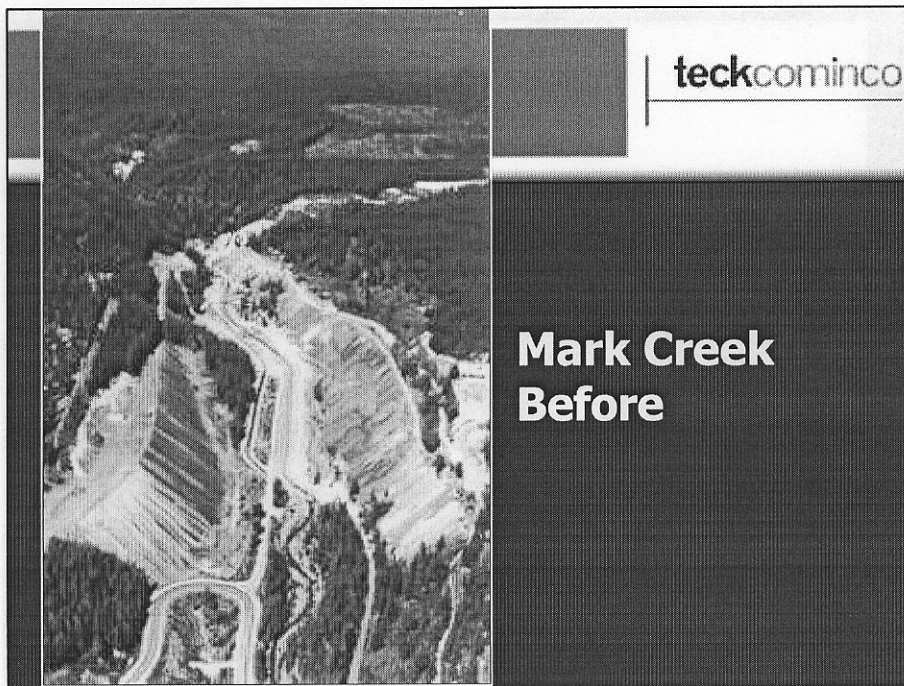
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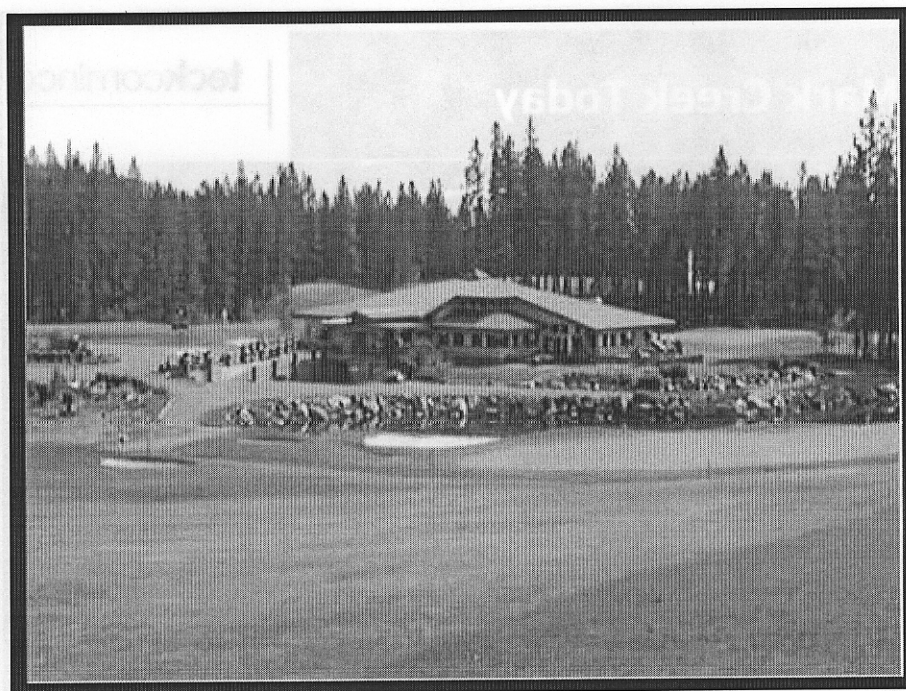
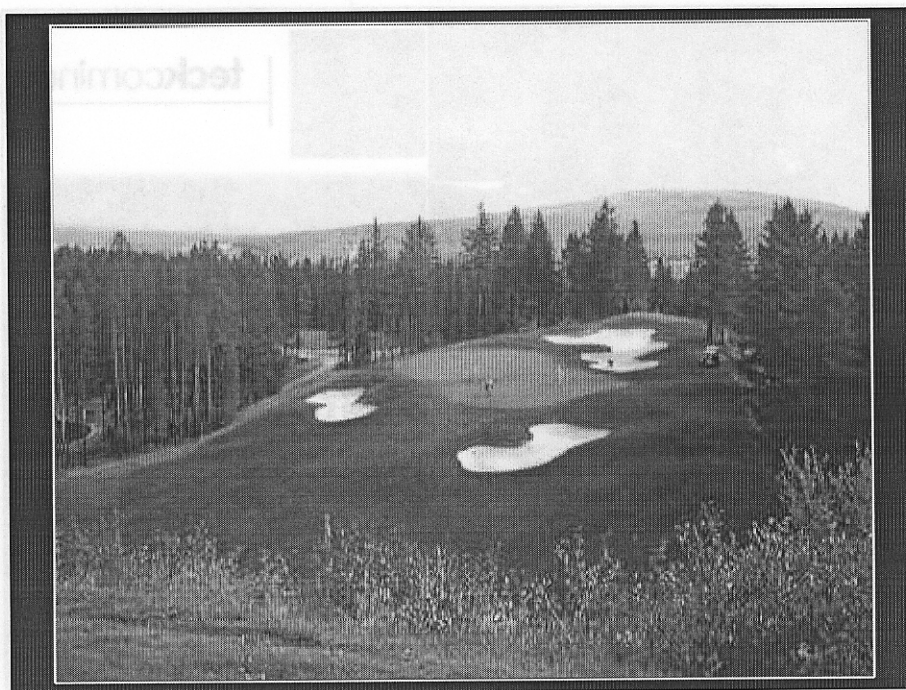


Drainage Water Treatment Plant

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Social Performance

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Civic Leadership – Community Participation

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- Sullivan Mine Public Liaison Committee (SMPLC).





Conclusions

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- Mining contributes positively to sustainable development.
- The Sullivan Mine and the City of Kimberley gives us example.
- OUR INDUSTRY NEEDS SOCIOLOGICAL RESEARCH TO MAKE ITS CASE.

Teck Cominco is firmly committed to...

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1. Proactively identifying issues, concerns and priorities at the early stages of development.
2. Endeavoring to be financially viable throughout the operating cycle.
3. Employing environmental best practices.
4. Demonstrating social responsibility.

Teck Cominco is firmly committed to...

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5. Engaging critics in constructive dialogue
6. Being accountable for all decisions and address past practices.
7. Working with end users of our products to promote reuse, recycling and safe handling.
8. Continually striving to ensure our actions measure up to our commitments to sustainability

Slide 1 – Title Slide

My name is Doug Horswill and I want to speak to you today about the Sullivan Mine. First, I want to thank you for inviting Teck Cominco to this important conference to make a presentation on what we think is one of the stellar zinc-lead orebodies of all time. I am sorry I am not able to be with you there today but 34¢ zinc and 64¢ copper do have their various implications on all of us and for me it's travel restrictions that as well as the economic reality of today. I am delighted however that Wayne Spilsbury of our Perth office is able to be with you in my stead.

- The Sullivan Mine is closing in December of 2001. As a result we wanted to look at the contributions that the Sullivan Mine has made to the sustainability of the community of Kimberley and the people who have lived in that community and work at that mine or with the businesses that have been supported by that mine over the last eighty or ninety years. That is the real essence of our paper, of the research that underlies the paper and of the presentation that we want to make to you today.

Slide 2 - Overview

- This presentation is divided into three parts. The first will take you on a tour of Kimberley and talk about the evolution of the relationship between Teck Cominco and the City of Kimberley. Secondly, we will talk about indicators of social, economic and environmental contribution, in effect the sustainability

indicators to measure the benefits brought to the community by the Sullivan Mine. And we will close with conclusions and comments.

Slide 3 – Discoverers

- Let's start at the beginning. The mine was discovered in 1892 as part of the construction of the CPR, the Canadian Pacific Railway. The four gentlemen here are credited with the discovery and Pat Sullivan, of course, was the one whom the mine was named after. The mine started into production in 1909 but actual economic success didn't come until 1916 when the company bought the technology necessary to separate lead and zinc in the concentrator.

Slides 4 and 5 – Kimberley 1948 and 1964

- When the mine was first discovered there were no roads, no towns, and no infrastructure in the area. Natural resource development in fact was the basis for opening up of the southwestern part of British Columbia. People who came to work for the Sullivan Mine built a community around the mine that later became the City of Kimberley, pictured here in 1964. Three distinct phases describe the relationship between Kimberley and Teck Cominco. First phase was the shift of economic power that led to the diversification of the local economy as power shifted from the mining company to the community. Second phase was characterized by the shift of the community mindset from one of dependency on the company to one of independence. And the third and current phase is the shift of the company mindset from a

patriarchal supporter of the community to a collaborative partner in the development of the future life of Kimberley.

Slide 6 – Phase I

- We will start with Phase I.

Slide 7 – 1900-1948

- This time period was characterized by the laying of new railway tracks, of copper wires, telegraph lines, telephone. The increasing development of the community to support production as more and more people were required to be able to operate the mine effectively. Cominco at the time was renowned for generous social programs for employees that lived in a very self-contained aspect.

Slide 8 – 1914 Mine Office

- Pictured here in 1914 is the mine office and the staff quarters of the operation in those days.

Slide 9 – 1919 Hotel

- This is a picture of the North Star Hotel, a source of fun and frolic in the community of Kimberley in 1919.

Slide 10 – Phase II

- The 1944 to 1990 period began with the incorporation of the Town of Kimberley and ended with its transition into a tourist destination. It was

characterized by the mindset of the community shifting from dependency to independency.

Slide 11 – City Council

- This is a picture of the first of the city fathers taken when the incorporation of the Town occurred in 1944 with the Town taking over certain public services such as water and electricity.

Slide 12 - Swimming

- We see the city fathers relaxing after a hard day at the office. In 1968 the company began its real shift toward independency in mindset when the City Council made a decision for an urban renewal project to transform Kimberley's downtown into a diverse multicultural area devoted to the theme of Germany and the Bavarian City of the Rockies.

Slide 13 – Phase III

- Phase III was the real development of a diversified economy and a destination resort.

Slide 14 - Downtown

- The City responded to this idea by taking Bavarianization and really creating the opportunities, attracting entrepreneurs who are willing to invest in this part of the world of this purpose and then attracting people from all around the world to this destination resort.

Slide 15 - Marriott

- The new development of a major hotel at the foot of the ski hill, a development by Marriott International is the beginning and the centerpiece of a four-season resort.

Slide 16 – Bavarian Railway

- This slide depicts the Bavarian railway. Collaboration between Teck Cominco and the City of Kimberley to provide a tourism experience based on mining history. This is an example, like many others, of how the collaboration between the two partners has created a sustainable future for the City of Kimberley.

Slide 17 – Sustainable Development Indicators

- So what has mining contributed to Kimberley and the townsfolk there? How does a nonrenewable resource exploitation activity like mining contribute to sustainability in any case? These were key questions that came to our minds as we come to the last of the life of the Sullivan Mine. In order to explore this question we contracted two researchers to examine the social and economic contributions and the environmental contributions that the Sullivan Mine has brought into this area. The first thing we had to do was set the foundation to determine how we were going to assess these particular initiatives. We looked at the Canadian Mining Association Guidelines for Sustainable Development and the Australian Mineral Industry Code to be able to determine what guidance those particular codes could give us to understand

how to measure and how to analyze sustainability criteria in a mining context. We looked at a number of the international reporting and best practice standards that are out there: Global Reporting Initiative indicators, the indicators of the World Business Council for Sustainable Development from the matrix social reporting, UK's business in the community principal for corporate community investment and Boston College standards for excellence in corporate community investment, were all points of reference when we tried to develop sustainability indicators – again to measure what the Sullivan Mine has contributed to the people of that area. Particularly helpful were indicators from the so-called Oregon benchmarks and from the Federation of Canadian Municipalities quality of life reporting systems. We can provide information on any and all of those if that is of interest to you, let Wayne know and we will provide the appropriate citations. The research that we are relying on in this area were by two individuals Catherine Rockandel and Debra Kerby. We hired Catherine and Debra to assist us in preparing a paper that will be used for the foundation for a symposium that we are hosting together with The World Bank in Kimberley on November 5 and 6. The idea of this symposium is to try and get at the issues of what the industry can do to contribute positively in the sustainable development criteria areas using three case studies: a new mine, Antamina; a closing mine, the Sullivan Mine; and Placer Dome operations in Porgera as examples of mines in the middle of their life in developing areas. These three case studies (early life, end-of-life and mid-life in developing and in developed worlds) will give us a basis to

workshop three distinct cases of mining and sustainability in different world settings.

Slide 18 – Kimberley Indicators

- The first step involved research to develop sustainability indicators for Kimberley. Following the sustainable development model, indicators possible were divided into three areas: economic, environment and social. Research is continuing to attempt to develop data on as many indicators as possible. However, our problem turns out to be a lack of good data in many areas.

Slide 19 - Economic

- Under the economic category we looked first at traditional measures, as you will see momentarily. The other key areas were labour force, looking at employment, unemployment; what we call sustainability or the multiplier effects; what new businesses were spawned as a consequence of the mine and investment areas such as local infrastructure and restoration activities. We are still attempting to establish the data sets needed to understand all of these indicators so our focus today will simply be on all of the traditional and on labour force.

Slide 20 - Environment

- In the environment area we have four sets of indicators as shown: ecosystem, health, soil erosion, vistas, that sort of thing; natural resources and their availability; ecological amenity, the effects the company has had on the ecosystem in terms of both revegetation and recontouring of areas and so on;

also on things like the amenities that are useful to communities in the future; and then the sustainability indicators including conservation, restoration, protection of habitat, transportation and pollution prevention areas.

Slide 21 - Social

- The social indicators that we are attempting to focus on include education, that's skill development, training, health and safety, literacy, occupational health, looking at injury days and so on historically; and then the civic leadership, the community involvement during the mining life and as the mine prepares for shutdown to what extent has the community been involved.

Slide 22 –Economic Performance

Slide 23 – Traditional Economic Indicators

- Traditional economic indicators speak to the wealth that has been generated by the Sullivan Mine. The numbers on this slide speak for themselves – 9 million tonnes of zinc, 9 million tonnes of lead and 280 million ounces of silver. The generated net returns from that amount of physical production amounts to something in the order of \$20 US billion of wealth generated directly by the Sullivan Mine. That includes payments to shareholders, wages, purchases of goods and services and taxes paid to local, provincial and national governments. Secondary effects, those effects rising from the purchase of goods and services and so on have been estimated to be approximately \$3 for every \$1 direct benefits or another \$60 US billion into the British Columbian and Canadian economy as a result of the Sullivan

Mine. Sullivan also provided sustainable livelihoods for the workers and their dependents in Trail, British Columbia (about a four-hour drive away from Kimberley) where the concentrates from the Sullivan Mine were turned into zinc and lead metal. An untraditional indicator which I don't get into in this talk but which one should look at is in fact the contribution of our products to the sustainability of the world's economy and its environment. How many tonnes of steel were saved from corrosion and therefore not replaced because that steel was galvanized? And, as a result of that, how many tonnes of CO₂ were not spewed into the atmosphere? Our estimate is that one year's production of zinc by Cominco saves as much as 20 million tonnes of CO₂ emissions into the atmosphere as a result of the steel that has its life extended as a consequence of galvanizing. These numbers are being taken up by the zinc industry to show how our products themselves contribute to a sustainable future.

Slide 24 – Workforce

- Unfortunately, because of data gaps a whole host of very interesting questions can simply not be answered today but one that is the question of workforce and how the workforce is deployed in the community. A typical case for many resource communities is that when the primary industry – mining industry or forestry industry – begins the process of closure, the proportion of people working for the company usually increases as the total population in the community declines. The usual result is that there are a larger percentage of people working for the industry as a percentage of the

total population, which means an increasing dependency on the industry as the community shrinks as people move away looking for new livelihoods. Sustainability is demonstrated when this doesn't occur as is the case with Kimberley. Kimberley has had a relatively stable population over the last fifty years despite the dramatic drop in the percentage of the population working at the mine. In 1951 26% of the population was working at the mine, and by 1996 this number had dropped to 6% while the population levels remained relatively stable. In addition the total Kimberley labour force has actually grown over the last fifty years while the Cominco workforce itself actually declined.

Slide 25 – Labour Force

- The total labour force in Kimberley employed by Cominco was around 89% in 1951 and it was only 14% by 1996. These numbers convey the extent to which there has been a tradition from reliance on the mine to economic independence on the community. There has been a strong growth in diversification of the labour force over these years. The sectors such as service sectors, community education, health, these are the sectors which have grown in relation to the mine independent of the company. In terms of economic sustainability and economic contributions to the quality of life over the last forty years, the Kimberley labour force has moved from a reliance on the mine to a wide range of other industries. The transition to a destination tourist site and a retirement haven has led to the diversification of jobs into tourism and into housing as the workforce changes and grows. The

community itself is attempting to attract new light industry given its particularly attractive circumstances both from a climate and a quality of life point of view.

Slide 26 – Environmental Performance

- The next area of indicators related to environmental performance.

Slide 27 – Revegetation

- The focus of the research that we are doing at Kimberley is on the economic and social contribution that the Sullivan Mine has made to the community. This, however, cannot be separated from the environmental impact. Our business is an invasive business. We do disturb ground when we try to win from the earth's resources the metals that are needed to support modern society. When the Sullivan Mine began environmental consciousness society was very different that it is today. The use and disturbance of land was seen as irrelevant because it was an endless resource. Today our consciousness is much different than that so the focus on environmental performance at the mine has been on reclamation. Approximately \$70 million will be spent in recreating useful natural habitat out of disturbed areas in the mine. This will leave hundreds of new acres of new wildlife habitat to enhance the lives of Kimberley citizens those on two legs as well as those on four.

Slide 28 – Water Treatment

- One of the items in Kimberley's continuing future is the treatment of acid rock drainage. This will go on forever. A drainage treatment plant has been established and it will be manned for a period of time and then run on a

maintenance only basis. Water will be collected from within the mine as well as from all of the dumps and tailings ponds after those have been vegetated to try and minimize the source of new impacted water. Pollution prevention is the guiding principle that will take us forward as we go into reclamation.

Slide 29 – Mark Creek Before

- This slide shows a stream called Mark Creek that ran right through the lower mine yard, the area where the 1915 access portal was first generated where all of the ore and waste was removed from the mine. The waste piles were simply made along the edges of the banks of Mark Creek and little concern was given to the consequences on that creek. That, of course, is totally unacceptable today so a significant project was put into place both to try and regenerate life in Mark Creek and to revegetate these areas.

Slide 30 – Mark Creek Today

- We see what this looks like today after something in the order of \$10 million worth of spending. The creek is clean, supporting life, fish are in the creek area and the revegetation has taken hold.

Slide 31 – Golf at Trickle Creek

- We get into the area of ecological amenities or measuring how our activities after we have finished them have left the landscape in terms of the future users. One of the areas in which we have taken initiatives is collaboration with the community to take advantage of the natural scenic landscape existing in Kimberley to create such things as the Trickle Creek Golf Course,

considered today one of the very best golf courses in British Columbia, as well as the skiing area called the North Star Ski Hill.

Slide 32 – Clubhouse at Trickle Creek

- This shows the clubhouse at Trickle Creek Golf Course built on land turned over from Cominco to the City of Kimberley for the use in the development of the community's future.

Slide 33 – Social

- We get into one of the most difficult areas of trying to measure contribution and that's social performance.

Slide 34 – Public Liaison Committee

- The social dimension of sustainability is liaison interaction and information to communities of interest. In the case of Sullivan, the Sullivan Mine Public Liaison Committee was established for this purpose. A little history helps. In 1990 Cominco shut down the Sullivan Mine as a result of certain economic factors including high labour costs for contract miners. In 1991 when the mine was set to reopen a community meeting was held wherein the company presented certain reclamation proposals related to the end of life. The community, having experienced the shutdown, finally realized that they needed to take action on both the economic front to establish a sustainable future from an economic perspective and on the environmental front. The Sullivan Mine Public Liaison Committee became the vehicle by which these issues could be discussed between the company, community, environmental

groups and others. The Ministry of Environment was an attendee at these meetings, the Ministry of Mines chaired them and various organizations including the key environmental groups attended the meetings. This interaction with the community is a key part of social performance in respect to sustainability. Of course, other key areas such as education are also critical and over time I hope we can develop the data which will allow us to show the contributions we have made in those sorts of areas to the community of Kimberley. And I hope the industry will be able to take the work that we do and adapt it to other cases where we can start to show just how important our industry is to the sustainability of the modern world and modern economy.

Slide 35 – Kimberley West

- I want to look at one area where we have an integrated example of economic, social and economic components within the framework of the legacy that Teck Cominco is leaving the City of Kimberley. Kimberley possesses a new subdivision that is being developed by a Calgary company on lands formerly owned by Teck Cominco and donated to the City. Our intention here is to help expand the shrinking tax base of the community - that tax base shrinking of course because we are moving out - and supplying instead residential taxes from folks who retire from communities and cities like Calgary in Alberta into the Rocky Mountain area for the purposes of taking advantage of the tremendous recreational opportunities that exist there.

Slide 36 - Conclusions

- In conclusion I would like to make the point that mining does contribute positively to sustainable development. In the Sullivan Mine's case the lifetime economic contribution exceeded \$20 US billion of direct value and \$60 US billion in spin-off benefits; social contributions such as the use of the public liaison committee; and environmental contributions measured by the amount of disturbed land that is put back to productive uses round out the three dimensions of sustainable development.

Ignore Slides 37 and 38

- Kimberley has made the transition from a single resource-dependant community to an independent sustainable community with a future after mining.
- To understand what the contributions have been, we have to do more research and that work is underway. Kimberley and the Sullivan Mine do give us the opportunity as an industry to try and begin to understand how we contribute to sustainability and what we have to do to improve that contribution as we go forward. Frontiers of knowledge are just opening up in these areas and we can take these ideas and apply them to planning our next mines to make sure that the contribution these mines make to society is maximized and that people welcome our industry wherever we want to go or wherever we happen to find the orebodies.

Thank you and, Wayne, questions are over to you.