Alaska-Canada Rail Link Feasibility Study

Southern Yukon and Port of Skagway Analysis

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In association with
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EXECUTIVE SUMMARY

The most important conclusion of this report is a solid business case exists to modernize the White Pass & Yukon Railroad (WP&YR) to standard gauge and renovate the port facilities in Skagway. It is recommend that the investment level in railroad and port facilities be the smallest capital undertaking technically and economically feasible. This level is described as "Built to Fit Need". It is important to emphasize the report scenarios assume common ownership and operation of both port facilities and WP&YR.

It is recommended that resumption of rail freight service to the Yukon be undertaken by conversion of the WP&YR to standard gauge with a capital investment of $180 million (Appendix 1). Concurrent with WP&YR modernization, it is recommended that investment to the level of $110 million be made in the Port of Skagway to provide year round intermodal and bulk cargo service to the Yukon and Alaska with a rate of return on capital employed on both ventures yielding 9%.

The positive central conclusion of this report is revenues generated from exported coal and energy projects freight with rail barge service between Prince Rupert and Skagway will generate attractive returns on capital investments. In all cases the tourist excursion rail business is protected from modernization impacts. This report projects that a southern Yukon rail project is realistically feasible and removes the question of whether constructing the southern Yukon rail segment and rebuilding the port of Skagway is adequate to serve Alaska's and Yukon's present and future needs. Resumption of southern Yukon rail with the development of new port capacity in Skagway is recognized as a distinct component of the Alaska Canada Rail Link (ACRL) Feasibility Study.

The recommencement of rail freight service to southern Yukon and the improvements to the Port of Skagway will provide the economics necessary for Yukon mining to compete with other Pacific Rim regions. Increasingly, the State of Alaska requires redundancy in its critical transportation facilities not only for transportation economics but also for self-sufficiency in the event of natural disasters, homeland security and national defense. Renewed standard gauge rail service to the Yukon providing the first critical rail link between the Port of Skagway and the Alaska Railroad will provide Alaska with multiple transportation corridors reducing its dependence on the Alaska Highway and a single sea lane.

Opportunity and Challenges Statement

Five Largest Opportunities:

1. Currently, the WP&YR is a profitable rail excursion operation. The railroad infrastructure is in place and underutilized.
2. Competitive highway cargo transportation alternatives to the Port of Skagway are extremely expensive.
3. Worst case scenario proposal still yields a positive return on capital and the stakeholders will be in a favored position to influence price and service level of rail and port services.
4. An independent and profitable southern Yukon rail link and the Port of Skagway are essential elements to economic growth of both Alaska and Yukon.

5. Alaska gains independent, economic and transportation assets and Yukon mining can compete in Pacific Rim markets.

Five Largest Challenges:

1. Stakeholders must be identified to invest to modernize the WP&YR or the Port of Skagway.
2. Capital investment in infrastructure is significant.
3. The rail and port cargo is dependent upon mineral and coal exports and freight from large energy projects.
4. The nature of the energy projects is challenging and mining in the Yukon has not been a sustainable economic component in the Yukon economy.
5. Stakeholders for the rail barge service between Skagway and Price Rupert must be identified.

BACKGROUND

The ACRL Study project team has been tasked with the assignment of assessing and determining the market potential, costs, benefits, engineering and technical challenges of providing a cost effective transportation railroad service to Northern British Columbia, the Yukon Territory, and southeastern Alaska. As a part of this effort, Pacific Contract Company, LLC and HDR Engineering, Inc., in association with TEC Infrastructure, Inc., have been tasked with determining the feasibility of providing freight railroad service between Carmacks, Yukon and the Port of Skagway, Alaska.

SCOPE OF PROJECT

The assignment for the Southern Yukon and Port of Skagway Analysis includes evaluating the following critical elements.

1. Condition assessment of the Port of Skagway.
2. Condition assessment of the White Pass & Yukon Railroad (WP&YR).
3. Analysis of the potential imports and exports of the Port of Skagway.
4. Analysis of the potential port and railroad operating scenarios required to address the minimum and phased maximum potential use of the port freight facilities.
5. Determination of the potential infrastructure improvements required to support the Port of Skagway.
6. Determination of the potential infrastructure improvements required to support the WP&YR.
7. Identification of the potential environmental elements to accommodate both port and railroad improvements.
8. Conceptual schedule of potential improvements to accommodate a phased implementation plan.
9. Conceptual costs of these improvements.

BUSINESS CASE

The business case for improving the Port of Skagway, modernizing the WP&YR between Skagway, Alaska and Whitehorse, Yukon Territory, and extending it between Whitehorse and Carmacks has been analyzed as a base case operating scenario to haul coal, other bulk materials, and to support the construction of the Alaska Highway Pipeline Project (AHPP) and the Mackenzie Valley Pipe Line Project (MGP).

A total of eight base railroad construction and operating scenarios are examined to form the basis of this report. In all cases, the existing WP&YR narrow-gauge summer tourist excursion operation continues utilizing the same locomotives and coaches with standard gauge freight trains operating on a third rail. Freight trains will only operate outside the hours of operation of the tourist excursion trains. The base case has been analyzed for a period of 10 years using 4% bonds as a financing tool. This report presents the operation of the Port of Skagway and the railroad as if both were of common ownership. In all cases, the net revenue from the benefits of modernization of the WP&YR to Whitehorse and reconstruction of the Port of Skagway is positive. A new 108-mile railroad constructed to Carmacks, Yukon Territory to a “Built-to-Fit-Purpose” standard is also positive in the development of the area.

“Built-to-Fit-Purpose” is a railroad industry term meaning to construct, equip and operate a line of railroad in the most economic manner for the cargo hauled.

The report makes no assumption regarding the potential use of transcontinental railroad corridors, or for the additional potential interchange traffic with a potential transcontinental railroad corridor. The report only makes the assumption that incremental improvements of the WP&YR from Skagway to Whitehorse and then to Carmacks is feasible, and is economically viable under certain conditions at this early stage in the ACRL Study.

This report anticipates substantially increased new segmented passenger revenues and surging profitability from both reformed passenger operations and the third-rail conversion efficiencies on the tourist excursion portion of the WP&YR. This result is shown as a single line item, WP&YR PASSENGER REFORM in accompanying financial presentations.

The format of this report has been to develop an operating scenario based upon the existing WP&YR passenger trail operations and then superimposing the following:

- Rail-barge Yukon Territory-destination base freight traffic using the Port of Skagway as a transfer point;
- A new coal rail haul unit train operation from Braeburn, Yukon to Skagway;
- Bulk export mineral product from Yukon and northern British Columbia to Skagway;
- Line pipe for both the AHPP and MGP energy projects;
- Surge traffic for the period of staging and construction of both the AHPP and MGP energy projects; and
- Fuel haul and community restocking from Skagway to Whitehorse and Carmacks.

The base case working budget includes WP&YR revenues and expenses. Utilizing the base case operating scenario, a capital cost with depreciation schedule was developed for each scenario. Several iterations of revenue, operating and construction costs were developed to yield the passenger, freight and coal haul financial presentations including depreciation and bond payback costs.

The business case only works best for the years that the port and railroad are hauling line pipe surge traffic, equipment and materials for both energy projects. The Division Mountain Coal (DMC) Mine’s base case was originally estimated with the mine producing 1.1 million tons per year. This is factored into the base case for the study with no other major mining considered. One analysis indicates that considerable additional mining tonnage, up to 3 million tons annually, is possible and would substantially modify the financial feasibility of a rail extension to Carmacks to a positive position even with construction of the railway to the highest standards set by the Alaska Railroad.

Additionally, further analysis indicates that it would be possible to triple or quadruple the base to 9.3 and 12.4 million gross tons with relatively minimal investment required in the railroad infrastructure for operations.

After the pipeline boom, the traffic assumed for the study includes tourist passengers at the level currently experienced by the WP&YR, base rail general freight arriving via barge from Prince Rupert and DMC Mine coal from Braeburn.

Additionally, Yukon-based traffic will be specified by further ACRL efforts being prepared by others. As further information is developed, this report can be easily updated to reflect the newly developed results.

Yukon Mine Cargo

There is a significant opportunity to economically develop the mining and export of mineral resources in Yukon. These minerals primarily include coal, iron ore, zinc and gold. Bulk minerals can be mined economically and with respect for the environment. These resources cannot be exported without the use of a cost efficient transportation system and quality port facilities.

This report presents a framework of discussion about the vast known and anticipated quantities of bulk materials which are located within a close proximity to a proposed rail line. This new rail line would connect to, and serve as an extension of the current WP&YR system. The use of currently available advanced technology for mineral mining and transportation systems to bring bulk minerals to a rail line, and the use of a railroad to transport bulk minerals to improved port facilities, is critical to the future economic success of Yukon.

This report uses the known mineral information available through the Yukon government. Capital costs for rail line construction and the installation of new port facilities are included in this report. The environmental elements must be carefully evaluated and accomplished with significant input from the public. These systems can be engineered and constructed with respect for the environment and completed in a modest, yet realistic timeframe. The initial economic analysis accomplished during this study, indicates that the capital costs and operating costs would support a cost effective operation.

The resumption of rail freight service to the Yukon combined with a rail barge service between Prince Rupert and Skagway will provide a competitive new fuel haul service to the Yukon. Railroad tank cars loaded with fuel at the Husky refinery in Prince George, BC and then barged to Skagway for furtherance to Whitehorse can compete against the existing tanker barge- and truck-supplied fuel hauls currently operating. Even the freight rate for fuel hauled between Skagway and Whitehorse will be cheaper by rail than by truck given the rail scenarios presented in this analysis.

The scenarios used in this analysis assume railroad construction capital, depreciation and operating cost to both Whitehorse and Carmacks. Additional Yukon-based traffic will be specified by further ACRL Study project efforts being performed by others.

The report assumes a major reconstruction of the WP&YR, including the heavy reconstruction of the existing 38-mile railroad corridor between Carcross and Utah Yard in Whitehorse.

Southern Yukon and Port of Skagway:

> "When a Boston capitalist is invited to invest in a Railroad project, it is not considered sufficient to tell him that somebody has rode over the ground on horseback and pronounced it practicable. He does not care to be informed that there are 999 different variety and species of plants and herbs, or that grass is abundant at this point, or Buffalo scarce at that; that the latitude or longitude of various points are calculated, to a surprising degree of accuracy, and the temperature of the atmosphere carefully noted for each day in the year.
>
> His inquiries are somewhat more to the point. He wishes to know the length of your road. He says, "let me see your map and profile, that I may judge of its alignment and grades. How many cubic yards of various kinds of excavation and embankments have you and upon what sections? Have you any tunnels, and what are their circumstances? How much masonry, and where are your stone? How many bridges, river crossings, culverts, and what kind of foundations? How about timber and fuel? Where is the estimate of your road, and let me see its details? What will be its effect upon travel and trade? What is its business and revenue? All this I require to know, in order to judge if my investment is likely to prove a profitable one.'
>
> When the friends of the Pacific Railroad can approach a capitalist and answer all these questions, they may begin to hope for a realization of their wishes."
>
> Theodore Ted Judah, Civil Engineer, 1857
> Central Pacific Railroad

Noticeably profitable port operations directly linked to summer rail excursions on the narrow-gauge WP&YR route provide the only present day rail-based source of revenue for the ACRL Study. Except for the 400,000 excursion passengers riding the WP&YR trains, all other potential sources of freight, mineral and passenger revenue will be speculative and subject to market analysis. This market analysis is being undertaken in other tasks assigned to other firms within the ACRL Study.

The key to WP&YR's success, both with its port operations and the 21-mile rail excursion, is their ownership of the only deep water docks in Skagway. Often as many as four major cruise ships are simultaneously berthed at the WP&YR's docks in Skagway. For a sense of scale, four cruise ships represents about $1.2 billion in new ship construction to support cruise ship operations on a busy day in Skagway. The Port of Skagway and the City, together, hosted about 1 million visitors during the 2005 summer session.

Restoration and extension of freight rail service to the Southern Yukon must, by absolute necessity, include the Port of Skagway because the City truly is the "Gateway to the Yukon." Skagway's port is the most direct link to tidewater from most of the Yukon land area. Transportation by water is the most cost efficient form of transportation for freight and bulk mineral products. Therefore, the shortest line from a mine site to tidewater will provide the cheapest transportation costs for a mine. And, conversely, the most efficient method of delivering inbound freight to the Yukon Territory and to mines is to bring the cargo as close to the Yukon as possible on tidewater.

Skagway is linked to the Yukon by the Klondike Highway, which is classified as an industrial use highway allowing truck weights to 160,000 lbs. In the past, just before the last Cyprus-Anvil Mine (Anvil Range) closing, there was an effort underway to increase the Klondike Highway weight limit to 180,000 lbs. The narrow-gauge WP&YR has been rehabilitated from the Port of Skagway (MP 0.0) to Carcross (MP 67.5), approximately 67.5 miles. The railroad track infrastructure is also still in place between Carcross (MP 67.5) and Utah Yard (MP 106.0), approximately 38 miles, but has not been maintained since 1982 and has deteriorated to a condition where it cannot be used for any rail service without substantial rehabilitation. In all cases, this analysis addresses the capital requirements to reconstruct the railroad to standard gauge between Carcross (MP 67.5) and Utah Yard (MP 106.0).

Transportation is a significant cost factor in whether or not a mine or other natural resources, especially in the Yukon Territory, can compete in the world market. History demonstrates that the Yukon Territory mines are the last to open and the first to close due to the sensitivity of the global economy and the critical role and cost that the transportation infrastructure provides.

While the WP&YR was operating as a year-round freight railroad serving the Yukon Territory mining, its narrow-gauge track infrastructure prevented the direct interchange of transcontinental railroad freight. The high cost of direct freight interchange was minimally ameliorated by the use of containers, but it was the inherent inefficiencies of the narrow-gauge track that was a material element in the WP&YR decision to completely suspend all railroad service in October 1982.

Familiarization and understanding the relative physical location of Skagway is necessary to understand the strategic importance of the Port of Skagway to the Yukon Territory. After Skagway, the next closest available tidewater port available to the Yukon Territory is Haines, Alaska, which requires a several hundred mile long and circuitous highway connection.

The closest ports to the Yukon Territory with standard gauge railroad service are Prince Rupert to the east and Whittier to the West. Thus, the practical business case for the use of the Port of Skagway in harmony with modernization, conversion to standard gauge and extension of the WP&YR is a vital component in this feasibility analysis.

SECTION 1: SKAGWAY, ALASKA

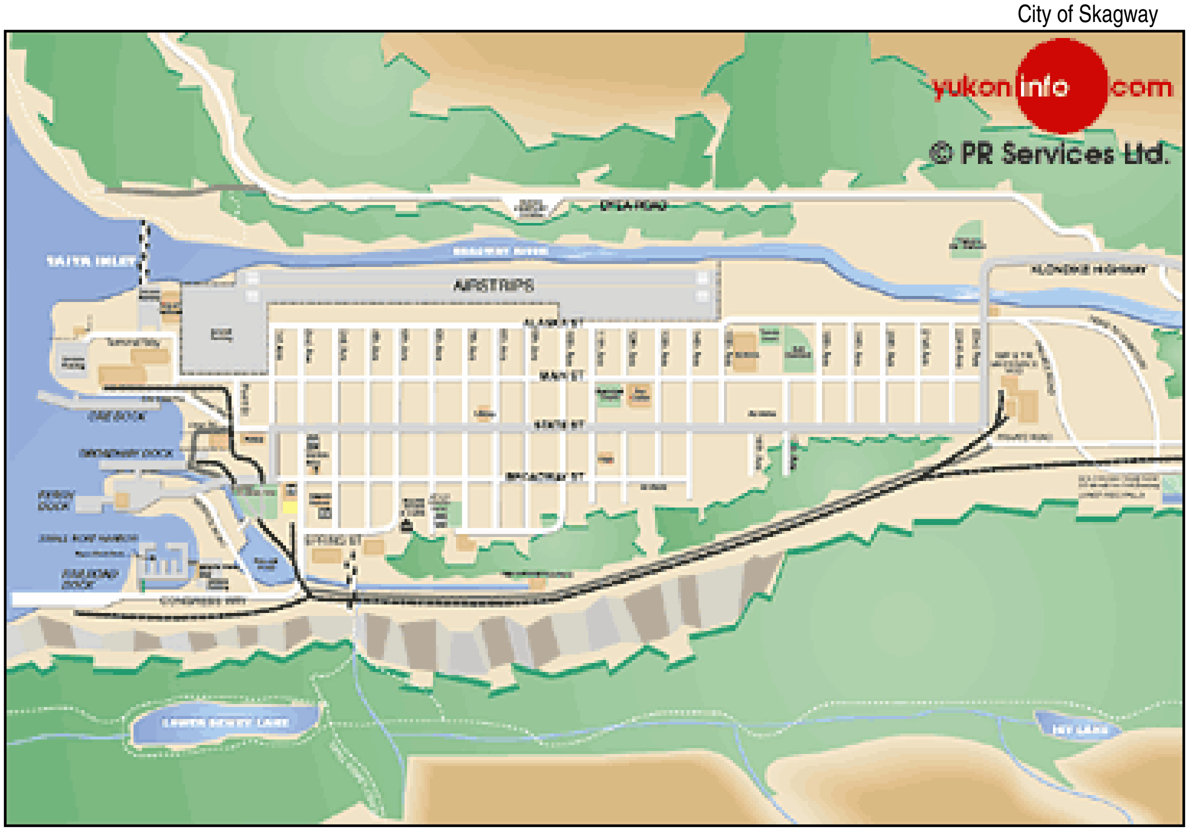
The City of Skagway is a small, very concentrated community of approximately 700 full-time residents. The community benefits from a large tourism industry which lasts from approximately mid-May to mid-September. Annually, approximately 1 million tourists now visit Skagway. Most of these visitors arrive and depart by large cruise ships.

The community is very reliant on the Klondike Highway for all vehicular movement into and out of Skagway. This Highway has an 8-percent ruling grade leaving Skagway and is plagued by heavy snow during the winter months. The Klondike Highway can be closed due to weather, heavy snow, by chance of avalanche or nighttime darkness. The Highway could be closed two or three times per year for one or two days in duration.

Additionally, the Skagway Airport serves as a single runway, visual flight rule, fair weather Class 3 airport. There is very limited commercial air service into and out of Skagway. Aircraft size is limited to smaller single engine aircraft.

The Klondike Gold Rush National Park and the City of Skagway Historic area encompass the majority of the waterfront and downtown areas. This is a critical consideration to preserve and enhance while providing a co-existing rail and port infrastructure to serve Skagway and the Yukon Territory.

City of Skagway



SECTION 2: PORT OF SKAGWAY

Existing Facilities

Located at the head of Taiya Inlet and the Yukon's only direct access to the Pacific Ocean, the Port of Skagway is characterized by its very narrow opening in the Skagway Valley, being only a little over one-half mile wide. The Port of Skagway, located in the southeast Alaska, is an existing passenger and freight port. It is an ice-free port. Although limited in area, the current port facilities have been designed to handle four major cruise ships at one time as well as State of Alaska ferries, smaller cruise ships and commercial fishing and pleasure craft. The port is dominated by three large docks owned and operated by the WP&YR. The 2005 tourist season was a record year for the port with a total of 479 cruise ships berthing at both WP&YR and City of Skagway docks.

The Port of Skagway has the potential to increase its size and become an important import and export port serving the immediate Skagway and Haines area as well as the Yukon.

WP&YR Dock

The WP&YR dock is located on the extreme east side of the Skagway harbor. The railroad dock has the most shelter from winds by being located on the side of a steep bluff forming the east boundary of Skagway. In the middle of the harbor is the City of Skagway floating dock. The City of Skagway shares the 120-

foot by 160-foot floating dock with the State of Alaska Marine Highway System for use by all State ferries. All Alaska ferries, including the fast ferries, use the west side of the dock. The east side of the floating dock is used to berth smaller cruise ships.

The Skagway River forms the border of the west side of the Harbor. The river is contained by a high, steep rock bluff that forms the west border of the Skagway town site. The west side of the harbor is known as the Ore Terminal. The Ore Terminal consists of a dredged basin with the dredged material used to make uplands for the ore handling buildings and loading facilities. The tidelands under the entire Ore Terminal are owned by the City of Skagway and are leased to the WP&YR and others until 2023. WP&YR owns the only two docks in the Ore Terminal basin: (1) the dock on the east side of the Ore basin is the Broadway Dock, and (2) the dock on the west side of the basin is the Ore Dock.

Only the three WP&YR docks are large enough to have draft for berthing cruise ships over 180 feet in length. Therefore, all but the smallest cruise ships use the WP&YR docks. In 2005, WP&YR docked 404 cruise ships at its three docs. The number of tourists on these 404 ships totaled approximately 772,000 passengers. There are often four and sometimes five cruise shops docked in Skagway on the busiest summer days.

Tourist Data for Skagway, Alaska **(November 2005 – Final Count for 2005 Season)**

YEAR	CRUISE	AMH	HIGHWAY	WP&YR	FAIRWEATHER	AIR	OTHER	TOTAL
1983	48,066	25,288	72,384	N/A	15,000	3,500	N/A	**164,238**
1984	54,907	25,196	79,215	N/A	15,000	3,750	N/A	**178,068**
1985	77,623	31,522	89,542	N/A	15,000	4,000	N/A	**217,687**
1986	100,695	30,981	91,908	N/A	15,000	4,250	N/A	**242,834**
1987	119,279	30,905	70,993	N/A	15,498	4,953	N/A	**241,628**
1988	115,505	31,481	74,614	N/A	15,123	5,957	N/A	**242,680**
1989	112,692	29,997	63,789	15,972	14,562	7,233	N/A	**244,245**
1990	136,512	33,234	63,237	16,072	17,767	4,799	N/A	**271,621**
1991	141,284	33,630	64,610	19,069	19,157	4,853	1,163	**283,766**
1992	145,973	37,216	79,946	17,809	18,852	7,947	2,000	**309,743**
1993	192,549	33,650	80,709	16,313	13,220	10,092	3,000	**349,533**
1994	204,387	34,270	81,172	15,865	13,000	10,000	3,000	**361,694**
1995	256,788	33,961	87,977	15,521	13,000	17,000	4,100	**428,347**
1996	299,651	35,760	86,536	20,871	14,782	20,721	4,000	**482,321**
1997	438,305	27,659	91,849	14,416	-	11,466	7,173	**590,868**
1998	494,961	31,324	100,784	20,432	2,671	20,679	7,923	**678,774**
1999	525,507	31,467	92,291	20,422	-	15,963	4,767	**690,417**
2000	565,639	30,732	94,925	19,231	-	15,626	8,362	**734,515**
2001	599,520	23,232	82,692	20,674	-	7,479	10,205	**743,802**
2002	611,638	27,148	87,851	14,361	-	5,641	12,154	**758,793**
2003	639,742	23,814	74,750	13,065	-	6,340	23,724	**781,435**
2004	722,095	23,171	77,837	13,187	-	6,046	15,069	**857,405**
2005	772,323	22,351	71,387	16,546	-	6,382	14,343	**903,332**
TOTALS	**7,375,641**	**687,989**	**1,860,998**	**289,826**	**217,632**	**204,677**	**120,983**	**10,757,746**
2004-2005 INCREASE	**7%**	**-4%**	**-8%**	**25%**		**6%**	**-5%**	**5%**
TOTAL INCREASE	**1507%**	**-12%**	**-1%**	**4%**		**82%**	**1133%**	**450%**

("Other" category includes: Allen Marine, Fjord Express to Juneau and Chilkat Cruises &Tours fast ferries)

Note: 1983-1997 totals are for the months of May through September (5 months).
Note: 1998-2001 totals are for the months of April to September (6 months).
Note: 2002 totals are for the months of May through October (6 months).
Note: 2003-2005 totals are for the monthsof May through September (5 months).

WP&YR owns the dock and underlying tidelands under the Railroad Dock. The Railroad Dock is 1,825 feet long with additional breasting dolphins that provide for berthing of two of the longest cruise ships that serve the Alaska market. The Railroad Dock is made up of two distinct docks (North Dock and South Dock), joined by a short steel plate.

- **North Dock**
  The north 800 feet of the Railroad Dock is a heavy duty freight dock (800 feet long by 100 feet wide) designed to sustain a HS20-44 truck loading (Alaska bridge loading) or the punching load of a 60-ton axle forklift load. A single railroad track with a third rail for standard gauge operations, is located on the back side of the dock constructed to the railroad bridge rating of Cooper E-80

(heavy railroad loads). The north portion of the Railroad Dock is well suited to the heavy freight transfer operations for ship to rail or truck. The minimum draft alongside the Railroad Dock is 36-feet at the head of the dock and becomes progressively deeper towards the open inlet end.

- **South Dock**
  The South Dock is 784 feet long and is built to a lighter standard. It is still capable of HS20-44 loading, but not heavy forklift loading. There is no railroad track on this dock. The South Dock is only 50 feet wide, and is, therefore, very constrained in its use by its width.

WP&YR also owns the Broadway and the Ore Dock—the only two docks on the Skagway waterfront capable of docking either cruise or cargo ships. WP&YR owns the dock structures and the underlying tidelands are leased from the City of Skagway until 2023.

- **Broadway Dock**
  The Broadway Dock was constructed as a light duty, 300-foot by 44-foot wide, cruise ship dock with only very limited capability for handling cargo. This dock has been used to load exported Yukon logs and containers have been unloaded from the WP&YR container Ship, the Frank. H. Brown, to the dock. The Broadway Dock is now only suitable for cruise ship berthing, but the useable berth length was extended recently to accommodate 900 foot cruise ships beginning in 2006. The Broadway Dock is also heavily used during the summer tourist season, but the dock itself does not have the length, width or favorable ship maneuvering properties of the Railroad Dock.

- **Ore Dock**
  The Ore Dock, as its name implies, was the first built as an ore dock in 1969 suitable for only the bulk loading of ore. Over the years, the dock has been modified to handle cruise ship berthing. During 2000, a construction project added a 235-foot by 50-foot HS20-44 concrete dock at the extreme south end of the dock to better serve cruise ships. The 2000 construction added additional breasting dolphins and a new end dolphin to the Ore Dock. The overall usable face length of the Ore Dock is about 1,600 feet. The older wood pile passenger platforms on the Ore Dock, dating from 1969, cannot be used for any cargo transfer due to light duty construction.

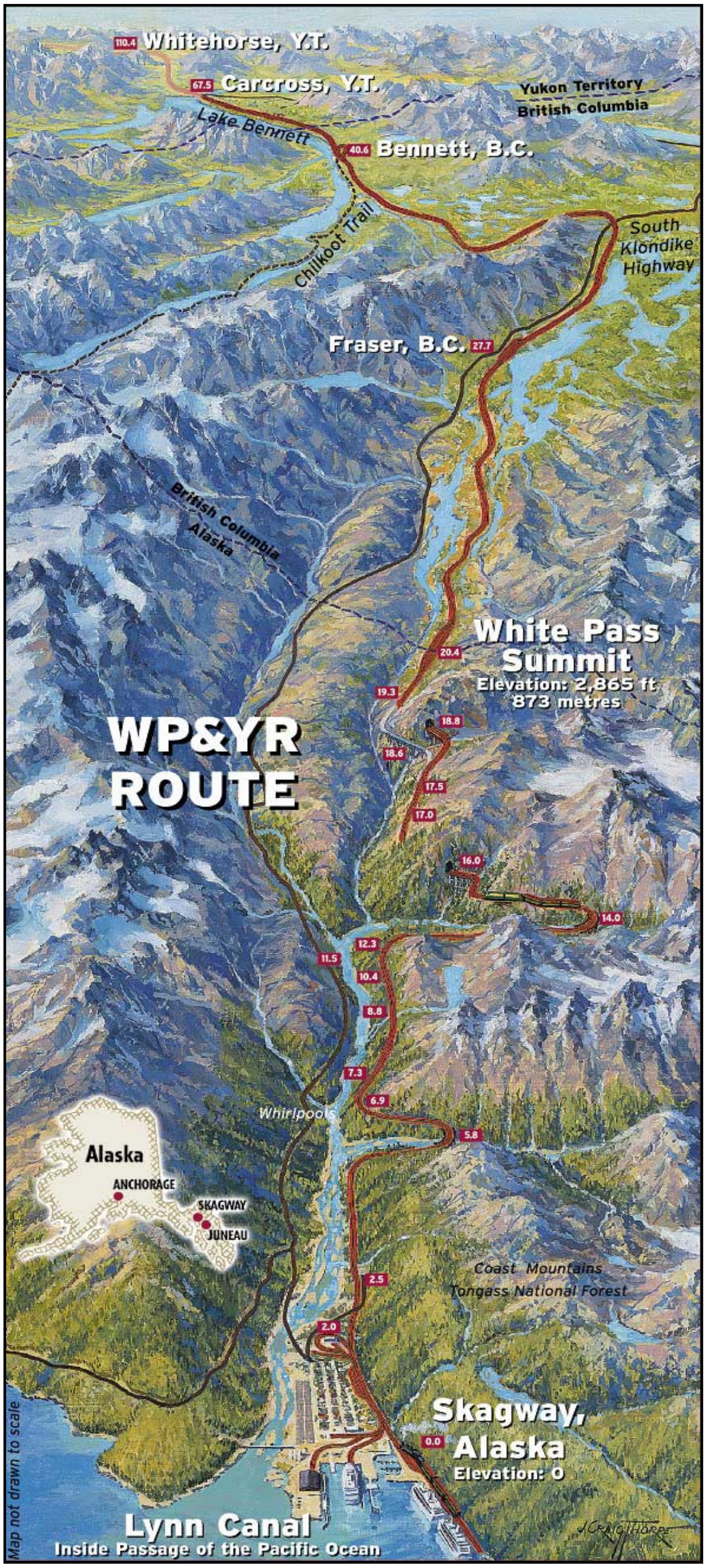
  Harbor Enterprises operates the marine fuel depot located near the mid-point of the dock. Harbor Enterprises services Skagway and more importantly the Yukon, moving approximately 30 million gallons of fuel annually. All of the fuel arrives in Skagway on barges. Alaska Marine Lines (AML) constructed a container barge facility at the head of the Ore Dock in 2001. The approach dock forming the AML ramp is constructed to a high standard for loaded forklifts. The old ore concentrate ship loading tower, located near the mid-point of the dock, is a no-go obstruction to cruise ships. Cruise ships are prevented from being able to use the full face length of the dock because of cruise shop overhang, including some lifeboats, fouling the clearance of the old ore loading tower. The Ore Dock draft is a minimum of 42 feet and gets progressively deeper toward the open inlet end.

All three of the WP&YR docks are available for use in the winter months for development and use for rail/marine cargo transfer operations. The North Dock of the Railroad Dock stands out as a true intermodal dock facility that is restricted only by the limited amount of upland staging available for the sorting of cargo. The dock is 100% available in the off-tourist season, but during the summer tourist season, the Railroad Dock is indisputably the most popular cruise ship dock on account of the properties of the dock itself and the adjacent tourism infrastructure that has been built up over the years.

The South Dock of the Railroad Dock is narrow, 50-feet wide, and is therefore limited in its use for cargo. Any cargo discharged from the South Dock must transit the North Dock. The Broadway Dock suffers from its narrow width of 44 feet and its limited uplands sorting area.

Even though the 2005 tourism season was a record year for cruise ship use of the WP&YR docks in Skagway, the Ore Dock was only used four days per week during the “high” month of July. Even after accounting for the weekly (Monday) AML barge and fuel barges arriving approximately every three weeks, the Ore Dock was available for most any combination of cargo (pipe) or bulk cargo ships allowing 84.5-hour work windows four times each month. An 84-hour work window is adequate time to load a bulk ship or to unload a cargo vessel (gas pipeline pipe) but may require multiple hatch gangs and 24-hour operation. The issue for such tight scheduling of ships other than cruise ship berthing is that bulk cargo ships traditionally cannot comply with such restricting dock availability windows due to the combination of variables of ocean transit time and conditions.

The Ore Dock is the only dock that has the potential for development into a truly intermodal dock with essential adjoining upland support area for cargo sorting, storage and handling with immediate access to rail and the Klondike Highway.



SECTION 3: WHITE PASS & YUKON RAILROAD (WP&YR)

The WP&YR is a common carrier international railroad with common carrier duties. No portion of the railroad has been abandoned.

The WP&YR is a 36-inch narrow-gauge railroad operating currently between Skagway, Alaska and Bennett, BC (Mile Mile 40.0), with track maintained to Carcross, Yukon, a distance of 67 miles. The WP&YR currently operates a high volume, slow speed tourist excursion rail passenger service which handles approximately 430,000 passengers annually, all during the summer months. Additionally, the WP&YR had, until 1982 a history of handling freight between Skagway and Whitehorse. The maximum tonnage which was normally handled was approximately a 3,500 trailing tons train, and multiple mixed train operation in non-signaled territory. The WP&YR terrain segments may be summarized as follows:

From Skagway (MP 0) to White Pass (MP 20), the railroad is a steep 3.9% ascending grade located on a very steep sidehill cut with dramatic valley bridge crossings, retaining walls and tunnels. This portion of the railroad is very scenic and parallels the 1898 Gold Rush Trails. The railroad passengers are carried to within a few feet of the path at Dead Horse Gulch Trail, where they are treated to a long unobstructed view of the trail etched in the rock. Wildlife is often spotted and glaciers are in view. The railroad is an International Civil Engineering Monument, due mainly to this segment of the line.

From White Pass (MP 20) to Bennett (MP 41), the railroad traverses a rocky plateau for several miles passing the Canadian Customs station at Fraser, BC (MP 28), with a brief climb to Log Cabin (MP 33) then a steep but broken descent on a 3.3% grade to Bennett, BC., the head of Lake Bennett. Here again, the railroad is very scenic and passes the 1898 Gold Rush locations of Log Cabin, Lindeman Lake and Bennett City.

The railroad runs 6 feet above the high water level of Lake Bennett for 27 miles to Carcross, Yukon (MP 67.5). The lake is absolutely pristine with no development. The line of the railroad is very curvy and is located in rock to MP 55 where after the terrain gradually breaks into a more gravel material and the alignment improves.

From Carcross (MP 67.5) to Utah Yard (MP 106), the railroad is located on a very good quality alignment for all of its 38 miles with only three exceptions – the curves at MP 80, MP 82.5 and MP 99. This portion of the railroad has not been maintained since 1982 and cannot be used without major rehabilitation.

Utah Yard (MP 106) is the site of the Anvil Mine lead/zinc truck-to-rail transfer yard. There is land area available to construct a rail yard suitable for the tonnage levels anticipated in this analysis.

The Carmacks extension will begin two miles north of Utah Yard (MP 106) leaving the WP&YR right-of-way at MP 108.

Rail Corridor Alignments

FROM			TO		Approximate Distance
Skagway, AK	MP 0	to	**Utah Yard**	MP 106	106 miles
Carmacks Extension	MP 108	to	**Braeburn, YT**	MP 172	64 miles
Braeburn, YT	MP 172	to	**Carmacks, YT**	MP 217	45 miles

Note: A 70-car, 7,000-ton unit train would require approximately 1.5 hours to load at Braeburn and would require 4 hours to unload at Skagway. The WP&YR maintenance and car storage is located in Skagway.

SECTION 4: CONDITION ASSESSMENT

PORT OF SKAGWAY

WHITE PASS & YUKON RAILROAD (WP&YR)

WHITE PASS GRADES

"The Hill"

The longest grade on the WP&YR is the 15 miles of 3.9%-grade northbound from Skagway (MP 0.0) to the summit at White Pass (MP 20.4), known locally as "The Hill." This grade, beginning near MP 5, is steep for any railroad operations. By contrast, the designer of a modern heavy haul railroad will attempt to locate a line of railroad with a maximum 1% grade.

Fraser Hill and Bennett Hill

The 3.9% northbound grade operating out of Skagway must be considered in the context of the grades on the other side of "The Hill." There are actually two grades on the southbound side of "The Hill," those being Fraser Hill (MP 25.4 to MP 26.4) and Bennett Hill (MP 35 to MP 40.3). Fraser Hill is 1-mile of a maximum of 3.3% grade in spots with a grade break at the halfway point and Bennett Hill is 5 miles of discontinuous 3.3% grade.

Fraser Hill (MP 25.4 to MP 26.4), because it is so short (0.9 miles), will be a momentum grade if several curves at the bottom of the corridor are reconstructed so as to allow a speedier approach by heavily loaded locomotives to the bottom of the hill. Also, the grade at the top of Fraser Hill will be smoothed off to further reduce the effect of the uphill grade. Of the two hills, Fraser Hill, while already a short hill, can be improved with capital infrastructure improvement that even when considered at this preliminary stage, will have a favorable cost-to-benefit ratio.

Bennett Hill (MP 35 to MP 40.30) is 5.3 total miles of 3.3% maximum grade with three distinct leveling breaks in the grade. Bennett Hill can also be improved with capital infrastructure investment to provide curve reductions and grade smoothing. Bennett Hill will be the ruling grade hill for trains operating southbound. "The Hill" out of Skagway will be the ruling grade for northbound trains.

SECTION 5: IMPORT AND EXPORT

Criteria for Port of Skagway

It is anticipated that the Port of Skagway would handle the following export items generated by the Yukon and northern British Columbia:

- Ore
- Coal
- Copper
- Zinc
- Forest products
- Fuel

It is anticipated that the Port of Skagway will handle the following import items:

- 60- or 80-foot pipe, 1.25 inches thick, 30 tons per pipe
- Concrete (raw material) and finished products
- 65 freight rail cars arriving/departing each rail barge
- Intermodal and container traffic, approximately 200 TEUs per week
- Construction equipment and construction materials
- Fuel

A large Panamax ship is approximately 85,000 DWT. The length of this type of ship is 234 meters; or 768 feet. The beam is 32.3 meters, or 106 feet.

A small Cape ship size ranges from 125,000 DWT to 140,000 DWT. China uses a Cape-size ships for the transportation of bulk materials. The typical Cape-size ship may be summarized as follows:

- 140,000 DWT maximum tonnage
- Length is 273 meters, or 895 feet
- Maximum hatch is 191 meters, or 626 feet
- Beam is 43.4 meters, or 142 feet
- Air draft is 52.6 meters, or 173 feet
- Fully loaded draft is 17.2 meters, or 56.5 feet
- Must add 3 feet for underkeel clearance (this is approximately 10% of the fully loaded draft), plus 5 feet for freshwater contribution, dredge to 65 feet.

EXPORTS

- **Ore**
  - Bags to the level of approximately 40,000 tons per year
  - Bulk
- **Coal**
  - 1 to 3 to 5 million tons per year to be transported between the coal mines at Braeburn and the Port of Skagway, a distance of 172 miles.
  - Using 70-car unit trains, 100 tons per car, 7,000 net tons of coal per train. The total weight of the train including both the weight of the coal and dead weight of the cars will be 8,750 tons, not including the locomotives.

- 3 each, 4400 Hp AC traction locomotives per train, with an additional 4 locomotives operated as distributed power between Bennett and Skagway. This provides a Hp/Tonnage ratio of 3.52 for both ascending and descending the grades between Bennett and Skagway.
- Even coal hauling train use distribution throughout the year between Braeburn and Skagway
- May require multiple car thaw shed, approximate length of 275 feet depending upon annual coal volume.
- May require a single car rotary dump for unloading, building length of 65 feet, depending upon coal volume. Railcar Rotary Dump Occupancy Matrix is presented as Appendix 2.
- Stock pile size is 1.5 times largest ship size, or 200,000 tons storage.
- Requires 29 unit trains for storage to fill storage area.
- Requires 20 unit trains for each 140,000 DWT ship.
- Stock pile will have a greater quantity or slightly lesser quantity, but fluctuates.
  - Storage building: 120,000 tons – 2 buildings are required.
  - 800 feet long by 160 feet wide and 100 feet high
  - Loading from overhead shuttle
  - Unloading from underground reclaim tunnel at a rate of 1,500 tons per hour
- Radial ship loader will be able to load 3 hatches.
- Berth occupancy:
  - Using 65,000 ton ships
  - 1 ship loading every 3 weeks
  - Using 140,000 ton ships
    1 ship loading every 6 weeks

  A copy of our Berth Occupancy Analysis is included in this report as Appendix 3.

Radial Ship Loader

Coal can be loaded between 1,500 tons per hour and 3,000 tons per hour.

Iron ore pellets are loaded between 500 tons per hour and 1,000 tons per hour.

There must be a new clean section of the Railroad Dock adding a 300 feet of new passenger ship access.

- **Copper**
  The export of copper concentrate is estimated to be approximately 150,000 tons per year. This is normally shipped in 2-ton supersack bags. There would be a requirement for 75,000 bags annually.

- **Zinc**
  The export of zinc is also an option.

Rail Barge

The Port of Skagway can easily accommodate a rail-barge operation. This would require yard trackage, an adjustable rail-barge ramp, and supporting rail operations to minimize the unloading and loading time of rail cars and container/trailer units. The following items will be considered as a part of the overall rail-barge operation:

- Each barge has 9 railroad tracks with 7 or 8 cars per string per track for a total of approximately 65 railroad cars per barge.
- Containers stowed on a rack near the stern of the barge with the rack running to about mid-point of the barge. The rack will have the capacity to stow approximately 102 each, 53-foot x 8.5-foot x 9.5-foot containers.
- ITB (Integrated Tug Barge)
- Propose ITB for speed, 10 to 12 knots.
- Barge size would be proposed as 465 feet x 107 feet will be used as a maximum. (Currently, a 420 feet x 100 feet rail-barge is used at Whittier.)
- Adjustable ramp, 140 feet long, three-track ramp will provide access from the land rail yard to the barge.
- A 65-rail car storage yard will be required as a minimum land-side yard.
- Two locomotives will be assigned to load and unload the rail barge simultaneously
- A crane will unload the containers on the rail barge
- It is estimated that there will be approximately 102 each, 53 feet containers on a single barge – about 340 TEUs per barge.

- **Construction Equipment**
  The Port of Skagway could provide generous port facilities for handling of construction equipment and materials to support the both the AHPP and MGP energy projects. This approach will significantly reduce the overall impact on the existing Alaska Highway system and will dramatically reduce the overall truck-haul mileage (and cost) required to support the energy project. This construction equipment includes:
  - Construction machinery
    - Sidewinders
    - Bulldozers
    - Cranes
    - Backhoes
    - Welding trucks
    - Tractor trailer flatbed trucks
    - Mechanics vehicles
    - Buses for employee transport
    - Drilling machines
    - Welding vehicles
    - Housing trailers
    - Emergency response vehicles
    - Tow trucks
    - Inspection and testing vehicles
- **Construction Materials**
  Again, the Port of Skagway could provide generous port facilities for handling of construction equipment and materials to support both the AHPP and MGC energy projects. The use of the port will reduce the costs of both projects. These construction materials include:
  - Line pipe
  - Concrete (raw material) and finished products
  - 3 to 5 joints of pipe can be handled per car depending upon length and weight of pipe.
- **Fuel**
  - Off load tank barges to tank farms; use rail to transport to Yukon.
  - Load rail tank cars in Prince George, BC; transport by rail-barge to Skagway for furtherance to Whitehorse and Carmacks.

  Delivering vessels will be barges of U.S. and Canadian suppliers and most likely open-hatch, box-shaped handymax vessels from Asian suppliers.
- **Community Replenishment**
- **Rail Transfer of Community Supplies**

SECTION 6: ANALYSIS & OPERATING SCENARIOS

WP&YR PASSENGER

The WP&YR currently operated passenger excursions during the summer tourist season between May and September. Passenger cruise ships berth at the Port of Skagway. The majority of the tourists which choose to participate in the WP&YR excursions are cruise ship passengers. The passenger rail excursion options include:

- White Pass Summit Excursion (2.5 hours)
- Lake Bennett Adventure (8.5 hours)
- Fraser Meadows Sunday Steam (4 hours)
- Skagway to Whitehorse Bus & Rail Connections
- Skagway to Fraser (2 hours)
- Hikers Service
- Chilkoot Trail Hikers Service

WP&YR FREIGHT

Currently, there is no freight service operated over the WY&YR.

Operating Scenarios

The following table contrasts eight operating scenarios with both the Alaska Railroad and the WP&YR.

SKAGWAY PORT & RESUMPTION OF YUKON RAIL FREIGHT (Public Private Partnership)

	Alaska Railroad	White Pass Railroad	Best Case Least Capital Whitehorse	Built to Fit Purpose Whitehorse	3-Rail Built to Fit Purpose Whitehorse	3-Rail Built to Alaska RR Standards Whitehorse	Best Case Built to Fit Purpose 3 MM Coal Carmacks	Built to Alaska RR Standards 1.1MM Coal Carmacks	3-Rail Built to Alaska RR Standards 1.1 MM Coal Carmacks	Worst Case Post Pipe Const. No Coal Whitehorse
REVENUE	(MM)	(MM)	(MM)	(MM)	(MM)	(MM)	(MM)	(MM)	(MM)	(MM)
PORT		5	19	27	27	27	39	27	27	8
RAILROAD	*116	33	41	53	53	53	88	60	60	33
OPERATING COSTS										
PORT		1	3	5	5	5	6	5	5	1
RAILROAD	106	22	27	29	29	29	33	30	31	25
BOOK VALUE										
PORT		33								
RAILROAD	**55	31								
CONSTRUCTION CAPITAL										
PORT			34	110	110	110	110	110	110	34
RAILROAD			161	175	180	278	620	732	747	161
DEPRECIATION (NEW)										
PORT			1	3	3	3	3	3	3	1
RAILROAD			6	7	7	9	15	17	17	6
BOND 4%										
PORT			1	4	4	4	4	4	4	1
RAILROAD			6	7	7	12	25	30	30	6
WPYR PURCHASE			2	2	2	2	2	2	2	2
NET										
PORT		4	14	15	15	15	26	15	15	5
NEW WPYR PASSENGER REFORM			3	3	3	3	3	3	3	3
RR FREIGHT & PAX	10	11	0	8	8	1	13	-19	-20	-6
COMBINED NET	**10**	*****15**	**17**	**26**	**26**	**19**	**42**	**-1**	**-2**	**2**

*Railroad operations only
**Current assets
***Before taxes

Only the Best Case Least Capital Scenario does not include major investment in the port facilities in Skagway. The Best Case Least Cost scenario only envisions a rail barge facility and a new intermodal dock in the Ore Terminal area of the harbor. The rail modernization of White Pass to Whitehorse is kept to the lowest investment level possible but still provides for third rail operation of the summer tourist excursion trains.

All other scenarios include a new bulk coal and mineral export facility constructed on the Ore Terminal site. Other dock improvements will be a new rail barge ramp, an intermodal dock and a cruise ship floating dock extension. Upland storage facilities bulk with material handling equipment is included. The total for these harbor improvements is $110 million.

The “Built to Fit Purpose” scenario does not include a third rail for the narrow gauge tourist excursion operation. This scenario would have the narrow gauge passenger cars converted to standard gauge and hauled by leased standard gauge locomotives. The existing narrow gauge locomotives would not be used.

A Heavy Haul reconstruction scenario of WP&YR is presented. Heavy haul is grade reconstruction of WP&YR to a very high standard characterized by 141# rail, concrete ties and positive train control with the line of railroad supporting high speed on some terrain segments.

This report recommends the 3-Rail “Built to Fit Purpose” Scenario with freight service to Whitehorse.

This report does not recommend new railroad construction to Carmacks unless coal cargo is at the 3 million tons per year level or cargo is presented for the transcontinental ALCAN route. A new railroad construction scenario to Carmacks will be at best breakeven at the coal haul level of 1.1 million tons, therefore the risk is too high and the result too meager to launch such an undertaking.

The last four scenarios couple the investments in the port, modernization of WP&YR with construction of a new railroad line to Carmacks. Only the “built to Fit Purpose” scenario with 3 million tons of coal generated for rail haul is attractive given the cargo levels anticipated in this report.

SECTION 7: INFRASTRUCTURE IMPROVEMENTS

PORT OF SKAGWAY

INTERMODAL FACILITIES REQUIRED FOR THE ORE TERMINAL AREA

The planning layouts and operational descriptions in this report have been prepared with a view to accommodate planned future phases of construction without incurring major rearrangement or "sunk" costs for either truck or rail service to the Skagway docks.

There exists an excellent opportunity to plan a new facility that will not only function according to current operational preferences, but of equal importance, provide for a waterfront with the potential for maximum throughput capacity, operational flexibility and profitability.

Intermodal Competitive Reach

This report takes the pragmatic position that the Port of Skagway and Yukon must ally with each other to make the whole transportation and service enterprise of construction and operation greater than the commercial enterprise either could attract on its own. Whitehorse will be a major administration center for the construction and operation of the AHPP due to its strategic location at the mid-point of the Yukon portion of the line, its major airport facilities, center of government and well-developed infrastructure. Whitehorse will also play a lesser but still important role for the MGP for the same reasons.

Skagway and its port have the potential to become the Yukon's total port – to the exclusion of all other ports – in terms of providing for timely, efficient and economic transfer of marine cargos. The Port of Skagway, with good planning and execution, can remain a historic, popular and growing cruise ship destination, and at the same time transload general cargo, bulk export mineral cargo and pipeline construction materials.

For the AHPP and MGC, the Port of Skagway must compete with the Canadian Port of Prince Rupert and with the Alaskan ports of Whittier and Seward.

The Port of Skagway can compete with the ports of Haines, Whittier and Seward with a northern reach to about the Alaska/Yukon border at Mile 1222 on the Alaska Highway. The southern reach of the Port of Skagway on the Alaska Highway is the Lower Liard River Bridge – a total reach of about 725 miles. For the MGP, the reach of the Port of Skagway is at least from the Little Chicago Compressor Station and under certain circumstances to Inuvik Center northward. The Port of Skagway, with the resumption of rail haul, is superior to the Port of Haines under any circumstances.

Even with a truck haul, the Port of Skagway is superior to the Port of Haines in that any trucking operation in the Yukon will be based in Whitehorse for administration, fuel, maintenance, and mechanic and driver accommodations. Therefore, the only difference in truck haul length (Haines to Skagway) is the 40-mile distance between Champaign and Whitehorse, equating to about $5.50 per ton.

The Port of Skagway is the least cost port and transportation segment for the continuing operation of the MGP production fields. Skagway is the year-round, all-weather port of choice for the continuing re-supply for the gas fields of Parsons, Lake, Taglu, Niglintgak and Inuvik Center.

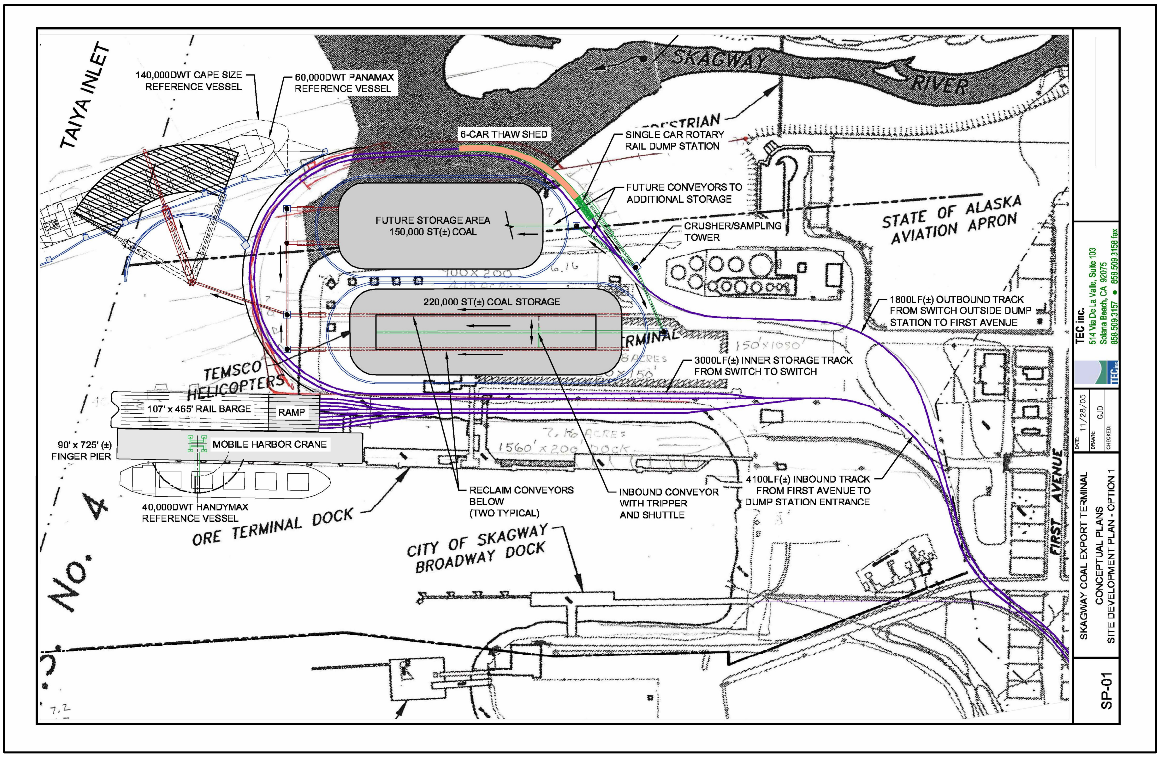
New Intermodal Facilities

A heavy-duty dock, 200-feet wide by 1,560 feet in length, will be constructed in place of the old timber pile passenger platforms at the Ore Dock. The old ship loader tower will eventually be dismantled after start up of low volume throughputs in the old ore terminal facilities. The new 1,560-foot dock will provide world-class dockage for both cargo and cruise ships with direct ship-to-rail transfer. The old Ore Terminal building site will be used for cargo sorting, storage and loading. The new dock will be considered for the use of the most modern on-dock container cranes. The dock will have three railroad tracks located along the dock face to provide the maximum efficiency of direct rail/ship transfer.

The 1,560-foot intermodal dock with additional deep water dolphins will provide enough new dock length to allow two of the largest cruise ships in the Alaska trade to be berthed at the new dock. The new intermodal dock will provide prime cruise ship berthing. The two intermodal dock berths will provide direct gangway transfers to rail, bus, transit system and local tour access, and it will be a shorter walk to the historic district of Skagway. The two cruise ship intermodal berths will have a positive ripple effect on port, railroad excursion and other revenues for both railroad operations and other related Skagway tourism interests.

The location and orientation of the berths and rail corridor are fixed by the site conditions so the predominate pattern of traffic flow between the berths and the rail corridor will have a profound influence on the terminal layout. The container stacks will be oriented parallel to the berths in order take advantage of container handling equipment efficiency. It will be desirable for straddle carriers to travel no more than a maximum distance of 665 feet (two 5-car double stack rail cars) before reaching an aisle where they can escape the track. The container stacks will be oriented perpendicular to the berthing and the rail corridor in order to dis-associate the movement of straddle carriers making long north-south runs (to and from the rail corridor or cranes) from those of vehicles or rail switching movements in and out of the container stacks.

This analysis is not intended to provide design details regarding the spacing and arrangement of light poles, fire hydrants, reefer plugs, drainage and utility vaults, maintenance garage, private parking, security gates, etc. These will be planned in such a way to provide flexibility in rearranging the terminal in the future.



Port Site Plan Option 3.1

Intermodal Capacity

Direct on-dock transfer of cargo from the vessel to rail or to trucks without intermediate storage will be essential to the economic competitive edge of the Port of Skagway. The use of a large and fast on-dock container crane (or cranes) will be one of the keys to modernization of the port. The crane will have a sustained productivity of approximately 45 lifts per net operating hour. One management goal of the port is that container retrieval and delivery operations minimize any delays to crane operations.

Free Running Universal Equipment

There are so many different container sizes and the container lifting equipment configurations in the domestic market that intermodal port capacity is often compromised and restricted by the need to continually reconfigure equipment and loading procedures. One key to operating the proposed Skagway intermodal dock and terminal at optimum capacity will be the choice of universal equipment to provide a free-running pool of containers, trailers and rail cars through the port both on/off vessels and ramping/de-ramping to rail cars and trucks.

Intermodal Throughput

The severest constriction to the Port of Skagway is its limited area with only a few expensive options for expansion of both dock and upland facilities. One of the methods to overcome the limited space is to work evenings and weekends without premium cost. Expanding intermodal terminal capacity by working around the clock is a primary driver of productivity. Managing the waterfront to work a 24-hour/7-day operation will enable more cargo to move with less investment in equipment. The equipment will be operational on evenings and weekends. In the past, the Port of Skagway operated on weekdays during daylight hours with premium costs applicable to evenings and weekends. There was even a serious movement to restrict arriving ore ships to daylight hours. To operate more efficiently, shippers will be given strict storage time and higher fees would apply if a shipper exceeds its free time.

Yard Paving and Lighting

The intermodal ramp/de-ramp yard will be fully lighted. The yard will be paved to a design to allow unrestricted use of loading equipment.

Cruise Ships

This analysis maximizes the potential for and extends the facilities for the continuation and expansion of tourism (cruise ship operation especially) in Skagway. The new intermodal dock will be able to accommodate two of the largest cruise ships, with wide on-dock staging room allowing trains, buses and vans to load and unload directly in front of cruise ship gangways. There will be no rail freight train operations during cruise ship port operations.

Rail Barge Ramp

A rail barge ramp located in the Skagway harbor is the essential centerpiece to the success of any configuration of rail service to the Southern Yukon. The barge ramp and the modernization of the WP&YR are fundamental and will be synchronized with an intercontinental Alaska Canada rail link.

The barge ramp will allow the direct transfer of U.S. and Canadian rail cars to a standard gauge WP&YR. The rail barge ramp will be configured to operate at 90% of Skagway tide range to ensure the rapid unloading and reloading of the rail barge. The ramp will be capable of handling low rail clearance double stack intermodal cars, covered hoppers with bottom dump doors, as well as the new general freight cars manufactured to an innovative design that replaces the center sill with low clearance side sills like those of intermodal cars. The clearance between the top of the rail to the bottom of the side sills on these new cars is about 10 inches—the same clearance as double-stack intermodal cars.

The three-track rail barge ramp will be located at the southern end of the Ore Terminal and serviced by a new rail corridor.

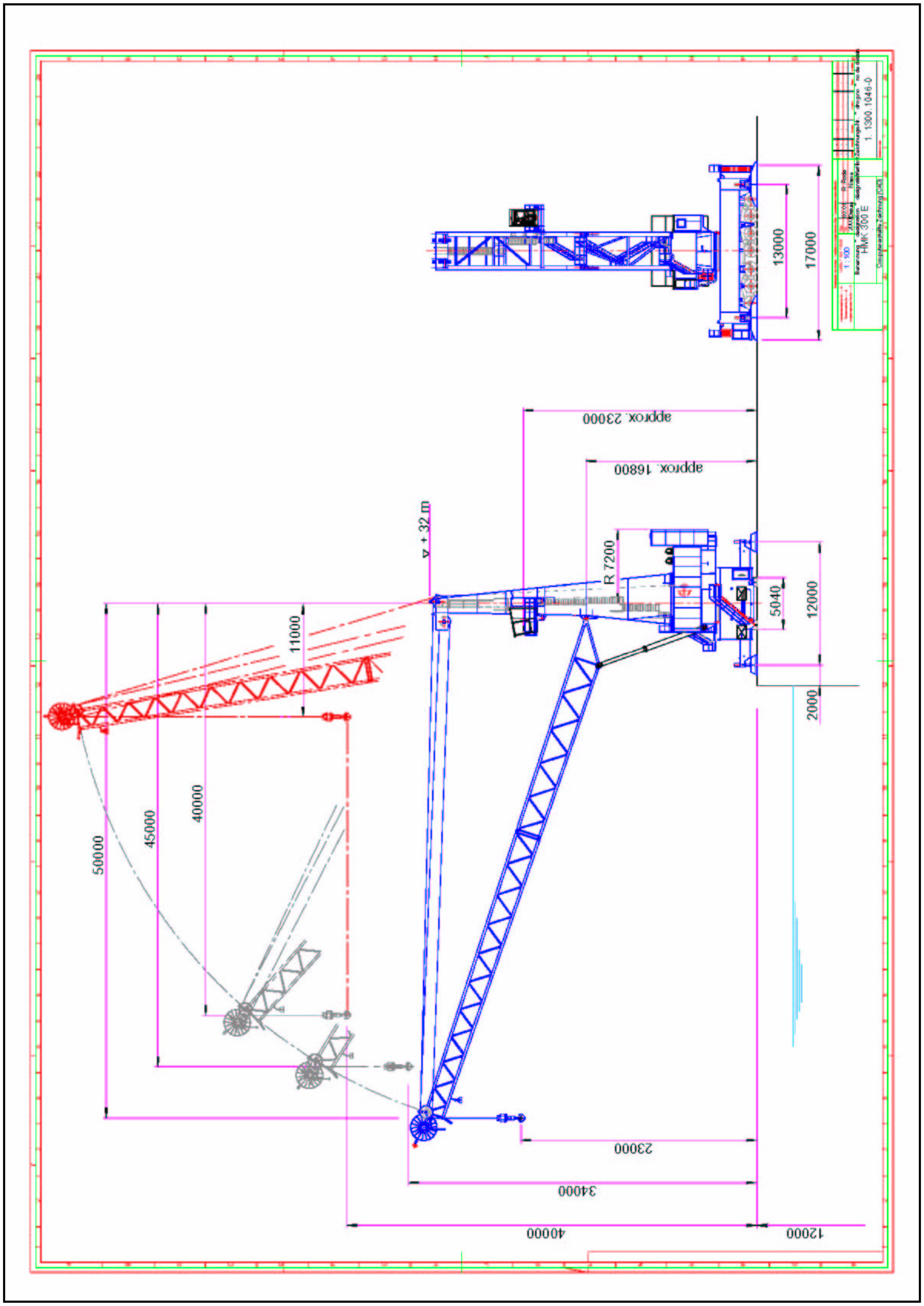
Rail Corridor

A four-track rail corridor will service the intermodal dock and the new bulk concentrate/coal terminal. The rail corridor switches will begin on the existing curve near the ferry terminal highway crossing. The corridor tracks will be outfitted with crossover switches to facilitate the most efficient passenger train operations as well as any rail barge, cargo, container or pipe cargo operation.

Mobile Harbor Cranes for Pipeline Pipe and Containers

Pipeline pipe for both the AHPP and MGP will be handled by a Gottawald crane of the size depicted. This crane will provide the lowest cost and best efficiency for the port to handle the cargos anticipated for the baseline containerized Yukon freight, energy project line pipe, equipment and materials. During the energy project staging and construction phase, consideration will be given to using a second crane, for a total of two cranes, on the intermodal dock to offload each ship or barge. Efficiencies with resultant cost savings gained by rapid discharge of cargos will place Skagway in a firm position of port appeal.

Mobile Harbor Crane Lifting 53-foot Container



Mobile Harbor Crane

Bulk Concentrates/Coal

The primary challenge with the movement of bulk concentrates through the Port of Skagway is lack of desired space in the Ore Terminal area for staging and loading. The area is constrained by the physical layout of the port (a fjord) being bounded by two mountain ridges. The offshore boundary is constrained by slopes going into very deep water. The Skagway River on the west boundary is depositing gravels where the river empties into the inlet creating potential unstable undersea slide conditions. The Skagway River and the adjacent mountain ridge is a heavily used recreational park connected to the Skagway town site with a pedestrian bridge. The east side of the Ore Terminal is bounded by the Alaska Marine Highway Terminal and Dock and by the City of Skagway Small Boat Harbor. Skagway is located in the highest seismic design and construction zone. The large Denali fault line runs through Haines, just 13 miles from Skagway.

Since the Curragh/Anvil mine operation closed, Skagway has thrived and expanded its tourism business to almost the total exclusion of other port business. Tourism is all that was available for the port, so over the past 15 years, the port has been focused on tourism operations and expansion of tourism business. The WP&YR has leased major portions of the Ore Terminal to other operators for tourism activities. In 1999, Skagway Airport expansion acquired additional Ore Terminal expansion space without negotiation for trades or offsets. The WP&YR has leased key portions of the Ore Terminal to other freight operators that effectively block railroad related development of the Ore Terminal. A portion of the Ore Terminal near the Broadway Dock has been acquired for environmental enhancement. All of these factors have placed enormous constraints on rehabilitation and re-engineering the Ore Terminal area for the resumption of export bulk products from the Yukon Territory. The cost to design and construct modernized intermodal and bulk handling facilities will be significantly higher due to current port use constraints. Future use planning will be critical to the economic success of all of the Port of Skagway facilities.

Any economic consideration of development of Yukon minerals for export leads to the necessity of transporting the product to the Port of Skagway as hauling the product beyond Skagway to the next available port exceeds the value of the mineral, and therefore, destroys further economic consideration.

Another economic constraint is capital for reconstruction. Any planning and design for the Skagway Ore Terminal will have a life of 40 years as the cost of capital investment of the infrastructure is so great that a long return-on-investment time is essential.

Even a modest flow of bulk products from the Yukon Territory to the Port of Skagway will require a reconstruction of the Ore Terminal from its current layout.

The only practical method to plan for the reconstruction of the Ore Terminal to export Yukon bulk product is to design the terminal for both storage and vessel loading to the maximum economic level possible. An option for bulk material storage at the Port of Skagway is the use of a wide span barrel vault (Appendix 4). These levels are estimated between 5 and 15 million net tons per year. The Ore Terminal facilities, ship loader and dock will be designed for easy adjustment to a throughput level above an initial 3 to 5 million tons per year by planning for the construction of storage facilities to the north of Skagway (Mile 3 on the WP&YR or the Russel Metals site, Mile 3-Klondike Highway). Transportation of the cargo from the Mile 3 site or the Russel Metals site to the Ore Terminal would most likely be by railroad with consideration given to a conveyor belt system. Storing the bulk materials just outside the Ore Terminal will help negate most of the land availability issue. With satellite storage at an upland site, the operational characteristics of the terminal will change so that the storage facilities at Ore Terminal site can handle only one ship's volume of the type of cargo the next ship due is scheduled to load out. The one ship's storage and ship loading facilities at the Ore Terminal will not be significantly changed thus preserving the 40-year economic life of the investment and minimizing the change and impacts to the waterfront with the increased level of shipping.

Bulk Fuel Handling

The existing arrangement of fuel headers is adequate, but some consideration should be given to relocating the headers closer to the head of the Ore Dock in order to maximize the efficiency of the new intermodal dock.

At-Grade Railroad Highway Sidewalk Crossings

All of the existing highway/rail crossings of sidewalks, City streets and state highways are at-track grade. The only protection afforded crossing traffic is the sounding of locomotive horns, bells and conductor whistles on trains. Some railroad crossing movements are protected by train operating personnel or other railroad personnel. All railroad movements operate at very slow speed.

Heavy haul freight train and more frequent passenger train operations will not be compatible with the existing highway/rail crossing configuration in Skagway. The seasonal tourist narrow gauge rail operation has evolved over the years to an extremely heavy frequency of at-grade crossings centered in the port area of Skagway. The relatively short, light and slow speed nature of the narrow gauge train operations is a factor in the grade crossing working without gates and flashers.

In the near term, it is envisioned that there will be a time separation between the tourist pedestrian traffic and freight train movements through this area. Cruise ships are usually in a position to discharge passengers beginning daily at 7:00 a.m. Cruise ships usually depart Skagway no later than 9:00 p.m. This implies that considerable freight operations may occur between 9:00 p.m. and 7:00 a.m., daily, during the 120-day cruise ship operation season. At all other times, freight traffic can operate at any time through the historic area. A large volume of freight traffic can be accommodated during the night time schedule restriction.

A long term, and preferable solution, is to grade separate the movement of all trains from sidewalk pedestrian traffic and street vehicular traffic and state highway traffic. Pedestrian traffic—thousands of persons per day—moving between the cruise ships and the Skagway historic district is a significant risk exposure factor when considering the complete separation of railroad traffic. As freight traffic increases through the historic area, the railroad could be raised several feet with sidewalks and roadways lowered to totally eliminate the railroad from all other street and sidewalk traffic through and near the Ferry Terminal Road Crossing.

Future economic descriptions must assume a complete railroad separation from other street traffic on the Skagway waterfront which should be discussed at this key location. This report assumes all rail traffic will utilize the current, at-grade railroad track structure. It is recommended that no additional at-grade crossings be constructed through the town of Skagway to ensure citizen and tourist safety not be further compromised.

CONCEPTUAL PLAN

A new bulk concentrate/coal terminal will be located at the southwest corner of the Ore Terminal on new embankment with the dock face aligned with that of Lutak Inlet so that bulk carriers can dock with the prevailing Skagway winds more in line with the centerline of the ship. With a new dock aligned with the inlet, delays to bulk carriers will be greatly reduced if not eliminated completely. A ship loader with dual capacity of traversing the length of the ships holds and slewing the loading into any location of the ships holds will provide the most efficient loading arrangement of concentrates or coal. The ship loader and the concentrate/coal storage building will be constructed to the highest environmental standards. Coal hauled at the rate of 1.1 million tons per year will require a Panamax or Cape size bulk carrier operation once per month. The shore side storage for the coal should be capable of holding about 150% of a ship's load requirement. Panamax and Cape size ships will require a minimum draft of 65 feet alongside.

RAIL BARGE HAUL (TRANSCONTINENTAL RAIL FREIGHT)

This analysis, given the information currently available, takes the realistic position that the most efficient barge configuration for Yukon trade will be an ITB barge equipped for rail cars on the barge deck with containers stacked above the rail cars. The advantage of this configuration is that the barge will transport both rail cars and containers. The disadvantage is that a slight amount of additional time may be required to handle containers at both Skagway and Prince Rupert ports. The minimal loss of port time will be offset by the additional carriage of premium merchandise. The rail barge facilities in Skagway will be designed to provide for the simultaneous unloading and loading of both rail cars and containers. The inherent advantages/efficiencies of hauling both rail cars and containers on the same barge far outweigh the disadvantages.

The rail barge will be Panamax ITB (Integrated Tug Barge) with a beam width of 107 feet. The length of the barge should be approximately 465 feet.

The rail barge principally dedicated to the Yukon market, sailing out of Prince Rupert, BC, will provide direct interchange with all other Canadian and U.S. railroads. The barge deck will be configured with nine tracks to accommodate approximately 65 rail cars. In addition to the tracks, the barge will be equipped with stanchions and caps to provide for carriage of conventional container freight above the rail cars.

A four-day rail barge cycle time between Prince Rupert and Skagway is possible. A rail barge with containers stacked over the rail cars will require a five-day turnaround cycle unless the dock facilities at Prince Rupert can be equipped to simultaneously load/unload both rail cars and containers. The new dock facilities at Skagway will be constructed to simultaneously load/unload both rail cars and containers in this analysis.

The nine-track rail barge with a beam of 107 feet and length of 465 feet will transport about 65 rail cars. Containers unloaded off the barge and loaded into double-stack intermodal cars in Skagway will make up a train consisting of 10 each, 5-unit double-stack car trains carrying approximately 100 each, 53-foot containers. Each container could be up to 53 feet in length and 8 feet 6 inches wide by 9 feet 6 inches in height. (This analysis starts from the assumption that the original line of the WP&YR will be upgraded to a modern standard with tunnel and cut clearances appropriate to longer and higher gauge freight cars.)

Since the rail barge is wider than 100 feet, it should be noted that some accommodation with the U.S. Coast Guard may be required to transit Wrangell Narrows.

The rail barge freight operation scenario will, of course, be driven by the barge schedule. This analysis addresses only a Skagway (MP 0.0) to Utah Yard (MP 106) rail haul with the understanding some barge freight would continue beyond Utah Yard. The rail car load from the barge will be taken to Utah Yard upon completion of the Carmacks extension as part of the overall Alaska Canada rail route. The rail car load from the barge will be taken to Utah Yard in a single train. The train will be approximately 3,700 feet long and will weigh up to 6,000 tons. The train's consist could include any rail car moving in the transcontinental rail system in Canada, the U.S. and Mexico. The containers from the barge will require a second or third train of mostly double-stack intermodal cars and flat cars loaded with containers and other than container loads. The length and weight of this train will vary with each barge load but will be about the same length and weight of the "rail car" train.

Almost all of the barge traffic will consist of loaded rail cars and containers moving northbound with almost all the rail cars and containers returning empty southbound.

The 6,000-ton trains will require seven locomotives (assuming the worst operating scenario of wet rail or snow on rail conditions) to lift the train up the 20-mile hill from Skagway (M.P. 0) to White Pass (M.P. 20). From White Pass to Utah Yard (MP 110.4) in Whitehorse, the train will be handled by two or three locomotives.

The rail operational plan will require intense coordination among all modes of rail freight in order to maximize the use of DPU helper locomotives, crews and terminal operations. For example, the DPU helper locomotives used on rail barge trains will be kept on the train all the way to Bennett during summer and Carcross in the winter, where the helper locomotives will be cut-off to assist coal trains up Bennett Hill. By turning the helper locomotives out of Bennett, trains moving both directions over the mountainous portion of the railroad will take maximum advantage of the helper locomotives for traction power up the hills and dynamic braking power from the helper locomotives to operate the trains down hills with minimum use of air brakes.

The rail barge train operational plan will place the emptied rail cars and containers from the previous northbound trip in Skagway so that the barge can be immediately unloaded and reloaded upon its arrival in Skagway.

RAIL PIPE HAUL

This analysis makes the assumption that all of the 725 miles of gas pipeline pipe to be used for construction in the Yukon Territory will come through the Port of Skagway and will be transported by rail to Utah Yard in Whitehorse for sorting, double jointing and conditioning.

PIPE HAUL DETAILS	
Pipe	725 miles
Pipe Diameter	52 inches/inside
Pipe Wall Thickness	1.25 inches
Pipe Weight	711 lbs. per foot
Total Pipe Tonnage for use in the Yukon Territory	1,360,854 tons

The assumption is that rail will handle transportation of all AHPP line pipe used between Lower Liard River and the Yukon/Alaska border, a distance of about 725 miles.

This analysis uses the information that all pipe for both the AHPP and MGP will be sourced in combination with Canadian mills in Regina or Camrose, U.S. mills in Florida or Portland, or Asian mills and shipped directly to the Port of Skagway by barge or cargo ship. Further, this report anticipates the pipe will be delivered over a two-year staging and construction period for each project.

The pipe will most likely be shipped on open hatch box-shaped, handymax ships if from Asian mills. Typically, these ships will have hold dimensions of 80+ foot length by 82-foot width by 40-foot depth. The hatch covers will match the hold top opening providing very efficient stowage, loading and unloading. The ships will most likely be equipped with gear, but the gear (unless of special ship construction) may be too light or too slow to handle pipe.

Even large cranes such as Manitowoc 4100s will not have the reach, lift and speed under all conditions to rapidly unload these ships carrying the pipe. That is why this analysis takes the firm position that a large on-dock container type crane, such as a Gottwald will be essential for use on the new intermodal dock in Skagway. These large and fast cranes will place the Port of Skagway in the best competitive position to receive all AHPP pipe placed in the Yukon between the Alaska border and Lower Liard River Bridge and the MGP line pipe from at least the Little Chicago Compressor Station northward to the gas fields.

The on-dock crane will have the capability to handle two sections of 80-foot pipe totaling about 57 tons on each lift. The pipe will be discharged from the barges or cargo ships directly to railroad cars never touching the ground in Skagway. The crane will also be used for any cargo vessel alongside the new intermodal dock.

The preferred method of unloading the pipe from the barges or oceangoing ships will be to load the pipe directly onto railroad cars for furtherance to Utah Yard without storing the pipe on the dock or other storage areas. If rail cars are not available, the pipe will be stored on terminal grounds until empty rail cars return from Utah Yard.

Pipe Delivery in 60-foot Joints

Some gas line reports use pipe supplied in 60-foot joints. The rail cars used for the pipe haul may be 286,000-lb. flat cars. Each car will have side stakes and end bulkheads. The end bulkheads and pipe stakes will eliminate the need for load tie downs. The only reason port/dock workers will have to access the car is to set or release a stuck crane hook.

Each ship delivering 60-foot pipe will yield 162 carloads of pipe. Barges will be less.

A pipe train of 40 cars will weigh 5,840 tons and be 2,840 feet in length, not including the locomotives.

It should be noted that flat cars instead of gondolas will be used for 60-foot pipe. The use of flat cars, 71 feet over the coupler pulling faces, would reduce the deadweight of each train. A mix of gondolas and flatcars should be considered to allow for car fleet flexibility for other material type loads as well as construction machinery.

Pipe Delivery in 80-foot Joints

The rail cars used for 80-foot pipe will be 286,000-lb. capacity flat cars equipped with semi-permanent end bulkheads and stake pockets. Each flat car will be about the same dimensions of a standard TTX flat car with an overall length of 93 feet between the coupler pull faces, 90 feet to the end strikers. Each flat car will carry four 80-foot pipes. The pipe weight will be 114 tons. The flat cars will weigh about 30 tons empty. The total car weight loaded would be 144 tons.

Each ship delivering 80-foot pipe will yield 202 carloads of pipe, barges would yield less.

A pipe train of 40 cars will weigh 5,760 tons and will be 3,720 feet in length.

PIPE	CARLOADS	CARS	TONS	LENGTH
60-foot Joints	162	40	5,840	2,840
80-foot Joints	202	40	5,760	3,720

Pipe Surge Freight

Pipe surge freight will be all matter of expendable supplies, equipment and materials necessary for both the direct construction of both the AHPP and MCG energy projects and related indirect freight needs of the supporting infrastructure of the Yukon for all projects.

RAIL COAL HAUL

The rail coal haul operating plan and cost analysis is based upon export coal mined from DMC Mine near Braeburn, Yukon, approximately 175 miles from the Skagway harbor. The information used in this analysis is taken from the latest public information available for the coal project and discussion with the coal mine owners.

Annual Division Mine Production	
Annual Coal Production	1,100,000 tons
Mine Holidays	10 days
Shutdown for Mine Maintenance and Upgrades	30 days (assumption)
Daily Production – 325 days per year	3,385 tons

The coal haul plan and costing is based upon the assumption that the WP&YR will be upgraded to a “Built to Fit Purpose” or Alaska Railroad Corporation (ARRC) heavy haul railroad to the 286,000-lb rail load standard with appropriate speed increases on the original WP&YR line.

Locomotives as described in this report are the most modern AC locomotives available with specifications similar to the newest AC locomotives acquired by the ARRC.

Coal Train Running Time - Northbound		
Station-to-Station	**Distance (Miles)**	**Time (Hours)**
Mile 3 SIT Yard to White Pass	16	1:00
White Pass to Bennett, BC (Customs)	21	1:00
Bennett to Carcross, YT	27	1:00
Carcross to Closeleigh Junction	41	1:00
Closeleigh Junction to Braeburn Junction	64	1:30
Braeburn Junction to area under Loadout Loop		0:30
Loadout		1:30
Total Travel Time between Skagway to Braeburn ready to turn		7:30

Coal Train Running Time -- Southbound		
Station-to-Station	**Distance (Miles)**	**Time (Hours)**
Braeburn Junction to Skagway SIT Yard (Estimated). (Time is included to set up retainers at WP&YR station prior to descending the hill into Skagway.)	169	6:00
Unload Coal Train in Skagway		4:00

The total cycle time for the coal train operations will be approximately 17:00 hours.

The worst case operating scenario is for the heaviest coal train to go down a hill descending the 3.9% grade of the “Hill” between White Pass and Skagway. Improvement in train braking technology using Electronically Controlled Pneumatic (ECP) air brakes, in combination with the use of DPU locomotives is a significant improvement in railroad operating practices.

The use of ECPs and DPUs may eliminate the need for a train crew member to set each retainer on a 70-car train. In winter, this effort could take up to an hour.

Federal Railroad Administration (FRA) requirements govern hours of service for train and engine crews operating within the U.S. Train crews can work a maximum of

12 hours. Therefore, two train crews will be necessary to complete each coal train cycle, most likely changing crews at Fraser Station (M.P. 27.7)

Each train loading operation would require about two hours at Braeburn. This time does not account for a run from the main track (Braeburn Junction) to the coal mine load-out tipple.

Unloading the coal train using bottom dump cars into a car dumper located at the Skagway Ore Terminal will require about four hours. The other method of dumping the cars would be to dump the coal by turning the cars upside down in a coal dumper. A rotary dumper requires a large capital investment – an investment not justified by the coal tonnage levels assumed in this analysis.

Inspecting, testing, cutting in distributed power units and fueling of the locomotives will require about two hours at the Skagway Ore Terminal.

The total train cycle time will be 17 hours during the dark of winter and less during the summer months.

A reasonable plan of rail operation will use 100-ton coal cars, 53 feet long (equal to the length of some of the coaches WP&YR is using on its tourist excursions). The total train weight will be approximately 8,750 tons with a length of 3,715 feet, not including the locomotives.

The coal haul ruling grade will be southbound trains operating up Fraser Hill (MP 27.7) and Bennett Hill (MP 40.6). Seven modern locomotives will be required to lift loaded coal trains up Fraser Hill (1 mile at 3.3% grade) and Bennett Hill without reconstruction of the present railroad corridor over the hills. During dry weather, where locomotive wheel –to-rail adhesion is good, six locomotives will be able to lift the coal trains up Bennett and Fraser hills.

Three locomotives will handle all coal train movements north of Bennett Hill.

In addition to operating the coal trains up the hills, the dynamic brakes of the seven locomotives will be used to maximum advantage to descend the 3.9% grade hill between White Pass and Skagway. The locomotives and cars will be equipped with ECP brakes for instant and simultaneous brake application on all cars in the train for speed control and stopping.

The coal train will cycle every other day leaving Skagway at a specific time to begin each cycle. By using the every other day cycle, train crews and locomotives will be most efficiently utilized, and the planned operation is a reasonable balance considering the length and weight of the coal trains, terminal operations, as well as other railroad activities all competing for track occupancy, train crews and locomotives. Each coal train cycle will require two train crews to complete. Rail barge and pipe trains will operate from Skagway to Utah Yard and return using one train crew start.

The four DPU helper locomotives required to lift rail barge trains and pipe trains up the "Hill" from Skagway will operate to Bennett where the helper locomotives will be cut out in order to assist coal trains up Bennett Hill and Fraser Hill. The DPU helpers will also use their dynamic brakes to help retard the coal trains descending the hill from White Pass to Skagway. Thus, the helper locomotives will be utilized to the absolute maximum extent possible for the railroad operating plan. The helper locomotive costs will be shared among coal, gas, pipeline trains and rail barge freight.

WHITE PASS & YUKON RAILROAD

Three Rail

The preservation, extension and the implementation of passenger operation reform is a material consideration in the operating plan and economic analysis of this report. All aspects of the tourism features of both the port facilities and rail services are enhanced by the information provided in this analysis and extended where possible.

The laying of a third rail to accommodate both the continuation of the tourist narrow-gauge rail excursion and inauguration of new standard-gauge freight service will be an attractive solution to accommodating both track gauges. The "look and feel" of the tourist excursion trains will not be changed on the Railroad Dock, the Depot, Coach Yard and most of the Shops. Three-rail standard gauge or just standard gauge track will be constructed to the coal terminal. The line from the shops to the docks will be three-rail. New standard gauge tracks will be built into a new locomotive shop located on the west side of the present shop building. The Three-Mile Store in Transit Yard will be standard gauge only.

One significant advantage of the three-rail track is that the third rail will perform as a continuous guard rail for all narrow-gauge passenger trains. And, the three-rail itself may become a point of difference to other railroads and an additional tourist attraction.

There is a difference in coupler height and track center alignment between narrow gauge and standard gauge couplers. The use of converter cars (Appendix 5) with adjustable couplers will provide a means for narrow-gauge equipment to couple with standard-gauge equipment if necessary.

The disadvantage of three-rail is, of course, its initial capital cost and certain track maintenance inefficiencies for tamping and ballast regulating/brooming machines.

This analysis makes the assumption that a traditional narrow gauge tourist train cannot be operated simultaneously on the same track segment as a standard gauge train. The issue being that none of the existing narrow gauge passenger cars meet modern rail car construction standards necessary for joint standard gauge rail operations. This restriction will only be in effect during the summer tourist season for about 12 hours per day and will have no effect on rail operation in the fall, winter and spring. So, the effect is marginal impact to costs.

This report also makes the assumption that <u>only</u> standard gauge passenger cars meeting federally-mandated passenger car construction and operation standards will be operated in trans-border and all service other than pure tourism excursion service.

An Overview – Prevailing Tonnage

First and foremost is the fact that the long-term prevailing tonnage movement over the WP&YR will be mined export traffic from the Yukon Territory. That tonnage will be operating <u>downhill</u> on WP&YR's longest and steepest grade.

The most efficient method to minimize the effect of the White Pass hills over which the WP&YR operates is to balance train weight and, with skillful use of the train schedule, keep every locomotive on full power so that helper locomotives lifting a train up one side of a hill can meet with and be used to lift a second train up the opposite side of the hill.

The train weights and operating scenario presented in this analysis utilizes such a locomotive balancing plan.

Grades

A considerable factor is that the grades on the WP&YR (and with any extension to Carmacks or the east-west transcontinental extension) are bunched. That is, all of the grades are located within the first 40 miles of the WP&YR corridor.

When considering the railroad grades, the object of railroad efficiency is the power that locomotives do not use when they travel from end to end of a particular division in order to be needed at a few scattered points down the line. But on the WP&YR, the helper locomotives are used to do their work to lift trains up the 15-mile “Hill” from Skagway and then travel to Bennett Hill (M.P 40) to assist southbound trains up Bennett Hill and Fraser Hill back to Skagway. Thus, the helper locomotives are used once and for all and are done with it, being necessary for operations on only the first 40 miles of the corridor.

AC Locomotive Efficiencies

Only new AC-powered locomotives will be used on the standard gauge freight operations on WP&YR. The increased efficiencies of new AC locomotives for use on the WP&YR will have a large effect on reducing the impact of the grades. New AC locomotives can continue to supply high power over long periods at low speeds, whereas DC locomotives seriously overheat over long periods of high power at low speeds.

Computers on new AC locomotives control all the systems on the locomotive and communicate with and control every major component. The control of the locomotive systems achieves maximum performance at the lowest possible cost. The computers will not permit any part of the locomotive to be overworked to the point of damage. The computer will keep the locomotive at its maximum permissible level of tractive effort for the speed to the point where the wheels are slipping an infinitesimal amount—but not slipping to cause a loss of traction or to where the throttle setting must be reduced to stop the wheel slip. On some new AC locomotives wheel slip is controlled at each individual axle. These AC locomotives use a mature technology and are proven by use of every major railroad in the U.S. and Canada.

The increase in tractive effort (pulling power) of AC locomotives over older DC-powered locomotives is enormous. The AC locomotive is capable of providing more pulling power over a much wider speed range. The dynamic braking is better and an AC locomotive will continue to provide braking power even with a portion of the dynamic brake system cut out or failed. The traction motors of an AC locomotive will not short-out in snow or wet conditions nor will they fly-apart "birdsnest" at speed or on rough track or turnout frogs.

There are many advantages of AC locomotives, and they can be summed up as strictly economic. Every single advancement in locomotive operating characteristics is embodied in the new AC locomotives: more power, less maintenance, less fuel use, less exhaust cleaner exhaust (meet latest EPA locomotive emission standards), more reliability and fewer locomotives are required for operations. A train can be brought to a complete stop with an AC locomotive using only the dynamic brakes on the locomotive so there is less "wear and tear" on the train wheels and brake shoes. The high horsepower of an AC locomotive can be fully used at low speed and is also available for high speed operations. Older diesel locomotives cannot match the new AC technology.

The condition of the WP&YR locomotive fleet presents a dilemma. The entire narrow gauge WP&YR diesel-electric locomotive fleet is all first generation in that they all have early model traction generators and have never been upgraded.

Second generation locomotives used alternators instead of generators.

Third generation locomotives are characterized by electronic control modules instead of basic circuitry.

Fourth generation locomotives are distinguished by microprocessor control.

AC locomotives, as described in this report, are the fifth and most recent generation of locomotives, and therefore, bring substantial economic and reliability benefits.

Main Terminal of Skagway and Shops Located at the Bottom of "The Hill"

The bottom of "The Hill" is Skagway, the site of the main locomotive and rolling stock maintenance and servicing terminal. Therefore all locomotives and rolling stock return to their assigned servicing and maintenance facility at the end of each run, providing the maximum operating efficiency possible.

This efficiency applies to the use of train crews as well. Train crew utilization is based on FRA-mandated hours of service.

Train Balance and Speed

For all three considerations of coal, rail barge and energy project traffic, the trains will be approximately 6,000 to 9,000 tons weight and will also be approximately 3,000 to 4,000 feet in length. This consideration will provide a great deal of railroad operating efficiency for locomotive utilization, power for operating over hills, crew training and utilization, helper locomotive cut in/out, retainer use, siding lengths, yard inspections, fuel use, etc.

Rail Traffic Density

Summer tourist excursion operations will be markedly more efficient once a cruise ship passenger rail operation is put into place under a superior passenger train operating plan in contrast to present day WP&YR operations. The time block for rail passenger service will most likely remain with the "high" hours of 7:00 a.m. to 7:00 p.m.

The combined coal, barge and gas light freight traffic will be as follows: (One round trip train moving from Skagway (MP 0.0) to Utah Yard (MP 106) or Braeburn Junction is counted as two trains—one north and one south for a total of two movements.)

Coal trains would operate one round trip every other day.

Rail barge would arrive at the Port of Skagway every fourth or fifth day, requiring four round trips per barge.

Gas line pipe will require four or five round trips per ship or barge.

In summary, a typical month would see the following level of traffic:

Coal	15 Round trips per month
Rail Barge	24/26
Pipe	7

Approximately 100 trains per month will operate between Skagway to Utah Yard. This level of traffic density will not burden the physical limitations of WP&YR, after being upgraded. The traffic mix will allow fairly efficient use of locomotives, rolling stock, train crews and maintenance resources.

Remote Control Yard Engines

Two yard locomotives in Skagway and one in Utah Yard will be operated by remote control. The cigar-box sized controller will be operated by the conductor (foreman) of a one-person yard crew. The conductor will operate the remote control only while standing on the ground and not from the locomotive or the cab of a pick-up truck or four-wheel drive vehicle. The yard engine will be “green goat” type locomotive. The power for the traction motors will come from a bank of batteries recharged from a small generator on the locomotive. The yard locomotive will generate less noise (operating from batteries) and will emit only a minimum amount of smoke (small generator). The rail yards will be constructed with welded rail to eliminate the click-clack sound of train wheels rolling over bolted joints.

Sidings

The railroad will have four classes of sidings:

1. Primary sidings where trains are planned for repeated meets. Sidings will be 13,250 feet in length with a mid-point crossover. The crossover will have 600 foot length for DPU locomotive set out. These sidings may also have a maintenance-of-way siding at one end.
2. Meet and passing sidings of 7,250-foot length.
3. Maintenance of Way and bad order set out sidings of 2,000-foot length.
4. Special sidings to meet specific operational needs.

All sidings will be located for ease of highway access. The maintenance-of-way sidings will be located for eventual lengthening. Sidings will not be located with road or highway crossings cutting the siding. Sidings will be located to take advantage of commercial power.

The sidings should be arranged as follows:

Skagway to Whitehorse on the Existing WP&YR

Note: **(Bold)** is a Timetable station

Skagway to White Pass configured to accommodate new passenger rail operations**.**

M.P.	Location	Type
27.6	**Fraser**	13,250-foot meet/pass siding and an additional maintenance-of-way and set-out siding (M.P. 27.1 to M.P 29.2). Construct access road with power the entire length. DPU set out in siding crossover.
33.0	**Log Cabin**	Special siding (double Bennett Hill and bad order set-out from M.P. 33.0 to M.P. 33.6). Reconstruct the siding with a full length access road to the west side of the main track.
40.4	**Bennett**	13,250-foot primary meet/pass siding and addition maintenance-of-way siding and loop (M.P. 40.6 to M.P. 43.1). DUP set out in siding crossover.
49.3	**Graves**	Maintenance-of-way and set-out siding.
55.5	**Pit**	Maintenance-of-way spur to gravel source.
59.4	**Watson**	Maintenance-of-way and set-out siding.
65.9	**South Carcross**	13,250-foot primary meet/pass siding. Construct access road with power entire length. DPU set out in siding crossover
67.6	**Carcross**	Maintenance-of-way and set-out siding, including wye. Use existing access road.
77.6	**Lorne**	Maintenance-of-way and set out siding (relocated to M.P. 77.7). Use existing access road.
89.0	**Robinson**	7,250-foot siding. Construct access road entire length.
95.5	**Cowley**	Maintenance-of-way and set-out siding. Use existing access road (look at relocating to near M.P. 96).
106.0	**Utah**	Yard

Whitehorse to Carmacks

M.P.	Location	Type
0.0	WPYR Mile 108	The Carmacks Extension leaves the WPYR near Mile 108 and bridges in front of the Whitehorse dam (Yukon River Bridge Crossing No. 1 and continues to curve around Riverdale.
NOTE: All of the sidings should have access roads. Meet/pass sidings should have access roads to both switches.		
1.0	Closeleigh Junction	This junction is a wye with the south leg of the wye forming the main line to Watson Lake and the north leg of the wye is the main line to Carmacks.
14.9	Yukon River Bridge Crossing No. 2	
15.0	**Takhini**	Maintenance-of-way and set-out siding
16.0	Takhini Overpass of Highway No. 2	Highway passes over railroad
23.0	**LeBerge**	Maintenance-of-way and set-out siding
36.0	**Rich**	7,250-foot passing siding. Construct access road the entire length.
51.0	**Fox**	Maintenance-of-way and set-out siding
64.0	**Braeburn** Yard	DMC Mine spur and loading loop
74.0	**Cong**	Maintenance of way and set-out siding
83.0	**Klusha**	7,250 meet and passing siding. Construct access road with power the entire length.
89.0	Montague House	Highway passes over railroad.
96.0	**Porter**	Maintenance-of-way and set-out siding (good gravel site)
106.5	Berdoe	Highway passes over railroad.
109.0	**Carmacks** Yard	Wye to Alaska Border and Pelly River

Capital infrastructure construction cost estimate options are presented as Appendix 7.

Engineering Standards

Track Class	Maximum Allowable Freight Train Speed	Maximum Allowable Passenger Train Speed
Excepted	10 mph	N/A
1	10 mph	15 mph
2	25 mph	30 mph
3	40 mph	60 mph
4	60 mph	80 mph
5	80 mph	90 mph

Vertical Curves	
Use the Formula: C= 100V/L	
Where:	L= Length of curve in feet (round to nearest 100-foot)
	V= Algebraic difference in G1 and G2
	C= Average change in gradient per 100-foot. This value should not exceed:
	0.06 for sags, or
	0.10 for summits

Spiral Design	
For new construction / reconstruction where possible use: L(min) = 1.639(Eu) V	
Where:	L(min) = desirable length of spiral in feet
	Eu = unbalanced superelevation in inches
	V = maximum train speed in miles per hour (mph)
In locations where cost of realignment is prohibitive, use: L(min) = 1.22(Eu) V	
Where:	L(min) = desirable length of spiral in feet
	Eu = unbalanced superelevation in inches
	V = maximum train speed in miles per hour (mph)

Benefits

Benefits to using Skagway as a major import and export port facility as an entry point to the Yukon Territory are

- Skagway provides a first-class intermodal and bulk materials port facility in an extremely close proximity to the Yukon Territory.
- Skagway is a shorter sailing time and saves one day over using Prince Rupert, BC as a waterfront.
- All Prince Rupert cargo must be handled by rail from Prince Rupert to either Fort Nelson, a distance of approximately 995 miles, or to Dease Lake, a distance of approximately 450 miles, then transferred to truck, and hauled an additional 400 miles from Dease Lake, or 600 miles from Fort Nelson to reach Whitehorse.
- The rail barge access to Skagway would serve the Yukon with cargo forwarded from Prince Rupert and Vancouver

APPENDICES

1. Proposed Railway Corridors – Whitehorse Bypass
2. Railcar Rotary Dump Occupancy Matrix
3. Shiploading Berth Occupancy Matrix
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6. Construction Schedule
7. Capital Infrastructure Cost Estimates
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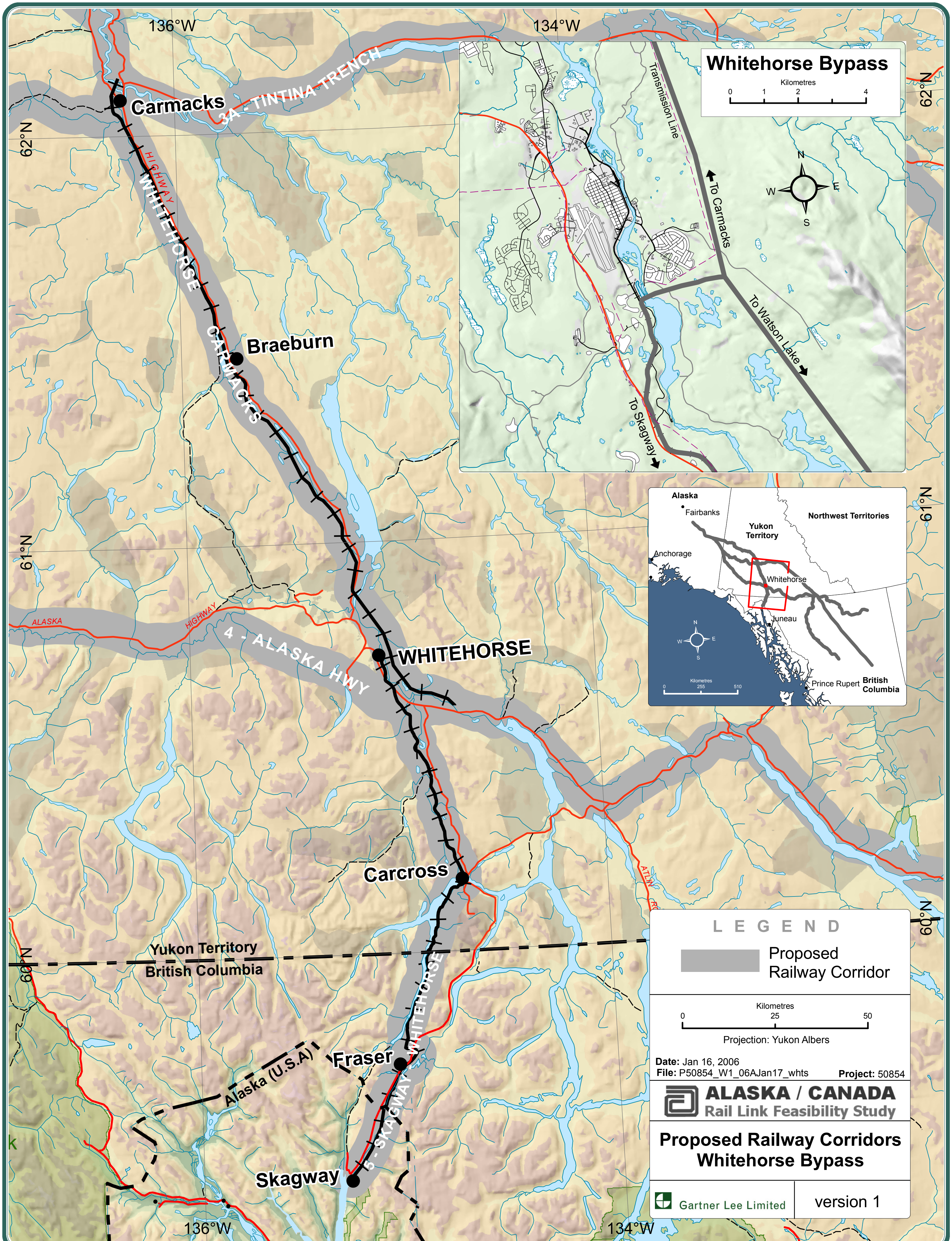
   B. 2 Capital Cost & Depreciation Port, Fit Purpose Rehabilitation & No Carmacks Extension
   C. 3 Capital Cost & Depreciation Port, Fit Purpose Rehabilitation & No Carmacks Extension
   D. 7 3-Rail Capital Cost & Depreciation, Port, Heavy Haul Rehabilitation & Heavy Haul Carmacks Extension Track

GLOSSARY & ACRONYMS

ACRL	Alaska Canada Rail Link
AHPP	Alaska Highway Pipeline Project
AML	Alaska Marine Lines
Cape Size Bulker	Ship Particulars: **185,000-ton class cape size bulker** Length: Approximately 290 meters Beam: Approximately 47 meters Deadweight: Approximately 185,500 metric tons
DMC	Division Mountain Coal
DPU Locomotives	Distributed Power Unit (DPU) – An unmanned locomotive, controlled remotely from the lead cab, and place in the middle or at the rear of the train.
ECP Air Brakes	Electronically Controlled Pneumatic Air Brakes
Fjord	A long narrow coastal inlet with steep sides, often formed by glacial action.
ITB	Integrated Tank Barge
MGP	Mackenzie Valley Pipeline Project
Panamax	Ships classified as **Panamax** are of the maximum dimensions that will fit through the locks of the Panama Canal. This size is determined by the dimensions of the lock chambers, and the depth of the water in the canal. Panamax is a significant factor in the design of cargo ships, with many ships being built to exactly the maximum allowable size. The maximum dimensions allowed for a ship transiting the canal are: • Length: 294.1 meters (965 ft) • 0 (width): 32.3 meters (106 ft) • Draft: 12.0 meters (39.5 ft) in tropical fresh water (the salinity and temperature of water affect its density, and hence how deeply a ship will sit in the water) • Height: 57.91 meters (190 feet) measured from the waterline to the vessel's highest point Note: Information source is www.answers.com/topic/panamax.
WP&YR	White Pass & Yukon Railroad

ASSUMPTIONS

1. Transportation that all pipe to be used for the gas pipeline between Lower Laird River and the Yukon/Alaska border will be by rail.
2. All pipes to be used for the gas pipeline in the Yukon will be rolled by Asian and domestic mills and shipped directly to the Port of Skagway.
3. Pipe to be used for the gas pipeline in the Yukon will be delivered over a three-year staging and construction period.



Whitehorse Bypass
Kilometres
0 1 2 4
Transmission Line
To Carmacks
To Watson Lake
To Skagway
N
W
E
S
Alaska
Fairbanks
Yukon Territory
Northwest Territories
Anchorage
Whitehorse
Juneau
Prince Rupert
British Columbia
Kilometres
0 255 510
136°W
134°W
62°N
61°N
60°N
Carmacks
3A - TINTINA TRENCH
HIGHWAY
WHITEHORSE
CARMACKS
Braeburn
ALASKA
HIGHWAY
4 - ALASKA HWY
WHITEHORSE
Carcross
ATLIN
Yukon Territory
British Columbia
Alaska (U.S.A)
Fraser
WHITEHORSE
5 - SKAGWAY
Skagway
LEGEND
Proposed Railway Corridor
Kilometres
0 25 50
Projection: Yukon Albers
Date: Jan 16, 2006
File: P50854_W1_06AJan17_whts
Project: 50854
ALASKA / CANADA
Rail Link Feasibility Study
Proposed Railway Corridors
Whitehorse Bypass
Gartner Lee Limited
version 1

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COMPANY: **HDR**

by M.Veilleux

SUBJECT: **Port of Skagway Coal Export Terminal**

Table No. S2: Railcar Dump Station Occupancy

ITEM No.	DESCRIPTION INPUT DATA													
1	**Annual tonnage**		**1.100**	**1.100**	**mill.t**	**2.200**	**2.200**	**mill.t**	**3.500**	**3.500**	**mill.t**	**5.000**	**5.000**	**mill.t**
1a	Average size of train		6,300	6,300	tons	6,300	6,300	tons	6,300	6,300	tons	6,300	6,300	tons
1b	Number of 90 ton cars per train		70	70	cars	70	70	cars	70	70	cars	70	70	cars
2a	Train unloader feeder design rate*		3,000	3,000	t/h	3,000	3,000	t/h	3,000	3,000	t/h	3,000	3,000	t/h
2b	Unavailable time at port (weather, maint.)		35.0	35.0		35.0	35.0	d/y	35.0	35.0	d/y	35.0	35.0	d/y
2c	**Overall Port Availibility**		**90%**	**90%**		**90%**	**90%**		**90%**	**90%**		**90%**	**90%**	
	OUTPUT DATA		Fast	Slow		Fast	Slow		Fast	Slow		Fast	Slow	
3	Move train into loop and to train unloader		0.15	0.20	hours	0.15	0.20	hours	0.15	0.20	hours	0.15	0.20	hours
4	Paperwork		0.10	0.15	hours	0.10	0.15	hours	0.10	0.15	hours	0.10	0.15	hours
5	Train problems		0.10	0.15	hours	0.10	0.15	hours	0.10	0.15	hours	0.10	0.15	hours
6	Unload cargo @ % feeder design rate:	72%	2.93	2.93	hours	2.93	2.93	hours	2.93	2.93	hours	2.93	2.93	hours
7	Downtime of item 6	4%	0.12	0.12	hours	0.12	0.12	hours	0.12	0.12	hours	0.12	0.12	hours
8	Downtime due to weather	5%	0.15	0.15	hours	0.15	0.15	hours	0.15	0.15	hours	0.15	0.15	hours
9	Train inspection		0.10	0.15	hours	0.10	0.15	hours	0.10	0.15	hours	0.10	0.15	hours
10	Move train out of loop and transit time		0.20	0.30	hours	0.20	0.30	hours	0.20	0.30	hours	0.20	0.30	hours
11	Total unloading time per train		3.84	4.14	hours	3.84	4.14	hours	3.84	4.14	hours	3.84	4.14	hours
12	Average unloading rate @ unloading time		1640	1521	t/h	1640	1521	t/h	1640	1521	t/h	1640	1521	t/h
13	Average unloading rate/feeder design rate		55%	51%		55%	51%		55%	51%		55%	51%	
14	Operating hours per day		22.5	22.5	hours	22.5	22.5	hours	22.5	22.5	hours	22.5	22.5	hours
15	**Unloader occupancy per train: Tb**		**0.17**	**0.18**	**days**	**0.17**	**0.18**	**days**	**0.17**	**0.18**	**days**	**0.17**	**0.18**	**days**
	OUTPUT - ANNUAL PROJECTIONS:													
16	**Annual tonnage unloaded**		**1.100**	**1.100**	**mill.t**	**2.200**	**2.200**	**mill.t**	**3.500**	**3.500**	**mill.t**	**5.000**	**5.000**	**mill.t**
17	Number of trains unloaded		175	175	trains	349	349	trains	556	556	trains	794	794	trains
18	**Unloader occupancy - hours**		**716**	**771**	**h/y**	**1,431**	**1,543**	**h/y**	**2,277**	**2,455**	**h/y**	**3,253**	**3,507**	**h/y**
19	Total unloader occupancy - days		30	32	d/y	60	64	d/y	95	102	d/y	136	146	d/y
20	Unloader availability - days		330	330	d/y	330	330	d/y	330	330	d/y	330	330	d/y
21	**Unloader occupancy percent:**		**9%**	**10%**		**18%**	**19%**		**29%**	**31%**		**41%**	**44%**	
22	Waiting time factor Tw/Tb assumed		0.020	0.022	s.chart	0.044	0.048	s.chart	0.081	0.090	s.chart	0.139	0.159	s.chart
23	Annual waiting time Tw calculated		0.6	0.7	d/y	2.6	3.1	d/y	7.7	9.2	d/y	18.9	23.2	d/y
24	Average waiting time per train		0.1	0.1	hours	0.2	0.2	hours	0.3	0.4	hours	0.6	0.7	hours
25	Average loop occupancy time per train		4.1	4.4	hours	4.1	4.4	hours	4.1	4.4	hours	4.1	4.4	hours
26	**Average train time in port**		**4.2**	**4.5**	**hours**	**4.3**	**4.6**	**hours**	**4.4**	**4.8**	**hours**	**4.7**	**5.1**	**hours**
27	**All train time in port**		**730**	**788**	**hours**	**1,494**	**1,618**	**hours**	**2,461**	**2,675**	**hours**	**3,706**	**4,064**	**hours**

* Car dumper design rate 90t car at 110 sec cycle time = 2,945 t/h; 70 cars unloaded in 2.14 hours

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COMPANY: **HDR**

SUBJECT: **Port of Skagway Coal Export Terminal**

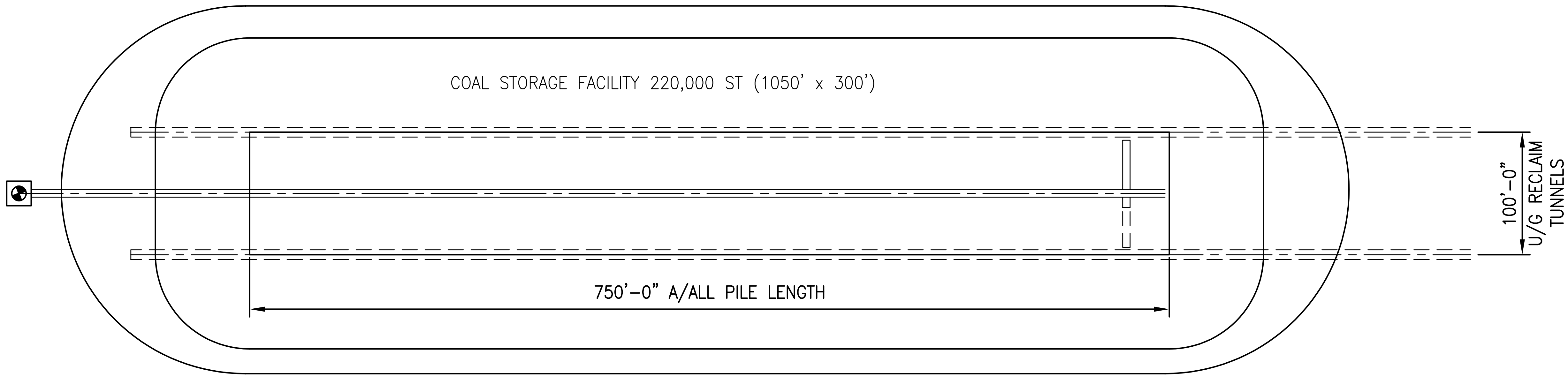
by M.Veilleux

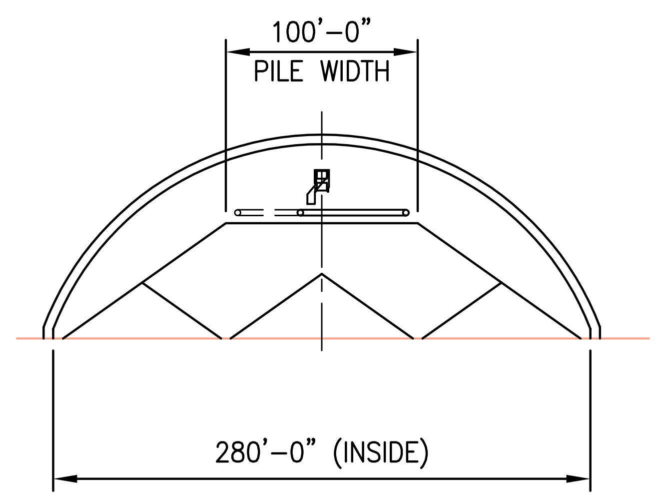
Table No. S1 : Shiploading Berth Occupancy

ITEM No.	DESCRIPTION INPUT DATA		MAXI FLEET 65,000 DWT					MINI FLEET 140,000 DWT				
1	**Annual tonnage**		**1.100**	**2.200**	**3.500**	**5.000**	**mill.t**	**1.100**	**2.200**	**3.500**	**5.000**	**mill.t**
1a	Average size of cargo		60,000	60,000	60,000	60,000	tons	130,000	130,000	130,000	130,000	tons
1b	Number of holds of vessel		7	7	7	7	holds	9	9	9	9	holds
2a	Shiploader Design Rate		1,500	1,500	1,500	1,500	t/h	1,500	1,500	1,500	1,500	t/h
2b	Shiploader interference factor		1.00	1.00	1.00	1.00	-	1.00	1.00	1.00	1.00	-
2c	Number of Shiploaders		1	1	1	1	-	1	1	1	1	-
2d	Design rate for no. of loaders		1,500	1,500	1,500	1,500	t/h	1,500	1,500	1,500	1,500	t/h
2e	Unavailable time at berth due to weather		4.4	8.8	14.0	20.0	days/yr.	4.3	8.5	13.6	19.4	days/yr.
2f	Unavailable time at port (weather, maint.)		32.0	32.0	32.0	32.0	days/yr.	32.0	32.0	32.0	32.0	days/yr.
2g	**Overall Availibility (Berth & Port)**		**90%**	**89%**	**87%**	**86%**		**90%**	**89%**	**88%**	**86%**	
	VESSEL TIME / EVENT											
3	Move to berth and dock		2.0	2.0	2.0	2.0	hours	2.0	2.0	2.0	2.0	hours
4	Paperwork		1.0	1.0	1.0	1.0	hours	1.0	1.0	1.0	1.0	hours
5	Vessel Problems		1.0	1.0	1.0	1.0	hours	1.0	1.0	1.0	1.0	hours
6	Load cargo @ % design rate:	75%	53.3	53.3	53.3	53.3	hours	115.6	115.6	115.6	115.6	hours
7	Hatch shifting 3 moves/hold [h]:	0.2	4.2	4.2	4.2	4.2	hours	5.4	5.4	5.4	5.4	hours
8	Downtime of items 6,7,:	5%	2.9	2.9	2.9	2.9	hours	6.0	6.0	6.0	6.0	hours
9	Vessel shifting 2 moves/hold [h]:	0.0	0.0	0.0	0.0	0.0	hours	0.0	0.0	0.0	0.0	hours
10	Downtime due to weather	10%	5.8	5.8	5.8	5.8	hours	12.1	12.1	12.1	12.1	hours
11	Vessel time/draught survey		1.0	1.0	1.0	1.0	hours	1.0	1.0	1.0	1.0	hours
12	Vessel deberthing and transit time		2.0	2.0	2.0	2.0	hours	2.0	2.0	2.0	2.0	hours
13	Total berth time per vessel		73.2	73.2	73.2	73.2	hours	146.1	146.1	146.1	146.1	hours
14	Average loading rate @ berth time		820	820	820	820	t/h	890	890	890	890	t/h
15	Avg.load.rate/design rate		55%	55%	55%	55%		59%	59%	59%	59%	
16	Operating hours per day		22.5	22.5	22.5	22.5	hours	22.5	22.5	22.5	22.5	hours
17	**Berth occupancy per vessel: Tb**		**3.3**	**3.3**	**3.3**	**3.3**	**days**	**6.5**	**6.5**	**6.5**	**6.5**	**days**
	OUTPUT - ANNUAL PROJECTIONS:											
18	**Annual tonnage loaded**		**1.100**	**2.200**	**3.500**	**5.000**	**mill.t**	**1.100**	**2.200**	**3.500**	**5.000**	**mill.t**
19	Number of vessels loaded		18	37	58	83	vessels	8	17	27	38	vessels
20	Berth occupancy - hours		1,431	2,861	4,552	6,503	h/y	1,319	2,637	4,196	5,994	h/y
21	Total Berth occupancy - days		60	119	190	271	d/y	55	110	175	250	d/y
22	Berth availability - days		333	333	333	333	d/y	333	333	333	333	d/y
23	**Berth occupancy Percent:**		**18%**	**36%**	**57%**	**81%**		**16%**	**33%**	**52%**	**75%**	
24	Waiting time factor Tw/Tb assumed		0.044	0.112	0.265	0.874	s.chart	0.040	0.099	0.221	0.600	s.chart
25	Annual waiting time Tw calculated		3	13	50	237	days	2	11	39	150	days
26	Approx. avg. waiting time per vessel: Tw		0.1	0.4	0.9	2.8	days	0.3	0.6	1.4	3.9	days
27	**Total Vessel Time in Port**		**3.4**	**3.6**	**4.1**	**6.1**	**days**	**6.7**	**7.1**	**7.9**	**10.4**	**days**
28	**All Vessel Time in Port**		**62**	**133**	**240**	**508**	**days**	**57**	**121**	**213**	**400**	**days**

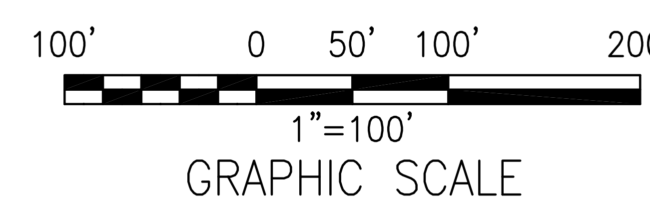
ITEM No.	DESCRIPTION INPUT DATA	MAXI FLEET 65,000 DWT					MINI FLEET 140,000 DWT				
1	**Annual tonnage**	**1.100**	**2.200**	**3.500**	**5.000**	**mill.t**	**1.100**	**2.200**	**3.500**	**5.000**	**mill.t**
1a	Average size of cargo	60,000	60,000	60,000	60,000	tons	130,000	130,000	130,000	130,000	tons
1b	Number of holds of vessel	7	7	7	7	holds	9	9	9	9	holds
2a	Shiploader Design Rate	3,000	3,000	3,000	3,000	t/h	3,000	3,000	3,000	3,000	t/h
2b	Shiploader interference factor	1.00	1.00	1.00	1.00	-	1.00	1.00	1.00	1.00	-
2c	Number of Shiploaders	1	1	1	1	-	1	1	1	1	-
2d	Design rate for no. of loaders	3,000	3,000	3,000	3,000	t/h	3,000	3,000	3,000	3,000	t/h
2e	Unavailable time at berth due to weather	2.4	4.7	7.5	10.7	days/yr.	2.2	4.5	7.1	10.1	days/yr.
2f	Unavailable time at port (weather, maint.)	32.0	32.0	32.0	32.0	days/yr.	32.0	32.0	32.0	32.0	days/yr.
2g	**Overall Availibility (Berth & Port)**	**91%**	**90%**	**89%**	**88%**		**91%**	**90%**	**89%**	**88%**	
	VESSEL TIME / EVENT										
3	Move to berth and dock	2.0	2.0	2.0	2.0	hours	2.0	2.0	2.0	2.0	hours
4	Paperwork	1.0	1.0	1.0	1.0	hours	1.0	1.0	1.0	1.0	hours
5	Vessel Problems	1.0	1.0	1.0	1.0	hours	1.0	1.0	1.0	1.0	hours
6	Load cargo @ % design rate:	26.7	26.7	26.7	26.7	hours	57.8	57.8	57.8	57.8	hours
7	Hatch shifting 3 moves/hold [h]:	4.2	4.2	4.2	4.2	hours	5.4	5.4	5.4	5.4	hours
8	Downtime of items 6,7,:	1.5	1.5	1.5	1.5	hours	3.2	3.2	3.2	3.2	hours
9	Vessel shifting 2 moves/hold [h]:	0.0	0.0	0.0	0.0	hours	0.0	0.0	0.0	0.0	hours
10	Downtime due to weather	3.1	3.1	3.1	3.1	hours	6.3	6.3	6.3	6.3	hours
11	Vessel time/draught survey	1.0	1.0	1.0	1.0	hours	1.0	1.0	1.0	1.0	hours
12	Vessel deberthing and transit time	2.0	2.0	2.0	2.0	hours	2.0	2.0	2.0	2.0	hours
13	Total berth time per vessel	42.5	42.5	42.5	42.5	hours	79.7	79.7	79.7	79.7	hours
14	Average loading rate @ berth time	1,412	1,412	1,412	1,412	t/h	1,632	1,632	1,632	1,632	t/h
15	Avg.load.rate/design rate	47%	47%	47%	47%		54%	54%	54%	54%	
16	Operating hours per day	22.5	22.5	22.5	22.5	hours	22.5	22.5	22.5	22.5	hours
17	**Berth occupancy per vessel: Tb**	**1.9**	**1.9**	**1.9**	**1.9**	**days**	**3.5**	**3.5**	**3.5**	**3.5**	**days**
	OUTPUT - ANNUAL PROJECTIONS:										
18	**Annual tonnage loaded**	**1.100**	**2.200**	**3.500**	**5.000**	**mill.t**	**1.100**	**2.200**	**3.500**	**5.000**	**mill.t**
19	Number of vessels loaded	18	37	58	83	vessels	8	17	27	38	vessels
20	Berth occupancy - hours	831	1,662	2,644	3,777	h/y	719	1,438	2,288	3,268	h/y
21	Total Berth occupancy - days	35	69	110	157	d/y	30	60	95	136	d/y
22	Berth availability - days	333	333	333	333	d/y	333	333	333	333	d/y
23	**Berth occupancy Percent:**	**10%**	**21%**	**33%**	**47%**		**9%**	**18%**	**29%**	**41%**	
24	Waiting time factor Tw/Tb assumed	0.023	0.053	0.099	0.179	s.chart	0.020	0.044	0.080	0.138	s.chart
25	Annual waiting time Tw calculated	1	4	11	28	days	1	3	8	19	days
26	Approx. avg. waiting time per vessel: Tw	0.0	0.1	0.2	0.3	days	0.1	0.2	0.3	0.5	days
27	**Total Vessel Time in Port**	**1.9**	**2.0**	**2.1**	**2.2**	**days**	**3.6**	**3.7**	**3.8**	**4.0**	**days**
28	**All Vessel Time in Port**	**35**	**73**	**121**	**186**	**days**	**31**	**63**	**103**	**155**	**days**

ITEM No.	DESCRIPTION INPUT DATA	MAXI FLEET 65,000 DWT					MINI FLEET 140,000 DWT				
1	**Annual tonnage**	**1.100**	**2.200**	**3.500**	**5.000**	**mill.t**	**1.100**	**2.200**	**3.500**	**5.000**	**mill.t**
1a	Average size of cargo	60,000	60,000	60,000	60,000	tons	130,000	130,000	130,000	130,000	tons
1b	Number of holds of vessel	7	7	7	7	holds	9	9	9	9	holds
2a	Shiploader Design Rate	5,000	5,000	5,000	5,000	t/h	5,000	5,000	5,000	5,000	t/h
2b	Shiploader interference factor	1.00	1.00	1.00	1.00	-	1.00	1.00	1.00	1.00	-
2c	Number of Shiploaders	1	1	1	1	-	1	1	1	1	-
2d	Design rate for no. of loaders	5,000	5,000	5,000	5,000	t/h	5,000	5,000	5,000	5,000	t/h
2e	Unavailable time at berth due to weather	1.5	3.1	4.9	7.0	days/yr.	1.4	2.8	4.5	6.4	days/yr.
2f	Unavailable time at port (weather, maint.)	32.0	32.0	32.0	32.0	days/yr.	32.0	32.0	32.0	32.0	days/yr.
2g	**Overall Availibility (Berth & Port)**	**91%**	**90%**	**90%**	**89%**		**91%**	**90%**	**90%**	**89%**	
	VESSEL TIME / EVENT										
3	Move to berth and dock	2.0	2.0	2.0	2.0	hours	2.0	2.0	2.0	2.0	hours
4	Paperwork	1.0	1.0	1.0	1.0	hours	1.0	1.0	1.0	1.0	hours
5	Vessel Problems	1.0	1.0	1.0	1.0	hours	1.0	1.0	1.0	1.0	hours
6	Load cargo @ % design rate:	16.0	16.0	16.0	16.0	hours	34.7	34.7	34.7	34.7	hours
7	Hatch shifting 3 moves/hold [h]:	4.2	4.2	4.2	4.2	hours	5.4	5.4	5.4	5.4	hours
8	Downtime of items 6,7,:	1.0	1.0	1.0	1.0	hours	2.0	2.0	2.0	2.0	hours
9	Vessel shifting 2 moves/hold [h]:	0.0	0.0	0.0	0.0	hours	0.0	0.0	0.0	0.0	hours
10	Downtime due to weather	2.0	2.0	2.0	2.0	hours	4.0	4.0	4.0	4.0	hours
11	Vessel time/draught survey	1.0	1.0	1.0	1.0	hours	1.0	1.0	1.0	1.0	hours
12	Vessel deberthing and transit time	2.0	2.0	2.0	2.0	hours	2.0	2.0	2.0	2.0	hours
13	Total berth time per vessel	30.2	30.2	30.2	30.2	hours	53.1	53.1	53.1	53.1	hours
14	Average loading rate @ berth time	1,985	1,985	1,985	1,985	t/h	2,449	2,449	2,449	2,449	t/h
15	Avg.load.rate/design rate	40%	40%	40%	40%		49%	49%	49%	49%	
16	Operating hours per day	22.5	22.5	22.5	22.5	hours	22.5	22.5	22.5	22.5	hours
17	**Berth occupancy per vessel: Tb**	**1.3**	**1.3**	**1.3**	**1.3**	**days**	**2.4**	**2.4**	**2.4**	**2.4**	**days**
	OUTPUT - ANNUAL PROJECTIONS:										
18	**Annual tonnage loaded**	**1.100**	**2.200**	**3.500**	**5.000**	**mill.t**	**1.100**	**2.200**	**3.500**	**5.000**	**mill.t**
19	Number of vessels loaded	18	37	58	83	vessels	8	17	27	38	vessels
20	Berth occupancy - hours	591	1,182	1,881	2,687	h/y	479	958	1,524	2,178	h/y
21	Total Berth occupancy - days	25	49	78	112	d/y	20	40	64	91	d/y
22	Berth availability - days	333	333	333	333	d/y	333	333	333	333	d/y
23	**Berth occupancy Percent:**	**7%**	**15%**	**24%**	**34%**		**6%**	**12%**	**19%**	**27%**	
24	Waiting time factor Tw/Tb assumed	0.016	0.035	0.062	0.101	s.chart	0.013	0.027	0.047	0.075	s.chart
25	Annual waiting time Tw calculated	0	2	5	11	days	0	1	3	7	days
26	Approx. avg. waiting time per vessel: Tw	0.0	0.0	0.1	0.1	days	0.0	0.1	0.1	0.2	days
27	**Total Vessel Time in Port**	**1.4**	**1.4**	**1.4**	**1.5**	**days**	**2.4**	**2.4**	**2.5**	**2.5**	**days**
28	**All Vessel Time in Port**	**25**	**51**	**83**	**123**	**days**	**20**	**41**	**67**	**98**	**days**





OVERHEAD TRIPPER WITH SHUTTLE, TWO UNDERGROUND RECLAIM TUNNELS
WIDE–SPAN BARREL VAULT COVER

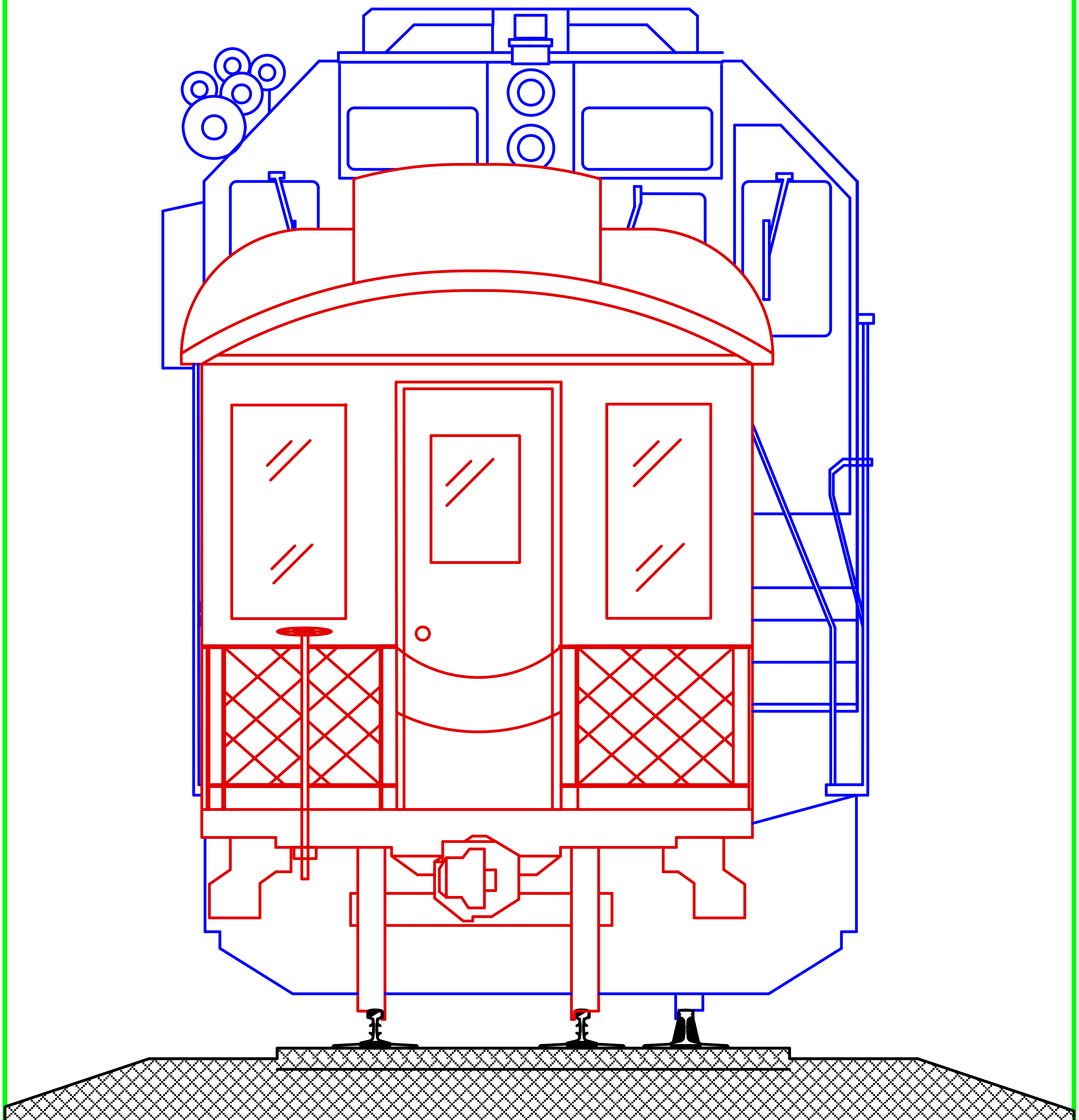


TEC inc.
514 Via De La Valle, Suite 103
Solana Beach, CA 92075
858.509.3157 • 858.509.3158 fax

DATE: 11/28/05
DRAWN: GJD
CHECKED:

SKAGWAY COAL EXPORT TERMINAL
STORAGE CONCEPTS
220,000 ST - WIDE SPAN BARREL VAULT

FIG. 1-1

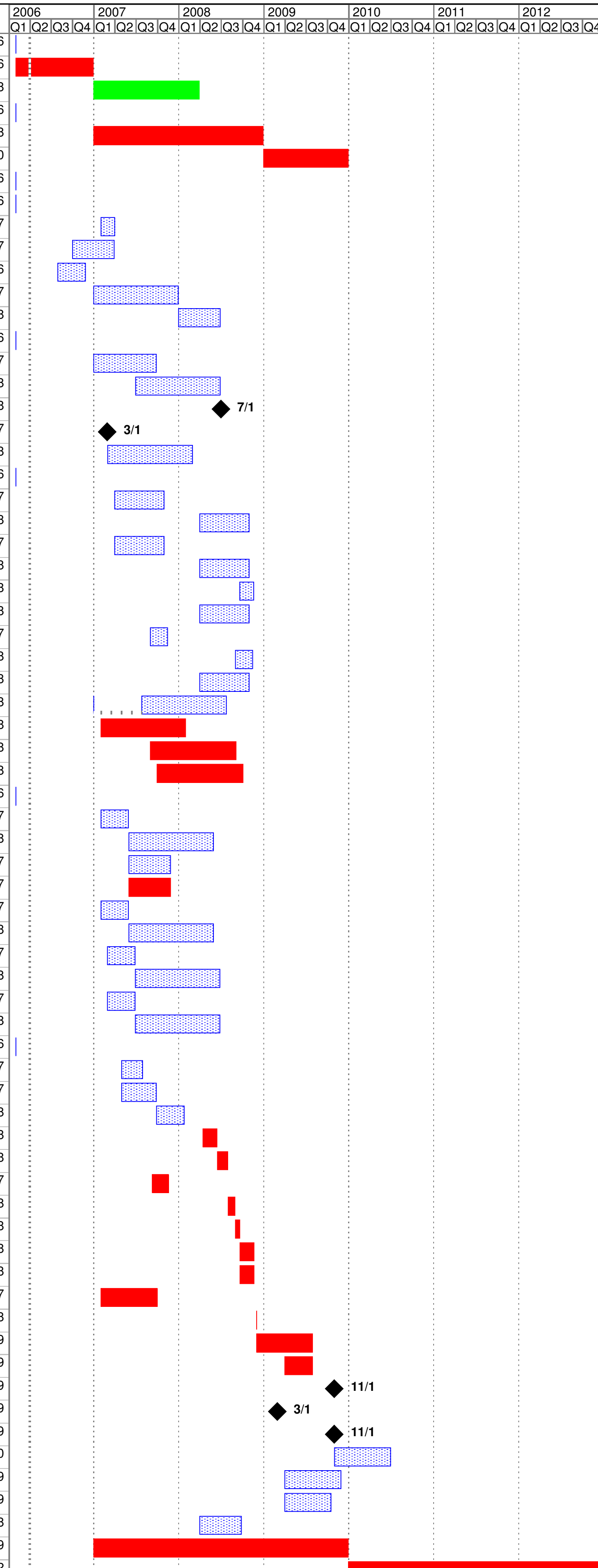


PACIFIC CONTRACT COMPANY LLC
567 15th AVE & ALASKA STREET
P.O. BOX 241
SKAGWAY, ALASKA 99840

3-RAIL COMPARISON
NARROW GAUGE COACH
STANDARD GAUGE GP-40

DRAWN BY: MPT
CHECKED BY: BYH
DATE: FEB 6, 2006
REVISED:
REVISED:
SHEET: 1 of 1

ID	Task Name	Duration	Start	Finish
1	**STAKEHOLDER COMMITMENT**	1 day	Wed 2/1/06	Thu 2/2/06
2	Stakeholder Project Commitment	333 days	Wed 2/1/06	Sun 12/31/06
3	Implement Passenger Efficiencies	455 days	Mon 1/1/07	Mon 3/31/08
4	**PORT OF SKAGWAY**	1 day	Wed 2/1/06	Thu 2/2/06
5	Coal Terminal EIS	730 days	Mon 1/1/07	Wed 12/31/08
6	Design/Build Coal-Intermodal Dock	365 days	Thu 1/1/09	Fri 1/1/10
7	**TRANSPORTATION SYSTEMS**	1 day	Wed 2/1/06	Thu 2/2/06
8	**Barge and Freight Rail Service**	1 day	Wed 2/1/06	Thu 2/2/06
9	Neg. Inside Passage Barge Service	60 days	Thu 2/1/07	Mon 4/2/07
10	Establish New Barge Service	180 days	Mon 10/2/06	Sat 3/31/07
11	Set up Freight Sales Office	120 days	Mon 7/31/06	Tue 11/28/06
12	Rail Barge Ramp Environmental Asses.	365 days	Sun 12/31/06	Mon 12/31/07
13	Design / Build Rail Ramp	180 days	Tue 1/1/08	Sun 6/29/08
14	**ITB Barge Service**	1 day?	Wed 2/1/06	Thu 2/2/06
15	Design ITB Barge/Tug	270 days	Mon 1/1/07	Fri 9/28/07
16	Order/ Construct ITB Tug Barge	365 days	Sat 6/30/07	Sun 6/29/08
17	Place ITB Rail Barge in Service	0 days	Tue 7/1/08	Tue 7/1/08
18	Serve Union Section 6 Notices	0 days	Thu 3/1/07	Thu 3/1/07
19	Negotiate Union Freight Conditions	365 days	Fri 3/2/07	Sat 3/1/08
20	**Railroad Infrastructure Improvements**	1 day	Wed 2/1/06	Thu 2/2/06
21	Cuts, Curves, Ice, Lake Bennett	213 days	Sun 4/1/07	Wed 10/31/07
22	Cuts, Curves, Ice, Fraser Section	213 days	Tue 4/1/08	Fri 10/31/08
23	Cuts, Curves, Ice, White Pass	213 days	Sun 4/1/07	Wed 10/31/07
24	Cuts, Curves, Ice, White Pass	213 days	Tue 4/1/08	Fri 10/31/08
25	15 Tunnel Work	61 days	Sat 9/20/08	Thu 11/20/08
26	Timber Bridge Work	213 days	Tue 4/1/08	Fri 10/31/08
27	5A, 7C, 15A,	76 days	Sat 9/1/07	Fri 11/16/07
28	18A, 67A	76 days	Mon 9/1/08	Sun 11/16/08
29	9A, 12A, 17A, 24A, 26A, etc	213 days	Tue 4/1/08	Fri 10/31/08
30	Permits 26, 83, Bennett Hill	365 days	Mon 1/1/07	Fri 7/25/08
31	Order New Rail 278 Ft Strings	365 days	Thu 2/1/07	Fri 2/1/08
32	Set/Operate Rail Weld Plant	370 days	Sat 9/1/07	Fri 9/5/08
33	Rail Train in Service	370 days	Mon 10/1/07	Sun 10/5/08
34	**Rolling Stock Procurement**	1 day	Wed 2/1/06	Thu 2/2/06
35	Negotiate Locomotive Purchase Order	119 days	Thu 2/1/07	Thu 5/31/07
36	Build and Deliver Locomotives	365 days	Fri 6/1/07	Sat 5/31/08
37	Design / Build Locomotive Shop	180 days	Fri 6/1/07	Wed 11/28/07
38	Convert Skagway Yard	180 days	Fri 6/1/07	Wed 11/28/07
39	Negitiate Standard Gage Passenger Car O	119 days	Thu 2/1/07	Thu 5/31/07
40	Deliver Standard Guage Passenger Carsk	365 days	Fri 6/1/07	Sat 5/31/08
41	Negotiate Freight Rolling Stock	120 days	Thu 3/1/07	Fri 6/29/07
42	Deliver Freight Rolling Stock	365 days	Fri 6/29/07	Sat 6/28/08
43	Negotiate Maintenance of Way Equipment	120 days	Thu 3/1/07	Fri 6/29/07
44	Deliver Maintenance of Way Equipment	365 days	Fri 6/29/07	Sat 6/28/08
45	**Trackwork Improvements**	1 day	Wed 2/1/06	Thu 2/2/06
46	Salvage 100# Rail 94-104	91 days	Tue 5/1/07	Tue 7/31/07
47	Pull Up Ties & Rail 68 - Utah Yard	150 days	Tue 5/1/07	Fri 9/28/07
48	Design / Build Utah Yard	120 days	Fri 9/28/07	Sat 1/26/08
49	Relay/Convert Carcross - 57	61 days	Tue 4/15/08	Sun 6/15/08
50	Convert 57 to Bennett	45 days	Mon 6/16/08	Thu 7/31/08
51	Log Cabin Hwy 2 Overpass	70 days	Mon 9/10/07	Mon 11/19/07
52	Convert Bennett to Fraser	30 days	Fri 8/1/08	Sun 8/31/08
53	***Convert Fraser to White Pass***	20 days	Mon 9/1/08	Sun 9/21/08
54	***Convert W Pass to Skagway***	60 days	Mon 9/22/08	Fri 11/21/08
55	***Lay 3-d Rail WPass to Skagway***	60 days	Mon 9/22/08	Fri 11/21/08
56	***Grade Improvements Mile 68-106***	243 days	Thu 2/1/07	Tue 10/2/07
57	***Deliver Standard Guage Flat Cars***	1 day	Mon 12/1/08	Tue 12/2/08
58	***Deliver Concrete Ties Weld Rail CX***	242 days	Mon 12/1/08	Fri 7/31/09
59	***Build Track 68-106***	121 days	Wed 4/1/09	Fri 7/31/09
60	***Open Full Standard Guage Service***	0 days	Sun 11/1/09	Sun 11/1/09
61	***Deliver 8-10 SG Passenger Cars***	0 days	Sun 3/1/09	Sun 3/1/09
62	***Operate Full NG Tourism Service***	0 days	Sun 11/1/09	Sun 11/1/09
63	***Crush Ballast***	243 days	Sun 11/1/09	Fri 7/2/10
64	***Sled/Install Timber Ties***	243 days	Wed 4/1/09	Mon 11/30/09
65	***Surface Track***	200 days	Wed 4/1/09	Sun 10/18/09
66	MacRae Highway 1 Over Pass	180 days	Tue 4/1/08	Sun 9/28/08
67	***YESAA Whitehorse / Carmacks***	1095 days	Mon 1/1/07	Thu 12/31/09
68	***Design / Build Carmacks Line***	1095 days	Fri 1/1/10	Mon 12/31/12



SOUTHERN YUKON PORT OF SKAGWAY
ESTIMATED CAPITAL EXPENDITURES
1 & 8 Capital Cost & Depreciation Port, Fit Purpose Rehabilitation & No Coal & No Carmacks Extension

	Capital	Depreciation
PORT OF SKAGWAY	(000)	(40 years)
Project Manager	1,000	
Environmental Impact Statement	500	
Planning and Design	2,000	
Temsco Buy Out	1,000	
1 each Coal Storage Building	0	
Marine Ship Loader & Foundations	0	
Marine Facilities, Dolphins	0	
Other Marine	0	
Intermodal Dock	15,000	
Coal Car Dumper (Bottom)	0	
Grizzles	0	
Sampling Staion	0	
Conveyors Underfloor	0	
Feed Conveyors	0	
Coal Terminal Equipment Loaders	0	
Coal Terminal Equipment Other	0	
Rail Barge Facility	4,000	
Floating Dock Cruise Ships	2,000	
Electrical Substation	0	
Electrical	0	
Lights	600	
Reefer Plugs	0	
Waterlines	500	
Relocate Fuel Lines	0	
Yard Paving & Drainage	1,000	
Access Roads	300	
Crane (Pipe & Containers)	2,000	
Straddle Carriers	1,000	
Office, Crew Room, Washroom	0	
Rail Corridor	0	
Contingency	3,000	
Port RR Highway Street Safety	FHWA	
& Intermodal	Mass Tran	
Sub Total	**$33,900**	**$848**

Rehabilitate White Pass Line (heavy haul)		Depreciation
	Capital	(60 years)
Project Manager Alaska Work	1,000	
Project Manager Canadian Work	1,000	
Rebuild Skagway Yard for 3-rail	2,000	
Rebuild Utah Yard	2,000	
Open Cuts, Curves, Eliminate Ice, Snow Eqt.	10,000	
Rail Welding Plant Skagway	2,000	
Covert 115# Rail Mile 2 to White Pass	1,000	
Install New Rail Mile 2 to White Pass	6,000	
Install New 3d Rail Skagway to White Pass	3,000	
New Rail White Pass to Mile 30	2,000	
New Rail Mile 30 to 42	5,000	
Convert 100# Rail Mile 42 to 57	3,000	
New Rail % Ties Mile 57 to 68	7,000	
Rebuild Mile 68 to 106	40,000	

Rail Contingency	6,000		
Rebuild American Shed w/enclosed switch	0		
Open Canadian Shed Cut/line change	2,000		
Fraser Hill Realign & Grade Reductions	place hold		
Bennett Hill Realign & Grade Reductions	place hold		
Raise Track 23A reduce snow drifting/fences	place hold		
Eliminate Winter Icing Locations	place hold		
Log Cabin Klondike Highway Overpass	place hold		
Macrae Alaska Highway Overpass	place hold		
Carcross Street Signals realignment	place hold		
Contingency-Other than Rail	place hold		
Sub Total	**$93,000**		**$1,550**
New/rebuild buildings Skagway		(40 years)	
Locomotive Shops Skagway	3,000		
Rehabilitate Shops Skagway	1,000		
Sub Total	**$4,000**		**$0**
Railroad Bridges to Fit to Purpose Standard		Depreciation	
	Capital	(60 years)	
2A	50		
5A	600		
7A	375		
7B	375		
7C	3,000		
9A	100		
12A	3,000		
14A	2,000		
15A	3,000		
15B	300		
15C	0		
17A	100		
18A	2,000		
24A	100		
26A	0		
55A	100		
57A	200		
62A	100		
67A	1,000		
88A	culvert		
100A	200		
Engineering	400		
Contingency			
Sub Total	**$17,000**		**$283**
Tunnels			
15T Open for Doublestack	750		
18T Portals for Doublestack	0		
Sub Total	$750		
MP&E		Depreciation	
		(10 years)	
10 Passenger Cars ea @ 1,000	10,000		
7 New ac Locomotives ea @ $2,200	15,400		
2 Yard Locomotives ea @ $1,100,000	2,200		
Coal Hoppers 80 ea @ $70,000	0		
Flat Cars for Pipe 50 ea @ $67,000	3,350		
Flat Cars General 50 ea @ $67,000	3,350		
10 each 5-unit doublestacks @ $150,000	1,500		
3 125 ton Lowboys ea @ $125,000	375		
Mill Gondolas 10 ea @ $70,000	700		
10 Ballast Cars ea @ $70,000	700		
10 Side Dump Cars ea @ 90,000	900		
Track Surfacing Equipment	2,000		
Tie Change Equipment	1,500		
Hi-rails Standard	500		

Car Shop Trucks	600	
30 Tank Cars @ $90,000	2,700	
Contingency	1,000	
Sub Total	**$46,775**	**$4,678**

Extension of White Pass to Carmacks		Depreciation
Project Manager	0	(60 years)
EIS Document	0	
Planning, Engineering & Design	0	
Positive Train Control System	0	
At grade Xings 25 @ $100	0	
Old WPYR Mile 106 to Mile 108	0	
Yukon River Crossing #1 Dam	0	
Closeleigh Jct to Takhini, Mile 0 to 15	0	
Takhini River Yukon River Crossing Mile 15	0	
Takhini Hwy Overpass, Mile 16	0	
Takhini to Rich, Mile 15 to 36	0	
Rich to Fox, Mile 36 to 51	0	
Fox to Braeburn, Mile 51 to 64	0	
Braeburn Yard	0	
Braeburn yard to Division Mine	place hold	
Division Mine Loadout Loop	place hold	
Braeburn Coal Loader	place hold	
Braeburn Yard to Klusha, Mile 64 to 83	0	
Montague House Hwy Overpass Mile 89	0	
Klusha to Porter, Mile 83 to 96	0	
Berdoe Hwy Overpass Mile 106.5	0	
Porter to Carmacks Yard, Mile 96 to 109	0	
Carmacks Yard	0	
Carmacks Wye	0	
Track- All Main Track Fit Purpose 107 Miles	0	
Track - All sidings & Terminals	0	
WPYR 106-108	0	
Turnouts 30 @ $50,000	0	
Bridges	0	
Contingency	$0	
Sub Total	**$0**	**$0**
Grand Total Capital/Depreciation	**$195,425**	**$7,358**

Port of Skagway & Rehabilitation of White Pass & Extension to Carmacks
Depreciation rates:
10 years equipment, locomotives & rolling stock,
30 years wood ties & wood bridges,
40 years docks,
40 years buildings
60 years rail & steel bridges.

SOUTHERN YUKON PORT OF SKAGWAY
ESTIMATED CAPITAL EXPENDITURES
2 Capital Cost & Depreciation Port, Fit Purpose Rehabilitation &
No Carmacks Extension

	Capital	Depreciation
PORT OF SKAGWAY	(000)	(40 years)
Project Manager	3,000	
Environmental Impact Statement	2,000	
Planning and Design	3,000	
Temsco Buy Out	1,000	
1 each Coal Storage Building	8,000	
Marine Ship Loader & Foundations	10,000	
Marine Facilities, Dolphins	3,000	
Other Marine	2,000	
Intermodal Dock	30,000	
Coal Car Dumper (Bottom)	4,000	
Grizzles	1,000	
Sampling Staion	400	
Conveyors Underfloor	4,000	
Feed Conveyors	1,200	
Coal Terminal Equipment Loaders	1,500	
Coal Terminal Equipment Other	500	
Rail Barge Facility	4,000	
Floating Dock Cruise Ships	2,000	
Electrical Substation	1,000	
Electrical	7,500	
Lights	600	
Reefer Plugs	500	
Waterlines	500	
Relocate Fuel Lines	500	
Yard Paving & Drainage	2,000	
Access Roads	300	
Crane (Pipe & Containers)	3,500	
Straddle Carriers	1,000	
Office, Crew Room, Washroom	1,000	
Rail Corridor	2,000	
Contingency	9,000	
Port RR Highway Street Safety	FHWA	
& Intermodal	Mass Tran	
Sub Total	**$110,000**	**$2,750**

Rehabilitate White Pass Line (heavy haul)	Capital	Depreciation (60 years)
Project Manager Alaska Work	2,000	
Project Manager Canadian Work	2,000	
Rebuild Skagway Yard	3,000	
Rebuild Utah Yard	4,000	
Open Cuts, Line in Spirals, Reduce Curves	10,000	
Rail Welding Plant Skagway	2,000	
Convert 115# Rail Mile 2 to White Pass	1,000	
Install New Rail Mile 2 to White Pass	6,000	
New Rail White Pass to Mile 30	2,000	
New Rail Mile 30 to 42	5,000	
Convert 100# Rail Mile 42 to 75	3,000	
New Rail Mile 57 to 68	5,000	
Rebuild Mile 68 to 106	40,000	
Rail Contingency	6,000	
Rebuild American Shed w/enclosed switch	1,000	
Open Canadian Shed Cut/line change	2,000	
Fraser Hill Realign & Grade Reductions	place hold	
Bennett Hill Realign & Grade Reductions	place hold	
Raise Track 23A reduce snow drifting/fences	place hold	
Eliminate Winter Icing Locations	place hold	
Log Cabin Klondike Highway Overpass	place hold	
Macrae Alaska Highway Overpass	place hold	
Carcross Street Signals realignment	place hold	
Contingency-Other than Rail	6,000	
Sub Total	**$100,000**	**$1,667**
New/rebuild buildings Skagway		(40 years)
Locomotive Shops Skagway	7,000	
Rehabilitate Shops Skagway	2,000	
Sub Total	**$9,000**	**$0**

Railroad Bridges to Fit to Purpose Standard	Capital	Depreciation (60 years)
2A	50	
5A	600	
7A	375	
7B	375	
7C	3,000	
9A	100	
12A	3,000	
14A	2,000	
15A	3,000	
15B	300	
15C	0	
17A	100	
18A	2,000	
24A	100	
26A	0	
55A	100	
57A	200	
62A	100	
67A	1,000	
88A	culvert	
100A	200	
Engineering	400	
Contingency		
Sub Total	**$17,000**	**$283**

Tunnels	
15T Open for Doublestack	750
18T Portals for Doublestack	0
Sub Total	$750

APPENDIX 7B

MP&E		Depreciation (10 years)
Passenger Cars	3,000	
8 SD70MACS ea @ $2,200,000	17,600	
3 Yard Locomotives ea @ $1,100,000	3,300	
Coal Hoppers 80 ea @ $70,000	5,600	
Flat Cars for Pipe 50 ea @ $67,000	3,350	
Flat Cars General 50 ea @ $67,000	3,350	
15 each 5-unit doublestacks @ $150,000	2,250	
5 125 ton Lowboys ea @ $125,000	625	
Mill Gondolas 10 ea @ $70,000	700	
10 Ballast Cars ea @ $70,000	700	
10 Side Dump Cars ea @ 90,000	900	
Track Surfacing Equipment	2,000	
Tie Change Equipment	1,500	
Hi-rails Standard	500	
Car Shop Trucks	600	
30 Tank Cars ea @ $90,000	2,700	
Contingency		
Sub Total	**$48,675**	**$4,868**

Extension of White Pass to Carmacks		Depreciation (60 years)
Project Manager	0	
EIS Document	0	
Planning, Engineering & Design	0	
Positive Train Control System	0	
At grade Xings 25 @ $100	0	
Old WPYR Mile 106 to Mile 108	0	
Yukon River Crossing #1 Dam	0	
Closeleigh Jct to Takhini, Mile 0 to 15	0	
Takhini River Yukon River Crossing Mile 15	0	
Takhini Hwy Overpass, Mile 16	0	
Takhini to Rich, Mile 15 to 36	0	
Rich to Fox, Mile 36 to 51	0	
Fox to Braeburn, Mile 51 to 64	0	
Braeburn Yard	0	
Braeburn yard to Division Mine	place hold	
Division Mine Loadout Loop	place hold	
Braeburn Coal Loader	place hold	
Braeburn Yard to Klusha, Mile 64 to 83	0	
Montague House Hwy Overpass Mile 89	0	
Klusha to Porter, Mile 83 to 96	0	
Berdoe Hwy Overpass Mile 106.5	0	
Porter to Carmacks Yard, Mile 96 to 109	0	
Carmacks Yard	0	
Carmacks Wye	0	
Track- All Main Track Fit Purpose 107 Miles	0	
Track - All sidings & Terminals	0	
WPYR 106-108	0	
Turnouts 30 @ $50,000	0	
Bridges	0	
Contingency	$0	
Sub Total	**$0**	**$0**
Grand Total Capital/Depreciation	**$285,425**	**$9,568**

APPENDIX 7B

Port of Skagway & Rehabilitation of White Pass & Extension to Carmacks
Depreciation rates:
10 years equipment, locomotives & rolling stock,
30 years wood ties & wood bridges,
40 years docks,
40 years buildings
60 years rail & steel bridges.

SOUTHERN YUKON PORT OF SKAGWAY
ESTIMATED CAPITAL EXPENDITURES
3 Capital Cost & Depreciation Port, Fit Purpose Rehabilitation &
No Carmacks Extension

	Capital	Depreciation
PORT OF SKAGWAY	(000)	(40 years)
Project Manager	3,000	
Environmental Impact Statement	2,000	
Planning and Design	3,000	
Temsco Buy Out	1,000	
1 each Coal Storage Building	8,000	
Marine Ship Loader & Foundations	10,000	
Marine Facilities, Dolphins	3,000	
Other Marine	2,000	
Intermodal Dock	30,000	
Coal Car Dumper (Bottom)	4,000	
Grizzles	1,000	
Sampling Staion	400	
Conveyors Underfloor	4,000	
Feed Conveyors	1,200	
Coal Terminal Equipment Loaders	1,500	
Coal Terminal Equipment Other	500	
Rail Barge Facility	4,000	
Floating Dock Cruise Ships	2,000	
Electrical Substation	1,000	
Electrical	7,500	
Lights	600	
Reefer Plugs	500	
Waterlines	500	
Relocate Fuel Lines	500	
Yard Paving & Drainage	2,000	
Access Roads	300	
Crane (Pipe & Containers)	3,500	
Straddle Carriers	1,000	
Office, Crew Room, Washroom	1,000	
Rail Corridor	2,000	
Contingency	9,000	
Port RR Highway Street Safety	FHWA	
& Intermodal	Mass Tran	
Sub Total	**$110,000**	**$2,750**

Rehabilitate White Pass Line (heavy haul)	Capital	Depreciation (60 years)
Project Manager Alaska Work	2,000	
Project Manager Canadian Work	2,000	
Rebuild Skagway Yard	3,000	
Rebuild Utah Yard	4,000	
Open Cuts, Curves, Eliminate Ice	10,000	
Rail Welding Plant Skagway	2,000	
Covert 115# Rail Mile 2 to White Pass	1,000	
Install New Rail Mile 2 to White Pass	6,000	
Install New 3d Rail Skagway to White Pass	5,000	
New Rail White Pass to Mile 30	2,000	
New Rail Mile 30 to 42	5,000	
Convert 100# Rail Mile 42 to 75	3,000	
New Rail Mile 57 to 68	5,000	
Rebuild Mile 68 to 106	40,000	
Rail Contingency	5,000	
Rebuild American Shed w/enclosed switch	1,000	
Open Canadian Shed Cut/line change	2,000	
Fraser Hill Realign & Grade Reductions	place hold	
Bennett Hill Realign & Grade Reductions	place hold	
Raise Track 23A reduce snow drifting/fences	place hold	
Eliminate Winter Icing Locations	place hold	
Log Cabin Klondike Highway Overpass	place hold	
Macrae Alaska Highway Overpass	place hold	
Carcross Street Signals realignment	place hold	
Contingency-Other than Rail	6,000	
Sub Total	**$104,000**	**$1,733**
New/rebuild buildings Skagway		(40 years)
Locomotive Shops Skagway	7,000	
Rehabilitate Shops Skagway	2,000	
Sub Total	**$9,000**	**$0**

APPENDIX 7C

Railroad Bridges to Fit to Purpose Standard	Capital	Depreciation (60 years)
2A	50	
5A	600	
7A	375	
7B	375	
7C	3,000	
9A	100	
12A	3,000	
14A	2,000	
15A	3,000	
15B	300	
15C	0	
17A	100	
18A	2,000	
24A	100	
26A	0	
55A	100	
57A	200	
62A	100	
67A	1,000	
88A	culvert	
100A	200	
Engineering	400	
Contingency		
Sub Total	**$17,000**	**$283**

Tunnels	
15T Open for Doublestack	750
18T Portals for Doublestack	0
Sub Total	$750

APPENDIX 7C

MP&E		Depreciation (10 years)
Passenger Cars ea	4,600	
8 New ac Locomotives ea @ $2,200	17,600	
3 Yard Locomotives ea @ $1,100,000	3,300	
Coal Hoppers 80 ea @ $70,000	5,600	
Flat Cars for Pipe 50 ea @ $67,000	3,350	
Flat Cars General 50 ea @ $67,000	3,350	
10 each 5-unit doublestacks @ $150,000	1,500	
3 125 ton Lowboys ea @ $125,000	375	
Mill Gondolas 10 ea @ $70,000	700	
10 Ballast Cars ea @ $70,000	700	
10 Side Dump Cars ea @ 90,000	900	
Track Surfacing Equipment	2,000	
Tie Change Equipment	1,500	
Hi-rails Standard	500	
Car Shop Trucks	600	
30 tank cars @$90,000	2,700	
Contingency		
Sub Total	**$49,275**	**$4,928**

Extension of White Pass to Carmacks		Depreciation (60 years)
Project Manager	0	
EIS Document	0	
Planning, Engineering & Design	0	
Positive Train Control System	0	
At grade Xings 25 @ $100	0	
Old WPYR Mile 106 to Mile 108	0	
Yukon River Crossing #1 Dam	0	
Closeleigh Jct to Takhini, Mile 0 to 15	0	
Takhini River Yukon River Crossing Mile 15	0	
Takhini Hwy Overpass, Mile 16	0	
Takhini to Rich, Mile 15 to 36	0	
Rich to Fox, Mile 36 to 51	0	
Fox to Braeburn, Mile 51 to 64	0	
Braeburn Yard	0	
Braeburn yard to Division Mine	place hold	
Division Mine Loadout Loop	place hold	
Braeburn Coal Loader	place hold	
Braeburn Yard to Klusha, Mile 64 to 83	0	
Montague House Hwy Overpass Mile 89	0	
Klusha to Porter, Mile 83 to 96	0	
Berdoe Hwy Overpass Mile 106.5	0	
Porter to Carmacks Yard, Mile 96 to 109	0	
Carmacks Yard	0	
Carmacks Wye	0	
Track- All Main Track Fit Purpose 107 Miles	0	
Track - All sidings & Terminals	0	
WPYR 106-108	0	
Turnouts 30 @ $50,000	0	
Bridges	0	
Contingency	$0	
Sub Total	**$0**	**$0**
Grand Total Capital/Depreciation	**$290,025**	**$9,694**

Port of Skagway & Rehabilitation of White Pass & Extension to Carmacks
Depreciation rates:
10 years equipment, locomotives & rolling stock,
30 years wood ties & wood bridges,
40 years docks,
40 years buildings
60 years rail & steel bridges.