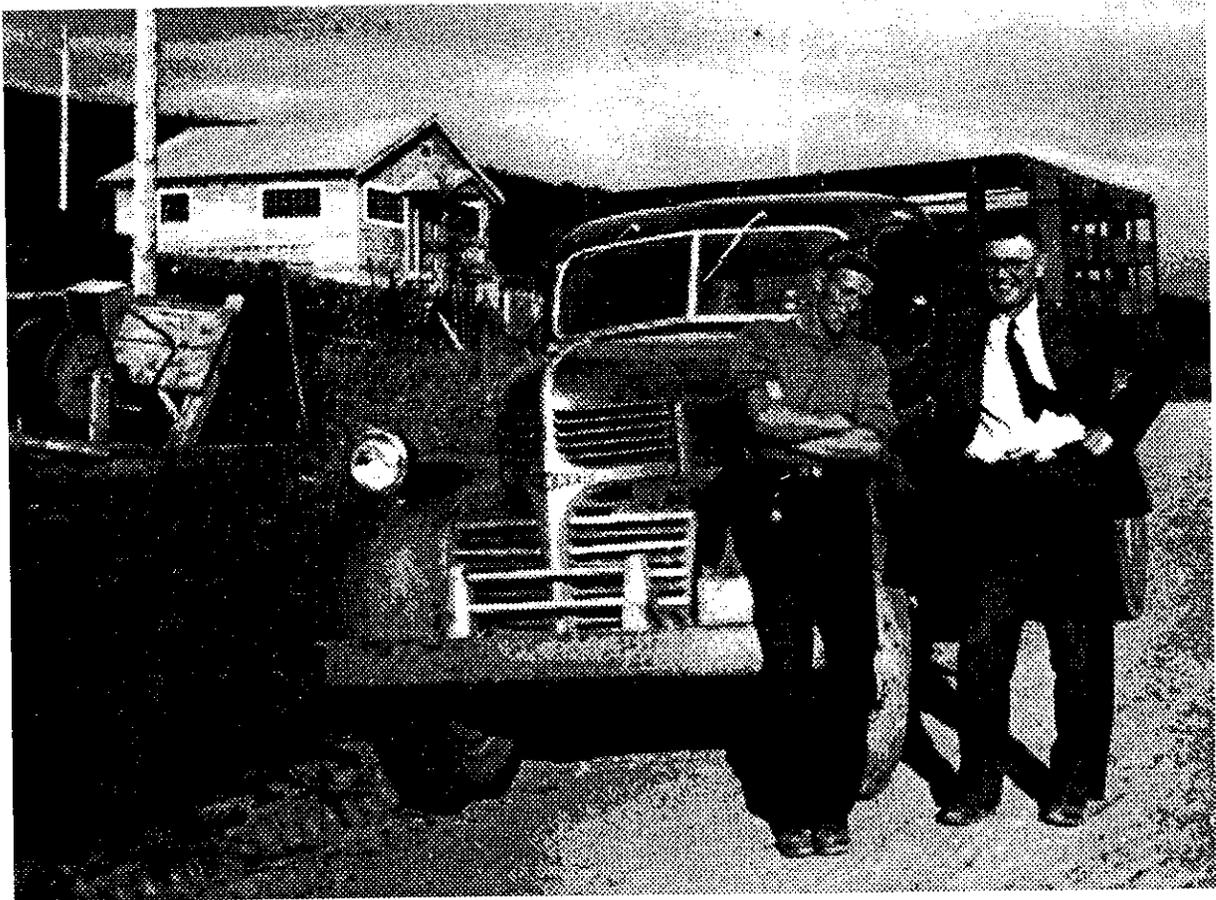


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Dredge Camps of the Klondike

The Yukon Consolidated Gold Corporation Camps of the 1940s



Birchmore Collection, YA

Building Types and Camp Layouts
as Background for Design

Prepared by David Neufeld
Yukon and Western Arctic Historian
Fall, 1993

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Dredge Camps of the Klondike

The YCGC Camps of the 1940s

This paper provides structural and design information on dredge camps and selected buildings for planning and cost estimate purposes.

Historical Background

The development of large-scale mechanized mining in the Klondike began early in the century. The Lewes River Mining and Dredging Company brought in the first dredge in 1901. By 1914 over a dozen dredges ranging in size up to the large Canadian Number 3 and Number 4 (later rebuilt as YCGC Number 4) were scooping up the gravels of the Klondike gold fields. Dredging continued in the area until the last YCGC dredge shutdown in 1966.



Dredge Camps 2

The dredges in the Klondike were effective mining machines. However the dredges were only a part of the mine face operation of a far-reaching and coordinated corporate mining system. The YCGC operations in the 1930s included major water management schemes, a hydroelectric plant and hundreds of kilometres of power lines, the Bear Creek shops, offices, and warehouses, and an extensive road network to the different dredges and their supporting camps.

Dredge operations required a multi-year program of mine development. This extended from initial prospecting of the ore body with keystone drills, the clearing and stripping of the surface vegetation and barren overburden of the ore body by work crews and hydraulic monitors, thawing of the gravels by water points and finally the movement of the dredge itself through the orebody. All of this work required a large workcrew and considerable supporting infrastructure. This infrastructure included pumps, pipelines, electrical sub-stations and accommodation for the workers.

The operations are widely distributed along the creeks, so that most of the ten dredges (4 on the Klondike and its tributaries and 6 on the Indian River tributaries) have their own separate camps and constitute practically individual mines grouped under one control.

- H.S. Bostock, 1940

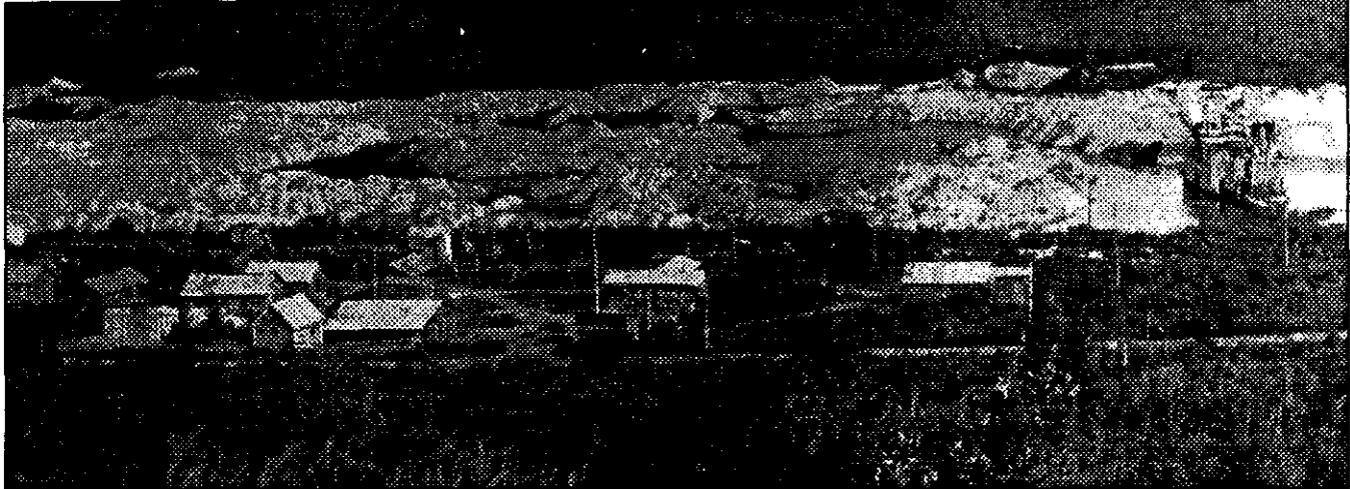
A dredge camp, possibly the **Granville** camp, in 1940.

Eccles Collection, YA



#17 Dominion Camp in 1927. One of the original log camps that was replaced during the 1930s.

Whitehouse Collection, YA



Early dredge operations were close to the major camps at Guggieville and Bear Creek. Dredge camps do not appear to have been built until the 1910s. These buildings were generally built of log and erected on grade. Through the difficult years of the First World War and the 1920s little attention was paid to the maintenance of these buildings. Consequently they deteriorated quickly and government health officers frequently charged

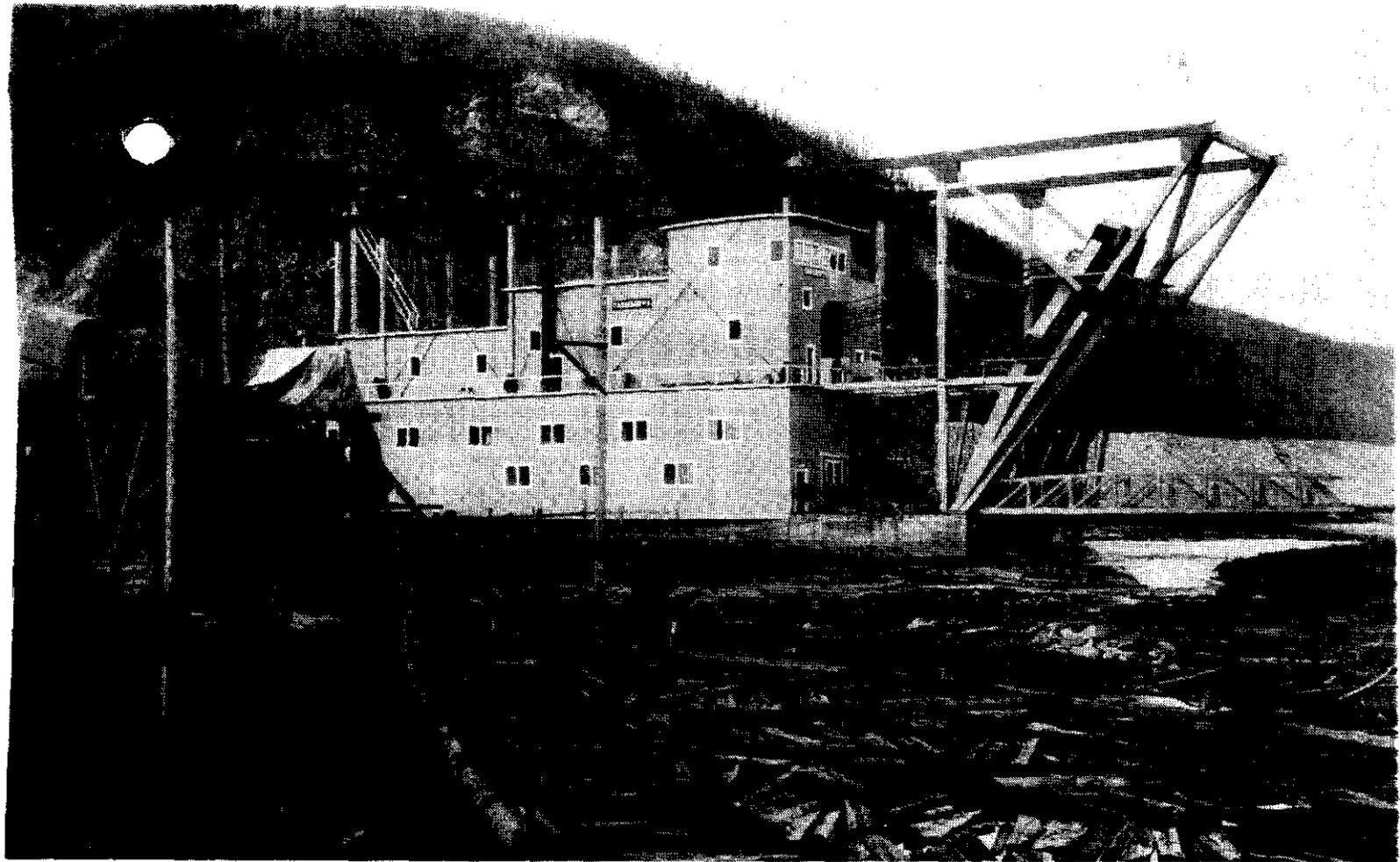
the company with unsanitary conditions, By 1932 a company assessment of the camps concluded, *[The buildings] are in need of repair. To a very large extent native lumber has been used in their construction and this has on/y a very short life. Flooring and foundations particularly need attention. Ground that was formerly frozen gradually thaws in the neighbourhood of buildings or a settled camp and this results in much settling of ground.*

An outdoor machine shop at the Granville camp in the late 1960s.
Innes-Taylor, Park Canada



With the major recapitalization of the company assets through the 1930s and early 40s, most of the dredges and their associated camps were completely rebuilt. In 1936 Dredges 6 and 7 were reconstructed, a completely new thawing outfit was purchased for Big Creek and new camp buildings were erected at Big Creek and Calder. From 1937 through the end of 1940 new camps or buildings were erected at Arlington, three camps on Sulphur Creek, two camps on Bonanza Creek, including the reconstruction camp for Dredge 4, Middle Dominion, Middle Hunker, Quartz Creek and Jenson Creek. Many frame buildings were reused as dredge camps were moved. Often a building was not only used at different locations but they were also often modified to serve different functions. Very little additional work was ever done on camp buildings after this building boom.

Generally one storey frame structures with corrugated iron roofs, these light grey buildings became an important part of the goldfields landscape and are generally seen as the trademark of corporate activity in the area.



Yukon Archives, Davies Coll.

YCGC NUMBER 4

The History and Raising of a Yukon Gold Dredge

by P.M. **Habiluk**, Project Manager, Winnipeg and
D.H. **Neufeld**, Yukon Historian, Canadian Parks Service. **Whitehorse**

The new mining method *will* be based on one principle, *and that* is: The excavation of *the greatest amount of gravel* in the *shortest* space of time.

- A.J. **Beaudette**, 1904 (Government Mining Engineer)

History

Placer gold mining techniques in the Klondike gold fields of the Yukon Territory evolved quickly in the early twentieth century. As the extent and richness of the goldfields deposits were appreciated there was a rapid and dramatic development in the equipment and methods of mining. The primary objective was to get **rich** quicker.

The prospecting and initial mining of the Klondike was done by hand. Equipped

with pick, pan, and shovel and using their backs the first miners worked their 250 foot claims. **Labouriously** digging shafts through swampy overburden and permanently frozen ground they randomly searched for the bedrock deposits of gold. Once gold was found they worked through the winter piling their 'paydirt' and waiting for the spring *runoff* to "clean-up" their gold. The prodigious amounts of **labour** and the difficulty of moving materials limited hand mining to only rich pockets of ore.

The richness of the Klondike placer deposits however attracted an ever increasing scale of capital investment. Larger companies moved in. Their new money brought in steam boilers and engines to power pumps, operate shovels, and thaw the ground for working. Summer operations

The original Canadian Number 4, along with a sister vessel - Canadian Number 3. was built by the Canadian Klondike Mining Company in 1912-13 on the Klondike River flats. It operated along the Klondike River for 10 years. The operating company's poor prospects in the 1920s resulted in its being abandoned for several years. However in 1928 it resumed operations and continued to dredge the Klondike until the reserves were exhausted in 1940. It was then dismantled and prepared for re-construction on Lower Bonanza Creek.

You have to work a large area. It cannot be worked otherwise, because you have got to go to big expense to install machinery and install your plant, and it won't pay on a small scale.

• E.A. Andrews, 1903
(Manager of Cheechako Hill hydraulic mine)

where whole claims were excavated to bed rock became the norm. These larger operations also required larger tracts of land and claims were purchased from **individuals** and worked more efficiently as a group. However these companies soon ran into difficulties. The increased scale of operations overtaxed available supplies of water and **fuel** wood. The costs of operation skyrocketed **marginalizing** many producers.

As early as 1905 however a radically different approach to the Klondike goldfields was being considered. Corporate interests began to assemble components for a grand mining scheme that would encompass the entire gold **fields** region as a single operation and address the shortcomings **experienced** by the smaller operators. Land holdings were eventually concentrated by purchase and government concessions into two large companies, the Yukon Gold Corporation and the Canadian Klondike Mining Company.

The corporations undertook to create a complete mining system in the Klondike. Huge water management schemes including a dam on Upper Bonanza Creek (1907) (the dam broke in 1960, sinking and burying YCGC Dredge Number 4) and a 110 **kilometre** ditch, flume, and pipeline

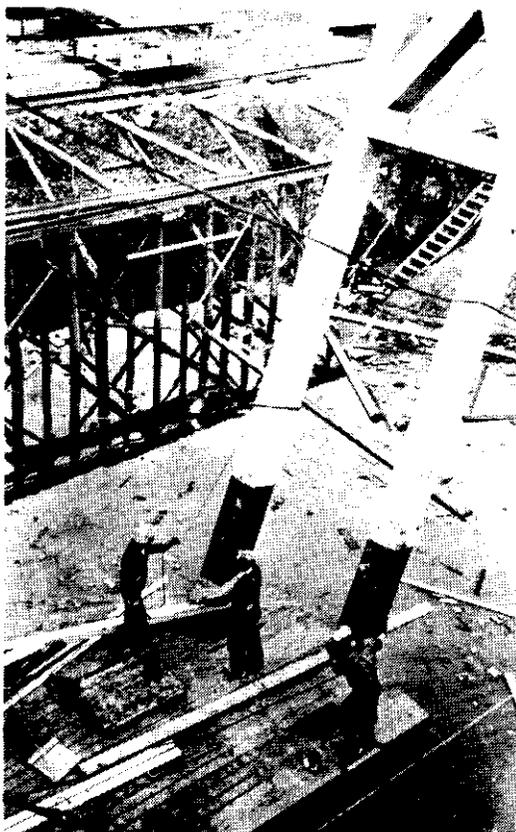
system (1909) were constructed and put into operation at great expense. Power was originally supplied by a thermal generation plant at Bear Creek. However, the exponential growth in power demands supported the construction of permanent **hydro-electric** plants at the Twelve Mile River (1907) and the North Fork of the Klondike River (1912). To support these development large camps were established. At Bear Creek the **thermal** powerplant was supplemented by accommodation and messes for **labourers**, engineering and accounting offices, workshops, warehouses, and a large machine shop.

The mine face of the operation was turned over to a combination of hydraulic monitors and dredges. The first dredge in the Klondike was a small 3 1/4 cubic foot dredge in 1901. Larger corporate dredges were introduced in 1905. The three monster dredges of the Canadian Klondike Mining Company were built between 1910 and 1913. These dredges successfully operated in the Klondike and lower Bonanza valleys for many years.

Inflation during the First World War and through the prosperous 1920s meant hard times for Klondike gold mining. The fixed **price** for gold eroded the **profits** of both companies. By 1923 several companies were collapsed into the single Yukon Consolidated Gold Corporation or YCGC, as **it** became known locally. Organized from the ruins of earlier **firms** the company **struggled** to reorganize their operations. During the 1930s the doubling of the world price of gold to \$35 an **ounce** rejuvenated the company's prospects. A massive **re-capitalisation** of assets included the expansion of the operations **centre** at Bear Creek, the construction of three new dredges and the re-construction of four **existing** dredges. YCGC Number 4 was the last and the largest of these rebuilds. In 1942 the company had ten dredges at work.

The company prospered until the post-war round of inflation once again cut **profits** and shrank **mineable** reserves. By 1950 the company ended **active re-capitalization** of company assets in the Klondike. Equipment was depreciated and company **activities** shrank over the next fifteen years as local **assets** were consumed. In 1966 the company ceased all operations and sold **its** remaining **assets** for salvage.

In 1941 YCGC Number 4 was completely rebuilt on lower Bonanza Creek. Hull and superstructure design was prepared by YCGC engineers and new timbers and building materials were shipped up from southern British Columbia. The machinery stripped from old Number 4 was refurbished at the Bear Creek shops. Completed in 1942 the dredge worked its way up Bonanza Creek until its sinking in the spring of 1960.



YCGC Number 4 - Technical Specifications

Designed and manufactured by the Marion Steam Shovel Company of Ohio Canadian Number 4 was shipped north to the Yukon in 1912. Considering the weight of some of the components (up to 45 tons), overcoming the material transportation problems over the various trails and river systems to the final destination was an accomplishment in itself. Assembled on site the vessel, with its sister-ship Canadian Number 3, was the largest dredge to operate in the Klondike. Today Number 4 retains the title as the largest wooden-hulled bucket-line dredge in North America.

The original dredge was dismantled in 1940 when the Klondike River reserves were exhausted. Using new timber and incorporating several design changes to accommodate working experience the new dredge, YCGC Number 4, began work in 1942 and worked its way up Bonanza Creek. After reconstruction, the Dredge hull was 140'-0" (43m) long, 65'-8" (20m) wide and 12'-2" (3.5m) to 14'-6" (5m) deep. The total height of the Dredge from the bottom of the hull to the top of the control room was 76'-0" (23m) and the displacement weight of the vessel was over 3,000 tons (2,722t).

The Dredge was powered by all electric drive motors from 300 to 30 HP output, which operated the bucket arm, waste material stacker arm and numerous on-board pumps ranging in capacity from 7500 to 750 US gpm. Power supply was by landline from the North Fork powerplant about 48 kilometres away.

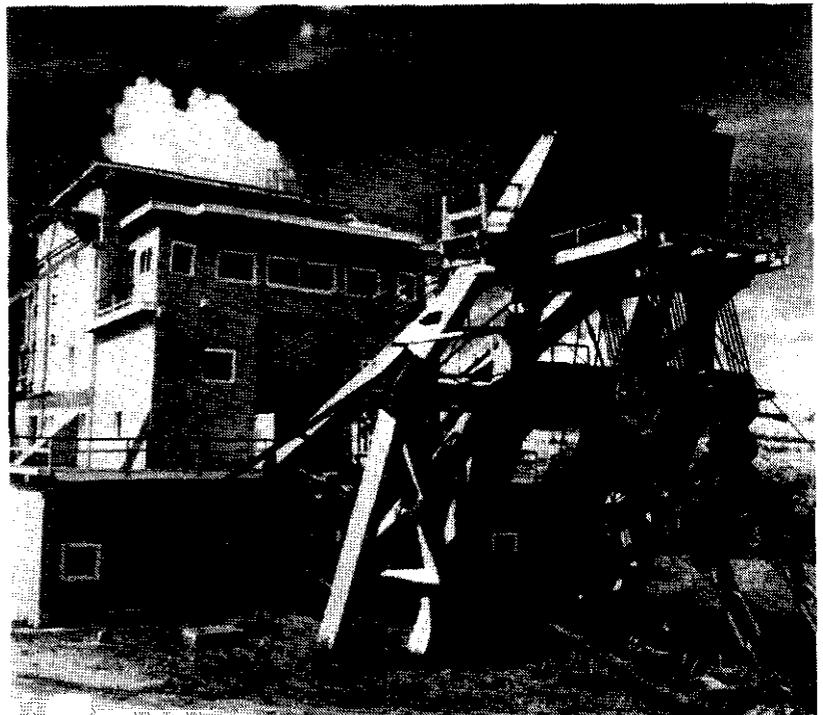
The complete hull and the structural components of the machinery are made of timbers up to 24" by 48" (0.6m by 1.2m) B.C. fir, the quality of which is superior to what is readily available today. When in operation the bucket chain could theoretically handle 18,000 cubic yards (13,740 m³) of gold-bearing gravels in 24 hours. Each bucket in the bucket chain weighs approximately 4,600 lbs. (2,087 kg.) and has a capacity of 0.60 cubic yards (0.46 m³).

Raising the Dredge

In 1987 the Historic Sites and Monuments Board of Canada recommended the acquisition of a dredge in working order to commemorate the evolution of mining methods in the Klondike. The Canadian Parks Service (CPS) acted on this direction by negotiating the donation of YCGC Number 4 by the company in 1989.

Officials of Klondike National Historic Sites (KNHS) quickly recognized that the Dredge was subject to various external and internal forces that were slowly deteriorating its condition. The CPS undertook field investigations of the vessel in 1983 and 1984 to determine its condition and to gather information for the preparation of possible relocation scenarios.

In 1987, the Department of National Defence (DND), 1 Construction Engineering Unit (1CEU), was invited to do a feasibility study to determine whether the Dredge could be successfully excavated and repositioned on higher ground to protect it from seasonal flooding on Bonanza Creek. The report, produced in 1988, recommended pursuit of the refloating option for the relocation of the vessel contingent upon the hull being free of major structural damage once the excavation to exhume the Dredge

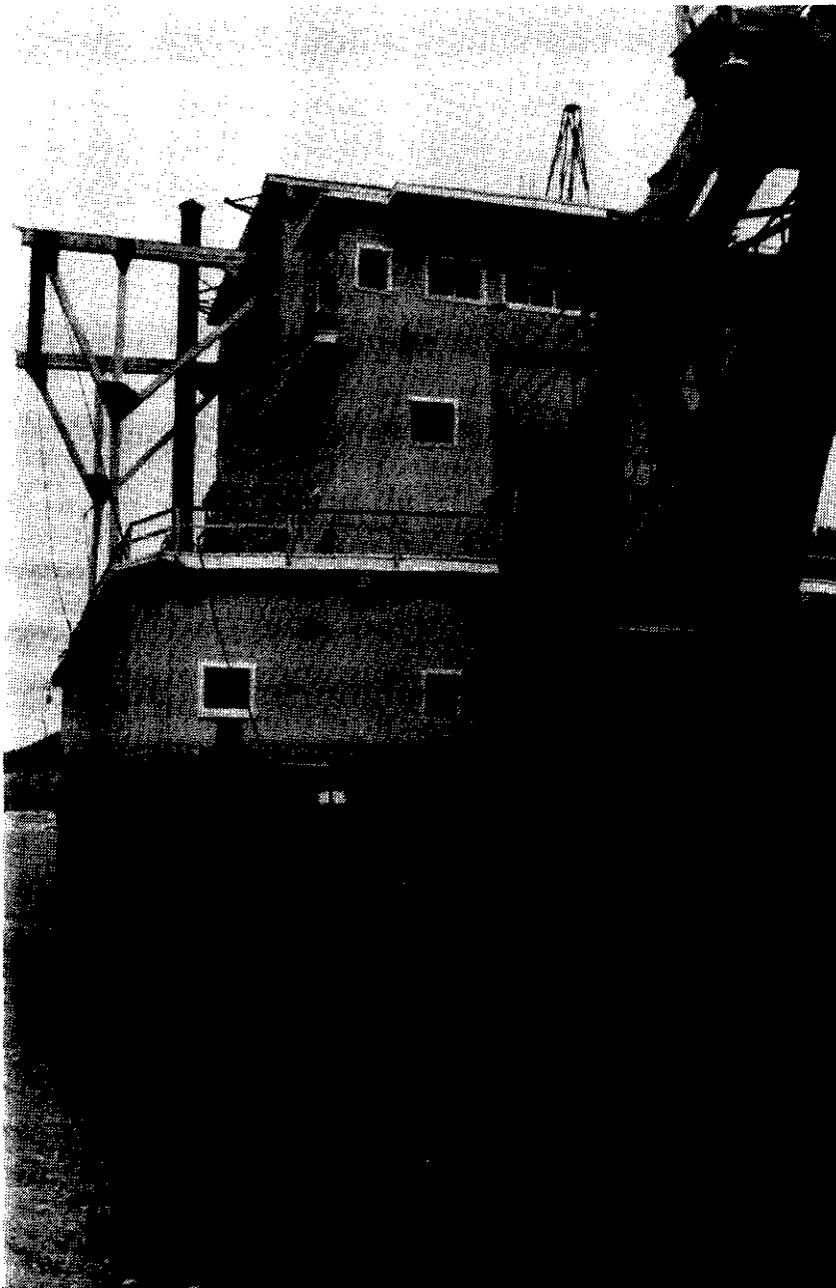


KNHS, Canadian Parks Service

was complete. The project was viewed as being one of very high risk because very little information was available on the condition of the Dredge hull, which was completely buried below grade in partially frozen sediments.

In the Fall of 1990, 1 CEU produced a report based upon additional field investigations completed in the summer, which detailed the full scope of activities necessary

YCGC Number 4, summer, 1990. In the fall of 1959 the dredge was settled on a shelf in its pond, a normal winter practise. The failure of the upper Bonanza dam in the spring sank it in the pond. Eventually the vessel was sited in to a depth of 67 meters.



Canadian Parks Service

YCGC Number 4 on its new cradle and being readied for restoration and interpretation. Note the stain indicating the 67 metre depth of burial. First visitors on the vessel are expected in July, 1993.

to excavate, refloat and reposition the Dredge. The final technical details for the work were ultimately fleshed out at a meeting between Public Works Canada, the CPS and 1CEU in early December. In late January 1991, the CPS approved the project. The estimated cost was approximately \$1.1 million.

Phase I of the project entailed hydraulic and mechanical excavation around the vessel and thawing and removal of large accumulations of ice and silt within dredge hull. This work was completed during the summer of 1991. When the excavation was complete in late September, no evidence of significant structural damage to the hull was detected. This gave rise to high hopes that

the vessel could be refloat in the following year.

Phase II of the work, which began in early May, 1992, involved thawing and removal of ice that had formed above deck level within the superstructure of the vessel. As well, it was necessary to remove ice in the flotation pond that had bonded to the exterior of the Dredge over the winter of 91/92. For the most part all this work was accomplished using high capacity pumps, 150 -200mm diameter hoses and plentiful supplies of water.

In late May 1992, with the flotation pond flooded, the hull of the Dredge was pumped free of water in the hope to create a buoyant force and cause the vessel to float. Unfortunately this event did not occur and it became necessary to install the suction-break system.

The suction-break system was comprised of a manifold piping arrangement which allowed water to be pumped under the hull to break the bond between the Dredge hull and the bottom of the flotation pond. The system was only partially installed and working when on June 11, 1992, the flotation of the Dredge became a reality.

Over a period of 6 days the flotation pond was pumped up to its full capacity and the floating Dredge was slowly towed over to its new location. It was then sunk onto a timber crib foundation which was submerged approximately 5 meters underwater. After that, the pond was slowly drained to reveal that placement of the vessel on the foundation was accomplished within a tolerance of centimeters,

Needless to say, there was great joy and a collective sigh of relief from the DND, Public Works Canada and Canadian Parks Service project personnel when this critical phase of the relocation was completed.

The writers wish to acknowledge the dedication and hard work of the military engineers and staff of 1CEU, who brought this high risk project to completion on time and within budget.

Camp Functions and Buildings

The camps provided three basic functions: accommodation, staff support services, and management. Although some older log buildings continued in use for many years the bulk of the buildings were one, or occasionally two storey, wood frame buildings clad in clapboard and roofed with corrugated iron.

The large work crews required for dredge mining operations required considerable long-term accommodation. The camps generally operated from the beginning of April to the ending of dredge operations in late fall. Labourers and dredge crews were housed in long single storey bunkhouses. The size of these buildings varied from 18' X 36' to the largest at 36' X 64'. The most common design, at least 16 of these were built from a standard plan, were 22' X 64'. These latter were initially large single rooms with bunks for 20 men. In the late 1940s many of these were partitioned into eight rooms, four on either side of a hallway, with two men in each. The camp cooks and the crew foremen **occasionally** had their own bunkhouse. These single storey frame buildings varied in size from 12' X 16' to 22' X 24' and were a **part** of the main camp. Small bathhouses, between 6' X 8' to 9' X 11', were nearby the bunkhouses. There does not appear to have been a standard plan for the bathhouses during the 1930s. However a standard plan for shower and washroom building was prepared in 1950 for all camps. [YCGC 1.A2.72]

Bunkhouses at Sulphur Creek camp in 1937.
Haines Collection, YA

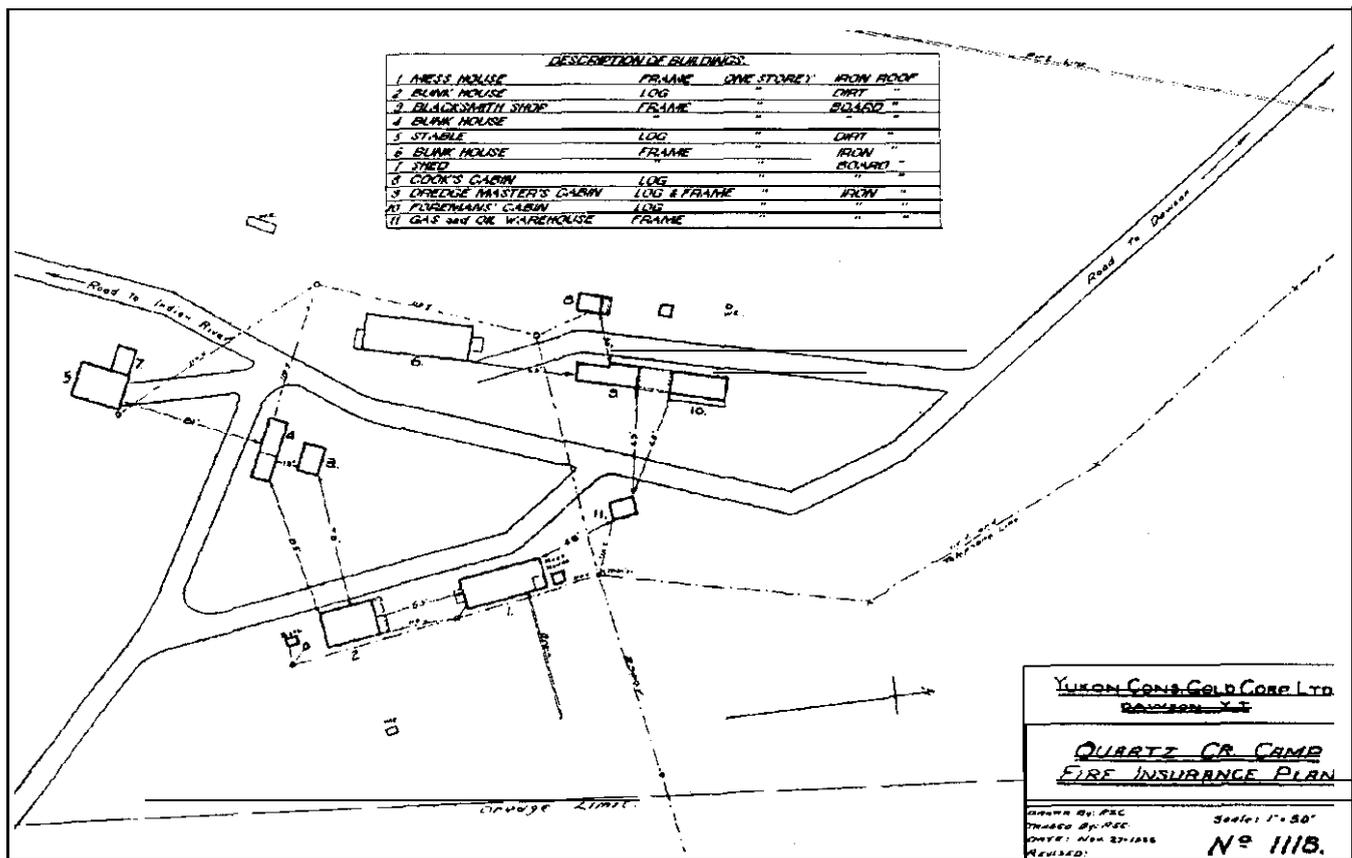


The dredge master was the senior staff out at the camps and was provided with a separate dwelling. Although modest buildings, the most common were about 25' X 32' frame structures, they were comfortable and wives often lived there with their husbands. They were usually some distance from the other camp buildings and often were attractively landscaped.

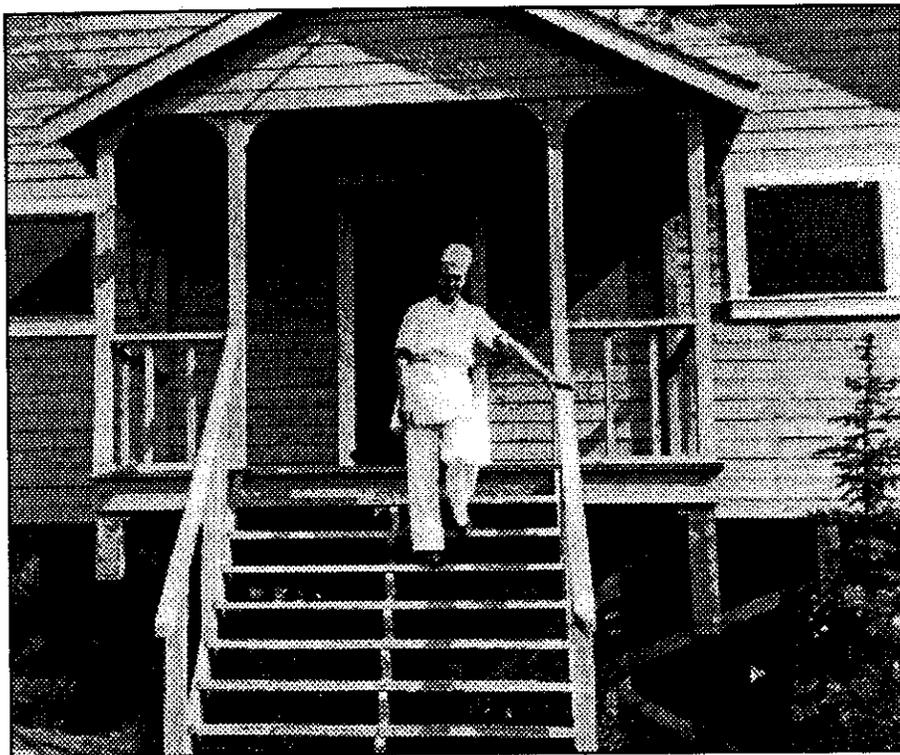
Staff were provided meals at the messhall. These were generally the largest buildings at the camp, often two storey frame structures, The largest was at the Bonanza camp. It was a two storey 26' X 52' building with a single storey kitchen and storage ell of 36' X 26'. Five camps had messhalls of a single storey 36' X 64' seating between 84 and 100 men. Food was usually good solid fare and was popular with visitors. Food storage was occasionally in the messhall, especially for dry goods but there was often a separate warehouse and a small meat house nearby. One camp also had a 16' X 16' ice house. Both the meat and ice houses were probably abandoned or reused for other purposes through the late 1940s and 1950s as refrigerators were added to the camps.

Each of the camps had an office to manage the various stages of ground preparation, These were single storey frame structures ranging in size from 12' X 16' to a more common 22 X 24'. A garage or combination stable/garage was also maintained at most camps. The Jensen Camp garage was 28' X 28'.

Quartz Creek Camp was one of the first of the field camps rebuilt. In 1949 a visitor described the dredge master's house as outstanding - being a one story grey frame bungalow on a hill. There is a lovely garden here but all the soil has been hauled from the woods as the hill itself is entirely gravel. There is a potatoe patch, vegetable garden, strawberry bed and greenhouse. Peppers, tomatoes, cucumbers and parsley are found in the greenhouse.
from YCGC 1.A12.1



Dredge Camps 6



Louis Halberg, the cook. at camp 10.
Birchmore Collection, YA

The largest camp was Granville with 18 buildings, Over 60 kilometres from Dawson on rough roads this isolated camp provided accommodation for as many as 100 men in six bunkhouses, two cabins and two bathhouses. A large messhall, meat and ice houses, several warehouses, tool house and a garage/stable completed this large camp.

Most camps however had between seven and nine buildings. The usual complement included a messhall, one or more bunkhouses, a cabin for

the foreman or dredge master and usually an office. A number of ancillary features such as storage or special function areas, such as a laundry area were also common. In addition to camp buildings there were a host of supporting structures housing pumps, electrical sub-stations and similar field functions scattered throughout the gold fields.

The YCGC dredge camps were an integral part of the corporate mining system in the Klondike gold fields. The wood frame bunkhouses, messhalls, and other structures were important features in the regional landscape and performed the three basic functions identified above: accommodation, staff support services, and management. Interpretation of corporate mining would be incomplete without representation of these structures.