A TOWN FORGED BY GOLD - JUNEAU, ALASKA

THE LASTING IMPACT OF THE ALASKA-

JUNEAU GOLD MINE

by

MEILANI ALANNA CLARK

A THESIS

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"A Town Forged by Gold - Juneau, Alaska: The Lasting Impact of the Alaska-Juneau Gold Mine," a thesis prepared by Meilani Alanna Clark in partial fulfillment of the requirements for the Master of Science degree in the Environmental Studies Program. This thesis has been approved and accepted by:

[redacted]

Dr. Jane Dawson, Chair of the Examining Committee

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Committee in charge: Dr. Jane Dawson, Chair
Dr. Jeffrey Ostler

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[redacted]

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The Alaska-Juneau Gold Mine operated in the town of Juneau, Alaska from 1897 to 1944. During its height, it was the largest and most successful low grade ore mine in the world, and by its close it had mined more than 90 million tons of ore. The Alaska-Juneau was unique among the Juneau mines, due to both its longevity and the fact that its mill was located near Juneau's city center. The role the mine played in the shaping of the town was tremendous. This paper will catalogue and assess the continuing significance of the Alaska-Juneau Gold Mine on the town of Juneau. Included in this assessment are the impact of waste rock use and disposal, the lay out of the community, local architecture types, the significance of fire protection, hydropower, and social legacies.

CURRICULUM VITA

NAME OF AUTHOR: Meilani Alanna Clark

PLACE OF BIRTH: Washington D.C.

DATE OF BIRTH: April 27, 1973

GRADUATE AND UNDERGRADUATE SCHOOLS ATTENDED:

University of Oregon
Colby College

DEGREES AWARDED:

Master of Science in Environmental Policy, 1999, University of Oregon
Bachelor of Arts in History, 1995, Colby College

AREAS OF SPECIAL INTEREST:

Alaskan Environmental History

PROFESSIONAL EXPERIENCE:

Instructor, Department of Environmental Studies, University of Oregon, Eugene, 1999

Teaching Assistant, Department of Environmental Studies, University of Oregon, Eugene, 1997-1999

GRANTS:

Barker Grant, 1999

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CHAPTER I

INTRODUCTION

In her book, In the Miners' Footsteps, Willet Janes writes: "Now all of the old mines are silent, with only the ruins and trails to remind us of the glorious mining years."[1] There are, however, so many more reminders. The mines still, so many years later, continue to make their imprint on the town of Juneau. The secret is knowing where to look. Reminders of the mines that were once scattered around the Juneau area, and especially the Alaska-Juneau Gold Mine are everywhere, they exist in every corner of the City, and are nearly always just beneath the surface of a street or a building or a story. The reminders are there; it is the connection, however, between the origin of many of Juneau's landmarks, structures, and history, which is slowly being forgotten as time winds its way into a new century.

For those who live and work in Juneau's downtown, "rubbing shoulders" with the past happens many times every day: Brunch at the Fiddlehead, a beer at the "Alaskan," a lunch time run on Basin Road, a walk around Starr Hill. Without the Alaska-Juneau Gold Mining Company that operated in Juneau from 1897 to 1944, these everyday places might never have come to be. Juneau's mining past allows for the existence of so many of the things in

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[1] Willette Janes, In the Miners' Footsteps: An Historic Overview of Mining Trails in the Juneau-Douglas Area (Juneau: Juneau-Douglas City Museum, July 1990) 1.

Juneau that are often taken for granted.[2] The ghost of the once grand Alaska-Juneau Mine is still very much alive in Juneau, and still impacting the lives of its residents.

Since the great environmental awakening of the 1970's, considerable resources have been spent establishing the long term impact of large industries and industrial developments upon communities and their surrounding environments prior to their development. Significantly fewer studies trace the lingering impact of historic development. At its height the AJ was the largest low grade gold mine in the entire world, and by its close it had produced over $80 million in gold,[3] or nearly 12 times more than the United States had paid for the entire state just 30 years before the mine began.

The Alaska-Juneau (AJ) Mine ran from 1897 until 1944. Its mill was located on the edge of downtown Juneau, Alaska. The town, in turn, grew up around the mill. As a result, the impact this mine had upon the town for which it was named was tremendous. Today, sixty-five years after the close of the mine, the AJ still shapes many important dimensions of the Juneau area and

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[2] The Fiddlehead was built on AJ rock used for tidal fill. The Alaskan was built to serve the needs of the mining community, and might have burned had it not been for the fire protection by the AJ. Basin Road originally led to the mining camp of the AJ, and waste rock from the mine were used in its construction. Starr Hill was originally miner housing, and contains a unique "Juneau Miner" architecture style. All of this will be discussed in the paper.

[3] Alaska Department of Community and Regional Affairs, 1999 Juneau Statistics, (1999), http://www.comregaf.state.ak.us, 27 April 1999.

community. The purpose of this thesis is to catalogue and analyze the overall impact and continuing significance of the Alaska-Juneau Mine.[4]

The Origin of Alaska-Juneau's Impact: An overview

In 1913 an agreement was executed between the Juneau City government and the AJ mine. In exchange for not having to pay any City tax the AJ would do three things: first, the AJ mill would be located within the Juneau City limits rather than on another mine-owned property a significant distance from the town; second, the tailings[5] and waste rock created by the rejected and processed ore would be donated to the town to be used for City development free of charge; and third, the AJ mine would provide fire protection for the town by placing fresh and salt water pressurized hydrants at specified locations around Juneau. This contract contained the policies which gave birth to most of lasting legacies of the AJ mine.

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[4] Attempts were made in the 1990's by the Echo Bay Mining Company to re-open the Alaska-Juneau Mine. These plans have recently been abandoned. Due to the need to limit the scope of this thesis, the historical operations and history of the mine will be the sole focus of this paper. The re-opening effort generated an enormous amount of controversy in Juneau, and could possibly provoke an entire thesis in its own right.

[5] In mining terms ore, waste rock, and tailings refer to different things. Ore is unprocessed metal (gold) bearing rock, waste rock is rock that has been rejected prior to processing. As used here this usually refers to rejection through hand sorting. Tailings is the processed, usually sand like substance from which the gold has been extracted. The distinction between tailings and waste rock is not made by the AJ's early documents, instead it refers to both waste rock and tailings as tailings.

Direct Impact

The decision to place the mill in the town was very significant. The close location made it unnecessary to develop a separate "miner barracks" community complete with housing and services. The mills of most other nearby mines[6] were built far from the town, near the source of the gold-rich ore. Housing for the transient male labor was constructed at the site of these mines, as were stores and saloons. There was little interaction between mine workers who lived off in these secluded mining camps and the Juneau community. When mines such as these closed, these areas were quickly abandoned, the infrastructure and housing that had been set up to accommodate the miners soon fell into disrepair.

The AJ was very different in this respect. By locating the mill in the town itself, miners and mill workers could live within the bounds of Juneau. Many housing structures and areas of town were built up specifically as residential areas for miners. A great many of the houses still remain in the town of Juneau today, and contribute not only to the character of the town, but also help define Juneau's neighborhoods.

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[6] There were quite a number of other mines in the area - some of which were successful and some which were not. The largest of these other mines was the Gastineau which existed from about 1890 until 1921, at which time it was incorporated into the AJ. The other major mine in the area was the Treadwell, which operated from about the same time until a cave in shut down the operation for good in 1917. Besides these mines, there were approximately 10 other mines that operated for some time in the immediate area, and 19 others located in the same region.

The location of the mill impacted the town in other ways. As the mine searched for different forms of power, an electrical system was set up so that the town of Juneau was more or less directly connected with distant hydroelectric power sources such as the Salmon Creek Dam and the Annex Creek Dam. The electrical system that was developed to meet the power needs of the AJ was very competent, very modern, and still provides much of Juneau's power today. The right-of-ways for electrical lines were established at that time, and are still key to Juneau's electrical grid.

The donation of the waste rock and tailings to the City, however, had the most visible and significant impact upon the town. The town of Juneau was not founded on what would have been called a very reasonable location by planners or landscape architects. It was originally established as a tent City at the foot of two mountains: Mount Juneau and Mount Roberts. The mountain sides are very steep, difficult to build on, and prone to mud slides and avalanches. In the opposite direction lay the ocean that rose and fell over long tidal flats. As a result, there was very little land space available to build on or expand into as the town grew.

The AJ waste rock proved to be the key for finding a solution to this problem. It provided a plentiful and strong building material, allowing City developers to expand the town of Juneau out onto the tidal flats by laying down waste rock as fill. Approximately one-third of modern Juneau is situated on the waste rock-filled tidal flats.

Juneau used the waste rock extensively in a variety of City projects other than tidal fill. The rock was used to build most of Juneau's major roads, Juneau's airport, and is thus a major part of Juneau's transportation infrastructure. During the Second World War, a great deal of AJ rock was used by the Army to construct military structures. The waste rock was also available gratis to any individual who had the means to haul it off. During the many construction booms of early Juneau, AJ rock was used liberally and is found today in the foundations of many houses.

The rejected tonnage from the AJ was large. The City could not begin to find uses for all of the mine's waste material. Other means besides donation were necessary to dispose of the great mountains of waste rock and tailings. The Gastineau Channel, located between Juneau and Douglas Island, was used for this purpose. Rock was first placed on a tidal rock dump. It was later hauled out to the channel on barges specially constructed for the task. The Juneau Rock Dump is still an especially visible Juneau landmark, and serves a variety of purposes for the community.

Juneau is one of the only gold rush towns that did not suffer from a major fire.[7] The fires that did occur in early Juneau were successfully fought by the local fire department. The neighboring town of Douglas, across the channel

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[7] Toni Croft, Phyllice Bradner, Touring Juneau: A collection of Old Time and Modern Photos, Maps, and Bits and Pieces of Juneau History (Juneau: n.p., 1973) 3.

from Juneau, had a similar contract with its founding mine, the Treadwell. The Treadwell mine was closed by a cave-in in 1917 and never reopened. In 1926, what began as a small fire engulfed the town in flames due to an inadequate supply of pressurized water which would have been available had the Treadwell still been operating.[8] It is feasible that Juneau could have suffered the same fate without the ready supply of the AJ's fire protection system.

Indirect Impact

The close proximity of the town and the mine made for lasting impact in other ways, not as readily foreseen by the early authors of the 1913 contract. These less direct influences however, still contribute greatly to the development and shaping of the town's character. Mining roads were developed leading from the town of Juneau into the gold fields. While these mostly dirt roads are no longer vehicle accessible, they have become a major part of Juneau's trail network, allowing Juneau hikers and tourists to enjoy Juneau's outdoors.

The AJ's mining involved extensive underground operations. A massive network of tunnels was created which still exist today (though access to these tunnels is limited to a single small tour per year). There are several points at which Juneau's drinking water supply enters the old mine through these tunnels, and out into Gold Creek from which the town's drinking water is

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[8] Trevor Davis, Looking Back on Juneau: The first Hundred Years (Juneau: n.p., 1979) N. pag.

pumped. One tunnel is filled with water and can be tapped should Juneau's water supplies ever run low.

Today there are few remaining individuals in Juneau who were personally part of the mining operation at the original AJ mine. Those who are still around tell colorful tales of early Juneau life and help to bridge the gap between historical Juneau and the City of today. Those who came to Juneau in the early days still make their presence felt through the families they raised in Juneau. Many of the leading members of the Juneau community now and in the past have family ties to the early AJ. In this way, the AJ left a human and cultural legacy, along with the physical contributions still remaining in the town.

In 1913 when the contract was written, little was known about the possible environmental hazards of waste rock and tailings. The AJ's lasting contribution to Juneau might easily have been one of environmental disaster. Fortunately, the composition of the rock did not lend itself to such scenarios. Studies are still being done to determine whether or not the environment has suffered the impact of rock placement, but no current evidence seems to support such concern .

Gold lay for millennia in the mountains and streams above and around Juneau. Perhaps the gold itself should be given the most credit for any and all changes that have occurred in over a century since the founding of Juneau. Without the gold the town would never have existed. Without the gold the Alaska-Juneau mine would have never had the chance to shape the town's future, and Juneau might just be a pretty unnamed location, poorly suited to place a town, passed by cruise ships on their way to someplace else.

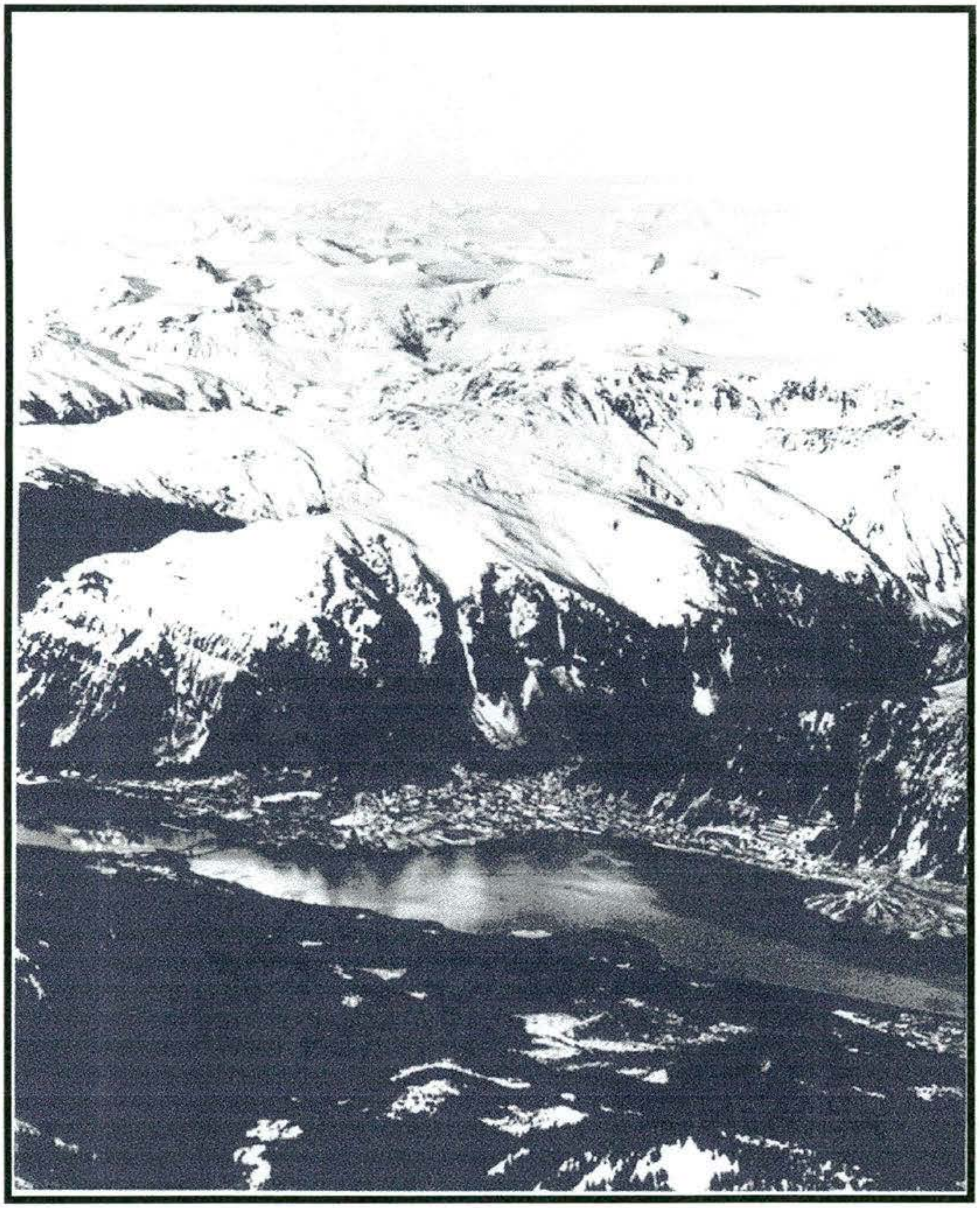

FIGURE 1. Aerial view of Juneau, Alaska. All historic photographs have been provided by the State of Alaska Historical Library.

CHAPTER II

EARLY HISTORY OF THE TOWN AND THE MINE

The Place: Juneau Alaska

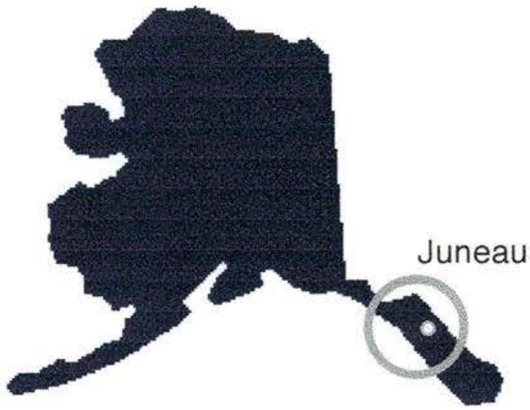

FIGURE 2. Area location map of Juneau, Alaska.

Juneau is 909 air miles northwest of Seattle and 570 air miles southeast from Anchorage at a latitude of 58°18' and a longitude of 134°24'. At 3,248 square miles, it has the second largest geographical area of any city in the western hemisphere. However, only 8% of this massive area is actually populated, with almost half of present day Juneau being ice field, and much of it being water. Figure 1 shows the City and Borough of Juneau. At its founding as a mining district in 1880, only 160 acres were included in the town.[9] Juneau has grown beyond these early bounds. Today, more than two-thirds of Juneau residents today live far away from the original settlement in areas such as Lemon Creek and the Mendenhall valley.

Juneau's role as Alaska's capital has proven to be vital to the local economy, as government employment accounts for nearly 45% of Juneau's jobs. Juneau is the site of several industries such as fishing, mining, and tourism. The climate in Juneau is temperate and maritime. In the summer the temperature generally ranging from 44-65°F, with winter from 25-35°F.[10] The area is famous for its continuous drizzle. The average precipitation is 92 inches, including 103 inches of snow, with approximately 250 precipitation days. Juneau's population of 30,684 makes it the third largest city in Alaska.[11]

It is difficult to compare Juneau to any other city in the world. It is full of unique attributes that contribute to its unmistakable charm. Juneau is the only capital city that is not accessible by a road of any sort. It is also home to the world's only "drive-up" glacier, the Mendenhall. Juneau is nestled into the base of the nearly 4,000 ft. Mount Roberts and Mount Juneau[12], a mountain called

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[9] Alaska Department of Community and Regional Affairs.

[10] Site Investigation of Selected Mine Sites Near Juneau, Alaska ([Juneau]: Versar Inc., 1989) 4.

[11] Alaska Department of Community and Regional Affairs, 1999 Juneau Statistics.

[12] Mount Roberts is 3,576 feet and Mount Juneau is 3,819 feet.

"glowing mountain" by early Tlingits.[13] Though Juneau sits on the Gastineau Channel, it is separated from the open ocean by about 75 miles of islands.[14] It is here that the Alaska-Juneau Mine began more than 100 years ago.

The founding of Juneau, as is so often the case in history, is credited to two individuals, Joe Juneau and Richard Harris, who had much less to do with the discovery than many other people. Though the date of discovery is given as 1880, the area was well known prior to this time. Juneau was not a native village, but there was a popular summer fish camp on the banks of Gold Creek used by the nearby Tlingit Aaak'w[15] which at the time had one of the largest salmon runs in the area.[16] Captain George Vancouver named Juneau's Douglas Island in 1794, [17] and Russians had been fur trapping in the general area since the 1700's. John Muir wrote about the area after a trip to visit the Aaak'w tribe in 1879:

> The scenery all through the channel is magnificent, something like Yosemite Valley in its lofty avalanche-swept wall cliffs, especially on the mainland side, which are so steep few trees can find footing.[18]

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[13] See Figure 1. Mt. Juneau is on the right, and Mt. Roberts in on the left.

[14] Juan Munoz, Juneau: A Study of the Gastineau Channel Area (Juneau: Alaska Resource Development Board, 1956) 7.

[15] Also spelled Auk and Auke.

[16] Telephone Hill: Historic Site and Structures Survey Juneau, Alaska (Juneau: Alaska Archives Resource and Records Management, 1984) 11.

[17] Mark Kelley, Annabel Lund, Juneau Portrait II (Juneau: n.p., 1997) 82.

[18] John Muir, Travels in Alaska (London: Houghton Mifflin Co., 1916) 127.

Muir wrote an article that same year in the San Francisco Evening Bulletin about the geology of the area, saying it was indicative of gold bearing rock.[19]

George Pilz, a German gold seeker living at the Stewart Mine near Sitka Alaska caught sight of Muir's writings.[20] Pilz was the first professional mining engineer in Alaska,[21] and had been sending men out in groups of two to do a bit of prospecting in different parts of southeast. To increase his odds of finding gold, he had guaranteed 100 blankets and work at a dollar a day to any native tribe to find gold.[22] Chief K̲awa.ée[23] of the Aaak'w kwan (tribe) thought that this sounded like a very good deal, and had visited Pilz bringing with him some rich ore samples with the hope of obtaining the promised prize of blankets and pay for his people. Pilz grubstaked two of his employees to stake claims in the area for him in July of 1880.

Pilz's later opinion of Joe Juneau and Richard Harris was not very high. Forty years later he would write of the event:

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[19] Munoz, 10.

[20] C.L. Andrews, The Story of Alaska (Caldwell, Idaho: Caxton Printers, Ltd., 1947) 156.

[21] John Mulligan, "George Pilz," Alaska Mining Hall of Fame Foundation Induction Ceremony Program (Juneau: 1999) 4.

[22] George E. Pilz, letter to James Wickersham, "Reminiscences of the Oldest Pioneer Miner of Alaska," 2 December 1922.

[23] In most literature this is spelled Kowee, though it is also written as Cowee, Kow-eeh, and Cow-ee. K̲awa.ée is the current accepted spelling of the name. His name means "It is cooked," a name of high regard.

> Harris and Juneau were among these so called hard rock miners (but they) could not punch a hole in soft muck...Harris was such an inveterate drunkard...Joe Juneau was always getting fascinated by some new squaw...Once they had landed at Auk village with their outfit they began immediately to trade off their outfit for hooch and squaws, and had remained drunk for over three weeks. [24]

The pair had then returned empty-handed to Sitka for more supplies. When they returned to finish their prospecting Chief K̲awa.ée, concerned that he might not get the reward offered if these two failed, led them directly to a quartz outcropping in what is now Gold Creek in the Silver Bow Basin.[25] The pair then schemed to abscond to Canada with their gold rather than tell Pilz what they had found. They were, however, convinced at gun point by George Langly, a friend of Pilz's, that it would be best to inform Pilz of their find. Pilz himself has been described as "vociferous and cantankerous to the end,"[26] however his depiction of the "town fathers" seems to be at least somewhat accurate.

The strike in Juneau was quickly broadcast. The Juneau beach became a village of tents and make shift cabins. That winter about three dozen prospectors spent an impatient and uncomfortable winter on that beach, desperately waiting for spring when claims could be staked. [27]

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[24] Pilz, N. pag.

[25] There is some talk, though unsubstantiated that K̲awa.ée was not a chief of the Auk at all, but a distant cousin from a different tribe. A rūmor which carries more weight, is that the Auks had several different chiefs, and that K̲awa.ée was not their only one.

[26] Mulligan, 5.

[27] Kelley, 82.

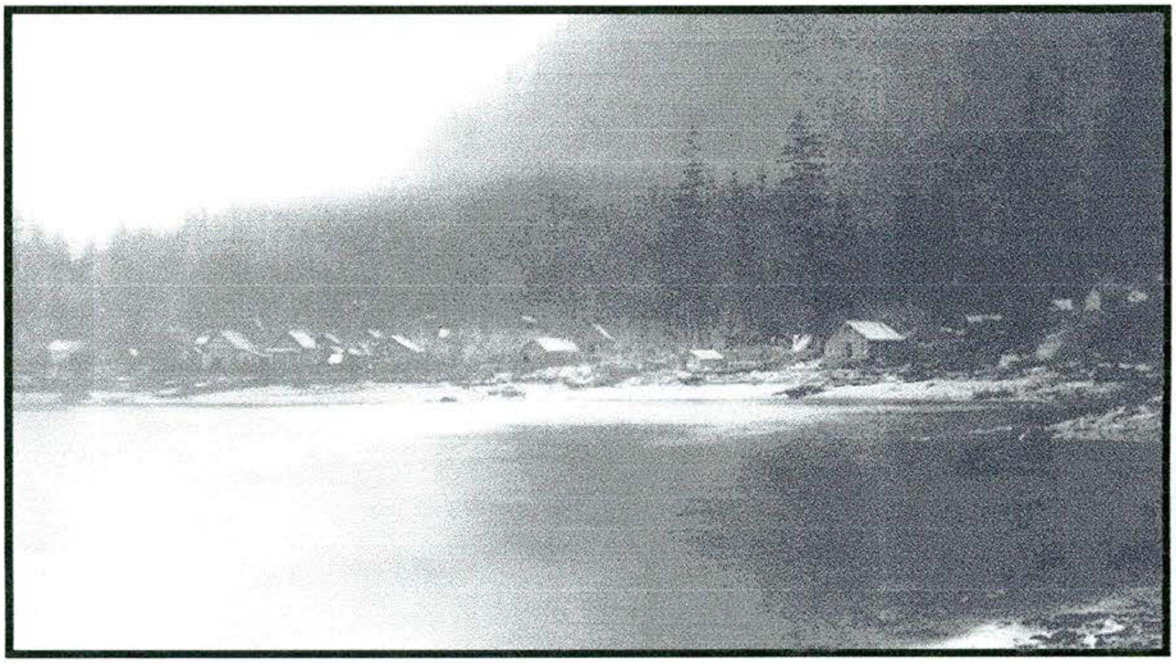

FIGURE 3. First photo taken of Juneau circa 1880.

Figure 3, a photograph of what was called Miner's Cove, allows a view of what it looked like that first winter. The shoreline today is far from its location in the photograph, as the tidelands were subsequently filled.[28] Due to the topography of the area, finding a reasonable place to put a cabin or house proved to be difficult as the town grew. Miner Bruce, a traveler to Alaska in 1895 discussed the predicament:

[28] For those familiar with Juneau, the center building in this photo is approximately the site of the Valentine Building today.

> Juneau is rightly called the metropolis. Whether she will retain this prestige remains to be seen. If so, one of two things must occur. She must plane down the sides of her mountains or erect sky-scraping buildings with elevators to accommodate her populace, for nearly every foot of available ground is already occupied.[29]

Bruce's envisioned methods of expansion for the area were never realized, as a third option emerged as most reasonable: Filling the tidal lands.

K̲awa.ée relocated his tribe to the Juneau area in order to reap the rewards promised to him and his people.[30] They would never see a penny or blanket promised, and the Tlingit group was met with such animosity that they were forced by the US Navy to leave the town center.[31] An Indian village was established on what is today Willoughby Avenue.

Early on, the town went through a number of name changes. Joe Juneau, however, shrewdly outwitted others vying for the honor to ensure that the town would bear his name. While Harris, Pilz, and other contenders went to Seattle for the winter, Juneau stayed on and spent all of his earnings at the new saloons and bars buying other miners drinks. Though dead broke by the end of

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[29] Miner Bruce, Alaska: Its History and Resources (Seattle: Lowman & Hanford Stationery and Printing Co., 1895) 84.

[30] It is unclear where the Auks were relocating from. Different accounts put them in different places: Young's Bay on Admiralty Island, a site on Douglas Island, and near Auke Lake on the mainland. The Auk's apparently had camp sites in each place, but was more permanently located at the Auke Lake site.

[31] There is talk that the animosity was intentionally aggravated so that the US Navy, stationed in Sitka, would have an excuse to come to Juneau and could get in on the mining action.

his campaign, he established his place in history when the final vote was taken on December 14,1881.[32]

By 1883 Juneau was already a bustling mining town with a winter population of 1000. The discovery of gold in Juneau was not the first in Alaska, but Juneau would be the very first town in Alaska founded for gold, as well as the first town founded in Alaska since the Russian sale of the state in 1867.[33] The word "gold" at this time in American history had a great weight and excitement to it that does not exist today. The California gold rushes had just ended and many fortune seekers were in search of new adventures and dreams. Juneau became a place of destination and quickly became the largest town in the state. The capital was moved from Sitka, the old Russian center of the state, to the gold rich center of Juneau in 1900. At this time it had the largest population of any place in Alaska.[34]

The Beginnings of the Alaska-Juneau Gold Mine

The history of the Alaska-Juneau Mine is closely tied to the founding of Juneau. The first claim staked by Harris and Juneau, named the Fuller First, was in the heart of what would later be the Alaska-Juneau Gold Mine.[35] This

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[32] Croft, 12.

[33] Telephone Hill, 17.

[34] The more official date is sometimes given as 1906, when the transfer became complete.

[35] Earl Redmen, History of the Mines and Miners in the Juneau Gold Belt: A Collection of Stories About the Mines, the Miners, Their Golden Dreams and How They Tried to Achieve Them, (Juneau: n.p., 1988) 71.

original site was sold and subdivided several times, and at one point belonged even to George Pilz.[36] The early workers of the Fuller First claim ran into a multitude of problems including lawsuits, snow slides, and mud slides making success on the claim difficult to achieve. In 1893 a five-stamp mill was brought over from the Treadwell Mine. The Treadwell Mine was in a very rich area that had been discovered shortly after the founding of Juneau across the channel from Juneau on Douglas Island.[37] This mill transformed the claim from a small scale operation, to a mine employing 30 men. In 1896 this was replaced with a 30-stamp mill that could handle 150 tons of ore in a 24 hour period.[38]

By this time, the operation was being run by A. Hayward and Charles D. Lane. The two had bought 21 claims in the Silverbow area in 1894, including the Fuller First claim and 16 claims which had been heretofore barely touched. These claims had been owned until this point by a group calling themselves the Juneau Mining Company. Internal disagreements within this original group resulted in no work at all moving forward. Hayward and Lane kept the name Juneau Mining Company. In 1897 the two sold the claims to South African Alfred Biet and Captain Thomas Mein, who was associated with the London

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[36] Redmen, 72.

[37] The original claim in this area was by Pierre Joseph Erussard, known as "French Pete" in 1881. Convinced his claim was not worth much, he sold it to John Treadwell later that year for $400 in order to pay his debts. The mine would go on to make millions of dollars.

[38] David Stone, Brenda Stone, Hard Rock Gold: The Story of the Great Mines that were the Heartbeat of Juneau, Alaska, (Seattle: Vanguard Press, Inc., 1987) 58.

Exploration Company, for approximately a half million dollars after yet another disastrous snow slide.[39]

This sale constituted the real birth of the Alaska-Juneau Mining Company, and it was incorporated in the same year under this name. The new owners brought with them grand new plans for the mine, and were soon outfitting the mine for large scale operation. In 1900 Frederick Bradley became president of the Alaska-Juneau, and under his tutelage the AJ would become the largest low grade gold mine the world had ever seen.

Bradley brought in an engineer in August of 1911 to build an enormous mile and a quarter tunnel at 425 feet above sea level through Mt. Roberts.[40] In a feat of engineering, the tunnel was driven from both sides of the mountain and when the sides met two years later, the calculations were off by only an inch.[41] This was called the Gold Creek tunnel and was the beginning of what would be an extensive network of tunnels in the mountain. Today there are 108 miles of horizontal works alone.[42]

At the same time plans were under way to construct a new mill. The mill was to be enormous, able to crush 8000 tons of ore per day. AJ was a very low

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[39] Redmen, 76.

[40] "AJ is Juneau's Claim to Big Fame; Largest Low Grade Quartz Property in the World." The Daily Alaska Empire October 13, 1935:3(2) (Reprinted from the Daily Alaska Empire's Development Edition of 1916.)

[41] Judge Tom Stewart, personal interview, 24 March 1999.

grade operation. A very large amount of ore had to be crushed in order for a very small amount of gold to be extracted. The AJ mine had to process 22 tons of ore to get just a single ounce of gold.[43]

No one wanted to situate the mill near the location of the early stamp mills, because climactic conditions in those highland areas made year round work impossible.[44] The mill could not be placed in the valley at the site of the "gold belt" due to the volume of tailings and waste rock that would be produced. The valley would be filled too rapidly. The AJ needed another mechanism by which to dispose of the waste generated. By placing the mill on the Gastineau Channel this could be accomplished by submarine disposal - placement of the waste into the ocean.[45] A rail system would connect the Gold Creek tunnel to the mill. The question now was simply where to place the mill.

The Inception of the 1913 Tax Agreement

The Alaska-Juneau Mine developed several alternatives for placing the mill. They had a suitable property outside the town. However this was not in the best interest of the City or the Alaska-Juneau Mine. It was evident to both parties that a more mutually beneficial arrangement could be had by placing the

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[42] David Stone, personal interview, 25 March 1999.

[43] David Stone, personal interview, 25 March 1999.

[44] P.R. Bradley, "Mining Methods and Costs: Alaska Juneau Gold Mining CO." Information Circular No. 6186 ([Washington DC]: Department of Commerce - Bureau of Mines, 1929) 2.

mill closer to town. The remoteness of these places made it difficult for local Juneauites to work in the mines while having a family in Juneau. Some members of the Juneau community were reluctant to miss out on the real benefits of having a large scale mining operation close by. The remote locations of mining camps and the separateness of those communities contributed little to Juneau, while locating a mine in town would bring more services to the town, more money, and more business to serve the needs of the mine and the miners. This approach could benefit all residents.

Lou Metzgar, General Superintendent of the Alaska-Juneau, explained the mine's thinking when mill placement was being discussed:

> If the mill had been built farther out, the company would undoubtedly have established boarding houses, commissaries and dwellings. When the Alaska-Juneau planned the erection of a milling plant it was entirely practical for them to build this plant on ground already owned outside the city limits.[46]

This was just was Juneau did not want. The City Council did not want another mine that was going to contribute little to the City economy and infrastructure. As David Stone[47], one of the current day experts on the history of the mine put it: "The City fathers of Juneau said, 'We have to get this mill site as close as

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[45] "AJ is Juneau's Claim to Big Fame; Largest Low Grade Quartz Property in the World - Reprinted from the Daily Alaska Empire's Development Edition of 1916," The Daily Alaska Empire 13 October 1935: 3+.

possible.'" [48] Juneau did not want to be left out of the next major mining phase in the area. The City of Juneau was also eager to have a ready supply of fill at its disposal for the continuing construction and improvement of the town which was continuing to grown at a rapid pace.

Across the channel, the town of Douglas had made an arrangement with the Treadwell mine to receive the protection of pressurized water mains, and Juneau was eager to obtain a similar arrangement. Juneau town leaders knew that the closer the mine was located, the better the fire protection would be, as a mine must ensure adequate fire protection for itself. Protection for a nearby City in addition to protection for the mine itself would not require much additional work.

There was a justified fear of fire that worried the Juneau community. Other mining towns had been plagued by fire. Juneau had been built up quickly out of wood and quite often on top of wood pilings. The original structures were also built close together, all making it easy for fire to spread rapidly.[49] The lack of fire protection in most of these places made fire a difficult problem to combat, and the bucket brigades usually did little to retard raging

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[46] "Metzgar Gives Mine's Reply in Tax Argument," The Alaska Daily Empire 8 December 1934: 7.

[47] David Stone is often cited in this paper. He is the author of Hard Rock Gold, the first book to compile and tell the history of the Juneau mines. He also worked at AEL&P for 10 years, which inherited the old AJ archives and records, and is very familiar with their contents. His third connection to the mine came from working closely with a recent failed effort to re-open the mine by Echo Bay Company. Today, he is widely considered to be the leading expert on AJ history and operations.

[48] "AJ is Juneau's Claim to Big Fame," 3.

flames. Towns like Fairbanks and Dawson had succumbed to fire and Juneau did not want to be its next victim.

The advantages of a close location for the mill were also great for the Alaska-Juneau Mine if a tax could be avoided. By being closer to the town the AJ could take advantage of existing infrastructure and would not have to commit more of its own resources developing new ones. Employee housing would not have to be constructed using mine money and resources, and the employees could enjoy the general pleasantries that the town had to offer. The mine would also enjoy the benefit of not having to find a way to dispose of the mountains of tailing and waste rock it was soon to begin generating. Without a tax exemption, however, these added benefits would not have been lucrative enough and the mill would have been located elsewhere.

Contents of the Tax Agreement

The agreement which was made on March 7 and signed on March 12, 1913 encompassed all of these concerns. It was drafted by Hellenthal & Hellenthal attorneys at law, and it incorporated the following statements:

> Witnesseth: that Whereas, the Alaska Juneau Gold Mining Company contemplate the erection of a large milling plant, to be used by it in connection with the milling of its ores mined from its mines in Silver Bow Basin, Alaska...

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[49] Robert N. DeArmond, Old Gold: A collection of Historical Vignettes (Juneau: n.p., 1985) N. pag.

> Whereas, said milling plant will in its erection, equipment and subsequent operation employ a large number of men at remunerative and profitable employment; and
>
> Whereas, the said Alaska Juneau Gold Mining Company contemplates the installation, in connection with its said milling plant, of a water system which will be connected with a salt water pumping plant, and also with its high pressure fresh water supply so that either fresh water under high pressure, or salt water or both will at all times be available for fire fighting purposes; and
>
> Whereas, the tailings coming from the milling plant to be so installed, are available for use in connection with the construction and improvement of the streets of the said City of Juneau... [50]

The document goes on to state that if these conditions are met, the City will consider these benefits to be "full payment of any and all taxes" that would otherwise be owed on the property for the next thirty years.[51] Specific terms of the contract indicated that water could only be used for fire fighting and tailings could only be taken in a manner that did not disrupt mine operations.

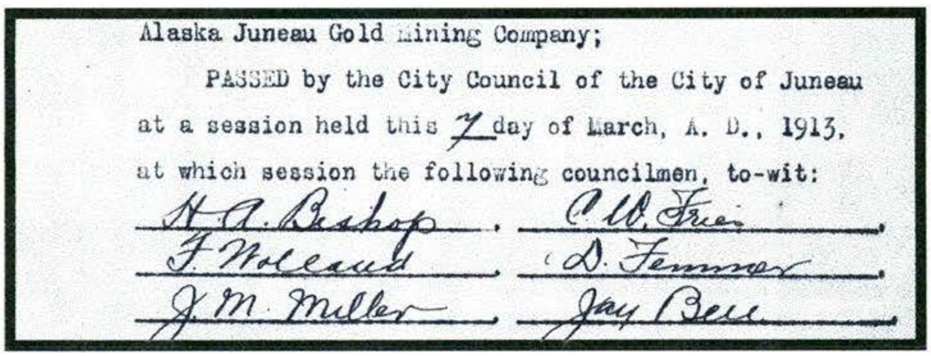
Alaska Juneau Gold Mining Company;
PASSED by the City Council of the City of Juneau at a session held this 7 day of March, A. D., 1913, at which session the following councilmen, to-wit:
H. A. Bishop, C. W. Fries,
F. Wolland, D. Femmer,
J. M. Miller, Jay Bell

FIGURE 4. A section of the 1913 contract between the city and the mine.

[50] Hellenthal and Hellenthal Attorneys at Law, "1913 Agreement between City of Juneau and the Alaska-Juneau Gold Mining Company," 7 March 1913, 2.

[51] [51] Hellenthal and Hellenthal, "1913 Agreement," 4.

The original document, a section of which is shown in Figure 4, is still in perfect condition and exciting to read, not only because it has never been published, but also because it gives such an indication of what was important to both the town and the mine at that time. It is clear that the town considered the services of the mine to be substantial. Indeed it was later determined that the property taxes that would have been generated from the mine would have been approximately $18,000 annually, or over a half million dollars in lost revenue over the 30 year term of this agreement.[52]

The AJ, on the other hand, sought agreement that would not interrupt its operations to any extent. Perhaps this attitude was a little too clear to City officials, as a modification of the agreement was drafted on September 16, 1916. This agreement was much more specific than the first and laid out not only what was to be done but specified the manner in which it would be accomplished. The focus of this later document dealt with the fire protection element of the agreement. The document expressly stated that the work on such a system would be done by the mine, and the materials would be provided by the mine:

> The Mining Company shall furnish and lay new fir wood stave, machine banded, pipe and new wrought iron pipe, along the following routes, of the dimension and in the manner following.. [53]

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[52] "Metzgar Gives Mine's Reply in Tax Argument," The Alaska Daily Empire, Dec. 8th, 1934, pg. 7.

[53] Hellenthal and Hellenthal Attorneys at Law, "1916 Agreement between the City of Juneau and the Alaska-Juneau Gold Mining Company," 16 September 1916, 5.

The "following routes" included laying an extensive amount of piping under nearly every Juneau city street, an enormous undertaking. The City agreed to pay the mine for half of the cost of the work and the materials, not to exceed $12,571.20.[54] Whereas the first document contained a number of references stating that the City must not disrupt mining operations. The modified document put it more responsibility in terms of the agreement concerning the Mine:

> It is understood that the Mining Company is to commence work hereunder as soon as it conveniently can after the execution of this contract and to continue the work with reasonable diligence until completed.[55]

As a matter of interest, the mayor at the time of this agreement, B.D. Stewart, was the same engineer who built the Gold Creek Tunnel a few years earlier.[56]

[54] Hellenthal , "1916 Agreement," 7.

[55] Hellenthal , "1916 Agreement," 9.

[56] Judge Tom Stewart, personal interview, 24 March 1999.

CHAPTER III

THE IMPACT OF MILL PLACEMENT

The Building Boom

In the second decade of the twentieth century, Juneau was experiencing a short-lived economic slump. The 1913 announcement that the Alaska-Juneau Mill would be placed within City bounds, however, gave rise to a new period of economic prosperity and activity in Juneau, which continued though out the life of the mine:

> An expanded period of economic development and building took place when the Alaska Juneau Mill was constructed... Larger, more substantial residential housing was constructed for mine superintendents and owners and well as more affluent business owners. Reinforced concrete was introduced into the construction of buildings in the downtown business area.[57]

Among these buildings were the Alaskan Hotel, the Seward Building, the Gastineau building, the Goldstien Building, the Gross Apartments building, and the Messerschmidt Building (which now houses the Silverbow Inn).[58]

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[57] Juneau Townsite Historic Building Survey (Juneau: City and Borough of Juneau, 1988) 90.

[58] Juneau Townsite, 90.

FIGURE 5. Photograph of the AJ Mill circa 1928.

The population of Juneau, which had increased so steadily after the founding of the town, was on the decline from 1900 to 1910. The work necessary to build the mill, which can be seen in Figure 5, required an increase in labor and between 1910 and 1920 Juneau's population nearly doubled.[59] The next step was to find housing for all of the Alaska-Juneau employees.

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[59] DeArmand, Old Gold, N. pag.

Housing

Today the houses and settlements built near Juneau by mines other than the AJ no longer exist. They are ghost encampments, shrouded by vegetation and decay. A lone house, or a few rotting boards are the only tribute to housing developments of over 100 buildings and nearly 500 inhabitants of the Alaska Gastineau Mining Company.[60] The Alaska-Juneau Mine was different. Its miners mostly found residence in the community of Juneau itself, and not in a removed mining camp. By placing the Alaska-Juneau mill close to Juneau, the town found itself facing housing pressures beginning in 1913 that continued through the life of the mine.

The Alaska-Juneau Mine rarely allowed the citizens of Juneau to feel the pressure of outside economic calamities:

> The AJ Mine operating at full capacity paid its miners with gold coins...Juneau did not feel the deeper effect of the depression as much as the "Outside" because of the stabilizing influence of the...mining payrolls.[61]

Residents could afford to build their own homes out of strong durable material. Those who had their own homes could afford to renovate and remodel. The building boom begun by the announcement of mill placement continued to some degree or another throughout the life of the mine. In 1938 alone, 115

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[60] Inventory of Historic Sites and Structures, (Juneau: City and Borough of Juneau Planning Department, 1986) 137.

[61] Davis, N. pag.

building permits were issued by the City Engineer's office.[62] This is quite a number for a town of 5,000. Juneau was described by the local paper as a place where, "there are people willing and in a position to demand more and better housing facilities."[63] The people of Juneau did build themselves houses, as did the miners who built up certain areas of town, often using a unique style of architecture. Most of their houses still remain, still are lived in, and continue to shape the character of Juneau.

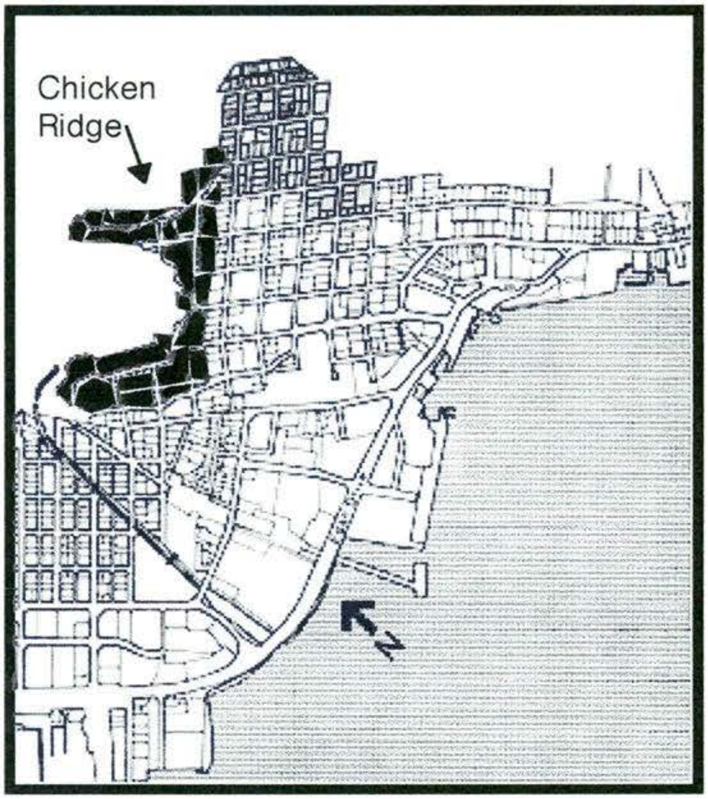

FIGURE 6. Location Map of Chicken Ridge.

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[62] "Million Dollars Spent for Juneau Building Program During 1938," The Daily Alaska Empire 26 March 1939: 1.

[63] "Million Dollars Spent," 1.

Though not immediately apparent from the name alone, Chicken Ridge was once synonymous with the fanciest section of town. Chicken Ridge, as shown in Figure 6, runs above 6th Street, and is bounded by Basin Road and Calhoun Avenue.[64] Its houses were grand, pillared, multiple storied, with enormous yards. These were the haunts of the mine bosses, as well as other leading members of the community. The mine superintendent lived here in a house built by the AJ for his use.[65] B.D. Stewart, a one time AJ engineer, built his home here. The Faulkner house is situated here. Faulkner Banfield was a law firm that worked almost exclusively with the mine. Approximately 30 additional homes were built in the so called "Gold Mining era" of construction which took place around 1921 and can be directly linked to the AJ Mine.[66]

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[64] Chicken Ridge Neighborhood (Juneau: City and Borough of Juneau, 1992) 15.

[65] Judge Tom Stewart, personal interview, 24 March 1999.

[66] Chicken Ridge Neighborhood, 202.

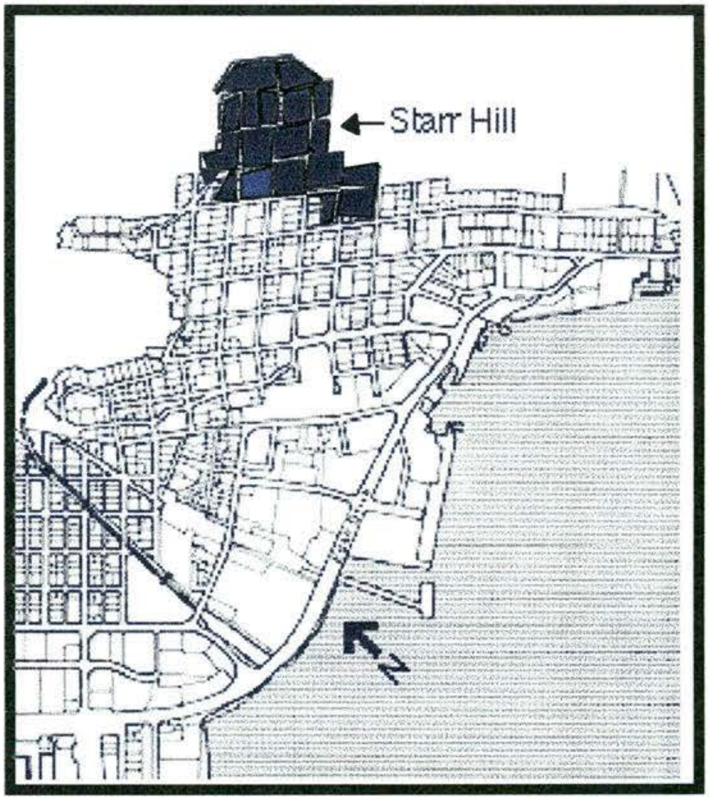

FIGURE 7. Location map of Starr Hill.

Starr Hill was more of a working class neighborhood. It was where many Alaska-Juneau miners made their homes. Starr Hill was once just an obstacle on a trail leading from the original Juneau beach settlement into the gold fields at Silverbow Basin.[67] Frank Starr established the first housing there in 1895. Starr's claims on the area were a bit unusual. He gained them after he had asked to be appointed sole guardian to an orphaned six year old girl who had inherited the property.[68] The location tuned out to be an excellent one for

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[67] Juneau's Historic Neighborhoods - Starr Hill: The Kennedy Street Mineworker's Houses, (Juneau: City and Borough of Juneau Planning Department, 1987) 2.

[68] Juneau's Historic Neighborhoods - Starr Hill , 2.

miners, as it provided easy access to the mines as well as to the downtown area.

Six houses which appear in Figure 8 were called the Kennedy Street Mine Worker's Houses. They were "occupied and owned by men and their families who, through the years, worked in mining and principally for the Alaska-Juneau Gold Mining Company."[69] It is very likely that many of these houses were built in direct response to the signing of the AJ-City tax agreement. The agreement was signed on March 12, 1913, and construction of the Kennedy Street houses was begun on May 27 of that same year.[70] Arthur Riendeau, Superintendent of the AJ for more than quarter of a century, was one of the past owners.

FIGURE 8. Photo of the Kennedy Street Houses.

[69] Juneau's Historic Neighborhoods - Starr Hill, 4.

[70] Juneau's Historic Neighborhoods - Starr Hill, 9.

The Kennedy houses are representative of a large number of houses built in and around the Juneau community which were lived in by miners and their families. All told there are about 200 such houses. Each used the same basic practical building design and material. The wood frame Kennedy houses followed the architectural design of Craftsman Style Bungalows. They are one and a half stories high, completely sided with shingles. "Double hung windows are characteristic as are the attached front and rear porches." [71] The Starr hill houses are very attractive and are a popular destination for tourists, though at the time of their construction they were known as tract houses and early Juneau tourist complained it was the most uninteresting section of town.

Basin Road was another ideal location for Juneau's early miners to live. It was situated above Juneau and on the way to the mine fields, but was still not extremely far away from the City center. All of the houses on Basin Road were either built or lived in at one time with persons connected with the AJ. Some examples are Jack Koby, a bulldozer operator, who lived at 853 Basin Road, now owned by the Sheltons, and Marko Dapcevitch, a reduction mill worker who lived in the now Meeker house across the street at 850 Basin Road. The Basin Road Boarding House is a few houses down, and was home to many single AJ miners.[72] Cindy Boesser, who lives a few houses up, still has the original walls of a turn of the century miners shack as part of her house.

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[71] Juneau's Historic Neighborhoods - Starr Hill , 8

[72] Chicken Ridge Neighborhood, 203.

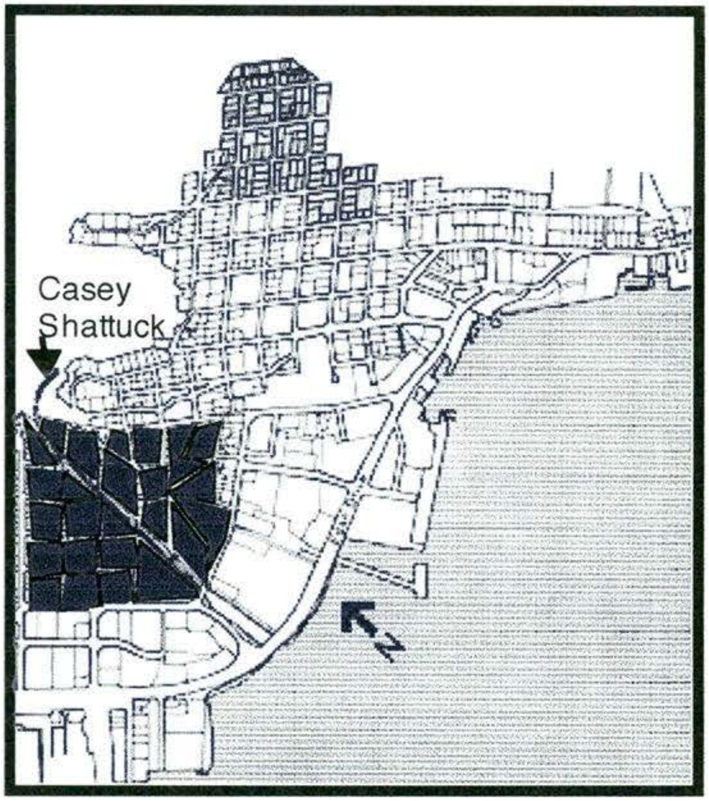

FIGURE 9. Location map of Casey Shattuck Subdivision.

The dark area in Figure 9 was originally a cow pasture situated on the tidal flats. It was part of the Calhoun Dairy.[73] At the beginning of the century this area was isolated from the rest of Juneau. The construction of Willoughby Avenue in 1913 gave the area accessibility. At that time, it was converted into a new subdivision called the Casey Shattuck. David Stone, author of Hard Rock Gold, believes that the largest Alaska-Juneau Mine impact on housing in Juneau was in this district:

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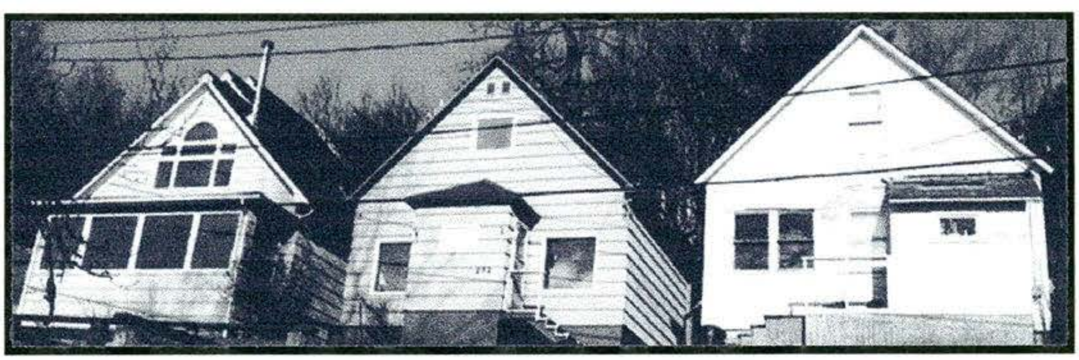
[73] Davis, N. pag.

> The real influence you see of the AJ miners and the construction is in the area near the Federal Building. Almost all of those flats houses are AJ employee houses. If you go along 12th street heading towards Willoughby almost all of those houses along there are AJ houses, as are most of the houses on the flats.[74]

As Stone note, houses located in the area had the same type of simple architectural design, though they were a bit larger than houses designed for single miners. This was an area of town where miners tended to move after they married, started families, and decided to settle permanently in the area.[75]

The housing needs of the Juneau miners were for simple, utilitarian, small, well built homes. The demand for this type of housing led to a prevalence of architecture which reflect these criteria. Craftsman Style Bungalows, mentioned earlier, followed this formula. Another style of architecture built during the AJ mining era is simply known as "Juneau Miner." These houses were built from one common floor plan which was shared among builders.



[74] David Stone, personal interview, 25 March 1999.

[67] David Stone, personal interview, 25 March 1999.

FIGURE 10. "Juneau Miner" style houses on 6th Street.

Like the Craftsman, these were also one and a half story houses and were built with consideration to functionality. These houses were steep pitched, front gabled, and had an entry porch.[76] Many home owners have made slight changes and additions through the years, giving these once tract houses a distinctive charm their builders had not originally intended. Their age and connection with Juneau's mining past make them an important part of Juneau's landscape. Perhaps the best place to see examples of the Juneau Miner style of architecture is along Sixth Street, shown in Figure 10, where the style is represented by a number of the houses.

Electric Power

The Juneau mines left the City a legacy through their quest for electrical energy. Juneau still acquires a large amount of its electrical power from facilities originally constructed to generate power for mine operations. Hydro-electric facilities built during Alaska's gold mining rush went against most notions we have today of the technology possible in that era in remote Alaskan locations. In Hydroelectric Power in Twentieth Century Alaska, John Whitehead explains:

[76] Juneau Townsite Historic Building Survey, (Juneau: City and Borough of Juneau, 1988) 1.

> In the first two decades of the 20th century, it could easily be said that technology in Alaska reached a state of the art level for small hydro plants unsurpassed anywhere in the world.[77]

The Salmon Creek and Annex Creek dams are holdovers from these mining days.

While these dams were not originally built by the Alaska-Juneau Mine, they were acquired from the Alaska Gastineau Mine after it failed in 1921. One of Juneau's leading historians on the Juneau mines, Earl Redman, feels the history of these two mines are undeniably intertwined, as the Alaska-Juneau took over most of the Alaska Gastineau Mine workings after its shutdown: "The history of the Alaska Gastineau Mine is really the history of the AJ."[78]

Salmon Creek and Annex Creek Dams[79]

Finding quality sources of low cost energy was a top priority of those who ran the early mines in Juneau. The enormous mining operations required considerable electrical energy and locating sources to fulfill these demands proved difficult. The mines were not, however, looking for short term solutions to this problem. There was a great deal of optimism at the start of the century as gold deposits were large - there seemed to be no end in sight to mining.

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[77] John Whitehead, Hydroelectric Power In Twentieth Century Alaska: Anchorage, Juneau, Ketchikan and Sitka (Fairbanks: University of Alaska Fairbanks, 1983) 15.

[78] Earl Redman, personal interview, 24 March 1999.

[79] It should be noted that the man behind both of these projects was mining engineer Bart Thane (1879-1927), who at one point controlled six of the mines in the Juneau area. Many of the mining legacies in the Juneau can be directly attributed to Thane.

The mines wanted a source of energy that would be cheap in the long term even if it meant substantial initial capital costs. Salmon Creek Dam was an enormous accomplishment for the age in which it was built. It was begun in 1912 and finished in 1914. The dam is 172 feet high and 648 across. It is a variable radius arch dam, also known as a thin arch dam, and was the first of its kind in the world. Today there are hundreds of dams world-wide designed after the Salmon Creek Dam.[80] From an energy standpoint, the Dam was a success. It remains as a legacy to the optimistic enterprises which took place over 85 years ago, long outlasting the industry it was meant to support. It still provides 13% of Juneau's power and is the lowest cost energy producer in the state. Hiking up to the dam, it seems to crawl out of the wilderness, appearing suddenly and reaching skyward. It is difficult to believe that such a feat as building this dam in a remote location could have been accomplished so long ago.

Annex Creek Dam was an equally impressive accomplishment. The creek site on Taku Inlet, approximately 12 miles from Thane, was discovered in April of 1915. By December of that same year the entire structure was complete.[81] Like so many leaps in mining technology which took place in Juneau during that time period, the Annex Creek Dam represented another first in world accomplishments. It was the first time ever that a lake was tapped via

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[80] David Stone, personal interview, 25 March 1999.

[81] David Stone, personal interview, 25 March 1999.

tunneling underneath without actually draining the lake.[82] Moreover, the dam was separated from the Alaska Gastineau Mine workings by a mountain range, making the establishment of transmission lines a major feat in its own right.[83]

Today, like the Salmon Creek Dam, the Annex Creek facilities have long outlasted the mines which used it. It currently provides Juneau with 10% of its power needs. After the acquisition of these utilities from the Gastineau Mine, the Alaska-Juneau was the sole producer of electric power in the Juneau area, and this would remain the case until the transfer of the facilities many years after the close of the mine. Both dams were passed on to Alaska Electric Light and Power Company (AEL&P) in 1972. This transfer, and the controversies which surrounded it, are a story in themselves.

AEL&P had desired to purchase these facilities at a much earlier date. AJ decided to hold onto them, continuing to charge for the energy derived from the dams. These charges were thought by many to be "excessively high wholesale power prices,"[84] and many bitter feelings arose during this period. When the transfer finally was made in 1972, the condition of the dams was said to be in complete disrepair. Whitehead charges that the AJ should not be given credit for keeping up the dams, but instead should be held responsible for the

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[82] Earl Redman, personal interview, 24 March 1999.

[83] Whitehead, 22.

[84] Whitehead, 31.

fact that more of the old hydro-power facilities were not looked to as a source of power in Alaska:

> Probably the most important factor in tarnishing the image of the older facilities was the lack of care given them by AJ Industries after 1944 and the battle that company waged in the early 1960s with the local Alaska Electric Light and Power Company.[85]

Vice-president and General Manager of AEL&P William Corbus Jr. felt at the time that the transmission lines were worth more to his company than the generating facilities.[86] However, when AEL&P's modern power source, the Snettisham, began to cause it problems, it looked again to the old dams, and thought they might be up to the challenge of providing energy for a modern Juneau. The Annex Creek and Salmon Creek Dams are today the lowest cost power producers in the state of Alaska. The ingenuity and future thinking of the engineers of the past allow Juneauites a significantly smaller electric bill than would have been possible without the construction of these dams.[87]

Power Grid Layout

It is not only the dams themselves which still provide a service to the town, but also the infrastructure developed by the mines to transmit power from the dam to the mills. The location of power lines established 80 years ago and their perpetual right-of-ways remain a vital part of the Juneau electrical grid.

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[85] Whitehead, 30.

[86] Whitehead, 34.

[87] David Stone, personal interview, 25 March 1999.

Perpetual easements are a difficult thing for a town or power company to obtain after a city has been established. David Stone explains how Juneau benefited a great deal due to the timing and magnitude of the mining power projects:

> The community could not have afforded the system - it would not have been nearly the quality nor the reliability. Juneau just did not have enough users to justify putting in a large system. It would have had a very small system which gradually would have been expanded, but the problem is when you expand a system to try and get a right away it would have been difficult if not impossible. The cost would have been horrendous.[88]

Moreover, as multiple mines were using the same sources for power, two power lines rather that one were often laid out to a single location. David Stone, who worked for 10 years at Alaska Electric Light and Power (AEL&P), knows first hand how shared power sources with separate power lines went on to benefit the community:

> If any one line goes down the other line can carry the entire community and switch it around. Because of the redundancy of the lines they are able to take big sections out and work on them to make repairs or whatever without us having to lose power.[89]

The overall power grid that was established early on has proven to be excellent. Had it been necessary for the town to establish a separate power system from the mine it would not have achieved the same quality. Juneau simply could not have afforded the same technology and high class performance electrical

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[88] David Stone, personal interview, 25 March 1999.

[89] David Stone, personal interview, 25 March 1999.

workings which were so essential to the mines.[90] However, with the help of the mine, Juneau's power structure was world class.

Energy plays an important role in all communities. Juneau was put in the fortunate position of needing to grow into its electrical system, rather than having to establish power sources and power lines as the community grew. This spared Juneau a great deal of expense and difficult choices in infrastructure placement. As a result, Juneau had a power grid that rivaled much more sophisticated cities. While Juneau no longer relies on the old mine workings for all of its power, the Salmon and Annex Creek dams exist as a living legacy to the early Juneau mines. Each light that shines in Juneau does so in part, through the continued use of power structures originally established to extract gold from Juneau rock more than eighty years ago.

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[90] David Stone, personal interview, 25 March 1999.

CHAPTER IV

THE IMPACT OF TAILING AND WASTE ROCK USE AND DISPOSAL ON THE JUNEAU AREA

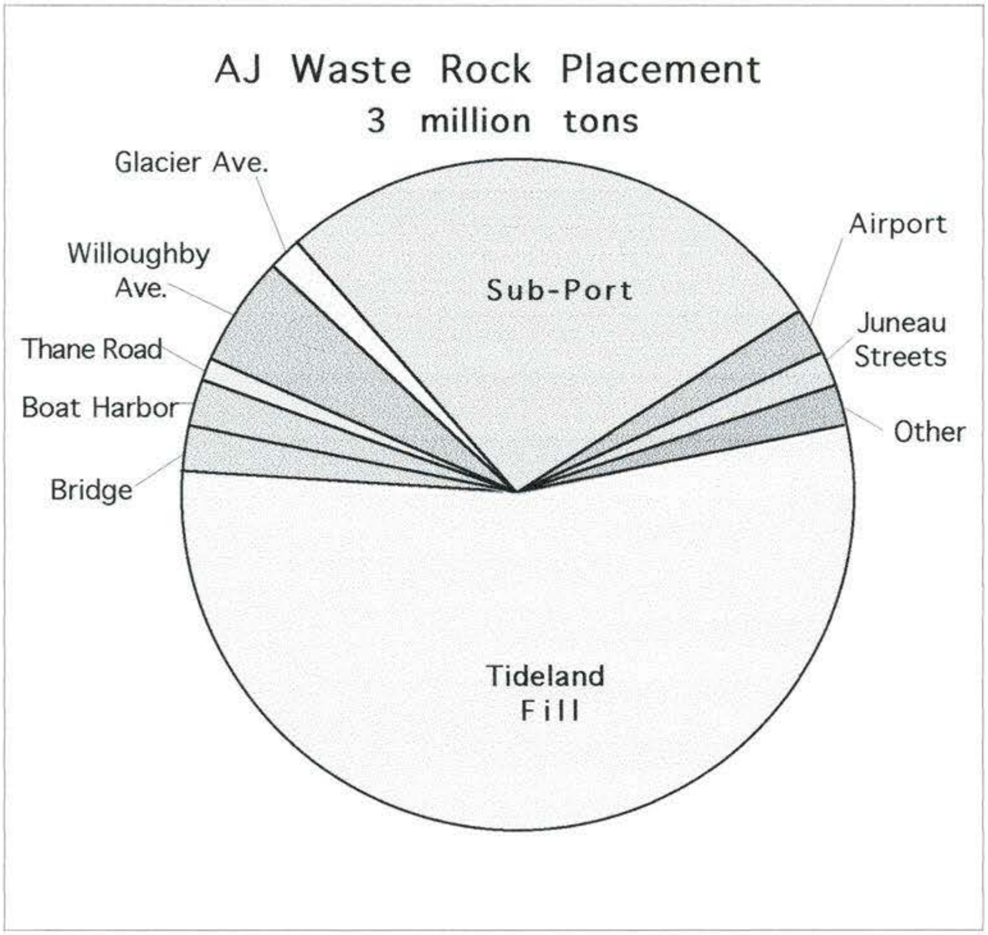

FIGURE 11. Graph showing use of AJ rock. This graph was compiled using data from several sources. Some of the percentages are approximate.

As indicated earlier, the terms, "tailings" and "waste rock," refer to two distinct things. Waste rock is the unprocessed rejected ore which, after being broken up in the mining process, does not have a sufficient gold content to warrant running through a mill. Tailings are the sand-like remains of rock, pulverized in the mill with the gold and other precious metals extracted. It is only in recent decades that these terms have been given specific separate definitions. Prior to this time they were used somewhat interchangeably. They were also refereed to as fine and coarse tailings. The old Alaska-Juneau documents, including the contract with the City, do not always use the term "tailings" as it is used today, which may lend some confusion to this section. The contracts between the City and AJ talk of "tailings" being used for construction purposes. However, a small amount of tailings were used in City projects. The term as it was used in the contract refereed mostly to waste rock, as the terms are defined today.

In the AJ Mill, waste rock was actually sorted by hand, a method which was arrived upon after a bit of trial and error. The Alaska-Juneau finished construction of its mill in 1917. It was supposed have the capability to process 8000 tons of ore daily and was to be hailed as a world achievement in mining technology. Instead it was a disaster, able to operate at only 15% of capacity.[91] The mill simply could not handle the high quantities of ore run thought it because the Juneau rock was much harder than that for which the mill had been designed. This caused the machinery to quickly wear out. Slowly corrections were made in the flawed conceptions and design of the mill. One of the many solutions was to reduce the tonnage processed in the mill by having

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[91] Stone, Hard Rock Gold, 61.

workers remove rocks one by one as they came by on a conveyor belt. Rejected rock became Alaska-Juneau waste rock.[92]

Tailings were the end result of the rock put through the mill. Judge Tom Stewart worked in the Alaska-Juneau Mill in his youth and watched ground rock divided into several parts:

> If you looked at the stuff on the table you could see a fine yellow line that went into one of the pipes and that was gold. Another line was a blue gray metallic looking material that was maybe an inch wide and that went into the second pipe and those were concentrates, an amalgam of lead, zinc, and silver and that was shipped in heavy sacks to a smelter in Tacoma. After that everything was waste. The fine waste went out to the rock dump.

The fine waste that Stewart talks about is the tailings. The tailings created in this process made an excellent material for pipe laying, as it contained no sharp jagged rocks which might pierce a pipe.[93] Though some tailings were deposited in the Juneau Rock Dump, most of the tailings "ended up on the bottom of the Gastineau Channel."[94]

It was the rock that turned out to be the building material of choice, and the building block of Juneau Alaska:

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[92] Judge Tom Stewart, personal interview, 24 March 1999.

[93] Joanne Quigg, personal interview, 25 March 1999.

[94] David Stone, personal interview, 25 March 1999.

> AJ waste rock has been used for the majority of construction and fill projects in Juneau for at least the last 70 year. The subport area, the federal building, in fact, all those areas westward of Willoughby Avenue are constructed on AJ waste rock fill. Wasted material excavated from the old mill area has continued to be utilized in local construction since shut down of the mine.[95]

According to the records of the Alaska-Juneau Mine nearly three million tons of AJ rock[96] were used in projects around town as is shown in Figure 11.[97] A bit of AJ exists beneath most of Juneau's downtown roads, under Juneau's sidewalks, in the foundation of many older Juneau houses. It is in Gold Creek,[98] it is in the harbor, and indeed, more than a third of downtown Juneau's business district is built on it. Anyone who flies to Juneau lands on it, anyone arriving by cruise ship embarks on piers held up by it. It is underneath, Old Glacier Highway, and Thane Road. It is underneath the High School, and the Harborview playground. In fact, it is such a prevalent building block of Juneau, that it would be practically impossible to avoid. The question then remains, what is it?

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[95] Frank Bergstrom, letter to Mr. David Dorris, "Responses to Questions generated on AJ project," 27 June 1990 (Juneau: CBJ, 1990) 12.

[96] 1,819,460 cubic yards

[97] EG Nelson, memo to JA Williams, 12 March 1945.

[98] "Gold Creek Rock Banks Repaired," The Daily Alaska Empire 13 October 1935: 3.

A Description of the Rock

The rock mined by the Alaska-Juneau Gold Mine was from a "local subdivision of the Coast Crystalline Belt" in the Juneau Goldbelt,[99] which is located about two miles east of Juneau.[100] This subdivision contains slate, schist, gabbro, metagabbro, and greenstone, which became AJ rock.[101] This rock is excellent for construction. It is a very hard rock, it does not absorb water, and structurally it is extremely sound.[102] Moreover, it does not break down, it compacts well, and it is not affected by wave action, a very important quality of tideland fill.[103] The waste rock ranges in size from 3 inches to 14 inches.[104] In other areas, rock such as this was intentionally mined for the sole purpose of construction. This was the rock the city of Juneau was given by the AJ Mine.

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[99] Versar Inc., 5.

[100] Frank Metzgar, "Geological Control of Mining in the Juneau Gold Belt," thesis, University of Notre Dame, 1942, 3.

[101] Metzgar, "Geological Control," 22.

[102] Joanne Quigg, personal interview, 25 March 1999.

[103] David Stone, personal interview, 25 March 1999.

[104] JA Williams, letter to CA Norris, "Notes of Government case," 19 July 1945.

The Use of Rock Fill in Juneau

Tidelands Fill

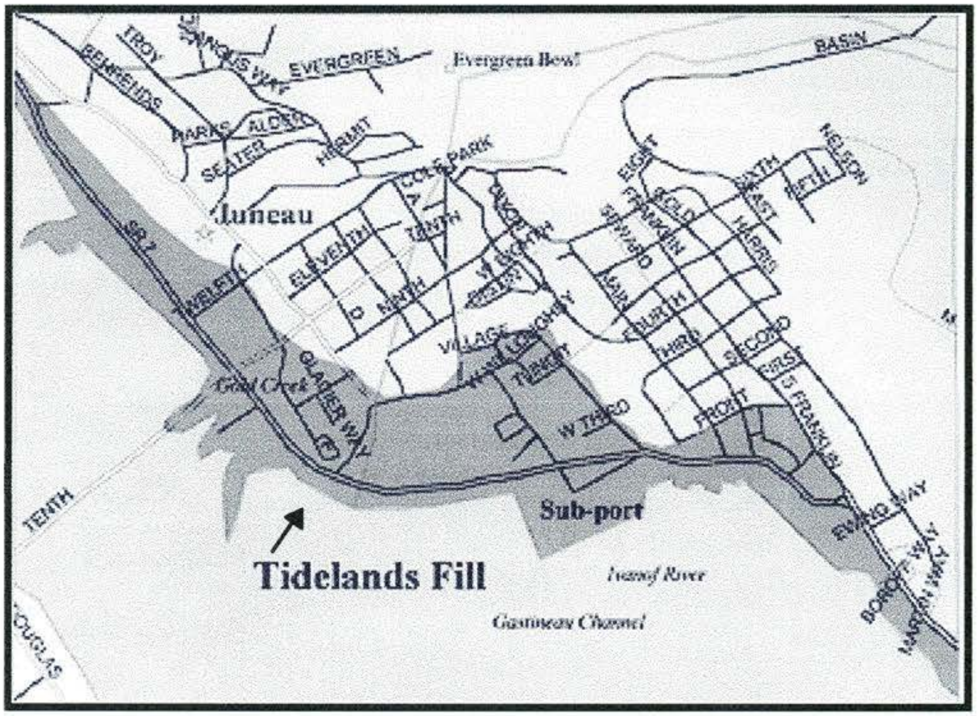

FIGURE 12. Map of Juneau: Dark area shows tideland fill.

The most dramatic impact of the Alaska-Juneau was the use of waste rock to alter Juneau's shore line (see Figure 12). At the time of settlement, Juneau was characterized by long tidal flats and the meandering river delta of Gold Creek, both of which are now buried under thousands of tons of fill. Alaska-Juneau waste rock was placed between high tide and low tide across approximately two miles of shoreline.[105] The 1910 photograph in Figure 13,

[105] "Tidelands Bill is Sent By Delegate," The Daily Alaska Empire 1 February 1916: 6.

gives the viewer an idea of the original contours of the shoreline, and how high the coast line really was prior to tideland filling.

FIGURE 13. 1910 view of Juneau looking across the channel to Douglas.

There were two distinctive motivations behind filling the tidal flats. The initial incentive to fill the tidelands was related not to obvious space limitations in the area, but to something else entirely: Bad smell. It was the waste of so many individuals that was a major concern of the early community as population grew.[106] Juneau, as a rapidly built mining village, had focused very

[106] "To Locate a Mine Station in this Town," The Daily Alaska Empire 26 March 1915: 4.

little on the infrastructure of waste and sewage removal while constructing the town. Passion and energy was spent chasing gold, rather than concentrating on planning details for the town. The favored disposal method of waste at that time was simply to throw it in the ocean. Unfortunately, the long tidal flats seemed to be a magnet for all that waste at low tide. A 1915 local news article explained that something had to be done about the problem:

> The proposal was to cover the entire beach to a depth of two feet or more at once to do away with the stench which is constantly arising from the filthy sewage which has washed back and lodged there.[107]

By June the AJ mill was already delivering 500 yards of rock per day to the project.[108]

There were other benefits which could be gained by filling the tide lands aside from odor control. The population of Juneau was increasing rapidly and downtown had little room in which to extend.[109] In the decade between 1910 and 1920 the number of individuals living in Juneau increased by almost 100%.[110] Space was needed to accommodate the new comers as well as the growing needs of the mining industry.

As one can see in Figures 12 and 13, the former Juneau shore line used to run along South Franklin Avenue until Franklin joins Front Street. It then

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[107] "Another Step Taken Toward Downtown Fill," The Daily Alaska Empire 18 April 1915: 8.

[108] "Tideland Fill Start Right Away," The Daily Alaska Empire 6 June 1915: 5.

[109] "Tidelands Bill is Sent By Delegate," 6.

[110] George Rogers, Alaska in Transition: The Southeast Region (Baltimore: Johns Hopkins Press, 1960) 350.

curved with Front Street and around along West 1st Street. In fact, the first canoes to reach Juneau landed on the Juneau beach near the site of the current Valentine building.[111] High tide would then run along the contours of the hill behind the State Office Building touching the bottom of the stairway that come down from Calhoun Avenue, slightly Northeast of Willoughby Avenue. It stayed behind Willoughby Avenue, running along Village Street, where Chief Kawa.ée's former Auk Village stood. This village, as can be seen in the Figure 13 photograph, used to sit directly on the shore, which is now a quarter of a mile away from the water.

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[111] "Waterfront of Juneau is Growing," The Daily Alaska Empire 24 December 1927: 11.

FIGURE 14. Photograph showing Auk Village prior to tidelands fill.

After Village Street, the former high tide land would continue until it reached the alley way that comes down beside where the tank farm used to be, meeting the Gold Creek Delta in what would now be the parking lot of the Federal Building. It would have continued to run just to the South of the Federal Building, curving just slightly below the junction of Glacier Avenue at 9th Street, approximately at the site of the present Gold Belt building, passing just the south of the Bill Ray Center. The shore line then continued to curve to the present intersection of 10th and F Streets. At this point it continues to follow F Street to its end. At this point the shore line would have continued on, nearly dissecting Harborview, Marie Drake, the Augustus Brown Swimming Pool, as well as Juneau Douglas High School, an area which was a pig farm prior to the time of filling.[112] It continued along this line past the boat harbors, which were artificially constructed at a later date, towards the point at which one can see it now, between Egan Drive and Old Glacier Highway.

It would be difficult to imagine Juneau today void of the areas which were filled in with AJ rock eighty years ago. "It would have impacted my day today," explained a snow boarder on her way to Eaglecrest in March of 1999, "I wouldn't have been able to eat breakfast at Channel Bowl this morning!" Although this statement may seem trivial, many of the businesses and developments which exist on the former tidal flats have become a part of the daily and weekly rituals of local Juneau residents. The State Office Building, Centennial Hall, Foodland Super Market, the Downtown Juneau Racquet Ball Club, Thibodeau's Liquor Store, Marine Park, the Fiddlehead Restaurant and Bakery, and the State Museum - all of these places are not just businesses and buildings to the people who live in Juneau. These places help shape the character of the town. Without the filled land these enterprises would have had to exist someplace else, perhaps in Lemon Creek or the Valley or not at all.

It is not clear what would have occurred without the tidelands fill, but the possibilities are endless. A population shift might have occurred to one of the various present day regions of modern day Juneau. What is clear is that downtown Juneau would not be recognizable today without the addition of several feet of AJ rock upon the tidal flats. It is somewhat ironic that these areas

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[112] Davis, N. pag.

were covered originally so Juneau's residents would not have to endure the terrible stench of their own waste which refused to be swept away forever into the ocean.[113]

The Filling of Juneau Streets

Before the advent of large successful mining companies, Juneau was a town of individualists who worked together to try to make their town livable. If someone claimed a town lot, he was required to do four hours of street work.[114] However, the roads created by these industrious miners soon became sloppy thoroughfares of impossible mud. Gravel from the beaches was tossed hopefully onto the mud to improve the situation, but this often succeeded only in creating a greater mess. In the late 1880's, as more horses arrived in Juneau and the streets became more trafficked, wooden planks were laid over the thick mud on the main roads to make them more passable.

This solution lasted until 1920 when the City Council authorized tearing up the planking on Franklin Street and adding AJ rock to a depth of 18 inches.[115] At this point in Juneau's history, horses were being replaced with automobiles which were not as well suited to the planked streets. At times loosely secured boards would swing up wildly when the cars bumped over

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[113] It was not long before a modern day system of dealing with sewage and waste replaced the "Channel dumping" method employed by early Juneau residents.

[114] DeArmand, Old Gold, N. pag.

[115] "City Projects Threatened by Man Shortage: Much Street Work Authorized," The Daily Alaska Empire 25 May 1920: 4.

them. The Council declared the wood planked streets to be, "unsafe for heavy automobile traffic," [116] and in 1926, the Juneau City Council decided to go a step further and pave Juneau's Streets. [117] The paving further necessitated the use of rock fill. The fill of choice was naturally the gratis AJ rock. The use of AJ rock to fill City streets continued for years. In the end, approximately 3.42 miles of Juneau's downtown streets were filled with AJ rock.[118]

Talk of filling Front Street with AJ rock began back in the summer of 1920, but it was to be a long time before the City acted.[119] Parts of Front Street, from the old sawmill to the old Alaska-Juneau tramway, were filled in March of 1927.[120] Lower Front Street, which would be named South Franklin in 1936,[121] was filled in late May of 1927. Front street filling began on April 20, 1928 and was completed ten days later after, according to the local newspaper: "Practically all available trucks in town were hauling for the city."[122] AJ rock was placed from what was then the City dock (at about the site of the current tram) to the Alaskan Hotel.[123] Ferry Way was filled with AJ rock on April 21, 1927.[124] Basin Road was also constructed using the waste rock from the Alaska-Juneau

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[116] "City Projects Threatened by Man Shortage," 4.

[117] DeArmand, Old Gold, N. pag.

[118] EG Nelson, memo to JA Williams, 12 March 1945.

[119] "Rock Fill on Front Street Being Planned," The Daily Alaska Empire 8 August 1922: 8.

[120] "Rock Fill on Front Street Begins Monday," The Daily Alaska Empire 5 March 1927: 8.

[121] People's Wharf Neighborhood: Lower Front/South Franklin Street (Juneau: City and Borough of Juneau Planning Department, 1986) 1.

[122] "Front Street Fill Completed Sunday," The Daily Alaska Empire 30 April 1928: 2.

[123] DeArmand, Old Gold, N. pag.

[124] "Rock Fill Started on Ferry Way Today," The Daily Alaska Empire 21 April 1927: 3.

Mine. The rock on these roads were covered with AJ sand to make the road less rough on the vehicles which traveled it.[125] It is difficult to assess just how much rock was used as the work was done by any local citizen who owned a truck. These men were paid 25 cents per yard of rock hauled.[126]

Work on the new and improved Thane Road was begun on August 14, 1931. At the time of its completion in September of 1932, it was called the finest stretch of highway in all of Alaska. The road was three and a half miles long, but it was its width that impressed everyone: At 24 feet across, it was the widest road in the Territory. Thirteen inches of AJ rock was spread over the road before its paving.[127] All told, nearly 18,000 cubic yards of AJ rock were used in the Thane road project.

Willoughby Avenue was first constructed in 1913. It began as a planked road built on pilings, reaching out into the channel. The maintenance of such a major road on pilings proved to be extensive, and the City council once again opted to take advantage of the free first-rate building material provided by the Mine. In 1933 the filling of Willoughby Avenue began. Willoughby was filled from Main Street to the bend near the ANB hall - a project which took 100,000 cubic yards of waste rock. In 1941 the fill was completed to just past the intersection of Willoughby and Capital Street.[128]

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[125] "Rock Fill Started on Ferry Way Today," 3.

[126] "Rock Fill on Front Street Begins Monday," 8.

[127] "Thane Section of Highway is Now Completed," The Daily Alaska Empire 22 September 1932: 8.

[128] DeArmand, Old Gold, N. pag.

Army Fill Projects

After December 7, 1941, the City of Juneau found itself amidst the hustle and bustle of a new industry: The military. Alaska's close proximity to Japan made it the site of much army activity and construction. The Federal Government was caught by the war without any defenses in Alaska, even thought Alaska was situated very close to both Japan and Russia.[129] The military worked feverishly to make up for that lack.[130] Juneau became a military base over night, and soon would have the infrastructure to prove it.[131] The War Department constructed a sub-port, an airport, and improved the road to the airport. All projects relied heavily on AJ rock.

The Juneau Subport was to once again radically change the face of Juneau's waterfront. Work on the project moved quickly. The rapid pace of activity was aided by the ready supply of building material offered up by the mine. The military assumed it had the same privileges as the City, and used AJ rock liberally in its projects without compensating the mine for the material. The subport would be one of the largest single uses of the waste rock at one time. The location and extent of the sub-port is shown in Figure 12.

The subport converted 10 more acres of ocean into waterfront land, and unlike the years spent in filling the 40 acres of Juneau waterfront, the subport

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[129] The distance between the United State's and Russia's closest islands is just 2 miles.

[130] JA Williams, letter to CA Norris, "Notes of Government case," 19 July 1945.

[131] Davis, Looking Back on Juneau, N. pag.

was built at a rapid pace due to the ready availability of the building material. Mine documents explain the operation:

> It was ordinary to place from 2,000 to 3,000 cubic yards of rock in 24 hours, and the fill was complete to where it could be used, within four months time...To have supplied a comparable filling for the sub-port construction in so short a time from any other source than the company's rock, would have been impossible.[132]

In the end, the subport used approximately 500,000 cubic yards of AJ rock in its construction. The subport is still under Federal control, and does not have on it the types of businesses that are common on the rest of Juneau's filled tidal area. However, its construction produced a permanent visual alteration to the coast line of Juneau.

The lack of an airport in Alaska's capital city was a major concern to the Federal Government, as water was at that point the only way to reach the City. Small float planes served the area before the forties, but more was needed to support the military Air Corps operations in Alaska. Plans for an airport quickly came underway. The US Army used what had until then been a large dairy farm on the Mendenhall flats as the site for the airport. Construction on the Juneau airport began in 1942, and would use a total of 39,225 cubic yards of waste rock.[133] After building the airport, the Army needed a more substantial road. The Old Glacier Highway, the only road to the airport at that time, was widened to accommodate military traffic. The road was designated a military

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[132] PR Bradley, draft of a letter to Honorable Robert P. Patterson, Under-Secretary of War, 18 Aug., 1945, 3.

[133] HA Kenyon letter to AJ Mining company 21 April 1944.

highway, and once again the operation used a significant amount of AJ rock in the process.

Today the airport is vital to Juneau, as there are few other ways to reach the town but by plane. However, the large development was clearly a project before its time. In 1964, it was named the "un-busiest" FAA controlled airport in the nation.[134] Juneau grew into its airport, however, and now it handles a rather large amount of air activity relative to its size.[135] There are many who will claim the airport was hastily and poorly placed. It is often weathered in, and in 1971, was the site of the worst aviation disaster to that point in America. One hundred and eleven people died.[136] None of this, of course, is directly related to the AJ, except that the readily available building material allowed the project to go forward very quickly, and gave the airport a solid foundation. Alaska-Juneau rock was also barged to Gustavus, a nearby town which had a much larger flat area, to help build a much larger airfield build there for the purpose of refueling large heavy bombers to Russian during the war.

Other Local Fill Projects

There were other projects which used rock from the Alaska-Juneau Mine as their main building component. Rock walls were popular in the town due to

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[134] Kelley, 90.

[135] Davis, N. pag.

[136] Kelley, 90.

the extreme slopes of many of the building sites.[137] The Juneau Rock Dump made such a good breakwater for the town that AJ rock was used again to create a small breakwater for the Harris Harbor, after it was created by dredging in 1937.[138] Many local residents took advantage of the gratis rock and used the AJ waste in the foundations of their home. The Badger residence at 126 West 7th Street recently discovered that its entire basement was filled with the rock.[139] Most of these projects were not even documented, and as the rock was so commonly used at the time, little notice was paid to many of the situations in which use of AJ rock played a role. However, some of the more significant contributions to the town and use of AJ rock were recorded, such as work to control flooding on Gold Creek, and the building of the Douglas Bridge.

Gold Creek, or Tscantiq'chini (meaning flounder) as it was called by the early Aaak'w, was crucial to the founding of the town. It was this stream that led the Aaak'w to the area in the first place, and this was the stream to which K̲awa.ée led Juneau's explorers to find gold. The town boundaries were usually defined as being South of Gold Creek in the early days.[140] However, this innocent looking creek turned out to be a source of real trouble when the rains came. On September 27, 1918, 6.32 inches of rain fell in a 24 hour period, an enormous amount by Juneau standards. During the storm, Gold

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[137] Davis, N. pag.

[138] Davis, N. pag.

[139] Marcia Badger, personal interview, 30 March 1999.

[140] DeArmand, Old Gold, N. pag.

Creek raged. Its delta swelled to a half mile in width, and as it rose onto its flood plains, it completely swept away six houses and a part of a hospital. The Alaska Daily Empire captured some of the scene:

> At times, the men were waist deep in the flood and floating debris...Strong men shouted, women screamed and became hysterical at the moment two of the houses went out, for at the moment one of the workers was knocked down by the force of the falling buildings and was seen struggling in the water.[141]

Amazingly, there was no loss of life during the flood, however, elaborate plans were quickly put in place to ensure such a situation would not be repeated. In 1920, construction began on a 200 foot long retaining wall, ten feet high on either side of the creek.[142] AJ rock was used as the construction material in this project. Today the creek is hemmed in by steep concrete walls. Its once wild flow patterns are strictly regulated. AJ rock thus provided material for flood control for nearby residents.

The Douglas Bridge, which was to finally unite Douglas Island and mainland Juneau, was completed in October of 1935, was one of Juneau's finest achievements to date, and once again, the use of AJ was critical to the project. The bridge itself was designed by O.H. Stratton, the same man who later would design the famous San Francisco Bay Bridge. Juneau's version was an early prototype. An incredible 40,000 cubic yards of AJ rock was used

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[141] "Much Damage From Floods in Juneau and the Vicinity and Homes are Swept Away," The Daily Alaska Empire 28 September 1918: 1-2.

[142] "City Projects Threatened by Man Shortage: Much Street Work Authorized," The Daily Alaska Empire 25 May 1920: 4.

in the construction of the rock-filled approaches to the bridge which connected the span to the existing roadways on either side of the Channel.[143] Though the bridge itself has been replaced by a more modern, less beautiful version, the rock itself remains in place.

The Impact of Waste Rock and Tailings Disposal

A great deal of fill was used in a variety of local projects throughout the years. However the demand for the AJ rock could not keep up with the vast quantities of waste being generated each day at the mine. The rejected rock and tailings were generated at a rate of up to 13,000 tons per day at the height of operation.[144] In 1925 alone, 1,700,000 tons (approximately 1,133,333 cubic yards)[145] were generated.[146] The entire need for waste rock in Juneau was equivalent to the rock generated by just two and a half years of mining operations. Most of the waste rock and tailings had to be disposed of in other ways.

Throughout the operation of the mine, nearly 90,000,000 tons of ore was mined.[147] Fifty-three percent of this was rejected immediately though the hand

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[143] "New Douglas Bridge Built With PWA Funds at Cost of $225,000 Connecting Two Gastineau Channel Cities," The Daily Alaska Empire 13 October 1935: 1.

[144] "How AJ Makes Its Tail Rock Disappear," Mining World August 1939: 15-16.

[145] I computed that to convert yards to tons is roughly 2:3, but a more exact computation might make this figure more exact.

[146] "Local Company Has Best Year in its History," The Daily Alaska Empire 1 January 1926: 1.

[147] JA Williams, internal memo, "Alaska Juneau Operations in Relation to Taxation," April 1944.

sorting process as waste rock.[148] After milling was complete, a large tonnage of tailings remained from the processing. Alternative methods had to be employed to deal with the mountains of waste material. These consisted of submarine disposal into the Gastineau Channel and the construction of a rock dump on the Thane Road.

The Juneau Rock Dump

> The dumping of tailings into Gastineau Channel has created a breakwater that furnished protection to the whole waterfront and creates a small boat harbor in front of the property of the company...If the mill were farther out and the breakwater farther from Juneau, it would not afford the protection it now does.[149]

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[148] Bradley, "Mining Methods and Costs," 6.

[149] "Metzgar Gives Mine's Reply in Tax Argument," The Daily Alaska Empire 8 December 1934: 1-2.

FIGURE 15. Photograph showing formation of the rock dump, early 1930's.

There are some who say that more than anything, it is the Juneau Rock Dump that remains as the most conspicuous reminder of Juneau's past, and one of the town's most valued assets. The rock dump was not constructed to benefit the town. Its advantages were accidentally found or discovered along the way. The dump was simply a means to dispose of the unwanted remnants of gold mining. This once dump site became more advantageous than any at the time imagined.

The Juneau Rock Dump extends 1,500 feet into the Gastineau Channel[150] and runs 2,800 feet along the Thane Road.[151] Its construction, shown in Figure 15, is described by David Stone in Hard Rock Gold:

> Rock in the waste piles slid to the bottom of the hillside where it was funneled into railroad cars and carried away. The waste trains were dumped at the beachline somewhat down-Channel, there to be distributed by another set of conveyor belts...[152]

Some claim that the real value of the rock dump is the gold content of hastily rejected rock. This claim has been disputed by experts,[153] but these individuals are not wrong about the value of the dump. Trevor Davis, one of Juneau's premier historians described the dump in the following manner: "The best deed accomplished by the mine for Juneau was the 'rock dump'... The rock dump is worth million of dollars to Juneau." [154] The Juneau Rock Dump contributed in two significant ways to the town of Juneau. It acted as a breakwater and it provided a location in Juneau to concentrate industrial activities. Prior to the creation of the rock dump, heavy storm activity which came up the Channel had a serious impact on Juneau. Large waves would come crashing in on the town at three to four feet high, [155] such wave activity today would make things more difficult for Juneau's many visiting cruise ships and visitors who reside overnight

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[150] JA Williams, letter to CA Norris, "Notes of Government case," 19 July 1945.

[151] Versar Inc., 4.

[152] Stone, Hard Rock Gold, 64.

[153] David Stone, personal interview, 25 March 1999..

[154] Davis, N. pag. .

[155] Judge Tom Stewart, personal interview, 24 March 1999.

on these vessels.[156] Thus the existence of such a breakwater provides tourists easier access Juneau.

The Juneau Rock Dump was converted into a golf course after the close of the mine. It was called the Million Dollar Golf Course based on the estimated value of gold which remained in the dump.[157] Over time, however, it was recognized that the Rock Dump had more value as a site of industrial activity. Today a great number of business that citizens would not normally want in close proximity to their neighborhood are located on the Rock Dump. These businesses include the sewage treatment plant, two tank farms, the GCI telecommunications site, and the Alaska Marine Lines barging company. David Stone recently discussed where these facilities would have been located had the Juneau Rock Dump never existed:

> It would have been scattered all over the place, not in a concentrated area. There used to be a bulk fuel tank farm in the middle of Juneau that was always a great concern. At one time there was a gas leak and people were evacuated. If that had gone off it could have been a catastrophic event for this community. By locating the tank farm far and away it would have had a significantly lower impact.[158]

While the Rock Dump provided locals numerous benefits, it was not a magical "waste sink" into which all rock could be disposed. As early as 1921

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[156] Judge Tom Stewart, personal interview, 24 March 1999.

[157] Bern Keating, Alaska (Washington DC: National Geographic Society, 1969) 52.

[158] David Stone, personal interview, 25 March 1999.

rock from the dump would simply "disappear" into the channel.[159] While speculation abounded as to the reasons behind the disappearance of the rock, little concern was paid to the phenomenon.[160] By 1928 it was realized that the rock movement was not due to aberrant currents, but that the rock was settling lower into the channel itself.[161] The immense weight of the rock was displacing the channel floor: "The weight of the tailings did strange things to the bottom of the channel, pushing it up at other points. Extension of the dumps eventually would encroach upon navigation."[162] Use of the rock dump could not continue if it were to have such consequences. Due to the concern for navigation safety, additions to the rock dump were not allowed during the last 10 years of the Alaska-Juneau Mine's life.[163] Submarine tailing disposal became the method of choice for eliminating the mine's tailings and waste rock.

Submarine Disposal of Waste Rock and Tailings

In 1934, self-dumping barges were brought in to handle the disposal of waste rock and tailings. Three of these state-of-the-art barges were purchased so the dumping operation could be continuous. As an internal mine document

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[159] "Many Thousand Tons of Waste Rock Take Dip," The Daily Alaska Empire 17 August 1921: 3.

[160] "Alaska-Juneau Rock Dump is Again in Bay," The Daily Alaska Empire 12 December 1921: 13.

[161] "Rock Dump Settles," The Daily Alaska Empire 5 March 1928: 8.

[162] "How AJ Makes Its Tail Rock Disappear," 15.

[163] Judge Tom Stewart, personal interview, 24 March 1999.

explained: "one for loading, one for towing and dumping and one for repair."[164] Each barge had a capacity of 700 tons of waste rock.[165] When it arrived at its dumping point, a valve would be opened causing the barge to flood and flip over, depositing its load into the Gastineau Channel. The barge was reversible, once it flipped over the water immediately drained and the barge was ready to be returned to shore and reloaded.[166]

Tailings were deposited in front of the mill, while the waste rock, which had more of a potential to encroach on navigation, was towed a few miles away from town before it was dumped.[167] Regulation regarding rock placement in the channel focused solely on issues of navigation. Rock had to be dumped at a minimum depth of 60 feet below water in the channel.[168] Little attention was focused on how these activities might be impacting the environment. These issues will be explored at a later point in this paper.

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[164] Lou Metzgar, memo to P.R. Bradley, "Waste Disposal," 6 June 1936.

[165] "How AJ Makes Its Tail Rock Disappear," 15.

[166] David Stone, personal interview, 25 March 1999.

[167] "How AJ Makes Its Tail Rock Disappear," 16.

[168] El Pease, Senior Engineer of US War Department to AJ Mine, letter to AJ Mining Company, 6 May 1944.

CHAPTER V

THE LASTING IMPACT OF FIRE PROTECTION

In accordance with the agreements with the City, the AJ Mine placed fire mains and hundreds of yards of iron piping along many of Juneau's downtown streets. A more than adequate supply of water would be available at all times, should the need for it arise. L.H. Metzgar, Superintendent of the AJ Mine explained the great need for the project:

> Such service as this would be entirely out of the reach of the City if they had to supply an adequate plant and pay for upkeep and operators wages. The measure of value is...what it would cost the City to duplicate and maintain it.[169]

However, the fire protection offered to the City in the agreement did more than just save the City the work and expense of developing a system of its own.

There had been several close calls in which water reservoir for fire fighting had run out during the fighting of a blaze.[170] Juneau was desperate for a better system with which to protect its town. In the years in which fire protection was provided by the Mine, numerous fires were successfully extinguished by Juneau's fire fighting forces, giving the Juneau Department a reputation for excellence. Juneau had the rare standing among early towns of

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[169] "Metzgar Gives Mine's Reply in Tax Argument," The Daily Alaska Empire 8 December 1934: 1+.

[170] Davis, N. pag.

never having a fire beyond the building in which it began.[171] The most notable of these were the Heidelburg Saloon, the Coliseum Theater, and the Goldstien Building.

The Heidelburg fire was in 1923. It was a building on the South side of Front Street, between the old Ace Hardware building and the Imperial Bar. Fortunately for the Heidelburg, a pair of the AJ fire hydrants had been installed in accordance with the 1916 contract on Front Street, thus water for fighting the blaze was easily procured.[172] Two fire hydrants were installed at each of several locations, one red one and one green one. The red hydrants contained fresh water, which for the most part was only available in the summer, and the green hydrants provided salt water, necessary for use during the winter months as salt water does not freeze.[173] The buildings surrounding the Heidelburg were in great danger during the blaze, but due to benevolent weather conditions, AJ's water, and the Juneau Fire Department, they were saved.[174]

Goldstien Hotel, located on the corner of Seward Street and Second Street where Stallone's' is now, burned on February of 1939. This fire has been described as one that might have wiped out much of what is now Juneau's historical district.[175] The Goldstien building was a bit more modern

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[171] Davis, N. pag.

[172] Joanne Quigg, personal interview, 25 March 1999.

[173] Judge Tom Stewart, personal interview, 24 March 1999.

[174] DeArmand, Old Gold, N. pag.

[175] Davis, N. pag.

than other building in the area at the time as it had a cement outer shell. Concern of fires had led to a new phase of building "fire proof" buildings out of cement, some of these new designs were drafted with the aid and expertise of AJ's highly educated engineers.

The fire began in the basement, and because it was thought that this fire would be contained within its outer, inflammable shell, it had been the plan of the firemen to just let the fire burn itself out. However, the wooden elevator shaft had been overlooked, and several hours later the flames exploded up the shaft.

> There were at least twenty streams of water pouring into the inferno as well as the hosing down of surrounding buildings...Since the Fire Department incorporated the AJ mine salt-water system on fires in that period, the firemen were able to put salt-water streams on the fire all day.[176]

This fire too was eventually put out, but this is almost difficult to believe considering photos taken of the fire. Flames leapt into the sky three times the height of the building, and out of windows. Neighboring buildings are snuggled up close. It is truly a fire that could have taken the whole town with it.

A third fire was in the Coliseum building, which was located at the current site of the Eastaugh-Bradley Building between Ferry Way and Front Street. At the time it was a movie theater owned by W.D. Gross with a seating capacity of 1000. Attached to the Coliseum was an apartment building. The fire was to leave 19 families homeless and cause a major dent in the entertainment

[176] Davis, N. pag.

options for Juneau.[177] This fire occurred in 1946, two years after the closure of the Mine. However the Mine was still being operated by a skeleton crew, and all of its facilities for fire fighting were still in use. These were by no means the only fires. Juneau was at times inundated with accidental flames. As Trevor Davis explains it: "One November day in the second decade of this century, there were fifteen fires in a twenty-four hour period, mostly roof blazes."[178]

With the help of the elaborate system of fire mains, and Juneau's industrious firefighters, Juneau's historical center remains almost completely intact. Photos taken now compared to those taken more than 85 years ago are nearly identical. Within the 160 acres of Juneau's original downtown, "there are still at least 60 buildings standing built before 1904 and 143 more that were built before 1914."[179] Such a statistic can not be matched anywhere else in Alaska. A Juneau edition of the Alaska Geographic discusses this fact:

> The town's heritage survived through the diligence of the Juneau Volunteer Fire Department, which saved the city from the sort of conflagration that erased history in so many Alaska towns.[180]

It is possible that Juneau would have come up with its own form of fire protection had the AJ system not been made available. However Metzger was correct in saying that Juneau did not have the resources at that time to operate a comparable system.

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[177] Davis, N. pag.

[178] Davis, N. pag. .

[179] Croft, Touring Juneau, 3.

[180] Keating, Alaska, 52.

Juneau simply would not be Juneau without its old buildings and rich, visible history. A fire would not only have changed the look of downtown, it would have significantly lowered the current visitor draw of the town. Juneau's downtown has a rich history full of interesting tales, mystery, and intrigue. Visitors shop in stores which used to be brothels in the days of mining and some of the bars which served AJ's thirsty miners more than a century ago, still serve beer. Tourism is now one of the City's leading industries, second only to government. The impact which the loss of those buildings would have had on tourism is difficult to judge, but can be assumed to be significant.

CHAPTER VI

THE INDIRECT LEGACIES OF THE AJ UPON JUNEAU

Tourism

Tourism grew in Juneau alongside the mining industry. In the early part of Juneau's existence, Juneau was one of the favorite stops on the Inside Passage Alaskan boat tour. Tourists marveled at the biggest and world firsts of the area's mining industry. Today tourists still come, and in ever increasing numbers - more than a half million each year.[181] Most arrive by boat, and at times there are more cruise ship passengers in the City than local residents. Juneau experiences an incredible 500 or more ship landings during the summer months. It is a destination in high demand:

> The cruise ship industry rates Southeast Alaska second only to the Caribbean in market appeal, and a recent poll of passengers rated Juneau the fifth most popular vacation destination in the world.[182]

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[181] The Capital Profile: A Biannual Report on Economic, Social and Environmental Measurements of Sustainable Community Indicators (Juneau: Juneau Economic Development Council 1998) 3.

[182] Kelley, 16.

Though it is the scenery which brings them, it is the stories of the mining past which intrigues them and make Juneau a bit more special than other Alaskan cities in Southeast. Juneau's mining past has become an integral component of the Juneau tourist industry.

This is especially true of AJ. Its now burned out and abandoned mill sits very close to where the tourists disembark from their cruise ships. Tourists take the Juneau Tram over this formerly magnificent structure up to Mount Roberts. In fact it is tourists, more than Juneauites themselves, who are better versed with many of the specifics of Juneau's mining past. The history of the AJ has become a commodity to sell. Actors dress up in miner clothing of 100 years ago and tell the tales of prospecting to cruise ship crowds. Tourists are also drawn to the old AJ Jualpa Mining Camp at the end of Basin Road with its mining museum and many old mining relics. Without the history of the AJ, the town would had less with which to lure visitors.

Juneau's interest in gaining a foothold in the tourism industry resulted, slightly, in Juneau going back in time. By the late 1960's, Juneau's downtown had depreciated into dirty bars and drab colors. In the seventies it was decided that this image must be altered to draw more tourists, and especially to attract return visitors. Rather than modernize the town, the decision was made to go backwards. A 1974 Juneau city survey asked, "Should downtown Juneau strive for an historic tourist oriented image?" to which 82% of responders said yes.[183]

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[183] Goals for Juneau: Publication of the 1974-1995 Goals for Juneau Questionnaire Results. (Juneau: City and Borough of Juneau, 1974) 18.

Due to excellent fire protection, the buildings of the past were still intact and in place. The former false fronts were cleaned up and painted. Bright colors and olden day clocks changed the town, giving it a nearly identical appearance to what it had in the Juneau teens. Juneau's looks were returned to a time when the AJ was king, and the town reeked with prosperity. The look worked, and tourism is now Juneau's second leading industry.

However, tourism is tied to the AJ mine in more ways than providing a pretty city with an interesting past. All of the facilities which the cruise ships use to dock were created with a foundation of AJ rock. Since the town was extended beyond the long shallow tidal flats, cruise ships can dock directly in the town of Juneau. Moreover, most of the tourist trinket shops and easy walking tours, are located on filled land. It is not uncommon for a tourist to get off the ship and walk from the dock to several of the stores in Juneau, stop for coffee, then perhaps sit on a bench in the sun, and then return to the ship while not once standing on land that existed before the AJ rock was used to fill the land.

Tourism, for better or worse, has proven to be a mainstay in Juneau's economic livelihood. Cruise ship spending alone constitutes more than 6% of the local cash economy. [184] Juneau has shaped itself to be more attractive to the hordes of travelers, while at the same time suffering the consequences of a tourist industry that has grown too large. Many complain that tourism's original

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[184] The Capital Profile, 3

benefits have in fact become eclipsed by an inordinate amount of tourists, reducing the overall quality of life for local residents.[185] Whatever the ultimate verdict is on the variable benefits of tourism, it is clear that mining history is a great tourist draw. As long as tourists are drawn to Juneau by the mining days of yore, that mining past will be preserved and exploited to capture the tourist dollars.

Trails

Juneau is a town that is known for, among other things, its beautiful and accessible outdoors. There are over two dozen trails in the area providing more than 130 miles of hiking.[186] The trails are used by the area's many outdoor enthusiasts for hiking, biking, camping, and running. The great services these trails provide to the town are easy to take for granted without questioning how they came to be in the first place. Nearly all of Juneau's trails are relics of Juneau's mining past. Though few were directly constructed by the Alaska-Juneau Mining Company, it was the long life of the mine which led to the continued use of many of these trails. By not allowing these trails to fall into disuse and become overgrown, as happened to many of Juneau and Douglas's original paths and roads, the AJ became responsible for the continued existence of many of Juneau's favorite get-aways.

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[185] The Capital Profile, 3.
[186] Kelley, 16.

Perseverance Trail is Juneau's most popular trail. It is excellent for running and mountain biking. It is accessible and moderate enough in difficulty to serve the needs of most visitors coming to Juneau in search of a day hike. It also leads to a number of more difficult trails and interesting side trails, such as Mount Juneau Trail, Granite Creek Trail, Ebner Falls, and a Glory Hole.[187] The trail begins at the end of Basin Road, near the old Jualpa Mining Camp. Depending on recent storm activity, it is a 3.5 mile trail leading to the remains of the Alaska Perseverance Gold Mining Company.[188] This mine was taken over by the Gastineau Mining Company, which was in turn taken over by the AJ.[189] The Granite Creek Trail leads up to one of the first places at which Joe Juneau, Richard Harris, and K̲awa.ée found gold. The Glory Hole connects via tunnel to the AJ. Tom Stewart, who came to Juneau in 1919, explained that in his view, "All of that wouldn't be there but for the mine."[190]

Dupont, a one and a half mile trail which begins at the end of Thane, leads to the remains of a an enormous dock. It ends at a perfect beach for a picnic or stone skipping. The trail was originally a road which led to a powder magazine and wharf owned by Dupont Powder Company, who stored dynamite

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[187] A Glory Hole is a large open pit which remains after the extraction of ore.

[188] Janes,10.

[189] Stone, Hard Rock Gold, 8.

[190] Judge Tom Stewart, personal interview, 24 March 1999.

there. The dynamite was originally used by all the Juneau mines until their closures early in the century. After this it was used almost exclusively by the Alaska-Juneau Mine until the end of its operations.[191]

Sheep Creek trail is a 3 mile trail that begin about 4 miles out on Thane Road. The trail leads past several ruins of the Alaska Gastineau Mining Company (AGMC).[192] After the AGMC's eleven years of successful operation, it was integrated into the Alaska-Juneau Mining Company.[193] The Salmon Creek trail was also originally due to an AGMC operation - the construction of the Salmon Creek Dam in 1914. When it shut down six years after the completion of the dam, the hydro-power was taken over by the AJ which controlled it until 1972. The 3.5 mile trail begins across Egan Highway from DIPAC,[194] and leads to the dam, which is still being used today.[195]

The Christopher Trail leads from Evergreen Bowl,[196] across Gold Creek, and meets up with the flume (which stretches from Basin Road to Evergreen Avenue.) Evergreen Bowl used to be a placer mine, and the trail leads along some old mining ruins. Evergreen Bowl also became part of the AJ, until it was given to the City to be used as a park in 1905. There are a number of other

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[191] Janes, 2.

[192] Janes, 13.

[193] The Gastineau Mining Company ran from 1910-1921. Its mill used a technique that only worked on dry ore. A tunnel blasted for the mine came too close to a lake which drained into the mine. The mine could not process the wet ore, and was forced to close its doors.

[194] Douglas Island Pink And Chum - a local hatchery.

[195] Janes,12.

trails in the Juneau area which at one time or another led to areas owned and operated by the Alaska-Juneau Mine, such as the Nugget Creek Trail and the Treadwell Ditch.

Juneau simply would not be Juneau without its vast network of trails. Juneau's children grow up exploring lost mining remains on the outskirts of these trails. They provide ample space for Juneau's very athletic community to run and hike, and allow scenic views on sunny days for tourists and locals alike. Pushing new trails into wilderness is not an easy task. Plans to do so erupt in political and environmental debates. Funding of new trail projects is also difficult to obtain. Juneau has experienced a great deal of difficulty simply in securing funding for the upkeep of existing trails. Echo Bay, which considered re-opening the AJ, and nearby Greens Creek Mine both have put resources and manpower towards keeping Perseverance trail passable when the City could not. Even now, Perseverance trail stops abruptly a mile from its historical ending. Little has been done to repair this. The development of new trails is not likely to occur under such constraints, especially trails that could rival the trails Juneauites may now enjoy because of historical circumstances, the Alaska-Juneau, and the quest for gold.

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[196] Most people now know this as "Cope Park," though this name refers only to the playing field, tennis courts, and swing sets. The greater area is still Evergreen Bowl.

Tunnels/Drinking Water

Tunneling played a major role in the development of the mine. As engineer/president P.R. Bradley explained in 1929: "On the average, 12,000 feet of tunneling and raising and 46,000 square feet of undercutting are completed in one year."[197] Today 108 miles of horizontal tunnel remain. The tunnels are lonely places, visited by few. However today, the tunnels contain something equal in value in some ways to the gold once removed from them - drinking water. Few in Juneau realize the relationship between Juneau drinking water and the old Alaska-Juneau Mine. Juneau's local water supply is still taken from the watersheds which were most heavily utilized by the Alaska-Juneau Mine. Ninety percent of all Juneau drinking water comes from Gold Creek and Salmon Creek.[198] In fact, both of these properties used to belong exclusively to the Alaska-Juneau Mine. The entire 3000 acres of the Gold Creek water shed was sold to the City in 1973 for a mere $18,000.[199]

While the infrastructure for obtaining and treating this water is no longer tied to the ancient mine workings, the many developments in these areas in the past can not help but make an impact. Much of Juneau's early mining activity took place adjacent to Gold Creek. Tunnels were built, glory holes developed, and Gold Creek water was diverted for a variety of gold mining purposes.

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[197] Bradley, "Mining Methods and Costs," 7.

[198] Alaska Department of Community and Regional Affairs, 1999 Juneau Statistics.

[199] David Stone, personal interview, 25 March 1999.

Currently 20% of Juneau's drinking water from Gold Creek runs through the old tunnel network. David Stone explains the origin of the water:

> Water come from surface flows that come down into the old glory hole and works its way out though drainage tunnels. The old glory hole is high up on the hillside where past mining activity occurred. When the snow melts or when it rains water goes into the glory hole, and then out a drainage tunnel that was built in the 1930's.[200]

Another tunnel, tunnel number three, has been plugged with concrete on either side and is used to store water. It goes from the AJ mill to Jaulpa Basin. It holds City water so that if City wells are down, several million gallons are available to fight a fire or deal with other emergencies.[201] Tunnel No. 3 is 2,200 feet long and holds several million gallons of water.[202] It is Juneau's back up water reservoir.

The relationship between Juneau's water supply and the tunnels has generated some local concern. Tourism is not allowed through the old mining tunnels in order to limit interaction between the drinking water and human activity, but the concern goes beyond that. Skip Grey is the head of "Alaskans for Juneau," an organization which opposed recent efforts to re-open the mine: "It worries me that there will be some sort of collapse that will stop the water, and then break out and wash out God knows what into our drinking supply."[203] In reality, the re-opening effort of the mine by Echo Bay led to a thorough

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[200] David Stone, personal interview, 25 March 1999.

[201] David Stone, personal interview, 25 March 1999.

[202] Redmen, History of the Mines, 80.

[203] Skip Grey, phone interview, 2 April 1999.

cleaning up of the old mine tunnels in which many rather dangerous remnants of the mining years were discovered, making them a much safer place for the City's drinking water.

Social Considerations

Juneau, once built by the waste rock of the Alaska-Juneau Mine, is still populated by its descendants. A large number of those who moved to Juneau to work at the mine stayed after the mine closed and made Juneau their home. Though a rather un-scientific examination, by comparing a list of persons employed as miners in 1935, to a current Juneau phone book, more than a third of the last names are still represented in the population of Juneau today.[204]

Those employed by the mine became many of the very significant individuals in Juneau history as well as Alaska history. Many of them went on to become Juneau's mayors, like Waino Hendrickson,[205] Thomas Judson,[206] Benjamin Duane Stewart,[207] and Joe McLean.[208] Many other went on to receive other sorts of political prominence in the town and in the state, like Edward Daniel Coffey, James Doogan, John Hellenthal, Maurice Johnson, John

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[204] Alaska Directory & Gazetteer 1934-1935 (Seattle: Alaska Directory Co., 1935) 127-158.

[205] Robert N. DeArmond and Evangeline Atwood, Who's Who in Alaskan Politics: A Biographical Dictionary of Alaskan Political Personalities, 1884-1974 (Portland, OR: Binford & Mort, 1977) 43.

[206] DeArmond, Who's Who, 52.

[207] DeArmond, Who's Who, 95.

[208] David Stone, personal interview, 25 March 1999.

McCormick, Frank Metcalf, and Judge Thomas Byrd Stewart[209] who went on to be senators, representatives, and City councilmen. The following list in Figure 16 provides the names of a few miners whose names are still represented in Juneau today:

[209] DeArmond, Who's Who, 86.

Amundsen	Armstrong	Ashby	Babcock	Bacon
Bates	Belarde	Bell	Bennett	Berg
Berggren	Bergstrom	Bland	Bodron	Bowers
Boyle	Bradley	Briggs	Bruce	Butler
Butts	Cameron	Campbell	Capp	Carlson
Carson	Carter	Casey	Cashel	Cashen
Cesar	Charles	Christensen	Collier	Converse
Cook	Coyle	Crane	Crowe	Culter
Culver	Cutler	Dailey	Daniel	Daniels
Danielson	Dapcevich	Davidson	Davis	Day
Donohue	Doogan	Doyle	Eames	Ecklund
Eide	Eldemar	Ellers	Engberg	Erickson
Erskine	Erwin	Estes	Evans	Ferguson
Fish	Flanagan	Fleek	Forrest	Fox
Fraser	Gallagher	George	Gibson	Graham
Green	Gregory	Grimm	Groves	Guerin
Guerin	Hall	Halverson	Harder	Hatch
Henderson	Hendrickson	Hermann	Hildre	Hill
Holm	Howell	Huber	Hudson	Hughes
Hulk	Hunter	Isturis	Iverson	Jack
Jacobsen	Jensen	Jorgenson	Karlson	Keith
Kelly	Kibby	Knudson	Kong	Lane
Larsen	Lawrence	Lee	Lenhard	Lillegraven
Liston	Livingston	Lowell	Lund	Lundstrom
Lyle	Lynch	Mack	Maki	Martin
Martinson	Mason	Matheison	Matheson	Mathews
Mattson	McCormick	McGee	McLaughlin	Metzgar
Michaels	Morrison	Mullin	Museth	Nelson
Niemi	Norman	Nyman	Olson	Orme
Osborne	Otis	Pasquam	Paulson	Payne
Pearce	Pekovich	Peterson	Poole	Post
Provost	Rasmussen	Richards	Richardson	Ritter
Rodenburg	Rogers	Rudy	Russell	Sarabia
Schindler	Schmitz	Schnieder	Scott	Shea
Simonson	Sinclair	Snider	Snyder	Spencer
Sterling	Stewart	Strom	Sturrock	Sutton
Swanson	Thibodeau	Traylor	Tripp	Tucker
Vogt	Wahl	Wahto	Walsh	Wanamaker
Warner	Watkins	Weiss	Weston	Wicks
Wood	Wright	York	Young	

FIGURE 16. Names still around town today: Descendants of AJ Miners.

Several of these names now represent large, well known Juneau families. Families such as the Cashens, the Niemis, and the Thibodeaus are known to almost all Juneau residents. These one time miners and mill workers stayed to shape the future of Juneau. They became Juneau's store owners, City council members, and helped determine the path which Juneau would follow. It is difficult to measure the impact of a person and their descendants upon a community - let alone several hundred people and their descendants. Juneau has clearly been enriched by the innumerable contributions made by the miners who came to work the AJ, and their countless descendants who stayed on in Juneau.

It is widely assumed that the Juneau mines were responsible for attracting the first Filipinos to Juneau. In fact, Filipinos originally came to work in the many Southeast Alaska's salmon canneries.[210] However, the mines did offer employment for this community, providing a reason to stay in Juneau. The enormous hand-sorting operation of millions of tons of AJ ore was mostly handled by Filipino workers.[211] Presently Juneau's Filipino community outnumber all other minority groups except for native Alaskans. While Juneau Filipinos represent only 3% of the total population,[212] the Filipino community is a very strong and vital part of the Juneau community. The Filipino Community center stages many important events in Juneau each year, and usually wins the award for the most popular parade entry of the 4th of July parade each year.

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[210] Judge Tom Stewart, personal interview, 24 March 1999.

[211] Judge Tom Stewart, personal interview, 24 March 1999.

[212] Community Profile of Juneau, Alaska: Including Selected Social and Demographic Statistics (Juneau: Alaska State Library, 1992) 1.

The Potential for Environmental Disaster

The potential for the Alaska-Juneau Mine to have created environmental havoc on the surrounding area was high. The mine literally moved mountains during the course of its production, it participated in huge watershed developments, and it disposed of a vast amounts of waste with almost no consideration towards the environment. Operations similar to the AJ have been the source of great environmental concern.[213]

> Hard rock mining operations can pose serious threats to the health of both aquatic and terrestrial systems...Aquatic systems are threatened by four primary factors: Acid mine drainage, heavy metals contamination, erosion and sedimentation, and chemical process pollution.[214]

Acid Rock Drainage (ARD) has been a serious consequence at many of America's more than 20,000 active and inactive mines. ARD is a insidious problem. ARD occurs when the oxygen in air, rain and surface water react with the surface area of exposed rock, causing a chemical reaction which produces sulfuric acid. Metal is soluble in the acid. The ensuing flow of water, contaminated with the acid, over waste rock deposits result in acid leaching leading to a high dissolved metal content in the water. Once it begins at a mine site, the acid has proven to be very difficult to successfully eliminate.[215]

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[213] David Stone, personal interview, 25 March 1999.

[214] Sara Vickerman, Stewardship Incentives. (Washington DC: Defenders of the Wildlife, 1998) 86.

[215] Don Elder, Gayle Killam , Paul Koberstein, The Clean Water Act: An Owners Manual (Portland, OR: River Network, 1999),128.

There are several examples of mines which disposed of waste rock using methods similar to the AJ that experienced dire consequences.[216] A good example is Island Copper Mine on Northern Vancouver Island. Much attention was paid by Island Copper to the disposal mechanism of the fine ground tailings. There had been concern regarding the tailing's potential be problematic. The waste rock, however, was not regarded as a threat and was disposed of along the surface. Presently, the waste rock on this island is leaching acid and is regarded as a huge environmental problem.[217]

Very little testing was done to the AJ rock before it was put to use as tideland fill or disposed in Juneau's Gastineau Channel. The rock might have been full of sulfides and heavy metals, as are found today in the waste rock of Juneau's Greens Creek Mine located nearby on Admiralty Island. A rock of a different composition could have spelled environmental disaster for Juneau. "It was more luck than science," explains David Stone, author of Hard Rock Gold. "Back then they didn't think much about it."[218] Through a mixture of good luck, non-acid leaching rock, and sound management decisions, the AJ managed to avoid being the site of environmental disaster.

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[216] David Stone, personal interview, 25 March 1999..

[217] David Stone, personal interview, 25 March 1999.

[218] David Stone, personal interview, 25 March 1999.

The AJ Mine was one of the first mines in the world to employ sub-marine tailing disposal on a large scale basis. In recent times the environmental impact of marine disposal has been closely scrutinized. The result of these studies has indicated that of the options available, such as disposal of tailings in wilderness or wetland areas, marine disposal is the method with the lowest environmental impact.[219] Moreover, disposal of waste into the water has been shown to actually reduce the potential for ARD, and salt water seems to have properties for reducing the potential for trouble even further.[220]

Not everyone agrees that the tailings and waste rock disposed of by the mine are not a source of environmental problems. Debra Rudis of US Fish and Wildlife did a 1993 survey in which she concluded that the Gastineau Channel was contaminated with some heavy metals which she attributed in part to "the extensive tailings dumping that occurred from the early 1900's" and "metals leaching from tailings for 75 years or more."[221] The Rudis study was met with harsh criticism by those associated with the re-opening effort of the AJ Mine. Robert LeResche, who reviewed the study, made these comments: "From a scientific perspective, Ms. Rudis' paper is fatally flawed at every

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[219] Roger Baer, Gary Sherman, Patrick Plumbk, Submarine Disposal of Mill Tailings From On-Land Sources - An Overview and Bibliography. ([Washington DC]: US Bureau of Mines, [1992?]) 5.

[220] Baer, Submarine Disposal, 6.

[221] Deborah Rudis, Draft Report: Metal Levels in Sediments, Fish and Mollusks from Gastineau Channel, Juneau, Alaska, (Juneau: US Fish and Wildlife Service, 1993) 8-13.

level...Conclusions are completely unsupported by the data presented, and contrary to other available data, information and publications."[222]

The Rudis paper was not published until three years after the first draft of the project, at which point her previous statements were significantly altered, and her concern regarding old AJ rock very toned down. She modified a great deal of her paper in response to the LeResche comments, and conceded that due to Juneau's high level of mineralization, greater than average metal values are to be expected in the channel. While she still had some concern about some levels she recorded, she attributed the source of these levels to a greater variety of factors, both historical and contemporary.[223] She remained concerned about the Rock Dump, however, and cited a 1990 Ecology and Environment study in concluding "heavy metals from the site could be released to the surrounding environment though surface water or as airborne particulates."[224] Such findings have not been reproduced in the other studies of the Rock Dump, such as the 1989 site investigation by Versar Inc.[225]

As Juneau is very dependent on a healthy aquatic habitat, it is fortunate for the City that the disposal of the rock waste and tailings did not cause a

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[222] Robert LeResche, J.W. Buell, memo to Frank Bergstrom, "Review of Deborah Rudis Paper," 19 April 1993.

[223] Deborah Rudis, Metal Concentration in Sediments and Selected Biota in Gastineau Channel, Juneau, Alaska, (Juneau: US Fish and Wildlife Service, 1996) 22-31.

[224] Rudis, Metal Concentration , 24.

degradation of the marine habitat. Had the rock been closer akin to rock found at Greens Creek or Island Copper, problems might have been very severe. ARD would have been a likely outcome. Acid leaching out of the waste rock could have contaminated Juneau's ground water, and created a dead zone in the Gastineau Channel. Juneau would have not been able to develop as a fishing community had this been the case, and the impact of such a scenario on the community would have been severe.

A high level of lead might have led to severe health effects. Juneau's water system would have likely been contaminated as well. The polluted area would have been a hard sell to newcomers and tourists. A contaminated downtown might have even been just the argument to influence a capital move out of Juneau. There have been several strong capital move campaigns in recent years to move the capital closer to Anchorage. If Juneau did not have its scenic, uncontaminated beauty as an attribute, this might have easily been more successful. Contamination would also have led to lower current population levels, another factor which might have made a capital move more possible. "If the AJ had had that kind of rock," Stone commented, "It would have

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[225] Versar Inc., 12.

been a problem for the community to grow and to develop."[226] The end result, however, was a non acid producing rock which was excellent for construction purposes. The availability of the rock led to the successful expansion of the Juneau community and not to its demise.

Lasting concern regarding the AJ rock goes beyond ARD and heavy metal contamination. There is some fear that the tidelands fill would be unstable in the event of a large earthquake. It is widely believed by many of Juneau's engineers that the lack of compaction of the fill at the time of placement, combined with the fact that the tidelands fill is not contained by any barrier device, is a combination which leaves Juneau very vulnerable to a "liquidation effect" in case of a severe earthquake, in which the tideland fill would simply slide out to sea along with everything built on it.[227] This view is not held by everyone, and indeed, Juneau has sustained a number of earthquakes through the years without consequence to the tideland fill. However, the possibility that the filled downtown area would not be stable in the event of a large earthquake persists in the minds of many.

Other environmental consequences persist from the mining days. Salmon Creek was once famous in the area for its plethora of salmon. Trevor Davis in his book, Looking Back on Juneau: The First Hundred Years, speaks of the Salmon Creek which existed before the days of the dam:

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[226] David Stone, personal interview, 25 March 1999.

[227] Joanne Quigg, personal interview, 25 March 1999.

> Salmon Creek was a beautiful place with its tremendous waterfall tumbling down to fork into three separate creeks. Each would be full of salmon - like sardines in a can. One could hardly wade through the fish to get to the other side of the stream.[228]

These pre-dam days of salmon abundance in the creek have long since passed.

Another potential environmental problem for the town was not a result of mining, but from the decision to build the town in such a odd location in the first place. From a planning perspective, Juneau was a terrible place to build a town for several reasons including the steep terrain. It was, however, an incredibly convenient spot for a gold mining rush. Unlike the distant gold fields of the Klondike where supplies had to be carried over long an arduous mountain ranges, Juneau's gold was readily accessible from the beach, which could be reached easily by boat. While Juneau has since overcome many of the initial problems this presented for developing a town, there is one it has not yet solved, and that is the constant threat of severe avalanches.

The National Geographic rated Juneau as having the largest potential for a devastating avalanche as anyplace in the world. Avalanches in Juneau are a common occurrence, and every few years a few houses are destroyed by large snow and mud slides, including a 1936 slide which made it all the way to South Franklin Street, killing 13 people, and a 1962 event in which more than two

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[228] Davis, N. pag.

dozen houses were demolished.[229] However Juneau has yet to experience the type of large scale disaster predicted by the National Geographic. This does not mean that such an event does not lie in Juneau's future.

The environmental issues associated with Juneau's mining past are surprisingly slight. The original intent of the paper had been to focus on these issues alone, however data simply did not support extensive environmental damage commonly related to many large older mining developments. It seems that Juneau was able to reap the many benefits that a large mine such as the AJ had to offer, without, at the same time, having to later suffer the many consequences large development can bring to a community.

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[229] Keating, 68.

CHAPTER VII

CONCLUSION

Juneau was not a clever place to build a town. It lay at the foot of two enormous, steep mountains. The stormy ocean nearly reached up far enough to lap the mountain sides. Almost no flat space existed, let alone enough space to build a town. Moreover the town lay in the path of nearly every southerly storm. The howling Taku winds blasted though Juneau's early settlement, blowing roofs into the channel, and crashing though windows.[230] The Aaak'w knew this. The original Auk Village, just 10 miles away from Juneau, receives only half the rain that Juneau does.[231] The site of Juneau was chosen not because it was a good place for a community, but for the gold alone.

As mining development progressed in Juneau, so did it fail. By 1921, nearly every mining enterprise in Juneau had ended in failure through one means or another, all save one. The Alaska-Juneau Mining Company for the next quarter of a century would be the biggest employer in the town, directly employing one in five of all Juneau residents. It was due to the needs of Alaska-Juneau's employees that Juneau began to grow in structure and development. As the mine provided a population of people eager to see the town grow, so did it provide the building blocks with which to accomplish this

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[230] Davis, N. pag.

[231] Alaska Department of Community and Regional Affairs, 1999 Juneau Statistics.

feat. The once poorly placed town was able to expand. It went seaward. The rock from the mine pushed back the ocean so the town could extend and stretch to encompass more people and more business with which to serve these peoples needs. By 1935, mostly due to the existence of the mine, the population of the town had reached 5000.[232]

At one time it was thought that Juneau was the prime location for a timber mill. As Marion Werner wrote in 1925 in her Masters Thesis, the next industry of great importance in Juneau would be the "greater utilization of the dense forest growth."[233] While Juneau could have grown strong and stable with a different industry, it most certainly would not have grown in the same way. Instead of interesting old mining relics, there would be clear cuts. Instead of growing out on AJ rock, Juneau would have had to find some alternative way with which to expand - perhaps by cutting into the mountain side itself as Bruce Miner proposed so long ago.

But it was not just the existence of the mine that was the secret to the Town's growth and expansion, it was also the little known of agreement which took place between the mine and the town in 1913. Metzgar, the mine's superintendent saw it like this:

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[232] Alaska Directory & Gazetteer 1934-1935, (Seattle: Alaska Directory Co., 1935) 127.

[233] Marion Beatrice Werner, "The History of Juneau, Alaska," thesis, University of California, 1929, 142.

> Without the benefits derived from the Alaska-Juneau operation and the tax agreement referred to, property in the City of Juneau would be of much less value than it is today. The City would have difficulty in maintaining itself at all...[234]

In the United States today, we have entered into a NIMBY(Not In My Back Yard) attitude, no one wants big industry near their community center. The Alaska-Juneau Mine was definitely in Juneau's backyard. Rather than damage the town, it was directly responsible for a number of extremely important contributions to the City. Without the mine Juneau might not have persevered at all, and it certainly would not exist if not for the large quantities of gold located nearby. The mine touched the town in so many subtle ways, and still continues to do so.

It is exciting to trace the lasting repercussions that the Alaska-Juneau Mine continues to have on Juneau, because simply stated, they have been extremely positive. We live in a time in which every large development is carefully scrutinized, and every attempt is made to limit the lasting impacts of these projects. However, without the lasting impacts of the Alaska-Juneau Mine, the town of Juneau would be significantly altered so as to be unrecognizable today. The question then asked is should new developments of the AJ's size and scope be solicited by the town. This is a difficult question.

When the AJ started up, the city of Juneau was in its infancy. It lacked many of the essential elements of a strong, mature community. Today Juneau has grown up. It has learned to rely on things other than mining for its vitality.

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[234] "Metzgar Gives Mine's Reply in Tax Argument," 1.

Today Juneau has the second highest standard of living of any community in the United States.[235] Juneau no longer needs the many benefits that a mine located close to its downtown district has to offer. It has a strong economy, an excellent fire department, many businesses, and a growing population. Juneau's boundaries have been expanded, and plenty of land has been found allowing Juneau to increase its community.

In the 1990's a strong movement was begun to re-open the AJ, and it was discovered that this great mine was no longer something that Juneau residents wanted. In many ways, Juneau had already reaped most of the benefits it could from such a mine. Presently Juneau does have a mine located within its borders. Kennecott Greens Creek Mine is located on Admiralty Island, a plane ride or boat ride from downtown Juneau. It is the largest silver mine in North America, and employs hundreds of Juneau residents. Juneau is able to have the benefit of employment, without having to sacrifice anything for this mine. It is tucked away, out of sight, away from the town of Juneau. The original AJ Mine was a success and was vital to the development of Juneau. However, this should not lead one to the logical conclusion that any and all mining developments would be good for Juneau. Juneau, once the needy child of the AJ, has come into its own. Further discussion needs to take place to determine whether Juneau would benefit more than it would lose by inviting a new mine into its city limits.

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[235] First is Montgomery County Maryland.

The old Alaska-Juneau Gold Mine was not only a benefit to the town of Juneau, it was crucial to the town's development on nearly every level. Town residents often joke that Juneau is built on gold, due to the small remnants of gold which remain in the waste rock that is under much of Juneau. Gold certainly was Juneau's integral building block. The town was built to accommodate a gold rush, and the mines and miners which heeded the call of the seductive yellow metal. Without the gold, Juneau wouldn't exist at all. Without the Alaska-Juneau, Juneau would never have grown into the charming capital city community it has become. The AJ is not only a part of Juneau's past, it is vital part of Juneau's current chronicle, and will continue to impact the town even though the doors of the AJ have long since been shut, and only a handful of miners remain today to tell its tales.

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