

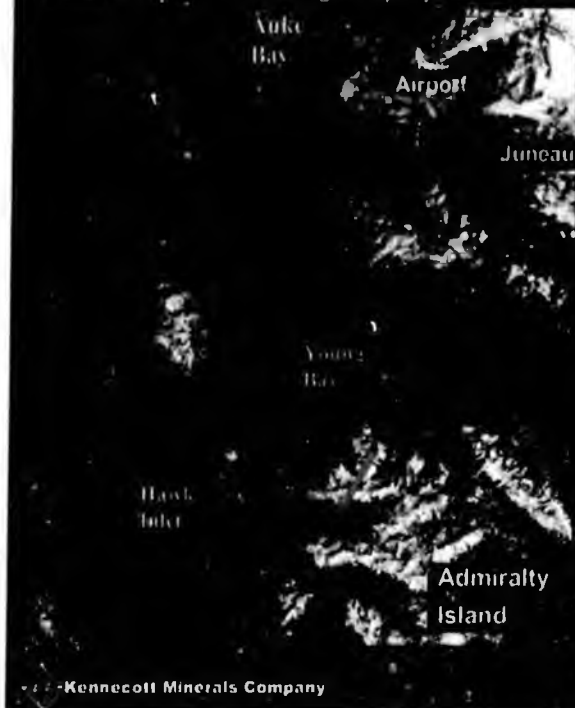
**PRESENT-  
ATION:  
MINING  
INDUSTRY,  
2/2/05**

Greens Creek Mining Company

**Alaska State Legislature  
Senate/House Resources Committees  
February 2, 2005**



Greens Creek Mining Company



## BACKGROUND

- 18 miles south of Juneau
- 1975 Initial drill hole discovery
- 1987 Pre-production development
- 1989 Full Production
- 1993 Cessation - depressed metal prices
- 1995 Pre-Production development
- 1997 Full Production

Kennecott Minerals Company

Hecla

Greens Creek Mining Company

## Greens Creek at a Glance

- Joint Venture – Kennecott Minerals Company / Hecla Mining Company (70/30 Ownership)
- Underground mine and surface concentrator
- Approximately 265 employees
- Pristine environmental locale (National Monument)
- Polymetallic ore body (zinc, silver, lead & gold)
- Dore and three types of concentrate produced (lead, zinc & bulk)
- Concentrate sold to smelter customers – Japan, Korea, Europe, Canada, and Mexico

Kennecott Minerals Company

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Greens Creek Mining Company

## Underground Ore Zones

Portal

North

West

SW

SE

South

South of Portal

2005

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Greens Creek Mining Company

## LHD Loading Haul Truck



Kennecott Minerals Company

Hecla

— Greens Creek Mining Company —

### Mine and Mill Site



— Kennecott Minerals Company

**Hecla**

— Greens Creek Mining Company —

### SAG Mill



— Kennecott Minerals Company

**Hecla**

— Greens Creek Mining Company —

## Tailings Facilities General View from Hawk Inlet



— Kennecott Minerals Company

**Hecla**

— Greens Creek Mining Company —

## Loading a Concentrate Ship



— Kennecott Minerals Company

**Hecla**

## Greens Creek; Historically ...

Some 7 million tons of ore mined; containing

- ~ 150 million ounces of silver
- ~ 820,000 tons of zinc
- ~ 1.2 million ounces of gold.

## 2004 Overview

- Finalized all aspects of EIS for tailings expansion; Federal, State and CBJ permits
- First year of tailings expansion completed
- Record production of 803,000 tons ore
- Continued efficiency improvements underground and surface
- Improved financial performance due to higher metal prices
- Increased ore reserves through geological model improvements
- ISO14001 Certified Environmental Management System
- Safest underground metal mine in US in 2003; Sentinels of Safety Award



## Greens Creek Environmental Overview

- 334 Acres of Associated Surface Use (45% Road Access)
- \$2M Annual Environmental Budget
- Regulatory:
  - 10 Federal Agencies, 14 Departments; 25 Permits/Leases, Plus 8 Compliance Programs
  - 4 State Departments, 15 Divisions; 23 Permits/Leases
  - City & Borough of Juneau; Large Mine Permit, Building Permits, Construction Inspections
  - Two Multi-Agency Memoranda of Agreement
  - Continuous Monitoring and Reporting of Air, Fresh & Marine Waters, Soil/Rock, Weather, Wastes, Fuel, Facility Operation

## Annual Effect on the Alaska Economy

- The largest private sector employer in SE
- 265 Employees, 527 total direct and indirect jobs
  - 75% Live in Juneau
  - 85% Live in Alaska
  - 15% Live in Lower 48
- Economic Impact
  - \$26M pay and benefits
  - \$20M purchases and contracted services
- \$26,000 in philanthropic contributions
- \$21,000 in local/UAF educational scholarships
- Property taxes of +\$600,000
- Alaska Minerals License Tax
- Employees
  - 4,000 hours volunteer time
  - 150,000 charitable contributions

## Greens Creek – The Future

- Life of Mine Plan of ~10 years; 8.0M tons reserves
- Continued aggressive exploration plan
- Continued expansion of tailings facilities
- Production rates to 2,300 t/d; continuous improvements
- SE Alaska Intertie possibility
- Remain ISO 14001 Certified in Environmental Management System





**Usibelli Coal Mine Inc.** – Established in 1943 by Emil Usibelli. Emil was killed in a mining accident in 1964.

Joseph Usibelli was president of UCM until 1987

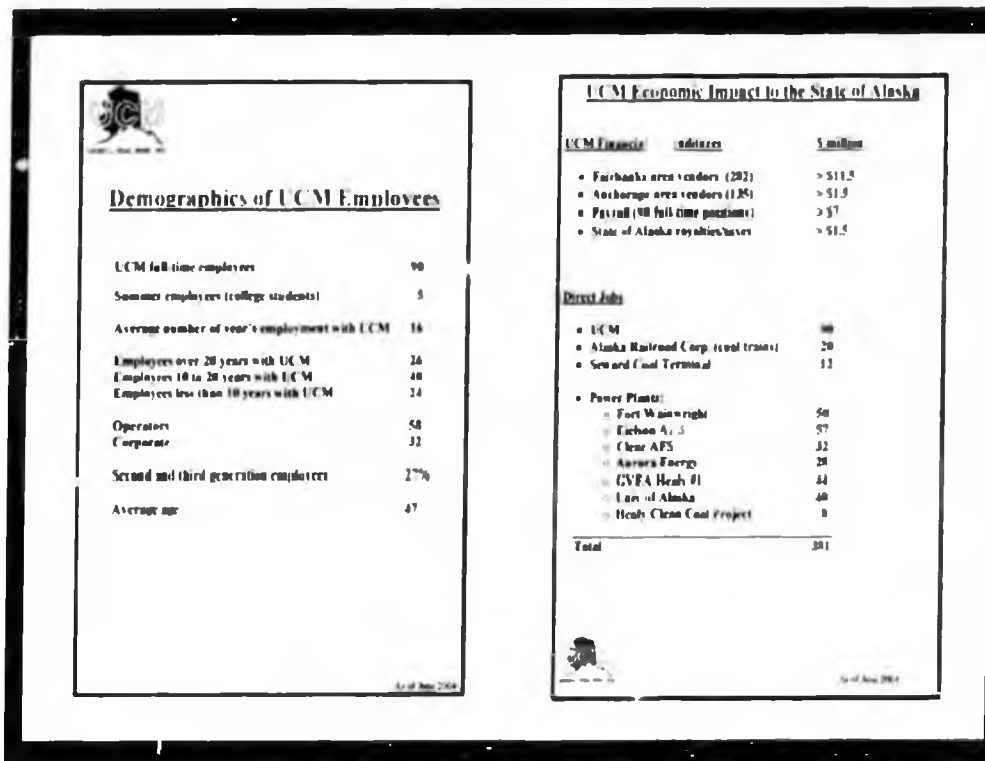
Joseph Usibelli Jr. is the current president of the company.

Main offices located at Mile 249 Parks Highway at Healy on the east side of the Nenana River on State and Railroad leased land.

Phone 683-2226

Marketing office in Fairbanks, Alaska.

Phone 452-2625



These numbers are averages.

During the winter we may sometimes add 5 to 10 people to our operations crew.

Our sales in the winter sometimes reach 50,000 short tons per week ( 22,000 tons to Seward for export and 28,000 tons to Alaska power plants and the railroad)- or the equivalent of 2.5 million tons per year if it was done year round at that pace!

When it is warm in the summer and sales drop off to our Alaska customers we may reduce to skeleton crews. We traditionally schedule the July 4<sup>th</sup> week off and the first week of hunting season off.

We begin gearing up for winter sales by mid September and try to keep a coal surge of about one month winter coal sales available.

**We have an exemplary safety record: We passed 365 days with no lost time on 1-26-05. That is somewhat over 200,000 man-hours without a lost time injury.**

## Two Bull Ridge Mine



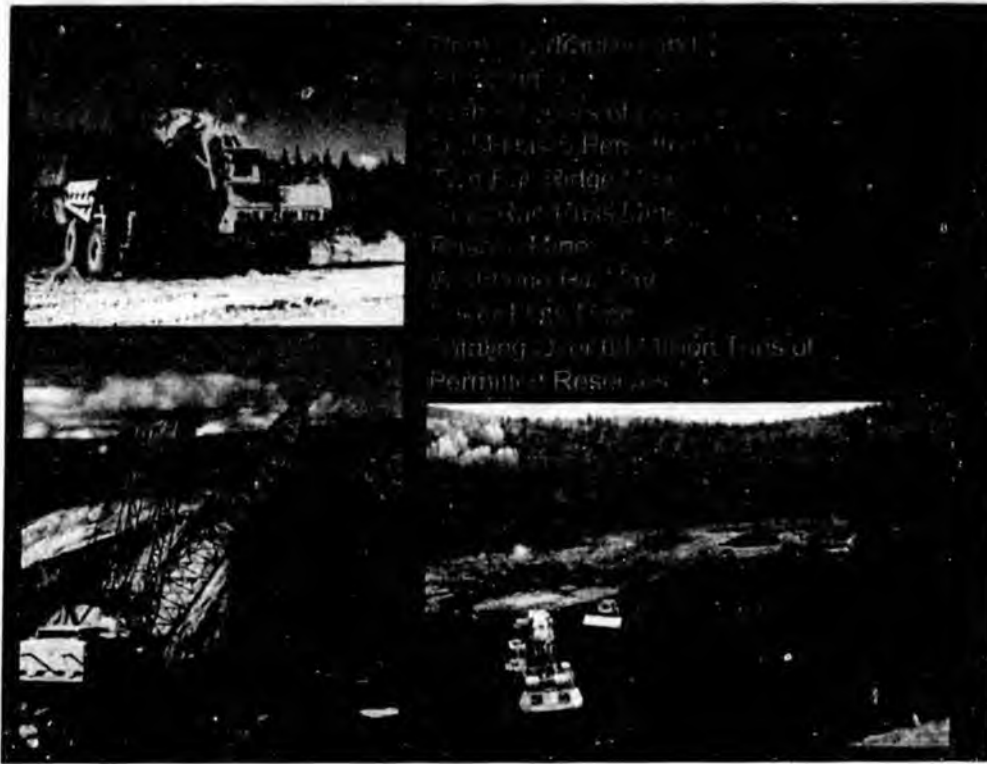
Two Bull Ridge- 40 million tons of coal permitted at this time at about 4.5 to 1 Strip Ratio

Our current production level is at about 1.4 million tons per year.

We are capable of producing 1.8M tons/ year out of this pit with existing equipment and some additional labor.

Three, four and six seams will be mined from the Suntrana Formation.

Typical thickness for three seam is 18 feet, four seam is 32 feet and six seam is 21 feet.



We are concentrating our mining efforts at this time in the Hoseana Creek Valley in the Two Bull Ridge Mine. Our satellite pits in the Healy Valley and at Gold Run Pass are within 10 miles of our main operations.

We are in the preliminary exploratory stages in the Jumbo Dome leases northeast of the Two Bull Ridge Mine.

We have leases in the Healy area that hold possibly 100's of millions of tons of mineable coal.

Our main stripping tool is our 33 yard, 1300W B.E walking dragline. We have an O&K 170- 26 BCY shovel for backup and dragline prepping.

We mine the coal with a shovel, backhoe or large loader depending on floor conditions.

## UCM Coal Customers



- ✓ Aurora Energy
- ✓ Ft Wainwright
- ✓ Eielson AFB
- ✓ Clear Air Station
- ✓ UAF
- ✓ GVEA Co-op
- ✓ Alaska Railroad
- ✓ Pacific Rim Exports

1.50 million tons sold in 2004

850,000 to 1,000,000 short tons to Alaskan customers.

All of these customers except GVEA are running coal fired power plants for heat production and electricity production. The railroad heats their Fairbanks complexes with coal. GVEA is producing electricity only at Healy with a coal fired plant.

450,000 tons export to Korea and 95,000 tons of spot sales to Chile- for use in coal fired power plants..

We have been supplying Alaska Clean Coal to Korea for almost 20 years.

Usibelli coal stats:

7800 BTU/Lb.

27% moisture

8.5 % ash

0.15% to 0.2 % Sulfur

This coal at UCM is considered ultra low sulfur and is some of the lowest sulfur coal in the U.S and the world.

Some of the attractiveness of the Usibelli coal is for blending down sulfur for power plants whose main fuel feed is high sulfur coal or pet coke as is being used in Chile.

The picture in the slide is the Chilean customer power plant.

## Coal Seams in the Two Bull Ridge Mine and the Suntrana Formation



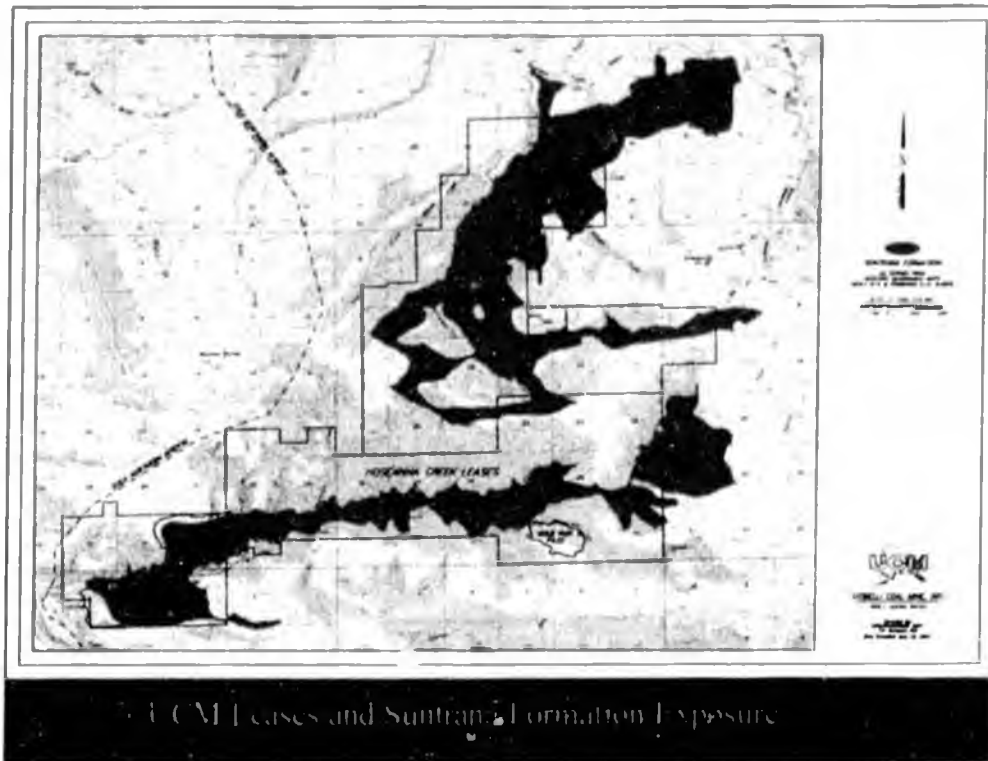
Three, Four and Six  
seams will be  
mined

Typical thickness for  
three seam is 18  
feet, four seam is 32  
feet and six seam is  
21 feet

We have the coal-

This picture shows a natural outcropping of the Suntrana formation in the Hoseana Creek valley east of our Two Bull Ridge mine.

This is a typical section of the Suntrana formation, the main coal bearing group in the area.



All of the orange area is the Suntrana Formation where the mineable section is exposed at the surface.

In the lower left hand corner notice the Poker Flats Mine and the Two Bull Ridge Mine- this gives a size reference to how much coal is left in the area. We mined 25 million tons from Poker Flats in 25 years and expect to mine 40 million tons from Two Bull Ridge.

Note the route of the Northern Intertie and the proximity to the Jumbo Dome Leases- this makes a Mine Mouth power plant very attractive near all that coal!

**Exploration has already begun.**

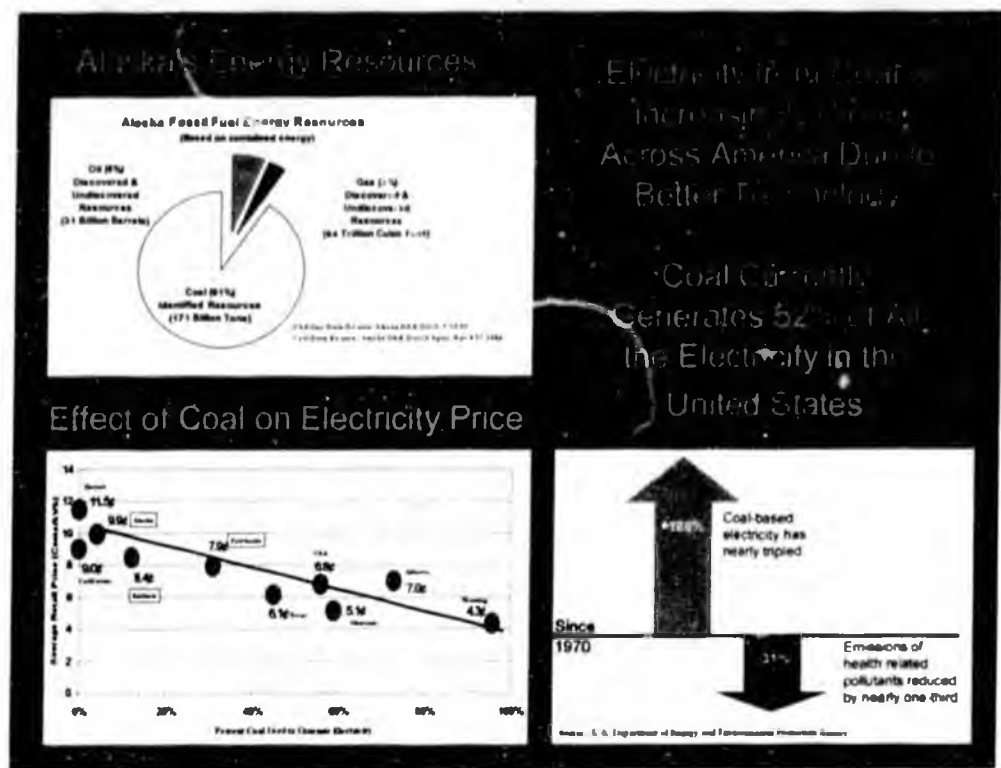
Sample access road is built and a bulk sample has been taken.

With all of the coal available at low strip ratio a mine in the Jumbo Dome leases that supplies a Mine Mouth Plant is very attractive.

\$1.00 /MBTU is the expected mining cost in the most likely mining areas in the Jumbo Dome leases.

2 to 1 strip ratio on at least 50 million tons- *Strip ratio is the amount of dirt that has to be moved per ton of coal- cubic yards per ton.*

Scale- 10 miles from Poker to Gold Run Pass.



- **Alaska is a Coal State**
- Usibelli has over 100 year supply at current demand.
- Add up the energy in identified coal resources – they equal over 1000 times the discovered and undiscovered energy in oil/gas resource.
- The U.S. states that have higher percentages of coal fired electrical power have lower per kw costs of electricity. These states sell their oil and gas to others and make a lot of money doing it!
- Over 50% of all electrical generation in the U.S. comes from coal fired plants.

UCM has an abundance of good quality coal.

A proven long term track record for supplying coal domestically and internationally

We would like to expand our coal markets and will continue to do business in Alaska and abroad.

THANK YOU FOR YOUR TIME

UCM has a lot of coal and the ambition to mine it.

We are a proven viable company with a large impact on the economy of the State Of Alaska.

We are in the process of selling coal in the export market and plan to continue to do so.

We believe that a larger coal fired electrical capability is a must in the Rail belt in Alaska for a better economic future for all of Alaska.



**Fairbanks Gold Mining, Inc.**  
A Wholly Owned Subsidiary of Kinross Gold Corporation



#1 Fort Knox Road, Fairbanks, Alaska 99712  
Mailing: P.O. Box 73726, Fairbanks, Alaska 99707-3726  
Phone: (907) 488-4653 Fax: (907) 490-2290

**History of Fairbanks Gold Mining, Inc.**

1901	Felix Pedro discovered gold near Fish Creek
1902	Felix Pedro Discovered gold on Pedro Creek
1902-1903	Fairbanks gold rush begins
1910-1930	Small scale drift and placer mining along Fish Creek and intermittent load mining in Fish Creek Valley
1916	Approximately 200 tons of stibnite shipped from the Hindenburg prospect
1920s	Tanana Valley Gold Dredging Co. (Old English Co.), moderate-scale dredge operations
1929	90-mile Davidson Ditch completed, diverting 80,000,000 gallons of water each day for dredging
1930s	Fairbanks Exploration Co. (F.E. Co.), large-scale dredge operations
1942	Federal government closes all non-strategic mining
1960s	Placer mining resumes in Fish Creek
1984	Geologist discovers visible gold on Fort Knox claims
1987-1991	Fairbanks Gold Ltd. and Gilmore Gold Inc. progress with exploration and pre-development programs
1990	AMAX acquires Hindenburg prospect
1991-1992	Initial drilling on the Hindenburg ( True North) property began
1992	AMAX purchases 100% of Fort Knox project. Fairbanks Gold Mining, Inc. (FGMI, a subsidiary of AMAX) is formed and is responsible for exploring, developing, and operating Fort Knox
1992-1995	Further exploration, engineering, environmental, and feasibility studies
1993-1994	57,557 feet of drilling completed at True North, La Teko acquires 100% interest in the property
1994	State and Federal environmental review completed and permits issued
1995	Construction begins along with pre-strip mining
1996	First gold pour (December)
1997	FGMI declares commercial production
1998	Kinross Gold Corp. and AMAX merge
1998	Fort Knox is awarded Sentinels of Safety Award by US Dept. of Labor
1999	One million ounces of gold produced at Fort Knox
1999	1,000,000 man-hours worked without a lost time accident
1999	Kinross acquires La Teko and 35% interest in True North
1999	Kinross purchases the remaining 65% interest in the True North claims from Newmont
2001	True North mine begins
2001	1,000,000 man-hours worked without a lost time accident achieved a second time
2002	Two million ounces of gold produced at Fort Knox
2002	True North is awarded Sentinels of Safety Award by US Dept. of Labor
2003	Kinross merges with TVX and Echo Bay, making Kinross the 4 <sup>th</sup> largest gold producer in North America and the 7 <sup>th</sup> largest gold producer in the world
2004	Three million ounces of gold produced at Fort Knox



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**Fort Knox Gold Mine**  
**Fairbanks, Alaska**

**Daily Averages**

- 45 tons of explosives used
- 21 tons of lime used
- 25 tons of grinding balls added
- 27,000 gallons of diesel fuel consumed
- \$54,300 in electric power used
- \$9,590 in property taxed paid
- 360,000,000 pounds of rock mined
- 86,000,000 pounds of rock milled
- 64 pounds of gold produced

**Start Up**

- Project construction began in 1995
- Construction costs exceeded \$375 million
- First gold pour: December 1996
- 3,000,000 ounces produced through December 2004

**Work Force**

- 450 employees
- Fort Knox employees are among the highest paid workers in Fairbanks

**Crushing/Conveying**

- Gyratory Crusher, 60 in x 102 in
- Crusher run by one 700 hp electric motor
- Capacity: 55,000 tons/day
- Conveyor: 54 in wide x ½ mile long
- Conveyor: two 800 hp electric motors
- Stockpile: 300,000 ton capacity

**2004 Spending:**

- \$22.4 million on wages
- \$18.4 million on electricity
- \$8.1 million on fuel
- \$3.5 million on property taxes

**Operating Period**

- 24 hours per day
- 365 days per year mining and milling  
Projected mine life: 2011, but always looking to extend
- Projected mill life: 2 years beyond the mine

**Milling**

- SAG mill: 34 ft diameter x 15 ft long, driven by two 6,500 hp electric motors
- Ball mills: two, 20 ft diameter x 30 ft long, each driven by a 7,000 hp electric motor
- 2 gravity concentrators
- High capacity thickener, 110 ft diameter
- 7 leach tanks
- 6 Carbon-in-Pulp (CIP) tanks
- Tailings thickener

**Equipment**

- 2 Hydraulic shovels – 27.5 yard (Hitachi EX 3600)
- 2 Hydraulic shovels – 23 yard (Hitachi EX 3500 and Cat 5230)
- 1 Loader – 23 yard (Cat 994)
- 2 Loaders – 16 yard (Cat 992)
- 10 Haul trucks – 200 ton (Cat 789 and Lectra Haul M13700)
- 10 Haul trucks – 150 ton (Cat 785)
- 5 Haul trucks – 90 ton (Cat 777)
- 7 Blast hole drills – 45,000 lb pulldown class
- Support equipment: track dozers, rubber-tired dozers, motor graders, water trucks, backhoes, loaders

**Electrical Requirements**

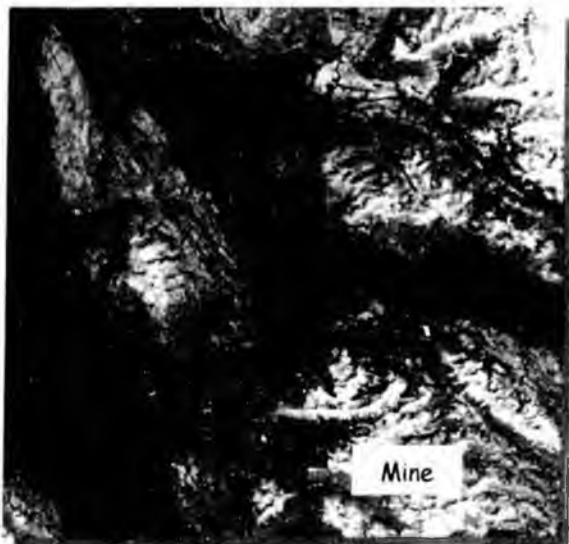
- 33.5 megawatts supplied by Golden Valley Electric Association via a 29-mile, 138 kV powerline
- 250 million kWh/yr consumption
- \$1.7 million spent on electricity per month
- Power spending increased in excess of 20% in 2004

## Brief History of the Mine

Mineralized outcrops near Greens Creek were first sighted by geologists in early 1975 and preliminary core drilling followed soon after. Between 1978 and 1980 an exploratory tunnel was driven to allow underground drilling and inspection of the ore body. Full scale mine development began in 1987 and full production was reached early in 1989. Production was temporarily halted in 1993 due to low metal prices but re-opened in July 1997. Since re-opening the mine has steadily increased its productive capacity from an initial production rate of 1320 tons per day (tpd) to over 2140tpd in 2003.

## General Information

Greens Creek is a polymetallic (silver, zinc, gold and lead) underground mining operation with a concentrator (or mill) and a 100 bed camp. The mine and the mill are located about three miles up the Greens Creek Valley and the camp is located at Hawk Inlet. The mine is expected to operate until 2012 based upon 7.4Mt of reserves and excellent exploration potential.



North Admiralty Island

## Mine Operations

There are three main phases to the mining process:

- Development
- Production
- Backfilling

**Development** is the tunneling or accessing phase. Using plans from the geology and engineering departments miners drive tunnels 15ft high by 15ft wide to access the various ore zones to be mined.

**Production** is the extraction phase. The method of extraction depends upon the geological nature of the orebody involved. Some of the smaller more contorted orebodies are extracted using the same tunneling procedure as the development phase. In other more massive orebodies larger scale extraction methods are used, sometimes producing voids of up to 150ft long, 25ft wide and 120ft deep.

**Backfilling** is the replacement phase. The voids created during the production phase are filled up with a combination of mill waste (tailings) and cement. This "backfilling" process stabilizes the production voids and allows extraction of the ore beside, above, and even below the backfilled area.

## Mill Operations

There are three main phases to the milling process:

- Grinding
- Flotation
- Filtering

**Grinding** is the reduction of the mined ore from an average size of 9" (225mm) to an average size less than 50 $\mu$ m (50microns or .05mm). The main purpose of the grinding process is to liberate the various components of the ore. A 9" lump of ore is a combination of some rock, some zinc, some lead, some silver and some gold. By grinding that lump down to particles of 50 $\mu$ m we aim to produce particles of either rock, zinc, lead, silver, or gold.

Water is added during the grinding phase to suppress dust and to help pump the material around the mill.

**Flotation** is the separation of the particles produced during the grinding phase. The ground ore and water is passed through a series of cells which selectively float the zinc particles and the lead particles to produce a zinc concentrate and a lead concentrate. The silver and gold particles are more difficult to isolate and some silver and gold ends up in each of the concentrates as well as in a gold/silver concentrate which is smelted on site to produce a doré bar.

**Filtration** is the extraction of the water from the concentrates and tailings. All of the mill products are filtered to produce a dry cake with a moisture content of around 12%. The dried concentrate is easy to handle and ready to be shipped off to smelters around the world to be turned into metal. The dried tailings material is trucked to Hawk Inlet where it is placed in an engineered and regulated tailings impoundment, or sent underground as backfill.



Maxhaul in the snow

### Surface Impacts

The whole philosophy behind the Greens Creek mining operation is to minimize the impact upon the National Monument. The total surface disturbance is only 350 acres, including all of the impoundments for waste rock and tailings. All discharges to the environment are regulated by independent state and federal agencies. The discharges to land are the waste rock from development and the mill tailings. The discharges to the air are the exhaust gases produced from our power generation plant. The discharges to water are the minerals contained in our water outfall pipe in Hawk Inlet. All of our water is cleaned at one of two water treatment plants to ensure that it meets Alaska State water quality standards prior to discharge.

### Closure and Reclamation

Part of the General Plan of Operations is an Agency approved reclamation plan. This plan details all the steps required to return the Greens Creek Operation back to a pristine wilderness, through a process of building removal, re-contouring and capping. The plan also requires bond or guarantee for \$26M, held by the regulating agencies, which can be used to employ a reclamation contractor should Greens Creek default on its reclamation responsibilities.



Hawk Inlet

### Community Involvement

The Greens Creek Mine is the largest private employer in the Juneau area and as such plays an important role in helping to diversify the local economy. The mine employs 260 people with an average payroll, including burden, of \$26M.

The successful operation of the Greens Creek Mine demonstrates that mining, with all its associated economic benefits: local jobs; diversification of the local economy; strategic national importance, can be undertaken in an environmentally compliant manner without sacrificing responsible stewardship of the land.

The city of Juneau developed initially as a mining town and has a history rich in mining folk lore. At the turn of the last century Juneau boasted three mines, the Alaska-Juneau at the south end of Juneau, the Alaska-Gastineau at Thane and on Douglas Island was the world-renowned Treadwell Mine. The Kennecott Greens Creek Mine is proud to be the latest chapter in the city's rich mining history.

### **GENERAL CONTACT INFORMATION KENNECOTT GREENS CREEK MINE**

P. O. Box 32199  
Juneau, Alaska 99803

Phone: 907-789-8114  
Fax: 907-789-8128

Email: [ron.plantz@greencreek.com](mailto:ron.plantz@greencreek.com)

## Kennecott Greens Creek Mine

### TOURIST INFORMATION



920 Mine Site

### Welcome to the Kennecott Greens Creek Mine

Greens Creek is considered by many to be the environmental role model for the mine of the 21<sup>st</sup> Century. Located at the North end of Admiralty Island, in a pristine environmental area, the mine continues to operate within strict standards of environmental compliance. Working closely in an atmosphere of mutual respect with community leaders, regulatory agencies and environmental groups, Greens Creek has developed a General Plan of Operations incorporating many stewardship activities recognized as best practice. All the activities undertaken at the operation take into account sustainability, with the goal of leaving Admiralty Island as beautiful as it was prior to existence of the mine.



**Kennecott  
Minerals**