PRESENT-ATION: MINING INDUSTRY, 2/8/06

ALASKA MINERS ASSOCIATION, INC.

Joint Senate/House Resources Committees
Annual Mining Industry Briefing

Wednesday, February 8, 2006, 12 noon

AGENDA

1. Overview – Steve Borell

Operating Mines

2. Usibelli Coal Mine – (Bartly Coiley)

3. Greens Creek – (Rich Heig)

4. Red Dog – (Karl Hanneman)

5. Fort Knox & True North – (Lorna Shaw)

Development

6. Pogo – (Karl Hanneman)

7. Kensington – (Tim Arnold)

Major Exploration Projects

8. Nixon Fork - (Bill Burnett)

9. Rock Creek – (Doug Nicholson)

10. Chutina Coal - (Bob Stiles)

11. Donlin Creek – (James Fueg)

12. Pebble – (Michelle Brunner)

The Economic Impact of Alaska's Mining Industry

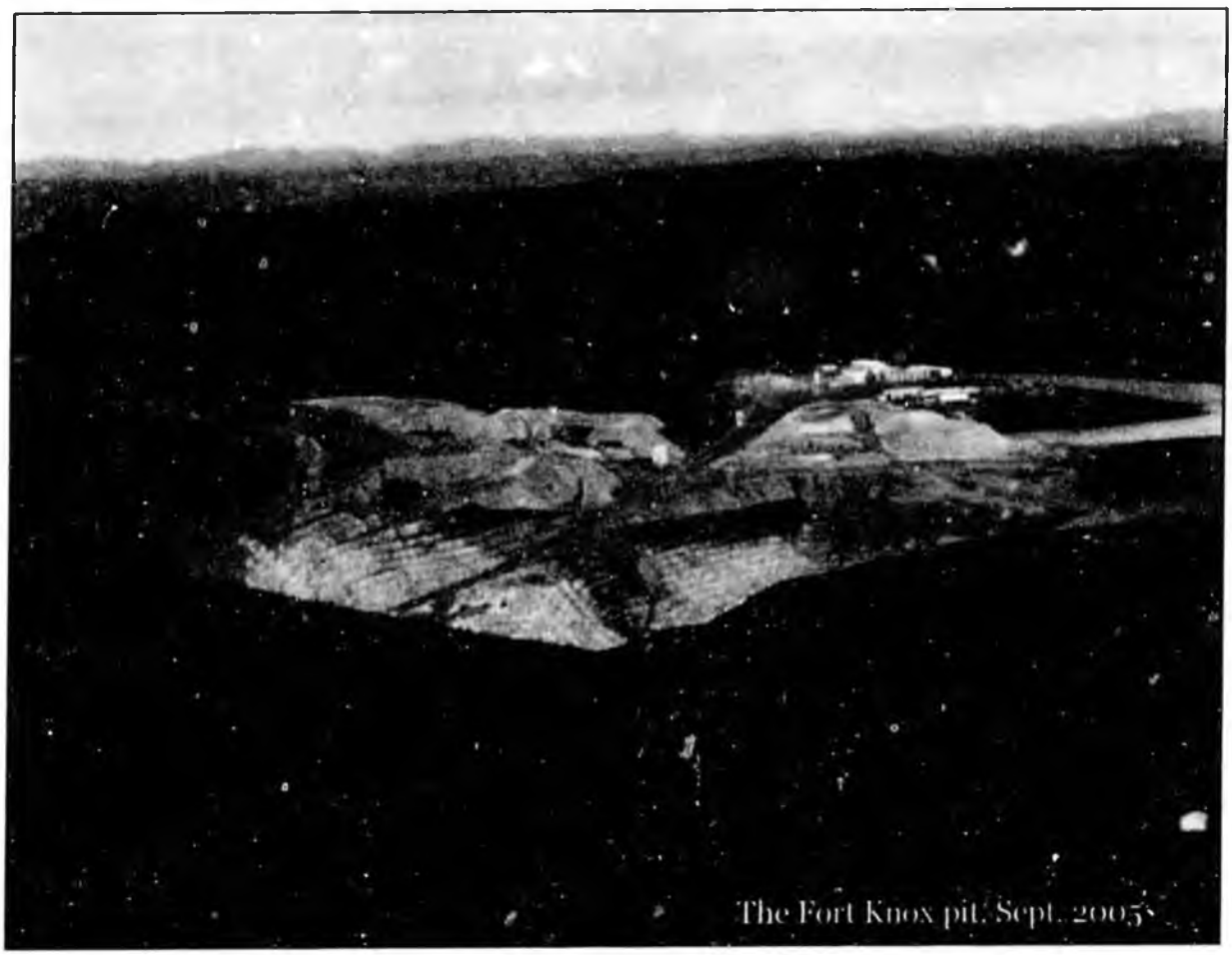
13. McDowell Report - By Jim Calvin of the McDowell Group

FORT KNOX

Gold Mine • Alaska

Fairbanks Gold Mining, Inc.

Fort Knox Fact Book



The Fort Knox pit, Sept. 2005

December 2005

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People

Human Resources

Priority number one is people – their safety and their livelihood. The success of Fort Knox is the product of the dedication and hard work of 400 full time employees. The mine is fortunate to have employees who are highly motivated self-starters eager to grow within the mining industry.

The Fort Knox team stems from a diversity of backgrounds. Some employees have been in the mining industry for most of their professional careers and display a willingness to share their expertise. Others are experienced employees who have learned their trades on the job, through electrical, mechanical, milling, crushing, and mining operations. And still others are newcomers to the industry whose past experience has been in construction, fishing, timbering and other businesses in Alaska.

Fort Knox employees live in the Fairbanks North Star Borough and lend their talents to improving community life for all citizens. Mine employees are concerned about the environment, are sensitive to its preservation, and work towards maintaining its quality. They hunt, camp, fish, and hike while enjoying the beauty of a state highlighted by contrast and color. Fort Knox employees want to ensure their children and other children have an opportunity to derive as much pleasure from outdoor activities as they themselves have experienced over the years.

Left to right, top row: Jeff Jackovich, Jeff Rankin, Gaylon Shoemaker
Middle row: Archi Tirado, Kent Franklin, Randy Garcia
Bottom row: Randy Wilson, Randy Wood, Kristy Brower

The Fort Knox team ranges in age from 18 to 70 years. The workforce is 90% male and 10% female, and women are represented in all departments of the mine. The average wage of a Fort Knox employee is $57,897 annually, or $23.82 per hour. All Fort Knox employees live in the Fairbanks area and drive to the mine each day for their scheduled shifts.

Fort Knox is committed to hiring locally whenever possible, and the company is seeking opportunities to partner industry and education to bridge the skill gap that exists in Alaska.

Safety

At Fort Knox health and safety of our employees truly more important than the production of gold. The company's goal is to make every day a safe day both accident and incident free. The mine has a comprehensive tracking system for incidents, action plans and training documentation and all of our employees participate in an incentive program rewarding positive progress towards safety milestones on an individual, departmental and site-wide basis.

(L-R) Stacy Staley (Environmental), Charlie Wells (Mill), Brad Morris (Welder), Larry Jackson (Environmental), Michelle Steel (Human Resources), Yvonne Pimentel (Human Resources).

Three times the Fort Knox workforce has achieved 1,000,000 manhours worked without a lost time accident; first in 1999, again in 2001, and most recently in 2004. The site's last LTA was in April 2005 and crews are working hard to reach this safety milestone again.

FGMI has twice been awarded the prestigious Sentinels of Safety award by the US Department of Labor. The first award was received in 1997 for Fort Knox and the second in 2001 for True North.

In the case of an emergency, Fort Knox has both an Emergency Response Plan and a Crisis Communications Plan. The mine's Emergency Response Team participates in monthly training focusing on various topics from high angle rescue and fire suppression to Hazmat response and emergency medical treatment. At Fort Knox safety will not be compromised.

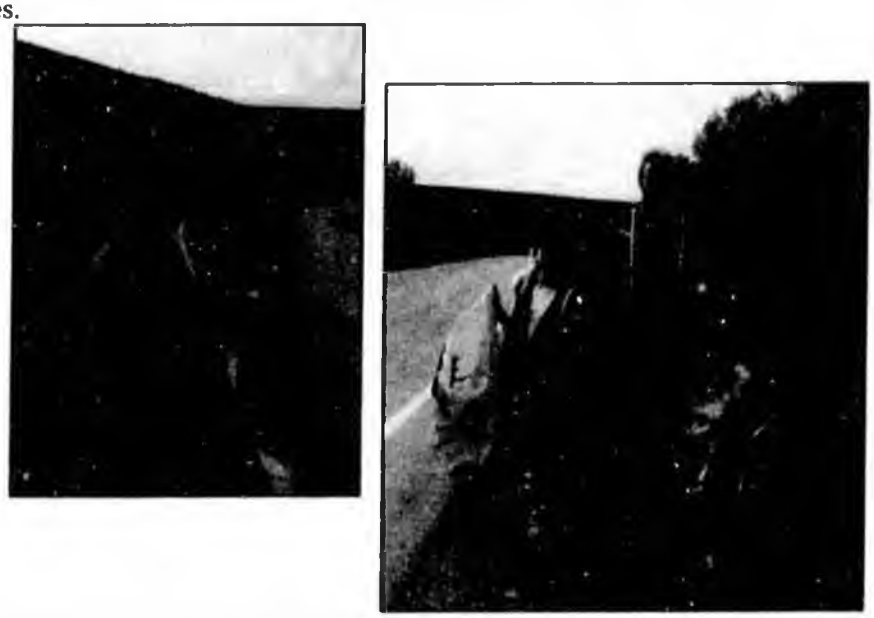
Well stocked first aid kits are located throughout the mine site.

Fort Knox

Where safety is more precious than GOLD

Commitment to the Community

Fort Knox participates in many local events and activities like Golden Days, the Tanana Valley Fair, and Clean Up Day. In addition to volunteering to clean up in town, Fort Knox was recently recognized for supporting our employees who serve in the military with the Employee Support Guard and Reserve award. The mine works with The University of Alaska, participating in Engineering Week, job fairs, and lending classroom expertise. Several members of the management team serve on local education advisory committees.



Fort Knox employees and their families participating in Clean Up Day 2005. (L-R) Emily and Bobby Organ (Security); Willow, Dave (Environmental) and Walker Stewart.

2005 Projected Spending

$117 million total spending
$36 million on wages and benefits
$21 on electricity
$8.8 million on fuel
$3.4 million on property taxes

Mining and processing at Fort Knox have a positive impact on the local and state economies by providing technically demanding jobs for professionals with an annual payroll of over $36 million. The mine also creates an additional 510 support sector jobs in Fairbanks. Working with over 500 companies in the Fairbanks area, more than $70 million is expected to be spent in direct purchases and over $7 million dollars on contract labor in support of mine operations in 2005. On average, Fort Knox's total spending exceeds $100,000,000 annually.

Fort Knox is a dedicated member of both the Interior and Alaskan communities.

(L-R) Mine Manager Dan Snodgress and HR Manager Caroline Sandel pose with Hutchison High School principal Bill McLeod and Tanana Valley Campus Director Rick Caulfield . Fort Knox has a School to Business partnership with the new vocational high school.

Tours and Education

For many years, Fort Knox has worked with AMEREF to teach Alaskan teachers and students about mining and resources. As well as welcoming classes at the mine site, mine employees visit local schools to teach lessons like cookie mining or cake core drilling.

Fort Knox is proud to offer free mine tours to educational groups from May to September. These tours are scheduled through the Community Affairs Department and are led by mine employees trained to lead tours. Tours are limited to 30 participants and all guests must be of at least third grade standing.

Employees may also lead tours for their family and friends. Such tours must be approved by the employee's supervisor and scheduled through the Security Office at least 24 hours in advance.

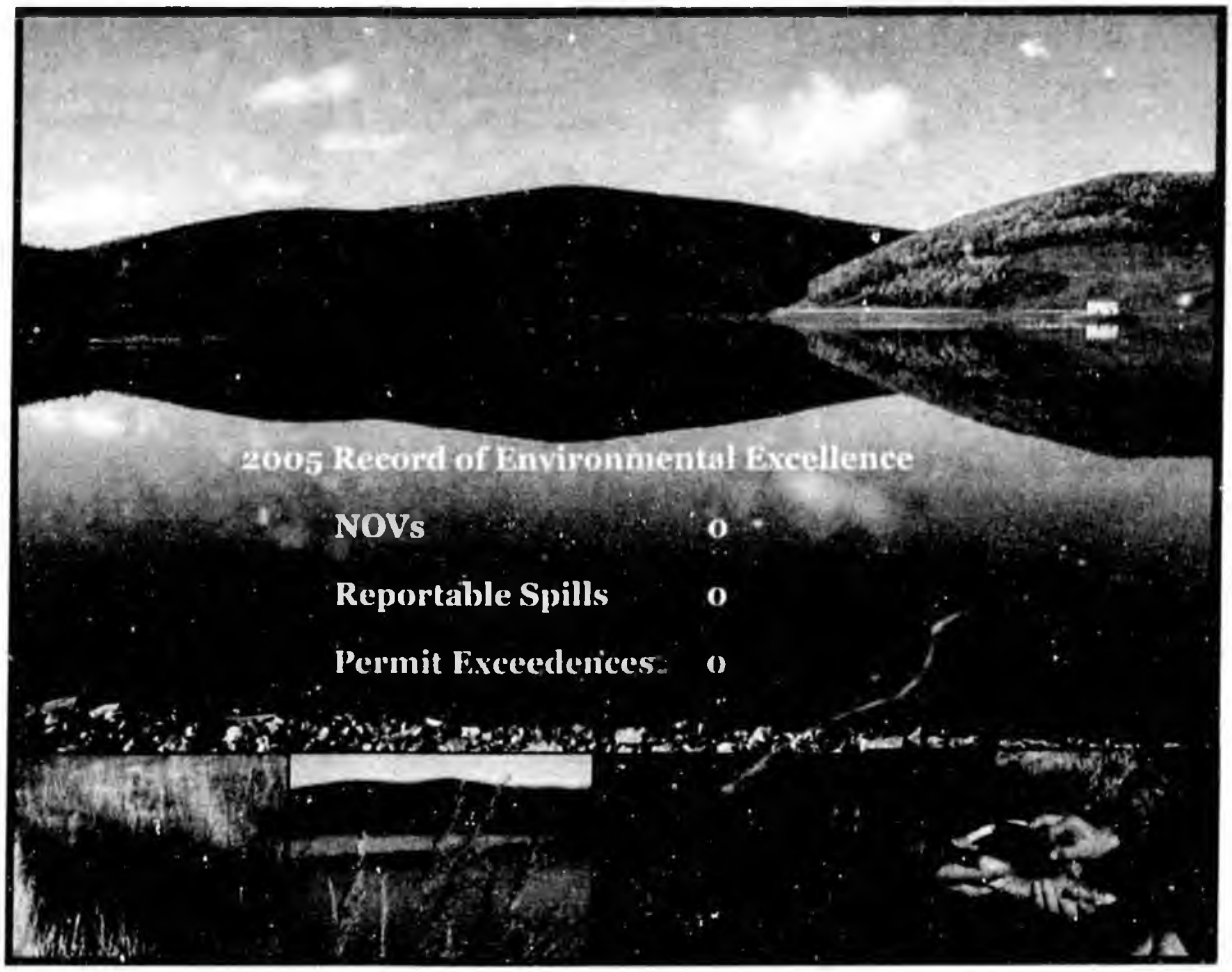
In addition to sponsoring Kids Day at the fair when all kids receive free admission, Fort Knox hosts a booth at the Tanana Valley State Fair every year, staffed by employee volunteers .

Fort Knox engineers David Quandt and Bill Angell (in the white hard hats) lead a tour of visiting professors from a Russian university.

Artwork from an elementary school student depicting what he learned when he toured Fort Knox. Most classes send a packet of letters or drawings as a thank you following a Fort Knox tour.

A group of elementary school children watch a haul truck back up to the crusher while on a school tour.

The Environment



Environmental Compliance

As important as safety is the environment. Thanks to the environmental department staff and all of the mine's employees, Fort Knox enjoys commendable environmental performance.

Every year has been a great year for Fort Knox and in the history of the site only one notice of violation was ever received. Just after mining commenced in 1997, Fort Knox was issued a citation for an improperly labeled used oil container. Throughout the years and through many inspections and audits, the mine's environmental compliance has been stellar. In fact, in August 2005, Stephan Johnson, the EPA Administrator from Washington DC, visited Fort Knox. This was his first visit to a mine and he was clearly impressed with the company's environmental stewardship.

Arctic Grayling (left) and Burbot (right) spawn in the developed wetlands in the valley below the Fort Knox mine. The Fort Knox spawning grounds provide many of the fish found in Fairbanks streams and rivers.

Concurrent Reclamation

Fort Knox is located in the heart of the gold rush boom area of the early 1900's. Continuing Fort Knox's commitment to the community, the mine has embarked on reclamation in the Fish Creek Valley. The historic placer mining left the Fish Creek Valley heavily impacted with extensive erosion. As Fort Knox was built, voluntary reclamation took place in the valley. Isolated pools became connected wetlands as the area was recontoured. Seeding native grasses stopped erosion and sediment movement into streams. The Water Supply Reservoir was built and the small fish populations increased, Arctic Grayling and Burbot are the most common fish species in the valley. A was channel built from the reservoir to the wetlands that increased Grayling spawning habitat. Fish population numbers hit target goals in 2 years rather than the expected 10 years. The reclamation efforts of Fort Knox greatly increased the high quality value of the wetlands. It is now home to moose, wolves, small mammals, birds of prey, and more.

The developed wetlands created through voluntary reclamation in the Fish Creek Valley.

A Functional Analysis of the Developed Wetlands was completed in 2004. This study evaluated all of the land within the Fort Knox claims and rated its value for habitat. A similar study was done during the permitting stage of the mine. Results from the 2004 study show that 88% of the value of the wetlands Fort Knox has disturbed for the entire minesite have been replaced by just the developed wetlands created through voluntary concurrent reclamation.

In 2004 FGMI received approval from the State Department of Environmental Conservation that the cleanup and reclamation efforts at Ryan Lode were successful. The Ryan Lode property was purchased in 1999 with the intent of developing the project. FGMI never developed the project but the company's comprehensive cleanup and reclamation efforts totaled nearly $800,000 and included removal of historic contamination, closure of the remaining process components including a leach pad, and reclamation of the disturbed areas. The company will continue to monitor water quality in the vicinity for years to come.

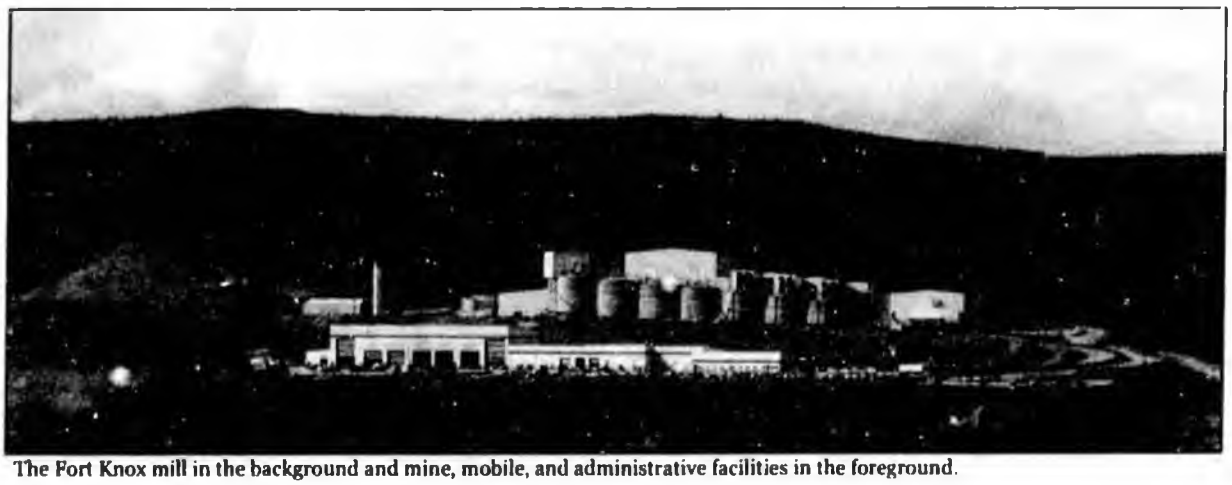
Most recently, this summer FGMI began reclamation at the True North property in areas that won't be disturbed by future mining activities. To date 124 acres have been recontoured and reseeded.

Like the area pictured, a total of 124 acres at True North were recontoured and reseeded over the summer of 2005.

Post Mining Reclamation

Closure and reclamation of the Fort Knox tailings impoundment will create a series of streams, pools and shallow wetlands by selective disposition of tailings during the final years of operation. The ore at Fort Knox is relatively free of sulfides and other problem metals that typically require water treatment during closure. Based on models developed to predict the post-reclamation water quality, treatment of water will not be required. However, no water will be discharged unless the water quality conforms with the discharge standards specified by permits approved by the agencies.

Making Gold



The Fort Knox mill in the background and mine, mobile, and administrative facilities in the foreground.

Facilities

One large building houses the administrative offices, the warehouse, and the mobile equipment shop.

The ambulance bay contains an emergency response vehicle and a fire wagon. The FGMI Emergency Response Team is trained to use these vehicles in the case of an emergency. Back up is provided by the Steese Area Volunteer Fire Department, located in Fairbanks.

The main warehouse and cold storage building (across the road) contain approximately $11 million inventory in support of Fort Knox operations.

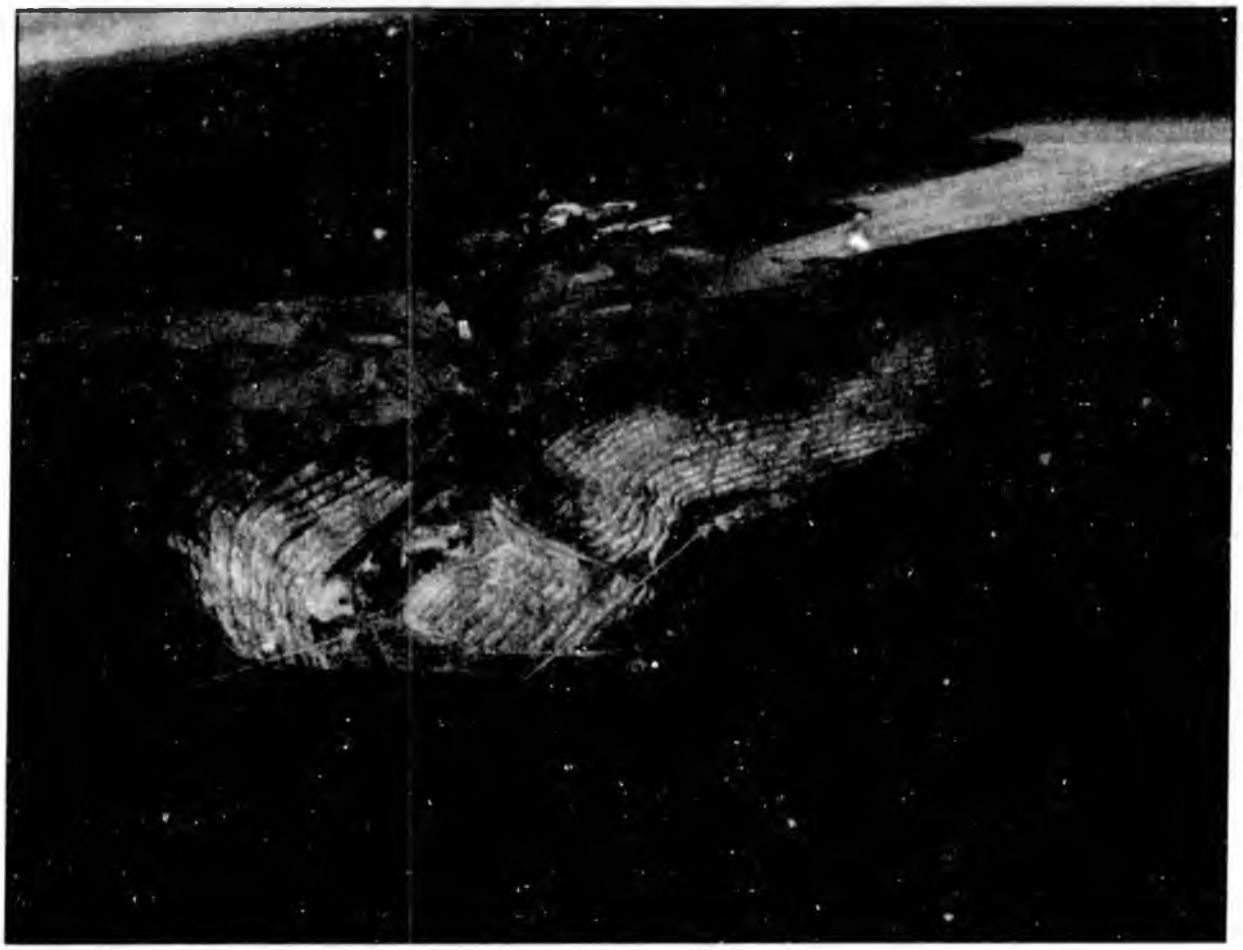
The cold storage building is located across the road from the main warehouse

The mobile equipment maintenance shop has two main areas, one for small vehicle and one for larger equipment. Two bays are dedicated to light duty vehicle maintenance. Vehicles ranging from pick-ups to crew vans to stemming trucks and fuel trucks are serviced in this shop.

Most major equipment is brought to the main shop for preventative maintenance (PMs) and repairs where it will be serviced in one of six heavy duty bays. With a tram time of only 1 mile per hour, the shovels are serviced in the pit. The local Caterpillar dealership has a maintenance and repair contract for 9 haul trucks, 2 loaders and 1 grader. Fort Knox mechanics are trained and responsible for maintaining all other equipment. The shop also features a large wash bay the site's wash bay where vehicles can be cleaned before servicing.

Left: The main shop where large equipment is serviced

Right: Light duty mechanic Luis Pimentel services a crew van in the light duty shop.



The Fort Knox pit from the air looking back at the mill and tailings facilities.

Pit Geology

When complete, the Fort Knox pit is planned to be 1 mile long by ½ mile wide and ½ mile deep. The hilltop elevation is 2,200 feet, and from the top of the tallest hill, the pit is 1,100 feet deep. The walls are lined with 30 ft tall stair-step side walls called benches. The bench slopes are angled at approximately 45 degrees. The brown metamorphic rock towards the top of the pit is called Fairbanks Schist. There is very little gold in the schist and when moved out of the pit, it is taken to a rock dump on the mine site. The white or gray rock beneath the schist is granite, and this is where the Fort Knox gold is found. Gold occurs along quartz veins, fractures and shear zones in the granite. Most of the gold found at Fort Knox is microscopic (less than 100 microns, or 0.1 millimeters) and cannot be seen with the naked eye. However, some gold is visible (up to 2 millimeters).

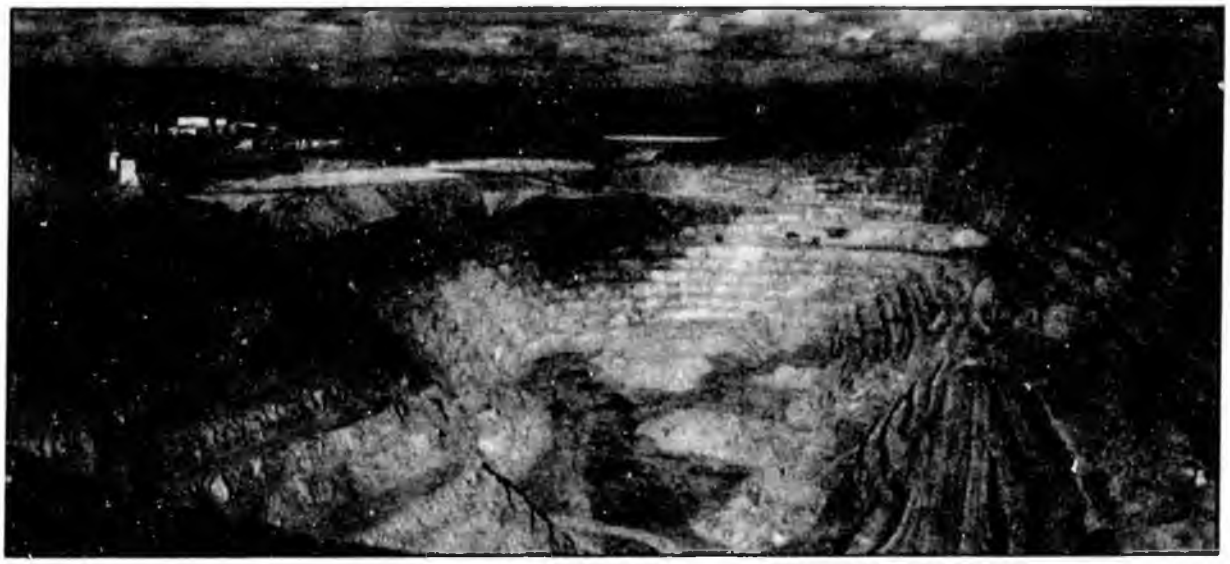
Three types of material are excavated from the pit. The A grade ore has a gold content higher than 0.015 ounces per ton (opt) or 0.017 opt, depending on the hardness of the material. This ore goes directly to the crusher for processing. B grade ore contains at least 0.012 opt and is stockpiled. This ore will be processed in the mill after mining is complete. The 30 million ton stockpile is expected to feed the mill for two years beyond the mine life. Material with less than 0.012 opt is considered waste and goes to the rock dumps.

Production

Mining is currently taking place in three different areas of the pit. Phase 4 is the area at the bottom of the pit. Because the pit narrows at the bottom, in order to go deeper mining must begin at the very top bench to make the entire pit bigger. The west end of the pit is growing with Phase 5, currently mid-way down the wall. Both ore and waste rock are being taken out of Phases 4 and 5. The south side of the pit is also growing. Phase 6 began in April 2004 and 60 million tons of waste rock are being moved before sustained ore will be reached in 2007.

Fort Knox has changed and grown over the years. In 2003 mining averaged approximately 83,000 tons per day. In March of 2004 the mining equipment from True North was brought over to Fort Knox. Work in the Phase 6 section of the pit began in April and by mid-year 2004 mine production had increased to 130,000 tons per day (tpd). By October, 6 of the 8 new 190-ton haul trucks were in service. In January of 2005 the mine's dispatch system went live. This system uses GPS to track and assign trucks to loading units optimizing production. A new production record was set in March, moving over 200,000 tons each day.

The combination of new equipment and the improved efficiency of the dispatch system have increased average production in 2005 to 180,000 tpd.



Looking across the pit from Phase 5 it is easy to see the contact between the granite and schist.

Dewatering

It is important to keep the pit dry while mining. Currently water is pumped out at a rate of up to 800 gallons per minute. The water table is 250 feet below the pit floor and water taken from the pit is used to fill water trucks and drills for dust suppression. Excess water is pumped into the tailings impoundment and used in the milling process. Additional wells are drilled every year to keep up with pit expansion.

DR7 drills holes on a new blast pattern at Fort Knox.

Drilling

In order to get each of the 30 ft benches in the pit, Fort Knox's 7 drills and 28 drillers are kept busy. Each grid pattern has 200 to 600 holes. The holes are 33 feet deep, and anywhere from 16 to 20 feet apart. The distance between holes depends on the material. Ore is drilled on 16 foot centers with a 6.75 in. bit while holes in waste, or non gold bearing material, are drilled 17 to 20 feet apart with a 7.5 in. bit.

Seven drillers work at a time, rotating on the same schedules as the four mine crews. The eight blasters work four ten-hour days each week. Drill and blast coverage spans 7 days per week.

Blasting

The drill patterns are blasted once daily, Monday through Friday at 11 AM or 3 PM. Fort Knox uses ANFO (ammonium nitrate (fertilizer) and diesel fuel). The blasts are set using a nonel (non electric) system for ignition that ignites at a rate of 10,000 feet per second. Each hole has a blast cap. The det cord moves at 26,000 ft per second, and there are surface delays of 67 milliseconds row to row, 25 milliseconds hole to hole, and 350 milliseconds "downhole."

By design, the blasts at Fort Knox are rather anti-climactic. Unlike the movies, there are no cars that burst into flames and no equipment gets turned upside down. The goal of the blast crew is to keep material movement consistent so zoned ore and non-gold bearing rock stay relative to each other as assayed from the drilled holes. The material is fractured just enough for loading units to maintain floor grade and achieve a high bucket fill factor with minimal effort. In layman terms, the ground is fluffed just enough for easy loading without disturbing the relative location of the ore and non-gold bearing rock.

Holes are drilled and filled with explosives prior to blasting.

Blasts at Fort Knox loosen the rock just enough for a loader or shovel to load the material into trucks.

SH6 loads a haul truck with ore that will tip the scales at close to 200-tons.

Shovels


SH5 shortly after it was commissioned.

Shovels are the primary loading units at Fort Knox.

Hitachi EX 3600 – SH5 and SH6

These shovels were purchased in 2003 and 2004 at a cost $3.7 million each. These giant orange shovels have 27.5 cubic yard buckets (21 cubic meters) and tram (move from location to location) at approximately one mile per hour. SH5 and SH6 are each the size of a four story building.

Hitachi EX 3500 – SH3


SH3 loads a truck in the Fort Knox pit.

At a cost of $3 million, SH3 was purchased in 2000. This unit has a 23 cubic yard bucket (17.6 cubic meters) and trams at the same speed as SH5 and SH6.

Caterpillar 5130 - SH4

This smaller shovel first joined the FGMI fleet in service at True North. When mining was suspended at True North, the shovel went to work in the Fort Knox pit. SH4 has a 17 cubic yard bucket and is the sole yellow shovel in service.

Loaders

Loaders function as supplemental loading units at Fort Knox, filling in when any of the shovels are down for maintenance or repairs. They can also provide additional loading capacity when required.

LR10, a Cat 994 front end loader, loads HT33, a Cat 789 haul truck.

Caterpillar 994 - LR10

The largest loader in the Fort Knox fleet is also the largest loader Caterpillar makes, a 994 with a 23 cubic yard (17.6 cubic meter) bucket. It was purchased for $2.6 million in 2004 and is one of the pieces of equipment that is maintained and repaired by NC Machinery, the local Cat dealer, under a maintenance and repair contract (MARC). Tires on this loader are 13 feet tall, cost $35,000 each, and last approximately 5,000 hours.

Caterpillar 992 - LR9

As Fort Knox's second largest loader, LR9 has a 15 cubic yard bucket. Purchased for $1.5 million in 2004, this machine has 9 foot tall tires that cost $11,000 each.

A full size pickup parked next to LR9 illustrates just how big a Cat 992 loader really is.

LR9 with its bucket in the air.

Tires

Tires are a critical component for equipment. Employees perform tire changes with a specialized truck and forklift, both with tire hands. The tire yard is located across the road from the fuel stand at the end of the shop.

A stack of tires sits in the tire yard before being installed on the heavy equipment.

Haul truck tires can cost anywhere from $5,500 to $17,700 apiece and loader tires run as high as $35,000 each. The chart below shows the size and cost of most of the tires used at Fort Knox.

Equipment	Tire Height	Tire Weight	Tire Cost
Cat 994 Loader	13 ft	12,500 lbs	$35,000
Cat 992 Loader	9 ft	5,300 lbs	$11,000
Cat 793 Haul Truck	11.5 ft	7,500 lbs	$17,700
Cat 789 Haul Truck	11.33 ft	6,300 lbs	$15,500
Cat 785 Haul Truck	10 ft	4,700 lbs	$10,000
Cat 777 Haul Truck	9 ft	,800 lbs	$5,500

Haul Trucks

Caterpillar 793 C – HT41

The largest haul truck in Alaska, HT41, has a 240 ton capacity. This is the second largest truck Caterpillar makes, boasting a list price of $2.1 million. It takes 9 passes ,or 5 to 6 minutes, for a shovel to fill this truck and each load of ore in HT41 contains 5 to 8 ounces of gold. The truck has 2,300 horsepower and an 1,180 gallon fuel tank. In a 24-hour period, HT41 uses 1,120 gallons of fuel. Tires for HT41 are 11.5 ft tall and cost $17,700 each.

A load of 240 tons fills the bed of HT41.

HT35 positions itself for loading.

Caterpillar 789C – HT31 to HT38

Each 190-ton load carried by the eight 789 haul trucks at Fort Knox takes 7 passes, or approximately 4 minutes, to fill and contains only 4 to 7 ounces of gold. These trucks were purchased in 2004 and 2005 at a cost of $1.75 million each. With 1,900 horsepower engines and 850 gallon fuel tanks, the trucks each use 821 gallons in a 24-hour period. Tires for these trucks measure 11 ft 4 in and cost $15,500 each.

Caterpillar 785B – HT1 to HT10

With 10 on site, the Cat 785 150-ton capacity haul trucks are the oldest in the Fort Knox fleet. It takes just 3 minutes, or 5 passes, to load each truck with ore containing 3 to 5 ounces of gold. At 1,450 horsepower, these trucks consume 520 gallons of fuel in a 24-hour period, despite having only a 500 gallon fuel tank. These trucks were purchased at an average cost of $1.5 million each. Tires are 10 ft tall and cost $10,000 apiece.

HT7 an HT8 and ready to dump their loads at the crusher.

Caterpillar 777C

Initially brought in for mining at True North, Fort Knox has three Cat 777 haul trucks, HT71, HT72, and HT73. These 85 ton trucks have 750 horsepower engines and 9 ft tall, $5,500 tires. These haul trucks can be loaded in just 3 passes. An additional 777 truck, HT74, has been modified to carry a large low-boy trailer for equipment haulage.

Haul trucks travel at a top speed of approximately 28 – 32 mph when full and only 10 – 15 mph on an incline.

A lowboy trailer pulled by a converted 777 serves the mine site by transporting large tracked equipment like shovels and dozers between work loca-

Crusher

The primary crusher, where all of the ore is dumped, is a gyratory crusher with manganese steel lining on the bell and 14EP alloy on the concaves. The mantle is 60 x 102 inches and the crusher can crush 150 tons in under 3 minutes and reduces rock to less than 6 inches. The crusher receives an average of one truck every three minutes and is capable of crushing 72,000 tons per day. Rocks up to 60 inches can be accepted. To assist with blockage and large rocks a hydraulic hammer, the Tramac, is controlled by the operator and can move or break up oversize rocks.

A truck backs up to the Fort Knox crusher where the gold recovery process begins.

The crusher is powered by a 700 hp electric motor and was built in 1952. It was first used at the Climax Mine in Colorado and was installed at Fort Knox during initial construction in 1996.

Forty-eight percent of the crusher building is above ground and 52% is below ground. The surge pocket beneath the actual crusher can hold two truck-loads of material before placing it on the apron feeder to conveyer #1 which transports it to the stockpile.

The crusher is staffed by 2 operators at all times working rotating 12-hour shifts. An additional staff of 5 mechanics work four 10-hour shifts per week.

A load of 150-tons is dumped into the crusher where it will be reduced to 6-inches or smaller in less than 2 minutes.

The spider cap tops the opening in which ore is dumped for crushing. The broken material around the spider cap is the "dead bed," a covering that protects the underlying concrete. It is only cleaned when maintenance is being performed.

The crusher operator controls most of the crusher functions from the computer screen above. The computer is located in the crusher control room.

Conveyer #1

A view of Conveyor #1 from the ground level of the crusher facing the stockpile.

This 1/2 mile long, 4 ½ feet wide belt has a concave surface and carries ore from crusher to the stockpile. The drive tower, located in the middle of the belt, holds two 800 hp electric motors. There are 187 stairs in the drive tower, climbed every 6 hours by a crusher employee to perform visual inspections. These operators also walk the length of the belt two times per shift (four times per day) performing visual inspections.

The 7.9 earthquake in November, 2002 did not affect the conveyor (or any other aspect of the mine).

Stockpile

The stockpile with the Fort Knox pit in the background.

The stockpile at the end of conveyor #1 has a 300,000-ton capacity, or a 7 day supply. This stockpile provides separation between the mining and milling facilities at Fort Knox. The live capacity is 15,000 to 20,000 tons, to 10 to 12 hours. This means that after the first 10 to 12 hours a dozer will need to help push the stockpiled ore into the feeders to the mill.

Beneath the stockpile are three apron feeders that move the ore onto conveyor #2 which feeds the large Semi Autogenous Grinding (SAG) mill.

Electricity

Electric power is the second largest cost every month at Fort Knox. (The number one cost is labor, number three is fuel, and number four is steel grinding balls for the mill.)

The 35 megawatts of power from GVEA are brought in on a 29 mile 138 kV line. The cost of electricity increased dramatically over the part two years, partially due to rate increase and partially due to fuel price and cost of power increases. Current power costs hit $73,484 per day, or $2.23 million per month. This is 56.6% higher than the cost in 2003.

The electrical substation at Fort Knox is located near the mill building.

The site is equipped with four 1.5 megawatt diesel powered generators installed at the substation. In an emergency, these generators will help maintain personnel and environmental safety, prevent slurry settling or freezing, and maintain other critical mine facilities during power interruptions.

Mill

The ore enters the mill building where it is ground down to the consistency of beach sand.

SAG Mill (Semi-Autogenous Grinding)

The first stop is the SAG mill where 5 ¼ inch steel grinding balls are used to break down the rock. The mill is 34 feet in diameter and 15 feet long, powered by two 7,000 hp electric motors. As the mill rotates, the ore inside is broken down to approximately ¾ inch pieces. Mill personnel add five to twenty four tons of grinding balls each day. One grinding ball weighs approximately 22 ¼ lbs. Once broken down, the ore comes out onto a screen deck. If the rock is still larger than ¾ inch in size, it is conveyed to 7-foot XHD shorthead crusher and back to the SAG mill. Ore that falls through the screen deck moves on for further processing.

This birds eye view of the mill shows a ball mill in the foreground, the SAG mill in the center and the second ball mill in the background.

Ball Mills (one on each side of SAG)

There are two ball mills, one on each side of the SAG. These mills process ore from the SAG that is less than ¾ inch size. Here the ore is ground down to the consistency of beach sand. The ball mills are each 20 feet in diameter and 30 feet long, filled with 3 inch grinding balls. Operators add 11 to 14 tons of these balls each day. Each ball mill is powered by one 7,000 hp electric motor.

The mill is computer controlled and staffed with a control room operator who monitors computer screens and can dispatch maintenance and operations personnel to investigate and repair any problems that arise.

The control room operator monitors computer screens for efficient operation.

Gravity Circuit

One of the Knelson concentrators used in the gravity recovery of gold at Fort Knox.

After ball milling, some material is diverted to the gravity circuit. Two gravity concentrators, called Knelsons, use gravity to separate gold from other material. The concentrators operated similar to a washing machine on the spin cycle and the riffles on the sides catch the gold. Twenty percent of the gold at Fort Knox is recovered using this method.

The total gold recovery at Fort Knox is approximately 86%.

The interior of the Knelson has riffles to catch the gold.

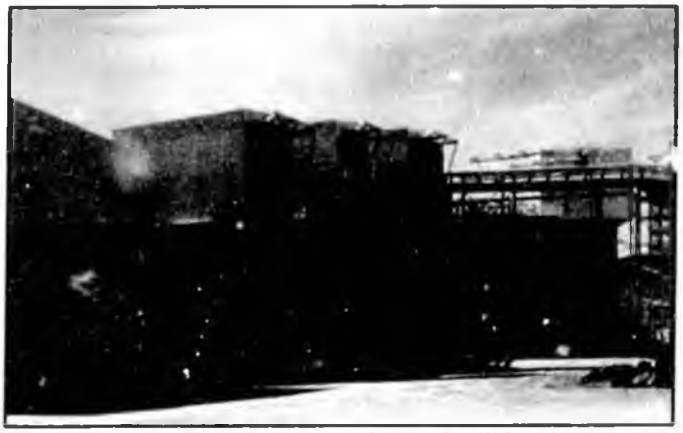
Pre-Leach Thickener Tank

After ore has been processed through ball mills, it moves on to the pre-leach thickener. This tank is 110 ft in diameter and flocculent is added to settle the solids to the bottom. The water that flows over the top is recycled, as the mill uses 33,000 gallons per minute. After the solids settle to the bottom, it is pumped to the Leach Circuit to recover the gold.

Solids are settled to the bottom of the thickener before heading to the leach circuit.

Leach Circuit

The leach process begins in the 7 leach tanks where cyanide is added to dissolve the gold. This process takes approximately 14 hours.



The leach tanks are shown in the background and the CIP tanks are shown in the foreground.

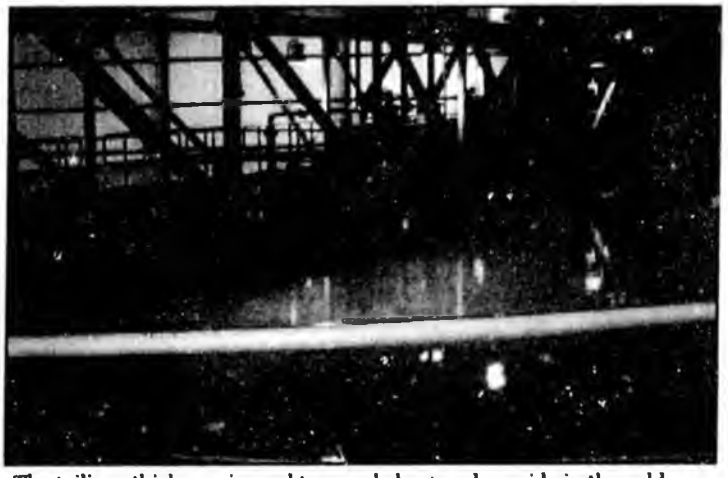
CIP

The next 6 tanks are Carbon-in-Pulp (CIP) tanks. In this 10-hour process, carbon is added to attract the gold. The carbon used at Fort Knox is made from roasted coconut shells and fresh carbon is added daily. Carbon is so porous that a piece the size of a fingernail has a surface area comparable to a football field. Carbon attracts the gold and fills all of those pores. While the gold heads for recovery, the remaining slurry continues on in the process .

Detox/Tails Thickener

Tailings, the remaining processed rock, and clean water are released to the tailings impoundment. Cyanide and heat are recycled by the tails thickener and cyanide releases to the environment are less than 25 parts per million (ppm) at all times. The monthly average cyanide released to the tailings impoundment is required to be less than 10 ppm.

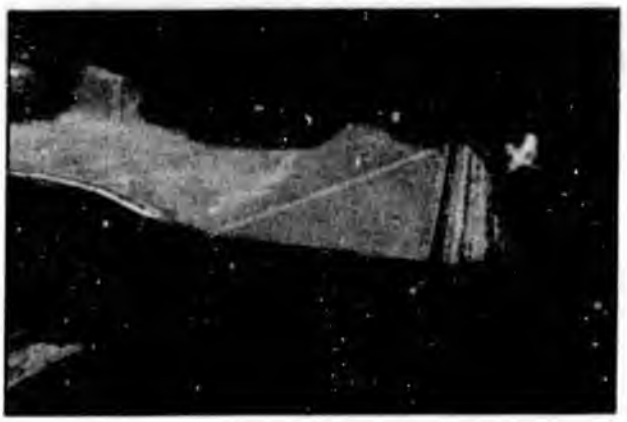
When necessary, the cyanide destruction system can be used as well. This utilizes Amonium Bi-Sulfate (ABS) to destroy the cyanide before water is released to the tailings impoundment.



The tailings thickener is used to recycle heat and cyanide in the gold recovery process.

Tailing Impoundment

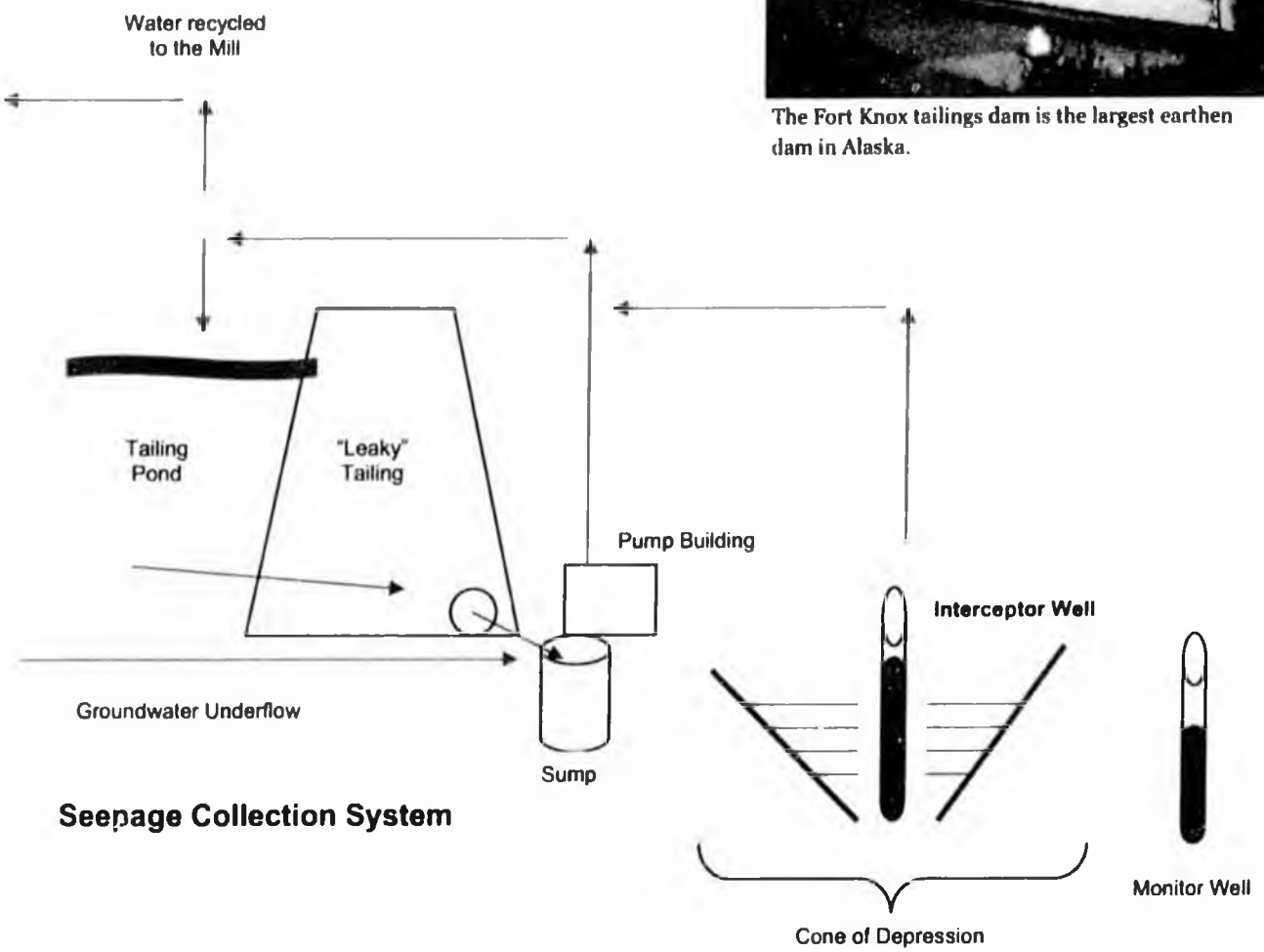
The tailing impoundment is located on Fish Creek. This zero-discharge facility contains the milled rock and water used in the milling process. As illustrated below, a seepage control system with a sump is in place at the toe of the dam and six interceptor wells a short distance downstream ensure zero discharge. The dam was designed for some seepage water to travel through and this collection system pumps the seepage water back into the tailing pond. These facilities have backup pumps connected to the standby emergency generators and a series of three monitoring wells to assure reliability of this system.



An aerial view of the tailings impoundment shows the dam downstream from the mill.

The tailings dam is the largest earthen dam in Alaska. It is raised every one to two years. The current height is 289 feet tall and the planned ultimate height is 320 feet.

The Fort Knox tailings dam is the largest earthen dam in Alaska.



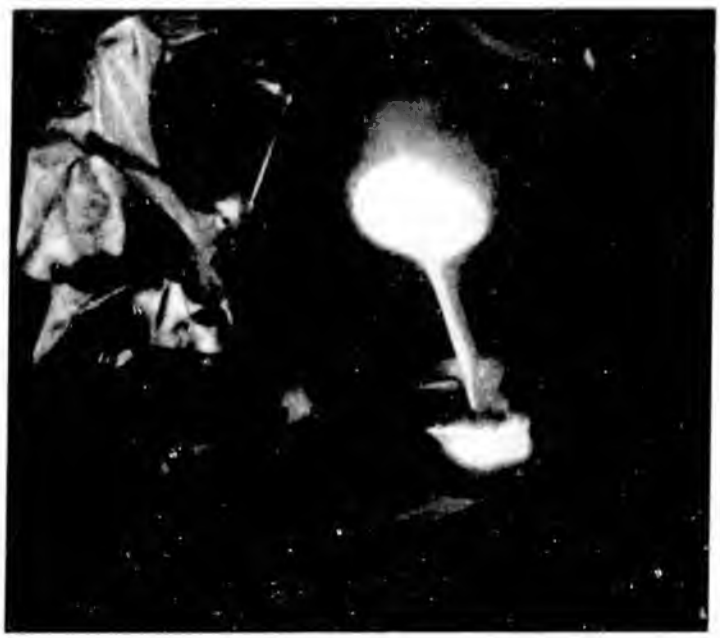
Seepage Collection System

Gold Recovery

Carbon loaded gold from the CIP tanks is stripped using an electrowinning process. The gold is plated onto stainless steel cathodes and then washed off.

Refinery

Gold that has been stripped from the carbon enters the refinery where it is melted in the furnace at 2,200 – 2,300 degrees F. Any impurities, or slag, rise to the top of the furnace and are poured off before the gold is poured. Slag looks like black glass and any remaining on a freshly poured bar of gold cools to the outside where it can be easily chipped off and removed.



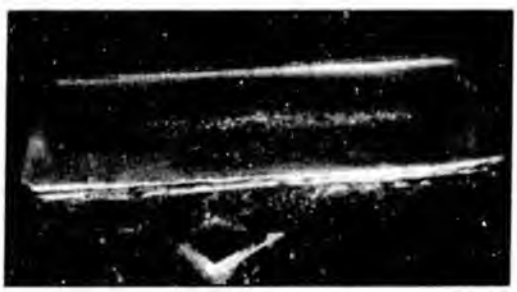
Refinery operators pour gold at temperatures up to 2300 degrees.

Fort Knox produced approximately 900 ounces of gold each day with a plan to produce 324,000 ounces in 2005.

The Final Product

The gold bars poured at Fort Knox are referred to as doré. Doré is French for mixture. Gold poured at Fort Knox is approximately 22 karats, averaging 90% gold, 6% to 8% silver, and 2% to 4% other impurities.

The Fort Knox mine is a high quality, major producer of gold. The high level of quality output is a reflection of a superior work force dedicated to working together toward a common goal: the safe, efficient, and environmentally sensitive extraction and processing of gold.



A gold bar is available to show mine guests. This bar poured specially for tours is approximately one third of the size of a typical gold bar. It is 257.05 troy ounces, or 21.42 pounds, and represents six to seven hours' production.

Fort Knox produces approximately 900 ounces of gold daily.

REPORT OF THE 2006 ALASKA MINERALS COMMISSION

The Alaska Minerals Commission was created by the 14th Legislature and signed into law on June 6, 1986. The enabling legislation instructs the Commission to make recommendations to the Governor and Legislature on ways to mitigate constraints, including governmental constraints, on the development of minerals, including coal, in the state.

ALASKA MINERALS COMMISSION
JANUARY 2006
MEMBERS

Chairman	Irene Anderson	Bering Straits Native Corporation P.O. Box 1008, Nome, Alaska, 99762 Phone (907) 443-5252, Fax (907) 443-2985 E-mail: irene@beringstraits.com
Vice-chairman	Eric Neil MacKinnon	Hyak Mining Co. 1114 Glacier Avenue, Juneau, Alaska, 99801 Phone (907) 586-1254, Fax (907) 463-3433 E-mail: nmackinnon@acsalaska.net
	Del Ackels	Goldust Mines P.O. Box 61520, Fairbanks, Alaska, 99706 Phone (907) 474-0971, Fax (907) 474-0966 E-mail: golddustmines@gci.net
	Leo Mark Anthony	C-D Development Co. 2020 Lake Otis Parkway, Anchorage, Alaska, 99508 Phone (907) 279-4702, Fax (907) 279-4702 E-mail: AKleomarkanthony@yahoo.com
	Greg Beischer	Bristol Environmental & Engineering Services Corporation 111 W 16th Ave # 301, Anchorage, Alaska 99501-5129 Phone (907) 563-0013, Fax (907) 563-6713 E-mail: gbeischer@beesc.com
	Bartly Colley	Usibelli Coal Mine, Inc. 100 Cushman Street, Suite 210, Fairbanks, Alaska 99701 Phone (907) 452-2625, Fax (907) 451-6543 E-mail: bcolley@usibelli.com
	Karl Hanneman	Teck Pogo, Inc. 3520 International Street, Fairbanks, Alaska, 99701 Phone (907) 455-8325, Fax (907) 455-8326 E-mail: Karl.Hanneman@teckcominco.com
	Rich Heig	Kennecott Green's Creek Mining Co. P.O. Box 32199, Juneau, Alaska, 99803-2199 Phone (907) 789-8110, Fax (907) 789-8117 E-mail: HeigR@Kennecott.com
	Charlotte MacCay	Bristol Environmental & Engineering Services Corporation 111 W 16th Ave # 301, Anchorage, Alaska 99501-5129 Phone (907) 743-9366, Fax (907)563-6713 E-mail: cmaccay@beesc.com
	Dr. Lance D. Miller	Juneau Economic Development Council 612 W. Willoughby Ave., Suite A, Juneau, Alaska, 99801 Phone (907) 463-3662, Fax (907) 463-3929 E-mail: lmiller@jedc.org
	Don Cook	Cook International P.O. Box 80093, Fairbanks, Alaska, 99708 Phone (907)479-2487, Fax (907)479-9038 E-mail: none

STAFF

Rich Hughes	Development Specialist, Office of Mineral Development Department of Commerce, Community and Economic Development 211 Cushman St., Fairbanks, Alaska, 99701-4639 Phone (907) 451-2738, Fax (907) 451-2742 E-mail: rich_hughes@commerce.state.ak.us

FOREWORD

The Alaska Minerals Commission, authorized until January 2014, was created by the 14th Legislature and signed into law on June 6, 1986. The Governor, the President of the Senate, and the Speaker of the House appoint the Commission. The current members represent the placer, hard rock, and coal mining industries and come from diverse areas of the state. The enabling legislation instructs the Commission to make recommendations to the Governor and Legislature on ways to mitigate constraints on the development of minerals, including coal.

Many important commission recommendations have been implemented since the first report in January 1987. Highlights of progress during 2005 included the legislative direction to ADEC to seek primacy from EPA for the NPDES program, the support for BLM to examine future management of the southern part of the National Petroleum Reserve-Alaska to include mining, intervention in the Kensington wetlands lawsuit, marketing minerals to Pacific Rim Nations, continued work on water quality regulations, selection of land given to BLM, streamlining the permitting process, the "Roads to Resources" program, and acceleration of the land conveyance timetable. These types of changes have put Alaska on track to become a premier global mining jurisdiction. There is more to accomplish, but the State is moving in the right direction. The Commission commends and thanks the Governor, the Legislature, and the Agencies for the proactive and supportive stance that has been provided to the industry over the past three years.

During 2005, the Commission met in Fairbanks on September 28 and held a follow-up meeting in Anchorage on November 1. The recommendations in this report are the result of input at, and follow-up to the meetings. On behalf of the Commission, I would like to express appreciation to those members of the public, the Alaska Miners Association, the Resource Development Council, and the many government agencies and private organizations that contributed to the preparation of the report. The Commission wishes to thank Commissioners Edgar Blatchford and William Noll of the Department of Commerce, Community and Economic Development. Division of Economic Development staff, Rich Hughes, provided valuable administrative and professional support. Diane Somers expertly formatted and assembled the report for publication and printing.

Irene Anderson, (Chair)
ALASKA MINERALS COMMISSION

ALASKA MINERALS COMMISSION

2006 Report to the Governor and Alaska State Legislature

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(www.dced.state.ak.us/oed/minerals/mining.htm)

EXECUTIVE SUMMARY

The Alaska mining industry enjoyed another excellent year in 2005. Following on gains in 2004, metal prices and profitability of existing mining operations have continued to improve. Venture capital markets have provided substantial funding for explorers, resulting in an exceptionally active year for mineral exploration in the state. Construction of the Pogo mine continued throughout the year and production from Alaska's newest mine will commence in early 2006.

Despite the improvements in 2005, the industry still faces a number of challenges and investment disincentives. A cloud of uncertainty has been cast over the industry by the U.S. Army Corps of Engineers decision to suspend a key permit for the Kensington mine. This decision by the federal agency is counterproductive to the state's efforts to present itself as a jurisdiction possessing tough, but efficient environmental permitting regulations. The State must demand that federal permitting agencies be accountable, and provide timely, responsive project review and permit issuance in cooperation with State agencies. Environmental obstructionists continued to throw up hurdles despite genuine, cooperative project design and permitting work on industry's part. Spurious lawsuits and appeals continue without Litigation Reform. Efficiency of permitting is improving under the Administration's initiatives, and though the proposed changes are at times unpopular, they are crucial for the long-term health of the mining industry, the environment, and the state economy.

State government has provided significant advances on initiatives put forward originally in 2004. The programs have not only benefited the industry directly, but also improved the perception of the State in the eyes of outside investors. The Commission looks forward to continuing to work with the Governor, the Legislature, and the Agencies to build the framework for a robust, sustainable, environmentally responsible industry that benefits Alaskans in all corners of the State.

CURRENT RECOMMENDATIONS

The Commission encourages the Governor and Legislature to act on the recommendations provided in this report in 2006, including the following:

- Continue to develop more efficient and timely permitting processes.
- Ensure adequate funding and personnel for permitting agencies so they can meet the needs of the State's growing mining industry.
- Seek NPDES State primacy from the US EPA according to legislation passed in 2005.
- Restore the General Permit for remote camps.
- Implement the proposed revisions to the mixing zone regulations.
- Continue to keep infrastructure development as a policy cornerstone.
- Resolve land tenure, navigability, and right-of-way access issues.
- Provide adequate funding for acquisition of baseline geological and environmental knowledge statewide.
- Support the Alaska Minerals & Energy Resource Education Fund (AMEREF).
- Ensure that a world-class mining engineering program is developed and maintained within the new framework of the College of Engineering and Mines at University of Alaska Fairbanks (UAF).
- Expand the effort directed toward marketing Alaska as a premier place to invest in mineral exploration and development prospects, particularly in Asian countries.
- Vigorously support the exclusion of waste rock in the U.S. Environmental Protection Agency (EPA) Toxic Release Inventory requirements.

- Support funding of Mine Safety & Health Administration (MSHA) training for small remote operations.
- Re-institute a systematic program that utilizes Recordable Disclaimers of Interest to secure state title to lands beneath navigable waters.
- Ensure fair and equitable taxation in state, municipality, and unorganized regions of Alaska to support the investment climate for the mining industry.

INDUSTRY OVERVIEW

The mining industry in Alaska continued to prosper during 2005. World metal prices have increased faster than most costs, making existing operations more profitable and stimulating additional exploration in the state. Substantial risk capital was available for exploration and development of projects and some new discoveries were announced. Construction of the Pogo gold mine continued and construction began at the Kensington gold project. The total value of Alaska's mining industry will be up for 2005 to about $1.7 billion compared to $1.6 billion in 2004. Initiatives put forth by the administration, such as "Permit Efficiency Streamlining", "Roads to Resources", and NPDES assumption continue to bolster the industry. Just as importantly, these programs have improved the outside perception of Alaska as a quality place to invest. The state and the industry are beginning to reap the rewards of these initiatives.

Red Dog, Fort Knox, and Greens Creek, Alaska's three major metal mining operations, and Usibelli Coal Mine all turned in strong performances. These mines contributed significantly to the employment base and economic vitality of their respective host communities and rural regions. Placer gold mining operations benefited from increased gold prices, although very high fuel prices had an offsetting negative affect.

Several mine development projects achieved important milestones in 2005. These include:

Pogo: Teck-Cominco and Sumitomo continued with the $347 million construction of the Pogo Mine near Delta Junction. This will be Alaska's next gold mine, with production to begin in early 2006. The underground mine will process ore at the rate of 2,500 tons per day and will produce approximately 400,000 ounces of gold per year for the 10 year mine life. The operating workforce will be 230 employees.

Kensington: Coeur Alaska, Inc. received its final permit in June of 2005 and began construction of this $105 million underground gold mine in July. Located 45 miles north of Juneau, the mine would employ approximately 200 workers during its 10-year operating life. The Wetlands Permit, issued by the U.S. Army Corps of Engineers, was subsequently withdrawn by the Corps for further study, as the Corps prepared to defend the permit in lawsuits brought by environmental opposition groups. Construction is continuing at a reduced pace.

Rock Creek: NovaGold Resources continued engineering studies of the Rock Creek Project during 2005. Rock Creek is located seven miles north of Nome; its satellite deposit, Big Hurrah, is located 41 miles east of Nome. Equipment acquisition has begun, with project construction targeted for mid-2006 and production at a rate of approximately 100,000 ounces per year beginning in 2007. Project construction costs are forecast at $40 – 50 million. Operating mine employment will be approximately 130 personnel.

Donlin Creek: Placer Dome and partner NovaGold continued with evaluation of the Donlin Creek gold deposit, located on Calista land in southwest Alaska, with a major drilling program consisting of 27,000 meters of drilling. A feasibility study is expected to be initiated in 2006. A three year permitting program is scheduled to commence in mid-2006, with construction to follow in about 2009 and production by about 2011. Construction costs are expected to be greater than $1 billion and average employment during operation at about 400 employees.

Chuitna Coal: Pacrim Coal announced initiation of permitting for the Chuitna Coal project located west of Anchorage on the north side of Cook Inlet. Construction for this project is scheduled for 2007 with production in 2009. Construction costs will be approximately $650 million. This will be a significant coal development for the state.

Pebble Copper: This is a large copper-gold deposit owned by Northern Dynasty and located north of Iliamna. Intense exploration drilling and baseline sampling activity continued during 2005. Announced resources are currently calculated at 31.3 million ounces of gold, 18.8 billion pounds of copper and 993 million pounds of molybdenum. Step out drilling to the east intersected very significant extensions to the ore body that could significantly enhance the project size and scope. Permit applications will be submitted once the company delineates the deposit extension, assesses its feasibility, and if necessary, redesigns the project.

Nixon Fork: This previous gold producer is located approximately 35 northeast of McGrath. The company has submitted permit applications and proposes to re-start of gold production in 2006 at the rate of approximately 45,000 ounces per year. This project is owned by St. Andrew Goldfields.

With increased metal prices, risk capital markets provided robust exploration budgets in 2005. Total expenditures are projected to approach $100 million. There was activity in virtually every corner of the state. Notable projects include:

Arctic: NovaGold Resources announced significant drill intercepts from its exploration efforts during the year. This project is a significant polymetallic volcanogenic massive sulfide deposit in the Ambler District.

LMS: AngloGold USA Exploration Inc. announced a significant Pogo type gold discovery between Pogo and Delta Junction. Significant gold intercepts were obtained from two parallel quartz vein systems.

Rainy Pass (Whistler): Kennecott Exploration (Rio Tinto) announced a significant copper-gold porphyry discovery at Rainy Pass. Metallurgical (flotation) testing shows that gold reports to the copper concentrate. Minor amounts of silver and molybdenum are present. Kennecott has identified eight other targets similar to the Whistler prospect in the surrounding area.

ER, Eagle, Beverly: AngloGold and Rimfire Minerals Corp. conducted exploration on these gold occurrences near Pogo. Significant gold values have been obtained from sampling and drilling.

MAN: Nevada Star Resources and Anglo American Exploration continued exploration on the large nickel, copper, platinum group complex located northwest of Paxson. Interesting sample results have been returned and continued exploration is scheduled.

Shulin Lake: Golconda Resources, Ltd., Shulin Lake Minerals Inc. and Shear Minerals, Ltd. joint venture has identified numerous intrusive-style magnetic anomalies over the Shulin Lake diamond property near Talkeetna. Diamond drilling of 5 holes to test 3 of the anomalies returned one diamond fragment and indicated that the holes were drilled on the apron of a volcanic center. Three test pits taken from glacial till in the area returned visual observation of diamond indicator minerals. Exploration work will continue in 2006.

Lucky Shot: Full Metal Minerals of Vancouver announced discovery of a high grade extension to the historic Lucky Shot Mine located 40 miles north of Anchorage in the Willow Creek district. Six significant drill intercepts, including one 13.1 ft containing 7.04 ounces of gold per ton, were encountered.

Shotgun: TNR Gold Corp. announced that it received assay results from its 2005 six-hole drilling program on the new Winchester Gold Zone. The holes were more than 1000 meters apart and

returned anomalous gold values warranting further drilling. The property is located about 280 miles west of Anchorage and 100 miles north of Dillingham in the Kuskokwim Mineral Belt.

Other: Exploration drilling, trenching and geochemical/geophysical mapping were conducted on a number of other new or historic projects in the state. The pace of exploration during the year will reach near record levels. Further information on projects can be obtained from Dave Szumigala, DGGS or Rich Hughes, Commerce.

The Minerals Branch of the Alaska Division of Geological and Geophysical surveys (DGGS) continued to provide quality data with an improved budget for 2005. The division completed the ground surficial geologic mapping project of the Council mining district. Geophysical surveys were conducted northeast of Fairbanks, in the Black Mountain area and east of Richardson in the Pogo area. A major geophysical survey to evaluate geologic hazards was initiated on the proposed pipeline corridor between Delta Junction and the Canadian border. A geological mapping program was conducted in the Liberty Bell area south of Healy. An airborne geophysical survey, funded by the BLM, was initiated on 1448 square miles of the southern National Petroleum Reserve of Alaska. The division, in collaboration with DNR, provided rankings on all remaining state-selected lands with mineral potential as part of the BLM 2009 Project prompted by the federal Alaska Land Transfer acceleration Act (S.1466).

The global mining industry continues to expand rapidly in response to explosive demand for mineral commodities in developing countries. The cycle appears to be long term. The improvements to the geopolitical character of the state made by the administration and legislature are attracting minerals industry funding to the state. People in rural regions are benefiting from the increased economic activity in their areas. With continued positive change in permitting efficiency, access and infrastructure development, land tenure, Alaska's geological database, education, marketing and a stable tax structure, the state will achieve a robust, sustainable mining industry that will provide economic and social benefits throughout the state.

FINDINGS AND RECOMMENDATIONS

PART A: ISSUES REQUIRING STATE ACTION

A1) REGULATORY REFORM

1a) NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PROGRAM PRIMACY

FINDING: NPDES permitting may be the greatest obstacle to timely development of mines in Alaska. The EPA currently conducts NPDES permitting, compliance, and enforcement for the State of Alaska. Alaska is one of only four states that does not have primacy over the NPDES program.

State control of this program will likely make the process more efficient by allowing for greater access to permit writers, allowing for better coordination with other State agencies during the permitting process, and by removing the duplication of effort of permitting through EPA while also working on State certification. State primacy may allow more efficient, timely administration of NPDES permitting while effectively addressing unique Alaska water issues and maintaining high environmental standards.

The state legislature funded a study to determine if the State of Alaska should assume NPDES program primacy, as it has in air quality. The study report included the pros and cons of program primacy, the funding requirements if adopted, and a preview of what the program and regulations will look like. This work product has prepared the State to assume a program that has been well-researched and planned with careful forethought.

Legislation was passed and approved by the Governor in 2005 to direct the Alaska Department of Environmental Conservation (ADEC) to promulgate regulations for the State assumption of NPDES permitting. By this legislation, ADEC is required to 1) file a completed application to seek State NPDES primacy to US EPA before July 1, 2006 and 2) continue work-group sessions, including representatives of permittees affected under the federal NPDES program, in the development of the permitting program. Additionally, ADEC is required to report to the Governor and the Legislature within 10 days of the Legislature convening in regular session 1) on progress of the application to the US EPA, 2) to provide a description of progress by US EPA in reviewing the application, and 3) to provide progress made by ADEC and the US EPA during the five-year transition period in transferring the NPDES program to the State.

The Minerals Commission supports the State of Alaska assuming NPDES primacy.

THE COMMISSION RECOMMENDS THAT:

1a1) The Alaska Department of Environmental Conservation aggressively pursue NPDES State primacy according to the schedule provided in the 2005 legislation.

1a2) The Alaska Legislature ensure the NPDES program is appropriately funded during the transition period and when the NPDES program is fully assumed.

1b) LITIGATION REFORM

FINDING: The Minerals Commission supported the adoption of the Public Interest Litigant legislation passed in 2003. The new legislation placed mining companies (and other industries) on equal status with any party bringing a civil action seeking judicial review of Administrative Agency decisions. This legislation is very positive and will increase investor confidence immeasurably. Unfortunately, a legal challenge to the legislation was lodged in mid 2003, with a ruling in favor of the plaintiffs in 2004, preventing implementation of the legislation. The Administration has appealed the court's ruling on this legislation, which has now been heard before the Alaska Supreme Court (November 9, 2005).

Alternative legislation was introduced in 2005 by the Administration that will serve a similar purpose. This legislation will continue to be heard in the 2006 legislative session.

THE COMMISSION RECOMMENDS THAT:

1b1) The Administration continues to vigorously defend the Public Interest Litigant statute against the legal challenge.

1b2) The Legislature consider and pass SB86 legislation on State/Municipal Liability for Attorney Fees.

1c) PERMIT EFFICIENCY

FINDING: The Alaska State agencies have been successful in improving permit efficiency. Through consolidation of permit administration under the Department of Natural Resources (DNR), and direction by the ADEC Commissioner, the permitting process for mining operations is becoming more streamlined. Permit coordination under DNR and aggressive review of backlog permits by ADEC appears to improve both timeliness and cooperation, making the process reasonably predictable while reducing the burden of the permitting process. Professional staff has been added in both Air and Water Quality to reduce the backlog of permit applications. The benefits of the Administration's and State Agencies' efforts in improving permit efficiency have been recognized by the mining industry in their business activities.

The Alaska industries, Agencies, Administration, and Legislature can work together to provide responsible and reliable permitting that ensures the protection of the environment, predictability to permittees, and a sound future. Coordination with Federal Agencies must be improved among all parties to make the permitting process more efficient.

The Administration received approval for six (6) additional staff positions in the FY06 budget for the Division of Mining, Land and Water to support and maintain efficient permitting activities. As of late 2005, these positions had not been filled, although recruitment was underway.

In late 2005, a number of talented senior staff members of the DNR left the Agency, including the Commissioner. The staff members that departed the Agency had significant experience in the mining industry, both from previous operational tenure as well as Agency experience in mining. The Administration and DNR has assured the mining industry that current policies and activities will continue, and that there will be no diminution of service from DNR. The mining industry supports this Administration's efforts in ensuring the environmentally sound development of Alaska's natural resources, and DNR's assertions of continued rescurce management services, however the industry also recognizes the difficulty in the timely filling of vacancies with highly talented individuals, especially in an era of increased mining activity warranted by regional and world-wide economic growth.

The present economic growth being experienced in the natural resource industries world-wide, as well as regional and US economic growth in all industries, has strained the supply of human resource professionals available to fill vacancies in industry as well as governmental agencies. If not already, the Alaskan agencies will see the same inability to attract skilled professional staff. The ADEC and DNR should review their recruiting mechanisms and salary and benefits packages to ensure they are capable of maintaining existing staff and attracting staff in a timely manner.

THE COMMISSION RECOMMENDS THAT:

1c1) The Administration continue to seek efficient and timely permitting by maintaining high quality internal staff and using third-party contractors to support the permitting process.

1c2) The Department of Natural Resources aggressively recruits to fill the outstanding vacancies approved in the FY06 budget for the Division of Mining, Land and Water.

1c3) The Department of Natural Resources ensures excellent resource management services by ensuring the vacancies occurring in late 2005 of senior staff members are filled with highly qualified individuals with relevant experience.

1c4) The agencies ensure their recruiting mechanisms and salary and benefits packages are capable of reacting to market conditions in the employment of professional staff.

1c5) The Legislature require a periodic permitting status report accounting for agency staff and management.

1c6) The Administration demand that Federal Agencies respond in a timely, responsive manner when their participation is required in the permitting process.

1d) GENERAL PERMITS FOR SMALL REMOTE WORK CAMPS

FINDING: Small work camps are commonly used for construction and mining exploration throughout the remote areas of Alaska. These camps are short-term, low-impact facilities with common features. However, the camps require several State permits to address waste, wastewater, drinking water, food service and other environmental and human health regulations. To ease the permitting burden on both the permittee and the State, ADEC needs to develop a General Permit for these facilities.

THE COMMISSON RECOMMENDS THAT:

1d) The Alaska Department of Environmental Conservation and Alaska Department of Law develop a simplified permitting method to bring small, remote work camps into compliance with all applicable State regulations, or restore the ADEC General Permit provision for simplification of permitting small work camps.

1e) MIXING ZONES

FINDING: Existing water quality regulations contain a prohibition against mixing zones in anadromous or resident fish spawning areas. This overly broad language makes it more difficult to consider site-specific conditions, such as the productivity of the spawning area compared to the potential benefit of a municipal waste treatment plant or industrial project that might require a mixing zone. Without flexibility in the regulation, many projects that could significantly improve the health and welfare of people throughout Alaska may be precluded because of the widespread presence of spawning fish, including resident fish.

During 2004 and 2005, ADEC proposed revisions to the mixing zone regulations and solicited public comment. Three critical improvements were provided in the proposed mixing zone regulations. These included 1) allowing mixing zones in spawning areas provided an applicant can demonstrate no adverse effect to the spawning area, 2) simplifying and reorganizing the mixing zone regulations into one section of the water quality standards as compared to several locations, without compromising the protection of the environment, and 3) moving the technical specifications for designing and modeling mixing zones into guidance documents and out of regulation to allow for modifying and improving design criteria and specifications based on current science and technology. As of the end of 2005, these proposed revisions to the mixing zone regulations have not been finalized.

THE COMMISSION RECOMMENDS THAT:

1e) The Alaska Department of Environmental Conservation finalize the promulgation of the mixing zone regulations after considering the comments provided during the comment period that result in enhancements to the proposed regulations and without detracting from the original three improvements in the proposed regulations.

A2) ACCESS and INFRASTRUCTURE

The lack of infrastructure, including roads, airports, and power transmission networks, increases the costs of mineral exploration, development, and mining, and substantially increases economic risk incurred by potential investors. High costs and risk levels are a deterrent to investment and, consequently, decrease the rate of mineral deposit discovery and subsequent development. Alaska mining operations are rendered less competitive in the global marketplace because of the lack of public infrastructure, limiting mining industry growth and slowing economic diversification, particularly in rural areas.

2a) ROADS TO RESOURCES

FINDING: The current Administration has recognized this deterrent to resource industry investment, and has taken positive action to develop the needed infrastructure through the Industrial Roads Program ("Roads to Resources"). High-priority roads and facilities have been identified and engineering studies commissioned. The program significantly bolsters perception from Outside that the State is open to mineral development, and that logistical hurdles inherent in frontier regions can be overcome in an active partnership with State government. The program thereby stimulates exploration investment and allows development projects to proceed more rapidly. The Commission applauds the government for its actions and initiatives.

THE COMMISSION RECOMMENDS THAT:

2a1) The State continue with the Roads to Resources program and select projects for funding that can directly result in resource development.

2a2) The Administration aggressively seek federal funding to complete the selected projects.

2b) POWER SUPPLIES

FINDING: Major mines typically require substantial (20-80 megawatt) power supply, and additional or extraordinary processing requirements can significantly increase that demand.
The availability of electrical power is a significant challenge to mineral development in Alaska. Many remote mines must generate their own power using costly modular diesel or other forms of power generation, and transportation of the fuel adds to the logistical hurdles that must be overcome by the mine. If the existing power grid in Alaska was enhanced by additional generation facilities, future extensions of the grid could incrementally extend power-by-wire not only to mining developments, but also to remote communities. Coal fired generation offers the means to provide stable long term power supply to enhance the existing power grid in Alaska.

THE COMMISSION RECOMMENDS THAT:

2b) The Governor and Legislature support development of a long-term electrical generation plan for the existing electrical grid in Alaska that incorporates the use of coal.

A3) STATE'S RIGHTS ISSUES

These issues have been segregated because although they are also about ownership and access, both of which are fundamentally important in mineral investment decisions, two of them are not exclusively Alaska issues, and allow for cooperative efforts with other states at the federal level.

RS 2477 trails may offer the only access across lands in Alaska where ownership patterns have changed and become more complex since statehood. Similarly, navigable waterways can provide the cheapest form of transportation for some mineralized areas, and some are inherently important sources of placer gold.

Western States have as much a vested interest in RS 2477 access as does Alaska, and all states have an interest in ownership of the riverbeds and water columns of navigable rivers and lakes.

3a) RS 2477 TRAILS

FINDING: In 1993, the Legislature appropriated funds for a task force to create an RS2477 right-of-way inventory. The Division of Mining Land and Water has recently formed a Public Access Assertion and Defense Unit to focus exclusively on asserting access to public lands and waters. The unit, under former State Senator Scott Ogan's direction, is managing the Quiet Title Action on a RS 2477 (RST) in the Coldfoot-Chandalar Lake area of the Brooks Range. This trail was chosen because of it's long history as a critical access to a mining region. There are many active mining claims that are directly and indirectly affected by this trail. The defendants in the case are primarily the Federal Government, a Native Corporation and a private property owner near Chandalar Lake. The objective of the litigation is to set a precedence to make it easier for miners and others to get access across RSTs. There has been a recent 10th Circuit case ruling that is favorable to acknowledging the existence of RSTs.

The Alaska Division of Mining, Land, and Water has researched 1,950 routes proposed as RS2477 rights-of-way. Of these, about 620 routes have been legislatively recognized, about 250 need more information, and the remainder may not qualify because of circumstances such as lack of evidence, duplication of existing rights-of-way, or failure to meet the requirements of the RS2477 law.

The Department of Law and the Division of Mining, Land and Water require continued funding for "quiet title" actions that could establish the validity of these 620 routes.

THE COMMISSION RECOMMENDS THAT:

3a) The Legislature should preserve the State's rights by providing adequate funding for a multiyear, multi-agency Capital Project of aggressively pursuing precedent-setting Quiet Title actions for RS 2477 trails based on the results of the Coldfoot-Chandalar Lake litigation.

3b) NAVIGABILITY

FINDING: State ownership of the beds of navigable waters is an inherent attribute of State sovereignty protected by the United States Constitution.

The State of Alaska owns all water columns and the land under most navigable waterways in Alaska. The Equal Footing Doctrine, the Submerged Lands Act of 1953, the Alaska Statehood Act of 1958, the Alaska State Constitution, and the Alaska Statutes establish State ownership of public water (actual water that is in a lake or river) and the submerged lands (the beds of navigable waterways below the mean high water mark). The courts have defined navigable waters as those "used or **susceptible to use** for travel, trade, and commerce at the time of statehood" (emphasis added). In the Gulkana decision the court determined that for this purpose, any stream capable of floating a boat, canoe or raft carrying 1,000 pounds is navigable.

This interpretation would include not only the obviously navigable waterways, such as the Yukon, Kuskokwim, Tanana, Fortymile, and Kobuk rivers, but many smaller rivers and lakes used for travel. Some of the rivers that will clearly qualify under the Gulkana decision contain important placer gold deposits. Regrettably, the Bureau of Land Management Solicitors refuse to recognize this important 9th Circuit Case Law in their adjudication of Recordable Disclaimers of interest filed by the State of Alaska.

While title to the beds of navigable waters was vested in the state at Statehood, the federal courts have only ruled on the navigability of 13 waterways in Alaska. Alaska faces two types of legal hurdles in establishing its ownership of lands under navigable waters. The first is to determine what rivers and lakes are navigable under federal law, as determined by the Gulkana decision. The second is to establish that the United States did not defeat the State's title to navigable waters through pre-statehood federal reservations. The State has used the court action (quiet title) to address both of these hurdles by defining the types of rivers and lakes that are navigable under federal law, and to determine whether or not certain pre-statehood federal reservations defeated the State's title. The most recent case is the Glacier Bay case, which the courts ruled was a pre-Statehood withdrawal that defeated State Title. However, in that case, the Federal Government acknowledged state title to the tidelands within the Tongass National Forest.

In 1980, the State established a comprehensive navigability program within the DNR. This program was designed to respond to federal land conveyances and land management activities under the Alaska Statehood Act, the Alaska Native Claims Settlement Act, and the Alaska National Interest Lands Conservation Act. The basic purpose of the program was to protect the public rights associated with navigable waters, including the State's title to the submerged lands. The program also included monitoring of federal land conveyance and management programs to identify navigability disputes, seeking cooperative resolution of navigability problems through negotiation and legislation, and preparing for navigability litigation. The program was mostly eliminated through budget cuts in the late 1980s, although the program has been restored in recent years, and further strengthened with the establishment of the Public Access Assertion and Defense Unit.

In January 2003, the Department of Interior adopted new regulations that allow Bureau of Land Management (BLM) to issue "Recordable Disclaimers of Interest" for navigable waters. The Recordable Disclaimer process provides the state and federal governments with a process to agree on State ownership of navigable waters without going through the costly Quiet Title process. The state must submit applications to the BLM. To date, the state applied for such determinations on 21 rivers and 10 lakes, and BLM has issued disclaimers for six rivers and two lakes. In FY03 and FY04, the Legislature provided special funding to DNR and the Alaska Department of Fish and Game (ADFG) that has been used to prepare the state's initial work on this project. BLM has agreed to provide the State with funding for conducting research to support additional applications by the State for Recordable Disclaimers of Interest for navigable waters.

THE COMMISSION RECOMMENDS THAT:

3b) The Legislature continue to adequately fund the Department of Natural Resource's Public Access Assertion and Defense Unit and personnel within the Department of Fish and Game to continue work on the Recordable Disclaimers applications program. Additionally, funding should continue to be made available to the Department of Law to support any Quiet Title actions necessary to assert ownership of submerged lands. Further, Federal Government should continue to establish more efficient methods for determining what water bodies are navigable and recognize the established Gulkana Case Law in regard to susceptibility when issuing Recordable Disclaimers of Interest.

A4) DATA ACQUISITION

4a) GEOPHYSICAL AND GEOLOGICAL MAPPING

FINDING: Alaska is one of the most poorly mapped regions of the world and ranks far behind many third world countries in spending for geologic data acquisition. Many potential investors in Alaska's mineral industry are discouraged by the lack of detailed geologic information, and choose to invest in areas that have more public data to guide grassroots exploration. Furthermore, companies that have persevered and identified prospects worthy of development find that they are expected to fully define the baseline data of the whole area surrounding their discovery because no such database exists.

Since 1993, the State of Alaska has spent an average of $400,000 per year on airborne geophysical surveys and the "ground truth" geologic mapping necessary for interpretation of the airborne surveys. The geophysical work to 2005 has covered approximately 9,000 square miles, less than 6% of the State's land entitlement. At the current rate of mapping, it will take more than 100 years to have basic coverage of State land in Alaska. A healthy, growing mining industry, as well as competent State management of mineral and other natural resources, requires a much more substantial and

consistent annual investment in basic geological data acquisition. The Governor has proposed funding for this geophysical mapping at a level of $600,000 for 2006. The Governor has also proposed $350,000 for surficial geologic mapping of the proposed gas pipeline corridor between Delta Junction and the Canadian border as a follow-up to airborne geophysics. To be consistent with the other high-quality mapping products produced by the State and to be efficient in field work and map production, additional funding should be provided to insure that bedrock geology mapping is completed as well. DGGS made significant progress in making geological information more accessible to the public, through a graphical web-based interface. This was a major undertaking initiated some years ago. With information easier to obtain and synthesize, exploration companies are better able to learn of high-potential areas, and are more inclined to make financial investments in exploration. This is an example of how relatively small investments in Alaska's geological survey translate to major economic investment in the state.

THE COMMISSION RECOMMENDS THAT:

4a1) The Governor and the Legislature increase the annual rate of investment in geophysical surveys to a level greater than $1,000,000 per year.

4a2) The Governor and the Legislature should provide $500,000 to complete both surficial and bedrock geology mapping of the Delta Junction – Canadian border pipeline corridor.

A5) EDUCATION AND RESEARCH

5a) AMEREF

FINDING: The "Alaska Resource Kit", which is being used in the statewide public school system, is an excellent program for educating Alaska's students in the issues and fundamentals of resource development. With the current expansion of mining activity in the State, there is a parallel need to educate our youth in all aspects of mineral development. The AMEREF program provides a broad-based resource education for Alaska's students that is critical to their future ability to make well reasoned decisions about the use and protection of Alaska's wealth of natural resources. The kit incorporates technical, economic, and environmental aspects into a balanced program that addresses mineral, timber, and energy development.

AMEREF is supported by the resource industries in partnership with the State of Alaska. The resource industries fund AMEREF's production and replacement of all teaching materials and ensure the technical accuracy of the material. The resource industries also organize and distribute the education kits. AMEREF is looking to expand the program by obtaining additional funding through various grant programs.

The Governor and Legislature reinstated basic AMEREF funding with a Department of Education position in the FY05 budget. The AMEREF program's successful integration into the State of Alaska school systems has been the result of past cooperative efforts between AMEREF and the Alaska Department of Education. This position was specifically designed to work with AMEREF to ensure that the curriculum was developed in a manner that would meet State standards. This position

also provides teacher training to familiarize Alaska teachers with the program and to facilitate its application in the classroom. The Commission appreciates the reinstatement of funding for this position by the Administration and seeks to build on this success for the future.

THE COMMISSION RECOMMENDS THAT:

5a) The Governor and the Legislature should appropriate $100,000 to the Division of Teaching and Learning Support, Minerals and Energy Education Program for curriculum development of AMEREF. Industry will continue to support all AMEREF materials, but the State's support in funding Department of Education approved curriculum development is essential to the program's integrity.

5b) COLLEGE OF ENGINEERING AND MINES

FINDING: The University of Alaska was founded as a mining and agriculture college to train Alaskans for the development of our resources. Alaska has some of the most highly prospective mineral lands in the world and mineral development remains an important component for a strong, diversified state economy. Alaska also presents unique educational requirements. Mineral resource operations are challenged by severe cold, permafrost conditions, and remoteness. These challenges are best met with home-grown, in-state expertise and knowledge. The State should maintain a strong mineral engineering degree program so that there is a base of knowledgeable, capable people prepared to meet Alaska's unique challenges.

UAF recently integrated the School of Mineral Engineering into the College of Engineering and Mines in 2004. The School of Mineral Engineering has had the reputation of being one of the best school of mines in the United States. Its graduates hold responsible mining positions around the world. There is strong concern that the school's focus on mining, geological and petroleum engineering will be significantly diminished within this broader context of general and civil engineering. Many other mining schools across the continent have been forced to roll their mining programs into their engineering schools for financial survival. However, in many instances, the mining programs have been under-funded and poorly staffed. As a result, these formerly venerable institutions have become ineffective at producing quality mining graduates. A similar fate must be prevented in Alaska, where mining is poised to become a premier employer of professional mining personnel.

The president of UAF, Mark Hamilton, has committed to funding a President's Professor of Mining and Energy Technologies for the next five years. He has stated that attracting a world class researcher to help address the most pressing needs of our mining industry should help "jump start" UAF's new college in the right direction. He has also stated that he would hope, during those five years, that we can demonstrate enough progress and growth to justify endowing the position. That position has not yet been filled.

THE COMMISSION RECOMMENDS THAT:

5b1) The Legislature encourage the University to maintain a world-class Mine Engineering degree program.

5b2) The Legislature ensure that the UAF Administration and Board of Regents has the resources necessary to support the position of the President's Professor of Mining and Energy Technologies.

A6) IMPROVING THE INVESTMENT CLIMATE IN ALASKA

6a) TAX CONSIDERATIONS

FINDING: Diversification of the Alaska economy is a cornerstone of all credible discussions regarding long-term fiscal planning for Alaska. With the development of the Greens Creek, Red Dog, Fort Knox, True North, and Pogo mines over the last decade and a half, it is a proven fact that mineral development can bring substantial private sector investment and employment to diverse geographic regions of Alaska, from southeast Alaska to the Interior and on to the northwest Arctic. Other projects such as Kensington, Chuitna Coal, Rock Creek, Nixon Fork, Donlin Creek, and Pebble offer potential economic development to still other parts of Alaska, including eastern, western, and southwestern Alaska.

Mining is an industry that can bring economic development to areas both inside and outside the rail belt. Yet with much of Alaska's mineral potential located in portions of the State that remain within the unorganized borough, there are major fiscal uncertainties with respect to the private sector investment needed to explore and develop these projects. The legislature has considered the possibility of mandatory borough formation in these areas, bringing with those proposals the uncertainty of taxation formulas, tax rates, and the overall equity of the potential tax structures that might be instituted.

The mining industry expects to contribute to state and local government. In addition to state income tax paid by corporations in all industries, mining operations pay an additional 7% Net Profits Interest (NPI) Mining License Tax to the state, regardless of where they are located in Alaska. Operations on State land pay an additional 3% NPI royalty. Mining is one of the few industries to pay this additional percentage of profits to the State over and above the corporate income taxes. In addition, all of the major mining operations make large payments to local municipal governments via property taxes or payments in lieu of property taxes.

During discussions regarding borough formation in rural areas, it has become clear that the residents in these areas do not generally endorse payment of taxes themselves to support new local government. If borough formation was effected in these areas, it is possible that the potential tax burden would be placed primarily on the major industry in the region. While the mining industry does expect to pay its fair share of future municipal government costs, if and when it is appropriate to form these local governments, it should do so by an equitable, broad-based tax such a property tax, not an industry-specific tax such as a severance tax. Without the mitigating effects of a broad-based tax, the mining industry could then end up facing a very onerous tax structure. Such uncertainty serves as a strong disincentive to the very investment and economic diversification that is so vital to rural development.

From the perspective of making the initial decision about whether to invest in Alaska, the unpredictability of future tax liability makes planning difficult. This unpredictability contributes to the disincentive against investment in mining in Alaska, for the mining industry in particular, because unpredictable operating costs, such as tax liability, combine with fluctuations in metals prices to make projection of economic risks more difficult at the development decision stage. Placing limits on the extent of new taxes for mining operations would make economic planning more predictable and thereby reduce the disincentive against investment in Alaska.

THE COMMISSION RECOMMENDS THAT:

6a) The Governor and the Legislature take steps to improve the investment climate for the mining industry by ensuring that future municipal taxes, especially in those areas presently within the unincorporated regions of Alaska, are broad-based, equitable, and stable.

6b) MINERALS MARKETING AND FOREIGN TRADE OFFICES

In the past three years, the State of Alaska has made dramatic improvements to the business environment for the mining industry. This improvement, coupled with the long-recognized geological potential for strong mineral endowment, makes Alaska one of the premier locations in the world for mineral exploration and development investment. With a resurgence in metal prices, the State is experiencing growth in exploration. However, most of the exploration funding comes from Canadian-based sources. A lesser amount comes from American companies. Very little Alaska exploration funding originates outside North America.

FINDING: Much greater investment in Alaska mineral exploration and development could be achieved through more aggressive marketing of Alaska's potential, both in North America, and abroad, particularly Asian countries. Foreign trade representatives maintained on contract by the State in Korea, Japan, China and Taiwan respond to industry requests for assistance in those marketplaces. They can provide assistance by initiating contacts, making introductions to potential investors, and representing the state's improvements to the markets. Increased cooperation among mining entities and state agencies could better market Alaska as a place for Asian companies to invest in mineral projects. Expanded, better-financed, minerals marketing efforts could elevate North American investment in Alaska. Despite the very positive changes that have been made, it is necessary to follow through and convince mineral exploration and development managers and financiers around the world that Alaska truly is, in a global context, one of the best places in the world to explore and develop mineral deposits.

THE COMMISSION RECOMMENDS THAT:

6b1) The Department of Community and Economic Development work with the Alaska Minerals Commission, the Alaska Miner's Association, and the Governor's Office of International Trade to provide information, marketing materials, and instruction to the Alaska foreign trade representatives in Asia, and

6b2) The Department of Community and Economic Development and the state's foreign trade representatives be provided with adequate funding to expand the presence at domestic and foreign trade shows at which investment in Alaskan mineral exploration, development and mining projects can be promoted, and

6b3) The State continue with high-level Trade Mission efforts that promote development of coal resources in Alaska.

PART B. FEDERAL ISSUES OF STATE CONCERN

B1) TAILINGS IMPOUNDMENT CLASSIFICATION

FINDING: The Clean Water Act (CWA) generally prohibits the discharge of pollutants into "waters of the United States" except in compliance with a permit issued under sections 402 (NPDES program) or 404 (dredge and fill program) of the CWA. EPA Region 10 is responsible for issuing NPDES permits in Alaska and the U.S. Army Corps of Engineers issues 404 permits.

In 2002, the Corps and EPA adopted regulations defining "fill material" for purposes of the 404 permitting program as any material that has the effect of either replacing any portion of a water of the United States with dry land or changing the bottom elevation of any portion of a water. The new regulations also include a definition of "discharge of fill material," which is now defined to include "placement of overburden, slurry or tailings or similar mining-related materials.

On May 17, 2004, EPA headquarters issued a memorandum entitled "Clean Water Act Regulation of Mine Tailings" (also known as the "Regas memo") to EPA Region 10 addressing the permitting of the disposal of mine tailings under the 404 permitting program. Among other things, the Regas memo provides that the discharge of fill material to construct the dam for a tailings impoundment as well as the discharge of the mine tailings into the impoundment is subject to permitting under CWA section 404; any discharge of pollutants from the impoundment to a downstream water is subject to CWA section 402.

The location of the tailings impoundment is to be specified through the application of guidelines developed by EPA pursuant to Section 404 (b)(1) of the CWA. The guidelines include among other requirements a provision that no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharged that would have less adverse impact on the aquatic impact system. An alternative is "practicable" if it is available and capable of being done taking into account cost, existing technology, and logistics in light of overall project purposes. The guidelines also generally prohibit the discharge of fill material if it will cause or contribute to "significant degradation" of waters of the United States. EPA has the power to veto or place restrictions on any 404 permit issued by the Corps if the discharge would have an unacceptable adverse effect on municipal water supplies, shellfish beds and fishing areas, wildlife, or recreational areas.

The Regas memo notes that in 1992, prior to the adoption of the current definitions of "fill material" and the "discharge of fill material," EPA had issued a memorandum (the so-called "Wilcher memo") stating a different regulatory basis for permitting tailings impoundments. The regulatory definition of "waters of the United States," contains an exclusion for "waste treatment systems." Therefore, neither a 402 nor 404 permit is required to put fill material or other pollutants into a waste treatment system.

Since a tailings impoundment is a type of waste treatment system, EPA concluded that a 402 or 404 permit isn't needed to put tailings into it. EPA states in the Regas memo that although EPA now chooses to rely on section 404 of the CWA and the 2002 changes in the regulations definitions of "fill material" and the "the discharge of fill material" in permitting the disposal of mine tailings into waters of the United States, this reliance does not preclude the use of the waste treatment exclusion.

The permitting of the disposal of mine tailings into waters of the United States including wetlands is critical to the mining industry in Alaska. Many mine operations can only be built in valley areas through which streams run and wetlands are present. In many instances disposing of tailings in a "drystack" on uplands is not practicable. The benefits of the 2002 rulemaking and the permitting guidance provided in the Regas memo will not be realized if Region 10 EPA does not appropriately exercise their oversight responsibility of the Corps' 404(b)(1) process, particularly in regards to the practicability analysis. In regards to a 404 permit recently issued for a tailings impoundment in Southeast Alaska, EPA Region 10 categorically stated that drystack tailings management is the "preferred method in Alaska." This statement indicates a possible bias against wet tailings facilities, which are often the only practicable alternative in Alaska.

The Minerals Commission appreciates the Murkowski Administration's and EPA Headquarter's and Region 10's efforts to develop and implement the Clean Water Act Regulation of Mine Tailings memorandum of May 17, 2004. The Administration and ADEC have strongly supported the resolution to provide clear direction on the permitting of mine tailings as "fill material" under the Army Corps of Engineers Section 404 permitting program.

THE COMMISSION RECOMMENDS THAT:

B1-1) The Administration work with EPA to appropriately implement the Regas Memorandum in a consistent and objective manner, recognizing that it is the Army Corps of Engineers' responsibility to conduct the 404(b)(1) analysis, with oversight from EPA, and that in all cases site-specific environmental factors and the practicability considerations of cost, existing technology, and logistics are to be fairly considered in light of the overall project purpose.

B2) TOXIC RELEASE INVENTORY

FINDING: The Toxic Release Inventory (TRI) program details toxic chemical releases and waste management activities reported annually by certain covered industry groups as well as federal facilities. This inventory was established under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) and expanded by the Pollution Prevention Act of 1990. In 1997, EPA added seven new industries to the TRI reporting program, which included coal and metal mining. The original intent of the program was to identify possible releases that could occur from a regulated facility – and how they might affect the health and well being of a community. The disagreement over what should be reported centers around the fact that the term "release" is not defined under the TRI program as the term is commonly used in the English language. Myriad environmental programs for mining already regulate and have reporting requirements for "true releases" to the environment.

THE COMMISSION RECOMMENDS THAT:

B2-1) The State Administration and Legislature send a message to Congress and the Federal Administration that the TRI reporting of mining wastes clearly violates the spirit of EPCRA. Reporting gross quantities of naturally occurring compounds that never leave a permitted facility only creates distorted numbers that have no basis in reality in predicting risks posed by a mining operation to the general public. It costs mining companies time and money, whether reporting to the TRI data base or not, because of having to do all of the requisite paperwork to establish whether threshold amounts of any one compound would necessitate the filing of a report.

B3) GEOLOGICAL MAPPING

FINDING: The State of Alaska lacks a comprehensive geological base of information. As a minimum, the state should have, for each 1:250,000 scale quadrangle: 1) a basic geological map, 2) an airborne magnetic survey at suitable line spacing, 3) reconnaissance stream sediment sampling surveys, and 4) baseline water quality data. Information at this level of detail is necessary to attract investment in mineral resources to the state. The federal government is carrying out very little geological mapping and geophysical surveying, and is not meeting its obligations under ANILCA in a systematic, sustainable fashion.

Section 1010 of ANILCA requires that "The Secretary shall, to the full extent of his authority, assess the oil, gas, and other mineral potential of all public lands in the State of Alaska in order to expand the data base with respect to the mineral potential of such lands..."

This ANILCA requirement was formerly met by the Alaska Mineral Resources Assessment Program (AMRAP), which was funded for several years immediately after passage of ANILCA, and was carried out by the United States Geological Survey (USGS). Over time, the amount of funding for the program was cut, and finally the budget line item was eliminated and folded into other USGS programs. The AMRAP program was subsequently cut to the point where it has effectively been dormant since about 1992.

THE COMMISSION RECOMMENDS THAT:

B3-1) The legislature pursue reinstatement of the AMRAP program by lobbying the congressional delegation.

B4) RESOLUTION OF OUTDATED SEGREGATIONS

FINDING: Large tracts of land in Alaska that were "temporarily" withdrawn from public entry more than 30 years ago remain unnecessarily closed. These Outdated Segregations preclude mineral development, deny access to other lands and resources, and prohibit transfer of land selections to the State of Alaska and Alaska Native Claims Settlement Act (ANCSA) corporations.

The land segregations were originally set aside for three primary purposes:

1. Selection and conveyance to ANCSA corporations,
2. Possible inclusion within federal conservation units, and
3. Industrial developments such as alternate candidates for a Trans-Alaska Pipeline corridor.

The BLM has initiated a large number of land management planning studies that are required before the land withdrawals can be removed by congressional action. As the first task required by S1466, The Alaska Land Tranfer Acceleration Act, the agency has prepared a report to Congress that clearly identifies all lands forming the outdated segregations, and made recommendations for those that can be immediately rescinded.

THE COMMISSION RECOMMENDS THAT:

B4-1) The Department of Natural Resources continue to work cooperatively with the BLM to allow completion of the land conveyance process on schedule by 2009.

B4-2) The Department of Natural Resources monitor the land planning process to ensure that high-potential mineral lands are reopened to mineral entry when the withdrawals are rescinded.

B4-3) The Alaska Legislature provide adequate funding for the Department of Natural Resources to carry out the actions that will be required to permit it to meet the deadline imposed by S1466.

B5) ESSENTIAL FISH HABITAT

FINDING: Protection of "Essential Fish Habitat" (EFH) is a key component of the 1996 Sustainable Fisheries Act (SFA), which amended the 1976 Magnuson-Stevens Fisheries Conservation and Management Act (MSFCMA).

EFH is an evolving program administered by the National Marine Fisheries Service (NMFS). In January, 2004, a Draft Environmental Impact Statement (DEIS) for Essential Fish Habitat Identification and Conservation in Alaska was made public for review and comment. The State of Alaska, in April, 2004, forwarded their comments to NMFS. The State of Alaska was generally supportive of the progress shown in the DEIS, but held a deep concern about the possible inland reach of the EFH program. The State claimed that EFH consultation for activities and projects occurring within State waters and uplands is a duplication of existing protections and processes in which the State is currently engaged. The State also contends that EFH consultation does not provide for any enhanced protection for those identified habitats. In fact, the additional consultation does nothing more than create additional work for local, State and Federal agencies, as well as the applicant proposing the activity or project within the State. EFH consultation may ultimately result in loss of resource development opportunities and economic benefit to the State without any additional habitat protection or gain beyond those required under local, State or Federal regulatory programs.

Under the SFA, eight Regional Fisheries Management Councils develop Fisheries Management Plans for important fish species, and provide this information to NMFS. The NMFS has defined essential fish habitats very broadly, and throughout the western states has included all waters currently accessible to salmon. All federal agencies involved in any kind of development are required to consult NMFS if their actions "may adversely affect EFHs."

This broad mandate will, at best, slow permitting with a complex consultative process, or in the worst case result in project denial or modifications that effectively prohibit resource development. Thus, this

poorly defined EFH program has the potential to be at least as onerous as the Corps of Engineers 404 "Wetlands" permitting.

THE COMMISSION RECOMMENDS THAT:

B5-1) The Governor and Legislature work with the Congressional Delegation to require NMFS to define the scope and application of the EFH program, limit the authority of the NMFS to marine waters, and leave management of anadromous fish within State waters to ADF&G.

B6) MSHA

FINDING: MSHA regulates the safety of mining operations. This agency has recently added the requirement that gravel operations that "screen, crush, or size" gravel must provide MSHA training for

employees. This requirement affects all road, airport, community, and other infrastructure construction or upgrade pro jcts in Alaska. MSHA also increased the penalties for violations. MSHA did not increase the University of Alaska funds for this training, which will be required in potentially 200 Alaska villages.

FINDING: Comparing MSHA with the Occupational Safety & Health Administration (OSHA) Benefits for Small Business one sees that OSHA has fewer recordkeeping requirements for very small business. Employers with 10 or fewer employees are exempt from most OSHA recordkeeping. The violations are also reduced for smaller business with a 60% reduction with 25 or fewer employees.

THE COMMISSION RECOMMENDS THAT:

B6-1) The Governor communicate with the U.S. Department of Labor to ensure that appropriate funds are available for the required annual MSHA training held throughout the State of Alaska.

B6-2) The Governor communicate with the U.S. Department of Labor to ensure that small mines in Alaska, who fall under MSHA, can have similar regulatory relief as provided to small operators under OSHA.

APPENDIX A
ENABLING LEGISLATION

Chapter 98
Session Laws of Alaska, 1996
As Amended by Chapter 12
Session Laws of Alaska, 1998

AN ACT

Relating to the Alaska Minerals Commission; and providing for an effective date.

Section 1(a) The legislature finds that the minerals industries, including metallic minerals, industrial minerals, and hydrocarbons, have traditionally and continue to be the major source of wealth and income in the state.

(b) The legislature further finds that there are major constraints on the continued development of a diverse mineral industry in the state, including the Environmental Protection Agency's effluent guidelines, state water quality standards and improperly classified streams and rivers, restriction on surface access, complex and numerous permitting requirements, and limited access to minerals through mineral closing orders and restrictions on multiple use through state and federal land use plans.

Section 2. ALASKA MINERALS COMMISSION ESTABLISHED. (a) The Alaska Minerals Commission is established in the Department of Commerce and Economic Development.

(b) The Commission is composed of 11 members. The Commission shall be composed of individuals who have at least five years' experience in the various aspects of the minerals industries in the state. The Governor shall appoint five members of the Commission, one of whom must reside in a rural community. The President of the Senate shall appoint three members of the Commission. The Speaker of the House of Representatives shall appoint three members of the Commission. Each member serves at the pleasur of the appointing authority.

(c) The Commission shall make recommendations to the Governor and to the Legislature on ways to mitigate the constraints, including governmental constraints, on development of minerals, including coal, in the State.

(d) The Commission shall report its recommendations each year to the Governor and the Legislature during the first 10 days of the regular session of the Legislature.

Sec. 3. This Act is repealed February 1, 1994.*

Sec. 4. This Act takes effect immediately in accordance with AS 01.10.070(c)

*Note: The Act was amended to extend the life of the Commission to February 1, 2014.

APPENDIX B
ALASKA MINERALS COMMISSION
STATEMENT OF PURPOSE

The Alaska Minerals Commission was created by the 14th Legislature in Chapter 38 of the Session Laws of 1986 and was established to make recommendations to the Governor and to the Legislature on ways to mitigate constraints on the development of minerals in the State.

The minerals industry offers the greatest potential of any Alaska industry for expanding and diversifying the State's economic base, for increasing Statewide employment, and for generating new wealth to create businesses and provide revenues for State and local governments.

However, Alaska has a complex pattern of land ownership and management; has overlapping and uncertain regulatory requirements; has unique geographic, geologic and climatic conditions; and has an undeveloped transportation system.

To attract the capital necessary for the exploration and development of new mines, to ensure that mines can be developed feasibly and in a timely fashion, and to ensure that producing mines remain viable, constraints on the industry must be mitigated.

The Alaska Minerals Commission will prepare reports for the First and Second Sessions of the 15th Legislature and the First Session of the 16th. Legislature, recommending to the Governor and to the Legislature the adoption of legislation and the implementation of administrative policy that will best accomplish the statement of policy found in Article VIII of the Constitution of Alaska:

"It is the policy of the State to encourage the settlement of its land and development of its resources by making them available for maximum use consistent with the public interest."

And the statement of policy found in the President's National Materials and Minerals Report to Congress of April 5, 1982:

"It is the policy of this administration to decrease America's mineral vulnerability by taking positive action that will promote our national security, help ensure a healthy and vigorous economy, create American jobs, and protect America's national resources and environment."

The goals and recommendations of the Alaska Minerals Commission are to assure that the Legislature and the State administration endorse and promote development of a viable mining industry in the State.

APPENDIX C
MINERAL POLICY ACT

Sec. 44.99.110. Declaration of state mineral policy. The Legislature, acting under act. VIII, sec. 1 of the Constitution of the State of Alaska, in an effort to further the economic development of the state, to maintain a sound economy and stable employment, and to encourage responsible economic development within the state for the benefit of present and future generations through the proper conservation and development of the abundant mineral resources within the state, including metals,

MINING TAX 7% NET PROFITS

RENTS AND UP TO 3.30 per acre/year

ROYALTY 3% NET PROFIT

Permitting status report

? INDUSTRY SPECIFIC TAX STRUCTURE IN CANADA

This publication was released by the Department of Commerce, Community, and Economic Development. Its purpose is to report the findings and recommendations of the Alaska Minerals Commission to the Governor and to the Legislature of Alaska. It was produced at a cost of $1.31 per copy and printed in Fairbanks, Alaska. This publication is required by Chapter 98, Session Laws of Alaska, as amended by Chapter 4, Session Laws of Alaska, 1993.

Overview

Chuitna Coal Project

"green field" coal export development project based on 20,000 acres of state coal leases with measured reserves in excess of 1 billion Tons

PacRim Coal, L.P.

Owner/Project Developer

A Delaware limited partnership.

Two of the limited partners:

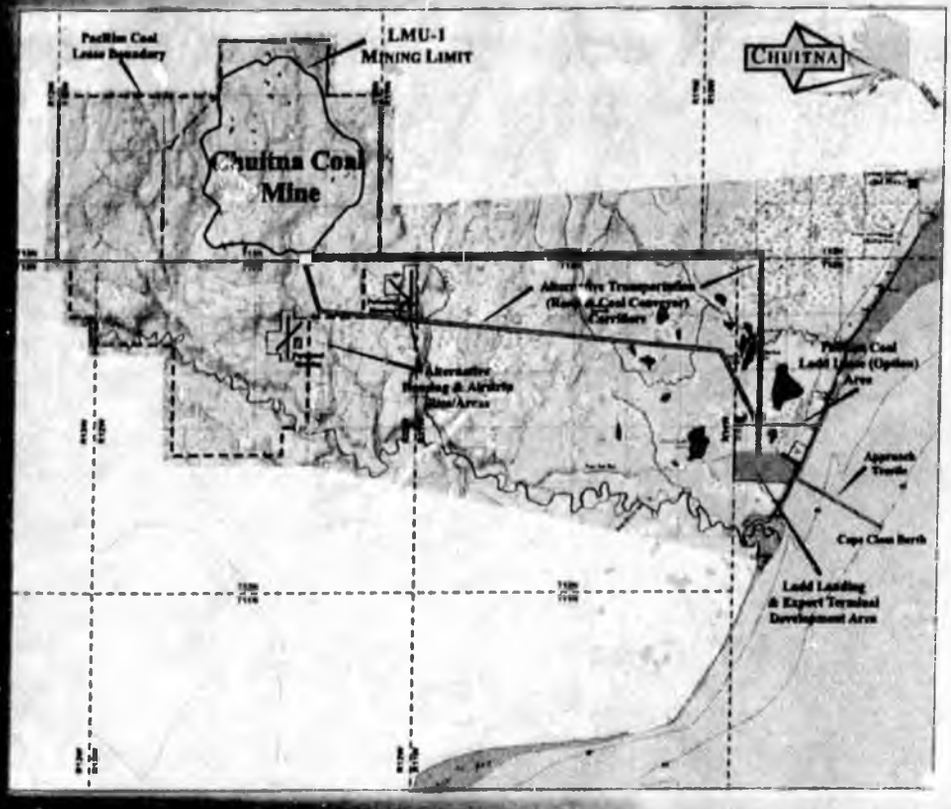
Richard D. Bass

&

W. Herbert Hunt

involved since 1978

Chuitna Coal Project



Chuitna Coal Mine

- 300 MM Mineable Tons in LMU 1
- Surface Facilities

Infrastructure

- Single Status Housing
- Mine Access Road
- Coal Transport Conveyor

Ladd Development

- Coal Export Terminal
- Bulkhead
- Logistics Center

Project Data

- Total Investment: $350-$400 million
- Earliest Construction Start 3rd quarter 2007
- 1st Shipments 4th qtr 2009-1st qtr 2010
- Peak Operating Workforce ± 350
- Rotating work shifts
- 12 MMTpy Mine production capacity
- 15 MMTpy coal transport capacity
- 15 MMTpy vessel loading capacity
- Cape Class draft (60') vessel berth
- 1 MMTon coal stockpile capacity
- Ladd receiving, warehousing, & distribution center

The Economic Impact of
Alaska's Mining Industry

Prepared for:

Alaska Miners Association
3305 Arctic Blvd, Suite 105
Anchorage, Alaska 99503
(907) 563-9229
www.alaskaminers.org

Prepared by:

McDowell GROUP

Juneau Office
PO Box 21009
Juneau, Alaska 99801
(907) 586-6126

Anchorage Office
1400 West Benson Blvd, Suite 350
Anchorage, Alaska 99503
(907) 274-3200

www.mcdowellgroup.net
info@mcdowellgroup.net

February 2006

Cover photos, top to bottom:
Rock Creek Development Project, courtesy of NovaGold Resources
Fort Knox Mine, courtesy of Kinross Gold
Greens Creek underground drill rig, courtesy of Kennecott Greens Creek Mine

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The purpose of this study was to measure the economic impact of the mining industry on Alaska. Alaska's mining industry includes exploration activity, mine development and mineral production. The industry produces zinc, lead, gold, silver, coal, as well as construction materials, such as sand, gravel and rock. This study examines the direct and indirect economic impacts of the mining industry, primarily focused on 2004 impacts.

The study highlights some prominent themes about the mining industry in Alaska, such as:

- Mining offers some of the highest paying occupations in Alaska.
- Mining projects provide jobs in rural areas, where there are few other private sector jobs available.
- Mines make significant local government tax payments.
- Native corporations receive benefits from mining activity on their land, both in jobs for shareholders and revenue.

Alaska's mining industry is poised for additional growth. However, the industry faces high-risk, long development periods, and high development costs. A stable and equitable tax environment is necessary for Alaska to realize the greatest potential economic benefit from mineral development.

Key study findings are summarized below. A map of Alaska's major mining and exploration projects is provided at the end of this chapter.

Mining Industry Expenditures

Exploration

- Exploration expenditures in Alaska in 2004 totaled **$71 million** (2005 expenditures are over $95 million). From 1981 to 2005, mining and mineral exploration companies have spent $1 billion in Alaska on exploration programs.
- In 2004, there were **26 significant exploration projects** in Alaska, including 15 with expenditures for the year of over a million dollars. Many of these projects provide employment for residents of rural Alaska.
- The preliminary estimate for 2005 exploration expenditures is **$95 million**, an increase of 33 percent over 2004 expenditures.

Development

- In 2004, mine development investment in Alaska totaled an estimated **$209 million**. Since 1981, mining companies have invested **$2.5 billion** on development of Alaska mining projects.
- The preliminary estimate for 2005 development spending is **$294 million, up 41 percent** from 2004.

Operations

- Approximately 73 open-pit, underground, mechanical placer, and suction dredge mines were in production in Alaska in 2004.
- In addition there are at least 37 rock quarries and 71 active sand and gravel operations within Alaska.
- Alaska's three largest metal mines, Red Dog, Fort Knox, and Greens Creek, spend approximately **$170 million** annually in Alaska in support of their operations, including payroll and in-state purchases of goods and services.

Mining Industry Employment

- Direct mining industry employment in Alaska totaled approximately **2,900 jobs** in 2004, accounting for **$194 million** in payroll. This employment includes workers engaged in production (metals, coal and construction materials), exploration or mine development during 2004.
- Including direct, indirect and induced employment, Alaska's mining industry accounted for approximately **5,100 jobs** and **$280 million** in annual payroll in 2004.

- Alaska's metallic mineral mines reported annual average employment of **1,130 workers** in 2004. These workers earned a total of $80 million in payroll, with an average annual wage of **$70,750**.
- The mining industry's average wage is **83 percent** above the statewide average annual wage of **$38,616**.
- Metal mining employment in Alaska is expected to increase by approximately **500 jobs** over the next two years as the Pogo and Kensington mines come on line. Direct mining industry payroll will increase by **$35 million**.
- Development of the Chuitna coal project on the west side of Cook Inlet would add **300 to 350 jobs** to Alaska's coal mining industry.
- Development of the Pebble project in Southwest Alaska would require a construction labor force of **2,000 workers** and a permanent operations **labor force of 1,000**.

Alaska Resident and Contractor Hire

- The mining industry has a high Alaska resident hire rate. The industry actually has a higher resident hire rate, at **83 percent**, than the statewide average of 80 percent, and significantly higher rates than other key Alaska industries.
- Mine development projects employ Alaskans and support Alaskan businesses. Approximately 300 workers have been hired for the Pogo Mine construction project, located near Delta Junction. Pogo's construction labor force is **85 percent Alaska resident**.
- Coeur Alaska's Kensington Gold Project, located near Juneau, is under construction and has so far awarded **$42** million in construction contracts, **85 percent to Alaskan companies**.
- At Placer Dome's Donlin Creek project, in 2005, Calista shareholders made up 94 percent (111 shareholder employees) of the 118 Donlin Creek direct and contract employees. Of this number, 70 shareholder employees have worked at Donlin Creek for at least five years and some have worked for nearly 10 years.
- In 2005, Northern Dynasty Minerals hired 45 consulting firms to conduct environmental baseline studies, planning and research on its Pebble Project. These firms employed 441 Alaskans who worked on some aspect of the project. Of the Alaska workforce, **21 percent were hired locally** from the Bristol Bay region and 26 percent were Alaska Native.
- Many of the jobs offered by the mining industry are rural-based, including those at Red Dog, Donlin Creek, Pogo, and Pebble. These jobs are offered where few if any other employment opportunities are available. They also offer transferable skills in a rapidly growing industry in Alaska and worldwide.

Mining Industry Payments to Local and State Government

- Mining companies represent some of the most significant taxpayers in the Northwest Arctic Borough, Fairbanks North Star Borough, City & Borough of Juneau, and the City of Nome. In 2004:
  - --Red Dog paid **$6.2 million** in payment in lieu of taxes (PILT) to the Northwest Arctic Borough.
  - --Fort Knox/True North paid **$3.5 million** in property taxes to the Fairbanks North Star Borough
  - --Greens Creek Mine paid **$660,000** in property taxes to the City and Borough of Juneau
  - --Usibelli Coal Mine paid property taxes of **$125,000** to the Fairbanks North Star Borough and **$155,000** to the Matanuska-Susitna Borough, and **$75,000** in other taxes to the Denali Borough.
  - --Alaska Gold Company paid **$53,300** in real property taxes to the City of Nome.
- The Red Dog Mine's $6.2 million PILT to the Northwest Arctic Borough is the borough's single most important source of revenue, representing three-fourths of its General Fund receipts.
- In a PILT agreement between the Pogo Mine and the City of Delta Junction, mine developers paid the city $500,000 in 2005, will pay another $500,000 in 2006, and another $1,000,000 in 2007 (if a Borough has not yet been incorporated).
- The mining industry pays a wide variety of taxes, rent, royalties and fees to the State of Alaska. Mining license fees are the largest source of revenue, totaling $10.3 million in FY 2005. In total, the mining industry paid the State of Alaska **$15.8 million** in rents, royalties, and fees in 2004; a year when metal prices were just beginning to improve.

- Mining is an important source of revenue for the Alaska Railroad (ARR). In FY 2004, the railroad earned approximately **$17 million** from movement of coal and gravel destined for Alaska or export markets (15 percent of ARR's total operating revenue).
- The Alaska Mental Health Trust earned $167,000 in rents and royalty payments from the mining industry in 2004. The Trust also earned $60,000 from construction material sales.

Mining Industry Partnerships with ANCSA Corporations

- Red Dog Mine is operated by Teck Cominco under an agreement with NANA Regional Corporation. NANA is the landowner and Teck Cominco is the operator. As part of a lease agreement, Teck Cominco pays a net smelter return royalty to NANA, which in 2004 was $10.9 million. Of the 2004 royalty payment, NANA deducted $250,000 for its scholarship program and other administrative costs, retained $3.1 million, and redistributed $5.9 million to the other 11 ANSCA regional corporations as part of its 7(i) payment requirement. Teck Cominco paid $90.1 million in total royalties to NANA from 1982 to 2004.
- Of the 480 employees at Red Dog, approximately 360 are employed directly by Teck Cominco, while most of the remaining employees are employed by NANA/Lynden (which provides concentration haulage from the mine to the port site) and NANA Management (which provides the meals and lodging for all mine employees).
- Teck Cominco has hired more than **1,000 NANA shareholders** (nearly one-third of all Northwest Arctic Borough residents age 18 to 65) at Red Dog Mine since production began in 1989. This does not include many more who have worked as contractors at the mine. Of Teck Cominco's direct jobs, **56 percent** are held by NANA shareholders or spouses of shareholders, and a third of the people holding Red Dog jobs live in the villages of the Northwest Arctic Borough
- Teck Cominco has provided 52 full college scholarships for NANA shareholders since 1996. Additionally, for the fall of 2004, $37,000 was provided to 23 students.
- Developer of the Donlin Creek project, Placer Dome, has entered into exploration and mining lease agreements with Calista Corporation and The Kuskokwim Corporation for mining and surface use. Further, Placer Dome is talking with Calista and Kuskokwim about opportunities for services contracts.

Local Level Economic Impacts

In Juneau...

- Greens Creek is Juneau's **largest private sector employer** in terms of annual payroll.
- Greens Creek Mine's 260 employees as a group are among the highest-paid workers in the community. Employees have average annual wages of nearly $79,000, almost triple the average $29,000 wage for Juneau private sector workers, and double the average state worker annual average wage of $40,000.
- Greens Creek Mine spent $20 million for goods and services purchased in Alaska, $17 million of which was spent in Juneau, in 2003.
- Greens Creek Mine households contributed $307,000 in residential real estate property tax in 2003 for the $26.4 million in assessed value of their homes.
- Greens Creek Mine contributes $50,000 annually to charitable organizations and pays employees for several hundred hours of community service work. Employees contributed in excess of $100,000 to local charitable organizations, and donated another $15,000 in goods and more than 4,000 hours of volunteer time to more than 50 charitable organizations, schools, and community organizations.

In Fairbanks...

- In 2004, Fort Knox was the second-largest private sector employer in the Fairbanks North Star Borough, with annual average employment of 411. It is the eighth largest among all 2,000 public and private sector employers in the borough.
- Fort Knox Mine employees' average salary was 70 percent higher than the borough average.
- The Fort Knox Mine spent $70 million on goods and services in the Fairbanks North Star Borough in 2004 with over 500 different local businesses.

- Because the Fort Knox Mine is a large purchaser of Golden Valley Electric Association power, other GVEA customers enjoy lower electric power rates – 7 percent lower for residential customers and 10 percent lower for large commercial customers, according to the most recent available data.

In the Northwest Arctic Borough...

- Including contract employment, the Red Dog Mine (with 480 workers) is the second largest employer (after Maniilaq Association) in the Northwest Arctic Borough. In terms of payroll, the mine is the largest employer in the borough. The mine generated $46 million in total wages in 2004.
- Red Dog accounted for 17 percent of all wage and salary employment in the Northwest Arctic Borough, and 30 percent of all private sector employment.
- Prior to Red Dog Mine's opening, average income in the Borough was well below the statewide average. However, the median household income in the Northwest Arctic Borough grew by about 87 percent from 1979 to 1989 ($17,756 to $33,313) and by 38 percent from 1989 to 1999 ($33,313 to $45,976), largely as a result of new jobs associated with the mine. Annual wages at the mine are typically from $45,000 to $85,000 per year, plus benefits.
- According to a 2002 study, Red Dog accounted for one-third of the private sector jobs held by the residents of Buckland (33 percent), Kiana (36 percent), Kivalina (38 percent), Noorvik (33 percent), Selawik (34 percent), and Shungnak (32 percent). It accounted for 63 percent of the private sector jobs held by the residents of Noatak.

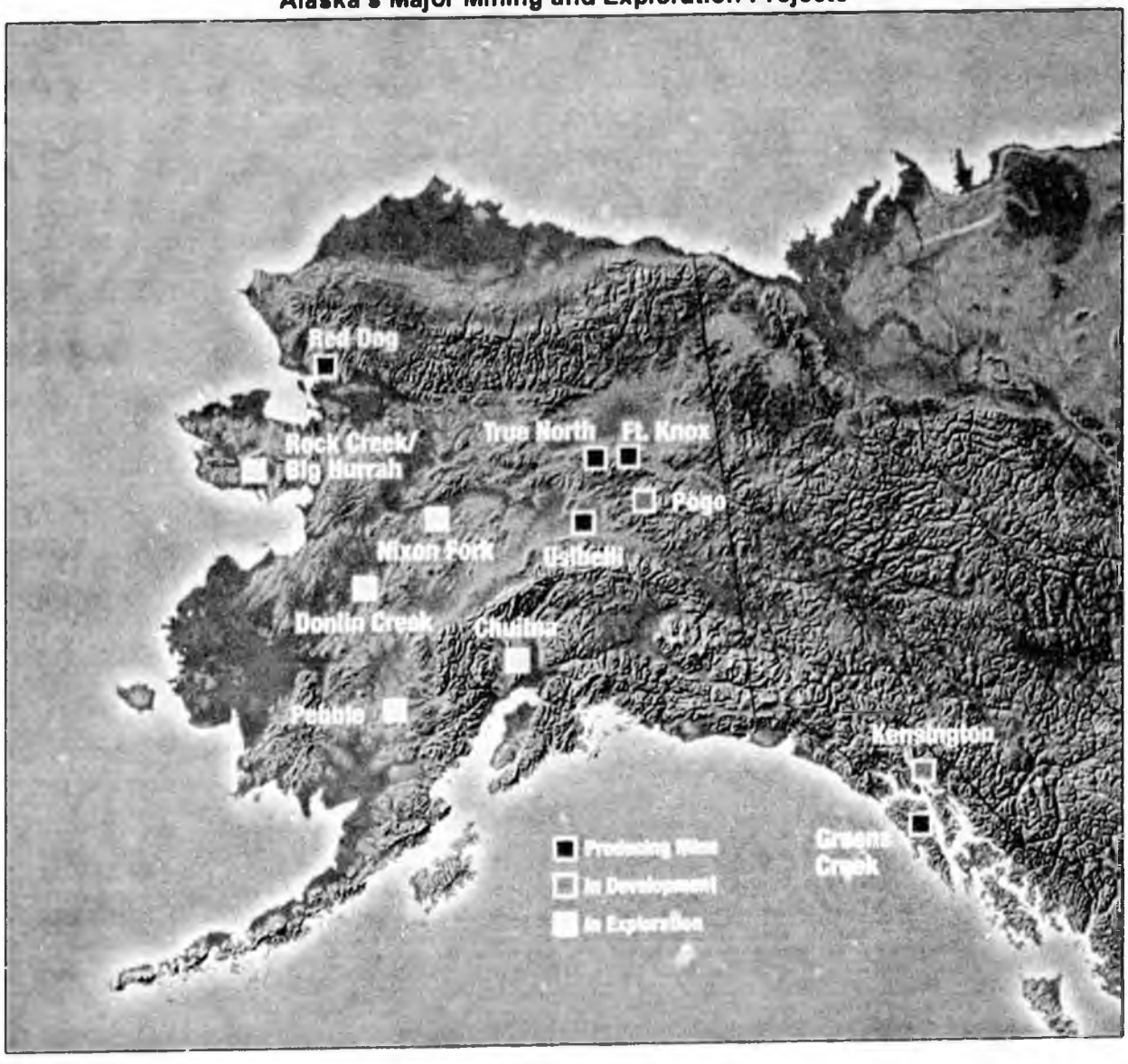
Infrastructure Development

- The mining industry has historically played a role in the development of important infrastructure in Alaska. For example, development of the Alaska Railroad, the Richardson Highway, and the settlement of Anchorage, Fairbanks, Juneau, Skagway and Nome are all linked with early mining industry activity.
- Mining industry development of Alaska infrastructure continues today. For example, in 2005, Alaska Electric Light and Power Company extended a transmission line from Juneau to the Greens Creek Mine. That extension may make it possible to transmit power to the small community of Hoonah, which now must rely on costly diesel power. Without the economies of scale offered by Greens Creek, the extension to Hoonah would not be economically feasible.

Summary of the Mining Industry's Statewide Economic Impact, 2004

Direct Employment and Payroll	
Average direct mining industry employment in Alaska, 2004	2,900
Direct mining industry payroll in Alaska, 2004	$194 million
Total Employment and Payroll (Including Direct and Indirect Impact)	
Total employment attributable to the mining industry in Alaska, 2004	5,100
Total payroll attributable to the mining industry in Alaska, 2004	$280 million
Investment	
Total investment in Alaska mining exploration & development, 1981–2005	$3.5 billion
Exploration and development expenditures, 2004	$280 million
Exploration expenditures in 2004	$71 million
Mine development expenditures in 2004	$209 million
Royalties, User Fees, and Tax Revenues	
Payments to state government, 2004	$15.8 million
Payments to local governments, 2004	$11.0 million
Payments to Native corporations, 2004	$11.1 million
Payments to the Alaska Railroad	$16.9 million
Payments to the Alaska Industrial Development & Export Authority (AIDEA)	$17.7 million

Alaska's Major Mining and Exploration Projects



CHAPTER I:
PROFILE OF THE MINING INDUSTRY

The mining industry, and the minerals and metals it produces, are an essential component of the average American's way of life. According to the Mineral Information Institute, nearly seven billion tons of minerals and energy fuels had to be produced in 2004 to supply the needs of the U.S., averaging 46,414 pounds of minerals per year for ea American.[1] For instance, based on statistics from the U.S. Geological Survey, for every American:

- 12,095 pounds of stone was used to make roads, buildings, bridges, and other construction uses;
- 9,134 pounds of sand and gravel was used to make concrete, asphalt, roads, blocks, and bricks;
- 20 pounds of copper was used in buildings, electrical and electronic parts, plumbing, and transportation;
- 11 pounds of lead was used for transportation, batteries, electrical, communications, and TV screens;
- 11 pounds of zinc were used to make metals rust resistant; paint, rubber, skin creams, health care, and nutrition; and,
- 7,423 pounds of coal were used to produce energy.[2]

The mining industry is a multi-faceted and diverse part of Alaska's economy. More than just extracting mineral resources from the earth, it involves reconnaissance exploration, prospect assessment, advanced exploration, pre-development, mine construction, production, final reclamation and monitoring. This chapter describes the various phases of the mining "cycle" of activity.

The beginning of the mining cycle is exploration, or more specifically, reconnaissance exploration – typically a regional program aimed at discovering previously unrecognized mineral deposits with economic potential.

With discovery comes a more specific exploration effort, sometimes termed target exploration or advanced exploration. This is a process of prospect assessment, where the deposit is sampled to determine grade and tonnage and the feasibility of profitable mining. It is this stage of mineral development that is the most complex and most dynamic. Literally dozens of constantly changing economic, financial and technical forces influence mine feasibility. Low grades, small tonnages, or high costs may mean that a deposit never advances beyond the assessment stage, or it may sit idle for decades until rising metal prices or technological advances help turn the project into a profitable venture.

Many mineral prospects are drilled and sampled, but only one in a thousand ever becomes a mine. For those few prospects where detailed sampling indicates profit potential, the next step is mine development (construction). Here the ore body is prepared for mining, an ore processing mill is constructed and the support infrastructure developed. In large-scale mine development efforts, hundreds of millions of dollars are invested and hundreds of workers employed over a period of several years as the mine is readied for production.

Because mineral deposits are finite resources, mining companies are constantly active at all the different stages of the mineral cycle; performing reconnaissance exploration in one area, drilling and sampling a prospect in another area, maybe developing a new mine in yet another. When one deposit is depleted and the mine must close, the mining company must be prepared to begin production at another deposit in order to survive. This is the mineral cycle.

The following discussion is a more detailed description of mineral exploration, mine development and production.

Reconnaissance Exploration and Advanced Exploration

The business of mineral exploration has become increasingly sophisticated in recent years. Reconnaissance exploration programs often begin with analysis of satellite or high altitude aerial photographs covering hundreds of square miles. Depending on the target minerals, airborne geophysical surveys may also be employed over large tracts of land. Geochemistry plays an important role in mineral exploration today. Chemical analysis of stream sediment and soil samples allows mining companies to preliminarily test mineral potential without actually sampling the underlying bedrock.

[1] Mineral Information Institute, "Every American Born Will Need...", March 2005.
[2] Ibid.

With discovery comes the sometimes lengthy and very costly process of determining if a prospect can be profitably mined. Prospect drilling, sampling, and the whole process of property evaluation and mine feasibility analysis is, in the simplest of terms, an effort to determine if ore exists in sufficient quantity (tonnage) and quality (grade) to make profitable mining possible.

Rock Creek Development Project

Photo courtesy of NovaGold Resources.

Ore grade, tonnage, and mineral/metal prices are critical in determining mine feasibility. But so are costs: the cost of preparing the ore body for mining, building a mill (concentrator), mining a ton of ore, and crushing, grinding, and refining a product from that ton of ore. Inherent in all these costs are labor costs, the cost of electric power, the cost of shipping supplies to the mine site, tax burdens, and the cost of acquiring the necessary permits to develop a mine and the cost to reclaim the mine after closing down production.

Mine Development and Construction

Millions of dollars spent on regional exploration and millions more spent on assessing a handful of prospects may finally identify a mineral property that is worth mining. Five years may elapse between discovery and development, but 15 years is probably more the norm (for example, the Greens Creek Mine near Juneau was discovered in 1975, and went on-line in 1989.) U.S. Borax spent $100 million over 20 years on its Quartz Hill molybdenum deposit near Ketchikan and mine construction has not yet occurred. Some prospects see 50 years of intermittent assessment work, conducted by multiple owners, before final development occurs. New technology, new mining approaches, and changing market conditions often help turn once uneconomic deposits into successful mines.

The process of mine construction involves construction of a mill or concentrating plant – a facility to separate the valuable metals from the uneconomic rock. These facilities typically include mechanical (crushing, grinding, gravity separation) and/or chemical processes to separate the metals from the rock. In some cases only a concentrate is produced at the mine. The concentrate is then shipped to a smelter where final processing occurs and a metal product is generated. The Greens Creek Mine, for example, produces three types of concentrates containing silver, gold, zinc, and lead. These concentrates are shipped to several smelters around the world for final processing. Other mines produce a final product on site.

The construction effort will also include support facilities, which may involve transportation infrastructure (roads, docks, or airstrips depending on the location of the mine), tailing disposal facilities, power generating facilities if no outside power source is available, and the office and lab facilities for the mine's managers, engineers, and geologists. For remote mines, facilities are required to house and feed the mine's workforce.

Even after millions of dollars of investment and many years of effort, a project may never become a mine. These major Alaska projects were never developed:

- ***Lost River (tin, fluorite, tungsten deposit), $20 million invested (1964-1972)***
- ***Orange Hill (copper), $30 million invested (1963-80)***
- ***Bornite (copper), $20+ million (1957-1972)***
- ***Quartz Hill (largest molybdenum deposit in North America), $100 million invested (1974-1989)***
- ***AJ Mine (gold), $80 million invested (1983-1995)***
- ***Brady Glacier Mine (largest nickel deposit in Alaska, also copper and platinum), $8 million invested (1958-1972)***

Mine development is the process of preparing the ore body for mining: for underground mines, driving tunnels from the surface (adits), sinking shafts, driving access and ventilation raises, and accessing ore blocks with crosscuts and other tunnels. For surface mines,

development may include stripping overburden and removing overlying waste rock. Mine development expenditures also include the purchase of mining equipment such as drills, loaders, trucks, etc.

Major mine development can be an extremely costly business and even more so in Alaska's challenging environment. For example, nearly a billion dollars have been invested in initial and subsequent development of the Red Dog mine, including the transportation infrastructure. Half a billion has been invested in the Fort Knox Mine, near Fairbanks.

Mine Operations

With mine development and construction complete, production can begin. There are many different mining methods, though the two basic types of mines are open-pit and underground mines. Greens Creek is an underground mine. The Red Dog and Fort Knox mines are open-pit. Open-pit mining methods are usually employed when a mineral deposit is on or near the surface. Profitable mining of lower grade deposits often requires that huge volumes of ore be processed. The world's largest open-pit mines move more than 100,000 tons of ore per day, far more than the typical underground mine. The Fort Knox pit is the U.S.'s twelfth largest open-pit metal mine in terms of tonnage mined per day.[3]

The production phase of the mineral cycle can last from a few years to several decades, depending on production rates, the size of the ore body and market conditions. For example, based on current market conditions, the Greens Creek Mine has a minimum life expectancy of about 12 more years.

The life of a mine can be longer or shorter than anticipated. Increasing metal prices, improved technology, lower costs of production factors such as fuel or electric power can all add years to the life of a mine. Conversely, technical difficulties, falling metal prices, or increasing production costs can force temporary closure or prematurely end the life of a mine.

The Fort Knox mine typifies the challenges facing the mining industry. The Fort Knox deposit was explored and evaluated in the late 1980's and early 1990s, with mine development occurring in 1995 and 1996. The first gold was poured in December 1996. During the ten-year period from 1987 to 1996 – including the exploration and development period for Fort Knox – gold prices averaged $387 an ounce. Mine developers invested $373 million in the mine, preparing the ore body, building the mill and constructing ancillary facilities. With the expectation of cash operating costs averaging $245 an ounce, the mine had a bright future. However, in 1997, gold prices began to slide, averaging $331 an ounce for the year. In 1998, the average price slipped further, to $294 and then again to $279 in 1999.[4]

In 1998, as a result of low gold prices, Kinross wrote down $145 million of the $375 million value of mine. In 1999, the company again evaluated the property with the assumption of a lower gold price of $300 per ounce and wrote down an additional $109 million for the Fort Knox Mine. Today, the mine is profitable, with gold prices over $500 an ounce.

Mine Closure and Reclamation

Mine reclamation is the process of returning an area to a physically and chemically stable condition and converting mined or otherwise industrially developed land to some other useful function. In remote areas, the goal is most often to create productive ecosystems. In more urbanized areas, the goal might be to convert land to other industrial, commercial or recreational uses. The process of mine reclamation can include grading and stabilizing the landscape, placing topsoils, and generating re-vegetation. Mine reclamation can also involve long-term commitments by mining companies to monitor environmental conditions in the reclaimed areas.

In many mines, reclamation is an activity that occurs while the mine is in operation. For example, at the Usibelli Coal Mine near Healy, recontouring and replanting of mined-out areas is an on-going, routine part of the operations of the mine.

[3] Information provided by the Office of Mineral Development, Alaska Department of Commerce, Community, and Economic Development (January 3, 2006).

[4] Source: World Gold Council/Kit[illegible] Gold

CHAPTER II: CURRENT MINING INDUSTRY ACTIVITY IN ALASKA

To appreciate the economic benefits of the mining industry in Alaska, it is important to have an understanding of the type and scale of mining-related activity in the state. This chapter summarizes exploration, development and mineral production in Alaska.

Exploration Programs

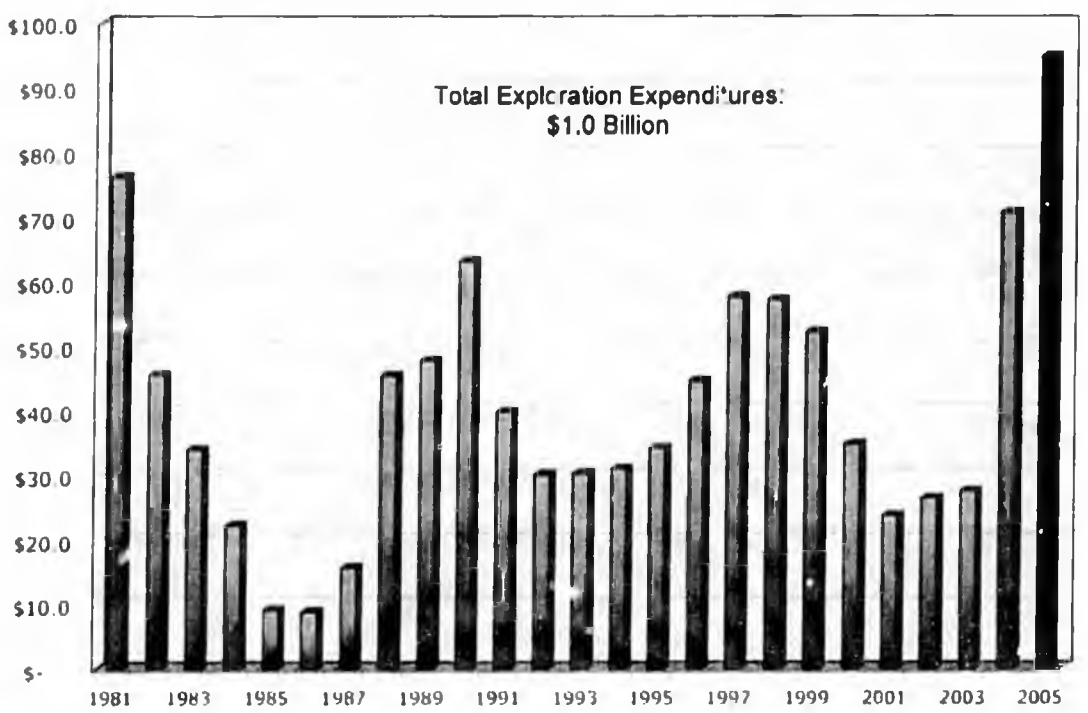
Each year, millions of dollars are spent in Alaska searching for and evaluating mineral deposits. According to the State of Alaska's Division of Geological and Geophysical Surveys (DGGS), exploration expenditures in Alaska in 2004 totaled $71 million.[5]

The preliminary estimate for 2005 exploration expenditures is $95 million, an increase of 33 percent over 2004 expenditures.[6] Since 1981, mining and exploration companies have spent a billion dollars in Alaska on mineral exploration programs.

In 2004, there were 26 significant exploration projects in Alaska, including 15 with expenditures for the year of over a million dollars. Companies explored for gold, copper, nickel, silver, lead, zinc, platinum, diamonds, molybdenum, and coal (as well as construction minerals). There were 66 new federal mining claims and 6,965 new state mining claims recorded in 2004.[7] In 2004, there were 141 new prospecting sites pushing the statewide total to 1,581 active prospecting sites.

Exploration occurred throughout Alaska, though most expenditures were focused on two Southwestern Alaska projects, the Pebble Project and the Donlin Creek Project (described in detail, below).

Exploration Expenditures in Alaska, 1981-2005* ($Millions)



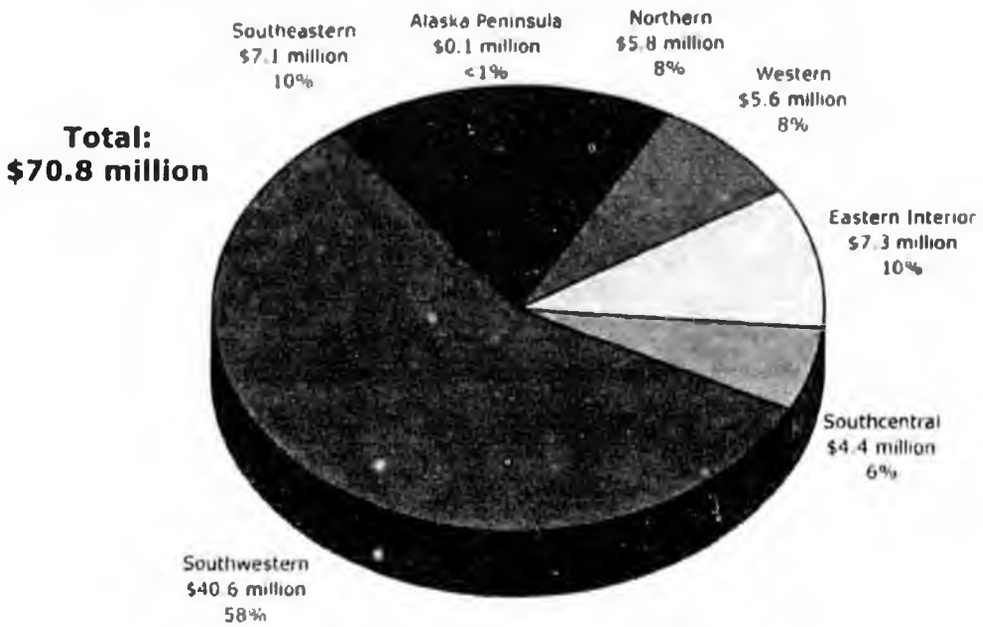
Source: *Special Report 59, Alaska's Mineral Industry 2004*, Division of Geological & Geophysical Surveys/Department of Commerce, Community and Economic Development, October 2005.
*Preliminary 2005 estimates provided by the Division of Geological & Geophysical Surveys.

[5] *Alaska's Mineral Industry 2004, Special Report 59*. Division of Geological and Geophysical Surveys/Department of Commerce, Community and Economic Development, 2005.

[6] Division of Geological and Geophysical Surveys, Alaska Department of Natural Resources.

[7] Alaska Department of Natural Resources Land Records Information Section and U.S. Bureau of Land Management.

Exploration Expenditures in Alaska, by Region, 2004



Source: *Special Report 59, Alaska's Mineral Industry 2004*, Division of Geological & Geophysical Surveys/Department of Commerce, Community and Economic Development, October 2005.

Key Alaska Exploration Projects

Exploration expenditures often have direct impacts on local and regional economies through spending made on local accommodations, camp services (including catering, housekeeping, and communications), air transportation and other forms of transportation and logistics, drilling labor, security, and environmental services (such as collecting information on water and air quality, as well as biological baseline research).

Following are brief profiles of several projects that are in the advanced exploration phase and have potential to become operating mines, and some examples of how their exploration expenditures impact the local, regional and Alaska economies. These projects are listed in order of potential timeline to development, with the Nixon Fork most likely to reach the mine development stage first.

Nixon Fork

Nixon Fork is located 35 miles northeast of McGrath in Interior Alaska. The deposit has been mined for many years, beginning with placer gold discovered in 1917 and lode gold in 1918. More recently, Nevada Gold Fields operated the mine in the 1995 to 1999 period. The project is now owned by Mystery Creek Resources, a company of St. Andrew Goldfields, Ltd. Resources are indicated at 76,000 tons at 0.95 ounces per ton gold with total resources amounting to 160,000 tons containing 136,300 ounces of gold. Efforts to permit and operate the mine, beginning with the treatment of existing tailings, are in progress. Start-up of production is projected by the summer of 2006.

Rock Creek/Big Hurrah

Rock Creek project is located seven miles north of Nome. Big Hurrah is located about 45 miles east of Nome. Both projects are owned by Alaska Gold Company, a subsidiary of NovaGold Resources Inc. Currently, both projects are in the feasibility and permitting stage and both are intended to be mined concurrently. The measured and indicated resources for Rock Creek are 7.4 million tonnes of ore at 1.36 grams of gold per tonne. Commissioning of production is forecasted for the first half of 2007 at a production rate of 7,000 tonnes a day producing approximately 100,000 ounces annually. Estimated construction costs are $58 million. When operational, the mines are expected to provide 130 year-round jobs and bring $30 million in annual expenditures (including $9.1 million in payroll) to the Nome area.[8]

[8] Information about Rock Creek and Big Hurrah was provided by, NovaGold Alaska/Alaska Gold Company (January 9, 2006).

Chuitna Coal

The Beluga-Chuitna coal fields are located on the west side of Cook Inlet, 10 miles from Tyonek. The coal fields contain an estimated 1 billion tons of sub-bituminous, thermal coal, 700 million tons of proven reserves. Development of the mine could start as early as late 2007, with the first shipment of coal by 2010. Preliminary planning indicates that the coal mine could produce 10 to 15 million tons of coal annually, employing as many as 300 to 350 workers.[9]

Mineral exploration has a significant impact on local and regional economies in Alaska. An estimated $95 million was spent on Alaska mineral exploration in 2005. This spending is for a wide variety of goods and services provided by Alaska businesses. This spending also includes millions of dollars of payroll for Alaskans, including many rural Alaskans who have few, if any, other employment opportunities.

Donlin Creek

Containing an estimated 25 million ounces of gold, Donlin Creek is a very large undeveloped gold deposit. Located near Crooked Creek, 12 miles north of the Kuskokwim River, the project is a joint venture between NovaGold and Placer Dome. Preliminary feasibility analyses indicate that an open-pit mine milling 30,000 to 40,000 tons of ore per day and producing 1 million ounces of gold per year may be economically feasible. Donlin Creek has an expected 15 to 20 year mine life. In 2004, the project had average annual employment of 39 direct workers.[10] Placer Dome's total 2004 exploration expenditures for Donlin Creek were about $7.2 million, of which approximately 65 percent was spent with Alaska companies. Placer Dome spending in 2005 totals approximately $14 million.[11]

The Donlin Creek project is under lease agreements from Calista Corporation for the sub-surface rights and The Kuskokwim Corporation for the surface rights.

Pebble Project

Since 2002, Northern Dynasty Minerals has spent $68 million on its Pebble Project exploration program in southwestern Alaska to explore and delineate the deposit (drilling), carry out baseline environmental and socio-economic studies, and perform geotechnical work and project engineering. Northern Dynasty, based in Vancouver, B.C., estimates the project contains 31 million ounces of gold and 19 billion pounds of copper. The project also contains silver and molybdenum. If Pebble is developed, it will be one of North America's largest copper and gold mines, employing about 2,000 workers during the construction phase, and as many as 1,000 during production. The mine will likely require a capital investment of $2 billion or more.[12] With new drilling to take place in 2006, it is anticipated that the resource could support a mine-life of 40 years.

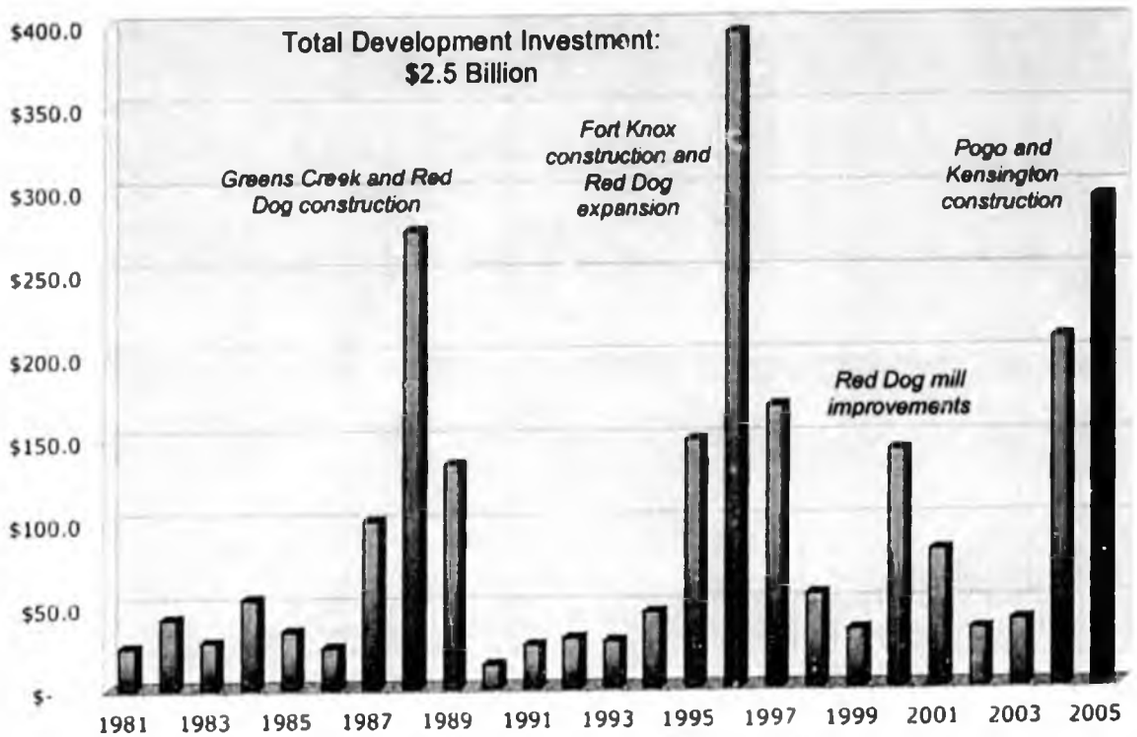
In 2005, 45 consulting firms were hired, which employed 441 Alaskans. Of the Alaska workforce, 21 percent was hired locally from the Bristol Bay region and 26 percent were Alaska Native. About $2.8 million was spent in the Iliamna area alone.

Mine Development in Alaska

In 2004, mine development investment in Alaska totaled an estimate $209 million. Since 1981, mining companies have invested over $2.5 billion in development of Alaska mining projects. There were several peaks in development spending: 1987 to 1989 reflecting Greens Creek and Red Dog Mine construction; 1995 to 1997 for Fort Knox Mine construction; and, 2004 and 2005 construction spending for the Pogo and Kensington projects. The preliminary estimate for 2005 development spending is $294 million, up 41 percent over 2004.

[9] Comments by Bob Stiles, PacRim Coal, at the Alaska Miners Association Annual Conference, November 4, 2005.
[10] According to data provided by the Alaska Department of Labor and Workforce Development.
[11] Email correspondence with James Fueg, Placer Dome, December 6, 2005.
[12] Comments by Bruce Jenkins, CEO, Northern Dynasty Minerals, at the Resource Development Council Annual Conference, November 17, 2005.

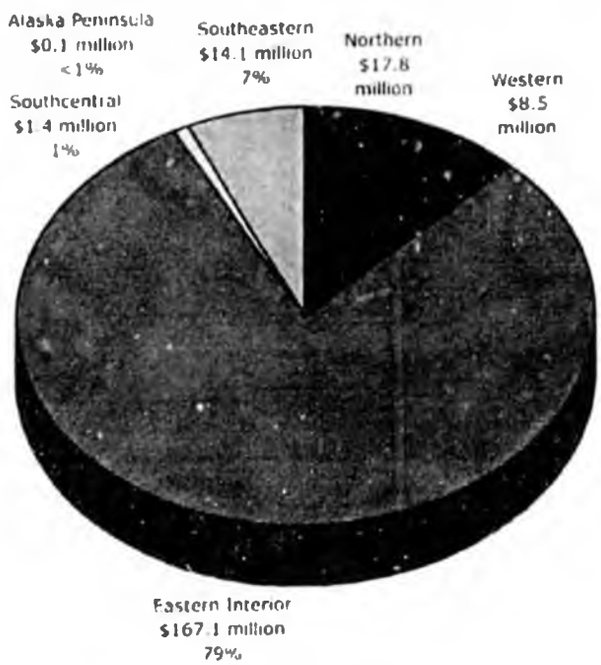
Mine Development Investment in Alaska, 1981-2005* ($Millions)



Source: *Special Report 59, Alaska's Mineral Industry 2004*, Division of Geological & Geophysical Surveys/Department of Commerce, Community and Economic Development, October 2005.
*Preliminary 2005 estimates provided by the Office of Mineral Development, Department of Commerce, Community and Economic Development.

Development Expenditures in Alaska, By Region, 2004

Total: $209.1 million



Source: *Special Report 59, Alaska's Mineral Industry 2004*, Division of Geological & Geophysical Surveys/Department of Commerce, Community and Economic Development, October 2005.

The development of the Teck Pogo project accounts for most of this investment in 2004. However, other significant investments were also made around the state, including at the Fort Knox Mine, Red Dog Mine, Greens Creek Mine, Kensington, Usibelli Coal Mine and various placer gold projects.

Below is a brief description of two new Alaska mine projects that are in the development stage, the Pogo Project in eastern Interior Alaska and the Kensington Gold Project in Southeast Alaska.

Pogo Project

The Pogo project is jointly owned by Sumitomo Metals Mining Co., Ltd. (51 percent), Sumitomo Group (9 percent), and Teck Cominco (40 percent). Teck Cominco is the operator and developer of the Pogo gold property, which is located in the Delta Junction area. A 50-mile road connecting the mine site to the Richardson Highway is completed and a power transmission line constructed. Mill and infrastructure facilities are expected to be complete in early 2006. The mine will start up in the first quarter of 2006 and be operating at full capacity by the second quarter of 2006.

Mine development projects employ Alaskans and support Alaskan businesses. Approximately 300 workers have been hired for the Pogo Mine construction project, located near Delta Junction. The construction labor force is 85 percent Alaska residents. Coeur Alaska's Kensington Gold Project, located near Juneau, is under construction and has so far awarded $42 million in construction contracts, 85 percent to Alaskan companies.

It was estimated that $127 million was spent on development in 2004, with total development costs eventually reaching $347 million by 2005. About 300 people have been hired for the construction of the mine, with 85 percent being Alaska residents.[13]

The underground gold mine and 2,500-ton per-day mill will produce an average of 400,000 ounces of gold per year over a 10-year mine life. The mine will employ approximately 240 full-time workers.

Kensington Gold Project

In 2005, Coeur Alaska moved into the development stage for its Kensington Gold Project, located between Juneau and Haines. The mine site is within the City and Borough of Juneau. To date, Coeur has awarded $42 million in construction contracts, 85 percent of which have been awarded to Alaska companies. The total capital cost for the project is $105 million. According to Coeur Alaska, there are 190 people actively working at the mine site.

Once production starts in early 2007, the mine is expected to produce approximately 2,000 tons of ore per day, resulting in gold production of 100,000 ounces annually, over an estimated 10-year mine life. The mine will employ 225 full-time, year-round workers and generate $16 million in annual payroll.

Producing Mines in Alaska

Since 1981, minerals valued at $15.4 billion have been produced in Alaska, including $1.3 billion in 2004 and an estimated $1.5 billion in 2005, up 15 percent from 2004. (See chart, next page.) Approximately 73 open-pit, hard rock, underground, and suction dredge mines were in production in 2004.

With the addition of three large mining operations (Red Dog, Greens Creek, and Fort Knox), the production value of Alaska's mining industry has grown over 500 percent since the late 1980s. Annual production values have averaged $1.1 billion a year over the past six years (1999 to 2004).

In 2004, zinc accounted for almost half (49 percent) of the total mineral production value in the state. Gold ranked second in terms of production, at 14 percent of the total. Lead and silver production each accounted for about 9 percent of the total Alaska minerals production value in 2004.[14] All metals combined accounted for 80 percent ($1.1 billion) of the total $1.3 billion in mineral production in 2004.

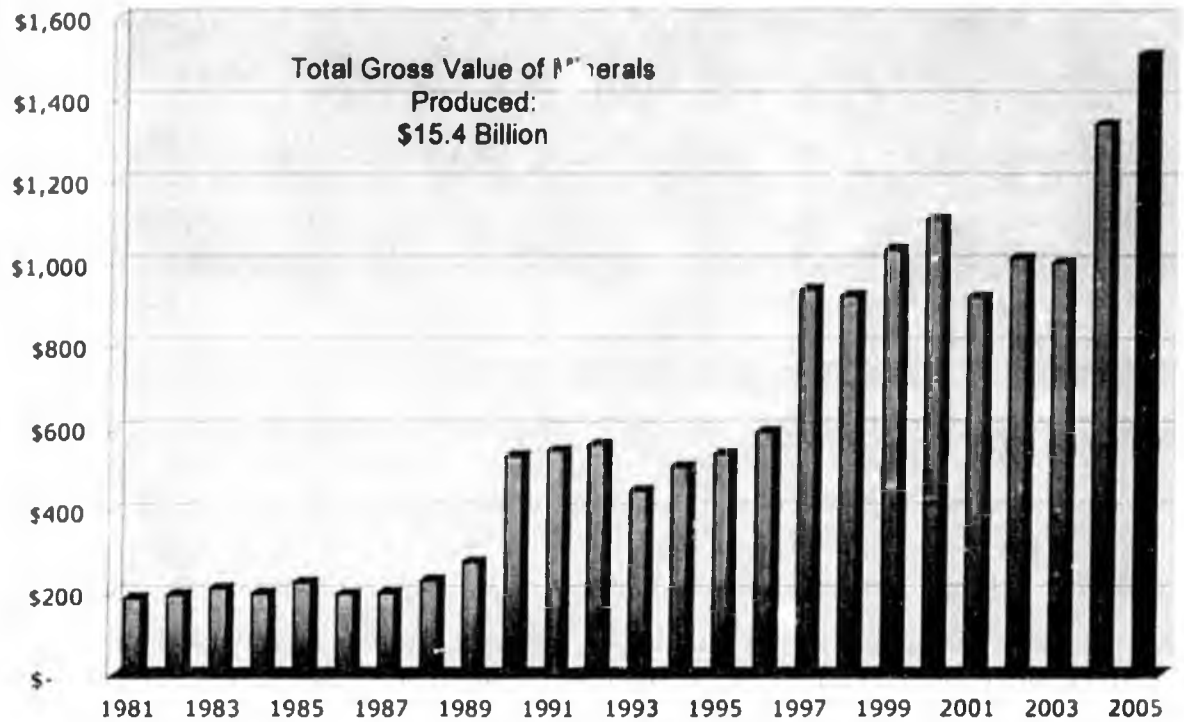
In 2004, $505 million worth of minerals were exported to Canada, Europe, and Asia.[15]

[13] www.teckcominco.com/operations/pogo/articles.htm

[14] Special Report 59, Alaska's Mineral Industry 2004, p. 28

[15] U.S. Census Bureau, Origin of Movement Series.

Mining Production Value in Alaska, 1981-2005* ($Millions)



Source: Special Report 59 Alaska's Mineral Industry 2004, Division of Geological & Geophysical Surveys/Department of Commerce, Community and Economic Development, Alaska Department of Natural Resources, p. 2.
*2005 estimates provided by the Office of Mineral Development, Department of Commerce, Community and Economic Development.

Alaska's Metal Mines

Greens Creek Mine

Greens Creek is an underground silver, gold, lead, and zinc mine located on Admiralty Island 15 miles southwest of Juneau. The mine originally opened in 1989 but closed in 1993 because of low metal prices. With some improvement in prices and additional mine and mill development work, the mine reopened in 1996 and has been operating continuously since then. Greens Creek produced 9.7 million ounces of silver in 2004, making it the largest silver producer in North America and the fifth largest in the world. The mine also produced 86,000 ounces of gold in 2004. The Greens Creek mill produces three separate concentrates, which are shipped to various smelters around the world for further processing. Most of the gold and all of the silver is in the concentrate. The mine has sufficient reserves for at least 12 more years of operations. Most mine employees live in Juneau and commute via boat and bus to the mine on a daily basis. The Greens Creek Mine is a Joint Venture between Kennecott Minerals and Hecla Mining Company. The mine employed an average 260 workers in 2004. It is the largest private sector source of payroll in Juneau. A summary of the economic impacts of the Greens Creek Mine on Juneau is provided in a following chapter of this report.

Red Dog Mine

Red Dog Mine is the world's largest producer of zinc concentrates. It is an open-pit zinc, lead, and silver mine located in the DeLong Mountains of Alaska's Brooks Range, 90 miles north of Kotzebue and 55 miles from the Chukchi Sea. The mine produced 554,000 metric tonnes of zinc, 7.2 million ounces of silver, and 117,000 metric tons of lead in concentrates in 2004.[16] Red Dog's proven and probable reserves total about 75 million metric tonnes, which are expected to keep the mine operating through to 2031.[17]

Red Dog Mine represents a unique relationship between a private owner and operator, Native landholders, and state government. The Mine is owned and operated by Teck Cominco, and is

[16] www.teckcominco.com/operations/redog/review.htm
[17] Sarah Hurst, "Red Dog looks to schools for employees," *Petroleum News*, November 27, 2005, http://www.petroleumnews.com/pnarchpop/051127-32.html

located on property owned by NANA Regional Corporation, an Alaska Native corporation.[18] The Red Dog deposit was discovered in the late 1960s. Construction of Red Dog began in 1986 with production commencing December 1989. The mine required construction of a 60-mile access road from a port site on the Chukchi Sea. The Alaska Industrial Development and Export Authority (AIDEA) financed and constructed the road and port with Red Dog paying user fees to repay AIDEA for its cost of capital plus a small return to the state. Teck Cominco guaranteed to pay back this cost even if the mine is not in operation. Red Dog is the most capital-intensive mining project in Alaska; its original construction costs and subsequent investments totaled between $500-$550 million. In addition, AIDEA has invested $270 million in the road and port.

Over three quarters of a billion dollars have been invested in the Red Dog zinc, lead and silver mine located near Kotzebue. The project, which directly generates 450 jobs, includes NANA Regional Corporation, Teck Cominco, and the Alaska Industrial Development and Export Authority (AIDEA). NANA owns the property, Teck Cominco is the mine operator, and AIDEA is the developer and owner of the marine terminal and access road.

While ore is mined year-round, the concentrate produced is stored for shipment at the port and shipped during the summer months when waters are ice-free and navigable.

Fort Knox/True North Mines

Fairbanks Gold Mining Inc. (a wholly-owned subsidiary of Kinross Gold Corporation) operates the Fort Knox Mine, which opened in 1996. Fairbanks Gold also mined the nearby True North deposit, from 2001 to 2004. Fort Knox is an open-pit gold mine located about 15 miles northwest of Fairbanks. It is Alaska's largest gold mining operation. In 2004, 338,000 ounces of gold were recovered from the two deposits – 74 percent of all the gold mined in Alaska that year.

Construction of the Fort Knox mine and mill was completed in 1996 at a total cost of approximately $375 million. The True North property was developed at a cost of $30 million.

The company announced plans to spend $60 million on a three-year mine expansion project in 2004.[19] In addition, the company invested $28 million in mining equipment, increasing capacity by 30 percent. Since initial mine development, half a billion dollars has been invested in the mining project.

Fort Knox had an annual average employment of 411 in 2004. It was 59th on the list of top 100 private sector employers in Alaska for 2004.[20] A summary of the economic impacts of the Fort Knox Mine on the Fairbanks North Star Borough is provided in Chapter V.

Placer Mining

"Placer mining" is defined as a type of mining that removes valuable minerals such as gold, platinum, and precious stones from unconsolidated detrital material. Placer deposits are formed when the host rock is eroded over millions of years, and minerals are transported and deposited by rivers and streams.

Archeological records have shown that Alaska Natives were the earliest miners in Alaska, mining native copper, marble and other materials. But placer mining is the oldest form of mining by Western inhabitants in Alaska. The first placer coal was mined on the Kenai Peninsula during the later 1840s and 1850s by the Russians. The earliest gold prospectors were placer miners from the California gold rush who moved north in the 1860s and 1870s. The first significant discovery of placer gold was near Juneau with later discoveries along the Yukon River near Rampart, the Fortymile River, and Circle. At the turn of the 20th century, placer deposits were discovered at Nome and Fairbanks. With the introduction of large-scale cold water thawing, hydraulic stripping, and mechanized excavation, Alaska became a leading gold producing state with a yield of nearly 750,000 ounces of gold in 1940, most of which came from placer mines.[21]

However, gold mining was effectively shut down during World War II by Presidential Order. After the war, the industry failed to recover due to rising operating costs and fixed gold prices. Most placer mining was discontinued by the 1960s. With the lifting of gold ownership restrictions and abandoning of a fixed price in the 1970s, gold production rose dramatically. By 1982, there were

[18] "Shared Values, Common Goals, Exceptional Results, The Red Dog Mine Story," Northwest Alaska Native Association, Cominco LTD., p. 7.
[19] "Fort Knox Moves Forward to Keep Production on Target," *Alaska Business Monthly*, November 2004, p. 34.
[20] "The Trends 100," *Alaska Economic Trends*, August 2005, p. 10-11.
[21] Alaska Department of Commerce and Economic Development, "The Role of Placer Mining in the Alaska Economy – 1985." 1986, p. 4.

more than 500 placer mines statewide (including recreational mines) producing 174,900 ounces of gold worth $70 million.[22]

The fluctuation of gold prices continues to affect the level of gold placer production in Alaska. For instance, gold prices saw a marked improvement in the late 70s peaking at over $800 per ounce in 1980, followed by a gradual but fluctuating decline to $256 per ounce in 2001. With the fall in prices, the number of operating mines dropped to 42. The price has been improving since that date with recent prices above $550 per ounce. By 2004, there were 68 Alaska placer mines recovering 28,074 ounces of gold.

Most of the state's active placer mines are located in the Interior. The three largest placer mines accounted for over half of all placer production.

Alaska's Non-Metal Mines

Rock, Sand and Gravel

Rock, sand and gravel deposits are being mined in most Alaska communities, supporting road, air strip, and other commercial, industrial, and residential construction projects throughout Alaska. Some of the operations are quite small, ranging from small gravel pits serving village communities to large quarries and gravel pits found closer to the larger population centers along the Alaska Railbelt. For instance, some of the larger gravel pit operations are found in Anchorage, Palmer, Wasilla, and Fairbanks.

According to the Alaska Department of Commerce, Community and Economic Development, there are 37 rock quarries and 71 sand and gravel operations within Alaska. It is difficult, however, to know if this count is complete as many of the operations are small, unregulated, and infrequently operated. In 2004, approximately 20 million tons of sand and gravel were produced in Alaska. With an estimated average value of $5.19 per ton, the total value of this sand and gravel was $101 million.

Rock production in Alaska in 2004 was estimated to be 7.3 million tons. This includes shot rock, crushed stone, D-1, riprap, and modest quantities of ornamental stone. With an estimated unit value of $14.51 per ton, the total value was estimated to be $106 million in 2004.

Annual rock, sand and gravel production is often a reflection of trends within the construction market. For example, production dipped in the mid-1980s and mid-1990s, and peaked in late 1990s, reflecting booms and declines in Alaska's housing, industrial and commercial construction markets.

Coal

The Usibelli Coal Mine is the only operating coal mine in Alaska. The mine is located near Healy and has 200 million tons of proven coal reserves. In 2004, coal production totaled 1,450,000 tons, about half of which was shipped to six Interior Alaska electrical generation power plants. Approximately 601,000 tons were exported to South Korea through a terminal in Seward, and two test shipments totaling 105,000 tons were made to Chile. Rail shipment of coal is an important source of revenue for the Alaska Railroad (ARR). Coal accounted for $10 million in revenues for ARR in FY 2004.

Coal has the potential to play a much greater role in the Alaska economy. Alaska coal reserves total approximately 174 billion tons, 40 percent of the U.S. total. Plans for a coal gasification plant on the Kenai Peninsula to supply Agrium's ammonia and urea production facility could increase the importance of coal in the Alaska economy in the near term.

[22] Ibid.

Recreational Mining in Alaska

"Recreational mining" is defined as amateur, casual, short-term mining for placer gold using non-mechanized equipment, such as a gold pan or a small, backpackable sluice box, metal detector or rocker-box. In specific areas, small suction dredges and/or metal detectors may be used. It is typically conducted on private and public properties designated for such purposes and may involve a fee. Recreational mining opportunities are expanding rapidly and are documented throughout most of Alaska.[23] Generally, the visiting miners are allowed to keep the gold they find or participate in a venture where recovered gold is split equally amongst the participants.

A growing number of visitors are coming to Alaska to participate in small-scale placer mining activities. Visitors are willing to spend thousands of dollars for the opportunity to prospect for placer gold in Alaska. At least 800 people traveled to Alaska to primarily participate in recreational mining.

Recreational mining operations range from gold-panning activities attracting several thousand tourists spending under $10 and a few hours to find some gold flakes to operations where a few hundred people spend as much as $2,500 per week (including equipment, room and board) for as long as two months looking for more significant rewards for their efforts.

Based upon interviews with recreational mine operators, at least 800 people traveled to Alaska to primarily participate in recreational mining, amounting to at least 1,000 miner-weeks of annual recreational mining at the remote pay-to-mine camps. Several thousand miner-weeks are also estimated to occur at highway accessible sites near Anchorage and Fairbanks. No attempt has been made to estimate the number of recreational miners visiting Federal and State designated gold panning areas, but it is likely to exceed the number visiting commercial sites.

Though no specific data is available, the total economic impact of recreational mining in Alaska likely exceeds several million dollars, including payments to private owners and spending on transportation, accommodations, food, services and supplies.

[23] The Recreational Miners Association website at www.recminer.com includes information for 16 recreational mining sites in Alaska. Several of these are free sites located on State and Federal lands withdrawn from mineral entry (claim staking) and available for recreational use while the others are commercial locations located on private property or permitted mining claims that charge for the right to mine.

CHAPTER III: EMPLOYMENT AND PAYROLL IN ALASKA'S MINING INDUSTRY

The mining industry directly or indirectly creates thousands of jobs and millions of dollars in payroll throughout the Alaska economy. These jobs and payroll occur in the following sectors of the mining industry:

- Production
  - Metals
  - Coal
  - Construction materials
- Exploration
- Development
- Other (government, recreational, etc.)

In addition to jobs in these key segments of the industry, mining also indirectly creates employment and income in the state. As mining-related businesses and their employees purchase goods and services in Alaska, additional jobs and income are created. This analysis of employment and payroll in Alaska's mining industry begins with an overview of available employment data for the industry. Following that is an analysis of the indirect impacts of the mining industry. Including direct, indirect and induced employment, it is estimated that the mining industry accounts for over 5,000 jobs in Alaska.

Sources of Employment Data

There are two sources of mining industry employment data for Alaska: the Alaska Department of Labor and Workforce Development (DOLWD) and an annual report produced by the state Division of Geological and Geophysical Surveys (DGGS) and the Office of Mineral Development, Department of Commerce, Community and Economic Development (DCCED). DOLWD collects employment data from all Alaska employers, drawn from quarterly employment security "ES 202" forms. Employers are required by law to submit these forms, providing a count of all workers employed each month, as well as their total quarterly wages. In the DOLWD data, there is no distinction between full-time and part-time employment.

DOLWD categorizes employment according to the North American Industry Classification System (NAICS). Industry sectors that encompass the mining industry include:

- Coal
- Metal Ore
  - Metal ores mining
  - Gold ore and silver ore mining
  - Lead ore and zinc ore mining
  - All other metal ore mining
- Non-metallic Mineral, Quarrying
  - Crushed and broken limestone mining and quarrying
  - Other crushed and broken stone mining and quarrying
  - Construction sand and gravel mining
  - All other non-metallic mineral mining
- Mining Support Activities
  - Metal mine drilling
  - Non-metallic mine drilling

Mining-related activity falls into several other NAICS categories as well, though it is combined with non-mining employment. This includes the professional services sector, where a number of mineral exploration firms are classified. These firms typically work under contract for mining companies, therefore their employment could be considered indirect. The mining industry creates jobs indirectly in many sectors of the economy, as described in the following section of this report.

There is also mining industry employment that is not captured at all in DOLWD data. DOLWD data does not include self-employed "proprietors." In the mining industry this could include small-scale placer mining operations. It could also include any individual working under contract, such as an exploration geologist.

DGGS/DCCED provides a broader measure of mining industry employment in Alaska. In its 2004 report, *Alaska's Mineral Industry 2004*, DGGS/DCCED estimated mining industry employment at 3,048 full-time equivalent jobs.[24] This estimate includes both direct and indirect employment, as conventionally defined. It is based on survey data collected from approximately 100 businesses in Alaska that are engaged in some aspect of mining in the state. The DGGS/DCCED estimate includes production employment such as that reported by DOLWD as well as a broad range of contract employment in drilling, camp support services, and other professional and trade services. The

[24] Reported man-days are calculated on a 260-day work year to obtain average annual employment unless average annual employment numbers are provided.

DGGS/DCCED estimate also includes construction materials handling employment that is likely captured by DOLWD in the construction sector rather than in the mining sector. Finally, it includes the smaller operations, including many placer operations, which do not report employment to the DOLWD.

The following text draws employment data from both DOLWD and DGGS/DCCED to present a complete picture of mining industry employment. An assessment of the "multiplier" affects of mining industry activity follows.

Mineral Production Employment in Alaska

This section summarizes employment and payroll in the production segment of Alaska's mining industry. Payroll data is not available for certain categories due to confidentiality restrictions.

Metal Mining

Based on DOLWD data, there were 27 metal mining sector employers that reported annual average total employment of 1,130 employees. These employees earned a total of $80 million in payroll in 2004, with an average monthly wage of $5,896. The mining industry's average monthly earnings are 83 percent above the statewide average for all industries of $3,218.

Alaska's metallic mineral mines reported annual average employment of 1,130 workers in 2004. These workers earned a total of $80 million in payroll, with an average monthly wage of $5,896. The mining industry's average wage is 83 percent above the statewide average monthly wage of $3,218.

The metal production side of the mining industry provides a consistent level of year-round employment. Three mines, Fort Knox, Greens Creek, and Red Dog, accounted for 75 percent of all mine production employment in Alaska in 2004. Monthly employment data for these three mines illustrates that there is virtually no seasonal variation in employment at the mines.

Monthly Employment with Alaska's Largest Mining Operations, 2004

	Fort Knox	Greens Creek	Red Dog	Total
January	405	257	372	**1,034**
February	401	260	375	**1,036**
March	401	261	374	**1,036**
April	395	259	378	**1,032**
May	391	256	372	**1,019**
June	391	265	380	**1,036**
July	391	260	383	**1,034**
August	403	260	398	**1,061**
September	426	259	380	**1,065**
October	438	260	380	**1,078**
November	444	261	380	**1,085**
December	451	258	391	**1,100**
Average	**411**	**260**	**380**	**1,051**

Source: Alaska Department of Labor and Workforce Development. Red Dog employment for Sept. – Nov. are McDowell Group estimates. This data includes only direct production employment.

Metal mining employment that is not captured in DOLWD data includes small-scale placer mining, as well as some small scale lode mining. DGGS/DCCED data indicates that this employment averaged 140 jobs in 2004 (measured in annual average, full-time equivalents). Earnings data is not available for these miners; however, applying the metal mining industry average monthly earnings ($5,896/month) provides an order of magnitude estimate. Based on an estimate of annual earnings of $70,750, income to workers in this segment of the mining industry is estimated at $10 million.

Coal Mining

Alaska's only operating coal mine, the Usibelli Coal Mine located in Healy, employed an average of 92 workers in 2004, according to DOLWD.

Metal mining employment in Alaska is expected to increase by approximately 500 jobs over the next two years as the Pogo and Kensington mines come on line. Industry payroll will increase by $35 million.

Payroll data for these employees is not available from DOLWD due to confidentiality restrictions; however, based on available data, payroll likely totaled $6 million. As illustrated in the following table, employment at the coal mine is steady throughout the year.

Coal Mining Monthly Employment at Usibelli Mine Monthly and Annual Average, 2004

	Usibelli Mine
January	89
February	89
March	89
April	90
May	88
June	93
July	93
August	95
September	94
October	94
November	95
December	95
Average	**92**

Source: Alaska Department of Labor and Workforce Development. Includes direct employment only.

Development of the PACRIM coal mine on the west side of Cook Inlet would add 300 to 350 jobs to Alaska's coal mining industry.

Construction Materials Mining

A third segment of Alaska's mineral production sector is in the mining of sand, gravel and rock. DOLWD data indicates that an average of 136 workers were employed in this activity in 2004, with a seasonal peak of 197 workers during the summer construction season.

Construction Materials Mining Employment in Alaska, Monthly and Annual Average, 2004

	Construction-Related Mining
January	81
February	80
March	95
April	131
May	169
June	197
July	175
August	172
September	171
October	165
November	108
December	83
Average	**136**

Source: Alaska Department of Labor and Workforce Development. Includes direct employment only.

DOLWD data does not capture all construction-related mining employment in Alaska. Many companies that mine and transport sand, gravel and rock are classified in the construction sector rather than the mining sector. Based on its survey of companies, the DGGS/DCCED reported full-time, annual average employment in construction-related mining at 1,042 jobs in 2004. Total annual payroll for these jobs is estimated at $63 million. It is quite likely that a portion of this employment and payroll is related to transporting construction materials from quarries to construction sites and as such might be considered an indirect impact.

Exploration Employment

According to DGGS data, mineral exploration firms spent $71 million in Alaska exploration programs in 2004. Approximately $41 million of that was spent on two major projects in Southwest Alaska, the Pebble and Donlin Creek projects.

There are no comprehensive measures of exploration employment in Alaska from DOLWD because businesses that participate in exploration programs are scattered across many sectors of the Alaska economy. Some of the types of businesses and professionals engaged in exploration programs (including advanced exploration programs which can involve baseline environmental research) include:

- Geological exploration services
- Drilling services
- Camp support services
- Helicopter support services
- Construction services
- Scientific and other professional research services.

Among these sources of employment, DOLWD provides mining-specific data only for drilling services. Approximately 15 companies provided drilling services representing an annual average of 55 employees. This is only a partial measure of drilling employment, as other drilling jobs are likely included in the construction sector.

The best comprehensive estimate available for exploration program employment in Alaska is provided by DGGS/DCCED. In the DGGS/DCCED report, exploration employment is estimated at 184 annual average, full-time equivalents. Though data is not available, peak employment is clearly much higher, as most exploration activity occurs during the summer.

Exploration-related payroll data is unavailable from any source. However, by applying industry average wage rates to exploration-related jobs, it is possible to make reasonable estimates. For example, annualized earnings for drillers were $77,700 in 2004. Commercial pilots averaged $76,850; geoscientists, $108,000; and heavy construction workers, $74,800. There is no data available on wage rates for camp support personnel, but there is related data, such as wage rates for "institutional" cooks, which averaged $38,400 in 2004.

Clearly, there is a broad range of salaries paid to exploration program personnel. However, if it assumed that for each of the 184 full-time, annual average equivalent jobs recorded by DGGS, annual earnings average $75,000, total exploration program payroll in 2004 would be approximately $14 million. This estimate appears conservative, given that total exploration program expenditures were $71 million (meaning payroll accounted for 20 percent of total exploration expenditures).

Mine Development Employment

Spending on mine development can vary significantly from year to year, depending on the number and scale of mines under construction. In 2004, mine developers spent $209 million in Alaska. Construction activity at the Pogo project accounted for about 61 percent of all development expenditures in the state.

Mine development employment is concentrated in sectors other than the mining sector. Much of the development employment is found in the construction sector, though other employment is generated in transportation (i.e., air and water transportation), services (i.e., engineers) and a number of other sectors (i.e., housekeepers and caterers).

In the DGGS/DCCED report, development-related employment is estimated at 284 annual average full-time equivalents in 2004. Peak employment is, of course, much higher. Approximately 300 workers have been hired on the Pogo project alone.

By applying the statewide "heavy" construction industry average annual salary to the DGGS/DCCED employment figure, it is possible to estimate mine-development-related payroll. At the annual average of $74,800, the 2004 payroll total would be $21 million.[25] This is likely a conservative estimate as remote construction projects, such as Pogo, are more likely to include overtime wages than urban construction projects, due to the cost of transporting workers to and from a remote mine site.

Other Mining-Related Employment in Alaska

There are a wide variety of other jobs indirectly linked to Alaska's mining industry. For example, there are regulatory and research jobs in state and federal government that serve the mining industry. These include jobs with the US Bureau of Land Management, the US Geological Survey, and the USDA Forest Service. In State government, there are personnel within the Department of Natural Resources tasked with conducting mining industry-related research. The University of Alaska's Mineral Industry Research Laboratory conducts basic and applied research to facilitate the development of Alaska's mineral and energy resources. The UA College of Engineering and Mines in the Department of Mining and Geological Engineering has a staff of seven. Mining industry-related employment in Alaska includes jobs at miner training centers such the Delta Mine Training Center. In this study, these jobs are assumed to be included in the mining industry's indirect employment, which is discussed below.

Assessment of Total Mining-Related Employment in Alaska

To summarize, the preceding analysis identified just under 2,900 direct jobs and $194 million in direct payroll attributable to the mining industry in Alaska, engaged in mining, exploration or mine development during 2004. Metal mining is the largest source of employment and payroll, followed by construction materials mining. (See table below.)

[25] According to DOLWD data, the average monthly earnings for workers in the heavy construction sector was $6,237 in 2004.

Direct Mine Employment in Alaska, 2004

	Employment	Payroll
Metal Mining	1,270	$90,000,000
Coal Mining	92	6,000,000
Construction Materials Mining	1,042	63,000,000
Mineral Exploration	184	14,000,000
Mine Development	284	21,000,000
Total	**2,872**	**$194,000,000**

Source: Employment data are from DOLWD (metal mining and coal mining) and DGGS. Payroll figures are McDowell Group estimates.

These figures do not, however, include all of the jobs in Alaska that are linked to mining. Many additional jobs are created in Alaska's service and supply sectors as a result of mining company spending and the expenditure of mining industry payroll dollars. The "multiplier effects" are spread throughout the Alaska economy and are an important part of the industry's role in local, regional and statewide economies.

Multiplier Effects

Direct mining industry employment in Alaska is estimated at just under 2,900 jobs, accounting for $194 million in payroll. This employment includes workers engaged in mining (metals, coal and construction materials), exploration or mine development during 2004.

When considering the multiplier effects of mining activity, it is helpful to have a conceptual understanding of how economists typically describe the impact of an industry or a particular project on local, regional, or statewide economies. In this regard there are three categories of employment. With respect to the mining industry, they are:

- Direct employment and income
  - Includes employees of mining and exploration companies
- Indirect employment and income
  - Includes employees of businesses which provide goods and services to mining and exploration companies
- Induced employment and income.
  - Includes jobs created as a result of spending of direct and indirect mining industry-related income.

In the mining industry (as in some other industries) there is no clear line between direct and indirect employment. For example, Teck Cominco employment at the Red Dog Mine averaged 360 workers in 2004, according to DOLWD data. However, total permanent employment at the mine actually averaged 480 workers, including 120 employees of NANA/Lynden and NANA Management who provide transportation services from the mine to the port site and meals and lodging for all mine employees. Strictly speaking, because NANA/Lynden and NANA Management provide services to the mine under contract, that employment is indirect. However, those transportation and camp support jobs are an integral part of the day-to-day operations of the mine and could rightly be considered direct employment.

Precisely measuring the indirect and induced impacts of a project or an industry is complex and can require a major investment in research (including tracking how every dollar from every mining-related project is spent). However, through the use of multipliers it is possible to generate reasonable estimates. A multiplier is a single number that, when applied to a direct effect such as employment, captures direct, indirect and induced effects of industry activity.

The value of a multiplier depends on several factors, including how an industry is defined. If defined narrowly (for example, if *direct* Red Dog employment is defined as 360 workers, rather than the 480 who actually work at the mine), the multiplier must necessarily be higher to capture those on-site contract jobs, as well as all other jobs associated with spending in Alaska in support of operations. If direct employment is considered to be the 480 jobs, the multiplier to capture indirect employment must be lower.

The geographic area of interest in the multiplier assessment is also important. The multiplier for Red Dog for the Northwest Arctic Borough will be smaller than the statewide multiplier. This is because not all the Alaska purchases of goods and services are made by the mine in the borough. In other words, the larger the geographic area being considered, the larger the multiplier.

Other factors affecting the multiplier are wage rates (higher wages can mean more local spending) and the residency of the labor force (high non-resident participation can mean higher leakage of payroll dollars from the local economy).

A range of multipliers has been applied to help understand the full effects of mining activity in Alaska. Employment multipliers applied to specific mining projects have ranged from 1.76 in the Alaska Juneau Mine environmental impact statement (EIS) to as high as 3.2 in the Kensington Mine EIS.[26,27]

Including direct, indirect and induced employment, Alaska's mining industry accounted for 5,100 jobs and $280 million in payroll in 2004.

Input-output (I/O) models also provide industry multipliers. For example, the IMPLAN model generates I/O multipliers for approximately 500 industry sectors (fewer for Alaska's small economy). IMPLAN is widely used nationally to predict the economic impact of business or industrial development projects. IMPLAN produces multipliers in the several mining and mining-related sectors, as illustrated in the following table.

IMPLAN 2002 Employment Multipliers for the Alaska Mining Industry

Sector	Employment Multiplier	Payroll Multiplier
Coal mining	1.89	1.46
Lead and zinc mining	2.03	1.62
Gold and silver mining	1.78	1.48
Rock quarrying	1.65	1.43
Sand and gravel mining	1.3	1.32
Mining support services	2.44	1.55
Construction of industrial buildings	1.51	1.32

Though IMPLAN is best suited for predicting the regional economic impact of changes in activity in a particular sector (the impact of a new mine, for example) rather than measuring the role of an industry in a regional or statewide economy, it provides some guidance on the range of multipliers potentially applicable to the mining industry in Alaska.

The federal Bureau of Economic Analysis (BEA) also publishes multipliers for Alaska industries. For 2003, BEA calculates an employment multiplier of 2.05 for Alaska's mining industry (metals and coal combined). BEA's earnings multiplier for Alaska's mining industry is 1.61.[28] BEA has an employment multiplier of 2.61 for "support activities for mining," however this multiplier includes support services to the oil and gas industry (as does the IMPLAN multiplier for mining support services) therefore likely overstates the multiplier effects of mining industry support services.

Fort Knox Mine

Photo courtesy of Kinross Gold

The table on the following page summarizes the mining industry's estimated direct, indirect and induced employment impacts in Alaska. Multipliers used are a blend of IMPLAN and BEA data.

In summary, this analysis indicates that Alaska's mining industry accounts for approximately 5,100 jobs and $280 million in annual payroll. (See table on next page.)

Share of Total Alaska Employment and Payroll

Based on the estimated 5,100 direct indirect and induced jobs measured in this study, the mining industry accounted for 1.7 percent of Alaska's 301,000 non-agricultural wage and salary jobs in 2004.

The $280 million in annual income attributable to the mining industry accounted for 2.4 percent of total wage and salary payroll in 2004.

[26] *A-J Mine Project Draft Environmental Impact Statement*, January 1991, prepared by James M. Montgomery Consulting Engineers, Inc for the U.S. department of Interior, Bureau of Land Management.

[27] Kensington Gold Project Final Supplemental Environmental Impact Statement, Tetra Tech, Inc. for the USDA Forest Service, December 2004.

[28] Bureau of Economic Analysis, RIMS II multipliers, 2003.

Total Direct and Indirect Employment and Payroll in Alaska's Mining Industry, 2004

Type of Activity	Direct Employment	Multiplier	Total Employment	Direct Income	Multiplier	Total Income
Metal Mining	1,270	2.0	2,540	$90,000,000	1.6	$144,000,000
Coal Mining	92	1.9	175	6,000,000	1.5	9,000,000
Construction Materials Mining	1,042	1.5	1,563	63,000,000	1.3	81,900,000
Mineral Exploration	184	2.0	368	14,000,000	1.3	18,200,000
Mine Development	284	1.5	426	21,000,000	1.3	27,300,000
Total	2,872		5,072	$194,000,000		$280,400,000

Source: McDowell Group estimates based on Department of Labor and Workforce Development and Division of Geology and Geography surveys.

Alaska Resident Hire in the Mining Industry

The mining industry has some of the highest Alaska resident hire rates among all of Alaska key basic industries.

Alaska Resident Hire, by Key Industry, 2003

Industry	Resident Workers	Non-Resident Workers	Percent Non-Resident Workers	Percent Alaska Resident Workers
Mining	**1,651**	**342**	**17.2%**	**82.8%**
Construction	22,619	5,627	19.9	80.1
Oil and Gas Extraction	2,464	722	22.7	77.3
Accommodations and Food Services	28,487	10,485	26.9	73.1
Seafood Processing	5,622	13,858	71.1	28.9
All Industries	309,468	68,305	18.1%	81.9%

Source: Alaska Department of Labor and Workforce Development. Includes only reported metal, coal and construction materials mining employment. Does not include mine development, exploration or unreported construction materials employment.

Based on DOLWD data, the industry actually has a higher resident hire rate, at 83 percent, than the statewide average, and significantly higher rates than other key Alaska industries. The preceding table compares mining to other key sectors of the state's economy

Alaska's commercial fishing industry also has higher non-resident participation than the mining industry. According to the Alaska Commercial Fisheries Entry Commission (CFEC), approximately one-quarter (27 percent) of active permit holders are non-resident. Further, non-residents captured 57 percent of value of Alaska's commercial harvest (measure in terms of ex-vessel value).

Alaska's largest mining employers have very high percentages of residents in their work forces. The following table provides Alaska resident employment rates for the Greens Creek, Red Dog, Fort Knox and Usibelli Coal mines.

Calista Corporation and Placer Dome's exploration shareholder hire agreement (signed in 1995) is a case study in the benefits of resident hire during the exploration phase. While no specific goals were laid out, Calista shareholders and their descendents were given a hiring preference for the Donlin Creek project. This policy has been successful. By 2005, Calista shareholders made up 94 percent (111 shareholder employees) of the 118 Donlin Creek employees. Of this number, 70 shareholder employees have worked at Donlin Creek for at least five years and some have worked for nearly 10 years.[29]

Resident Hire by Major Mines, 2003

	Total Workers	Total Residents	Total Non-Residents	% Alaska Residents
Teck Cominco (Red Dog)	490	396	94	80.8%
Fairbanks Gold (Fort Knox)	536	479	57	89.4
Greens Creek	306	234	72	76.5
Usibelli	97	95	2	97.9

Source: DOLWD, *Residency Analysis of Alaska's Workers by Firm, 2003.* Employment figures presented in this table are total number of employees, rather than annual averages.

[29] Placer Dome, Donlin Creek "From the Ground Up" Project Update, Fall 2005, p. 6.

Seven out of the eight supervisors at Donlin Creek are Calista shareholders. They also made up 75 percent of the drillers and drilling helpers. This number could have been 100 percent, but several of the drillers from the region were working on other Alaska projects like Greens Creek Mine and Nixon Fork Mine.[30]

The Donlin Creek example helps to demonstrate that a key benefit of mining is that it often happens in remote areas where employment opportunities are very limited.

[30] Ibid., p. 7.

CHAPTER IV: OTHER ECONOMIC BENEFITS OF THE MINING INDUSTRY

The mining industry has a broad range of economic impacts in addition to jobs and income. The industry generates revenue for state and local governments. It generates revenue for other public and private landowners and business interests in the state. It offers training and skill development for Alaskans that can have lifetime benefits within the industry and in other sectors of the economy. Mining helps build infrastructure that can support communities and other industries. These and other benefits are described below.

Mining Industry Payments to the State of Alaska

The mining industry generates revenues to the State of Alaska through a number of mechanisms, such as license fees, rental, royalties, material sales, and others. The mining industry is also an important source of revenue to quasi-government organizations such as the Alaska Railroad and the Alaska Industrial Development and Export Authority. These revenues are described below.

Mining License Tax — The state collected $10,317,238 in mining license tax in fiscal year 2005. The amount collected through this tax is expected to increase in fiscal year 2006 as world metal and mineral prices improve. This is a tax on the net income of all mining property in the state irrespective of land ownership status, capping at 7 percent, less exploration and other credits. Except for sand and gravel operations, new mining operations are exempt from the mining license tax for a period of 3.5 years after production begins.

Annual Claim Rental — In 2004, the mining industry paid $2.7 million in annual claim rentals.

The Annual Rental law (AS 38.05.211) requires locators and holders of State mining locations to pay an annual cash rental. The requirement applies to mining claims, leasehold mining leases, offshore mining leases and prospecting sites on State land. For all traditional mining claims (40 acres), the annual rental amount is $25 per year for the first five years, $55 per year for the second five years, and $130 per year thereafter. For all section locations (160 acres), the annual rental amount is $100 per year for the first five years, $220 per year for the second five years, and $520 per year thereafter. For all leases, the annual rent is $.66 per acre per year for the first five years, $1.32 per acre for the second five years, and $3.30 per acre per year thereafter. For prospecting sites, there is a one-time upfront requirement of $200, which covers the two-year term of the site.

Production Royalty — In 2004, the production royalty payment from minerals was $162,367. The majority of this payment came from royalty interest holders at True North (Fort Knox Mine) and the remainder came from individual placer miners.[31] No other mining production occurred on state land in 2004. As world mineral prices improve, it is anticipated that production royalties will increase in fiscal year 2006.

The Production Royalty law (AS 38.05.212) requires holders of state mining locations to pay a production royalty on all revenues received from minerals produced on state land. The production royalty is 3 percent of net income as determined under the Mining License Tax Law (AS 43.65), and regulations (15 AAC 65). A production royalty return must be filed and all required royalty payments must be made by anyone: 1) owning, leasing, and operating a mining property; 2) owning a mining property and receiving lease fees, royalty payments based on production, or a combination of lease fees and royalty payments from the property; 3) leasing a mining property from another person and operating the property; and 4) possessing a mineral interest, whether an economic or production interest, in a producing property, including royalty, receiving lease fees, working or operating interests, net profits, overriding royalties, carried interests in, and production payments.

Annual Labor — The 2004 payment in lieu of annual labor from mining and exploration companies was $226,191.

The payment in lieu of annual labor is based upon the premise that when prospecting and the discovery of a locatable mineral, and the staking of a mineral location, annual labor must be performed each year in the further development of the locatable minerals so that it can be mined. Every year, a minimum of $100 or $400 worth of labor or improvements must be performed on or for the benefit or development of each mining claim leasehold location on State land. Further, $100 worth of labor or improvements must be performed on each partial or whole 40 acres of each mining lease. The holder of a mining claim, leasehold location, or mining lease may make a cash payment to the State equal to the value of labor required ($100 or $400 per claim). In 2004,

[31] While True North is on state land, Fort Knox is on Alaska Mental Health Trust land.

the state collected $226,191 in payments in lieu of annual labor.

Coal Rents and Royalties — The State received $1,475,789 in rents and royalties from coal mining in Alaska in 2004. The standard rate for coal royalties on state lands for new leases is 5 percent of gross value. For coal leases in existence on Juneau 18, 1982, the royalty rate at the next time of adjustment will be five percent of the adjusted gross value. This will allow for certain costs to be deducted.

Material Sales — In 2004, the state earned $579,407 from sales of sand, gravel, rip rap, rock, limestone, slate, peat, and any other substances mined from State of Alaska ground that are not applied for through the location (mining claim) system or leasing. Of this amount, $112,047 was paid by Alyeska Pipeline Service Company to the State Pipeline Coordinators Office for use of material along the Trans Alaska Pipeline System corridor. Much of the remaining sales are made in the North Slope region to support North Slope oil exploration and production development.

There are three types of materials sales from which the state receives payments: 1) Limited Material Permit, where there is no filing or application fee; 2) "Limited" and small "negotiated" sales where the price charged is set by the Alaska Department of Natural Resources based generally on the fair market sales price of material in the area; 3) "Negotiated" and "competitive" sales where the amount charged for larger material sales (>25,000 cubic feet) is based on a site-specific appraisal or an abbreviated appraisal. A "competitive" sale price is initially set by an appraisal, but may be raised during an auction if more than one person or company competes for the material.

Other State Mining Fees — In 2004, $93,102 was collected in various mining fees. These fees include filing, penalty, bond pool payment, surface mining application, and Annual Placer Mining application fees.

Corporate Net Income Tax — In FY 2005, the mining industry paid $242,490 to the State of Alaska in corporate net income tax.

All corporations doing business in Alaska must file a tax return. The corporate net income tax payment is a reflection of a corporation's profitability.

The State of Alaska levies a corporate net income tax based on federal taxable income with certain Alaska adjustments. Multi-state corporations apportion income on a "water's edge" basis using the standard apportionment formula of property, payroll, and sales. Tax rates are graduated from 1 to 9.4 percent in increments of $10,000 of taxable income. The maximum rate (9.4 percent) applies to taxable income of $90,000 and higher.

In summary, the mining industry paid approximately $15.8 million in taxes, rents, royalties, and fees to the State of Alaska in 2004.

State of Alaska Direct Revenue from Mining, 2004

	Amount Paid
State mineral rents and royalties	
Annual claim rentals[2]	$2,657,939
Annual labor[5]	226,191
Production royalties	162,637
Sub Total	**$3,046,767**
State coal rents and royalties	
Royalties	$1,239,257
Rents	236,532
Sub Total	**$1,475,789**
State material sales	
Division of Land	$467,360
State Pipeline Coordinators Office	112,047
Sub Total	**$579,407**
State mining miscellaneous fees	
Bond pool payment	$35,426
Annual Placer Mining Application fees	27,150
Penalty fees	26,110
Surface coal mining application fee	3,116
Filing fees	1,300
Sub Total	**$93,102**
Mining license payments	
Mining license[1,3,4]	**$10,317,238**
Income Tax payments	
Corporate net income tax[1]	**$242,490**
TOTAL	**$15,754,793**

Source: Alaska Department of Natural Resources, Alaska Department of Revenue, Alaska Industrial Development and Export Authority, Alaska Department of Commerce, Community and Economic Development. *Special Report 59, Alaska's Mineral Industry 2004*, Division of Geological & Geophysical Surveys/Department of Commerce, Community and Economic Development, October 2005.

1. Fiscal year 2005 figures
2. Includes upland lease and offshore lease rentals.
3. Includes metals, coal, and material.
4. Payments made in FY 2005 have not yet been adjusted for refunds; these refunds will be recorded in FY 2006, and may significantly reduce the totals recorded for FY 2005.
5. Payments in lieu of annual labor

The Alaska Railroad is owned by the State of Alaska. In FY 2004, 15 percent of the Alaska Railroad Corporation's total operating revenue

were generated by movement of coal and gravel destined for Alaska or export markets.[32]

Alaska Railroad Operating Revenues from Mining, FY2001-2004 (Millions)

	Coal, Local	Coal, Export	Gravel	Total
FY2001	$5.0	$3.2	$7.5	**$15.8**
FY2002	5.4	1.6	7.9	**14.9**
FY2003	5.9	1.1	9.8	**16.8**
FY2004	7.3	2.9	6.7	**16.9**

Source: Alaska Railroad and "Economic Significance of Alaska Railroad," ISER Publications, December 2004, p. 10.

Teck Cominco, as the operator of Red Dog Mine, also pays an annual user fee for use of the state-owned DeLong Mountain Regional Transportation System, the road and port that serve the Red Dog Mine. In FY 2005, Teck Cominco paid $17.7 million in user fees to Alaska Industrial Development and Export Authority (AIDEA). This payment goes to AIDEA's general fund to repay the bonds issued for construction of the transportation system and provides a return on AIDEA's equity investment in the port and road.

Payments to Local Governments

The mining industry paid an estimated $11.1 million to local governments in 2004. There are several ways the mining industry provides direct payment to local governments, including property taxes, sales tax, severances taxes, payments in lieu of taxes (PILTs), and rents or production revenue from rock, sand, and gravel production on local government lands.

Property Tax

Mining companies represent some of the largest property taxpayers in the City & Borough of Juneau, Fairbanks North Star Borough, and the City of Nome. In 2004:

- Fort Knox/True North paid $3.5 million in property taxes to the Fairbanks North Star Borough. This mine is the Borough's second largest property tax payer.
- Greens Creek Mine paid $660,000 in property taxes to the City and Borough of Juneau. The mine is the largest private property tax payer.
- Usibelli Coal Mine paid $155,000 in property taxes for its Wishbone Hill property to the Matanuska-Susitna Borough. It also paid $125,000 in property taxes to the Fairbanks North Star Borough.
- Alaska Gold Company paid $53,300 in real property taxes to the City of Nome. Alaska Gold Company was the fourth largest property tax payer in Nome

These are direct payments by mines to these local governments. These figures do not include property tax payments made by mine employees. A 1999 study conducted by Information Insights and the McDowell Group for the Fairbanks North Star Borough found that the Fort Knox mine-related workforce paid $500,000 in property taxes. That figure is no doubt higher today as a result of increased assessments and an increase in the mine workforce.

Payment in Lieu of Taxes (PILT)

Local government payments can also include payment in lieu of taxes (PILT), such as that which is stipulated in an agreement between Teck Cominco (operator of the Red Dog Mine) and the Northwest Arctic Borough.[33] In FY2005, Teck Cominco's PILT payment to the Borough totaled $6,228,000, and represented 76 percent of the Borough's total General Fund revenues.[34] Teck Cominco is the Borough's single most important source of revenue. The borough receives no sales tax or property tax revenues.

In November 2005, the City of Delta Junction and Teck-Pogo, Inc. also entered into a PILT agreement. As part of that agreement, Teck-Pogo paid the City of Delta Junction $500,000 in 2005; another $500,000 is to be paid in 2006 and $1,000,000 in 2007, if a Borough has not yet been incorporated.[35]

Severance Tax

In the Denali Borough, Usibelli Coal Mine pays a severance tax of $0.05 per ton of coal. The Borough also receives other severance tax payments for sand and gravel operations. In 2004, mining companies paid $74,630 in severance taxes to the Denali Borough.[36]

[32] Bradford Tuck and Mary Killorin, "Economic Significance of Alaska Railroad," ISER Publications, December 2004, p. 10.

[33] AS 29.45.030 prohibits the Northwest Arctic Borough to assess a property tax on the value of Teck Cominco's leasehold interest in the road and port system.

[34] Northwest Arctic Borough Finance Department.

[35] Section 3, Agreement for Payment in Lieu of Taxes Delta/Teck-Pogo signed October 14, 2005.

[36] Figure provided by Usibelli Coal Mine.

Sales Tax

In certain jurisdictions, mining companies pay sales taxes on their local purchases of goods and services. For example, in Juneau, Greens Creek Mine paid an estimated $350,000 in sales taxes in 2003.[37].

Rock, Sand, and Gravel Production

Most local governments also receive payments for the production of locally-owned or leased rock quarries, and sand and gravel pits. There is no data available providing these revenues by community, but one estimate placed the statewide total at approximately $250,000 annually.[38]

State and Local Mining Taxation Policy Issues

The potential for the mining industry to generate revenues for state and local governments depends to large degree on the location of the mine and the tax structure in local jurisdictions. The table on the following page outlines the land ownership and local jurisdiction for Alaska's largest producing mines and potential mines.

While most mining projects pay either a property tax or a payment in lieu of taxes to a local government, most are on private or federal land and therefore not subject to state royalty payments. As described above, in addition to state royalties and property tax payments, a number of other fees and taxes are imposed on the mining industry. This includes mining license fees, annual mining claim rentals, severance taxes on coal produced from state land, severance taxes on gravel production, and others. Of course, mining firms also pay corporate income taxes to the State of Alaska.

As this report has described, the mining industry is unique in terms of its high risk, capital intensiveness and the uncertain, exhaustable, finite nature of the resource upon which it depends. As with any industry or business, paying appropriate taxes to compensate for the services provided by government is a necessary and responsible part of doing business in Alaska. However, it is important for local and state policy makers and others to understand that taxes can have unanticipated negative effects on mining operations and, further, can actually result in wasting of potentially valuable natural resources.[39]

[37] Socioeconomic Impacts of the Greens Creek Mine, McDowell Group, Inc. May 2004.

[38] Estimate based on known rock, sand, and gravel production, and in consultation with Rich Hughes, Minerals Development Specialist, Alaska Department of Commerce, Community, and Economic Development.

[39] A severance tax, for example, can be both inequitable and wasteful. It can be inequitable because it can place a much greater burden on high-cost mines than on low-cost mines (if based on production rate or gross value), or on high-grade mines compared to low-grade mines. A severance tax can be wasteful because it can force a mine to increase its cut-off grade and, as such, cause potential ore to be left in the ground and never produced.

Land Ownership of Alaska's Major Mines/Projects

Mining Project	Land Owner	Subject to Mining License Tax	Subject to State Royalty	Local Tax Jurisdiction	Subject to Local Tax or PILT
Usibelli Coal Mine	State	Yes	Yes	Denali Borough	Yes
Greens Creek Mine	Federal	Yes	No	City & Borough of Juneau	Yes
Red Dog Mine	Private (ANSCA)**	Yes	No	Northwest Arctic Borough	Yes
Fort Knox Mine (including True North)	Alaska Mental Health Trust Authority/State	Yes	Yes*	Fairbanks North Star Borough	Yes
Pogo Project	State	Yes	Yes	City of Delta Junction	Yes
Nixon Fork	Federal	Yes	No	None	No
Rock Creek	Private and ANSCA**	Yes	No	None	No
Kensington Mine	Federal, Private	Yes	No	City & Borough of Juneau	Yes
Donlin Creek	Private (ANSCA)**	Yes	No	None	No
Chuitna Coal	State	Yes	Yes	Kenai Peninsula Borough	Yes
Pebble Project	State	Yes	Yes	Lake & Peninsula Borough	Yes

* Production royalties from True North leases.
** Royalties paid to private landowners.

Payments to ANCSA Corporations

Alaska Native Claims Settlement Act (ANCSA) corporations are major private holders of land and sub-surface mineral interests in Alaska. Much of these lands have significant mineral potential, including a number of historic mining districts, such as the Ambler district, numerous placer gold areas, and rock, sand, and gravel deposits.

ANCSA corporations can lease their land to mining companies. As part of some lease arrangements, the mining industry makes direct payments (royalties) to Native corporations.

Additionally, under a clause referred to as Section 7(i) in the 1971 Alaska Native Claims Settlement Act, ANSCA corporations are mandated to annually redistribute 70 percent of their net revenue earned on subsurface developments of lands given to them by the settlement among the 12 regional corporations (the 13th Region is not included) based on shareholder enrollment. Net revenue from rock, sand and gravel extractions is exempted from 7(i) payments. The purpose of this clause was to create an opportunity to share the wealth between those regions rich in natural resources and those which are not.

Teck Cominco's Red Dog Mine exemplifies the potential of this broader relationship with ANCSA corporations. Red Dog Mine is operated by Teck Cominco Alaska, Inc. under an agreement with Northwest Arctic Native Association (NANA) Regional Corporation. NANA is the landowner and Teck Cominco is the operator. As part of the lease agreement, Teck Cominco pays a net smelter return royalty payment to NANA. In 2004, this payment was $10.9 million (up from $7.7 million paid in 2003).[40] Of the 2004 royalty payment, NANA deducted $250,000 for its scholarship program and other allowable administrative costs, retained $3.1 million, and redistributed $5.9 million to the other 11 ANSCA corporations as part of its 7(i) payment requirements.[41]

Placer Dome's Donlin Creek is another example of mining's relationship with ANCSA corporations. Placer Dome has entered into exploration and mining lease agreements with Calista Corporation

[40] NANA Annual Report, 2004, p. 10
[41] Telephone conversation with Kevin Thomas, CFO, NANA Regional Corporation (November 29, 2005).

for the sub-surface rights and The Kuskokwim Corporation for the surface rights. While some production royalties have been paid by Placer Dome to Calista and lease payments to The Kuskokwim Corporation, the major effort has been to collaborate with business development to utilize Calista's and Kuskokwim's business subsidiaries. Both organizations have or are in the process of negotiating contracts for construction, transportation, catering, and supply services.

Calista has other mineral development initiatives, including its Nyac gold property where Tonogold Resources Inc. has spent over $400,000 in the project so far, and is planning a $2 to $3 million drilling program for 2006. Calista also has two placer mine leases in operation. They continue to market other properties such as their Goodnews Bay platinum mining operation and the Stuyahok property.

In 2004, Calista's mineral revenues totaled $258,000. In 2005, they totaled $465,000, including Donlin Creek and Nyac lode mineral agreements, and placer leases on Crooked Creek and the Tuluksak River.[42]

Alaska Gold Company has exploration and mining lease arrangements with Bering Straits Native Corporation and Sitnasuak Native Corporation for mining and surface use. Alaska Gold Company has committed to working with Bering Straits Native Corporation and Sitnasuak to explore business opportunities with the mine.

Payments to Alaska Mental Health Trust Authority

In 1956, the US Congress passed the Alaska Mental Health Enabling Act, transferring the responsibility of providing mental health services from the federal government to the Territory of Alaska. To establish the Alaska Mental Health Trust, the state selected a million acres of land to provide funds for the development of the mental health services. In 1994, a legal settlement reconstructed the Trust with 500,000 acres of original Trust lands and 500,000 acres of replacement land. The Trust contracts with the Alaska Department of Natural Resources to manage the Trust's land. These lands are managed separately from other State of Alaska lands.

Most Trust lands are located in Interior and Southeast Alaska, with active exploration and mining occurring in the Interior. For example, Fort Knox Mine is located on Trust land and makes production royalties and rental payments to the Trust. The Trust is also encouraging exploration of its lands near Livengood, Salcha, McGrath, and Haines. The Trust is considering offering land for coal exploration and development in the Mat-Su Borough. In 2004, rents and royalty payments totaled $167,000.

Trust material sales currently take place in Southeast Alaska (such as Wrangell and Petersburg) and in the Interior (such as Fort Knox Mine). In 2004, these material sales totaled $60,000.

Alaska Mental Health Trust Revenue from Mining, 2004

Type of Payment	Amount Paid
Material sales (rock, sand and gravel)	$60,000
Annual rental payments (mining claims, lease payments, production royalties)	167,000
Total	**$227,000**

Source: Mental Health Trust Lands Office, Alaska Department of Natural Resources.

Additional Mining Industry Benefits

Workforce Development

The mining industry can offer long-term, year-round employment. Many of the jobs are rural-based, offering transferable skills in a rapidly growing industry. Direct job training is available in management, engineering and science (geologists, metallurgists, environmental scientists, etc.); technical specialties (surveyors, drafters, computer technicians, instrumentation technologists, lab technicians, environmental, etc.); mine and mill work (millwrights, electricians, mechanics, plumbers, maintenance planners, metallurgical samplers, machinists, welders, industrial mechanics, operators, drillers, laborers, etc.); and administrative and support staff (accountants, purchasing agents, in-house trainers, employee relations personnel, payroll clerks, secretaries, health workers, cooks, security guards, warehouse workers, etc.).

There are a number of institutions and organizations in Alaska currently providing training support for and with the mining industry. These include:

[42] Email correspondences from Jeff Foley, Calista Corporation, December 5, 2005.

- Alaska Department of Commerce, Community, and Economic Development
- Alaska Department of Labor and Workforce Development
- Alaska Mineral and Energy Resource Education Foundation (AMEREF)
- Alaska Vocational and Technical Education Center (AVTEC)
- Bristol Bay Economic Development Corporation
- Delta Mine Training Center (DMTC)
- Kawerak, Inc.
- Kotzebue Technical Center
- Lake & Peninsula Borough
- Mining and Petroleum Training Service
- Mine Safety and Health Administration
- Nilavena Sub-Regional Health Clinic
- Southwest Alaska Vocational Technical Center
- Tribal organizations
- University of Alaska – Bristol Bay Campus
- UAF College of Engineering & Mines
- UAF College of Rural Alaska
- UAF Cooperative Extension Service
- UAS
- Works Alaska

The Delta Mine Training Center (DMTC), a non-profit organization located in Delta Junction, illustrates the role a training program can play in supporting local hire. The Center provides training courses for underground mining, including Drill Helper, Forklift, Hazcom, and Hazwaper Certification. They also offer surface mining training and CPR/First Aid/AED training. Since December 2002, there have been a total of 129 training classes for 1,053 students. Of these, 48 Alaska statewide business contractors were served and 309 of their employees were trained and certified.

The Center runs a unique model of an underground working mine. Underground, students learn about drilling, loading explosives, blocking, ground control, excavation (mucking), as well as installation of utilities, ventilation, communication, and electrical systems. Approximately four students run through each six-week program. These students are recruited, screened, and interviewed by a panel that includes the superintendent and human resources manager for Pogo Mine. Once these students complete their training, they are all guaranteed a position at Pogo Mine. These students are primarily prepared for entry-level jobs. Entry level jobs make up 25 percent of the employment opportunities for underground miners.

The Center also offers workshops for AMEREF,[43] prospecting skills, navigation and GPS, outdoor safety and survival, rock and mineral identification, first aid, placer mining, and remote field skills. Since December 2002, there have been 37 workshops and 368 students enrolled. These workshops were offered throughout Alaska, including Anchorage, Aniak, Bethel, Delta, Dillingham, Fairbanks, Ketchikan, Kodiak, Kotzebue, Nome, Northway, Sitka, Tok, and Wrangell.

Infrastructure Development

Alaska's mining industry has also played a historical role in the development of important infrastructure, including the development of the Alaska Railroad, Richardson Highway, Steese Highway, Hatcher Pass, the road through Denali National Park, and even the settlement of Anchorage. Though initially developed for mining-related purposes, this infrastructure now has obvious value to non-mining interests.

There are two recent examples of this in the Juneau area. In 2005, Alaska Electric Light and Power Company extended a transmission line to the Greens Creek Mine on Admiralty Island. That extension will ultimately make it possible to transmit power to the community of Hoonah on Chichagof Island, which now must rely on costly diesel power generation. Without the economies of scale offered by Greens Creek, it is unlikely that the extension to Hoonah would be economically feasible.

Also in the Juneau area, Goldbelt Corporation, Juneau's urban ANCSA corporation, is building a marine terminal in the Berners Bay area north of Juneau. The terminal will initially be used to support operations of the Kensington mine. In the future, however, the facility is also expected to be used for a number of other transportation-related business ventures planned by Goldbelt, potentially serving the tourism and commercial fishing industries.

There are other examples of mining infrastructure serving other community, business and industrial interests. The Skagway ore terminal is now being used for cruise ship moorage during the summer visitor season.

[43] Alaska Mineral and Energy Resource Education Fund is a non-profit Alaska specific resource education program created through the Alaska Department of Education and Early Development, and Alaska's resource producing industries for use in Alaska's elementary, middle, and high schools.

CHAPTER V:
MINING IMPACT CASE STUDIES

Alaska's three largest metal mines have come to play important – sometimes critically important – roles in local economies. This chapter describes the impacts mines are having on Alaska communities.

Local Mining Impact Case Studies

Red Dog Mine

NANA and Cominco (now Teck Cominco) joined forces in 1982 to create the world's largest producer of zinc concentrates and provide employment opportunities for NANA shareholders. Under an agreement between Cominco and NANA, Cominco has the responsibility for training NANA shareholders, and giving first preference for all jobs at Red Dog to qualified Alaska Natives. Some key points related to Red Dog Mine's impact on local and statewide economies are summarized below.

Red Dog Mine

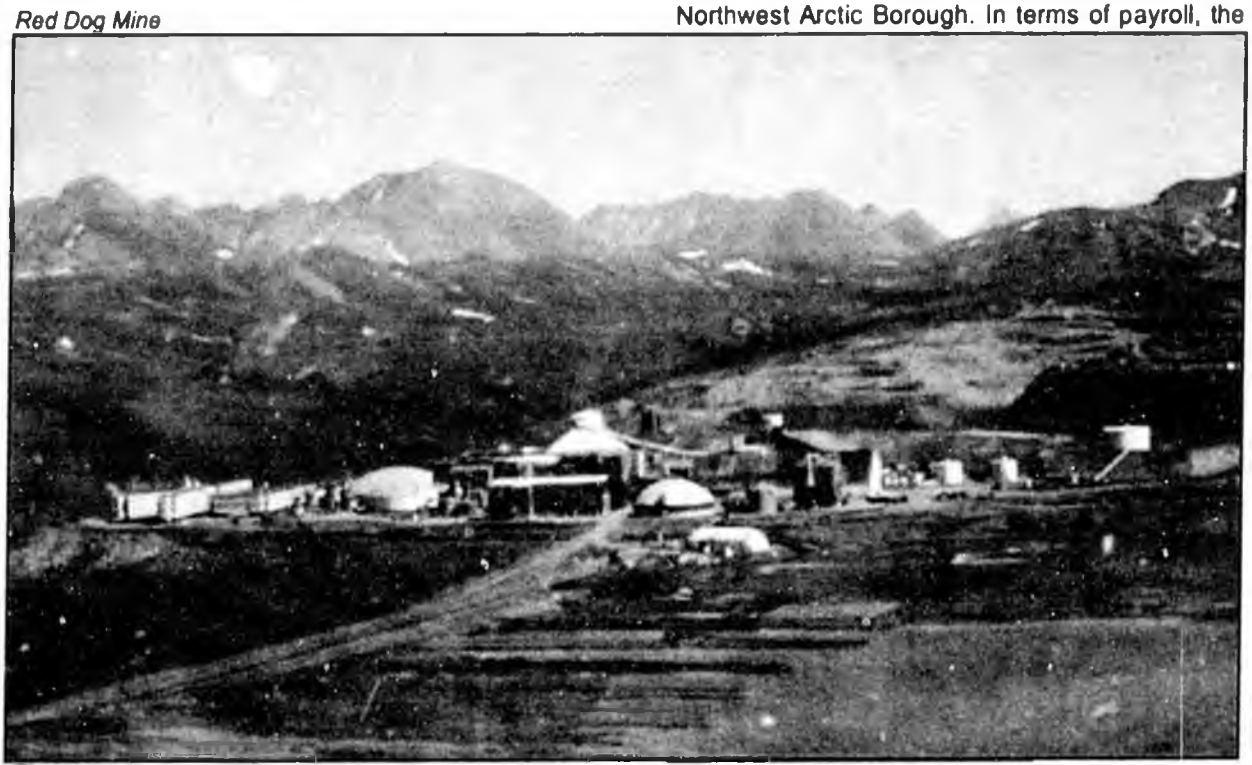


Photo courtesy of Teck Cominco.

- In 2004, Red Dog Mine reported 480 year-round workers (including contracted employment). Of the 480 employees reported at Red Dog, approximately 360 are employed directly by Teck Cominco, while most of the remaining employees are employed by NANA/Lynden (which provides the transportation from the mine to the port site) and NANA Management (which provides the meals and lodging for all mine employees).

- Teck Cominco has hired more than 1,000 NANA shareholders at Red Dog Mine since production began in 1989, which does not include many more who have worked as contractors at the mine. Of Teck Cominco's direct jobs, 56 percent are NANA shareholders or spouses of shareholders, and a third of the people holding Teck Cominco jobs live in the villages of the Northwest Arctic Borough.[44] All of the clerical staff employed at the mine are shareholders, as are 75 percent of the equipment operators and 35 percent of the trades personnel (such as electricians).[45]

- Teck Cominco has provided 52 full college scholarships for NANA shareholders since 1996. For the fall of 2004, $37,000 was provided to 23 students.

- Including contract employment, the Red Dog Mine (with 480 workers) is the second largest employer (after Maniilaq Association) in the Northwest Arctic Borough. In terms of payroll, the

[44] www.nwabor.org/edc/EDC%20CompPlan.htm
[45] Sarah Hurst, "Red Dog looks to schools for employees," *Petroleum News*, November 27, 2005, http://www.petroleumnews.com/pnarchpop/051127-32.html

mine is the largest employer in the borough. The mine generated $46 million in total wages in 2004.

▸ Red Dog accounted for 17 percent of all wage and salary employment in the Northwest Arctic Borough, and 30 percent of all private sector employment.

▸ According to a 2002 study, Red Dog accounted for one-third of the private sector jobs held by the residents of Buckland (33%), Kiana (36%), Kivalina (38%), Noorvik (33%), Selawik (34%), and Shungnak (32%). It accounted for 63 percent of the private sector jobs held by the residents of Noatak.[46]

▸ Prior to Red Dog Mine's opening, wages in the Borough were well below the statewide average, but just one year after the mine became operational, the local average wage rose above that of the state. The median household income in the Northwest Arctic Borough grew by about 87 percent ($17,756 to $33,313) from 1979 to 1989 and by 38 percent from 1989 to 1999 ($33,313 to $45,976), according to US Census data. Annual wages at the mine are typically from $45,000 to $85,000 per year plus benefits.[47]

▸ Teck Cominco has paid $90.1 million in total royalties to NANA from 1982 to 2004. In addition, payments in lieu of taxes to the Northwest Arctic Borough from 1988 to 2004 have been $44.3 million.[48]

Greens Creek Mine

In 2004, McDowell Group produced a report of the socioeconomic impacts of Greens Creek Mine in Juneau.[49] Key findings are summarized here.

▸ Greens Creek is Juneau's largest private sector employer in terms of annual payroll.

▸ Greens Creek Mine's 260 employees as a group are among the highest-paid workers in the community. Employees have average annual wages of nearly $79,000, almost triple the average $29,000 wage for Juneau private sector workers, and double the average state worker annual average wage of $40,000.

▸ Greens Creek Mine spent $20 million for goods and services purchased in Alaska, $17 million of which was spent in Juneau, in 2003.

▸ It employs a higher percentage of residents (89 percent at the time of the study) than the overall Juneau private and government entities combined (85 percent).[50]

▸ Economic multiplier impacts add annual average employment of 273 and annual payroll of $8 million, totaling an average annual employment of 527 and payroll of $28 million.

▸ Greens Creek Mine households contributed $307,000 in residential real estate property tax in 2003 for the $26.4 million in assessed value of their homes.

▸ Greens Creek Mine contributes $50,000 annually to charitable organizations and pays employees for several hundred hours of community service work. Employees contributed in excess of $100,000 to local charitable organizations, and donated another $15,000 in goods and more than 4,000 hours of volunteer time to more than 50 charitable organizations, schools, and community organizations.

Greens Creek underground drill rig

Photo courtesy of Kennecott Greens Creek Mine.

[46] *An Assessment of the Contribution of Red Dog Mine Operations to the Economy of the Northwest Arctic Borough*, Oct. 2002. Prepared for Northern Economics for the Alaska Industrial Development and Export Authority.

[47] www.nwabor.org/edc/EDC%20CompPlan.htm

[48] www.nana.com/businesses/mining.htm for payments prior to 2004. 2004 payments compiled by McDowell Group.

[49] McDowell Group, Socioeconomic Impacts of the Greens Creek Mine, May 2004.

[50] This estimate of resident employment is as of 2003 and is based on place of residency at the time of the study. This differs from ADOLWD residency data for Greens Creek, which is based on PFD application data.

Fort Knox Mine

A 1999 study prepared by Information Insights and the McDowell Group provides data on the economic impact of the Fort Knox mine in Fairbanks. Key findings from that study include (data has been updated where possible):

- In 2004, Fort Knox was the second-largest private sector employer in the North Star Borough, with annual average employment of 411. It is the eighth largest among all 2,000 public and private sector employers in the borough.
- Mine employees' average salary was 70 percent higher than the borough average.
- The Fort Knox Mine spent $70 million in the Fairbanks North Star Borough in 2004, with 500 different businesses.
- Mine spending generated $100 million in direct and indirect impacts on the local economy in 1998.
- Fairbanks North Star Borough received $4.4 million in mine-related revenues in 1998. The mine is the largest taxpayer in the borough.
- Because Fort Knox is a purchaser of Golden Valley Electric Association power ($14 million in 1998), other GVEA customers enjoy lower electric power rates – 7 percent for residential customers and 10 percent for large commercial customers.

Fort Knox Mine

Photo courtesy of Kinross Gold.

February 1, 2006

Senator Thomas Wagoner
Alaska State Legislature
State Capitol (MS 3100)
Juneau, AK 99801

Coeur Alaska, Inc.
3031 Clinton Dr., Suite 202
Juneau, Alaska 99801
Telephone 907.523.3300
Facsimile 907.789.1503

Dear Senator Wagoner:

I am pleased to attach an overview of Coeur Alaska's Kensington Gold Mine, located 45 miles north of Juneau. Coeur Alaska's revitalization of Kensington began 17 years ago and has included the investment of millions of dollars in environmental and technical study and permitting. We are excited to be bringing this long awaited economic diversification into construction and expect that our total capital investment in the project will amount to more than $120 million.

We have worked diligently with all of the local, state and federal regulatory agencies to secure the myriad of permits that enabled us to begin construction last July. The support of the Alaska legislature during the permitting phase was very much appreciated. To date we have already issued over $40 million in contracts as we continue to move forward on this environmentally sound project.

I know that we all share a common vision of the need for long-term economic development in all of Alaska, and the Kensington project is a major component of that development. We are already employing over 100 men and women in the early construction phase; and that number will rise to about 300 during the peak building period. Once the mine begins operating, it will employ about 200 Alaskans.

As widely reported in the news media, the U.S. Army Corps of Engineers has temporarily suspended our 404 permit while it conducts a technical review of the record. During the suspension, we continue to be very active at the site while we engage in work that is not governed by the 404 permit. We remain confident that the Corps of Engineers will revalidate the rigorous scientific and engineering analysis that formed the basis of the original issuance of this essential permit. At the same time, however, we expect that the Kensington Gold Mine will continue to be a target of groundless criticism among those who simply oppose mining in general.

I want to assure you that we are prepared to answer any questions you might have, and we appreciate your continued support for the Kensington project.

Sincerely,

Dennis E. Wheeler
CEO and President

Kensington Gold Mine

E U R
SKA

Producing & Protecting

This underground mine will operate in accordance with the highest standards of environmental compliance, part of a policy we call **"Producing and Protecting."**

The Mine

Mining first began in the Berners Bay District, 45 miles northwest of Juneau, in the late 1800's. Today, mining is poised to return to this historic area, where the land has been designated for mining for many years. After performing 900 environmental studies, investing more than $25 million in environmental reviews, and working with local, state and federal agencies to secure the necessary permits to develop an environmentally sound mine, we at Coeur Alaska are moving forward with the Kensington Gold Mine development.

Delivering Area Investment

Coeur Alaska is now delivering on its commitment to create jobs and economic growth in Juneau and Southeast Alaska and will annually contribute millions of dollars to the regional economy for many years to come.

- Target commercial production in 2007.
- Operate for at least 10 years.
- Invest over $120 million by Coeur Alaska.
- Current reserves are more than 1 million ounces.
- Produce around 100,000 ounces of gold per year.
- Committed to hiring locally and working with Native Corporations like Goldbelt, Kake Tribal, Klukwan and Sealaska.
- Investing in training local workers through the University of Alaska Southeast and with Native Corporations for future jobs involving the mine.

Prospect with Respect

The mine has broad and deep support among political, community, business, and native leaders who recognize that Kensington strikes the perfect balance between environmental stewardship and economic contribution.

Thinking Locally

Coeur Alaska is now delivering on its commitment to create jobs and economic growth in Juneau and Southeast Alaska.

- At peak construction period, 300 workers will be employed.
- When fully operational, Kensington will directly employ approximately 200 people and generate more than $16 million a year in payroll and benefits.
- Kensington workers will receive highly competitive compensation and a full benefit package.
- The indirect employment will add more than 400 additional jobs during the minimum 10-year mine life.
- The Kensington Gold Mine will generate $11.5 million in annual tax revenue for Alaska. The State of Alaska and the City and Borough of Juneau will receive an estimated $10.1 million, while additional property taxes going to the local government are estimated to exceed $1.4 million annually. (Source: FSEIS)

COEUR
ALASKA

Producing & Protecting

Alaska's Kensington Gold Mine

A Positive Mining Legacy for Alaska

The Kensington Gold Mine has received overwhelming support from Alaskans, elected officials, Native Corporations and organizations. Among those supporting this environmentally sound project include Governor Murkowski, the Alaska Congressional Delegation, the State of Alaska House and Senate, Juneau and Haines Chambers of Commerce, the Resource Developmental Council, Sealaska, Kake Tribal, Goldbelt, and Southeast Alaska Gillnetters, among many others.

Jobs with the Kensington Gold Mine range from clerical to carpentry, mining to management positions. Jobs are advertised locally and information is also available through the Juneau Job Center at 907-465-4562.

Coeur Alaska is committed to the State of Alaska. The mine will play a positive role in diversifying and boosting the local economy while maintaining a high standard in environmental performance now and into the future. This is our policy of Producing and Protecting.

We invite you to learn more about Kensington by visiting our web site at
www.kensingtongold.com

3031 Clinton Dr., Suite 202
Juneau, AK 99801
907.523.3300

Environmental Commitment

Coeur is a leader in environmental protection. We have earned more than 20 environmental awards by conducting our activities in such a manner as to protect the physical environment and our employees - and by being a proactive member in the communities in which we operate. The Kensington Gold Mine will operate in accordance with the highest standards of environmental compliance and we have pledged $7.3 million to ensure we restore the site to productive wildlife and aquatic habitat after mining. This policy can be simply stated as: "Producing and Protecting."

There has been considerable discussion about tailings management at Kensington. Tailings are the sand-sized material that remains after gold and other metals are removed in the processing step. Kensington tailings have less metal content than the natural lake sediments where they will be placed. Management of the tailings in Lower Slate Lake was the permitted alternative as it had the least environmental impact. After mining, the reclaimed lake will be about 60 acres (three times larger than current size) with productive wetland and open water habitats - and native wild fish will be restocked into the lake.

Protecting Berners Bay

Berners Bay Before Kensington

Berners Bay After Kensington

Why Lower Slate Lake Placement?

This approved plan is a temporary use of a small, relatively unproductive lake called Lower Slate Lake. The naturally occurring water quality in the lake does not meet state standards, and there is little or no spawning habitat for native fish. A conventional dam will be built at the outlet. During mining this area provides a geotechnically sound location for tailings while minimizing long-term impacts to productive wetland and other wildlife habitat. At the end of mining, the tailings area will be reclaimed into a lake with improved productivity and aquatic habitat, as determined through the Final Supplemental Environmental Impact Statement prepared by the Forest Service.

The mill and the underground mine are not visible from Berners Bay. As a result the mine does not impact the panoramic views that Alaskans enjoy. The National Marine Fisheries Service concluded the project would not adversely affect marine mammals. To further protect the marine mammals and fishery, we have developed a Transportation Plan relating to boat and barge traffic. This plan includes trolling and noise controls, restrictions on construction when marine mammals are present, reduced traffic during Eulachon and herring spawning periods, and an extensive monitoring program.

Lower Slate Lake Before Kensington

Lower Slate Lake After Kensington

3:30PM

ALASKA MINERALS COMMISSION REPORT TO THE LEGISLATURE 2006

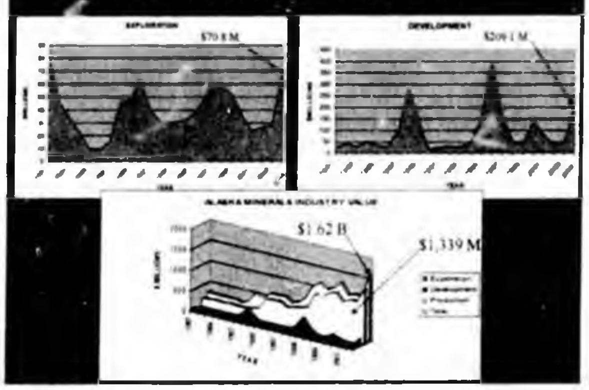
Joint Resources Committee

FEB. 8, 2006

ALASKA MINERALS COMMISSION

- Created by the 1[illegible] Legislature, signed into law on June [illegible]
- Authorized until January 2014
- Eleven Member Commission, appointed [illegible]
  - [illegible]
  - [illegible]
  - [illegible]
- Commission's Role: Make recommendations to the Governor and the Legislature on ways to mitigate constraints on the development of minerals including coal
- Many recommendations implemented since first report in January 1987

INDUSTRY OVERVIEW



INDUSTRY OVERVIEW

Major producing mine

Developing and major exploration projects

MINING LICENSE TAX

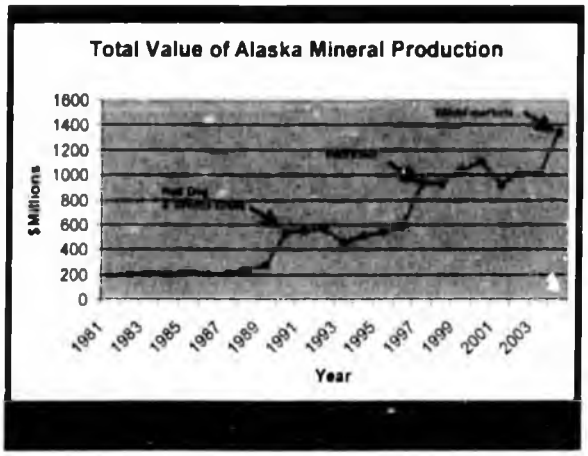
- First enacted by Territorial legislature in 1913
- Component of resource policy at statehood
- 7% Net Profits for major operations
- Payable by all operations in State regardless of land status or mineral ownership

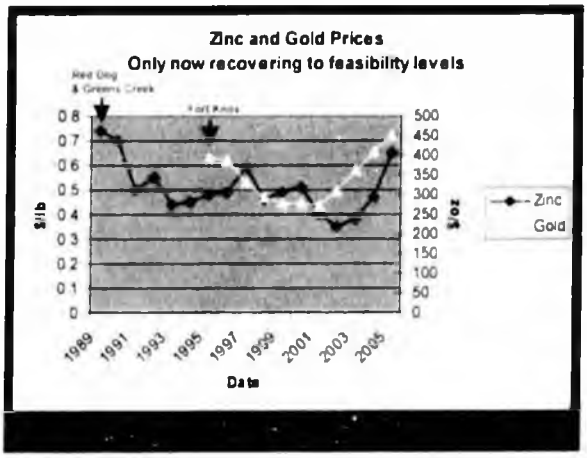
MINING RENTS & ROYALTIES

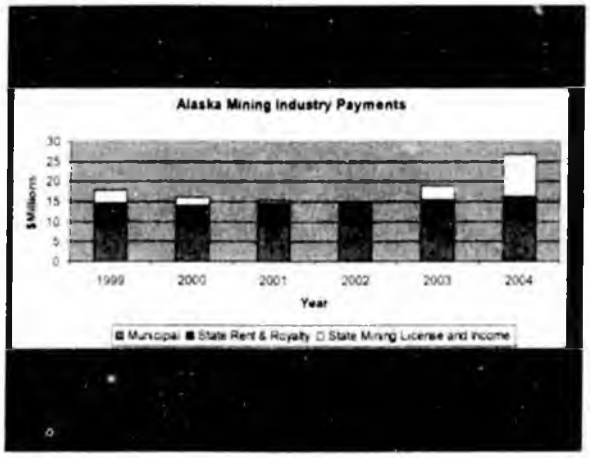
- Mineral development major factor at statehood
- 1981 - State AG questioned state policy (Section 6(i))
- 1981/82 legislature tried modification
- 1983-1987 litigation
- 1987 - AK Supreme Court – rents *or* royalties
- 1989 legislature – rents ***and*** royalties

MINING RENTS & ROYALTIES

- Rent – up to $3.30 per acre/yr
- Royalty – 3% Net Profits
- State land only
- Debate and resolution occurred prior to industry expansion







FINDINGS AND RECOMMENDATIONS TO RESOURCE

- NPDES PRIMACY
- PERMIT EFFICIENCY
- MIXING ZONES
- TAX CONSIDERATIONS
- GEOLOGICAL AND GEOPHYSICAL MAPPING
- POWER SUPPLIES

FINDINGS

- NPDES PRIMACY

RECOMMENDATIONS

- NPDES PRIMACY
  - ADEC aggressively pursue primacy
  - Legislature ensure appropriate funding

FINDINGS

- PERMIT EFFICIENCY

RECOMMENDATIONS

- PERMIT EFFICIENCY
  - **the Legislature require a periodic permitting status report accounting for agency staff and management**

FINDINGS

- MIXING ZONES

RECOMMENDATIONS

- MIXING ZONES
  - ADEC finalize the promulgation of the mixing zone regulation, after considering the comments provided during the comment period that result in enhancements to the proposed regulations and without detracting from the original three improvements in the proposed regulation.

FINDINGS

- TAX CONSIDERATIONS
  - Mineral development provides private sector investment and employment to diverse areas of the State
  - A substantial portion of the State's mineral potential lies in unorganized boroughs
  - The formation of boroughs presents uncertainty regarding future taxation

FINDINGS

- TAX CONSIDERATIONS
  - The mining industry is willing to pay [illegible] share of the tax burden, such as an equitable land based tax, a property tax, not an industry specific severance tax
  - An industry-specific tax could be a disincentive to development of the industry in rural areas and thereby becomes a negative to the rural communities
  - Tax uncertainty makes investment decisions in the State difficult and contributes to the disincentive against investment in mining in Alaska

RECOMMENDATIONS

- TAX CONSIDERATIONS
  - The Governor and the Legislature take steps to improve the investment climate for the mining industry by ensuring that future municipal taxes, especially in those areas presently within the unincorporated regions of Alaska, are broad-based, equitable, and stable

FINDINGS

- GEOPHYSICAL & GEOLOGICAL MAPPING
  - Alaska [illegible] is one of poorest in the world
  - Declining investment
  - When privately done, no baseline for progress
  - Mapping expenditures since 1993 have averaged $400,000 per annum
  - Approximately 8,000 square miles, less than 1% of the State's land entitlement, has been mapped during this period
  - $500,000 for detailed geophysical mapping [illegible] and $ 350,000 for pipeline Delta to Canada
  - geophysical-geological mapping has been proposed by the governor for [illegible]

RECOMMENDATIONS

- GEOPHYSICAL & GEOLOGICAL MAPPING
  - The Governor and the Legislature increase annual rate of funding in geophysical and geological mapping to more than $1,000,000 per year
  - Provide $500,000 to complete both surficial and bedrock geologic mapping of the Delta Junction to Canada border pipeline corridor

FINDINGS

- POWER SUPPLIES
  - Major mines require substantial power supplies
  - Many remote mines must generate their own power using costly modular diesel or other forms of generation
  - Extensions of Alaska's power supply and grids could enhance project development and provide more economical power to rural communities
  - Coal fired generation offers the means to provide stable long-term, economical power supply to Alaska

RECOMMENDATIONS

- POWER SUPPLIES
  - The Governor and Legislature support development of a long-term electrical generation plan for the existing electrical grid that incorporates the use of coal.

OTHER FINDINGS & RECOMMENDATONS

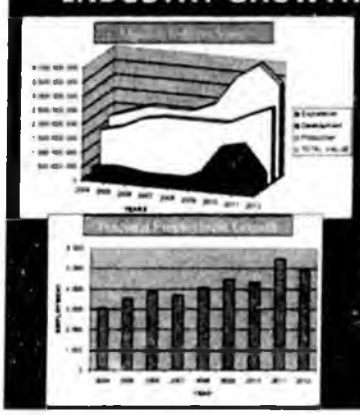
- Litigation Reform
- General Permits for Small Remote Work Camps
- AMEREF
- Roads to Resources
- RS2477 Trails
- Navigability
- College of Engineering & Mines
- Minerals Marketing & Foreign Trade Offices

FINDINGS & RECOMMENDATONS

Federal Level

- Tailings Impoundment Classification
- Toxic Release Inventory
- Geological Mapping
- Resolution of Outdated Segregations
- Essential Fish Habitat
- MSHA Training & Relief for Small Mines

INDUSTRY GROWTH POTENTIAL



Thank You

The Alaska Minerals Commission

An Economic Impact Profile

From the report
The Economic Impact of Mining on Alaska,
prepared for the Alaska Miners Association

Alaska's Mining Industry

February 2006

The Benefits of Mining

Historically, mining was a cornerstone of the Alaska economy. Many roads, docks, and other infrastructure throughout Alaska were originally constructed to serve the mining industry. Today, a rejuvenated mining industry is bringing a broad range of economic benefits to Alaskans and Alaska communities.

For example, mining:

- Offers some of the highest paying occupations in Alaska.
- Provides jobs in many rural areas in Alaska, where there are few other private sector jobs available.
- Makes significant local government tax payments.
- Benefits Native corporations from mining activity on their land, both in jobs for shareholders and through direct payments.

The future promises even greater economic benefits. However, the mining industry requires a stable and equitable tax environment for Alaskans to realize the greatest potential economic benefits from mineral resouce development.

Alaska's mining industry includes exploration, mine development and mineral production. The industry produces zinc, lead, gold, silver, coal, as well as construction materials, such as sand, gravel and rock.

In 2004:

- There were 26 significant exploration projects in Alaska. Exploration spending totaled $71 million (2005 exploration expenditures are over $95 million).
- Another $209 million was invested for development of new mines in Alaska.
- Alaska's three largest metal mines, Red Dog, Fort Knox, and Greens Creek, spend approximately $170 million annually in Alaska in support of their operations.
- Approximately 73 open-pit, underground, mechanical placer, and suction dredge mines were in production in Alaska.
- There are at least 37 rock quarries and 71 active sand and gravel operations.

Key 2004 Mining Industry Economic Impacts

2,900 average direct mining jobs in Alaska

5,100 total jobs attributed to the mining industry in Alaska

$280 million in payroll attributed to the mining industry

$280 million spent in mining exploration and development in Alaska

$16 million paid by the mining industry to state government in royalties, fees, and taxes

$11 million paid by mines to local governments

$11 million paid by mines to Native corporations

$17 million paid to Alaska Railroad to move coal, sand and gravel to state and international markets

$18 million paid to the Alaska Industrial Development & Export Authority (AIDEA) for DeLong Mountain Regional Transportation System user fees

Employing Alaskans in Good Jobs

In 2004, the mining industry directly employed 2,900 Alaskans, paying them $194 million in wages. If indirect and induced jobs are added in, a total of 5,100 Alaskans with $280 million in payroll can be attributed to the mining industry.

Providing year-round jobs with good wages

The average annual wage for employees working in Alaska's metallic mineral mines is $70,750, 83 percent above the statewide average annual wage.

Fort Knox Mine employees' average salary was 70 percent higher than the Fairbanks North Star Borough average. Greens Creek Mine's 260 employees are among the highest-paid workers in Juneau with average annual wages of nearly $79,000, almost triple the average $29,000 wage for Juneau private sector workers.

Prior to Red Dog Mine's opening, average income in the Northwest Arctic Borough was well below the statewide average. Following development of Red Dog Mine, the median household income in the Borough increased by about 87 percent. Annual wages at the mine range from $45,000 to $85,000 per year, plus benefits.

Providing jobs in rural Alaska

Many jobs offered by the mining industry are rural-based, including those at Red Dog, Donlin Creek, Pogo, and Pebble. These jobs are offered where few if any other employment opportunities are available.

Red Dog Mine is the second largest employer in the Northwest Arctic Borough. Including contract employment, it accounts for 17 percent of all employment in the Borough.

Supporting Alaska workers and Alaska businesses

The mining industry has a higher resident hire rate, at 83 percent, than the statewide average of 80 percent, and significantly higher rates than other key Alaska industries.

Alaska Resident Hire by Key Industry, 2003

Industry	% Alaska Resident Workers
Mining	82.8%
Construction	80.1
Oil and Gas Extraction	77.3
Accommodation and Food Services	73.1
Seafood Processing	28.9
All Industries	81.9

Source: Alaska Department of Labor and Workforce Development

Mining projects offer employment and business opportunities to Alaskans. For example:

- Approximately 300 workers have been hired for the Pogo Mine construction project near Delta Junction. Pogo's labor force is 85 percent Alaska resident.
- For construction of the Kensington Gold Project near Juneau, $42 million in contracts have been awarded so far, 85 percent to Alaskan companies.
- In 2005, Calista shareholders made up 94 percent (111 employees) of Donlin Creek's direct and contract employees. Seven of eight supervisors on the project are shareholders.
- In 2005, for the Pebble project, 45 consulting firms have been hired to conduct environmental baseline studies, planning, and research. These firms reported 441 Alaskan employees worked on some aspect of the project. Of the Alaska workforce, 21 percent were hired locally from the Bristol Bay region and 26 percent were Alaska Native.

More mining jobs in the future

With the Pogo and Kensington projects coming on line within the next two years, metal mining will introduce 500 more high-paying jobs for Alaskans, increasing mining's payroll by $35 million.

Projects currently in exploration, such as Pebble, Donlin Creek, Rock Creek, and Chuitna Coal, have the potential to employ 1,500 Alaskans.

Training Alaskans

Many jobs in the mining industry offer transferable skills in an industry rapidly growing in Alaska and worldwide. There are a number of Alaska education institutions and organizations that provide training for and with the mining industry throughout Alaska.

Strengthening Government

Mining companies are a significant source of revenue for local governments. In 2004:

- Red Dog paid $6.2 million in payment in lieu of taxes (PILT) to the Northwest Arctic Borough, representing three-fourths of its General Fund receipts.
- Fort Knox/True North was the second largest property tax payer to the Fairbanks North Star Borough, paying $3.5 million in property taxes.
- Greens Creek Mine is the largest private property tax payer, paying $660,000 in property taxes to the City and Borough of Juneau.
- Usibelli Coal Mine paid property taxes of $125,000 to the Fairbanks North Star Borough and $155,000 to the Matanuska-Susitna Borough, and $75,000 in other taxes to the Denali Borough.
- Alaska Gold Company was the fourth largest property tax payer to the City of Nome, paying $53,300 in real property taxes.

Rock Creek Development Project. Photo courtesy of NovaGold Resources.

More local government support expected

In a PILT agreement between the Pogo Mine and the City of Delta Junction, mine developers paid the city $500,000 in 2005, will pay another $500,000 in 2006, and another $1,000,000 in 2007 (if a Borough has not yet been incorporated).

Reviewing core samples at the Pebble Project. Photo courtesy of Northern Dynasty Mines Inc.

Generating state government revenues

The mining industry paid $15.8 million to the State of Alaska in 2004 through a variety of taxes, rent, royalties, and fees. Mining license taxes were the largest source of revenue, totaling $10.3 million in FY 2005, a year when metal prices were just beginning to improve.

Mining is an important source of revenue for the Alaska Railroad Corporation. In FY 2004, the railroad earned approximately $17 million from movement of coal and gravel destined for Alaska or export markets (representing 15 percent of its total operating revenue).

Red Dog Mine paid the Alaska Industrial Development & Export Authority close to $18 million in annual user fees for use of the state-owned DeLong Mountain Regional Transportation System road and port that serves Red Dog Mine.

Greens Creek underground drill rig. Photo courtesy of Kennecott Greens Creek Mine.

Supporting the Alaska Mental Health Trust

The Alaska Mental Health Trust earned $167,000 in rents and royalty payments from the mining industry in 2004. The Trust also earned $60,000 from construction material sales.

Partnering with Alaska Native Corporations

Red Dog is operated by Teck Cominco under an agreement with NANA Regional Corporation. NANA is the landowner and Teck Cominco is the operator. Teck Cominco pays a net smelter return royalty to NANA, which in 2004 was $10.9 million. Of the 2004 royalty payment, NANA redistributed $5.9 million to the other 11 ANSCA regional corporations as part of its 7(i) payment. Teck Cominco paid $90.1 million in total royalties to NANA from 1982 to 2004.

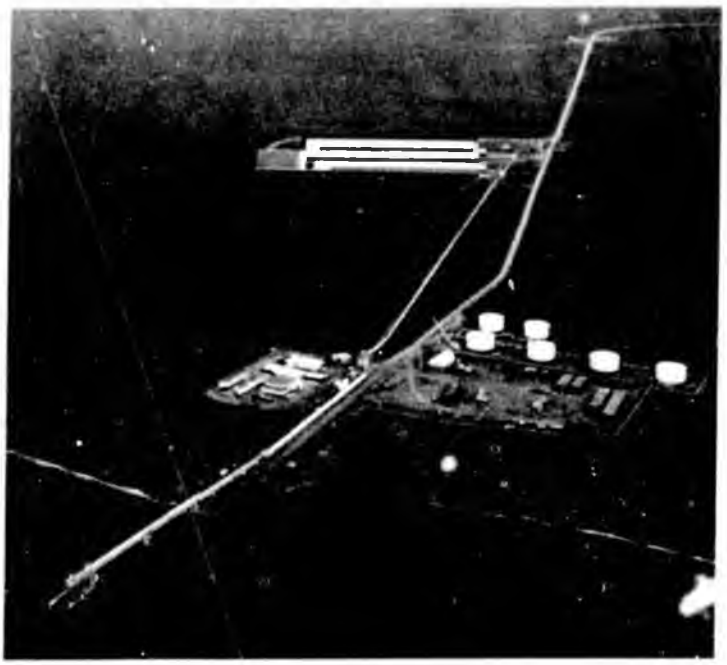
Of the 480 employees at Red Dog, approximately 360 are employed directly by Teck Cominco, while most of the remaining employees are employed by NANA/Lynden and NANA Management.

Teck Cominco has hired more than 1,000 NANA shareholders at Red Dog Mine since production began in 1989. This does not include many more who have worked as contractors at the mine. A third of the people holding Red Dog jobs live in the small villages of the Northwest Arctic Borough.

Placer Dome, developer of the Donlin Creek project, has entered into exploration and mining lease agreements with Calista Corporation and The Kuskokwim Corporation, and is talking with Calista and Kuskokwim about opportunities for service contracts.

Alaska Gold Company has exploration and mining lease arrangements with Bering Straits Native Corporation and Sitnasuak Native Corporation for mining and surface use.

Fort Knox Mine. Photo courtesy of Kinross Gold.



DeLong Mountain Regional Transportation System Port. Photo courtesy of Teck Cominco.

Developing Important Infrastructure

The mining industry has historically played a key role in the development of important infrastructure in Alaska. Development of the Alaska Railroad, the Richardson Highway, and the settlement of Anchorage, Fairbanks, Juneau, Skagway, and Nome are all linked with early mining industry activity. The mining industry is also responsible for the development of smaller communities throughout Alaska, such as Eagle, Circle, and McGrath, among others.

Mining industry development of Alaska infrastructure continues today. Examples include the DeLong Mountain Regional Transportation System port and road (developed in support of the Red Dog Mine), the Seward coal-loading facility, and the Pogo Mine road. Mining-related infrastructure can also reduce the cost of basic services to Alaskans. For example, because Ft. Knox is a large purchaser of electric power, other local customers enjoy lower power rates.

Contents of this handout are taken from the report, *The Economic Impact of Alaska's Mining Industry* (February 2006), prepared by McDowell Group, Inc. The full study is available online at www.alaskaminers.org or from the Alaska Miners Association in Anchorage at (907) 563-9229.

Alaska Department of Natural Resources
Division of Geological & Geophysical Surveys

Mineral Resources Program

Robert Swenson
Acting Director & State Geologist
Division of Geological & Geophysical Surveys

http://www.dggs.dnr.state.ak.us
http://akgeology.info

February 7, 2006

Alaska Department of Natural Resources

Division of Geological & Geophysical Surveys

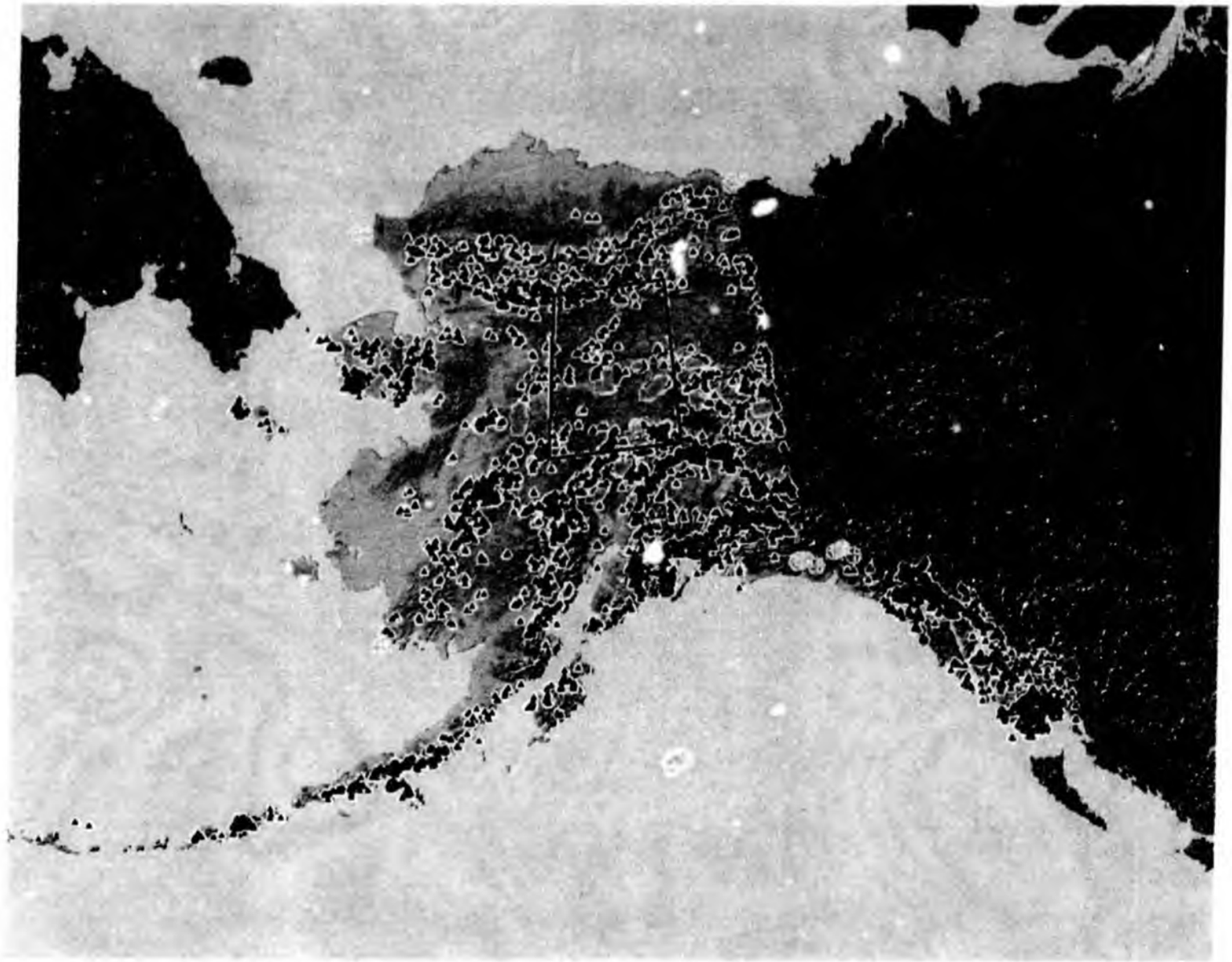
MISSION STATEMENT

Alaska Statutes 41.08.020

Conduct geological and geophysical surveys to determine the potential of Alaskan land for production of metals, minerals, fuels, and geothermal resources; the locations and supplies of groundwater and construction materials; and the potential geologic hazards to buildings, roads, bridges, and other installations and structures.

DGGS Mineral Resource Program

Challenge



Mineral Resource Program

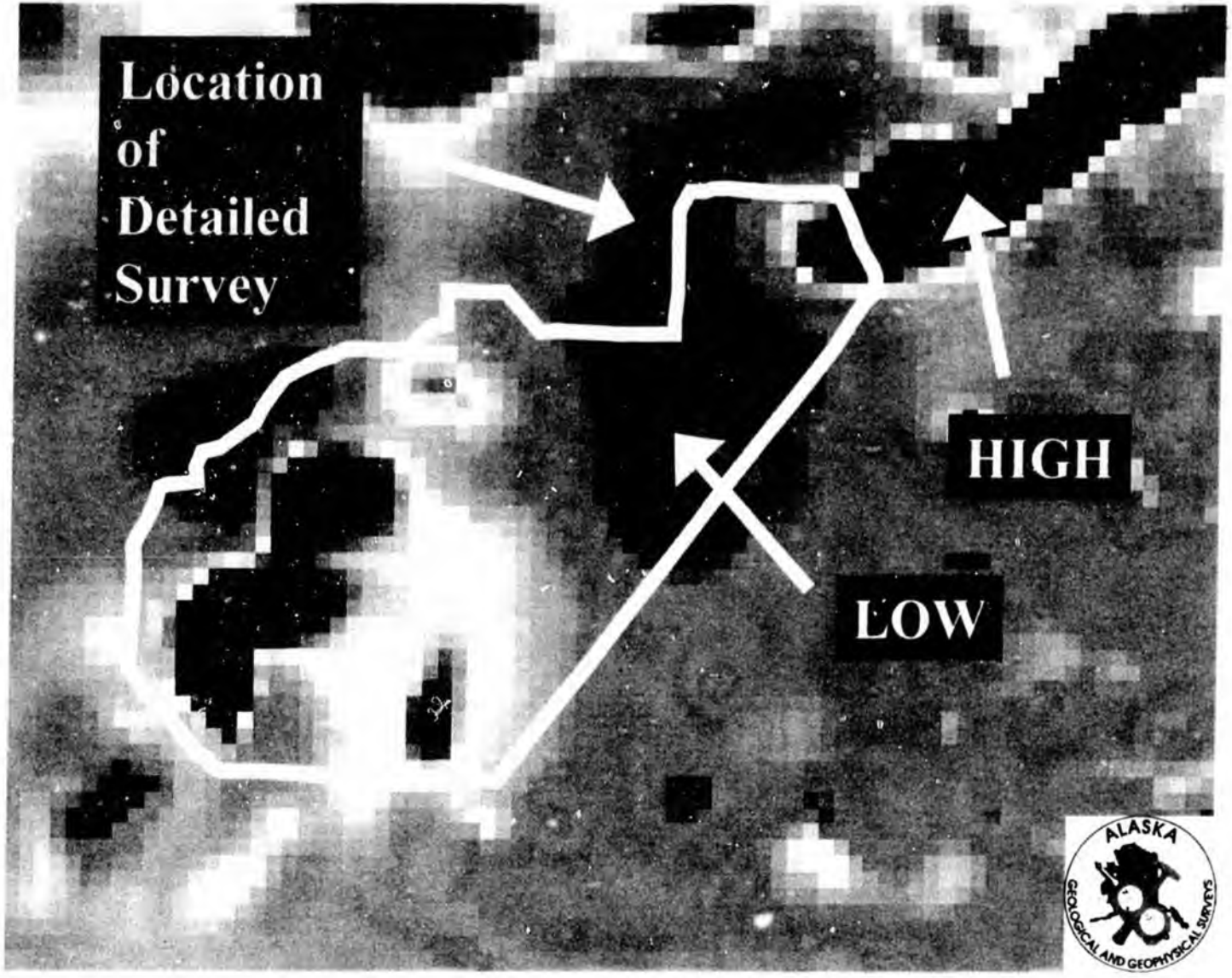
Statistics

- **$1.7 mm Federal Matching Funds for Geologic Mapping since 1993**
- **6.1 mm acres (9,531 sq. mi) of high resolution geophysics state funded, 3.7 mm acres (5,781 sq. mi) BLM funded**
- **40 million acres (62,500 sq. mi) currently identified as high potential**
- **Geophysics cost about $575/sq. mile ($0.90/acre) currently**
- **Over 3 Million Acres (4,700 sq. mi) of 1:63,360 Detailed Geologic Mapping completed and published using High Resolution Geophysics**

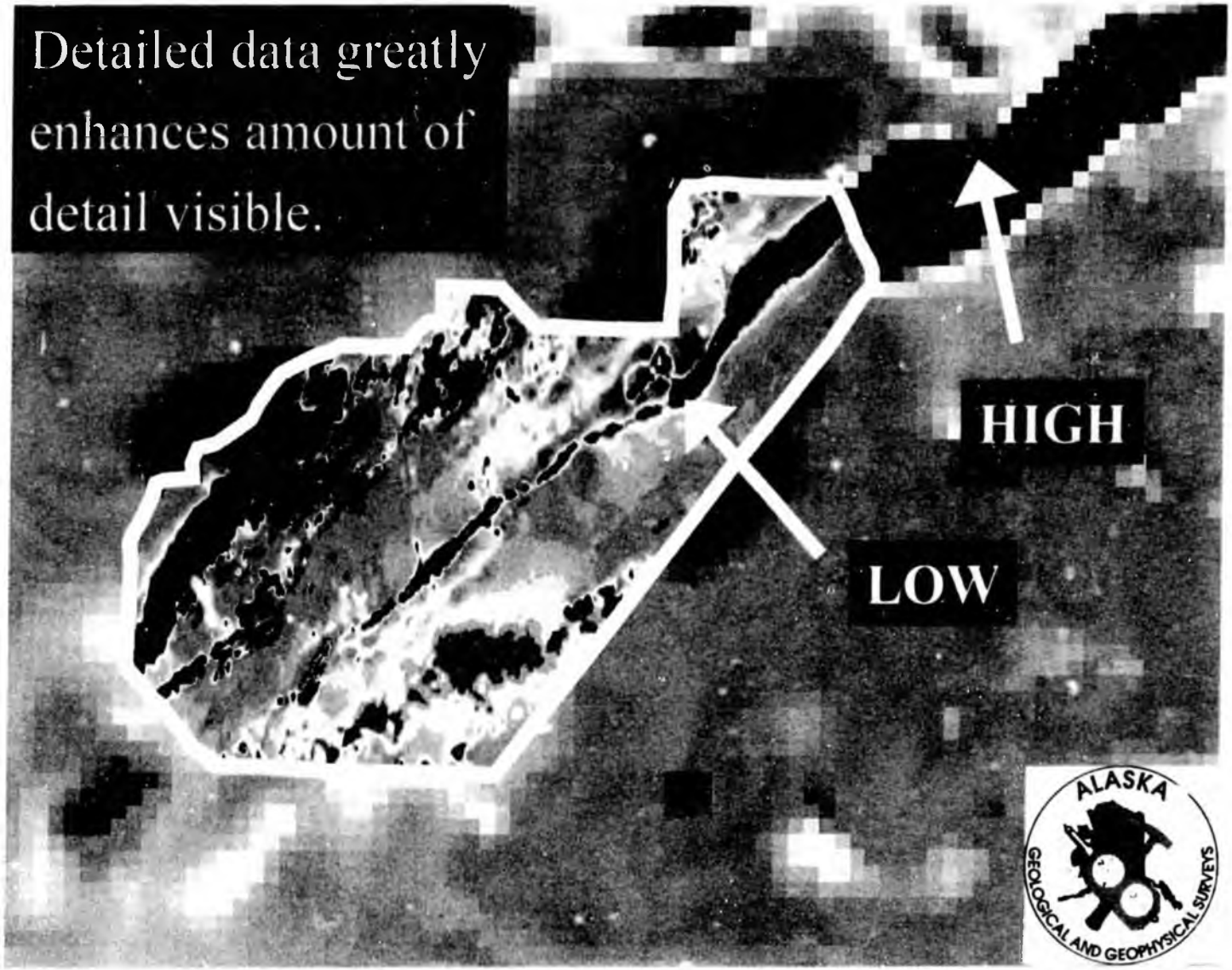
Mineral Resource Program
Benefit

- Better assessment of State's resource base
- Keeps high-resolution data in public realm
- Viable prioritization of land selections and transfers
- Stepping-off point for explorers
- Critical data for infrastructure and community planners and

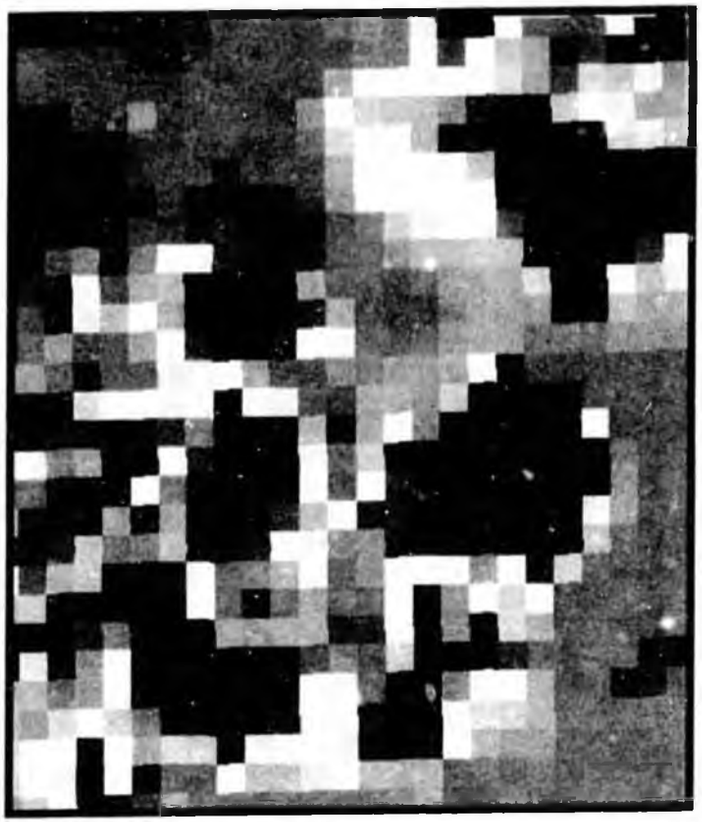
Regional Magnetics – Chulitna Area



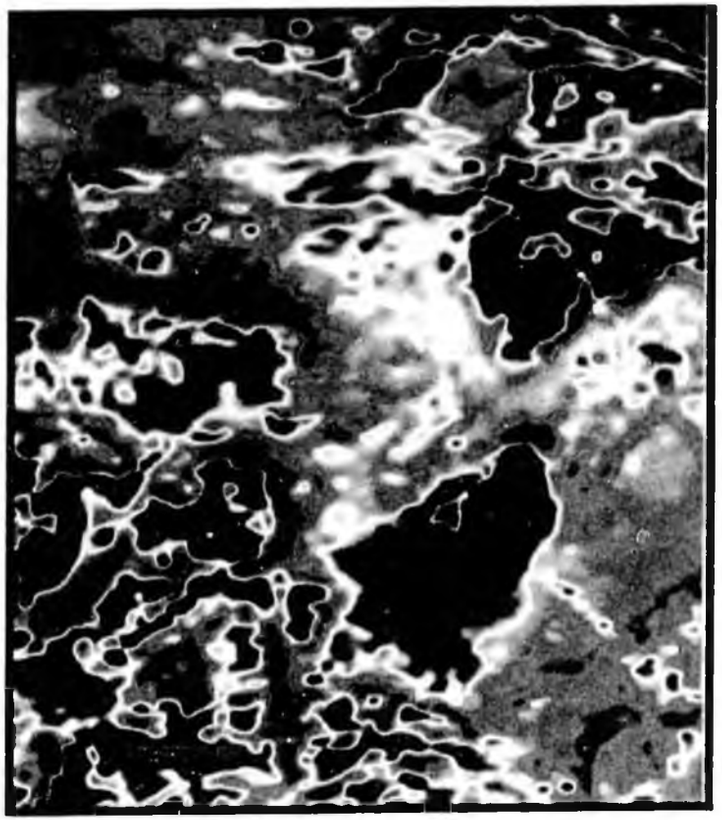
Detailed Magnetics – Chulitna Area



REGIONAL AEROMAGNETICS



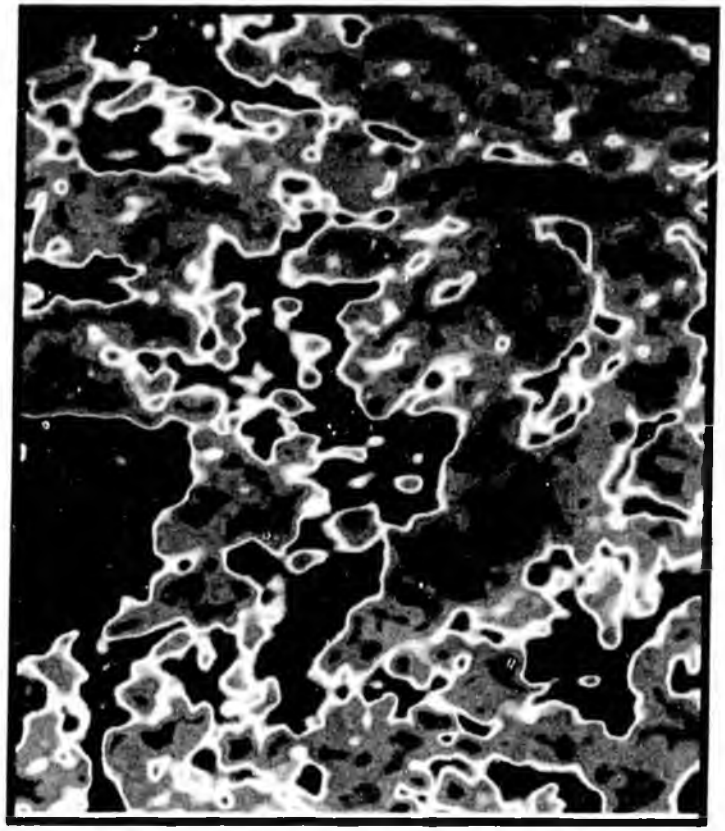
DETAILED AEROMAGNETICS



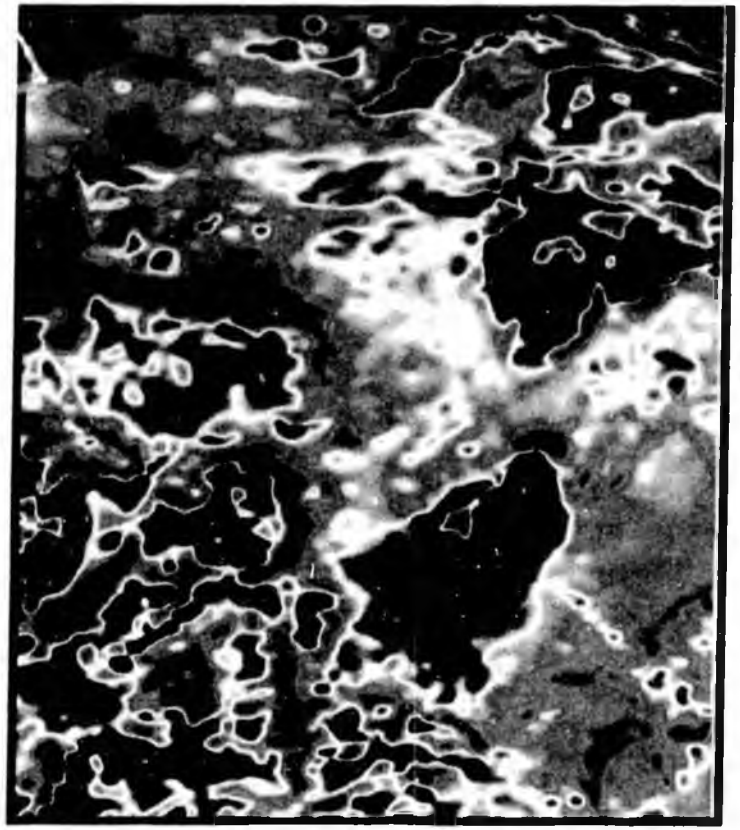
Eagle A-2 Quadrangle

5 Miles

7200 HZ RESISTIVITY



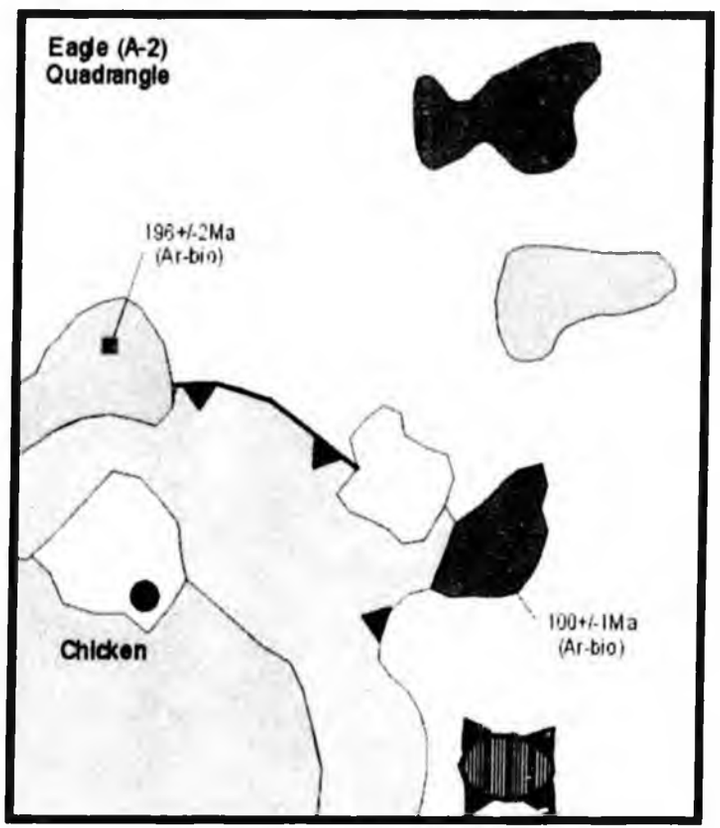
DETAILED AEROMAGNETICS



Eagle A-2 Quadrangle

5 Miles

GEOLOGY WITHOUT GEOPHYSICS

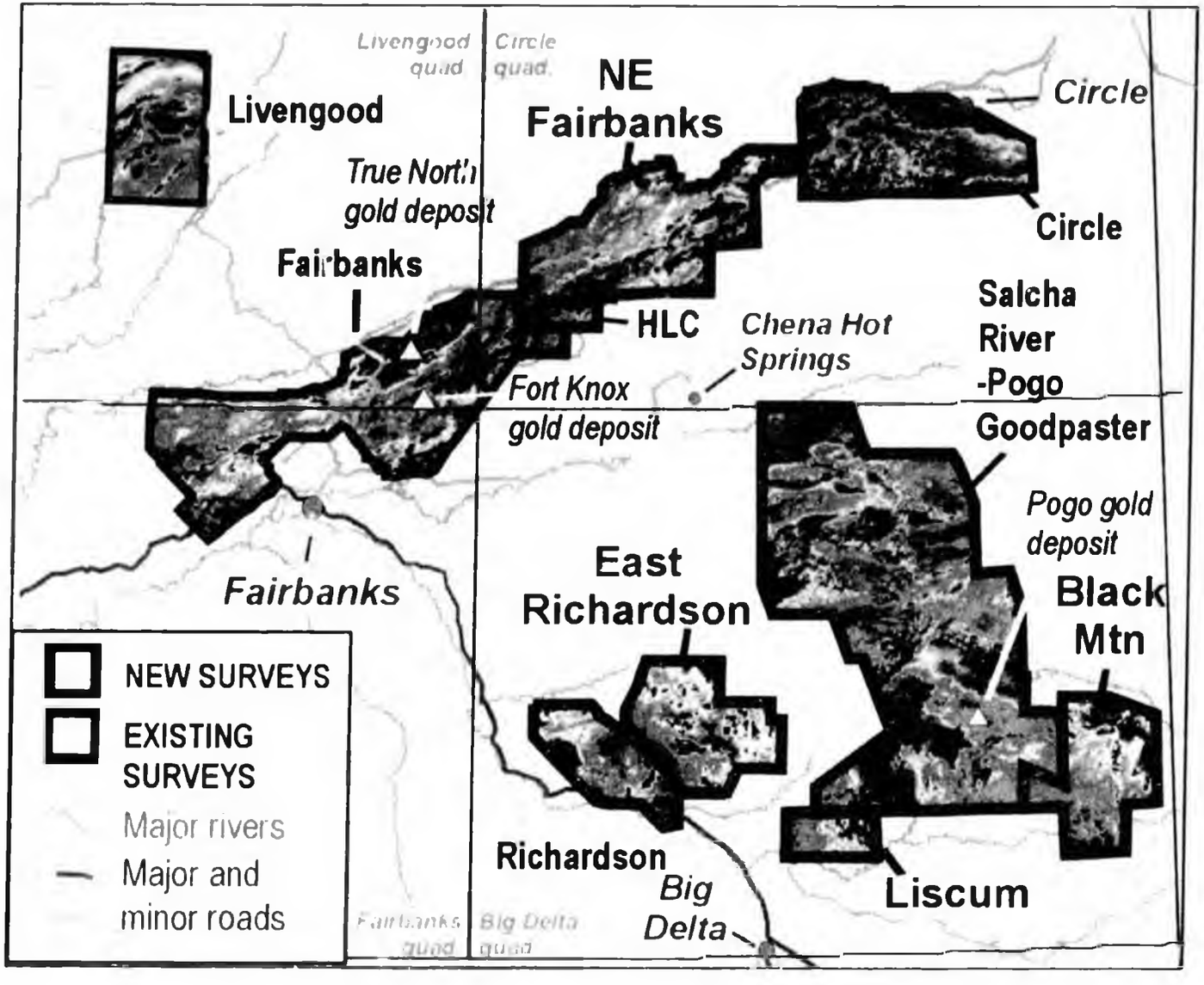


GEOLOGY WITH GEOPHYSICS

Eagle A-2 Quadrangle

Fort Knox Footprint ■ Pogo Footprint

Alaska Geophysical/Geological Mineral Inventory Program



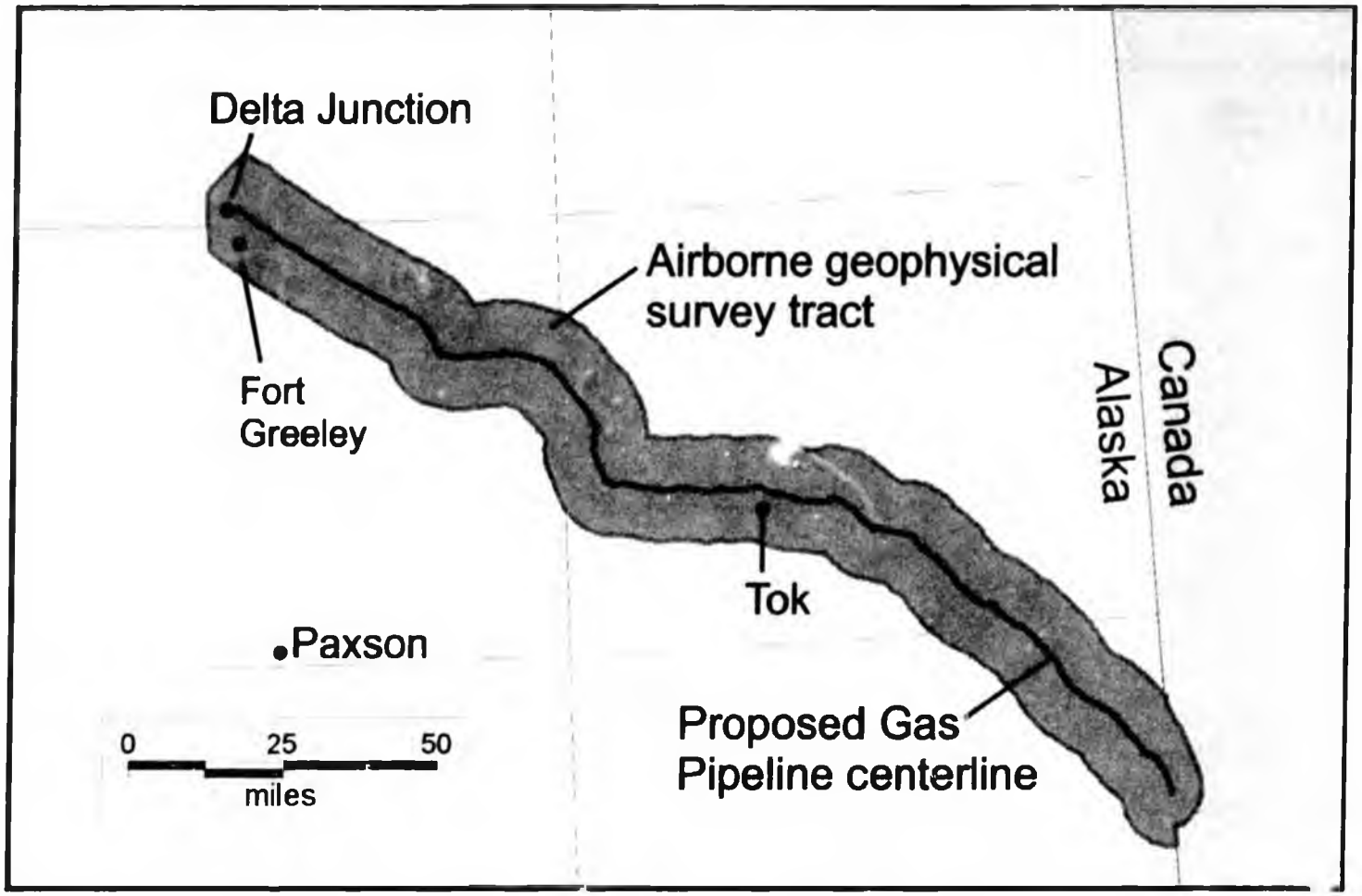
NE Fairbanks

E. Richardson

Liscum

Black Mountain

Airborne Geophysical Survey of the Proposed Gas Pipeline Corridor, Interior Alaska: First Phase of Geologic Hazards and Resource Evaluation

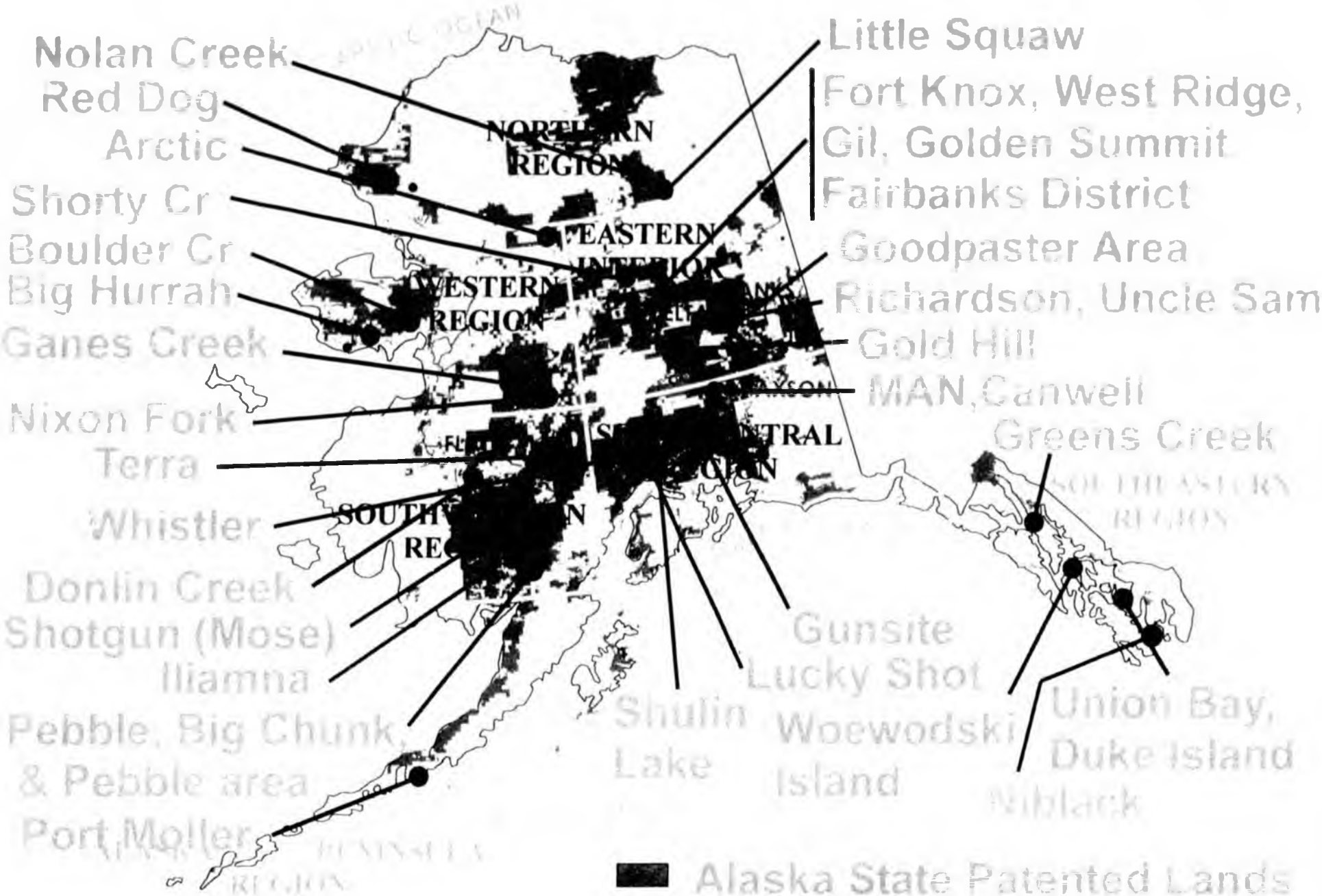


Geophysics Release

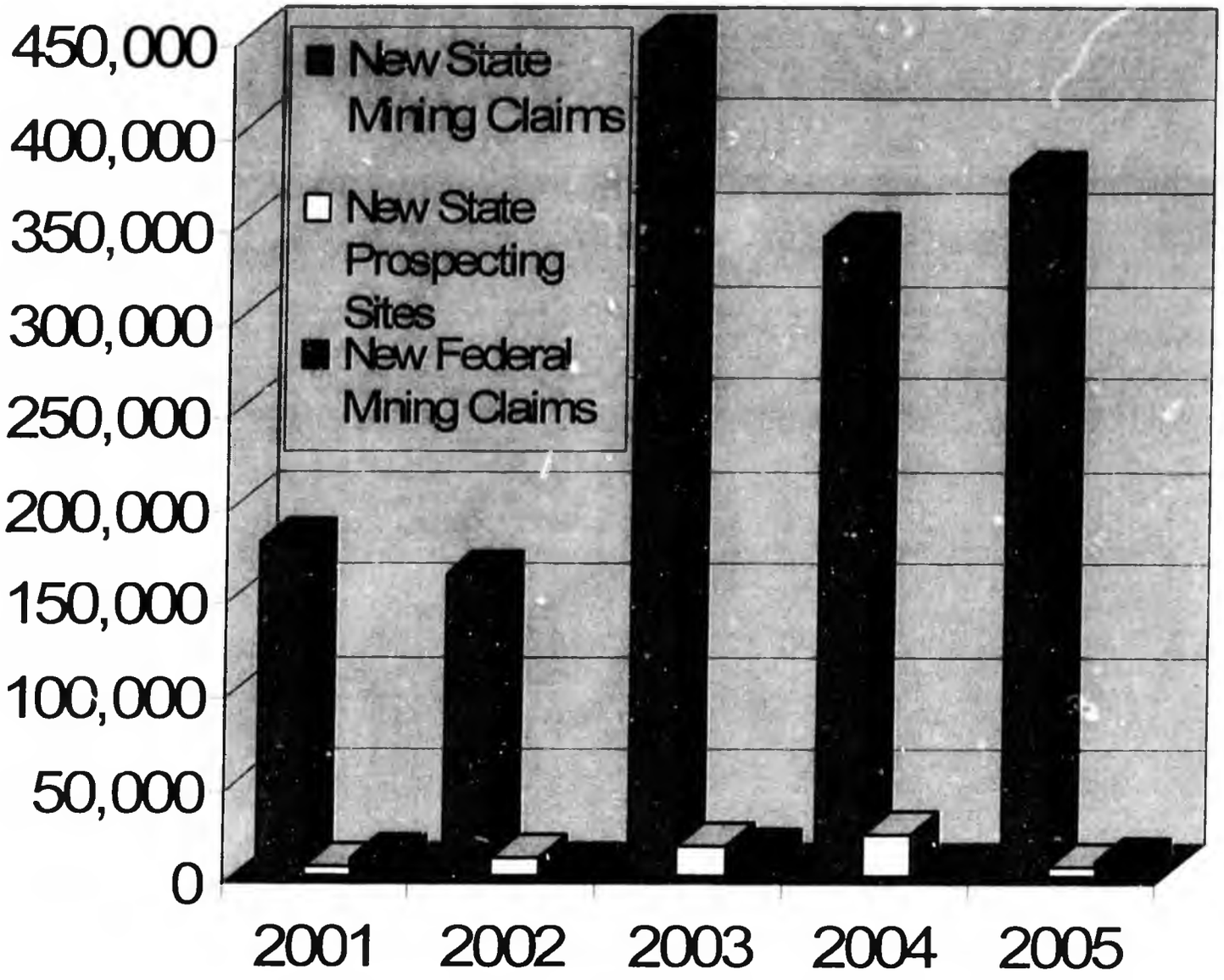
January 2006 -- Vancouver, Fairbanks, Anchorage

- **Barrick Gold Corp.** (the world's largest gold mining company) – purchase
- **Kennecott Exploration Co.** (a subsidiary of Rio Tinto Co., the world's 2nd largest mining company) – purchase
- **Phelps Dodge Corp.** (one of the world's (top 5) largest copper producers, world's largest molybdenum producer) – questions, etc.
- **AngloGold Ashanti Ltd.** (one of world's largest gold producers, employs 60,000 worldwide) – purchase/paid for part of survey costs
- **Rimfire Minerals Corp.** (Canadian junior mining company with major claim holdings in the Pogo area) – purchase
- **Geoinformatics Exploration Inc.** (Canadian junior mining company in worldwide strategic alliance with Kennecott Mining Co.; working on Uncle Sam area near Delta Junction and Nixon Fork Mine near McGrath) – purchase
- **Select Resources Corp.** (U.S. junior mining company with Alaskan holdings in Livengood and Richardson mining districts, recently purchased Calder marble mine in Southeastern Alaska from SeaAlaska Corp.) – purchase
- **Tanya Strate** (Australian geophysicist moving to North America) – purchase
- **Nicholas Van Wyck** (Alaskan certified professional geologist) – purchase
- **Avalon Development** (Alaskan mineral exploration company) – purchase
- **Interior Landscaping** (Alaskan company) – purchase

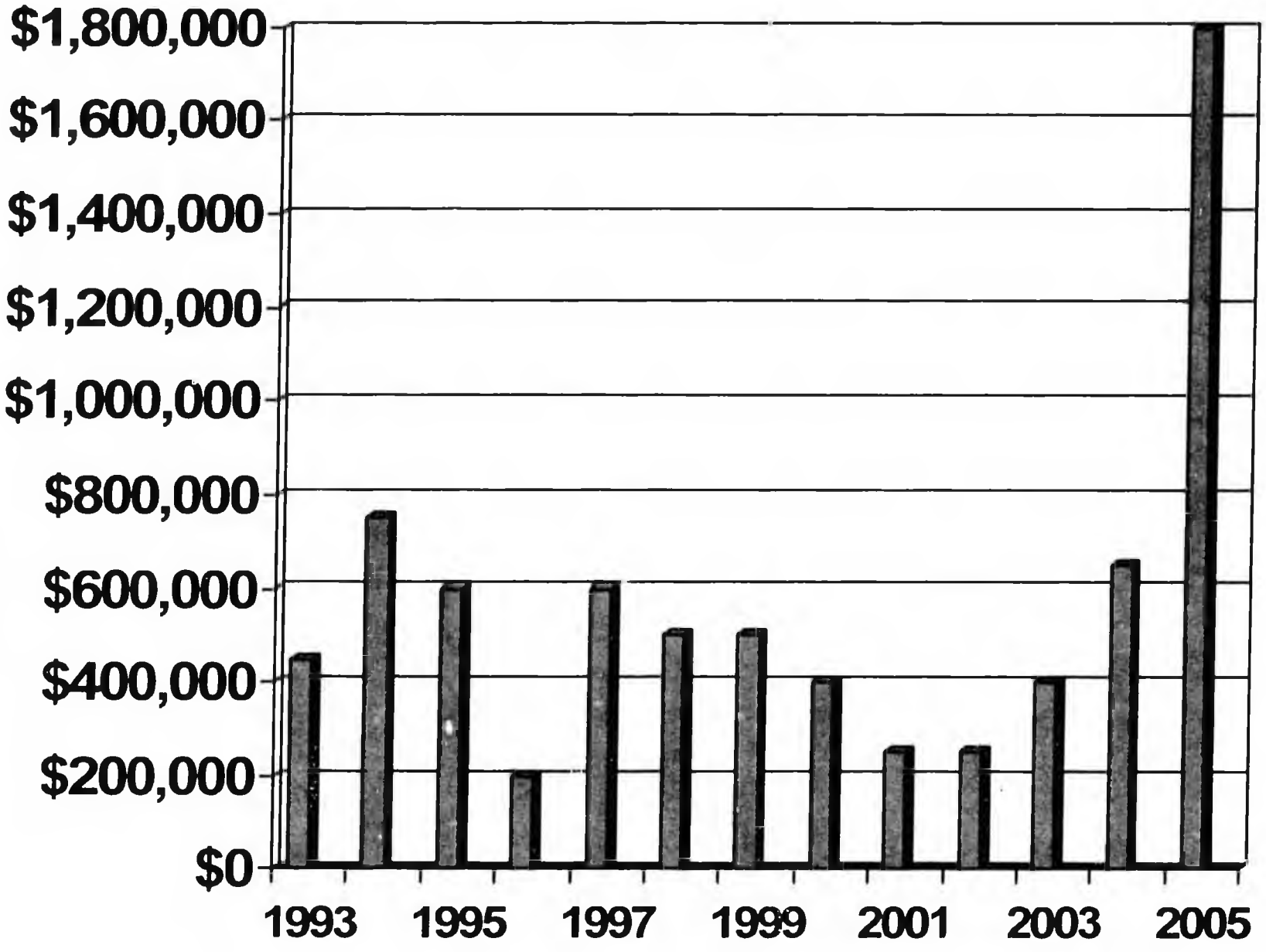
2004 & 2005 Alaska Exploration



Acreage of New Mining Claims Staked Per Year



Historic Funding of Program



Benefits of Stable Funding

- **Ability to negotiate long-term contract**
- **Cost savings on mobilization /demob**
- **Increased coverage of geophysics and high-resolution geologic mapping on state land**
- **Understanding the state's resource base**