

Idaho Mining and Exploration, 2010

Virginia S. Gillerman
Earl H. Bennett

Staff Report 2011-1
November 2011

Idaho Geological Survey
Morrill Hall, Third Floor
University of Idaho
Moscow, Idaho 83844-3014

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public distribution. This publication may not
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INTRODUCTION

It was a very good year for Idaho's mining industry. Metal prices, particularly for silver and gold continued to rise to stellar heights in 2010, and operations rebounded along with much of the global economy – except for the domestic housing market. Optimism in the overall mining industry was reflected by an increase in exploration activity for metals and phosphate but a shortage of experienced and new personnel for the minerals industry operations. Unfortunately, employment and budget woes continued for other sectors of Idaho's economy, including government and education, as well as the construction industry. Figure 1 shows the location of Idaho's active major mining operations.

According to the Idaho Division of Financial Management, mining employment increased 4% in 2010, to 2,260 Idaho jobs, not including the mineral-related chemical plants. New mines and expansions are anticipated to add additional jobs through 2014 (DFM, Idaho Economic Forecast, January, 2011). Savvy investor's portfolios, as well as corporate earnings, were buoyed by gold prices which closed on December 31, 2010, over \$1400/troy ounce, after starting the year near \$1100 per troy ounce. Silver ended the year at approximately \$30.90 per troy ounce, almost double the \$16.85 per ounce cost on January 1. Copper, partly an indicator of global industrial development, rose from approximately \$3.30/pound to \$4.30/pound over the year. However, some of the price increase was due to a decline in the value of the U.S. dollar, and much of the demand was international. Of some interest to Idaho, prices in rare earth elements and oxides skyrocketed, particularly during the second half of 2010, due to increased demand and fears of supply restrictions from China, producer of 97% of the world's output. Idaho has

undeveloped rare earth deposits, and rare earths were mined historically from black sand placer deposits in central Idaho in the 1950's and earlier.

According to the U.S. Geological Survey, the value of non-fuel mineral production in Idaho in 2009 was \$ 935 million, a decrease from the 2008 record of \$ 1,066 million (Figure 2). Idaho was ranked 22nd of the 50 states, and the leading commodities by value were molybdenum concentrates, phosphate rock, silver, construction sand and gravel, and lead. Preliminary U.S. Geological Survey data for 2010 show Idaho's mineral production total rising again to over a billion dollars (about \$ 1,202 million), as expected with the year's sharp increase in metal prices (Figure 2). A major contributor was the record output from Custer County's Thompson Creek mine, which produced a whopping 25 million pounds of molybdenum in 2010, versus nearly 18 million pounds in 2009.

METAL MINING

COEUR D'ALENE AREA

With the high silver and base metal prices, the Coeur d'Alene District in northern Idaho was an especially busy place (Figure 1). Mining of the high grade quartz-siderite-sulfide veins hosted in Precambrian meta-sedimentary rocks has produced over 1.2 billion troy ounces (over 37,588 metric tons) of silver since 1884. Two underground mines operated during 2010, along with several exploration and development projects (Figure 3).

Hecla Mining Company, headquartered in the city of Coeur d'Alene west of the district, operated the Lucky Friday Mine near Mullen and had another great year. The mining crews achieved a record number of tons, extracting over 351,000 tons of ore from the Gold Hunter deposit at the Lucky Friday unit. Grades were down slightly as expected but the prices were up, thus total cash costs including the byproduct lead and zinc credits were down, near \$ 4 per ounce silver, a decrease from 2009. Silver production from the Lucky Friday was 3.36 million ounces, a slight decrease from 2009, with record base metal production of 21,619 tons of lead and 9,286 tons of zinc in 2010. Mining advanced on the pillar left between underhand stopes off the 4900 level and the upper stopes off the 5900 level.

Development work and construction preparation further advanced the Lucky Friday's #4 Shaft project, though a final decision had not yet been made by the Board of Directors. The #4 shaft would be an internal shaft, extending from the 4900 level to the 8800 level, to access the new, higher grade deep discoveries on the Gold Hunter vein system.

Estimated capital expenditures are approximately \$ 200 million with a completion date in 2014. Shaft construction began with pouring of the concrete sheave deck for the shaft and hoist foundations, and installation of hoist drums and needed off-shaft development workings (Figure 4). Engineering work for the centralized refrigeration system was completed during the fourth quarter. A total of \$ 50 million in expenditures had been made since the beginning to the project. Deep drilling over the past several years has delineated an ore shoot with increased grades (averaging close to 14 oz./ton silver) below the current mine workings and extending to depth.

U.S. Silver Corporation operated the Galena mine near Osburn in Shoshone County. Their 14,000-acre land package also includes the Coeur mine and Caladay property. 2010 production from the Galena mine totaled 2.275 million troy ounces of silver, 5.6 million pounds lead, and 1 million pounds of copper (Bull Bear Financial Report, March 2011). Mining focused on the Silver vein, the 220 vein, and the 175 vein. Output was down slightly due to a contractor fatality in June. Repair of the Galena shaft, a \$ 6 million project, was completed in March. By the fourth quarter, the increased production and grade were reducing unit costs. The Galena mill was processing the Ag-Cu ores, and the Coeur mill was processing Pb-Ag ore.

U.S. Silver had a very successful exploration drilling program in 2010 with 15,048 meters (49,374 feet) of diamond drilling in 2010. The work was continuing into 2011, focused especially on the 4000 and 5200 levels. Reserve additions from exploration exceeded the depletion from mining during the year. A number of 20+ oz./ton silver intercepts were reported, and three new veins discovered. DDH 40-212 intercepted 3.9 feet (1.19m) grading 91 opt (3133g/t) Ag and 2.52% Cu on the 127 vein in the central target area.

The famous Sunshine mine remained closed during the year, following the 2008 mine closure and subsequent bankruptcy proceedings of Sterling Mining Company. In May, Silver Opportunity Partners LLC announced its acquisition of all assets of Sterling after their bid of \$ 24 million was approved by the U.S. Bankruptcy Court. Silver Opportunity is part of the Electrum Group of companies, which is owned by Thomas Kaplan and includes other global mining interests. Over 25 people remained working at the site, and the plan was to take time for a comprehensive study of the mine's assets, infrastructure and resources.

New Jersey Mining operated two small, underground precious metal mines in northern Idaho and a mill in Kellogg. A block of oxidized silver-gold ore was developed at the newly permitted Silver Strand mine east of Coeur d'Alene. However, metallurgical tests revealed difficulties with silver recovery. In June, drilling at their Golden Chest mine at

Murray hit high grade material, and the intercept diverted attention from the Silver Strand to the Golden Chest. Hole 10-01 intersected a length of 0.27 m (11 inches) of 864 g/t (25 oz./ton) gold in a banded quartz vein at shallow depth along the Idaho fault zone (Figure 5). Attempts to reach the area from existing workings were thwarted by bad ground, though additional veins were found. More work was planned, and in December, the company signed a joint venture agreement with Marathon Gold Corporation, a Canadian junior, to form a 50-50 partnership, Golden Chest LLC, to explore the mine. New Jersey remained the operator and a 10,000-meter drilling program was being planned for 2011.

The Environmental Protection Agency (EPA) released its proposed plan for expansion of the Upper Coeur d'Alene River basin cleanup. The 190-page long document called for a 50-90 year program at a projected cost of \$ 1.34 billion. The comment period was extended to November 23, 2010, after considerable public opposition to the plan by industry groups and local residents. Many comments requested that the EPA follow the advice of the National Academy of Sciences and break the site into several more manageable projects that could be completed much quicker and at far less cost.

OTHER METAL MINING

Thompson Creek Metals Company announced a record-breaking year. Idaho's large, open pit Thompson Creek mine in Custer County contributed a huge production total of 25,071,000 million pounds of molybdenum (calculated as molybdenum oxide and HPM) during 2010. This increase from the more typical 18 million pounds extracted in 2009 was due to a combination of optimal mining operations and planned mine sequencing that accessed significantly higher grade Phase 6 ore in the pit bottom (Figure 6). Prices for the year averaged in the \$ 15 to \$16 per pound range. The mine had approximately 375 employees. Thompson Creek was also working on a Phase 8 expansion project which would deepen the pit and require an EIS and permits to raise the height of the tailings dam. The new NI 43-101 reserve (about 150 million metric tons at 0.084% Mo) extends mine life to 2025. Exploration drilling was continuing.

PHOSPHATE MINING

Agricultural markets were favorable in 2010, and Idaho's phosphate mines and plants operated at full capacity as they transformed phosphate rock into intermediate and retail chemical products. Three open pit mines produce feedstock for southeast Idaho's two phosphoric acid fertilizer plants, Simplot's Don plant at Pocatello and Agrium's plant at Conda, and Monsanto's elemental phosphorus plant at Soda Springs. Most of the Idaho phosphate-based fertilizer is used regionally. Monsanto's elemental phosphorus is used

primarily to manufacture its trademark Roundup herbicide. The three mines are all located in Caribou County and mine the apatite-rich Meade Peak member of the Permian Phosphoria Formation, a organic-rich black shale, with local concentrations of P, C, V, U, Mo, and Se. Each plant has about 400 workers, and the mines each require another 100 or so employees, providing a large percentage of the employment and economic base for the local communities.

Monsanto was mining Phases 4 through 6 at their South Rasmussen mine and moved over 9 million tons of ore and waste. Ore was trucked to the elemental phosphorus plant, the only one in the western hemisphere. The company changed its marketing strategy to compete with cheap imports of off-brand herbicides, and the plant operated at capacity. The final Environmental Impact Statement (EIS) for Monsanto's proposed Blackfoot Bridge mine was being reviewed in Washington, DC, and scheduled for release in early 2011. A key feature of the plan was the extensive use of Geosynthetic Clay Liner Laminate (GCLL) cover system to reduce water infiltration and selenium leaching from waste dumps. The site is particularly sensitive due to its location a few hundred feet south of the Blackfoot River, which has been impacted by historic selenium releases. Monsanto was also conducting exploration drilling at their Caldwell Canyon leases.

J.R. Simplot Company continued mining on Panels B and F at their Smoky Canyon mine near the Wyoming border. Ore is crushed and converted to a slurry that goes by 87-mile long pipeline to the plant in Pocatello. The mine set a new record for pumping slurry, over 1.8 million short tons, and moved a yearly record of 25 million tons of material, largely in preparation for mining the new Panels F and G. Panel E was being backfilled with waste rock from Panel F. The mine had a very safe year while raising employment by 20%, and the Don fertilizer plant was sold out of production due to the excellent markets.

On December 23, 2010, the Smoky Canyon crews got a welcome holiday gift when the U.S. 9th Circuit Court of Appeals upheld the Idaho court's opinion that permitting for the Smoky Canyon expansion (Panels F and G) had properly followed the NEPA process, and that mining could continue. During the year, Simplot tested several cover designs using Dinwoody Formation shale as part of a clay cap to reduce infiltration. Test plots monitored with borehole permeameters that measured hydraulic conductivity, lysimeters, and other tools provided experimental data (Figure 7). The company also planted over 20,000 trees and shrubs and used a newly approved seed mix as part of their reclamation program.

Agrium was mining Panel D at their Dry Valley mine, while backfilling Panels C and D. Operations at Dry Valley were planned to end in mid-2011. The company was preparing

to move production to their North Rasmussen Ridge mine. Ore goes by rail to the phosphoric acid plant at Conda. The company was drilled about 17 core and RC holes at the Rasmussen Valley property. A mine plan for the new Rasmussen Valley mine was submitted to the agencies in March, 2010, to start the NEPA process.

Agrium's subsidiary, Nu-West Industries, Inc., was nearing completion on a remedial clean-up of the old Central Farmer's Georgetown Canyon fertilizer facility in far southeastern Idaho. The plant had operated in the 1950's and 1960's era. The remedial action included demolition of the old structures, water investigations, and removal or capping of contaminated material, along with stream channel relocation and restoration (Figure 8). The company gave a presentation on the Georgetown Canyon project in a session on phosphate mining at the annual Geological Society of America meeting in November.

Stonegate Agricom Ltd., a Toronto-based company, is a new player on the Idaho scene. They acquired the Paris Hills phosphate project in Bear Lake County near Paris, Idaho, from Rocky Mountain Resources Corporation. Two zones in the Phosphoria were drilled in 2008 by Rocky Mountain and earlier by ESI in the 1970's. The two zones on the 2,114-acre property have an inferred resource of 120 million tons at over 23% P₂O₅ and host a vanadium resource as well. The historic underground mines first operated in 1903, mining the horizontal and overturned limbs of the Paris syncline. Stonegate started a sizeable drilling program in the fall with plans for 24 RC holes and coring the mineralized intervals of at least 10. Initial results announced in January 2011 confirmed the previous high grade assays and noted plans for additional drilling.

OTHER INDUSTRIAL MINERALS

The aggregate industry continued to be negatively affected by the economic downturn. The only bright spots were highway construction projects, such as improvements on I-84 in the Treasure Valley and the Sandpoint bypass on US-95 in northern Idaho. Figure 9 shows the location of Idaho's other industrial mineral operations.

Emerald Creek Garnet, a subsidiary of WGI Heavy Minerals reported that business in 2010 was similar to that in 2009, with more improvement in the later portion of the year. One washing plant was operating at Carpenter Creek and the company conducted some reclamation and exploration activities. However, the tourist garnet diggings, operated seasonally by the U.S. Forest Service, were crowded during the summer with about 5,000 visitors.

Production was reportedly down at most of Idaho's building stone quarries, including L and W Stone's Three Rivers quarry near Clayton and the Oakley Stone quarries in Cassia County. In Ada County, historic Table Rock Sandstone was being used for the new business building at Boise State University and a custom stone castle residence in east Boise (Figure 10). Gerhard Borbonus Landscaping quarried the material and cut the silicified sandstone in its fabrication plant in Boise. In Idaho Falls, the Orchard family regained ownership of the travertine company and changed the name back to Idaho Travertine. Their quarry is located 40 miles east of Idaho Falls, and the finishing facility is equipped with large saws for custom cutting of its Continental Bluff Travertine and other stones.

Hess Pumice operates the Wrights Creek pit and a processing plant at Malad in Oneida County. Except for the housing construction related segments, business was improving in 2010 after the recession. Hess' ultrafine, pure pumice is used to prepare computer boards, to make paint fillers, to stonewash clothes, and for many other applications. Hess also owns U.S. Grout which makes a special ultrafine cement grout. The grout was being used to reduce water infiltration in South American gold mines and at the Lake Mead dam intake. Idaho Minerals, another Hess-owned company, saw its perlite sales up slightly.

Bear River Zeolite, a subsidiary of Montana-headquartered U.S. Antimony Corporation, reported a 30% increase in production at its clinoptilolite zeolite operation near Preston in Franklin County. The company added a vertical shaft impactor crusher to the facility and was aggressively seeking new markets. One shipment was to the U.S. Department of Energy to utilize in New York State for a demonstration project on recovering radioactive strontium 90. Zeolites have a large variety of uses in the filtration industry due to their high cation-exchange capacity, but they are also widely used in animal feed, agriculture and gardening, and the oil and gas.

ENERGY

U.S. Geothermal, a Boise-based company, operated a 10 MW binary geothermal power plant at its Raft River site. The company was participating in a DOE-sponsored project to evaluate the site and reservoir host rock for an EGS (enhanced geothermal system) thermal stimulation experiment, lead by a team from EGI, part of the University of Utah.

Bridge Resources Corporation, in a joint venture with Paramax Resources Ltd., drilled 11 holes to explore for natural gas near the town of New Plymouth in Payette County. The target was potential reservoir sands and organic-rich shaly source beds within the Tertiary basin fill along the northern margin of the western Snake River Plain graben, northwest

of Boise. Bridge announced potentially commercial quantities of natural gas in two areas, named the Hamilton (5 gas wells) and Willow (2 gas condensate) well fields, with a pipeline a few miles away (Figure 11). Announced, estimated resources are in the range of at least 68 to 100 recoverable BCFE (billion cubic feet of gas equivalent), though the company reported that mini-fracking (near well-bore stimulation) would be required on four of the seven productive holes. The company also conducted seismic testing. Bridge reported over \$ 20 million invested in the project, principally in drilling and lease costs.

EXPLORATION

Figure 12 shows the location of the numerous mineral exploration projects ongoing in Idaho in 2010. Activity was spurred by record metal prices and strong demand, particularly from developing nations overseas. Precious metals were also sought as hard assets in this time of political and financial uncertainty. The number of 2010 projects, along with the money spent on them, increased over 2009.

In the Helmar-Bovill area, i-minerals continued work on their multi-commodity industrial minerals project in Latah County. The company drilled 10 additional holes to test the clay resource in weathered granodiorite at the WBL area, and reported a favorable preliminary economic assessment done by SRK consultants. SRK also completed a pre-feasibility study, with positive economics, of the Kelly's Basin feldspar-quartz deposit. The i-minerals project is largely on state leases, and the company continued to work on permitting and public relations. A commercial operation could provide 100 long-term jobs to the region.

With silver and base metal prices up, there was considerable interest and activity in Idaho's famous Silver Valley, *a.k.a.* the Coeur d'Alene District in Shoshone County. Hecla Mining Company, headquartered in Coeur d'Alene, Idaho, has been digitally compiling in 3-D the vast amount of historic mine data available for their 25-square mile land position within the district. In 2010, surface drilling and field work started testing the numerous targets delineated from this assessment (Figure 13). Three diamond core drills worked all year drilling over 34,000 feet, and over 2000 soil samples were collected in a grid over parts of the property. One portal was reopened to access upper workings of the Noonday vein near the Star-Morning mine, where drilling and underground sampling delineated a modest (approximately 500,000 ton) resource of high grade, zinc-rich (over 10% Zn) material with substantial silver and lead. The area was last mined by Star-Phoenix in 1990.

Extending the Gold Hunter vein system to the east and west was another Hecla priority project. From the Lucky Friday mine northwest towards the Star Mine, the Gold Hunter 30 vein may correspond to the As You Like vein. Intersections of favorable stratigraphy containing brittle rocks and vein structures were targeted, and the exploration utilized modern analytical techniques and new geologic models. Drilling continued to intersect good grade mineralization deep on the multiple Gold Hunter veins enabling expansion of the 2009 resource boundary. Hecla reported spending approximately \$ 5 million on Silver Valley and Lucky Friday exploration in 2010 and expected to reach a similar sum in 2011 on the district exploration, in addition to the # 4 shaft project.

Farther west, just across Big Creek from the Sunshine mine, United Mine Group (UMG) started driving the Countess decline to access the drill-indicated resource on the Alhambra and South veins at the Crescent mine (Figures 3, 14). UMG obtained an 80% buy-in interest from SNS Silver to conduct the exploration and development activities. They also signed an agreement with New Jersey Mining Company to use and expand the Kellogg mill to 350-tpd to treat the Crescent ore. The Countess portal is on the northwest side of the ridge and is planned to be 2,200 feet long, intersect both vein structures and eventually connect by a raise to an extension of the Hooper Tunnel on a lower level. In 2010, UMG spent \$ 3.7 million on the project, according to the company website. SRK Consulting prepared a NI 43-101 indicated and inferred resource of approximately 10 million ounces of silver at grades near 19 oz./ton. In October, 2010, UMG added an additional 556 acres of claims to the Crescent property, including areas to the west towards the Bunker Hill mine.

Azteca Gold Corporation drilled DDH-009 to a depth of 6,760 feet on their Two Mile Gulch project near Osburn. The hole was designed to test a possible anticlinal hinge zone and other targets intersected in DDH-005 and DDH-006 drilled previously. Results were pending at year's end.

In the Murray area of Shoshone County, joint venture partners, Newmont Gold and New Jersey Mining Company, have been exploring for gold on a large block of ground at the Toboggan project. 2010 was the third year of joint effort on the 8,000-acre land position, and Newmont spent nearly \$ 2 million on geologic mapping, soil and rock sampling, geophysics, and drilling. In 2010, Newmont completed eight core holes totaling 914 meters and seven RC holes totaling 941 meters; drilling was targeted principally at the Gold Butte and Mineral Ridge prospects. A 2009 core hole at Gold Butte intersected 2.52 grams per tonne (gpt) gold over 4 meters in a mineralized structure. Holes at Gold Butte, Mineral Ridge and near Toboggan Creek hit anomalous gold. Several targets remained untested, in part as the necessary permits were not received until the end of the field season. Newmont decided in early 2011 not to renew the joint venture and quit claimed

the entire land package, transferring all the surface and drill data to New Jersey Mining. New Jersey also retains the Niagara copper-silver prospect.

Premium Exploration, Inc., continued with an aggressive program of geophysics and drilling along the Orogrande Shear Zone and the Friday/Petsite property west of Elk City in Idaho County. Gold mining in the region dates from the early 1900's. Modern exploration of the area includes work by Bema Gold in the mid-1980's to delineate and permit a small, near-surface gold reserve at Buffalo Gulch on the north end of the Shear Zone. From 1996-1999, Cyprus Gold (and subsequently Kinross Gold) conducted an extensive exploration project (over 100 RC holes and 23 core holes) at the Friday-Petsite property, but returned the project to Idaho Consolidated Metals Corporation (ICMC). Following agreements with Clearwater Mining, who had acquired the property, Premium Exploration, Inc., commenced work in 2009 along the length of the Orogrande Shear Zone, and conducted airborne and ground geophysical surveys and soil geochemistry to map the structure. Geophysics, especially conductivity, was used to map the location of the shear zone, its interpreted bounding faults (the Friday zone on the east and the Monday Zone to the west), and subsidiary structures (Figure 15). 2010 exploration focused on the Friday-Petsite deposit and included 20 core holes totaling 8,442 meters, 60-kilometers of ground magnetic lines, and a 3,707-kilometer grid of airborne magnetics and EM measurements. Drill targets included structural intersections and step outs of known mineralization. Premium reported numerous intercepts of gold in the range of 0.5 gpt to 3.0 gpt along the shear, particularly in the Friday-Petsite deposit. Drilling and preparation of a new 43-101 compliant resource was continuing into 2011. Tragically, geologist Wilf Struck, a key advocate of the project, died in a traffic accident in Canada during the summer.

Formation Capital Corporation, U.S., and its parent company, Formation Metals, Inc., were seeking financing for construction of the Idaho Cobalt Project, a newly permitted underground cobalt-copper-gold mine located in the Blackbird Mining District of Lemhi County. The State of Idaho authorized issuance of \$ 77.7 million in Federal Stimulus Program Recovery bonds in Lemhi County and Industrial Development bonds in Shoshone County, where the hydrometallurgical facility will be located. Formation engaged BNP Paribas Securities Corp. to arrange the debt financing. Capital cost of the project is estimated at approximately \$ 140 million. Formation also drilled six holes, totaling 5728 feet to the south of the known Ram deposit. Drilling extended the economic mineralization for 390 feet along strike and 200 feet down dip. One hole, DDH-R10-05 intersected a 5.4 foot high grade intercept of 1.267% cobalt, 3.57% copper, and 0.289 oz./ton gold (9.0 gpt), apparently along a shear cutting through the main mineralized horizon. Material from the drilling was being used to evaluate rare earth element

concentrations and metallurgy in the ore zones. Preliminary site clearing and equipment procurement was underway.

In eastern Idaho, Otis Capital had another large program at the Kilgore volcanic-hosted, epithermal deposit in Clark County. Otis drilled 35 core holes totaling 6,657 meters (21,841 feet) for their 2010 program (Figure 16). Drilling was concentrated in the Mine Ridge (or Kilgore) deposit area, but five holes were located in the Dog Bone Ridge CSAMT anomaly and sinter target. Results were very favorable with most holes encountering gold mineralization and extending the length of the Mine Ridge zone which remains open in several directions. Hole 10OKC-220, for example, intersected 30.5 meters of 2.81 gpt Au, which included 9.1 meters of 8.65 gpt Au. Hole 10OKC-242, located within the CSAMT anomaly, intersected 9.14 m of 1.32 gpt Au in near-surface, argillized tuff below the sinter cap. In November, Otis Capital negotiated a purchase agreement with Bayswater Uranium Corporation to acquire 100% interest in the Kilgore property. Drilling and environmental baseline studies were planned for 2011.

In central Idaho, Midas Gold Inc., a private company, completed 44 diamond drill holes totaling 12,893 meters (over 42,000 feet) at the Golden Meadows project in Valley County (Figure 17). The program focused on resource definition and exploration for gold in the Hangar Flats and West End areas at the historic Stibnite-Yellow Pine Mining District, which also supplied tungsten and antimony during World War II. One highlighted hole of the summer was MGI-10-26 which reported 176.8 meters assaying 2.43 gpt gold, including a 7.6 meter section of 7 gpt gold. Midas also conducted an IP survey and surface trenching and sampling, as well as compilation and interpretation of the historic mine data. In early 2011, the updated 43-101 compliant resource, prepared by SRK Consulting, for the Hangar Flats and West End deposits included 1.7 million ounces of gold in Indicated Resource, and 1.6 million ounces of gold in the Inferred Category. In December, Vista Gold, owner of the Yellow Pine gold project, reported that Vista and Midas had signed a letter of intent for consolidation of property positions in the district.

Molybdenum was the target at the Cumo property of Mosquito Consolidated Gold Mines Limited, located in southwest Idaho. The company was awaiting completion of a Boise National Forest Environmental Assessment (EA) for proposed exploration, including as many as 13 miles of temporary roads and 200 drillholes. The EA application aroused controversy among the public and opposition from several environmental groups; however many in rural Boise County welcome the jobs that a future project would bring. Mosquito purchased a small area of patented ground and drilled three diamond drill holes, totaling 4000 feet, on the Baby claim group. The drilling intersected a near surface molybdenum zone, as well as a gold-silver vein similar to those in the historic mines. The

area lies to the southwest of and across a fault from the main mineralized zone. Mosquito has been working on the huge porphyry molybdenum-copper deposit for several years.

Atlanta Gold Inc. has also met public opposition on its plans for development of the gold-silver resource at the historic Atlanta townsite in Elmore County. In response, the company shifted its focus from a large open pit to more selective extraction of higher grade material from underground mining and small open pits. Ore would be processed conventionally by gravity and flotation to produce gold and a precious metal-bearing sulfide concentrate – thus avoiding the use of cyanide. Arsenic, a contentious issue from the historic mining, is present in the mineral arsenopyrite, which would report to the sulfide concentrate and would be processed out-of-state. The company drilled 48 core holes totaling approximately 11,910 meters (39,075 feet) in the 2010 season. Results from several deep drill holes suggested that the shear zone splits but continues at depth; two intermediate depth holes intersected intervals of 8 to 37.9 gpt Au over true widths of 0.8 meters to 4.6 meters. An updated NI 43-101 resource estimate done by P&E Mining Consultants listed 450,600 ounces of gold in the Indicated category and an additional 284,600 ounces Inferred resource, including both open pit and underground material; average grade for both categories was over 4.5 gpt gold. A large drill program was underway in 2011.

Thunder Mountain Gold drilled seven reverse circulation holes, totaling 5,100 feet, on two targets at their South Mountain property in Owyhee County (Figure 17). Most of the project lies on private ground. Five of the holes drilled the newly discovered intrusive breccia zone, and 97% of the samples contained anomalous gold with the highest value intercept being 5 feet of 1.2 gpt. The other two holes tested the massive replacement and skarn-related base metal mineralization found in the historic mine workings on the Laxey and Sonneman levels. Both holes intersected 25-30 feet of high grade, zinc- and silver-rich polymetallic ores) at levels 120 feet and 415 feet below the historic tunnels. Late in the year, Thunder Mountain also optioned the CAS claims in the Iron Creek Mining District of Lemhi County. The CAS claims host cobalt and gold mineralization along the southeast extension of the Idaho Cobalt Belt. Previous work there includes geophysics and minor drilling.

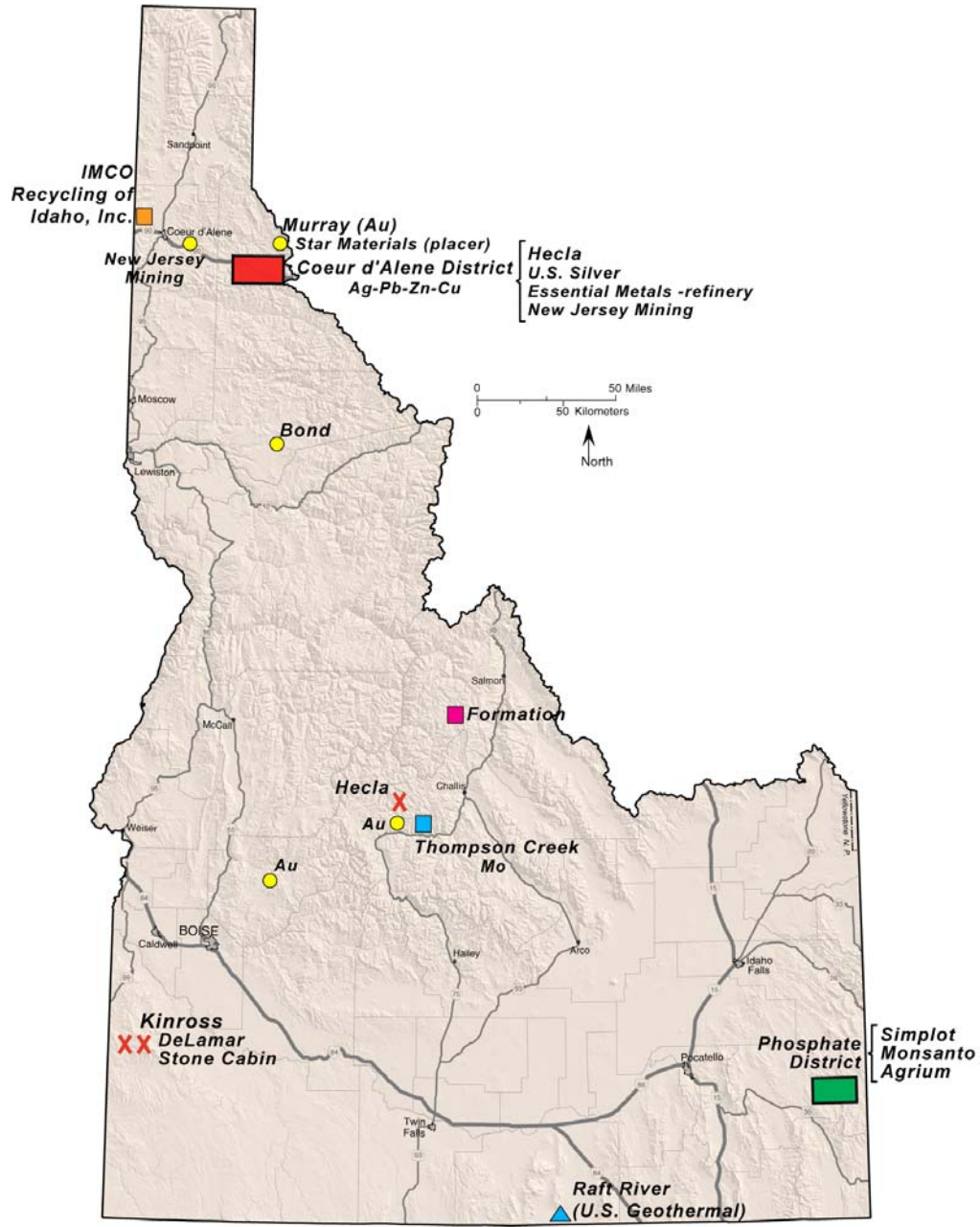
A number of additional properties in the state had lesser amounts of exploration activity on them. Though some grass roots efforts were reported, many companies struggled to obtain adequate funding. Agnico-Eagle drilled two projects. Silver Falcon built a mill in Murphy to process old mine dumps on War Eagle Mountain in Owyhee County. Western Pacific was exploring the Blackpine mine area in Cassia County, where Pegasus mined a disseminated, Carlin-type gold deposit in the 1990s. U.S. Rare Earths was exploring in the Lemhi Pass, Diamond Creek, and North Fork areas of Lemhi County. Elissa

Resources acquired the Sage Creek property in Lemhi County. Shoshone Silver was rehabilitating the Rescue mine and mill near Warren. Velocity Minerals Ltd. staked claims and did geochemical sampling at the Homestake mine on the south end of the Orogrande Shear Zone, contiguous to Premium's project.

STATE ACTIVITIES

The Mines and Minerals page of the Idaho Geological Survey website, www.idahogeology.org, now provides access to an enhanced, map-based search routine for the Mines and Prospects database which includes over 8,000 properties in Idaho. Searches can be conducted by geographic area or commodity. An indexing of the over 2,600 mineral property files in the Survey's archive is also indicated online, and those records can be scanned if needed. Likewise there is a new online, digital index of the historic oil and gas wells (to 1988) available. A new summary publication, GeoNote 44, *Rare Earth Elements and Other Critical Minerals in Idaho*, is also available for download. New geologic mapping of Idaho quadrangles is available on the website in downloadable PDF format.

FIGURES



ACTIVE MINES AND PLANTS 2010

Figure 1. Major mining areas in Idaho. X indicates closed operation.

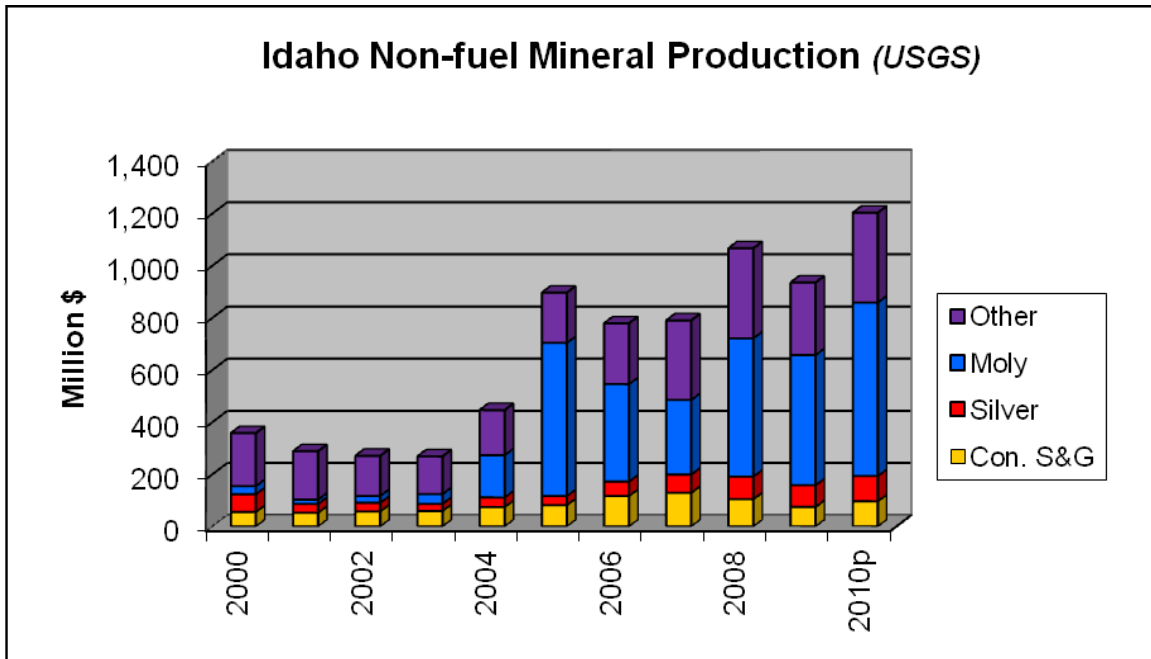


Figure 2a. Yearly Non-fuel mineral production in Idaho.

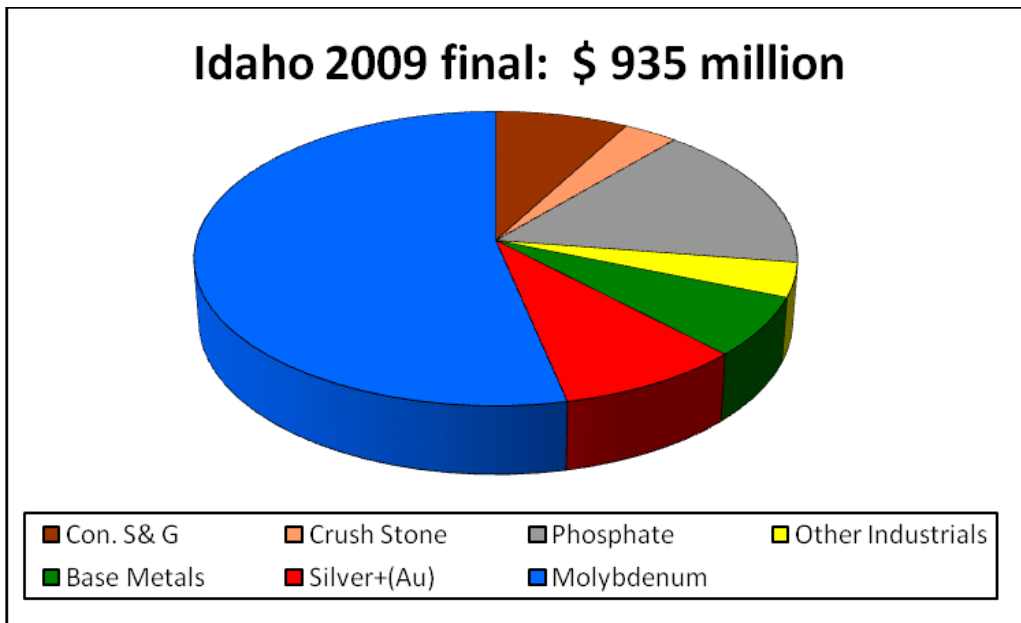


Figure 2b. Commodity value distribution for Idaho mineral industry, 2009.

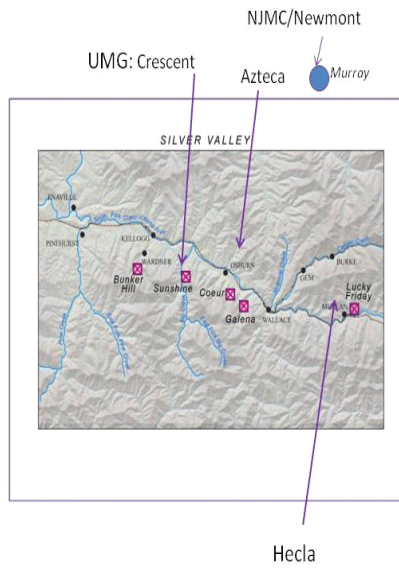


Figure 3. Mines and exploration projects in Silver Valley, Shoshone County.



Figure 4. Installing hoist drum halves, # 4 shaft, Lucky Friday mine.



Figure 5. High grade gold intercept, Golden Chest mine at Murray.

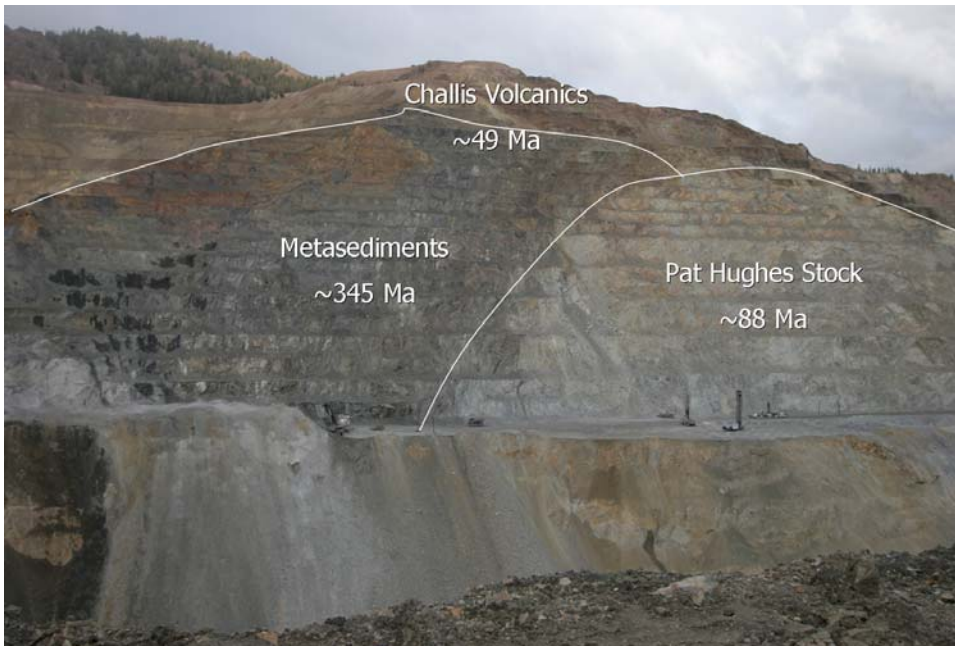


Figure 6. Thompson Creek mine high wall with geology indicated.

Simplot: Reclamation

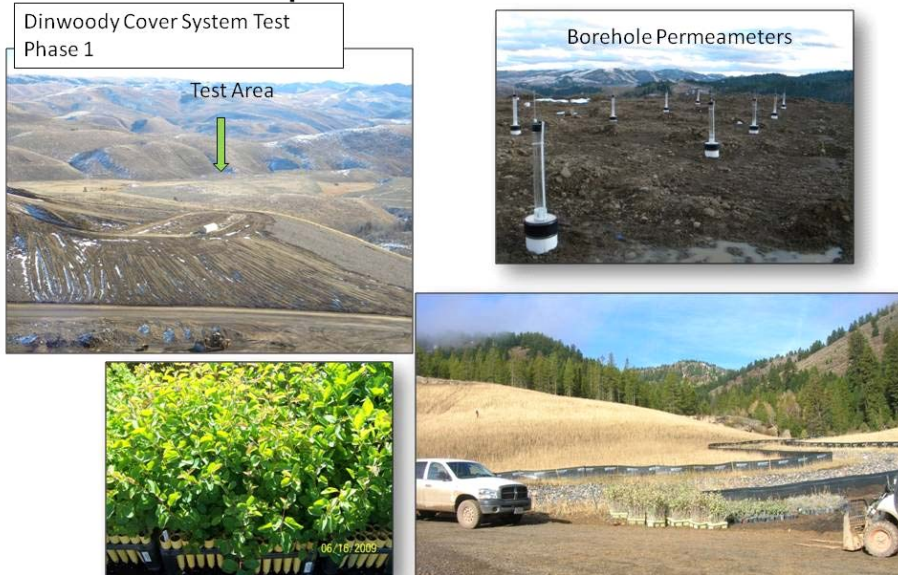
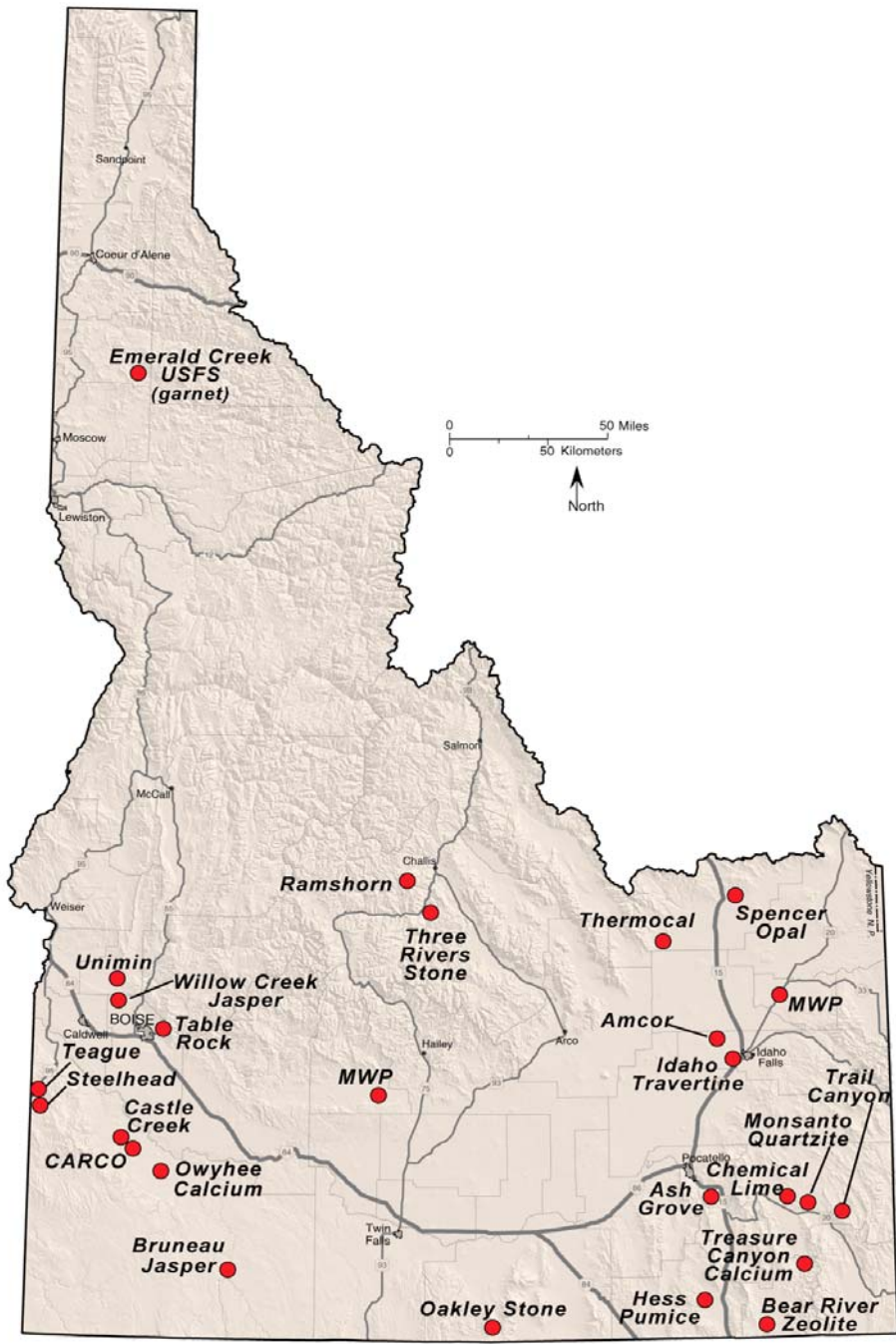


Figure 7. Reclamation and test plots, Smoky Canyon phosphate mine.

Georgetown Canyon Phase II – 2010 – Stream Channel



Figure 8. Agrium/Nuwest's Georgetown Canyon Remediation project.



INDUSTRIALS 2010

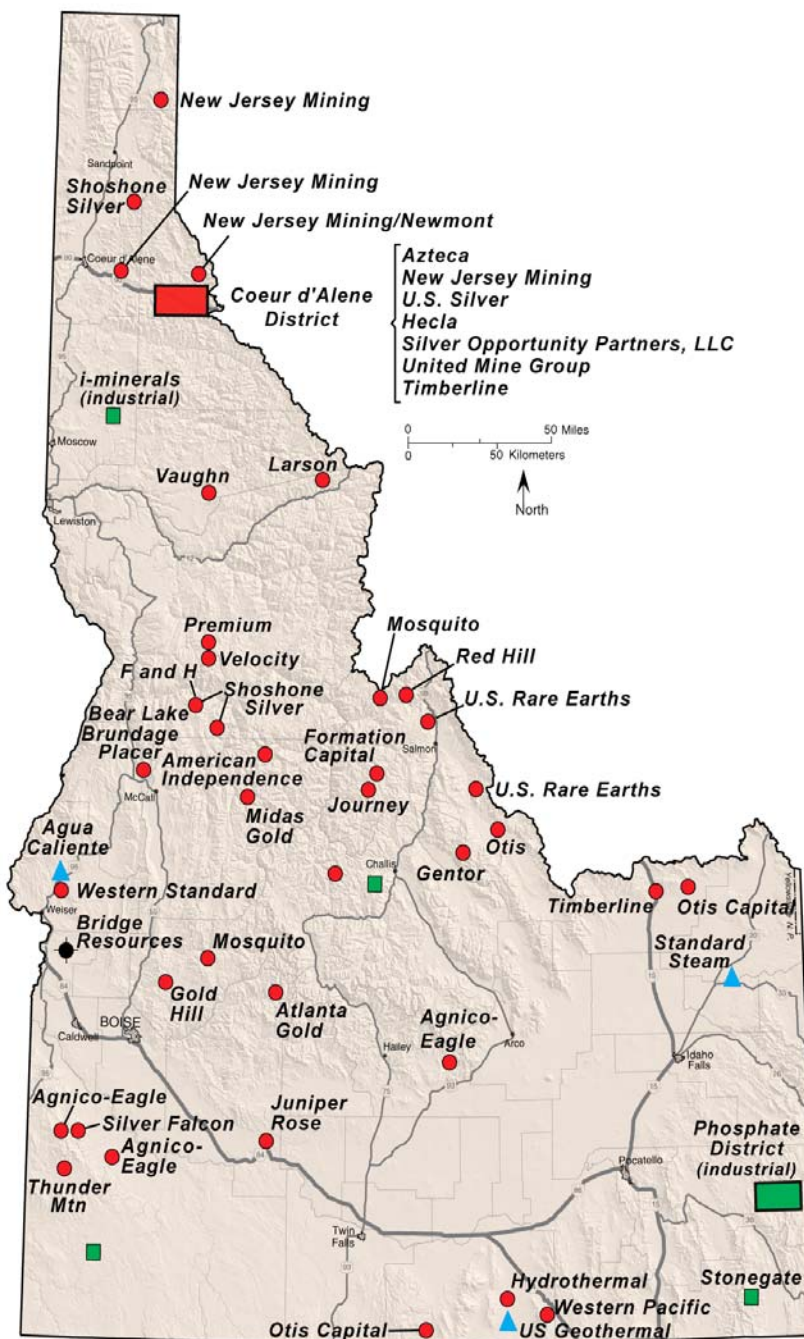
Figure 9. Industrial mineral producers (excluding phosphate).



Figure 10. Table Rock sandstone used in residential “castle” in Boise.



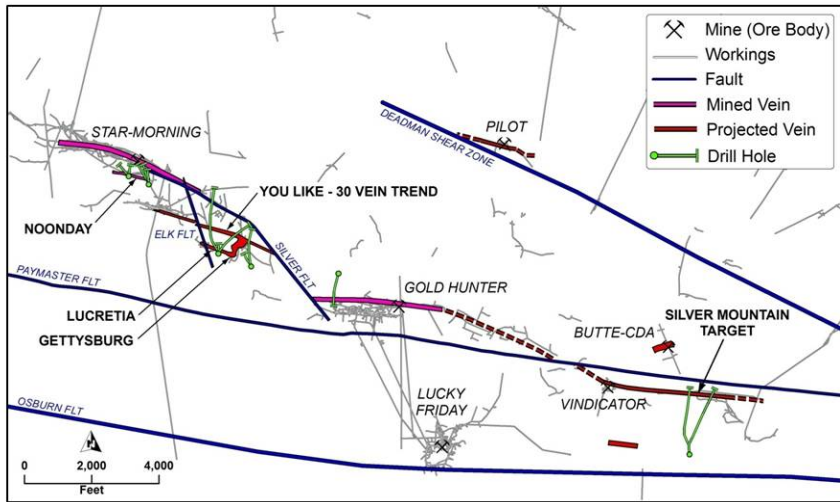
Figure 11. Bridge Resources' Island Cap well, April, 2010, near New Plymouth.



EXPLORATION 2010

Figure 12. Mineral exploration in Idaho, 2010.

Hecla Silver Valley Drilling - 2010



20 holes = 34K feet; 2,000 soil samples; Upper Grouse 700 portal reopened.

Figure 13. Hecla's Silver Valley exploration areas, 2010.



Figure 14. Portal of the Countess Decline, Crescent mine.

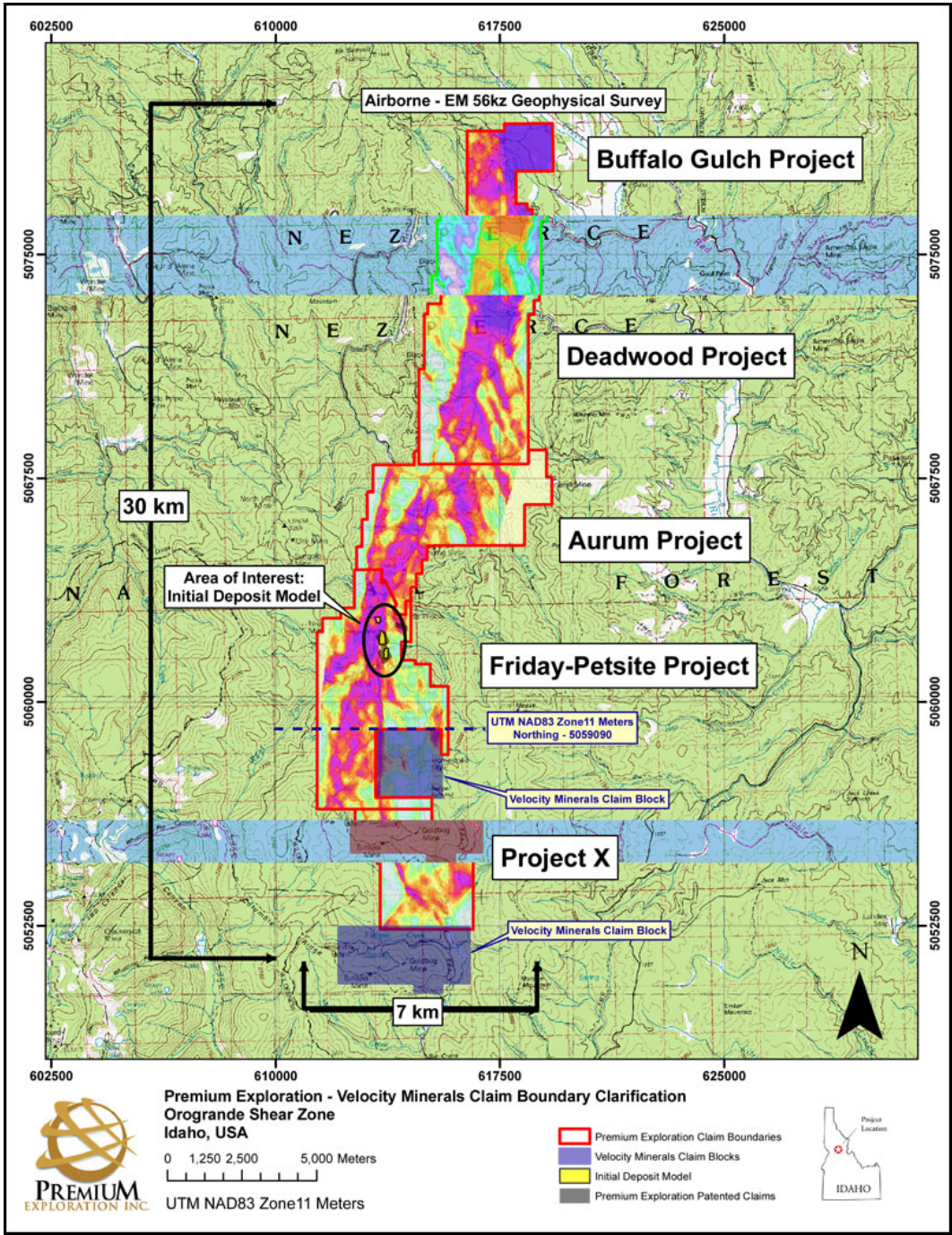


Figure 15. Premium Exploration’s map of target areas and airborne EM anomalies along the Orogrande Shear Zone.



Figure 16. Epithermal veins and breccias in core, Otis Capital's Kilgore project.



Figure 17. Helicopter-supported drilling, Midas Gold's Golden Meadows project.



Figure 18. Drilling at Thunder Mountain Gold's project on South Mountain.