THE STATE of ALASKA
GOVERNOR BILL WALKER

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Inspection Date: February 8, 2017
Weather: Cloudy, light snow showers at times, upper 20's F
Time of Inspection: 9:30 am to 2:30 pm
Operator Contact: Kevin Eppers – Coeur Alaska
Agency Personnel: David Wilfong – ADNR; Richard Dudek, Edward Gazzetti - USFS
Inspection Objectives: General Inspection

This report covers the February 8, 2016 inspection of the Kensington Gold Mine. Transportation to and from the mine was provided by a United States Forest Service (USFS) chartered DeHavilland Beaver floatplane operated by Ward Air. The inspection team (inspectors or team) consisted of David Wilfong – Alaska Department of Natural Resources (ADNR), Richard Dudek and Eddie Gazzetti – (USFS). The team was accompanied for the duration of the inspection by Kevin Eppers (Kevin) from Coeur Alaska's (Coeur) Environmental Department.


Figure 1 The diesel powered Jeeps are replacing the old Dodge pickups.

Kevin met the team at the Marine Terminal in one of Coeur's new Jeep style vehicles. The Jeeps are replacing the old Dodge pickups that are well worn. The Jeeps have had diesel engines retrofitted into them as very little gasoline is kept on the mine site (5-10 gallons for chainsaws and other small power tools). The team traveled to the Camp area where Personal Protective Equipment (PPE) was donned, and then traveled to the Mill Building where the extra equipment needed to travel underground was acquired. The team traveled through the main tunnel to the Comet side of the mine and stopped at the top of the Comet Waste Rock Pile.

Comet Waste Rock Pile

The Comet Waste Rock Pile continues to grow, and is far beyond its original design capacity. The approved Reclamation Plan states that the capacity of the Pile is 500,000 cubic yards. A survey of the waste rock was done on June 16, 2016, and it showed that approximately 1,140,000yds^3 had been placed. The volume of waste rock is not an environmental concern, but may cause problems when reclamation of the pile occurs. The waste rock pile's slopes are at the angle of repose, and it is still within the lease boundaries set by the USFS, but the

pile's footprint will grow when it is reclaimed due to flatter slopes. The Comet Water Treatment Plant (WTP) sits near the base of the pile, and Coeur has stated that the plant and ponds will need to be removed prior to reclamation of the waste rock pile. According to the Reclamation Plan, during and after closure, the WTP ponds are to be reclaimed as wetlands that will provide a receiving area for water draining from the closed mine. The Reclamation Plan should be updated to reflect the removal of the ponds.

Figure 2 The Comet WTP as viewed from the top of the waste rock pile.

Comet Water Treatment Plant

Figure 3 Pond 2 at the Comet WTP.

The team traveled down to the WTP at the base of the pile and walked over to the ponds. Mine water was flowing into Pond 1, and Pond 2 was sitting idle. Kevin stated that dewatering flows from the mine were averaging about 900 gallons per minute (gpm). 900 gpm is relatively low for the mine which can peak around 3000 gpm during the spring breakup, but flows typically drop off through the winter months when much of the water is locked up as snow and ice, and cannot infiltrate into the mine. The dredge that normally works the ponds had been pulled from the water and sat at the edge of Pond 2, wrapped in plastic. If water freezes in the dredge pump, it can expand and result in a broken pump case.

Sherman Creek

As the team traveled down to Sherman Creek, it passed by the dewatering bags filled with sediment dredged from the ponds. The bags were stacked high as the added weights helps the bottom bags to drain water from the pore space in the sediment, which can take several months. After walking down the trail,

Figure 4 Dewatering bags filled with sediment dredged from the ponds.

Figure 5White material covering rocks in Sherman Creek.

the team arrived at the partially frozen Sherman Creek. The white precipitate persists in the creek, and shows no signs of abating.

The white material has coated the rock intermittently for about 2 years. Coeur has used X-ray fluorescence and diffraction, spectrography, deoxyribonucleic acid (DNA) and other tests to determine the type and source of the white material. The testing shows that it is most likely bentonite. Bentonite is a type of clay that is used for many purposes including drilling mud, adsorbents and sealing agents. Because bentonite swells when it comes in contact with water, Coeur used it in the past as a drill hole sealant in an attempt to slow the infiltration of water into the mine. However, Coeur no longer uses bentonite in the mine and none is stored on site. Due to bentonite's very small grain size, it can be difficult to settle out in water treatment plants. Although the mine water is the source of the bentonite, at the time of the inspection, Coeur was meeting the water quality permit limits set by the Alaska Department of Environmental Conservation.

Mill Area

The team left Sherman Creek and drove back through the mine to the area near the Jualin Portal. Much work is expected to occur around the Mill in the upcoming construction season. According to Kevin, Coeur intends to replace the mine's generators with new units. The Kensington mine currently uses 7 gen-sets to provide the mine with its extensive power needs. Typically, 5 generators are running, one is down for maintenance, and one is on standby. Coeur has proposed to construct a new building to the north of the current Mill Building. The new building will have a concrete foundation, and will house four 2.5 megawatt generators. The current schematics show large V-20 two-stoke piston engines powering the generators, but Kevin stated that turbines may be used instead.

Figure 6 Secondary containment sump and lift station.

The old generators will likely be removed as they will make ingress and egress to the Jualin Portal difficult for haul trucks. On February 27, Coeur

submitted a mine plan for the latest discovery at the Kensington Mine, the Jualin Ore Body. The Jualin ore is of a higher grade than the current ore, and unlike the current ore, contains free gold.

The Assay Building may be repurposed as the above-ground maintenance shop, as the old shop near Pit 4 needs to be moved to accommodate the waste rock pile that has been proposed for the area. The secondary containment sump/lift station that froze a few weeks prior to the inspection and caused the unintentional release of diesel fuel into the Mill's water treatment system was free of ice. However, the Styrofoam board meant to insulate the sump was not properly placed.

Tailings Treatment Facility

The team drove south to the Tailings Treatment Facility (TTF), and followed the TTF access road to the base of the dam. The TTF was nearly completely covered with ice, but an area around the tailings deposit barge and mill water reclaim barge was open. The tailings slurry flowing from the pipe is warm enough to keep the area around the outlet free of ice, but the area around the reclaim barge needs to be aerated to keep ice from forming.

Figure 7 Emergency spillway and plunge pool.

The emergency spillway plunge pool was full of solid ice and no water was exfiltrating from the shotcrete that lines the spillway due to the cold weather. The shotcrete wall was covered with formations of ice that resembled frozen waterfalls, and it appeared that no water had flowed down the slope for at least several days. The Lower Slate Lake bypass outlet was flowing freely, and no major ice buildup was observed near the end of the pipe.

The team moved north to the barrel test area. The barrel tests were frozen, and no water has been collected for several months due to the cold weather. Water with high levels of metals continues to flow from the toe of the area where graphitic phyllite was accidentally dumped. The water was still flowing in the sub-freezing temperatures, likely due to impurities, and was collected in the nearby sump. The team traveled to the WTP and walked through. The plant and nearby containers were clean and tidy.

Figure 8 The area where water flows from the toe of the pile where acid-generating graphitic phyllite was dumped.

Fuel Tank Farm

Running short on time, the team moved to the newly commissioned tank farm. Seven 50,000 gallon tanks are installed above the Marine Facility's laydown pad, and a fill pipe runs between the tanks and a stand-pipe at the bottom of the hill. The tank farm uses state of the industry components and replaces the old system of using

ISO Containers to transfer fuel. A fuel truck was being filled at the time we arrived, and we took a moment to watch the process. The truck pulls into a concrete secondary containment filling area which ensures that no fuel is released into the environment in the event of a leak or spill. The driver connects a ground cable and wire harness from the pump shack to the truck, and attaches a hard line which carries the fuel. When the truck's tank is full, the system automatically shuts off and drains the fuel pipe. When the pipe was disconnected, not a drop of fuel spilled into the secondary containment. The entire process was very easy and efficient.

Figure 9 A fuel truck being filled at the tank farm.

The team traveled the short distance to the Marine Terminal, and waited a few minutes for the floatplane to arrive and took the 30-minute flight back to the Juneau Airport. The ADNR Mining Section would like to thank the USFS for providing transportation to and from the mine site, and Kevin Eppers for providing a safe and informative inspection at the Kensington Gold Mine.


Figure 10 View of Lynn Canal from the top of the Comet Waste Rock Pile.