

Yukon placer mining 2020 development and exploration overview

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Introduction

The COVID-19 pandemic and associated economic recession has had a profound impact on Canada and the world. In Yukon, the tourism industry nearly vanished overnight as flights and RV traffic were reduced to a trickle. Fortunately, gold mining was given an essential service “green light” to continue, amid strict protocols to control the spread of the virus. The industry responded with an incredible year of production, spurred on by high gold prices and low fuel costs. This scenario, where gold mining provided a safe haven and economic opportunity during global hard times, has played out before in Canadian history. The great depression of the late 1800s contributed significantly to interest in the Klondike Gold Rush, the dirty 1930s saw a resurgence in placer gold mining in Yukon, and similarly, the recession of the early 1980s kick started the modern era of placer gold mining in the territory. The story of the 2020 pandemic is no different, highlighting the value of economic diversification and ability of a remote northern industry to contribute new wealth to a nation when it is needed most.

Climate for mining

Warm early season conditions across much of Yukon offset initial delays associated with navigating the pandemic. The average high temperature in Dawson for the month of May was 18°C. Temperatures stayed seasonal until abruptly ending on October 22 when temperatures decreased to -22°C.

The big story in parts of Yukon was the excessive and steady rain. For central Yukon, the rain was less constant; however, flood-like conditions were documented in many creeks when 37.5 mm was recorded on June 21. Similarly, 32.4 mm was recorded on August 6. Mountainous terrain that is susceptible to orographic precipitation was also impacted, with regular daily rainfall occurring in the Keno Hill mining camp. Total precipitation recorded in Mayo for June and July measured 192.7 mm, approximately double the seasonal average. For the Kluane Ranges, wet conditions were the norm in July and August with 297.7 mm falling in Burwash Landing, causing washouts on the Alaska Highway. This two month accumulation exceeded the annual average precipitation for the area.

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Gold production and value summary

Placer gold production according to export tax reporting totalled 84,900 crude ounces as of November 5, 2020 (Fig. 1). This was the highest production total since 1999. With an average season gold price of CDN \$2506, this equalled CDN \$170.3 million in production revenue. Approximately 87% of this value (CDN \$148 million) enters directly into the Canadian economy within the mining season via goods, services and wages associated with mining. The high gold price, which increased by CDN \$800/ounce compared to the 2019 season, was the clear advantage in 2020. Furthermore, a \$0.25/litre drop in diesel prices heading into the mining season bolstered overall extraction costs. This price reduction was directly linked to reduced pandemic consumption leading to a surplus in stocks.

The distribution of placer gold production is illustrated in Figure 2.

Development highlights

Indian River drainage

Production from the Indian River recovered slightly from 2019 with a total of 29,294 crude ounces reported. More than half of this production originated from the Indian River main stem where 16,519 crude ounces was produced. Dominion, Eureka and Sulphur creeks also had a strong season with 4650, 2557, and 2458 crude ounces reported, respectively.

Slate River Mining consists of a two-person crew that operates on the lower Indian River (Fig. 3). They mine relatively shallow, point bar ground in strips along the margin of the river. Stripping benefits from the use of an excavator-mounted conveyor, which allows for convenient placement of overburden proximal to the cut. The strategic segregation of overburden facilitates backfilling and slope grading to produce excellent reclamation outcomes. Their left limit cut measured 1 km (3,280 ft) in length and 36 to 72 m (118–236 ft) in width. A New Zealand-style plant limits the need for hauling pay.

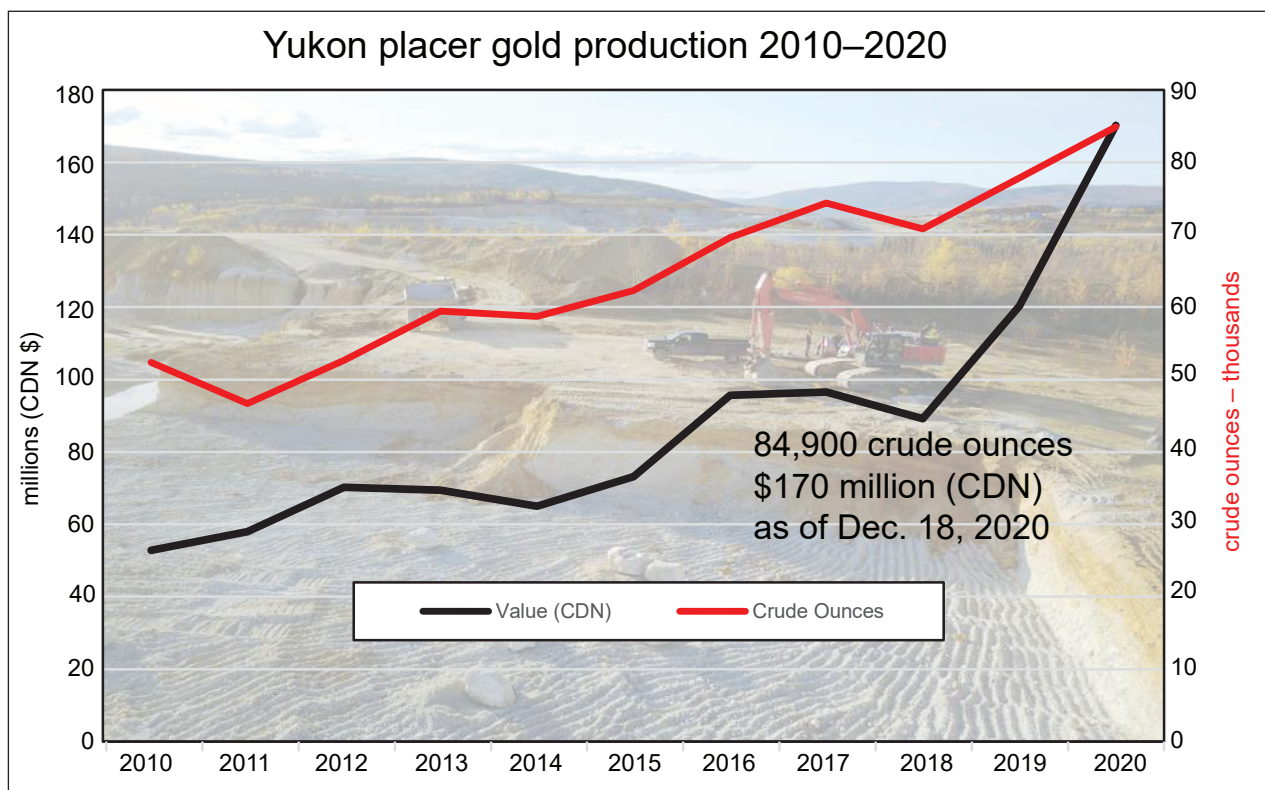


Figure 1. Total placer gold production in crude ounces and its value in Canadian dollars for the last 11 years.

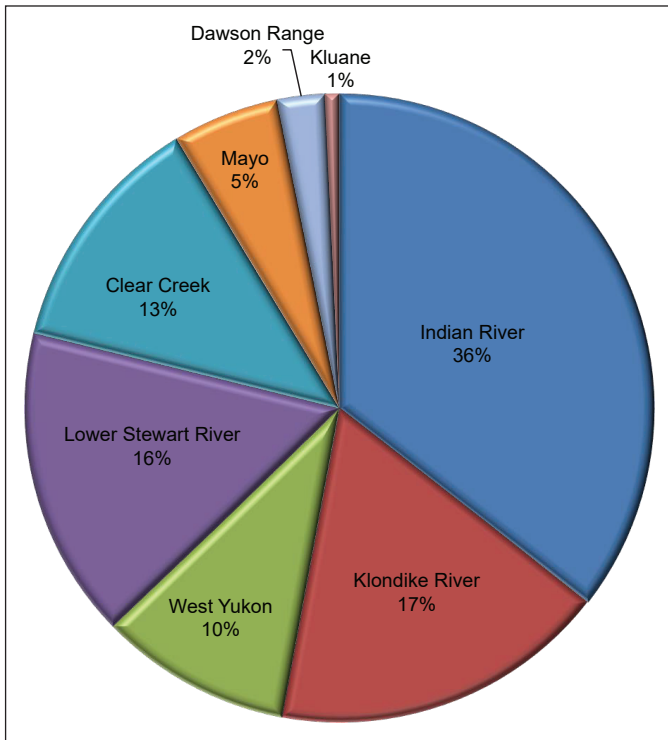


Figure 2. Placer production distribution according to district. Production from the Clear Creek area nearly doubled in 2020.



Figure 3. A view looking up the Indian River over Slate River Mining’s operation. Overburden is strategically stacked adjacent to the cut minimizing transport distances and facilitating reclamation.

On upper Eureka Creek, Treadstone Aggregate continued to open up the left limit Pliocene bench deposit, extracting pay from two locations (Fig. 4). The 14-person crew excavated a 24 m (79 ft) deep cut at the back of the bench and sluiced the bottom 2 to 3 m (6–10 ft) of pay consisting of high-energy cobble gravel with small boulders. Bedrock faulting is present in one corner of the cut resulting in a large slab of decomposed bedrock being thrust over the gravel. The second cut was excavated on the outer edge of the bench and consists of 6 m (20 ft) of oxidized gravel. Gold was distributed throughout this unit suggesting it may be an intermediate-level bench deposit that reworked the high-level bench. Treadstone Aggregate’s operation provides an upstream validation point on the Eureka bench, which is a significant deposit having a strike length of more than 3.0 km (1.8 mi).



Figure 4. Treadstone Aggregates operation on the Eureka bench. Visible in the foreground is an oxidized pay gravel located on the rim of the bench.

Yukon placer highlights

A new operation, Lonesome Dove Mining, commenced work on Wounded Moose Creek in 2020 (Fig. 5). The 17-person crew focused operations at the mouth of the creek where it dissects the Australia Creek bench. The Macon SD 300 plant screens material to ½", uses 2300 gal/min and was processing 190 yd³/hr. The gold is 840 fine and 100,000 yd³ of material was sluiced for the season.

Favron Enterprises mined on Sulphur Creek, initially focusing on left and right limit side pay, outside of the dredge limits. While doing so, the corner of their cut revealed a portion of the dredged ground indicating 0.6 to 1.2 m (2.0–3.9 ft) of virgin gravel remaining on bedrock. A decision was made to open up a cut within the dredge limits measuring 125,000 ft² (Fig. 6). Significant volumes of pay gravel were

encountered making the project a success. In stripping the dredge tailings, permafrost was encountered 1.2 m (3.9 ft) below the surface making for difficult excavation due to the high ice content. Permafrost was unanticipated since the site was dredged in the 1960s and very little vegetation had regrown. The high quartz content in the gravel, and resulting high albedo effect, may be responsible for redirecting solar energy.

On Dominion Creek, a new operation commenced mining near Granville and the Dominion drain (Fig. 7). NBC contracting moved up to the Yukon Territory from Barkerville and optioned the ground from Gimlex. The project has received YMEP funding in the past, which helped delineate a sizeable resource on the property. The 10-person crew sluiced 180 yd³/hr using a Macon triple deck plant and had a very successful first year of mining in Yukon.



Figure 5. A view of Lonesome Dove Mining's plant on Wounded Moose Creek. A water recirculation system consisting of a long U-shaped settling pond is visible in the background.



Figure 6. A view to the north of Favron Enterprises dredge tailing cut on Sulphur Creek. Coarse dredge tailings are visible under the pickup truck. Side pay cuts, outside of the dredge limits are also visible in the photo.



Figure 7. A view over NBC Contracting's operation on Dominion Creek. The Dominion drain is visible to the right of the stripped area. Mining progressed from the downstream end of the property, visible in the distance.

Klondike River drainage

Daval Mining had YMEP funding to conduct drilling on the limits of Hunker Creek near the mouth of Colorado Creek (Fig. 8). For the past number of years they have been targeting leftover pay within the dredge limits. Their 25-hole drilling program successfully identified a right limit bench on Hunker Creek under the road at the bottom of Trilby Hill. This discovery has significantly increased their mineable area on the property.



Figure 8. A view looking up Hunker Creek near the mouth of Colorado Creek and Trilby Hill. A right limit bench was discovered under the Hunker Creek road, to the left of the workings visible in the photograph.

Farther downstream on Hunker Creek, the Sailer family was mining a left limit cut near the mouth of Last Chance Creek (Fig. 9). They targeted a low-level bench that had been previously discovered by old-timers. Flow indicators within the bench gravel suggest that it may be originating from Last Chance Creek, which increases the area of the deposit. The four-person crew sluiced 150 yd³/hr and hydraulic monitoring was used to strip the muck overburden.

Dulac Mining continued their second season of mining on upper Eldorado Creek under an option agreement with Klondike Gold Corporation. The ground had been previously mined in the 1980s; however, side pay gravel preserved under a colluvium of weathered bedrock (slide rock) provided additional placer gold resources. Pay gravel was trucked out of the gulch to a landing near the mouth of Chief Gulch that provided adequate processing and settling space. The gold is clearly derived from a nearby source having a hackly appearance with quartz attached (Fig. 10).



Figure 9. A view to the north looking down the left limit of Hunker Creek near the mouth of Last Chance Creek. The excavators are sitting on a low-level bench, which was the target of operations for the Sailer mine in 2020.



Figure 10. Locally derived, hackly gold was extracted from upper Eldorado Creek on Klondike Gold Corporation's claims.

A significant shift in ownership occurred in 2020 when Doug Jackson purchased Jim Archibald's French gulch and hill claims. Mr. Archibald staked his first claim in the Klondike in 1962, and placer mined every year until 2020 when he retired. Mr. Jackson has been focused on American Hill for many years so this property acquisition increases his holdings significantly. A left limit Eldorado Creek side pay discovery was made below the French Gulch road that was overlain by an accumulation of weathered bedrock colluvium (Fig. 11).

West Yukon

M2 Gold continued working their mining project on the Sixtymile River. They processed pay from both bench ground and the floodplain flats. Their primary focus has been on the left limit, however this year they discovered paying ground on a right limit bench, which could indicate new source contributions or a migrating pay streak (Fig. 12). The crew of 18 personnel operated 23 hours per day using a newly acquired Macon plant.



Figure 11. An exposure below the French Gulch road with virgin Eldorado Creek deposits overlain by colluviated weathered bedrock. The buried gravel is the red unit near the base of the measuring tape.

For the first time in many years placer mining activity occurred on Bedrock Creek. K-1 Mining has conducted a significant exploration program consisting of 80 drill holes near the mouth of Winters Pup (Fig. 13). Using the new drill data, old air photos and government documents they were able to identify a target and commence mining. This year they processed valley bottom left limit side pay and opened up a sizeable bench deposit on the left limit.



Figure 12. A view of M2 Gold Mines' plant on the Sixtymile River. Their mobile trommel plant reduces costs associated with hauling pay gravel.



Figure 13. A view to the south of Bedrock Creek in the Sixtymile River drainage. K-1 Mining has exposed a left limit bench deposit at the mouth of Winters Pup.

Fortymile Placers was active on Marten Creek, a narrow tributary to the Fortymile River. Their operation consists of a floating trommel-style plant (Fig. 14). The two-person operation processes ground that is between 1.8 and 4.6 m (6–15 ft) deep and is highly efficient. The trommel and excavator combined burn 4 gallons of fuel per hour and they process 50 yd³/hr. Gold is primarily fine with 80% passing through a 10 mesh screen.



Figure 14. Fortymile Placers floating trommel plant on Marten Creek. One crew member operates a series of winches that swivel the plant and control the tailings stacker.

Lower Stewart River

HC Mining on Henderson Creek had a big year processing four cuts, each up to 518 m (1700 ft) long. Mining was focused on lower Henderson Creek where two new Macon SD-600 screen deck plants were introduced later in the season and operated adjacent to one another (Fig. 15). A single excavator fed both plants and had a combined production of 400 yd³/hr. Production from Henderson Creek in 2020 was the highest recorded since modern recording started in 1978.

Bedrock Mining Company Inc. completed a 56 drill hole YMEP project on lower Maisey May Creek in 2020. The project was successful in delineating more right limit pay gravel than expected. This is the largest operation in the drainage consisting of a 4-person crew that excavated three cuts.



Figure 15. HC Mining added two Macon SD-600 screen deck plants to their operation and had them running side by side later in the season. The plants are fed by a Hitachi ZX470-5 bucket.

Clear Creek

Activity ramped up in the Big and Josephine creek drainages in 2020. Schmidt Mining Corp. conducted a two-phase sonic drilling program that consisted of 345 holes. This included an 18 hole program on Gem Creek. Northern Sonic was hired to complete the drilling, process the samples and map the pay streak. In Big Creek, mining continued below camp in ground that is 5 m (17 ft) deep and consists largely of high energy, oxidized gravel (Fig. 16). Placer gold has been found to be somewhat spotty in the drainage making drilling particularly necessary. Farther downstream, the ground is increasingly glaciated and becomes deeper. Till is present in the stratigraphy and contains much of the placer gold. A channel was delineated on the center-right limit of Big Creek immediately above the deep ground. On Josephine Creek, both production and exploration drilling was completed by Schmidt

Mining Corp. Placer gold is largely contained in thin till deposits on the bedrock surface and subsequently overlain by mostly barren fluvial gravel (Fig. 17). Where mining occurred, the ground ranged from 3 to 6 m (10–20 ft) deep; however, this increases to 24 m (80 ft) deep at the mouth of valley and becomes uneconomic. The exploration drilling program on Gem Creek successfully identified a pay streak within the fluvial fan deposit at the mouth of the drainage.

Gordon Scott mined at the mouth of Left Clear Creek in 2020. This project targeted side pay gravel on both limits of the valley. The center of the valley, which has a high bedrock surface, had been cleaned out by old-timers. A right limit exposure contained 2 m (7 ft) of gravel overlain by a wedge of silt and organics up to 2.5 m (8.2 ft) thick (Fig. 18). All of the gravel was processed through a 6 × 20 ft double screen deck plant that operates for 600 to 800 hours per season.



Figure 16. A view looking up Big Creek at Schmidt Mining Corporation's placer mine. In this section of the drainage the total gravel thickness is 5.2 m and a distinct high-energy, oxidized gravel measuring 2.8 m in thickness is present on bedrock and contains most of the placer gold.



Figure 17. A cut on Josephine Creek shows the schist bedrock overlain by 0.6 m of till, 1.2 m of oxidized gravel and 1 m of silt. The till on bedrock contains the placer gold and was deposited during an early to middle Pleistocene glaciation.



Figure 18. A view of Scott Mining's cut on the right limit of Left Clear Creek. Bedrock is exposed at the base of the cut and two gravel units are present in the cut. The basal, placer gold-bearing gravel is periglacial in origin, deposited during a cold climate. The upper gravel unit is considered a relatively modern gravel and was likely deposited during the current warm period.

Mayo and Keno City

Activity increased on Granite Creek in 2020; there were six active operations in the area, the majority of which were leased from claim owner J. Davies. Dulac Mining excavated a cut below the last glacial end moraine exposing a complex stratigraphic sequence (Fig. 19). The pay unit consists of an oxidized till deposited by a glaciation prior to the last that originated from the Granite Creek cirque. This placer-gold bearing till was overlain by a weathering surface, outwash gravel and glaciolacustrine sediment. The total depth of the cut was 24 m (80 ft) to bedrock.

A new exploration program was initiated on Keystone Creek by Earth and Iron. Keystone Creek is a tributary to Mayo Lake and was identified as a potential placer target in Yukon Geological Survey Bulletin 13: Placer gold deposits of the Mayo area, central Yukon (Lebargé et al., 2002). A YMEP drilling program was initiated at the apex of the fluvial fan delta and a clearing was constructed on the right limit for a future camp or processing option (Fig. 20).



Figure 19. Dulac Mining's cut on Granite Creek in 2020. The oxidized till exposed at the base of the cut represents the top of the pay unit and was deposited by a pre-last glacial advance of a local alpine glacier.



Figure 20. A view to the southwest over Earth and Iron's exploration project on the Keystone Creek fan delta. Exploration drilling targeted the apex of the fan delta where Keystone Creek first empties into the Mayo Lake valley.

Rally! Mining optioned lower Duncan Creek from the Taylor family in 2020 and commenced mining at two locations. Initial production targeted the modern valley fluvial deposits that overlie a false bedrock of glacial sediment. On the left limit, excavation commenced into the last glacial end moraine that was deposited by up-valley flowing ice. This event buried placer gold-bearing outwash gravel and is the target for future development.

Dawson Range

A second season of mining occurred on Canadian Creek by a New Zealand company called Batavia Mining (Fig. 21). Their operation is focused on upper Canadian Creek near the mouth of Patton Gulch and the Casino hard rock deposit. They sluiced 80,000 yd³ this season from a boulder zone both in the modern creek valley

and on a low-level, right limit Canadian Creek bench. Total depth to bedrock measured 7.6 m (25 ft). The placer gold is locally derived and is described as having a popcorn appearance.

Mining continued on Mechanic Creek after a difficult start to the season. Diane Gow, part of a long time placer mining family in the Freegold Mountain camp, passed away in the spring. Diane was an active and vocal proponent of the industry and worked many water licenses over the years. Her knowledge and experience will be missed. For the 2020 season, the Gow family mined two locations, a right limit cut on the middle section of Mechanic Creek and a cut in the fluvial fan deposit at the mouth of the drainage.



Figure 21. Batavia Mining's operation on upper Canadian Creek near the Casino deposit. Production was focused on the right limit where a low-level bench was encountered.

Kluane

Canyon Mining Ltd. started a new operation on Fourth of July Creek in 2020. The operation focused on a left limit tributary called Snyder Creek where they processed a boulder gravel ranging in thickness from 1.5 to 6.1 m (5.0–20.0 ft). Their plant consisted of a combination Derocker and screen deck that was connected by a nugget trap sluice run (Fig. 22). The sluice runs below the screen deck to target finer gold. The plant is capable of processing up to 200 yd³/hr.

References

LeBarge, W.P., Bond, J.D. and Hein, F.J., 2002. Placer gold deposits of the Mayo area, central Yukon. Exploration and Geological Services Division, Yukon Region, Indian and Northern Affairs Canada, Bulletin 13, 209 p.



Figure 22. Canyon Mining Limited's wash plant and sluicing configuration on Fourth of July Creek.