Yukon placer mining 2023 development and exploration overview

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Introduction

Placer districts across the Yukon yielded strong production this season as a result of favourable conditions. A continued rise in gold prices and stable fuel prices were complemented by mild temperatures that allowed for an extended sluicing season. As of November 10, 2023, the 146 active placer operations in the Yukon had collectively generated $143.7M in production revenue. The Dawson Mining District was the primary contributor to gold production, accounting for 89% of the total production for the Yukon. The Mayo Mining District followed with a 7% contribution and Whitehorse Mining District reported 4% of the overall production.

Climate for mining

The winter period (November 2022 to April 2023) was marked by warmer-than-average air temperatures in November, January and February but colder than normal in December, March and April. The average low temperature for Dawson City in April was –9°C. These colder spring temperatures across the Yukon contributed to a late spring thaw, and winter conditions persisted in the valleys into early May.

Precipitation in Dawson City was very high in December and January, whereas the Whitehorse area experienced the third driest period in the precipitation record (Government of Yukon, 2023). The Upper Yukon Basin (Southern Lakes area) snowpack estimate on April 1, 2023 was 114% from median, and the White River Basin was 147% from median (Government of Yukon, 2023). A rain-on-snow event in early June led to washouts and flooding in the Klondike, and most streams in the Klondike exhibited flows above the 75th percentile for the entire open water period. In the rest of the territory, flows were below average (Emily-Jeanne Bercier, Water Resources Branch, Government of Yukon, pers. comm., 2023). As the sluicing months arrived, temperatures became more favourable across the Yukon, and mean temperatures remained in the normal range in Dawson City for June (14.4°C). In July, mean temperatures in Dawson City were 18% higher than those recorded in 2022, and in August, temperatures were 16% higher compared to the same period in 2022. Similarly, in Whitehorse, temperatures for July were 14% higher and August temperatures had a 7% increase compared to 2022. Dawson City's total precipitation for July to October 2023 was slightly less compared to the same period in 2022. Meanwhile, in Whitehorse, there was an increase in precipitation reported from June to September 2023 compared to 2022. Fall 2023 was marked by warmer-than-average temperatures across the territory and significant precipitation in October. Drier-than-average conditions in November resulted in a delay with the onset of winter snowfall.

Gold production summary

Placer gold production reported from April 1 to November 10, 2023, was 68,577 crude ounces (Fig. 1). Using $2620 as an average gold price per ounce, the reported gold production equates to a value of $143.7M for this season.

The Yukon is divided into eleven placer mining areas: Klondike River, Indian River, Lower Stewart, West

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Yukon, Clear Creek, Mayo/Duncan, Dawson Range, Livingstone, Kluane/Gladstone, Whitehorse South and Watson/Hyland (Fig. 2). Most of Yukon's production (82%) is from placer areas in the Dawson Mining District, which includes four areas: Indian River, which contributes 43% of the Yukon's total; Klondike River contributing 15%; Lower Stewart River contributing 14%; and West Yukon, contributing 10% (Fig. 3). Mayo/Duncan, the fifth largest placer gold producing area, contributed 7% of the Yukon's total production in 2023. The remaining placer mining areas contributed 4% to the total Yukon placer gold production. Placer gold production is derived from the royalty reporting collected by the Yukon Mining Recorders.

Development highlights

Klondike River area

The Klondike River is the second-highest gold-producing area, yielding 10,055 crude ounces. Responsible for contributing 15% of the total Yukon placer gold production, most of the Klondike River production is reported from Lovett Hill (2579 crude ounces), Hunker Creek (2518 crude ounces) and Bonanza Creek (2163 crude ounces). Of note was a 30% decrease in production from 2022, which could be due to a shift in operations that were once active on the Klondike River proper.

Lovett Hill Corporation had a successful second year on their lower Bonanza Creek property as one of the largest placer projects in the Yukon. They stripped the left limit of Lovett Gulch including the rim of the Trail Hill bench. The primary target is reworked White Channel gravel deposited on a bedrock surface and concentrated on the lower slopes of the bench rim (Fig. 4). The north-facing hillside is underlain by permafrost and consists of an apron of wind-blown silt (loess) that thickens toward the valley bottom. A combination of hydraulic monitoring and a Caterpillar D11 bulldozer was used to strip the loess unit. A two-person crew with a Hitachi excavator and Caterpillar D11 bulldozer sluiced the rim material and valley-side fluvial deposits. A Macon™ T-600 trommel was used for processing pay.

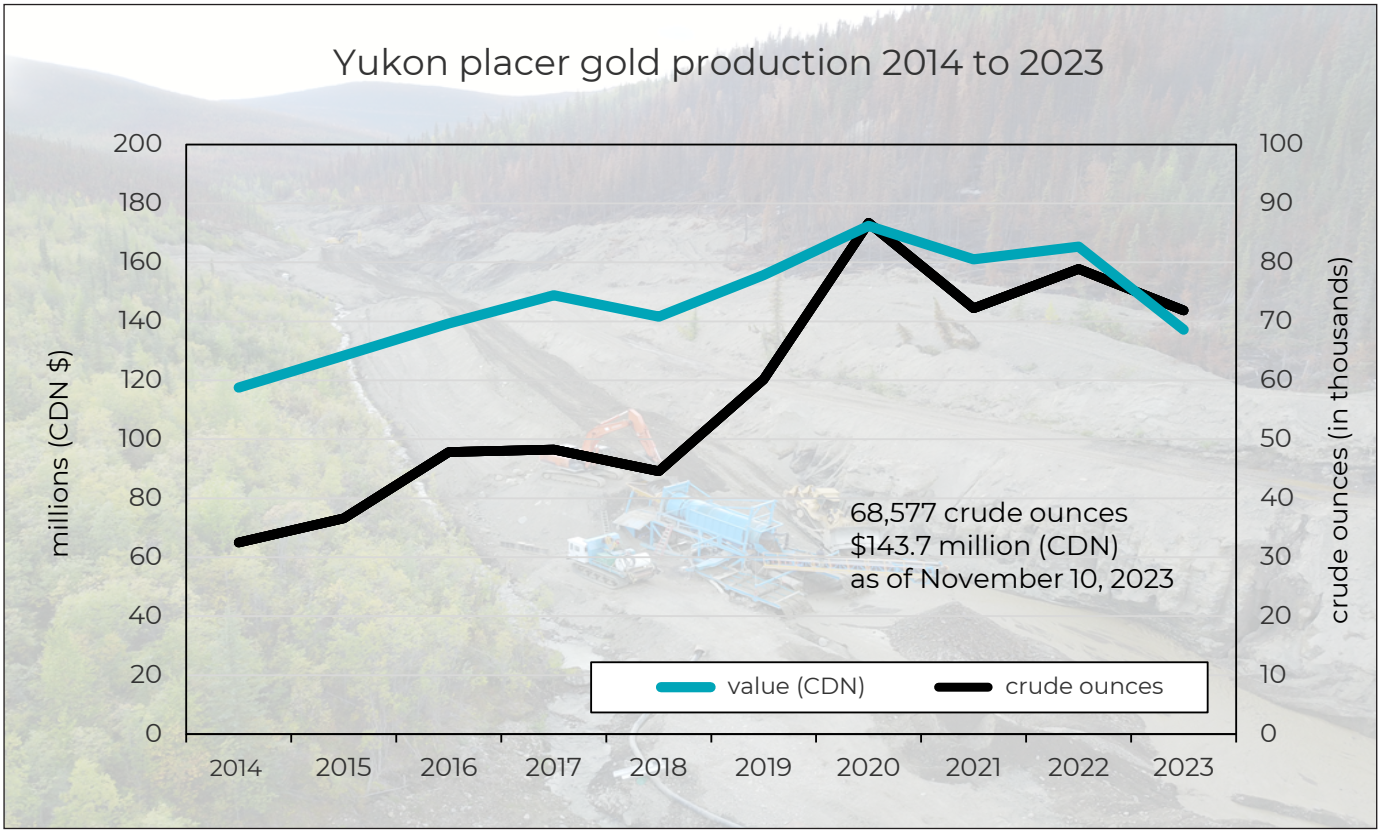

Figure 1. *Total placer gold production in crude ounces and its value in Canadian dollars for the past 10 years.*

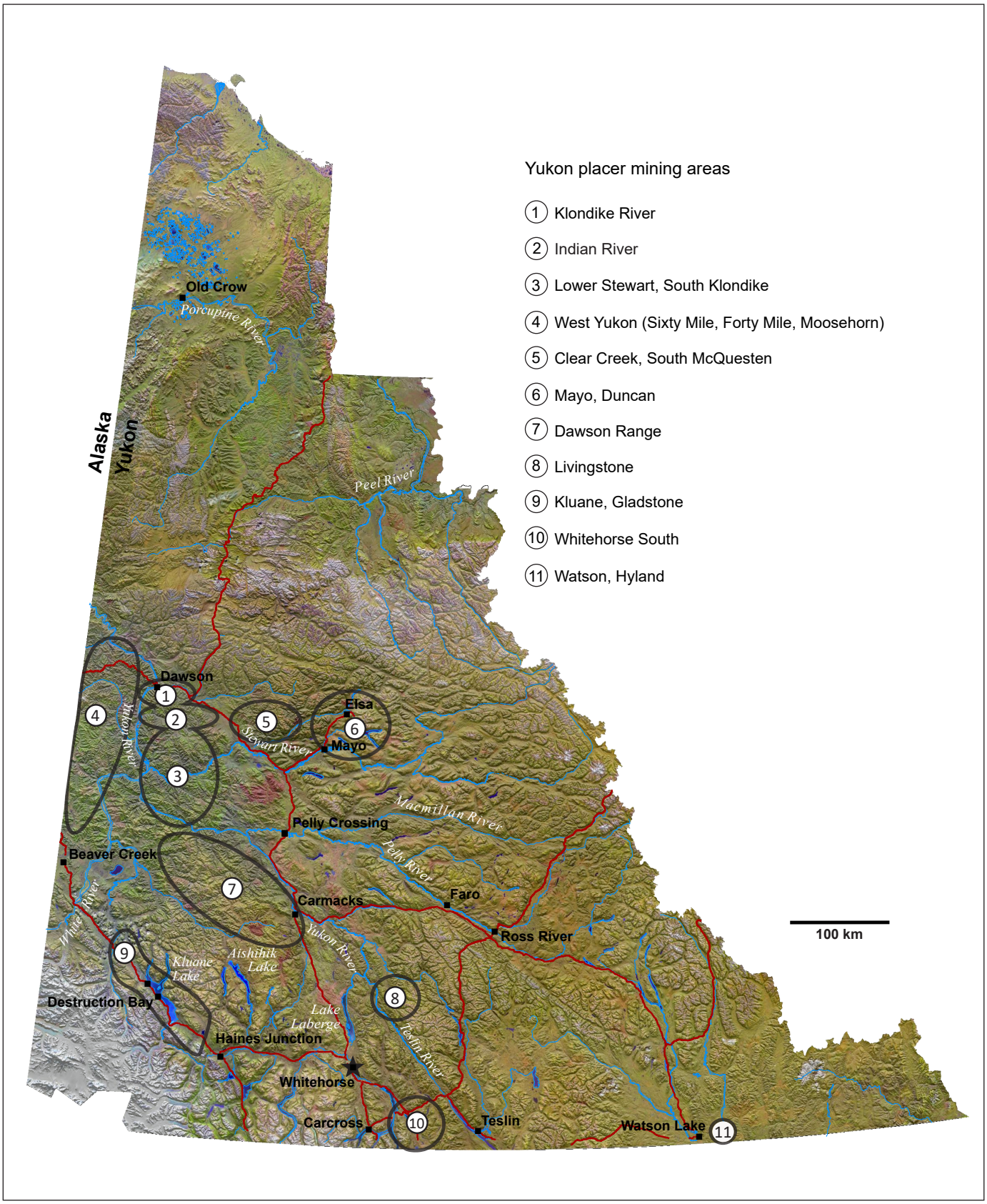

Figure 2. *Yukon placer mining areas.*

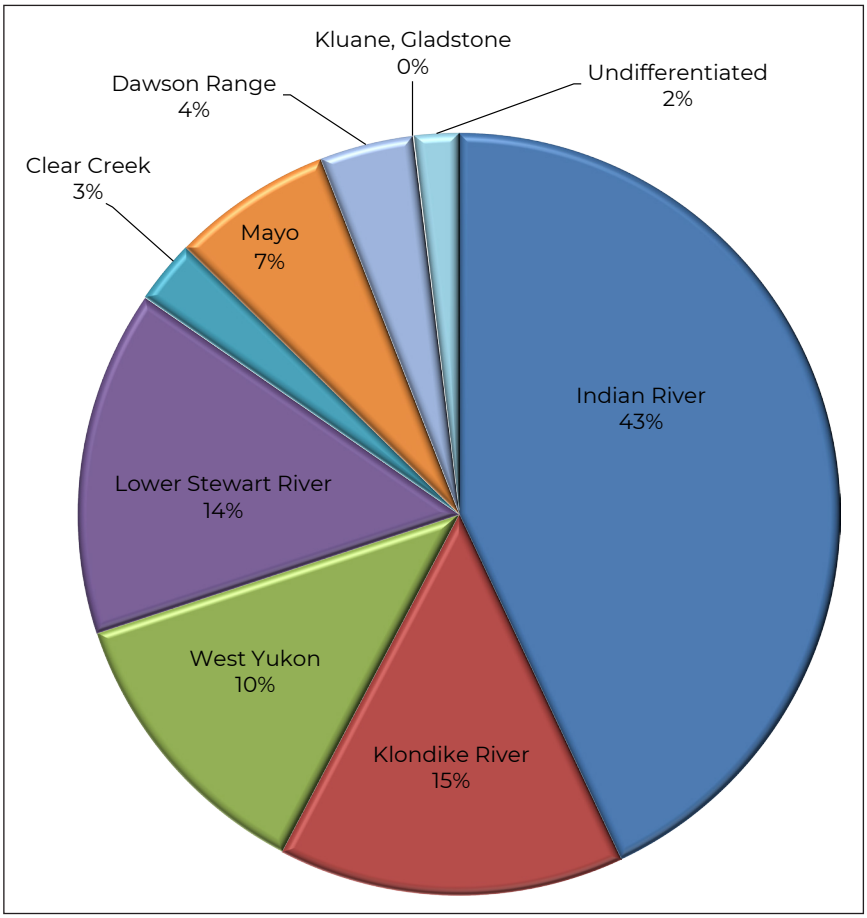

Figure 3. *Distribution of placer gold production derived from each placer area, according to the reported royalties as of November 10, 2023.*

Figure 4. *Lovett Hill Corporation's mining cut at their Lovett Hill property.*

Adrian Hollis completed a second season on his newly acquired Bonanza Creek property, mining claims in the modern creek and on the high-level White Channel bench deposits. He spent a significant amount of time reviewing air photos and compiling historical drilling and dredging data prior to conducting an exploration auger-drilling and bulk-sampling program in July. This property has undergone several phases of mining activity throughout the last century—from hand mining and shafting, to extensive hydraulic mining and dredging, and finally to modern mining methods used since the 1970s. Understanding the extensive work history and resulting modern deposits is essential for evaluating claims in these previously mined areas. The two-person crew sluiced 6116 m^3 (8,000 yd^3) of White Channel gravel from Monte Cristo Hill and King Solomon Hill (Fig. 5).

Tatra Ventures Ltd. reinstated activity on their Last Chance Creek claims this season, an area that has been inactive since they last mined in 2015. Previous mining occurred beneath the tailing stacker of Dredge 11 that had protected in-situ Hunker Creek gravel. This year they investigated the extent of the remaining Last Chance Creek side pay upstream from Dredge 11 (Fig. 6). By mid-season, they had completed a 76 by 107 m (250 by 350 ft) long cut. They continued to extend the cut throughout the season as they followed the lateral continuation of the side pay. Uncovering this extensive Last Chance Creek side-pay unit in a heavily mined area is an example of the importance of exploration programs, particularly in locations where there is a high density of mining activity.

Whiskey Hill Mining spent the first half of the season leasing claims from Mogul Gold on Temperance Hill. In mid-July, the two-person operation

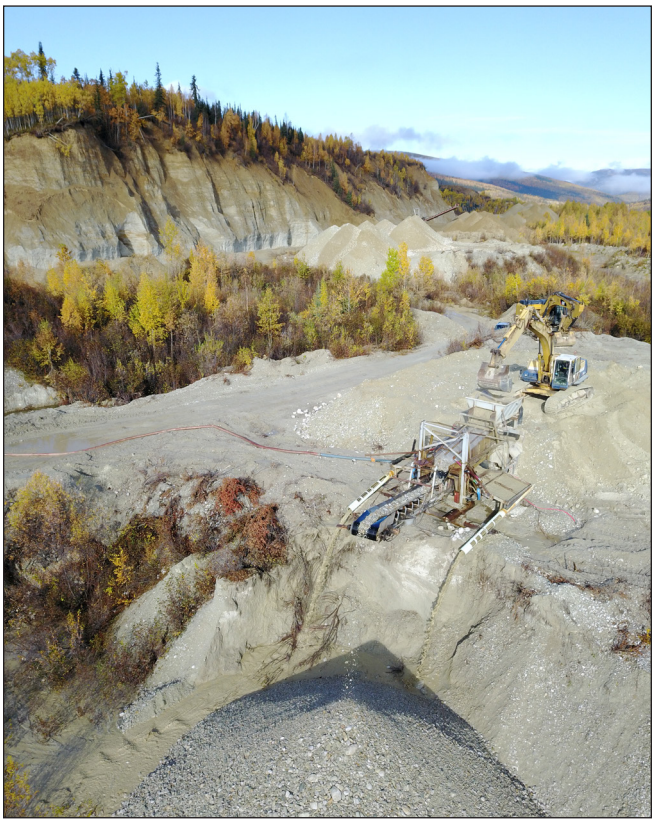

Figure 5. *Adrian Hollis processing material from King Solomon Hill on Bonanza Creek.*

Figure 6. *Dredge 11 at the mouth of Last Chance Creek; Tatra Ventures Ltd.'s cut is exposed behind the dredge.*

relocated to their own claims at the base of Whiskey Hill, situated 2.3 km downstream from Mint Gulch, a left-limit tributary to Hunker Creek. This section of Hunker Creek is narrow. On the left limit of Hunker Creek, a blanket of colluvium containing massive ice overlies the pay gravel, which has protected it from dredging efforts and modern mining. The operation uncovered up to 1.5 m (5 ft) of Hunker Creek gravel, overlain by 12.0 m (40 ft) of overburden.

Indian River area

The Indian River and its tributaries continue to be the highest placer-producing area in the Yukon, yielding 29,503 crude ounces, equating to 43% of the Yukon's total placer production. High numbers in placer gold reporting is due to the high density of large-scale operations (more than 20 employees) in this area (e.g., Quartz Creek, Eureka Creek and Dominion Creek). Of note is a 20% decrease in production this season, which could be attributed to the closure of a large-scale operation on Dominion Creek. The largest contributors in the Indian River area are Quartz Creek (7772 crude ounces), Eureka Creek (5898 crude ounces) and Dominion Creek (5783 crude ounces).

Little Flake Mining ULC purchased Dominion Gold Resources Ltd.'s property on middle to lower Dominion Creek this season. Little Flake began relocating in early spring and conducted an extensive sonic drilling program to establish a multi-year mine plan at the new location. The crew focused their mining on the middle to right limit of Dominion Creek, and an additional four claims were stripped in preparation for next season. Stratigraphy in their cut at the mouth of Washington Creek consists of 1.7 m (6 ft) of Ross gravel overlain by 2.0 m (7 ft) of Dominion Creek gravel.

Ace Placer Mining, a third-generation operation active in the Dominion Creek drainage, mined in two locations in 2023. They focused most of their season at the mouth of Lemare Gulch (Fig. 7), where local, high-energy gulch gravel incised into a low-level Dominion Creek bench. The gulch gravel likely incised into the bedrock surface easily because it was extensively oxidized and fractured. A second right-limit location, approximately 800 m upstream from the mouth of Portland Creek, was stripped and prepared for sluicing in 2024. While this area has been dredged, remnant pillars of in-situ Dominion Creek gravel may have been preserved by the inconsistent steam thawing method used at the time. Additionally, Ace Placer Mining will be evaluating the technogenic deposits derived from dredging for their economic potential.

Figure 7. *Ace Placer Mining active in 2023 at the mouth of Lemare Gulch in the Dominion Creek valley.*

Schmidt Mining purchased Dominion Creek and Brimstone Gulch claims from Lucky Lady Placers in 2019. The first earth-moving activities occurred in fall 2022 and consisted of a stripping program on the right limit. This program continued throughout the 2023 season, resulting in a stripped 120,000 ft^2 (11 148 m^2) cut ready for sluicing in 2024. Another cut along the right limit was also completed, revealing a section of in-situ Dominion Creek side pay. The gravel thickness ranges from 1.2 to 3.0 m (4 to 10 ft), and this cut is also slated for sluicing in the upcoming 2024 season.

Metallic Minerals Corp. leased out their Australia Creek claims to Little Flake Mining ULC in 2023. This year marks the first time gold production has been reported from this drainage. A large cut (Fig. 8) located 2.5 km upstream from its confluence with the Indian River was completed in 2023 and all gravel encountered was sluiced (up to 1.8 m or 6 ft). Gold is medium to coarse grained and has a fineness of 880.

Slate River Mining's operation is located on the lowermost reach of the Indian River, and the company had a crew of three individuals during the 2023 season.

Figure 8. *Looking downstream at Australia Creek; the Indian River valley is in the background.*

Efforts on these claims were concentrated on mining three distinct placer settings in the drainage: the modern Indian River valley bottom, an intermediate-level bench deposit, and a high-level bench deposit situated on the right limit. This was the first evaluation of placer potential in the high-level bench on the lower Indian River. Two cuts were successfully completed immediately downstream from the camp as part of this exploration effort. The high-level bench project was undertaken as a test mining initiative, aimed at gaining a better understanding of the placer potential of this location.

West Yukon area

There were 8415 crude ounces of placer gold produced from the West Yukon area in 2023, which equates to 10% of total Yukon production. This is the third highest placer-producing area, and within this area, the Sixty Mile River produces 60% of the total regional production (5072 crude ounces). Browns Creek is the second largest contributor, producing 11% (892 crude ounces) of the reported production for the West Yukon area. The third largest contributor is Bruin Creek, producing 512 crude ounces, followed closely by Ten Mile Creek, which yielded 487 crude ounces.

Boucher Creek, actively mined for the past four seasons by Schmid and de Windt, is one of the newer

placer creeks in the Yukon to report placer production. Boucher Creek is a tributary to the Sixty Mile River and was explored in 1892; it has remained relatively underexplored until the current owners staked it in 2016. Schmid and de Windt initiated sluicing in 2017, and operations continue to expand in the drainage. A three-person crew completed a cut on Boucher Creek, as well as a 137 by 222 m (450 by 730 ft) cut on Butler Gulch, a right-limit tributary of Boucher Creek. Figure 9 is a photo of the gold recovered from Boucher Creek.

Husky Wood and Exploration Ltd. began prospecting the lower reaches of Browns Creek, beginning with a shafting program in 2016. Sluicing began in 2017, and they have been mining the entire width of the modern valley bottom as well as a variably preserved, low-level bench deposit on the right limit. In 2023, they completed two cuts with a crew of six employees.

K-1 Mining and Services has been active in Bedrock Creek since 2020. This season, they had a crew of three people who extended their cut farther downstream on the Bedrock Creek bench to the mouth of Winters Gulch (Fig. 10). Mining efforts focused on a fan deposit at the mouth of Winters Gulch that has incised into a bench on Bedrock Creek. The average thickness of pay was 3.6 m (12 ft) and they sluiced 34 596 m^3 (45,250 yd^3) of pay gravel.

2074098 Alberta Ltd. leased claims from V. Bondarchuk this season on the middle to upper reaches of Moose Creek. The crew mobilized to the site in July. They began by first designing a mine plan that would allow them to operate efficiently in Moose Creek, which has a narrow width of 37 m (120 ft; Fig. 11). The bedrock surface undulates significantly in the creek bed and controls pay thickness. Pay ranges from 0.6 to 4.6 m (2 to 15 ft) thick and has an average thickness of 1.2 m (4 ft). A mixing zone is present at the contact between bedrock and the overlying gravel. Gravel in the creek is coarse and has an abundance of large boulders and bedrock fragments that have been remobilized into the drainage area as colluvium. The largest gold nugget recovered was one ounce or 28.3 g.

Figure 9. *Gold recovered from Boucher Creek.*

Figure 10*. K-1 Mining and Services' operation on Bedrock Creek.*

Figure 11. *Aerial view of Moose Creek; a John Deere 992 excavator (yellow) gives perspective of the narrow nature of the creek.*

Lower Stewart area

Lower Stewart area is the fourth largest gold-producing area, contributing 14% to the Yukon's total placer gold production. Reporting decreased by 11% compared to 2022 values and yielded 10,050 crude ounces for the 2023 season. Henderson Creek contributed 55% of Lower Stewart area's total production, generating 5484 crude ounces. The highest producing drainages include Black Hills Creek (1038 crude ounces), Scroggie Creek (978 crude ounces) and Maisy May Creek (693 crude ounces).

Bedrock Mining Company Inc., on Maisy May Creek, completed a significant amount of reclamation on their lowermost claims. By July, 11 claims in the valley bottom were reclaimed by contouring overburden and top coating the area. This exceptional work is just one example of the ongoing reclamation that placer miners are undertaking throughout the Yukon (Fig. 12). A crew of five employees processed 87 924 m^3 (115,000 yd^3) of gravel this season. They mined two placer settings: the modern Maisy May Creek valley and a mid-level, left-limit bench that has undergone minimal activity until this season. A cut 40 by 50 m (130 by 165 ft) was completed on the bench, which initiated further interest in conducting additional mid-level bench exploration in the creek.

Figure 12. *Reclamation on lower Maisy May Creek completed by Bedrock Mining Company Inc. this season. The view is looking upstream.*

R. Smith Placer Mining has been active in the headwaters of Black Hills Creek since 1996. This season was the first time the one-person operation processed a cut in an unnamed left-limit tributary 2.6 km downstream from the headwaters of the drainage (Fig. 13). Locally named 'Lucky Gulch', this tributary drains Eureka Dome and contains a poorly sorted, high-energy gravel deposit. At the confluence of Lucky Gulch and Black Hills Creek, the local high-energy gravel is incised into a Black Hills Creek bench and is overlain by frozen black muck containing massive ice. The crew sluiced gravel up to 5.5 m (18 ft) thick, including up to 0.6 m (2 ft) of the underlying bedrock. A 45 by 145 m (150 by 475 ft) cut was prepared for mining in the 2023 season, and the operator remained on the creek until mid-October to complete processing the thawed gravel.

Stuart Placers Ltd. has been mining on mid–Black Hills Creek, progressively mining upstream from Kernine Creek to McCrimmon Creek during the last three seasons. They operated a single 12-hour shift with a crew of six employees. The crew targeted the Modern Black Hills Creek gravel, mining the entire width of the valley bottom, and processing the lowermost 1.8 m (6 ft) of gravel and up to 0.9 m (3 ft) of bedrock. The company conducted exploration during the past two seasons by processing bulk samples from a low-level, right-limit bench near McCrimmon Creek, as well as samples from an upstream mid-level bench near Mills Creek.

Figure 13. *Confluence of Black Hills Creek and locally named 'Lucky Gulch', where R. Smith Placer Mining focused mining this season.*

Clear Creek, Mayo and Keno area

Production in Clear Creek decreased by 48% this year and 1863 crude ounces was reported. Most production was from Clear Creek proper, which produced 1815 crude ounces. Meanwhile, to the east, a 15% increase was reported in the Mayo/Duncan area. The notable production came from Granite Creek (2437 crude ounces) in 2023. Other producing creeks in the Mayo/Duncan placer area include Highet Creek (586 crude ounces), Owl Creek (427 crude ounces) and Duncan Creek (338 crude ounces).

Rally! Mining ULC leased claims from Duncan Creek Golddusters Ltd. on Duncan Creek this season. Three separate placer deposits were mined in the creek. The first target was modern Duncan Creek gravel, a near-surface deposit in which they sluiced 18 349 m^3 (24,000 yd^3). The second target is a deep channel on the right limit of the creek, immediately upstream from the camp, where they sluiced 19 878 m^3 (26,000 yd^3). Finally, they proved up an exciting deposit of a buried, left-limit bench (Fig. 14) that extends much farther into the slope than initially believed. Although they knew a preglacial bench existed on the left limit of the creek, Rally! Mining ULC used geophysics and a large cut to further expand the previously known extent of the deposit. The crew sluiced approximately 25 995 m^3 (34,000 yd^3) of the preglacial bench deposit.

Figure 14. *Rally! Mining ULC's buried left limit bench on Duncan Creek. The view is looking upstream at a large cut that was completed to evaluate the deposit.*

Yukon Mining Ventures Ltd. first staked Ross Creek in 2018 and began mining the following year. This season, the one-person operation sluiced 15 292 m^3 (20,000 yd^3) with a 4 ft (1.2 m) diameter trommel capable of processing 38 m^3 (50 yd^3)/h. The 17 by 35 m (55 by 115 ft) cut on the left limit targeted a buried glaciofluvial bench deposit. The total thickness of mined section was 3.0 m (10 ft) after stripping 6.0 m (20 ft) of overburden. The lowermost 1.5 m (5 ft) and up to 0.6 m (2 ft) of bedrock was processed as pay.

L. Andre and his crew of five employees completed their second season sluicing on 15 Pup. The 15 Pup property is a right-limit tributary of Haggart Creek, situated immediately to the west of Victoria Gold's Eagle Gold mine. A 52 by 198 m (170 by 650 ft) cut was completed, and the entire creek width was processed. As the cut evolved on 15 Pup, the stratigraphy began to indicate the potential of a buried left-limit deposit. Mining in the narrow valley of 15 Pup (20 m, or 66 ft wide) requires thorough mine planning and a well-developed total recirculation system. L. Andre spent the last few years fabricating a new trommel (Fig. 15), which can process 76 m^3 (100 yd^3)/h.

Figure 15. *L. Andre's operation on 15 Pup, and his newly fabricated trommel actively sluicing pay.*

Owl Creek is a tributary on the south side of Mayo Lake that has not been mined since the early 2000s. This season, Dulac Mining mobilized to the site and began mining on the lower reaches of the creek immediately above the fan. The pay gravel is a high-energy, poorly sorted deposit with abundant bedrock fragments and is interpreted to be a debris flow. Gold recovered from Owl Creek is typically coarse.

Faith and Allen creeks are two relatively new placer creeks that are located approximately 12 km east of Keno City and drain into the Keno Ladue River. Metallic Minerals Corp. staked the claims in 2017, and this season they contracted the Unrau's to conduct 16 excavator test pits. Gold is coarse and is believed to be locally derived from the vein system on the north side of Mt. Hinton. It is encouraging for the industry and for the Mayo placer area to see exploration unfolding in underexplored drainages.

Scott and Sons continued to mine upstream on the left fork of Clear Creek, starting this year's operations just downstream of Barney Creek (Fig. 16). This is an area of Clear Creek that has been previously dredged by Queenstake Resources. Scott and Sons is a third-generation placer operation, and they continue to target areas of the creek that were previously missed by the dredge. They are also targeting intermittently preserved, in-situ Clear Creek side pay that is masked by a blanket of colluvium. This season, 10 employees worked a double 12-hour shift, and mined 53 000 m^2 (570,487 ft^2) of pay.

Figure 16. *Scott and Sons operation on the left fork of Clear Creek. The view is looking downstream.*

Whitehorse Mining District

Whitehorse Mining District includes four placer mining areas: Dawson Range, Livingstone, Kluane/Gladstone and Whitehorse South. Cumulatively, these four placer mining areas contributed 4% (2901 crude ounces) of the Yukon's total placer gold production as of November 10, 2023. Additional reporting is forthcoming from southern Yukon due to operators mining longer into the season compared to those situated in the Dawson area. The Dawson Range placer area contributed 95% of the placer gold reported in the Whitehorse Mining District. The three highest producing creeks in the Whitehorse Mining District are all situated in the Dawson Range placer area. The largest contributors are Canadian Creek (1306 crude ounces), Nansen Creek (575 crude ounces) and Discovery Creek (555 crude ounces).

B. Gow, primarily mining independently, continued to focus his mining efforts at the mouth of Mechanic Creek (Fig. 17). He has been targeting a series of coarse boulder channel deposits derived from Mechanic Creek, which incised into a bench on Big Creek. These coarse boulder channels were preserved by the Big Creek bench deposits, after incision of Big Creek following the end of the last glacial period. This pay unit overlies a frozen silt unit, which acts as a false bedrock. Each individual channel is up to 1.8 m (6 ft) thick. This season, 7646 m^3 (10,000 yd^3) of material was processed for placer gold.

TIC Exploration has been mining on Gladstone Creek since 1992. This season they focused on the right limit above a canyon. A crew of up to five people completed a 30 by 100 m (98 by 328 ft) cut on a low fluvial bench deposit of Gladstone Creek. The bench deposit consists of a boulder gravel unit overlain by a wedge-shaped colluvial apron. The colluvium was 4 m (13 ft) thick on the north wall of the cut against the hillside and tapered to 0 m in the middle of the cut. Mining operations continued intermittently into the winter months when temperatures remained above –15°C. Sluicing in these temperatures was possible using groundwater sources as opposed to surface water.

S. Johnson remains active in Burwash Creek, holding claims in the middle reaches of the drainage and extending up Tatamagouche Creek. This season his

Figure 17. *View from the Big Creek valley, looking upstream Mechanic Creek; B. Gow's operation is shown at the mouth of the drainage.*

operation was scaled down and he focused mainly on exploration. A series of bulk samples were collected from test pits to determine the extent of buried, low-level bench deposits variably preserved on the right limit of the creek. A. Johnson plans to continue with exploration in 2024 by completing a drill program to define additional targets for future mining.

Summary

This year's placer operations benefitted from favourable weather conditions that extended the sluicing season. This was clearly reflected in the robust gold production that was reported. Activity expanded into previously underexplored areas, and with a predicted strong gold price throughout the winter months, the outlook for the next mining season is optimistic. The author sends out a sincere thank-you to all the placer miners and operators whose contributions were invaluable to the field season. The collaboration between those working on the creeks and the Yukon Geological Survey staff is what makes our data collection and geological discussions possible (Fig. 18).

Figure 18. *A. Hollis displays a test pan from his claims on King Solomon Hill.*

References

Government of Yukon, 2023. Yukon Snow Survey Bulletin and Water Supply Forecast, April 1, 2023 https://yukon.ca/en/april-1-2023-yukon-snow-survey-bulletin-and-water-supply-forecast [accessed November, 2023].