Platinum Mining in Alaska

DREDGE AND DRAGLINE OPERATIONS AT GOODNEWS BAY

By Charles Johnston

Goodnews Bay Mining Company

The only primary production of platinum metals in the United States occurs on the Bering Sea coast of Alaska. Goodnews Bay indents the mainland coast of western Alaska just south of the mouth of the Kuskokwim River. The Goodnews Bay Mining Company and its predecessor, Northland Development Company, have been mining a placer deposit of platinum metals in this remote area since 1934.

Goodnews Bay, from which the Mining Company derived its name, was originally called Imagpiguak, "Little Ocean", by the Eskimos. It owes its present name to the Russian explorers Ustiugof and Korsakof. In reporting their land expedition of 1818–1819 they called the inlet Dobriek Vestei. Sarichef continued the name in 1826, as did the Frenchman Lutke who came later. However, his use of Bonnes Nouvelles Baie must have been reluctant as he added the disillusioned comment that "Bay of False Reports" would have been more appropriate.

The discovery of platinum in the Goodnews Bay area was made in 1926, when Walter Smith, an Eskimo from the village of Kanakanagamute on Chagvan Bay, led Henry Wuya, an Eskimo, and Charlie Thorsen, a

The Yuba diesel-electric dredge of the Goodnews Bay Mining Company. Before dredging can begin each season some eight to ten thousand tons of ice have to be removed from the pond

Goodnews Bay and the township of Platinum lie on the coast of Alaska just south of the Kuskokwim River. In this remote and inaccessible region, with only two or three ships calling during the few months in which the Bering Sea is navigable, the mining company maintains a complete and self-sufficient undertaking, the only primary producer of platinum in the United States

white prospector, both from the village of Mumtrak, to a place on Platinum Creek where Smith had earlier panned some of the heavy metal which he termed "black gold". Thorsen persuaded Joe Jean, the French Canadian trader at Mumtrak, to send a sample of the metal to the College of Mines at Fairbanks for assay, and in the winter of 1927 came confirmation of the fact that the heavy grey metal was platinum.

Hand-mining operations began in the summer of 1927 in the relatively shallow gravels of Clara Creek, Squirrel Creek, Fox Gulch and Platinum Creek. All of these streams are right-limit tributaries of Salmon River, and all cut the eastern flank of Red Mountain, a rust coloured ridge of rock that rises two thousand feet from the Bering Sea.

From 1927 until 1933 hand mining produced a scant 3,000 ounces of crude platinum, or less than 500 ounces a year. As eight or ten individual miners were involved, it was clear that little profit or progress could be made in developing the deposit.

In 1933 an Anchorage prospector, Walter Culver, obtained leases and options on most of the mining claims in the area, and turned them over in the fall of that year to a group of successful pioneer goldminers headed by Andrew Olson, who with his partners operated the Northland Development Company and Olson & Company in the Flat-Iditarod section of interior Alaska.

In 1934 the Northland Development Company shipped into Goodnews Bay a dragline excavator, trestle sluice box, caterpillar tractor and the rest of the equipment and supplies necessary to set up a complete and self-sufficient modern mining camp. The boat carrying the equipment from Seattle arrived at Goodnews Bay on July 10th. The equipment and supplies were hauled approximately twenty-five miles around the western flank of Red Mountain and up Salmon River

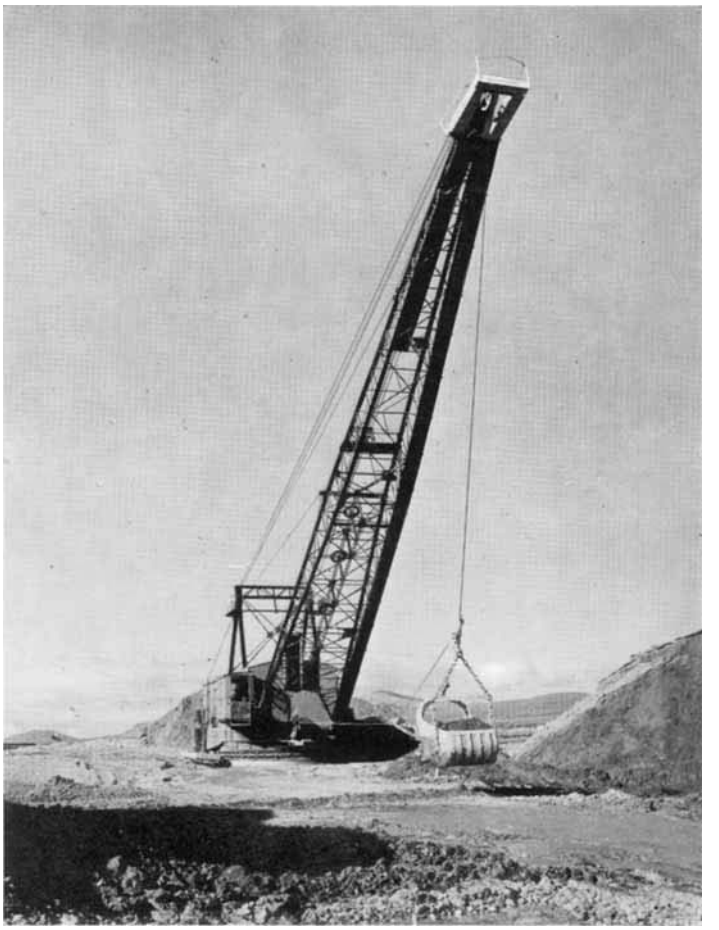
When a post office was established on the sand spit at the mouth of Goodnews Bay in 1935 an official name had to be found for the settlement and 'Platinum' was chosen. The photograph shows the post office and the general store

to Squirrel Creek, the mining camp site. Equipment was assembled, buildings completed and mining operations began on August 11th and have continued without interruption, except for the annual seasonal shutdown, to the present day.

Early in 1935 the Goodnews Bay Mining Company was incorporated under the laws of the Territory of Alaska to consolidate the holdings of the predecessor company in the Goodnews area. This company, with relatively few changes in management and stock ownership, has continued to operate the mine.

From 1934 to 1936, mining was limited to the dragline operation. An intensive drilling and exploration programme in 1934 and 1935 indicated a substantial yardage of deeper ground on Salmon River which provided the

Walter Smith, the Eskimo who discovered the placer deposit of platinum in 1926 while panning for gold



The Bucyrus-Erie walking dragline, with a six-cubic-yard bucket, strips the overburden to permit the dredge to reach bedrock

basis of a $600,000 loan from the Reconstruction Finance Corporation for the purchase of a dredge. In 1937 a Yuba diesel-electric dredge with eight-cubic-foot buckets was purchased, shipped from San Francisco, lightered, hauled to the erection site on Salmon River and assembled. The dredge started digging on November 10th, perilously close to the date of the usual freeze-up. A benign providence provided mild weather, which not only made possible the completion of the required thirty-day trial run to prove the mechanical performance of the dredge and the platinum values in the ground, but as an added and most welcome bonus, permitted dredging until December 22nd – almost a full month later than dredging has been possible in subsequent years.

The bare factual statements that a mining camp and dragline operation were established in 1934 and that a dredge was erected in 1937 are deceptively simple. Because of the isolation of Goodnews Bay and the extremely limited transportation facilities then available, both were substantial undertakings.

In 1934 the present settlement of Platinum consisted of a single log cabin and a few Eskimo sod huts. The log cabin housed the small trading post that had been established the year before. A somewhat larger trading post was located at Mumtrak at the head of Goodnews Bay, some ten miles from Platinum by boat or native kayak and a longer distance by foot or dogsled in the winter. The next nearest source of supply was Bethel, on the Kuskokwim River and about one hundred and thirty-five air miles from Platinum. Bethel could provide staple groceries, fresh meat, clothing and a few simple hardware items. Some repair parts could be obtained from Anchorage or Fairbanks, five hundred to six hundred miles away by bush plane, but the cost of air freight from this distance was prohibitive for all except the direst emergencies. Almost all supplies were shipped by boat from Seattle, a distance of over two thousand miles. During the four summer months – June to September – when the Bering Sea is

open to commercial navigation not more than two or three ships could be expected. In July orders were placed for August shipment for all the equipment and supplies that the mine and the community would require until the following June. As is usual in isolated mines, the problem of ordering for the mine was far more simple than ordering for the community.

In 1934, the first year of operations, the Mining Company produced approximately 2,575 ounces troy of crude platinum; production increased to almost 8,000 ounces in 1935. A production decline in 1936 and 1937 was partly attributable to the preparation for and the erection of the dredge. In 1938, the first full season of operation for both dredge and dragline, production rose to approximately 37,000 ounces.

In subsequent years operating methods have not changed materially, although a number of mining problems have been met and solved, and several ingenious modifications and additions to equipment have been introduced. The successful solution of mining and mechanical problems in large part has been due to the inventive minds of the two Olson Brothers: Andrew Olson, the President of the Mining Company since its inception, and Edward Olson, Vice-President and General Manager since 1937.

The mining season extends from about May 1st to November 15th each year. However, the first of the crew start work about April 1st, overhauling equipment and preparing for mining. One of the first tasks each spring is the removal of ice from the dredge pond. The ice, which averages about three feet in thickness, is first cut into blocks roughly

The digging ladder of the dredge carries a line of ninety-four buckets, each of eight-cubic-feet capacity. The dredge is capable of digging fifty feet below water level to reach the platinum-bearing gravel

Working twenty-four hours a day at a speed of thirty-one buckets a minute, the dredge digs over a million cubic yards of pay gravel in a mining season to yield about 15,000 ounces of platinum

five feet wide and ten feet long with a power chain saw. The blocks of ice are hoisted from the pond by the dragline and piled on shore. With an average dredge pond surface area of two to two and one-half acres, the weight of ice to be removed is formidable – running from eight to ten thousand tons.

The dragline operation utilised two Bucyrus-Erie machines of a yard and a quarter bucket capacity, bulldozers, and hydraulic water. Sometimes an elevated trestle was used for the sluice boxes; at other times, the boxes were placed on bedrock. The dragline season was shorter than the dredge season, running from May 15th to October 15th, an average season involving the handling of about 200,000 cubic yards of gravel and bedrock. Dragline mining operations were discontinued in 1957 when the shallow gravels suitable for this method of mining were exhausted.

The Yuba dredge is capable of digging fifty feet below pond water level and frequently does so, as the depth of the ground has varied from fifteen to sixty feet. The actual thickness of the pay gravel, lying on a bedrock of altered dunite, serpentine, and some extremely hard sedimentary rock, ranges from two to six feet. The dredge, which originally weighed about fourteen hundred tons, now totals nearly two thousand tons as the result of subsequent equipment additions. The added weight has required the addition of four more pontoons to the original thirty-three pontoons that constitute the steel hull. The digging ladder carries a line of ninety-four buckets, each of eight cubic feet capacity, running at a speed of thirty-one buckets a minute. Working twenty-four hours a day, the dredge has averaged a little over a million cubic yards each mining season.

In recent years the dredge has been operating in deep ground that required the stripping of up to forty feet of overburden

Packing the platinum concentrates into moose-hide bags for despatch to Johnson, Matthey & Company, Inc. in New York

to permit the dredge to reach bedrock. Stripping this ground was accomplished by a Bucyrus-Erie walking dragline with a six cubic yard bucket.

Material dumped by the dredge buckets into the main hopper feeds through a $7\frac{1}{2}$ foot diameter revolving trommel screen, thirty-six feet long with perforations ranging from $\frac{3}{8}$ to $\frac{5}{8}$ inch in diameter. Undersize material passing through the screen flows on to a bank of tables fitted with rubber covered riffles, from which the major part of the platinum concentrates are recovered. Overflow from the tables passes through a series of jigs, the concentrates from which are collected on expanded metal and coconut matting in a cleanup sluice. Oversize material from the trommel screen discharges on to the 140-foot long stacker belt at the stern end of the dredge.

Dredge concentrates, consisting of crude platinum and some gold with considerable quantities of black sands of magnetite, chromite and ilmenite, are processed further in a cleanup house on shore where they are passed over a four by eight foot Wilfley table. Further concentration is effected after drying by screening and magnetic separation. Finally, air is blown through the concentrates as they drop from a vibrating hopper, the heavier platinum metals falling through the air into a sectionalised box, while the lighter impurities are blown away into different sections. This method has been found successful in yielding a 90 per cent concentrate.

The crude platinum is shipped in moose-hide or calfskin bags called "pokes" which are double-sacked in canvas and sent by air to Johnson, Matthey & Company, Inc. in New York for weighing and sampling. The crude is then shipped to the J. Bishop & Company plant in Malvern, Pennsylvania, for assaying and refining. After refining, the six platinum metals are returned to Johnson, Matthey & Company, Inc. for marketing. Since the discontinuance of the dragline operations in 1957, the dredge has produced an average of 15,000 troy ounces of crude platinum each season.

An interesting characteristic of the Goodnews platinum deposit is the wide variation in the percentage of iridium. Clara Creek, which is the northernmost of the creeks cutting Red Mountain, yielded a crude that contained 4 per cent iridium. The iridium percentage increased progressively in each creek to the south, reaching a high of 33 per cent in Fox Gulch, the southernmost of the creeks cutting the mineralised section of Red Mountain. The Salmon River deposit, which is a mixture of mineral from its northerly right limit tributaries, has averaged an iridium content of 10 per cent over the years.