

The research on "short cut processes" from mill solutions to nuclear fuel will be terminated.

The research and development division's contribution to the mines branch research on non-nuclear uses of uranium will be increased.

The co-operation and direction of university research will be carried on as usual.

The division's staff has been engaged in studies concerning the probable demand for enriched and natural uranium and a preliminary report has been issued. A study is underway on the probable requirements and costs of producing heavy water in Canada.

The research and development division will continue its function to act as consultants to Eldorado's operating and head office personnel; to gather, evaluate and distribute information; to act as "trouble shooters", and to assist in the sales effort.

The important functions relating to process control, sampling and analytical check work and development are also permanent features of the research development division's operations.

In the following pages a more detailed description of the Beaverlodge and Port Radium milling and leaching plants is given.

PORT RADIUM MILLING AND LEACHING OPERATIONS

Before the operation closed in September 1960, Port Radium production was obtained from two sources—ore mined and old tailings reclaimed from Great Bear Lake.

Two treatment plants were in operation—a mill for gravity concentration and a leaching plant for extraction of uranium from current mill tailings and from reclaimed old tailings.

Milling

The mill was the original treatment plant. It served as a crushing and grinding plant for preparation of leach feed and also as a means of controlling the quality of leach plant feed. This second function was important. The Port Radium ores were exceedingly complex and contained heavy minerals which made the leaching of all mine ore unattractive. These objectionable minerals were partly removed in the mill by gravity concentration methods. Since the uranium mineral—pitchblende—is also a heavy mineral, a portion of the uranium content was recovered by the hydraulic jigs of the gravity concentration section.

The gravity concentrate was shipped to Port Hope since chemicals were much cheaper in southern Ontario than at Port Radium.

A brief description of the mill flowsheet follows:

The mine ore was delivered to a nine-inch grizzly and crushed to 4½ inch size in a jaw crusher. This product was conveyed to a coarse ore bin and fed over a vibrating grizzly feeder with 1½ inch spacing. The undersize was conveyed directly to the fine crushing section while the coarser ore passed over a sorting belt, a slow moving conveyor belt where waste was discarded by hand-picking. About 15% of the total ore was discarded by sorting.

The coarse ore from the picking belt was further crushed in a smaller jaw crusher to 2½ inch size and then joined the undersize ore which was by-passed by the sorting belt.

The fine crushing section consisted of vibrating screens in close circuit with a Symons cone crusher. This crushed ore, at minus ¾ inch size was conveyed to the mill fine ore bin. A certain amount of barren magnetite was removed in the crushing section by a magnetic pulley.