Report of Committee on Evaluation of Arsenic Problem at Yellowknife, Northwest Territories.

The undersigned members of the committee arrived at Yellowknife Monday afternoon, November 28th, 1949. That evening, a consultation was held with Mr. S. Homulos, Resident Mining Inspector, who provided maps and aerial photographs of the area. On the basis of this information an inspection programme was arranged.

Tuesday, November 29th, a flight was made over the area with the purpose of familiarizing the committee of the general topographic features and space relationships of the town and mining operations at the Con and Giant mines, as well as noting drainage from tailings piles at both properties.

The Situation at the Con Mine.

A detailed study of the problem of pollution began at the Con mine with Mr. C.E. White, Mine Manager; Mr. Dick Ross, Mill Superintendent and Mr. S. Gray, a senior metallurgist who had been assigned from the Head Office at Trail, B.C. for special study of the problem. From data presented by these officials it was evident that collection of arsenic fume from roaster smoke had been 88% to 98% efficient over the period August 15th to November 21st. Nevertheless, a besetting problem is still unsolved, --- disposal of the sludge, bearing the arsenic collected from the fume.

Disposal of Sludge at the Con mine

The sludge from the impinger method of collection at the Con mine consists of 20% solid material, this being roughly half by weight arsenic tri-oxide. The liquid comprising 80% of the sludge contains dissolved SO_2 and an amount of 1% to 3% of As_2O_3.

At the time of the inspection this sludge was being discharged into the tailings pile, some 20 feet from the collection boxes, thence along one edge of the pile, then streamed for a distance of approximately one thousand feet to enter the first of a series of small lakes at the head of Pud Lake. (see attached map). On November 28th the concentration of As_2O_3 at the exit to Pud Lake was found to be 13 milligrams per litre. We raised the question as to whether this could be regarded as a new potential hazard to the itinerant public in the general area.

The foregoing method of disposal was described as a stop-gap procedure, pending the delivery of certain pumps which were to be employed in delivering sludge to trenches excavated in the tailings pile. The two trenches already dug some four feet to the permafrost table are anticipated to be adequate for sludge storage until next summer.

Pollution Studies

Study from percolation in the trenches is proposed for the summer of 1950. Until the results of such studies are available, predictions cannot be made as to the probable migratory path and pollution potential of the arsenic bearing sludge solution. Meanwhile, snow samples are being collected weekly within a three mile radius of the roaster and arsenic content is being closely followed. During the early part of this year, arsenic content in snow was found to be as high as 50%. Data obtained this far in the 1949 - 50 season indicates that values will remain low as long as the collection of fume is continued. Unfortunately, it must be recorded that on November 30th, an unexpected breakdown in the collection machinery, made it necessary to revert temporarily to stack discharge through the 100-foot stack of untreated arsenic fume.

should read "in snow was dust" - see memo Kay-Charron 6 Dec 49 & letter Jewitt-Gibson 7 Jun 49

The committee wishes to stress that the Company has not closed it's mind to the conventional collection techniques of electrostatic precipitation or bag-house removal methods of arsenic tri-oxide from the roaster smoke, but desires to have a reasonable length of time in which to solve the problem of disposing of the sludge which is characteristic of their collection method.

The Situation at Giant Yellowknife Gold Mines.

The operations at Giant were inspected in company with Mr.K.Muir, Mine Manager; Mr. K.Grogan, Mill Superintendent and Mr. E. Bonenfant, Metallurgist.

Roaster smoke from this operation continues to be discharged through their 150-foot stack. Mr. Muir outlined in detail, the recent consideration which had been given to the collection and disposal problem. This included the procurement of estimates for electrostatic precipitation and the construction of tall stacks to disperse the fume as well as some work on selecting a disposal area for sludge, should the Con mine method of removal be adopted. The Company is prepared to take action to eliminate the hazard, but, because of the attractive economic feature of the Con process of removal, they wish to await the final evaluation of that process which they have ascertained will be available to them at reasonable cost. The Company as yet have not set up laboratory facilities and is therefore not routinely assessing the contamination of the nearby area. On the other hand, they are closely following the experimental work at Con and furthermore are anxious to co-operate with Federal agencies when their laboratory will be in operation, at an early date.

Local Medical Opinion

On December 1st, a meeting was held with Dr.O.L.Stanton, General Medical Practicioner and Medical Health Officer of the district. He reviewed the two poisoning cases of 1949 which occurred north of Giant at the Akaitcho property and involved two men who drank snow water over an extended period. Dr. Stanton added details to the recorded report of the poisoning of cows by fume deposition from the Con Stack. He indicated that many dogs in the town and surrounding area, showed symptoms of arsenic poisoning during the late winter and summer of 1949. Furthermore there was some loss of wild life in general attributed to arsenic poison.

During the past summer in his capacity as Medical Health Officer Dr. Stanton had warnings inserted in local newspapers advising the washing of leafy vegetables and berries. This was also done by letter to mining camps using water from smaller lakes in the area.

Based on water analysis and his clinical observations, Dr. Stanton expressed the opinion that the current danger to the general public is slight. He agreed to supply to Ottawa, clinical records of the two cases where humans had been poisoned and to undertake arsenic analysis on some proportion of future hospital admissions.

Conclusions

In view of the complexity of the problem, the committee is not in a position to record recommendations at the present time.

It is evident that a proper understanding of the length of time current practices can be permitted to continue, is wholly dependent on evaluation of the seriousness of the hazard these current practices create. Such an evaluation will require a further survey consisting of snow analysis, examination of water conditions at spring break-up, determination of drainage patterns and early summer percolation tests.

An addendum to this report will be submitted in a few weeks time when analytical data has been received from the Con mine and upon completion of tests by Industrial Health Laboratory on water samples from the district and vegetables grown during the 1949 seaso

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