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May 27, 1953

R. L. Kirk, Director, Production Division

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WASTE RESIDUE PROGRAM

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** . . . ** . 3,37.77.3 🔗 🖟 😓 This memorandum presents the current status of the Waste Residue 🙈 Program and advises that a comprehensive sampling program will be conducted on the raffinate cake (AM-7) at St. Louis to accurately determine its uranium content estimated now at about 150,000 lbs. of UgOg. Also, permission is requested to initiate informal discussions with representatives of the General Service Administration for the purpose of securing preliminary information on the potential realizations possible from the by-product cobalt, nickel and copper which would be produced in a Waste Residue Recovery Plant.

Our memorandum of May 20, 1955 presented the results of the detailed sampling program which was conducted on the waste residue materials at 100% and Haist last winter. These data demonstrated that there is appreciably less uranium in these materials than is indicated by 8/F records. The difference is sufficient to have a marked effect on waste residue recovery processing economics. It is not possible to determine from the information available what proportion of this difference is a true loss as a result of weathering and what proportion is a "paper" less. Our preliminary indication of recovery costs, the relative importance of AM-7 and the possibility of weathering losses in its storage make it mandatory that we confirm the uranium content of AN-7 by direct physical inventory methods. The LOOR and Haist data show that a number of the residues contain economically important amounts of sobalt, nickel and copper which may be expected to share the economic burden of uranium recovery.

of Barrell Wall of Since March 1, 1958 the Chemical Construction Corporation, under Contract AT(8001)-1485, has been conducting a development program and engineering studies with the objective of establishing a process for wranium recovery from the various Waste Residues which would be soonomically and technically sound. Developments to date strongly indicate that, a technically attractive process is being established. This process involves leaching the residues under elevated temperature and pressure (about 450°F and 450 psig) with sulfuric acid. The filtered leach liquor may be precipitated in a number of ways to give a good grade uranium product and marketable copper, cobalt and nightl by-products. Preliminary cost estimates (assuming book value

Ffor usenium content) given verbally to Mr. Beyor by Mr. Dasher, Project Engineer for Chemico, indicate costs including transportation OFFICE > MAY 29 1953 Process Development Banch SURNAME > Beyer, 1408

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and reportisation, nofellate 1885 per 15. of UgOs depending upon the extent of by-product realisation. The sector of the sector of the particle of the sector of the Experiment of the sector of the Experiment of the sector of t

The following bebulation presents our present picture relative to the Maste Residues at the three sites the was said was selected by the contract of the contr

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• Brod records - possibly low

• Using 8/7 value for All-7 through May 1, 1988

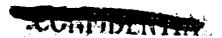
On the basis of a cost of \$25 per 1b. of UgO at 87%% overall recovery, the gross cost of this project including capital transportation and operating expense will be approximately \$5,750,000. From this gross may be deducted by-product credits for cobalt, nickel and copper. These might possibly be as high as \$3,000,000.

The breakdown is as follows:

Capital Costs Cost

Plant Capacity - 67 dry tons per day - 5 year life UgOg produced & 67g5 recovery - 280,000 pounds

Due to the lesser amounts of uranium in the Haist and LOCK residues the St. Louis AM-7 material has become increasingly important in the waste residue picture. Therefore, in view of our experience with the Haist and LOOW residues relative to their uranium content we believe a detailed sampling program must be conducted on AM-7. This has not been done previously because of the conditions which we recognised would be encountered due to the nonhomogenity of the material and the random manner in which it is piled. Despite these problems we must confirm by systematic sampling the uranium content of this material. In addition, the sampling program will provide reliable information relative to the cobalt, nickel and copper content of this material; this is important relative to the economics of a Waste Residue Recovery Plant. In view of Mr. R. S. Brief's experience in sampling the LOCH and Haist materials, we plan to assign him this task for the time required to complete a careful sampling program estimated at two weeks. We will initiate the necessary action for arrangements with St. Louis for this sampling work and with HBL for the necessary analytical services.



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We estimate that the cost of the sampling program, including Brief's salary and travelling expenses, the wages of AEC personnel employed at the Robertson Site, tools and sample containers, will not exceed \$2,600, Costs for the NBL analysis should not exceed \$2,000. These costs are believed to be in proper balance with the estimated project costs.

The cobalt, nickel and copper will be recovered, we expect, as two products a copper oxide and a mixed cobalt-nickel oxide. It is our expectation that these materials can most practically be sold to GSA for stockpile. Since in some cases, these metals are the property of African Hetals and in other cases of the Commission, arrangements will eventually be required for equitable compensation to African Metals for their portion of these metals. We might mention that African Notals has expressed approval in principle to an arrangement where they would "share" cost of an operation in which we recovered the uranium and they recovered the elements which they owned. As a first step to setting up such arrangements and to establishing sound estimates of our uranium recovery costs in this undertaking, we request permission for Mr. A. J. Beyor to contact GSA personnel to explore the amount of compensation we could expect in the sale of the copper oxide and cobalt-nickel oxide products. With this information at hand, we would be in a position to initiate exploratory talks with African Metals and to calculate more reliable costs for the Waste Residue operation with respect to by-product credit.

CC: S. H. Brown

