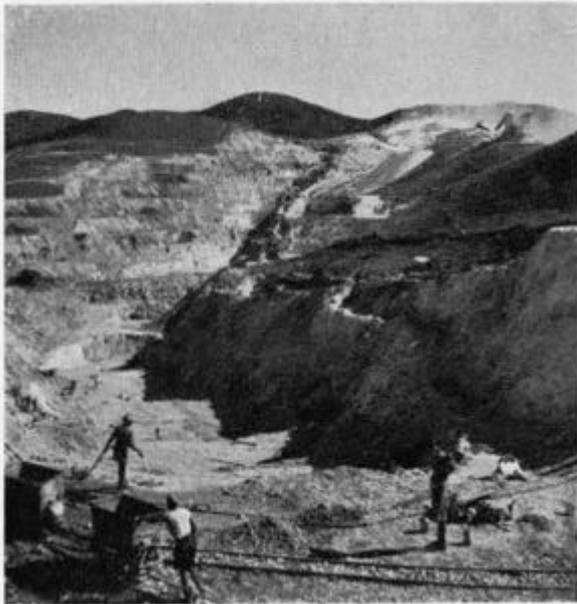


Swaziland – Colonial Geological Surveys 1947-1956

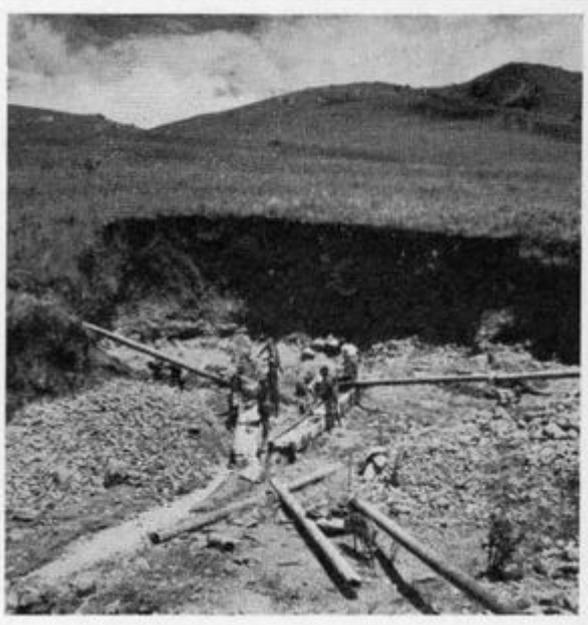
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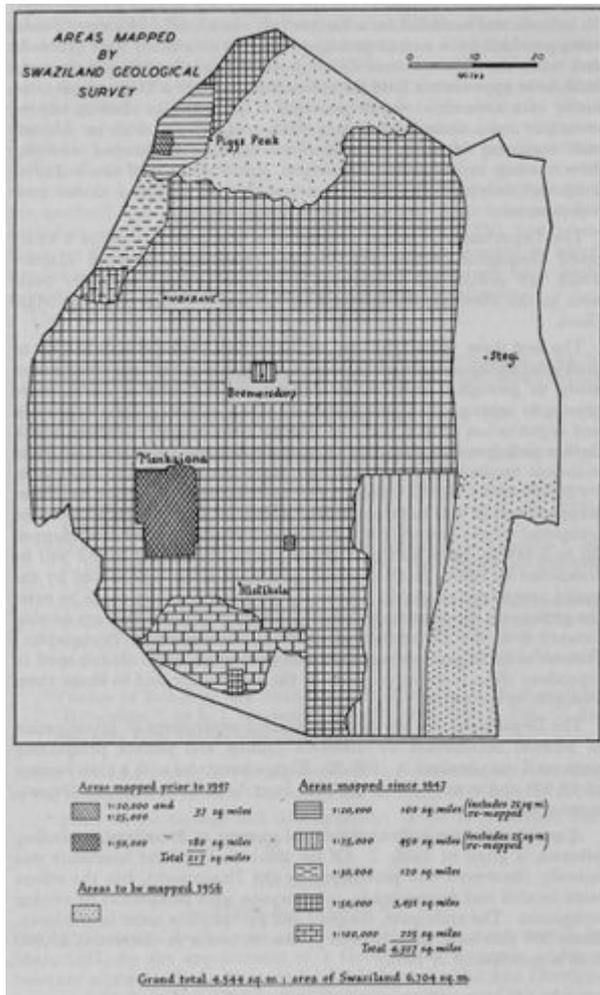
From Dixey, F. 1957. [Colonial Geological Surveys 1947-1956: a review of progress during the past ten years](#). Colonial geology and mineral resources. Bulletin supplement No. 2. London: HMSO.



Swaziland Geological Survey. 1. Havelock chrysotile asbestos mine, Piggs Peak district. Photo by Swaziland Geological Survey. Plate X.



Swaziland Geological Survey. 2. Ground sluicing for tinstone, Makwanakop, Mbabane district. Photo by Swaziland Geological Survey. Plate X.



Geological mapping by the Swaziland Geological Survey. Text-fig. 8.

Swaziland

Geological survey work under the Swaziland Government started in May, 1942, by the appointment of a Government Geologist under a two-year scheme with funds made available from the Colonial Development and Welfare Act. The preliminary reconnaissance of the geology and potential mineral resources of the territory was of such a nature that the scheme was extended for a further two years until 1946, extra funds being provided for a second geologist. Further extensions were granted, and, when the Directorate of Colonial Geological Surveys was formed, funds were approved in 1949 for the establishment of a Department consisting of a director, 1 senior geologist, 2 geologists, 1 drilling superintendent and a male clerk, a lady clerk, and a typist, with an African staff consisting of clerk, laboratory assistant, draughtsman learner, drivers, camp assistants and messengers. In 1956 the staff also included 1 mineral development officer and inspector of mines, 1 driller and 1 prospector.

The Department functions essentially at the present time as a combined Geological Survey and Mines Department, and all matters which are usually the concern of a Mining Commissioner are dealt with by the Director, the Mineral Development Officer and the Male Clerk.

The first three years (1942-44) of the Survey were devoted largely to geological reconnaissance work, though it was difficult to confine attention solely to geological matters, as mineral development problems were constantly arising. The period 1944-47 was a phase of slight expansion and organisation to deal with the mineral development situation, and a further geologist was recruited to map those areas most likely to yield economic results. Up to 1947, 217 sq. miles were

mapped at scales from 1 : 20,000 to 1 : 50,000. From 1947 to 1955, 4,327 sq. miles had been mapped, and it was anticipated that a further 900 sq. miles would be completed by the end of 1956. This should bring the total area mapped up to 5,444 sq. miles leaving 1,260 sq. miles which it is hoped will be completed in 1957. Hand-coloured geological maps reproduced by the ozalid process are available. Recently, an effort has been made to enter the geology on the quarter degree preliminary plot sheets that are coming forward from the Directorate of Colonial (Geodetic and Topographic) Surveys so as to produce standard size geological maps. It is hoped to reproduce these maps in quantity in the near future and to make them available to the public.

The Department has pursued a consistent programme of investigation of mineral occurrences by diamond drilling and surface prospecting since staff was obtained in 1949-50. Eighty boreholes with a total footage of 19,400 and costing about £14,000 have been drilled by the Department since 1950.

A summary of the estimated mineral reserves of Swaziland, excluding asbestos, is given in Table 2. Of the minerals listed the haematite was actually discovered and prospected by the Department, but the others were located and prospected in collaboration with prospectors or mining companies. The andalusite, diaspore and pyrophyllite occur in one body. Some 500 tons have already been produced, and a production of 10,000 tons is anticipated in 1957.

Table 2 Estimated mineral reserves excluding asbestos

Minerals	Estimated Reserves in tons	Remarks
Andalusite	30,000	Proved by drilling; associated with the diaspore.
Barytes..	1,000,000	Proved by drilling.
Cassiterite:		
Lode (metal content)	116	Proved by drilling.
Alluvial (metal content)	350	Estimated from present production.
Calcite	10,000	Estimated by excavation.
Coal	50,000,000	Estimated by drilling.
Columbite	150	Estimated by excavation.
Corundum	500	Estimated from geological knowledge.
Diaspore	30,000	Proved by drilling; associated with the andalusite and pyrophyllite.
Fluorspar	100,000	Estimated from geological knowledge.
Gersdorffite	400,000	By-product of talc deposit.
Gold	50,000 oz.	Estimated from geological knowledge.
Iron Ore:		
High grade haematite	62,000,000	Partly proved by drilling and partly estimated from geological knowledge.
Low grade magnetite.	280,000,000	Partly proved by drilling and partly estimated from geological knowledge.
Kaolin	300,000	Estimated by excavation.
Pyrophyllite	80,000	Half-proved by diamond drilling, half estimated from geological knowledge.
Silica	250,000	Estimated partly from excavation and partly geological knowledge.
Talc (soapstone).	100,000,000	Proved by drilling.

In addition to the reserves tabulated above, large quantities of chrysotile asbestos are known to occur, those of the Havelock Mine being estimated at about 14 million tons of rock carrying 4 per cent. of asbestos. This would indicate more than half a million tons of fibre.

The publication of a report " The Bomvu Ridge Haematite Deposits from Crown Mineral Area No. 7, Mbabane District, Swaziland " by the Department giving probable reserves of 32,000,000 and prospective reserves of 30,000,000 tons of ore averaging 64 per cent. iron has aroused considerable interest among the financial and mining houses in the United Kingdom and South Africa. It is understood that a consortium of interests has approached the High Commissioner with regard to acquiring a prospecting and mining lease.

Investigations of the coal deposits initiated by the Department in 1955, have shown that drilling and analytical results obtained 30 years ago by a company still owning mineral rights over the coal-bearing area are unreliable and that previous pessimistic conclusions concerning the quality and extent of the coal seams must be scrapped. The company has therefore decided to re-drill its holdings and, at the time of writing, it has three diamond drills in the area. Concurrently, the Department is carrying on with its one drill on the adjacent Crown mineral area.

The Department has not had sufficient staff to run an organised programme in connection with underground water supply and engineering problems. Nevertheless, in urgent cases advice has been given and reports written, and some 57 borehole sites have been chosen during the period under review. In the case of water supply it has not always been possible to follow up the advice given concerning the siting of boreholes and it is not therefore possible to give any statistics of results. During the last four years it has become customary for the Public Works Department and the Colonial Development Corporation to consult the Geological Survey on civil engineering problems in connection with the testing of dam sites or the selection of sites for the construction of a pulp mill. Four reports have been written on such problems and are included in the departmental annual reports.

Mineral production statistics of Swaziland for the period 1947-55 are given in Table 3, which shows that the total value has increased almost threefold in the nine-year period, due almost entirely to an increase in the value of chrysotile asbestos fibre, since output figures have remained almost stationary at about 32,000 short tons per annum. Asbestos is by far the most important mineral produced, the Havelock Mine, situated in the north-west of the territory, being one of the world's major producers of chrysotile asbestos. From June 1939, when working commenced, until the end of 1956, nearly 500,000 short tons of asbestos fibre, valued at over £200,000,000, has been produced. The production of tin ore has been small but fairly consistent, ranging from about 25 to 40 short metallic tons. Gold production ceased in 1952, owing to the closing down of the old Piggs Peak Mine. Production, however, at the Devil's Reef Mine was started in 1956. Production of barytes has risen from about 108 to 449 short tons, and it may be anticipated to increase still further in the near future. All previous output has been from surface workings, but a start has been made on underground mining, and the company is taking steps to increase its production to meet the demands of the South African market. A trial consignment of 1 i tons of yttrantalite was shipped to Europe during 1954, but no further orders have been placed for this very complex mineral.

Some 300 diagrams and maps have been drawn up by the technical staff with the assistance of the African draughtsman learner; they have been reproduced by the ozalid process, and, in some cases, have been hand-coloured. Some 50 per cent. of the diagrams have been needed for the acquisition of mineral rights by prospectors and companies.

The laboratory has been organised to provide for mineral separation by heavy liquids, the cutting of rock sections and the identification of mineral species by petrological and X-ray diffraction. The X-

ray apparatus has proved invaluable.

When the basic geological mapping is finished by the end of 1957, it is proposed to retain the two geologists. One will take over the organisation of a possibly enlarged laboratory and receive any additional training necessary to enable him to undertake assays and chemical and silicate analyses. The other will assist the senior geologist in the investigation of mineral deposits, a branch of work very much on the increase owing to the ever increasing demands made by mining houses and prospectors.

Table 3 Swaziland mineral production 1947-1955

		1947	1948	1949	1950	1951	1952	1953	1954	1955
	<i>Short ton</i>	27,954.6	32,431.1	33,966.8	— 32,666.9	34,964.1	34,769.2	30,103.7	30,142.0	32,613.0
	£	840,535	995,767	1,223,486	1,662,741	1,869,345	2,352,827	2,080,110	2,085,514	2,332,151
Metallic tin	<i>Short ton</i>	25.2	22.8	35.30	42.00	35.33	40.17	40.49	38.7	30.44
	£	8,828	11,017	17,528	25,884	31,961	32,501	24,931	24,654	20,629
Gold.	<i>Fine oz.</i>	5,637	3,110	2,840.61	1,793.55	321.85	0.58	—	—	—
	£	45,603	24,994	25,443	22,182	3,974	7	—	—	—
Silver.	<i>Fine oz.</i>	211	124	120	60.46	—	—	—	—	—
	£	35	21	22	15	—	—	—	—	—
Barytes.	<i>Short ton</i>	189.21	108.15	114.26	486.51	525.30	444.57	454.98	361.77	449.12
	£	1,603	1,188	637	3,106	3,355	2,860	3,081	2,384	3,129
Yttrantalite	<i>Short ton</i>	—	—	—	—	—	—	—	1.5	—
	£	—	—	—	—	—	—	—	1,360	—
	TOTALS (k)	896,604	1,032,987	1,267,116	1,713,928	1,908,642	2,388,195	2,108,122	2,113,912	2,355,909

It is possible that one of these geologists will also be detailed to cope with the selection of borehole sites for underground water supply.

The Department has been responsible for the following publications and other contributions to geological knowledge during the 10-year period under review:

Publications

Annual Reports for each year.

Special Report No. 2 Mineral Ownership as Affecting Mineral Development in Swaziland, by H. J. R. Way, 1949.

Special Report No. 3 The Bomvu Ridge Haematite Deposits, C.M.A. No. 7, Mbabane District, Swaziland, by J. G. Uric, 1955. (*In the press.*)

An Occurrence of Chrysotile Asbestos, Usushwana Valley, Mbabane District, Swaziland, by D. R. Hunter, *Geol. Mag.*, 1953, Vol. 90, No. 4. The Archaean of Swaziland, by H. J. R. Way, *Assoc. des Services Geologiques Africains, C.R. Congr. geol. internat. Alger*, 1954.

Iron Ore in Swaziland, by H. J. R. Way. *Symposium sur les Gisements de Fer du Monde*, Vol. 1, *C.R. Congr. geol. internat. Alger*, 1954.

Radiometric Survey as an Aid to the Geological Mapping of the Ancient System of Swaziland, by H. J. R. Way. Paper presented at the Regional Committee on Geology, C.C.T.A., Salisbury, S. Rhodesia, Sept. 1955.

The Intrusion of the Jamestown Igneous Complex in Swaziland, by D. N. Davies, to the Association des Services Geologiques Africains, 20th Sess. internat. geol. Congr. Mexico, 1956.

The Petrochemistry of Some Swaziland Granites, by D. R. Hunter, to the Association des Services Geologiques Africains, 20th Sess. internat. geol. Congr. Mexico, 1956.

The Sub-Karoo and Post-Cretaceous Surfaces of Eastern Swaziland, by C. J. Lenz, to the Association des Services Geologiques Africains, 20th Sess. internat. geol. Congr. Mexico, 1956.

Mineral occurrences

Andalusite

Asbestos

Barytes

Calcite

Coal

Columbite

Corundum

Diaspore

Fluorspar (Fluorite)

Gersdorffite

Gold

Iron and iron ores

Kaolin

Pyrophyllite

Silver

Talc

Tin and tin ores

Water supply

Yttrotantalite

Swaziland – Staff list

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