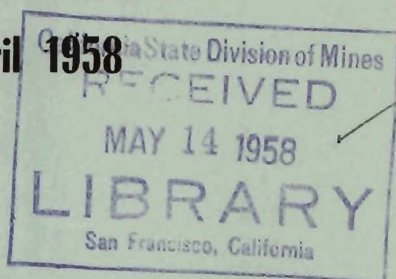


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*Mineral  
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**DIVISION OF GEOLOGY  
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**DEPARTMENT OF GEOLOGY  
University of South Carolina**

TITANIUM MINERALS IN THE VALLEY  
OF THE WATEREE RIVER  
KERSHAW, RICHLAND, AND SUMTER COUNTIES,  
SOUTH CAROLINA

By

T. E. Shufflebarger, Jr.  
Geologist, Southern Railway System  
Washington 13, D. C.

Results of investigations during the period June 1955 to December 1957 indicate that the floodplains of the Wateree River may constitute a commercially important source of ilmenite. The area investigated is centered approximately 9.5 miles south of Camden, South Carolina, and comprises both banks of the river for a distance of 8 miles north from Sumters Landing (Horatio, South Carolina<sup>1</sup>)

Methods of investigation included jetting and hand-augering. A light-weight, gasoline engine driven pump was used to supply a high-pressure nozzle for the jet drill; the jetting was accomplished without the aid of casing, which limited sampling to depths of approximately 20 feet. The hand-auger, 2 inches in diameter, was of conventional design and was used successfully to depths corresponding to the position of the water table locally.

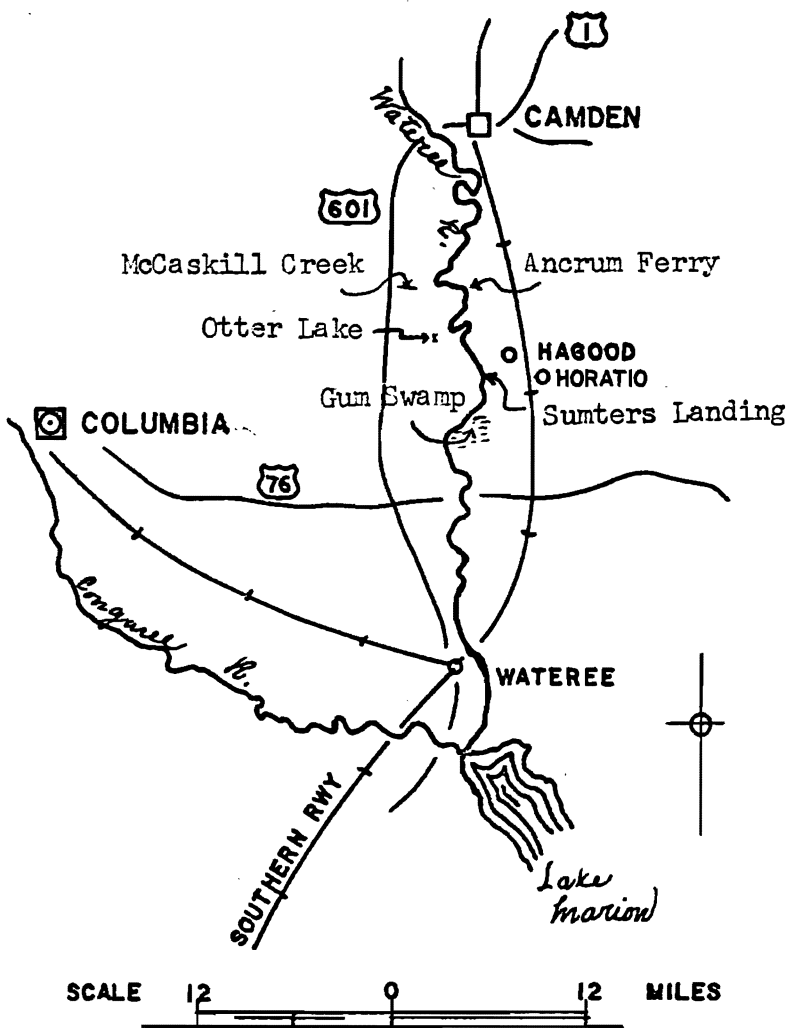
The depth of the valley-fill as well as the channel load<sup>2</sup> ranges from 8 feet in the

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<sup>1</sup>See U. S. Geol. Survey, Eastover and Hagood quadrangles, S. C., Scale 1:62,500, editions 1943 and 1938, respectively.

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<sup>2</sup>Vagrant features of the stream, bars and sand banks.



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vicinity of McCaskill Creek to more than 20 feet in the area of Sumters Landing. Where investigated, the sandy alluvium occurs in the near reaches of the channel as it is presently located. It is not indicated, however, that the bedrock-alluvium interface is a smoothly planed surface, but that channel erosion, hence back-filling, has occurred with increasing severity along the east wall of the valley (Fig. 2).

Samples SL-1 through SL-4 were obtained with the jetting equipment, and the analyses of these samples are shown in Table 1. The ilmenite ranges from 20 to 30 percent of the total "heavy" fraction and comprises a minimum of one percent of the sand by weight. The other heavy minerals present are epidote, hornblende, garnet, kyanite, staurolite, tourmaline, and others<sup>3</sup> in approximate order of decreasing abundance.

Samples SL-1 and SL-4 were obtained by jetting into sands which make up the present channel load. Samples SL-2 and SL-3 were obtained similarly from the alluvium that forms the more or less permanent banks of the river. Note that in all samples except SL-4 the heavy mineral content increases with depth.

Analyses of heavy mineral content of Sample Numbers 1 through 21 are listed in Table 2. With the exception of Numbers 1, 5, and 20 these samples were obtained from alluvium that consists chiefly of well-compacted silt and clay. The holes from which Numbers 16 and 20 were taken penetrated sandy clays probably of

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<sup>3</sup>Chiefly magnetite; rutile, zircon, and monazite are rare.

the Tuscaloosa formation. The heavy mineral fraction of these samples (Numbers 1-21) was composed predominantly of ilmenite.

The depth of alluvial cover, the proportion of sand to silt, and the heavy mineral content appear to be maximal in the vicinity of Sumters Landing; such conditions may also obtain in varying degree in the floodplain downstream from this locality.

The results of investigations to date suggest that further exploration should be carried out in the vicinity of Sumters Landing and on the floodplain downstream from that point. Sampling methods described above are usable, but heavy duty jetting equipment would be more satisfactory.

#### Notice to Readers

With our limited budget and staff we cannot spend as much time as we would like in preparing the Monthly Bulletin, but we feel that even in its present limited form it is well worth-while as a means of encouraging geologic interest in the Southeast. We want to serve as a clearing house for geologic information on South Carolina, and we use the Bulletin to disseminate information to all geologists working in the state or otherwise interested in its geology. We hope that these geologists will make use of the Bulletin to keep in touch with one another, and that from time to time they will submit short progress reports, informal notes, or general comments on their work or on anything related to the geology of the state. We feel that much can be accomplished by a coordinated attack on the geology of the Southeast, and we hope that our Monthly Bulletin will be helpful to the geologists who tackle the job.

Suggested Section, Waterer River Valley  
 J.E.S.G. 3/31/58

Elevation

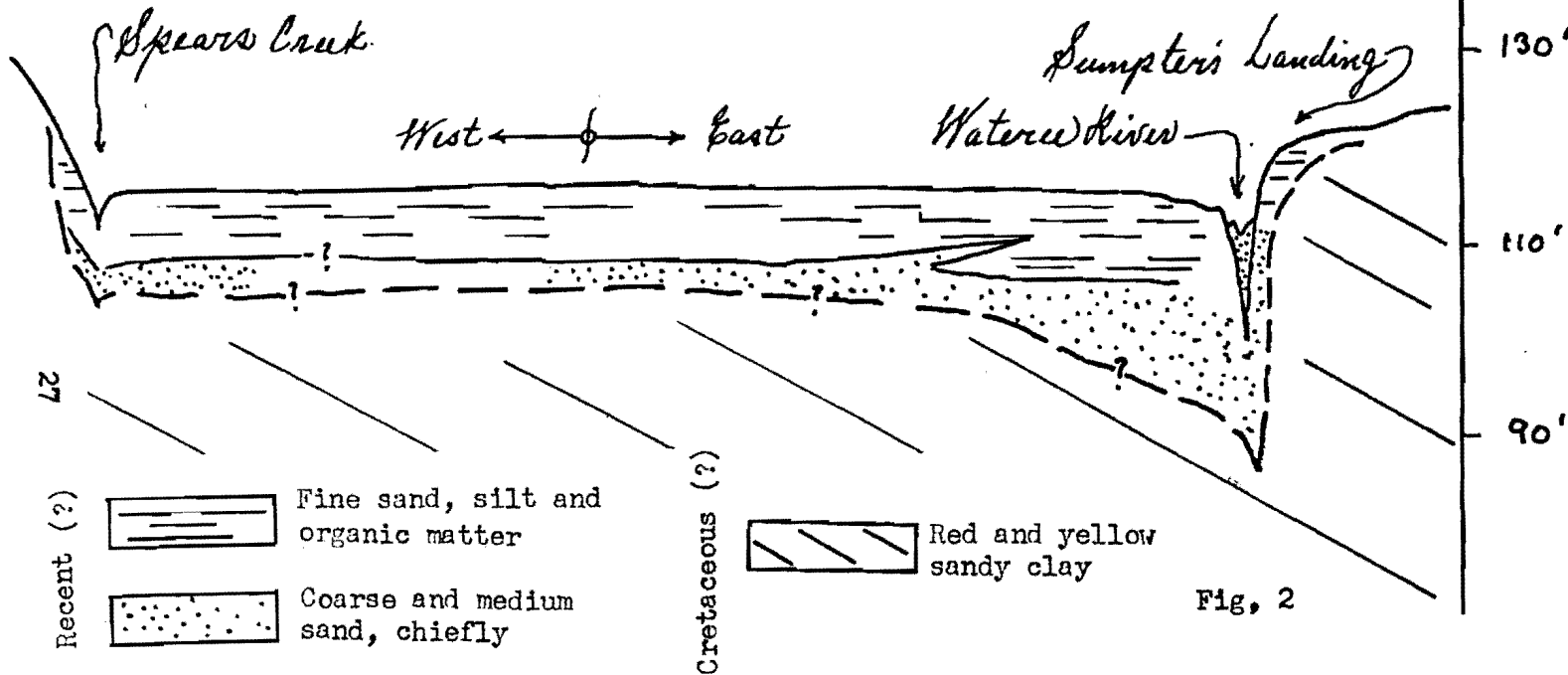


Fig. 2

HAGOOD QUADRANGLE, SOUTH CAROLINANEAR SUMPTERS LANDING

Table I

<u>Lot Sample</u>	<u>Wt. H. M.</u>	<u>% H. M.</u>	<u>% TiO<sub>2</sub> H. M.</u>	<u>% TiO<sub>2</sub> In Sands</u>	<u>Depth</u>	<u>Location From Sumpters Landing</u>
SL - 1	3.2	4.53	10.0	.45	0 - 10'	$\frac{1}{4}$ Mile below W Side
	4.4	7.65	12.6	.96	10- 20'	$\frac{1}{4}$ Mile below W Side
SL - 2	2.6	4.1	8.5	.35	0 - 10'	$\frac{1}{2}$ Mile below W Side
	4	6.7	14.9	1.00	10- 20'	$\frac{1}{2}$ Mile below W Side
SL - 3	4.9	8.0	10.1	.80	0 - 10'	$\frac{1}{2}$ Mile above W Side
	8.8	14.2	10.9	1.55	10- 20'	$\frac{1}{2}$ Mile above W Side
SL - 4	3.2	5.85	12.9	.75	0 - 10'	1 Mile above W Side
	3.7	5.65	9.5	.54	10- 20'	1 Mile above W Side

Table II

HAGOOD-EASTOVER QUADRANGLES,  
SOUTH CAROLINA

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<u>Sample Number</u>	<u>Depth</u>	<u>% H. M.</u>	<u>Location</u>
1	0-4	3.36	Left bank Wateree River, US Route 76 Highway bridge
	4-8	2.5	
	8-10	2.7	
2	0-4	0.6	Left bank Wateree River, between Horatio and Sumpters Landing; all located above surface elevation 133'
	4-8	1.2	
3	0-4	0.1	" " "
	4-6	0.3	
	6-8	0.3	
4	0-4	2.1	" " "
	4-8	0.7	
	8-9	1.9	
5	0-4	0.3	Left bank Wateree River, Ancrum Ferry (abandoned) at surface eleva- tion nearly 135'
	4-8	0.3	



<u>Sample Number</u>	<u>Depth</u>	<u>% H.M.</u>	<u>Location</u>
6	0-4	0.2	Gum Swamp - Jumping Gully area; surface elevation range from 130' to 142'
	4-8	0.3	
7	0-4	0.2	" " "
	4-8	0.2	
	8-10	0.1	
8	0-4	0.1	" " "
	4-8	0.1	
	8-12	0.9	
9	0-4	0.2	" " "
	4-8	0.3	
	8-10	0.9	
	10-11	2.3	
10	0-4	0.1	" " "
	4-8	0.3	
	8-11	1.7	
11	0-4	0.4	" " "
	4-8	0.3	
	8-13	0.4	

<u>Sample Number</u>	<u>Depth</u>	<u>% H. M.</u>	<u>Location</u>
12	0-4	0.5	McCaskill Creek; surface elevation range from 121' to 130'
	4-8	0.1	
	8-12	1.7	
	12-14	2.7	
13	0-4	0.8	" " "
	4-8	0.3	
	8-10	0.2	
14	0-5	1.8	" " "
	5-10	1.2	
15	0-4	0.3	" " "
	4-8	0.2	
	8-10	0.4	
	10-13	0.6	
16	0-4	Trace	" " "
	4-8	"	
	8-12	"	

<u>Sample Number</u>	<u>Depth</u>	<u>% H. M.</u>	<u>Location</u>
17	0-4	Trace	McCaskill Creek (Con't)
	4-8	0.1	
	8-9	0.2	
18	0-4	0.6	Otter Lake area; surface elevation range from 120' to 125'
	4-8	1.1	
19	0-4	0.8	" " "
	4-8	0.8	
	8-9½	2.0	
20	0-4	0.6	" " "
	4-8	1.4	
	8-11	0.6	
21	0-4	0.5	" " "
	4-8	0.1	
	8-12	0.2	

