

5456

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Ed. June, 1923

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
D. S. Patton, Director

State: South Carolina

DESCRIPTIVE REPORT

~~Topographic~~ } Sheet No. 5  
Hydrographic }

LOCALITY 5456  
Charleston, S. C.  
Upper Ashley River

1931

CHIEF OF PARTY  
Lt. H. O. Witherbee.

DESCRIPTIVE REPORT TO ACCOMPANY HYDRO  
SHEET NO. 5

DATE OF INSTRUCTIONS - November 2, 1933. ✓

SURVEY METHODS - Boat sheet No. 5 was used originally as a topographic sheet to locate signals. All signals from Beacon No. 6, lat.  $32^{\circ} 49.7'$ , long.  $80^{\circ} 00.7'$  to signal End, lat  $32^{\circ} 52.8'$ , long.  $80^{\circ} 05.0'$  were located by plane table using the Whatman sheet. These signals were scaled from the Whatman sheet and corrected for distortion before the sheet was sent into the field for use as a boat sheet. A copy of the locations of these signals is enclosed with the report. ✓

The signals on the northern end of the sheet, including Walk and Hard, were located on an aluminum sheet, No. N-2, and transferred with tracing paper. ✓

Shoreline was obtained for the smooth sheet by transferring the area covered by the aluminum topo sheet N-2 from the sheet N-2, and the balance from an enlargement 1-10,000 photostat of celluloid sheet, Reg. No. T-5157. ✓

It will be noted that in some areas, hydrographic signals were built and located near triangulation stations. This was necessary because the triangulation stations were not visible for any great distance along the river. (See Ken, Le Pont, Bee, She, and Fan.) The same name was used for the topographic station and the triangulation stations were not plotted. ✓

Standard methods of hydrography were used. All soundings were by lead line, and all positions by sextant angles on signals located either by triangulation or by topography. ✓

DISCREPANCIES - None.

RANGES - The Cowhead Reach Range, and also Beacons 1 & 3 should be changed as they mark a former channel which no longer exists. The break in the shoal, which was covered by the rear range and Beacon No. 3, has filled up.

CHANNELS - A shoal exists on the west side of the river just below the point where signal George is located and extends about a mile down stream. There is no break in this shoal as shown on chart No. 1239. The range covering this break should be removed. The channel on the North East side of this shoal, which has a minimum depth of seven feet should be used.

TIDES - Tide reducers for the area were obtained from gauges located at, Griggs Landing, Magnolia Gardens, and Bee's Ferry Bridge.

STATISTICS -

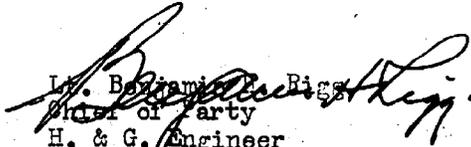
Vol.No.	Statute Miles	No. of Soundings	No. of Positions
1	33	1968	301
2	23.6	1362	216
3	31	1704	335
4	6.8	380	81
	<u>94.4</u>	<u>5414</u>	<u>933</u>

Respectfully submitted,

G. A. Stanton

Lt. M. O. Witherbee  
Chief of Party  
H. & G. Engineer

Forwarded by,

  
Lt. Benjamin Riggs  
Chief of Party  
H. & G. Engineer

TOPOGRAPHIC SHEET

&

BOAT SHEET NO. 5

Station	Scaled		Direct		Reverse			
	Latitude	Longitude	Cor. Lat.	Cor. Long.	Lat. Cor.	Long. Cor.		
End	32°52'	80°05'	1121.6 (420.7)	8.2 (1544.0)	5.4 1125.0	0 8.2	1.0 421.7	4.7 1548.7
Flag	"	80°04'	1225.1 (617.0)	1501.6 (53.3)	2.9 1228.0	4.6 1506.2	1.5 618.5	0.2 53.5
Dock	"	"	990.9 (852.5)	1407.5 (147.2)	993.3	1411.8	854.6	147.5
Mose	"	"	853.7 (987.3)	1145.7 (409.0)	855.7	1149.2	989.7	410.3
Lead	"	"	663.1 (1178.4)	921.5 (633.1)	664.7	924.3	1181.2	635.0
Gold	"	"	711.2 (1130.2)	704.5 (850.5)	712.9	706.7	1132.9	853.1
Van	"	"	498.2 (1343.5)	425.2 (1129.5)	499.4	426.5	1346.7	1133.0
Tooth	"	"	608.9 (1232.5)	179.6 (1374.5)	610.4	180.1	1235.5	1378.6
Tail	"	80°03'	306.1 (1534.8)	1201.3 (353.3)	306.8	1205.0	1538.5	354.4
Brook ↓	"	"	15.6 (1825.5)	1256.5 (297.0)	15.6	1260.4	1829.9	297.9
Cove	32°51'	"	1558.9 (285.6)	875.0 (681.7)	1562.6	877.7	286.3	683.8
Bend	"	"	1316.3 (527.3)	1031.4 (525.5)	1319.5	1034.6	528.6	527.1
Plain	"	"	1174.5 (672.4)	814.4 (743.3)	1177.3	816.9	674.0	745.6
Lost	"	"	758.2 (1087.7)	773.9 (784.0)	760.0	776.3	1090.3	786.4
Cone	"	"	289.3 (1558.9)	284.4 (1272.3)	290.0	285.2	1562.7	1276.2
First	32°50'	80°03'	1593.0 (252.3)	242.6 (1315.8)	1596.8	243.3	252.9	1319.9
Hen	"	80°02'	1494.3 (351.2)	1227.8 (325.4)	1497.9	1231.6	352.0	326.4
Bee	"	"	1258.4 (585.3)	1156.2 (398.5)	1261.4	1159.7	586.7	399.7
George	"	"	1478.4 (366.4)	628.7 (925.5)	1481.9	630.6	367.3	928.4
Bill	"	"	898.5 (947.2)	372.7 (1184.8)	900.6	373.8	949.5	1188.4
Dan	32°49'	80°00'	(8.4)	(131.5)	8.4		8.4	131.9
Lock	"	"	(968.0)	(164.6)			970.3	165.1
She	32°51'	80°03'	425.3 (1421.5)	1367.3 (188.8)	426.3	1371.5	1424.9	189.4

TOPOGRAPHIC SHEET  
&  
BOAT SHEET NO. 5

Station	Latitude	Longitude	Direct		Reverse			
			Cor. Lat.	Cor. Long.	Cor. Lat.	Cor. Long.		
Le Point	32° 50' (1406.6)	80° 02' (935.5)	438.0	621.0	439.1	622.9	1410.0	938.4
Grooms	" (1451.0)	80° 01' (1051.7)	393.5	501.8	394.4	503.3	1454.5	1054.9
Ken	32° 49' (752.0)	" (916.5)	1094.4	632.3	1097.0	634.2	753.8	919.3

Lat. 1848.31 True 1'  
1843.88 Ave. of Plot.  
 Error 4.43 meters

Long. 1559.9 True 1'  
1555.1 Ave. of Plot.  
 Error 4.8 meters

Correction/100 meters = + .23967

Correction/100 meters = + .3077 meters.

INVERSE POSITION COMPUTATION

$$s_1 \sin \left( \alpha + \frac{\Delta\alpha}{2} \right) = \frac{\Delta\lambda_1 \cos \phi_m}{A_m}$$

$$s_1 \cos \left( \alpha + \frac{\Delta\alpha}{2} \right) = \frac{-\Delta\phi_1 \cos \frac{\Delta\lambda}{2}}{B_m}$$

$$-\Delta\alpha = \Delta\lambda \sin \phi_m \sec \frac{\Delta\phi}{2} + F(\Delta\lambda)^2$$

in which  $\log \Delta\lambda_1 = \log (\lambda' - \lambda)$  - correction for arc to sin\*;  $\log \Delta\phi_1 = \log (\phi' - \phi)$  - correction for arc to sin\*; and  $\log s = \log s_1 +$  correction for arc to sin\*.

		NAME OF STATION				
1. $\phi$	32 50 03.56	Rear Range, Cowhead Reach	$\lambda$	80 01 51.94		
2. $\phi'$	32 50 19.30	Beacon No. 3	$\lambda'$	80 02 02.06		
$\Delta\phi (= \phi' - \phi)$		15.74	$\Delta\lambda (= \lambda' - \lambda)$	+ 0 7.12		
$\frac{\Delta\phi}{2}$		7.87	$\frac{\Delta\lambda}{2}$	3.56		
$\phi_m (= \phi + \frac{\Delta\phi}{2})$	32 50 11.43					
$\Delta\phi$ (secs.)	+15.74		$\Delta\lambda$ (secs.)	+7.12		
<b>log <math>\Delta\phi</math></b>	1.197005		<b>log <math>\Delta\lambda</math></b>	0.852180		
cor. arc - sin	-		cor. arc - sin	-		
<b>log <math>\Delta\phi_1</math></b>			<b>log <math>\Delta\lambda_1</math></b>			
<b>log <math>\cos \frac{\Delta\lambda}{2}</math></b>			<b>log <math>\cos \phi_m</math></b>	9.921391		
<b>colog <math>B_m</math></b>	1.43862		<b>colog <math>A_m</math></b>	1.490706		
<b>log <math>s_1 \cos \left( \alpha + \frac{\Delta\alpha}{2} \right)</math></b>	-2.685626 n	(opposite in sign to $\Delta\phi$ )	<b>log <math>s_1 \sin \left( \alpha + \frac{\Delta\alpha}{2} \right)</math></b>	+ 2.267580		
			<b>log <math>s_1 \cos \left( \alpha + \frac{\Delta\alpha}{2} \right)</math></b>	- 2.685626 n		
<b>log <math>\Delta\lambda</math></b>	0.852180	3 log $\Delta\lambda$	<b>log <math>\tan \left( \alpha + \frac{\Delta\alpha}{2} \right)</math></b>	- 0.418016 n		
<b>log <math>\sin \phi_m</math></b>	9.731191	log F	$\alpha + \frac{\Delta\alpha}{2}$	339 05 52.5		
<b>log <math>\sec \frac{\Delta\phi}{2}</math></b>		log b	<b>log <math>\sin \left( \alpha + \frac{\Delta\alpha}{2} \right)</math></b>			
<b>log a</b>	0.586674		<b>log <math>\cos \left( \alpha + \frac{\Delta\alpha}{2} \right)</math></b>			
<b>a</b>	3.860		<b>log <math>s_1</math></b>			
<b>b</b>			cor. arc - sin	+		
<b><math>-\Delta\alpha</math> (secs.)</b>	+3.9		<b>log s</b>			
$\frac{\Delta\alpha}{2}$	+1.9					
$\alpha + \frac{\Delta\alpha}{2}$	339 05 52.5					
<b><math>\alpha</math> (1 to 2)</b>	339 05 51.4					
$\Delta\alpha$	-3.9					
	180					
<b><math>\alpha'</math> (2 to 1)</b>	159 05 50.5					

NOTE.—For log s up to 4.52 and for  $\Delta\phi$  or  $\Delta\lambda$  (or both) up to 10', omit all terms below the heavy line except those printed (in whole or in part) in heavy type or those underscored, if using logarithms to 6 decimal places.

Table of arc-sin corrections for inverse position computations

$\log s_1$	Arc-sin correction in units of seventh decimal of logarithms	$\log \Delta\phi$ or $\log \Delta\lambda$	$\log s_1$	Arc-sin correction in units of seventh decimal of logarithms	$\log \Delta\phi$ or $\log \Delta\lambda$	$\log s_1$	Arc-sin correction in units of seventh decimal of logarithms	$\log \Delta\phi$ or $\log \Delta\lambda$
4.177	1	2.686	5.223	124	3.732	5.525	497	4.034
4.327	2	2.836	5.234	130	3.743	5.530	508	4.039
4.415	3	2.924	5.243	136	3.752	5.534	519	4.043
4.478	4	2.987	5.253	142	3.762	5.539	530	4.048
4.526	5	3.035	5.260	147	3.769	5.543	541	4.052
4.566	6	3.075	5.269	153	3.778	5.548	553	4.057
4.599	7	3.108	5.279	160	3.788	5.553	565	4.062
4.628	8	3.137	5.287	166	3.796	5.557	577	4.066
4.654	9	3.163	5.294	172	3.803	5.561	588	4.070
4.677	10	3.186	5.303	179	3.812	5.566	600	4.075
4.697	11	3.206	5.311	186	3.820	5.570	613	4.079
4.716	12	3.225	5.318	192	3.827	5.575	625	4.084
4.734	13	3.243	5.326	199	3.835	5.579	637	4.088
4.750	14	3.259	5.334	206	3.843	5.583	650	4.092
4.765	15	3.274	5.341	213	3.850	5.587	663	4.096
4.779	16	3.288	5.349	221	3.858	5.591	674	4.100
4.792	17	3.301	5.356	228	3.865	5.595	687	4.104
4.804	18	3.313	5.363	236	3.872	5.600	702	4.109
4.827	20	3.336	5.369	243	3.878	5.604	716	4.113
4.857	23	3.366	5.376	251	3.885	5.608	729	4.117
4.876	25	3.385	5.383	259	3.892	5.612	743	4.121
4.892	27	3.401	5.390	267	3.899	5.616	757	4.125
4.915	30	3.424	5.396	275	3.905	5.620	771	4.129
4.936	33	3.445	5.403	284	3.912	5.624	785	4.133
4.955	36	3.464	5.409	292	3.918	5.628	800	4.137
4.972	39	3.481	5.415	300	3.924	5.632	814	4.141
4.988	42	3.497	5.422	309	3.931	5.636	829	4.145
5.003	45	3.512	5.428	318	3.937	5.640	845	4.149
5.017	48	3.526	5.434	327	3.943	5.644	861	4.153
5.035	52	3.544	5.440	336	3.949	5.648	877	4.157
5.051	56	3.560	5.446	345	3.955	5.652	893	4.161
5.062	59	3.571	5.451	354	3.960	5.656	909	4.165
5.076	63	3.585	5.457	364	3.966	5.660	925	4.169
5.090	67	3.599	5.462	373	3.971	5.663	941	4.172
5.102	71	3.611	5.468	383	3.977	5.667	957	4.176
5.114	75	3.623	5.473	392	3.982	5.671	973	4.180
5.128	80	3.637	5.479	402	3.988	5.674	989	4.183
5.139	84	3.648	5.484	412	3.993	5.678	1005	4.187
5.151	89	3.660	5.489	422	3.998			
5.163	94	3.672	5.495	433	4.004			
5.172	98	3.681	5.500	443	4.009			
5.183	103	3.692	5.505	453	4.014			
5.193	108	3.702	5.510	464	4.019			
5.205	114	3.714	5.515	474	4.024			
5.214	119	3.723	5.520	486	4.029			

Lae

August 16, 1934.

Division of Hydrography and Topography:

✓ Division of Charts:

Tide Reducers are approved in  
4 volumes of sounding records for

HYDROGRAPHIC SHEET 5456

Locality Upper Ashley River, South Carolina.

Chief of Party: M. O. Witherbee in 1934.

Plane of reference is mean low water reading.

3.7 ft. on tide staff at Bees Ferry Bridge

8.6 ft. below B. M. 1

2.3 ft. on tide staff at Magnolia Gardens

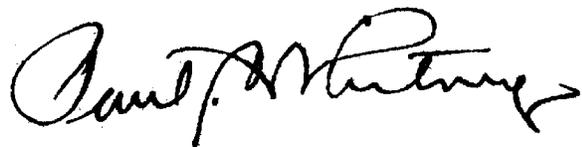
16.0 ft. below B. M. 1

2.8 ft. on tide staff at Grigg's Landing.

8.8 ft. below B. M. 1

Height of mean high water above plane of reference is 5.4 feet at Bees Ferry Bridge, 5.5 ft. at Magnolia Gardens, 5.8 ft. at Grigg's Landing.

Condition of records satisfactory except as noted below:



Chief, Division of Tides and Currents

Verification Report H. 5456.

Records;

The records are neat and legible. They conform to the general requirements of the Hydrographic Manual. ✓

Protracting.

The quality of the protracting is excellent. ✓

Drafting.

The day numbers and letters are poorly drawn and are not always legible. Aside from that the field drafting was good. ✓

Crossings.

Lines for the most part run parallel to the banks of the river. The few lines that cross are in agreement. ✓

Curves.

The usual depth curves could be drawn. However portions of several curves were omitted where there was not sufficient space to include them without confusing the adjacent curves. ✓

Comparison with other Data.

Inspection showed the hydrographic sheet to be in agreement with the boat sheet and the topographic sheet 6075. ✓

Junctions.

The only junction is on the south with H. 5449 which has not yet been verified. ✓

Remarks.

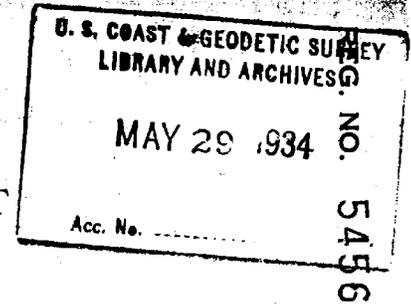
The topographic signals BROOK, SIX, SQUARE, and COM are plotted offshore. Inspection of T. 6075 and the boat sheet does not identify upon what features of topography these signals are located. Nor are these signals listed in the "Description of Topographic Signals" file. ✓

Signal CHARM, lat.  $32^{\circ}52'.4$ , long.  $80^{\circ}04'.8$ , was plotted on this sheet as a topographic signal. However it was found to be a triangulation station located in 1933. The position of the signal as plotted on this sheet checked the geographic position for the triangulation station so nothing was changed except the symbolic designation of the station. ✓

Submitted by - R. B. Krum,  
Sept. 10, 1934.

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET



The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

Field No. 5

REGISTER NO. **5456**

State South Carolina

General locality Charleston, S. C.

Locality Upper Ashley River

Scale 1-10,000 Date of survey Jan. - Mar., 19 34

Vessel Shore Party No. 2

Chief of Party Lt. M. O. Witherbee

Surveyed by G. A. Stanton & A. M. Weber

Protracted by A. A. Lockerbie & J. B. Kinghorn

Soundings penciled by C. J. Harryman & J. B. Kinghorn

Soundings in ~~fathoms~~ feet

Plane of reference Mean Low Water

Subdivision of wire dragged areas by \_\_\_\_\_

Inked by R. B. Krum

Verified by R. B. Krum

Instructions dated November 2, 19 33

Remarks: Survey and descriptive report under direction of Lt. M. O. Witherbee. Smooth plotting under direction of Benjamin H. Rigg.

Field Records Section (Charts)

HYDROGRAPHIC SHEET No. 5456.

The following statistics will be submitted with the cartographer's report on the sheet:

Number of positions on sheet	..933..
Number of positions checked	..205..
Number of positions revised	...1..
Number of soundings recorded	..5414..
Number of soundings revised	...3..
Number of signals erroneously plotted or transferred	none.....

Date:.....Sept. 10, 1934.....

Cartographer:.....R. B. Krum.....

Verification of pretracting } by R. B. Krum  
~~Verification of inking of rocks and shoals~~

Time: 10 hrs.

Verification of inking by R. B. Krum

Time: 30½ hrs.

Review by *R. J. Christman*

Time: 11 hrs.

Section of Field Records.

Review of Hydrographic Survey No. 5456 (1934).

Upper Ashley River, Charleston, South Carolina.  
Surveyed January-March 1934.  
Instructions dated Nov. 2, 1933 (M. O. Witherbee)

Hand lead soundings --- Fixed positions on shore objects.

Chief of Party - M. O. Witherbee  
Surveyed by- G.A. Stanton and A. M. Weber  
Protracted by - A. A. Lockerbie and J. B. Kinghorn  
Soundings penciled by C. J. Harryman and J. B. K.  
Verified and inked by R. B. Krum.

1. Condition of Records.

The records are neat and legible and conform to the requirements of the Hydrographic Manual. Four topo signals (Brook, Six, Square, Com.) are plotted in the water area without note or statement indicating their nature. However they are all close inland and whether or not they are permanent objects is of little importance.

2. Compliance with Instructions for the Project.

The character and extent of the survey is in accordance with the instructions for the project.

3. Sounding Line Crossings.

The general development is by lines parallel with the channel. On the few cross lines run the depth agreement is good.

4. Depth Curves.

The usual depth curves can be drawn satisfactorily.

5. Junction with Contemporary Surveys.

The junction with H. 5449 (1933-4) on the south is satisfactory.

6. Comparison with Prior Surveys.

H. 2188 (1894) is a survey of the Ashley River southward of lat 32-53. The deepest water in the channel retains its relative location but the details over shoal areas and at cross overs have changed considerably; in some places deepening and in others shoaling. The controlling feature is the middle ground shoal in Cowhead Reach. The crossover has filled up and the north end of the shoal has filled in to the western shore. The Descriptive Report recommends the removal of the range beacons as they no longer mark a channel. The channel lies eastward of the shoal with a controlling depth of 7 feet as against 8 feet in 1894. A 10 foot and a 3 foot sounding of the 1894 survey fall in lat. 32-51.6 long. 80-03.55 and lat. 32-51.45 long. 80-03.45 respectively, where the present survey shows 15 feet and 8 feet. They are soundings not supported by adjacent depths on their lines and in the light of present survey possibly were read 1 fathom in error.

They have not been carried forward to the new survey and should be disregarded in future charting. There are no prior surveys for the northern part of the Ashley River.

7. Comparison with Chart No. 1239.

The only information on the chart not traceable to the survey of 1894. is a 6 foot spot in the vicinity of Drayten Hall in lat. 32-52.3 long. 80-04.1 which appears to control the depth in the channel at this point. No authority for the 6 foot sounding was found, but it appears on the first edition (1922) Of Chart No. 1239. The depth in the locality according to the 1894 survey was 8 to 9 feet and on the present survey is 10 to 11 feet. The 6 should not be retained on the chart , but the channel charted in accordance with the 1934 survey.

8. Field Plotting.

Protracting and field drafting in general were good except that many of the position numbers and day letters were poorly drawn.

9. Additional Field Work Recommended.

None.

10. Superseding Old Surveys.

Within the area covered the present survey will supersede the following survey for charting purposes,  
H. 2188 (1894) entirely.

11. Reviewed by- R. J. Christman, Sept. 1934.

Inspected by-A. L. Shalowitz.

Examined and approved:

*K. T. Adams*

K. T. Adams,  
Chief, Section of Field Records.

*F. Borden*  
Chief, Section of Field Work.

*L. O. Solbut*  
Chief, Division of Charts.

*Glade*  
Chief, Division of H. & T.

Applied to chart 1239 S.M.A. Apr. 1937

20 for 23, 1936  
L.S.

U.S. GEOLOGICAL SURVEY, WASHINGTON, D.C.

WATER RESOURCES DIVISION

WASHINGTON, D.C.

REPORT OF INVESTIGATION

NO. 10, PART 1, CHAPTER 1, SECTION 1

WATER RESOURCES DIVISION, WASHINGTON, D.C.

1936

WATER RESOURCES DIVISION, WASHINGTON, D.C.

TABLE OF CONTENTS