

5299

U. S. COAST & GEODETIC SURVEY
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Ed. June, 1928

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

State: Louisiana

DESCRIPTIVE REPORT
Photo
Topographic } Sheet No. T-5299 5299
~~Hydrographic~~

LOCALITY

Timbalier Bay
Grand Pass Timbalier
~~Caillou Island To East of Timbalier~~
~~Bay~~ Island

1934

CHIEF OF PARTY

M. H. Reese, Jr. H. & G. Eng.

5299

Applied to EIR 1274. Mar. 1937 - J.H.T.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

REG. NO.

TOPOGRAPHIC TITLE SHEET

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

Field No. 12

REGISTER NO. T-5299 5299

State LOUISIANA

General locality TIMBALIER BAY

Locality ~~CALLOU ISLAND TO EAST OF~~ Grand Pass Timbalier
TIMBALIER ISLAND

Scale 1:24,000 Photographs 11/30
Date of survey 12/1, 1932

~~Work~~ AIR PHOTO COMPILATION PARTY NO. 24 NEW ORLEANS, LA.

Chief of party M. H. Reese

Surveyed by See data sheet in the descriptive report.

Inked by F. A. Donadieu

Heights in feet above ----- to ground to tops of trees

Contour, Approximate contour, Form line interval -----feet

Instructions dated November 7, 1933.

Remarks: Compiled on scale of 1: 24,000 and enlarged and
printed on scale of 1: 20,000 by Photo Lithography.

- NOTES ON COMPILATION -

SHEET NO. T-5299

FIELD NO. 12

PHOTOS, NO. 1826-1833; 1910-1917

DATE OF PHOTOGRAPHS 11/30/32

TIME 11:20 to 11:23 A.M.

12/1/32

10:39 to 10:42 A.M.

BY

DATE

PROJECTION BY *E. P. Hernandez Jr.*
E. P. Hernandez Jr.

2/19/34

PROJECTION CHECKED BY *M. H. Reese*
M. H. Reese

2/19/34

CONTROL PLOTTED BY *J. C. Dobler*
J. C. Dobler

2/21/34

CONTROL CHECKED BY *M. H. Reese*
M. H. Reese

2/21/34

RADIAL LINE PLOT BY *H. C. Smith*
H. C. Smith

2/22-28/34

RADIAL LINE PLOT CHECKED BY *M. H. Reese*
M. H. Reese

2/28/34

DRAFTING OF PHOTOGRAPHS BY *F. A. Donadieu*
F. A. Donadieu

3/29 to 4/4/34

PASTING OF NAMES BY *F. A. Donadieu*
F. A. Donadieu

5/22/34

REVIEW OF COMPILATION BY *E. L. Fitch*
E. L. Fitch

5/1/34

AREA OF DETAIL INKED- 8.0 sq. Statute Miles (Approx.)

LENGTH OF SHORELINE (more than 100 meters from nearest opposite shore)--
60.4 Statute Miles.

COMPILER'S REPORT.

FOR

PHOTO TOPOGRAPHIC SHEET, FIELD NO. 12.

GENERAL INFORMATION:

Instructions dated November 7, 1933.

The information used in the compilation of this sheet has been obtained from the notes and sketches on the field photographs, from members of the field inspection party in questionable areas, and from the reports and data of Lieutenant W. D. Patterson who was engaged in combined operations work in this vicinity at the time of the compilation.

The accompanying "Notes on Compilation" details all data and statistics in connection with the compilation of this sheet. The statistics, as to shoreline and area, of this sheet are approximate because of the irregularity of the coast line and the many bayous and small islands.

The high water line as shown on the South side of Timbalier Island was taken from the field photographs on which the field inspection party had sketched in the high water line. The islands east of Timbalier Island are very low and marshy. And the shorelines, and even the islands themselves, are subject to constant change. It was noted by the field inspection party that the islands had changed to such a degree since the pictures were taken (1932) that it was impossible to obtain the present shorelines from the photographs; consequently the high and low water lines of these islands were traced from the Topographic sheets executed by Lieutenant W. D. Patterson, reduced to the scale of this sheet.* Ordinarily there is very little tide in this locality (approximately one foot) and its effect was neglected because of the small scale of the photographs. The high winds that are common to this section in the winter are the cause of the changeability of these islands by backing up the waters of the Gulf or forcing it out from the bays and lakes to the north.

The area covered by this sheet consists principally of low marshy ground none of which is under cultivation.

This sheet was compiled from photographs taken by the U. S. Army Air Corps' five lens T-3A Camera, No. 32-3, photograph numbers 1826-1833 (West Flight), approximately parallel with Longitude $90^{\circ}26'30''$ and 1910-1917 (East Flight) approximately parallel with Longitude $90^{\circ}20'00''$.

CONTROL.

(A) Sources.

The following sources of control were used in the compilation of this sheet:

(a) Triangulation by W. Mussetter in 1928, recomputed to North American 1927 datum.

(b) Triangulation by W. D. Patterson (Lieutenant) in 1934.

In the compilation of this sheet the Geographic Positions obtained by W. Mussetter in 1928 were on the North American 1927 datum. These geographic positions were recomputed to the North American 1927 datum (by a member of Lieutenant E. R. Mc Carthy's party) eastward from the triangle "Amos", "Beach", "Hammock", which had been adjusted to the North American 1927 datum. Recent ties with first order work indicate very small error in this area. These positions were supplemented by those of Lieutenant W. D. Patterson in 1934, and because of the recent ties with first

* See review report at back.

order work, mentioned above, any error that exists would be unplotable at the small scale of the photographs, 1-24,000. Further data concerning the control in this area can be obtained from the reports of Lieutenant W. D. Patterson, 1934.

The control is adequate for this sheet and the radial line plot gave satisfactory intersections.

(B) Discrepancies.

No discrepancies in position of control stations was found. No control stations established by other organizations was used in this compilation.

COMPILATION:

(A) Method.

The usual five lens radial line method of plotting was used throughout in the compilation of this sheet.

(B) Adjustment of Plot.

The photographs in the two strips covering the area shown by this sheet appear to be free of excessive tilt and scale fluctuation and the radial plot required no unusual adjustments.

(C) Interpretation.

To denote mangrove brush three or four feet high the symbol used was- (ξ), otherwise only the conventional graphic symbols were used as approved by the Board of Surveys and Maps (1932), and no great difficulty was experienced in interpreting the photographic detail.

There are no roads or canals in this area. The larger bayous were shown by double full lines while the lesser bayous were shown by one solid line depending in weight upon the importance of the feature. In most cases (unless labeled on the field inspection prints) the classification of these features had to be determined by a close examination of the photographs.

Because of the constant change and the age of the photographs when compiled, no attempt was made to show shoal areas. This is left to the discretion of the Hydrographic Party which will soon be engaged in this area.

(D) Information From Other Sources.

There was no information derived from sources other than the photographs and reports of the field inspection party, except the shorelines of the islands east of Timbalier Island, as mentioned previously in this report under "General Information". The photographs covering this sheet (except those covering the above mentioned islands) were clear, and it is believed the compilation is exact in all particulars.

(E) Conflicting Names.

The names shown on this sheet were taken from U. S. Coast and Geodetic Survey Chart No. 197 entirely, as no other survey of this area has been made in recent years. Other than two or three small houses and one dock there is no development of

any nature in this area, and no names exist except those of bays, islands, bayous, etc., which have been used for years; therefore, as far as can be ascertained there are no conflicting names. The Hydrographic Party engaged in this area may, however, supplement the names shown on this sheet. *No new names are shown B.G.J.*

COMPARISON WITH OTHER SURVEYS.

The junctions with adjoining sheets to the east, north, and west, T-5303, T-5298, and T-5295, respectively, are satisfactory.

In comparing this sheet with U. S. C. & G. S. chart No. 197 the numerous changes in the marshy areas inland from the coast are to be noted, but, the old characteristics of shoreline and bayous may be readily seen. The islands along the coast, however, have undergone the greatest change, the east end of Timbalier Island having broken off so that Timbalier Light House is now approximately two (2) miles from the larger island. As noted previously in this report, the islands east of Timbalier Island have also undergone radical changes.

LANDMARKS.

The only landmark in this area suitable for navigation is Timbalier Light House which has been previously located.

RECOMMENDATIONS FOR FURTHER SURVEYS.

The compilation of this sheet is believed to have a probable error of five (5) meters in well defined detail of importance for plotting and of ten (10) meters for other data. There was no need to exaggerate any detail of importance in order to keep it distinct in the photo-lithographic process. *See below*

To the best of my knowledge this sheet is complete in all detail of importance for charting purposes, within the accuracy stated above, and no additional surveys are required.

Submitted by: *E. L. Fitch*
E. L. Fitch.
Chief Draftsman.

Approved by: *M. H. Reese*
M. H. Reese.
Chief of Party.

The value of 5 to 10 meters given above is high for work on this scale. A better estimate is an accuracy of location of about 10 meters for intersected points and 10 to 20 meters for other detail.

B. G. Jones.

OFFICE REVIEW

The following pages of the report discuss the revision of this compilation to coordinate the compilation with the plane table and Hydrographic surveys in this area.

The review at the back is concerned with the final compilation after revision and does not discuss the preliminary review made before the compilation was returned to the field.

B. G. Jones.

MEMORANDUM TO ACCOMPANY DESCRIPTIVE REPORT OF SHEET NO. 5299

The error found on sheet No. 5299 was between Lat. $29^{\circ}02' - 29^{\circ}04'$ and Long. $90^{\circ}26' - 90^{\circ}23'$, or the east end of Timbalier Island. The area in question is a mud flat. The shoreline of this area should have been rodded in by Lieut. Patterson's party as the photographs were available for his use, and could have been checked for hazy areas.

Reasons of error on this sheet were due to the photographs being taken at low water, and failure of the field inspection party to trace in the high water line on the photographs.

Another field inspection was made on July 10, 1934, during high water, and the high water line was sketched on the photographs. The sheet has been corrected from information received on this date.

~~There is attached to the sheet a rough tracing of the area corrected.~~


M. H. Reese

The revision mentioned above was taken up to coordinate the compilation and the Hydrographic surveys.

B.g.g.

MEMORANDUM TO ACCOMPANY SHEET NO. 5299

In the investigation of the apparent discrepancies existing between the air photo compilation sheet and the plane table survey by Lieutenant W. D. Patterson covering the area contained within the limits of this sheet, the geographic positions of the topographic stations were used in coordination with the geographic positions of the triangulation stations as control in a new radial line plot. This new plot was deemed necessary in order to determine the cause of the discrepancies between the compilation and the survey, and the intersections thus established are considered the proper and correct locations of the stations appearing on this sheet. In the development of this plot it was found that the geographic positions of some of the topographic stations did not coincide with the positions of these stations as established by the radial line plot intersections. Concluding these geographic positions to be in error, the geographic positions of the radial line plot intersections were scaled from the sheet and submitted as the correct locations of the topographic stations in question.

Plane table survey T6068 and T6062

The following individual reports of all topographic stations for which corrections were considered necessary describe in detail the corrections made and the conclusions drawn concerning the causes of the discrepancies between the compilation and the survey.

Topographic station BOBIN is located approximately at Latitude $29^{\circ}05'30''$ and Longitude $90^{\circ}26'50''$. The geographic position of this station, as established by the radial line plot intersection, coincided with the geographic position as established by the plane table survey of Lieutenant Patterson. A small correction of detail was found necessary due to an apparent misinterpretation of the shore line. The western tip of the island was shown somewhat too large. The topographic details in the vicinity of this station, when corrected, agreed with the sketch made by the field inspection party. The 4.4 meters distance from the station to the tip of the island, as stated in the card description of this station, is apparently meant to be 44 meters. This has been indicated in red ink on the card bearing the description of this station. The correction made on the celluloid tracing was also made on the overlay sheet.

Topographic station CASSE is located approximately at Latitude $29^{\circ}06'45''$ and Longitude $90^{\circ}22'25''$. The geographic position of this station, as established by the radial line plot intersection, coincided with the geographic position as established by the plane table survey by Lieutenant Patterson. However, due most likely to the dimness and indefiniteness of the photograph, some of the topographic details were not traced correctly on the celluloid. The photograph was properly oriented and the details, found in error, correctly drawn. This correction was also shown on the overlay sheet.

Topographic station DOG is located approximately at Latitude $29^{\circ}06'10''$ and Longitude $90^{\circ}21'55''$. The geographic position of this station, as established by radial line plot, coincided with the geographic station as established by the plane table survey by

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Lieutenant Patterson. It seems that misinterpretation of the shore line at this point caused the error found existing. This error was corrected on the celluloid, and shown in red ink on the overlay sheet. The ties from the station to the shore line to the south as indicated on the field sketches made by the field inspection party and the plane table survey party vary slightly. The former have taped it as six meters, the latter as three meters. The detail as traced from the photograph apparently checks the six meter distance.

Topographic station IF is located approximately at Latitude $29^{\circ}05'25''$ and Longitude $90^{\circ}25'55''$. The geographic position of this station, as established by radial line plot, coincided with the geographic position as established by the plane table survey by Lieutenant Patterson. Poor definition on the photographs is undoubtedly the cause of this error. Incorrect position of shore line and omission of a small lake and small streams were found to be the errors. These errors were corrected on the celluloid tracing and indicated on the overlay sheet. Reference points No. 3 and No. 4 on the field sketch made by the plane table survey party on the back of the card description of this station were not discerned on the photographs. Either these points were exaggerated on the sketch, or the very poor degree of definition of the photographs is the cause of their not being clearly discerned.

Topographic station GAD is located approximately at Latitude $29^{\circ}02'58''$ and Longitude $90^{\circ}24'50''$. The geographic position of this station, as established by the radial line plot, did not coincide with the geographic position as established by the plane table survey by Lieutenant Patterson. The geographic position as established by the radial line plot intersection was scaled from the celluloid and submitted as the correct position of the station.

See Pages 11 and 12

The topographic detail in the vicinity of the station was corrected on the celluloid tracing when the photograph was properly oriented. A small stream which has recently cut its way through this vicinity just west of the station, and which does not show on the photographs, was not drawn on the celluloid due to the fact that sufficient information concerning its location was not available.

The correction made on the celluloid was indicated on the overlay sheet. A new sketch was made and attached to the card description made by the plane table survey party.

Topographic station BRUSH is located approximately at Latitude $29^{\circ}05'15''$ and Longitude $90^{\circ}25'35''$. Part of the description made by the plane table survey party is evidently meant for station HAL. The geographic position of this station, as established by the radial line plot, does not coincide with the geographic position as established by the plane table survey of Lieutenant Patterson. The former was scaled from the celluloid tracing and submitted as the correct position of this station. A new field sketch was drawn and attached to the card description of this station made by the plane table survey party. Due to the existence of considerable grass and

mud near the shore line in the vicinity of the station, the shore line was found misinterpreted and incorrectly drawn on the celluloid. This was corrected on the celluloid tracing when the photograph was properly oriented, and indicated on the overlay sheet in red ink.

Topographic station BOB is located approximately at Latitude 29°04'15" and Longitude 90°28'05". The geographic position of this station, as established by the radial line plot, did not coincide with the geographic position as established by the plane table survey by Lieutenant Patterson. The former was scaled from the celluloid tracing and submitted as the correct position of this station. Upon proper orientation of the photograph no detail was found in error, and no correction made.

Topographic stations SAT located approximately at Latitude 29°03'45" and Longitude 90°28'50", JAY located approximately at Latitude 29°03'25" and Longitude 90°28'15", and GUN located approximately at Latitude 29°02'50" and Longitude 90°25'55" were not recovered.

Topographic station LOU is located approximately at Latitude 29°05'25" and Longitude 90°29'25". The geographic position of this station, as established by the radial line plot, coincided with the geographic position as established by the plane table survey by Lieutenant Patterson. Upon examination of the detail around this station it was found that a small bayou had been omitted in tracing the detail. This correction was made on the celluloid tracing and indicated on the overlay sheet. This oversight was probably due to the fact that the photographs were somewhat dim and indefinite in this vicinity.

Topographic station SOW is located approximately at Latitude 29°06'30" and Longitude 90°28'25". The geographic position of this station as established by the radial line plot did not coincide with the geographic position as established by the plane table survey by Lieutenant Patterson. The former was scaled from the celluloid tracing and submitted as the correct position of the station. No detail was found in error on the celluloid when the photographs were properly oriented. *See review of this page 12*

An oil field located between Latitudes 29°06'00"-29°27'00" and Longitudes 90°27'00"-90°28'15" has been shown on the sheet by a broken line showing its approximate limits and labeled "oil field". This is deemed advisable since the field is under development and new wells are constantly being drilled and old ones abandoned. Hence their position cannot accurately be shown without frequent revision.

Topographic station BALE is located at Latitude 29°03' and Longitude 90°25' approximately. The geographic position coincides with the location established by the radial line plot. No corrections of topography were found necessary.

On the topographic sheet, topographic stations COB and POT are reversed. Likewise, the description and geographic position given for station COB are apparently for station POT.

Topographic station ^{POT}~~COB~~ is located about 5 1/2 miles northwest of Timbalier Light, on the south point of the second most southerly island of a group known as Pelican Islands. This is a permanently marked station. The descriptive sketch made by the plane table survey party for this station cannot be reconciled, in part, with the topography around the station. However, ties #1 and #2 check satisfactorily. A sketch of the station is furnished as a supplement to the original sketch and attached to same.

Topographic station ^{COB}~~POT~~ is located as described on the description card originally made out for Topographic station COB, ^{POT} and its geographic position as shown on the description card for station COB may be correct. ^{COB}~~POT~~ is not a permanently marked station. Card description for ^{POT} has not been filed.

The topography around station COB was drawn incorrectly due to bad orientation of the photographs. The shore line was revised as shown on the celluloid and indicated on the overlay sheet in red ink.

The topography around topographic station POT which is located on a T-shaped island southwest of the Pelican Islands was checked, as all other detail was checked, for orientation and interpretation of the shore line, and a small change was necessary at approximately Latitude 29°06'05" and Longitude 90°25'12", and also at approximately Latitude 29°06'00" and Longitude 90°26'00". These revisions were made on the celluloid and indicated in red ink on the overlay sheet.

See page 12 and 13

List of scaled geographic positions:

		(37)
GAD ✓	29° 02'	1810
		(315)
	90° 24'	1308
		(1345)
BRUSH	29° 05'	502
		(612)
	90° 25'	1011
		(940)
SOW ^{not described}	29° 06'	907
		(943)
	90° 28'	679
		(1453)
Examined & approved: BOB ✓	29° 04'	394
		(1541)
	90° 28'	82

*50m SE Pelican Islands agrees with other
differs by 50 meters with plane table
differs by 15 meters from plane table
differs by 15 meters from plane table
differs by 10 meters from plane table*

Confusing. The "Pot" is never used and is shown on the compilation. The description has been corrected and placed. "COB" is not verifiable and is not shown and not described. B.S. Jones.

Examined & approved:

M. H. Reese
M. H. Reese,
Chief of Party.

See pages 11 to 13.

For general statement covering this report see memorandum attached to report for sheet T 5298

E. P. Hernandez Jr.
E. P. Hernandez, Jr.,
Surveyor.

REVIEW OF AIR PHOTO COMPILATION T 5299 (1934)

Comparison with other surveys:

1. Plane table control surveys T 6061 and T 6062 (1934). The plane table surveys show location of stations for hydrographic control, including stations marked and described on Form 524, and H. W. line along the outside coast.

The outer coastline east of $90^{\circ} 23'$ was taken from the new plane table surveys by the compiler. The outer coastline west of $90^{\circ} 23'$ (except for the eastern tip of Timbalier Island) has been changed on the compilation in this office to agree with the 1934 plane table surveys since they are later than the photographs. The ^{eastern} tip of Timbalier Island, mentioned above, was re-compiled after a second field inspection in July 1934, subsequent to the 1934 plane table surveys, and has been retained as shown on the revised compilation.

There were numerous and considerable differences between the descriptions on Form 524 for plane table stations and the compilation as first submitted. A general discussion and review of the revision of the compilations to secure coordination with the plane table work is given on Pages 8 to 12 of descriptive report T 5298.

A detailed discussion by the compiler of the revision of this compilation is given on Pages 7 to 10 of ^{the preceding} this report.

The differences noted on Page 10 of this report have been disposed of in this office as follows: (See Pages 10 to 12 of report T 5298 for conclusions leading to general acceptance of the plane table locations of described stations in preference to the compilation)

a. Station "Gad": Difference in location of 50 meters. Tried both positions out on the Hydrographic Sheets and found that the photo

location caused a decided jump in the sounding lines when fixes were changed. Plane table position is accepted as correct due to the probability of erroneous spotting of the station on the photographs. The description of the station does not agree by a considerable amount with the detail on the compilation. The station is not shown on the compilation and the description has not been filed.

Stations "Brush" and "Bob": The differences in location of 10 to 15 meters are probably due to erroneous spotting on the photographs. The plane table positions are accepted as correct. Stations "Brush" and "Bob" are shown on the compilation and the shoreline has been altered slightly to fit the descriptions.

Station "Sow", east gable of a house, difference in location of 15 meters. The plane table position is accepted as correct not described and not shown on the compilation.

The discussion regarding stations "Pot" and "Cob" on Page 10 is confusing. Station "Pot" is recoverable and is shown on the compilation. The description has been corrected and filed. Station "Cob" is not recoverable and is not shown and no description has been filed for it.

B. G. Jones

REVIEW OF PHOTO TOPOGRAPHIC SURVEY NO. T-5299

Title (Par. 56) Forwarded with sheet.

Chief of Party M. H. Reese

Compiled by F. A. Donadieu.

Project Louisiana Air Photo Compilation Instructions dated Nov. 7, 1933
Party No. 24

1. The survey and preparation for it conform to the requirements of the Topographic Manual. (Par. 8; and 16, a, b, c, d, e, g and i.) (Note) Par. 8 not applicable to this party.
2. The character and scope of the compilation satisfy the instructions and the "Notes on the Compilation of Planimetric Line Maps from Five Lens Aerial Photographs".
3. The control and adjustment of the radial plot were adequate. (Par. 12, 29.)
4. There is sufficient control on maps from other sources that were transmitted by the field party for their application to the charts. (Par. 28.) None submitted.
5. High water line on marshy and mangrove coast is clear and adequate for chart compilation. (Par. 16a, 43, 44.)
6. The representation of low water lines, reefs, coral reefs and rocks, and legends pertaining to them is satisfactory. (Par. 36, 37, 38, 39, 40, 41.) See Par. C, Page 3 of Desc. Report.
7. Important details shown on previous surveys and on the chart have been compared with this sheet and a statement has been entered in the report regarding the removal from the chart or change in position of important detail such as rocks, lights, beacons, prominent objects, bridges, docks, and structures along the water front. No changes in such details have been noted on this sheet. ~~See also at back of report page.~~
8. The span, draw and clearance of bridges are shown. (Par. 16c.)
9. The data furnished by the Field Inspection is adequate.

NOTE: Strike out paragraphs, words or phrases not applicable and modify those requiring it. Paragraph numbers refer to those in the Topographic Manual. Use reverse side for extending remarks.

- 10. The descriptive report covers all details listed in the Manual, so far as they apply to this survey. (Par. 64, 65 and 66.)
- 11. The descriptive report also contains all additional information required in photo topography as prescribed in the instructions and in the "Notes on the Compilation of Planimetric Line Maps from Five Lens Aerial Photographs".
- 12. The descriptions of recoverable stations and references to shore line were accomplished on Form 524, and scaling of positions checked. (Par. 29, 30 and 57.) ~~not a sample but a complete set.~~ See following review report attached at back pages 7 to 12
- 13. A list of landmarks for charts was furnished on Form 567 and scaling of positions checked. (Par. 16d, e, 60.) See page 4
- 14. The geographic datum of the sheet is North American 1927 ^(unadjusted) and the reference station is correctly noted. (Par. 34.)
- 15. Junctions with contemporary surveys are adequate.
- 16. Geographic names are shown on the sheet and are covered by the Descriptive Report. (Par. 64, 66k.)
- 17. The quality of the drafting is ^{fair} good. (Par. 31, 32, 33, 35, 36, 37, 38, 39, 40, 41, 42, 45, 46.)
- 18. No additional surveying is recommended.

19. Remarks:

20. Examined and approved: M. H. Reese
 (Sgd.) M. H. Reese.
 Chief of Party

21. Remarks after review in office: ^{pages 10 to 12}
~~See review report attached at back of this report.~~

Reviewed in office by: B. G. Jones

Examined and approved: C. J. Green
 Chief, Section of Field Records
L. O. Pollock
 Chief, Division of Charts

B. Borden
 Chief, Section of Field Work
G. Wade
 Chief, Division of Hydrography and Topography.

