

**F00442**

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SERVICE

## DESCRIPTIVE REPORT

*Type of Survey* Field Examination

*Field No.* AHP-10-6-98

*Registry No.* F00442

### LOCALITY

*State* Pennsylvania / New Jersey

*General Locality* Delaware River

*Locality* Vicinity of Tacony -  
Palmyra Bridge

1998

CHIEF OF PARTY  
Brian A. Link

### LIBRARY & ARCHIVES

DATE MAY 26 1999



**HYDROGRAPHIC TITLE SHEET**

F00442

INSTRUCTIONS - 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.

AHP-10-6-98

State Pennsylvania-New Jersey

General locality Delaware River

Locality Vicinity of Tacony-Palmyra Bridge

Scale 1:10,000

Date of survey July 7-July 8, 1998

Instructions dated 5-21-98

Project No. S-D902-AHP

Vessel Launch 0517

Chief of party Brian A. Link

Surveyed by Atlantic Hydrographic Party

Soundings taken by echo sounder, hand lead, pole \_\_\_\_\_

Graphic record scaled by M. McMann, J. Gaskin

Graphic record checked by MJM, JBG

Protracted by MAPINFO

Automated plot by HP 2500C Plotter (Office)  
HP Deskjet 694C (Field)

Verification by Atlantic Hydrographic Branch Personnel

Soundings in fathoms feet at MLW MLLW

REMARKS:

Notes in red in the Descriptive Report were made during office processing

AWOIS ✓ & SURFV by MBH 5-24-99



DESCRIPTIVE REPORT TO ACCOMPANY  
HYDROGRAPHIC SURVEY F00442  
FIELD NO. AHP-10-6-98  
SCALE: 1:10,000  
1998  
ATLANTIC HYDROGRAPHIC PARTY  
CHIEF OF PARTY: Brian A. Link

A. PROJECT

This survey was conducted in accordance with Hydrographic Project Instructions S-D902-AHP, Delaware River, New Jersey-Pennsylvania, Vicinity of Tacony-Palmyra Bridge, dated May 21, 1998.

This project was conducted in response to an urgent request from the Delaware River Pilots Association and the Burlington County Bridge Commission to perform a full bottom coverage survey in the area of the Tacony-Palmyra Bridge.

B. AREA SURVEYED

The area surveyed for F00442 covers a small area surrounding the Tacony-Palmyra bridge between New Jersey and Pennsylvania bounded by the following geographic limits:

North - 40°00'53"N  
South - 40°00'38"N  
East - 075°02'17"W  
West - 075°03'01"W

This survey was conducted from July 7 (DN 188) to July 8, 1998 (DN 189).

C. SURVEY VESSELS

NOAA launch 0517, a 21-foot MonArk, was the vessel used to collect all survey data. There were no unusual vessel configurations nor problems encountered.



D. AUTOMATED DATA ACQUISITION AND PROCESSING - See also Evaluation Report

Coastal Oceanographic's HYPACK software package, version 6.4 was used to collect all hydrographic data for this survey. HPS version 4.03 was used for data processing.

Other computer programs used were:

MapInfo	Ver. 4.5
VELOCITY	Ver. 3.1 (2/25/98)

E. SIDE SCAN SONAR EQUIPMENT

Side scan sonar (SSS) operations were conducted using an EG&G model 260 slant-range corrected SSS recorder and an EG&G 272-T dual-channel, single frequency towfish. The towfish was operated on the 100-kHz frequency and was configured with a 20° beam depression. The side scan sonar equipment used for the survey was towfish serial number 016835 and recorder serial number 016942.

Side scan sonar data was collected utilizing the 50-meter range scale. In order to obtain the required 200% coverage, main-scheme lines were run at 40-meter spacing. Adequate coverage was determined by producing two separate swath plots and ensuring 100% coverage on each plot.

The side scan sonar towfish was maintained at a height off the bottom of 8 to 20 percent of the range scale used. Confidence checks were performed on a routine basis, primarily by noting changes in bottom texture on the outer edges of the sonagram, and on buoys and other contacts in the survey area.

All significant contacts were measured off the sonagrams and entered into an HPS contact table. Contact heights, positions, and cross reference correlations were determined using the HPS Contact Utility program. Contacts were investigated using echo sounder development.

F. SOUNDING EQUIPMENT

An Innerspace model 448 depth sounder, serial number 241, was used to collect all soundings. No problems were encountered with the echo sounder.

A standard lead line calibrated in meters, serial number 0517, was used during this survey for comparison readings with the echo sounder.



## G. CORRECTIONS TO SOUNDINGS

The Innerspace model 448 depth sounder was adjusted for an assumed speed of sound through water of 1500 meters/second. Changes to the gain and/or chart speed were noted on the echogram. Digitized soundings agreed with the analog trace within 0.1 meter.

Corrections for the speed of sound through water were computed from data obtained with Sea-Bird Electronics Inc. SEACAT electronic profiler, serial number 192276-287. Data quality assurance tests were performed in accordance with the Field Procedures Manual (FPM) 2.1.3.2. Program VELOCITY was used to compute speed of sound through water corrections. \*Copies of the velocity tables and cast data are in the "Survey Separates." *Appendices!*

Correctors for the velocity of sound through water were determined from the casts listed below:

<u>Velocity Table No.</u>	<u>Cast No.</u>	<u>Deepest Depth (m)</u>	<u>Applicable DN</u>	<u>Cast Position</u>	<u>Day</u>
1	1	15.1/19.6*	188-189	40°00'46"N 075°02'36"W	189

\* software extrapolated depth

Correctors were applied to the sounding data prior to plotting.

A static draft of 0.3 meter was applied to the on-line data. The draft was measured by subtracting the difference from a punch mark on the side of launch 0517, 0.6 meter above the transducer, to the water surface. Settlement and squat measurements were performed on September 15, 1997 (DN 258), at Pasadena, Maryland, using Lietz level S/N 08754. Settlement and squat correctors and the static draft corrector were applied on-line through the offset table. \*Copies of the field data, the graphs of the settlement and squat correctors vs. speed in meters/second, and the offset table are included in the "Survey Separates." *Appendices!*

The Philadelphia, PA tide station (854-5240) served as control for datum determination. Unverified actual water level heights from this gauge were downloaded from the NOAA web site and used for correcting the soundings for this survey. This station is also the reference station for the predicted tides. This survey required one tide zone. A time correction of +24 mins was necessary for the actual tides. The height correction was x1.05.

Approved tides were requested from the Ocean and Lake Levels Branch, N/OES231, in a letter dated October 8, 1998. A copy of the letter is appended to this report.

*\* Data filed with original field records,*



## H. CONTROL STATIONS - See also Evaluation Report

The horizontal control datum for this project is the North American Datum of 1983. The USCG Differential GPS (DGPS) Beacon at Cape Henlopen, DE was used to control this survey. The position for the reference station antenna is 38° 46.60679'N, 075° 05.25105'W.

## I. HYDROGRAPHIC POSITION CONTROL

DGPS was used as the method of positioning for all hydrographic data on this survey. The USCG Differential GPS beacon at Cape Henlopen, DE was used as the reference station in conjunction with beacon receiver serial number X-1086 and antenna serial number MBA-M1039 on launch 0517. A Starlink sensor, serial number 700417A1065 was used as the remote station on vessel 0517. This equipment met the accuracy standards for this 1:10,000 scale survey.

Due to time constraints no performance checks were conducted during the project. Closing checks performed at the end of the previous project and opening checks on the subsequent project were within error tolerances.

Occasionally a good position misplotted on the raw track plot. This problem was attributed to good DGPS data following a period of questionable DGPS data. These positions were reviewed, then edited or rejected as necessary.

## J. SHORELINE - See also Evaluation Report

Shoreline shown on the final sounding plot was from the raster image of chart 12314, 28th edition, Oct. 17, 1992. The MapInfo program was used for plotting. There were no shoreline changes noted from the chart.

A complete list of all detached positions by day, listing the position of each feature, is included in the accordion file submitted with this survey.

## K. CROSSLINES

Crosslines were not run due to the small area surveyed. Contact investigations that crossed main scheme hydrography showed excellent agreement.

## L. JUNCTIONS - See also Evaluation Report

This survey does not junction with any contemporary surveys.



M. COMPARISON WITH PRIOR SURVEYS - See also Evaluation Report

The prior survey covering this project is H-9842, 1:10,000 scale, 1979.

No dangers to navigation were identified during the course of this survey.

Sounding comparison between the prior survey and the current survey is generally good. Most soundings agree within 1 meter, with the exception of a 17-foot shoal sounding on the prior survey at 40°00'47.4"N, 75°02'39.8"W. The shoalest depth found in this area on the current survey was 25 feet. *Concur - Chart present survey soundings*

N. ITEM INVESTIGATION REPORTS

No AWOIS items were assigned to this survey.

O. COMPARISON WITH THE CHART - See also Evaluation Report

Comparisons were made with chart 12314, 28th Edition, Oct 17, 1992. The majority of the areas of the current survey agree very well with the chart, with differences of less than 2 feet. A 17-foot shoal charted at 40°00'47.4"N, 75°02'39.8"W, was investigated with reduced line spacing of 10 meters and the least depth in the area was 25 feet.

The following contacts were identified during the course of this survey:

<u>Position Number</u>	<u>Investigation Position</u>	<u>Least Depth</u>	<u>Contact Position</u>	<u>Recommendation</u>
44.2	274-282	<i>9.3m/25ft</i> <i>9.1m/24ft</i>	40°00'49.876" 75°02'22.032"	Chart current survey soundings <i>Concur</i>
44.4	283	<i>9.4</i> <i>7.8m/31ft</i>	40°00'50.197" 75°02'22.981"	Chart current survey soundings <i>Concur</i>
62.6	288	<i>14.5</i> <i>13.0m/43ft</i>	40°00'38.405" 75°02'48.292"	Chart current survey soundings <i>Concur</i>
206.4	290-295	<i>14.8m/44ft</i> <i>11.6m/33ft</i>	40°00'42.884" 75°02'37.359"	Chart current survey soundings <i>Concur</i>
212.4	284	<i>15.5</i> <i>12.6m/51ft</i>	40°00'38.263" 75°02'48.734"	Chart current survey soundings <i>Concur</i>



There were no dangers to navigation identified on this survey.

The hydrographer recommends that sounding data from this survey be used to update the chart. *Concur*

P. ADEQUACY OF SURVEY - *See also Evaluation Report*

This survey is complete and adequate to supersede all prior surveys within the common area.

Q. AIDS TO NAVIGATION

Aids to navigation were not located. There were no ferry routes, pipelines, or overhead power cables within the survey area.

R. STATISTICS

<u>Description</u>	<u>Quantity</u>
Total Number of Positions	314
Total Lineal Nautical Miles of Hydrography	7.5
Square Nautical Miles of Hydrography	0.12
Days of Production	2
Detached Positions	15
Bottom Samples	0
Tide Stations	1
Velocity Casts	1

S. MISCELLANEOUS - *See also Evaluation Report*

No anomalous currents or tides were observed during this survey.

No bottom samples were taken.

T. RECOMMENDATIONS

No additional field work was identified after field office processing was completed. Specific recommendations are made in sections I, N, and O of this report.



U. REFERRAL TO REPORTS

There are no reports referenced in this report that are not included with this survey.

Submitted by:

Mark J. McMann  
Launch Hydrographer-In-Charge



CONTROL STATION TABLE FOR F00442

No	Latitude	Longitude	Cart	Name
100	038:46:36.407	075:05:15.063	250	CAPE HENLOPEN, <sup>DE</sup> <del>GA</del> , GPS



**APPROVAL SHEET**  
**Field Examination Survey**

S-D902-AHP

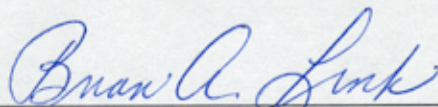
AHP-10-6-98

F00442

1998

This field examination survey was conducted in accordance with the project instructions for S-D902-AHP, the Hydrographic Manual, the Hydrographic Survey Guidelines, and the Field Procedures Manual. All reports, records, and survey sheets were reviewed by the Launch Hydrographer-in-charge. The descriptive report was reviewed and approved by the Chief of Party. The Chief of Party did not directly supervise any part of this survey

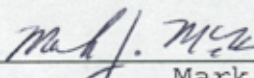
This survey is a complete field examination survey for the area described in Section B of this report.



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Brian A. Link

Chief, Atlantic Hydrographic Party (acting)



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Mark J. McMann

Launch Hydrographer-in-charge





UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL OCEANIC SERVICE  
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: March 15, 1999

HYDROGRAPHIC BRANCH: Atlantic

HYDROGRAPHIC PROJECT: OPR-D902-AHP  
HYDROGRAPHIC SHEET: F00442

LOCALITY: Delaware River, Vicinity Tacony-Palmyra Bridge

TIME PERIOD: July 7 - July 8, 1998

TIDE STATION USED: 854-5240 Philadelphia, PA

Lat.  $39^{\circ} 56.0'N$  Lon.  $75^{\circ} 08.5'W$

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.981 meters

REMARKS: RECOMMENDED ZONING  
Use zone(s) identified as: DB100.

Refer to attachments for zoning information.

Note 1: Provided time series data are tabulated in metric units  
(meters), relative to MLLW and on Greenwich Mean Time.

*Fm*   
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CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION



Final tide zone node point locations for OPR-D902-AHP-98,  
F00442.

Format: Longitude in decimal degrees (negative value denotes  
Longitude West),  
Latitude in decimal degrees  
Tide Station (in recommended order of use)  
Average Time Correction (in minutes)  
Range Correction

	Tide Station Order	AVG Time Correction	Range Correction
Zone DB100			
-75.072762 39.985516	854-5240	+24	1.03
-75.0643 39.979302			
-75.049456 39.992063			
-75.049137 39.994701			
-75.044422 39.99836			
-75.019117 40.011382			
-75.028177 40.022121			
-75.047016 40.01611			
-75.058816 40.006177			
-75.072762 39.985516			



GEOGRAPHIC NAMES

F00442

Name on Survey	A	B	C	D	E	F	G	H	K
	ON CHART NO. 12314	ON PREVIOUS SURVEY NO.	CON U.S. QUADRANGLE MAPS	FROM LOCAL INFORMATION	ON LOCAL MAPS	P.O. GUIDE OR MAP ATLAS	RANDOMLY	U.S. LIGHT LIST	
DELAWARE RIVER	X	X							1
EIGHT MILE POINT	X	X							2
FRANKFORD CHANNEL	X	X							3
NEW JERSEY (title)	X	X							4
PALMYRA	X	X							5
PENNSYLVANIA (title)	X	X							6
PHILADELPHIA	X	X							7
									8
									9
									10
									11
									12
									13
									14
									15
									16
									17
									18
									19
									20
									21
									22
									23
									24
									25

Approved

*Dennis J. Ransburg*

Chief Geographer FEB 11 1999



05/21/99

HYDROGRAPHIC SURVEY STATISTICS  
REGISTRY NUMBER: F00442

NUMBER OF CONTROL STATIONS	2
NUMBER OF POSITIONS	314
NUMBER OF SOUNDINGS	314

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	12	02/05/99
VERIFICATION OF FIELD DATA	10	03/23/99
EVALUATION AND ANALYSIS	15	
FINAL INSPECTION	12	04/30/99
COMPILATION	9	05/05/99
TOTAL TIME	58	
ATLANTIC HYDROGRAPHIC BRANCH APPROVAL		05/04/99



N/CS33-41-99

LETTER TRANSMITTING DATA

DATA AS LISTED BELOW WERE FORWARDED TO YOU BY  
(Check):

ORDINARY MAIL  AIR MAIL

REGISTERED MAIL  EXPRESS

GBL (Give number) \_\_\_\_\_

TO:

CHIEF, DATA CONTROL GROUP, N/CS3x1  
NOAA/NATIONAL OCEAN SERVICE  
STATION 6815, SSMC3  
1315 EAST-WEST HIGHWAY  
SILVER SPRING, MARYLAND 20910-3282

DATE FORWARDED

MAY 21, 1999

NUMBER OF PACKAGES

ONE TUBE

**NOTE:** A separate transmittal letter is to be used for each type of data, as tidal data, seismology, geomagnetism, etc. State the number of packages and include an executed copy of the transmittal letter in each package. In addition the original and one copy of the letter should be sent under separate cover. The copy will be returned as a receipt. This form should not be used for correspondence or transmitting accounting documents.

F00442

PENNSYLVANIA/NEW JERSEY, DELAWARE RIVER  
VICINITY OF TACONY-PALMYRA BRIDGE

(ONE) 1 TUBE CONTAINING THE FOLLOWING:

- 1 ORIGINAL DESCRIPTIVE REPORT AND ACCOMPANYING SMOOTH SHEET FOR F00442
- 1 DRAWING HISTORY FORM (NOAA FORM #76-71) FOR NOS CHART 12314
- 1 RECORD OF APPLICATION TO CHART FORM (NOAA FORM #75-96) FOR SURVEY F00442
- 1 H-DRAWING FOR NOS CHART 12314
- 1 COMPOSITE DRAWING FOR NOS CHART 12314

FROM: (Signature)

Deborah A. Bland



RECEIVED THE ABOVE

(Name, Division, Date)

Return receipted copy to:

ATLANTIC HYDROGRAPHIC BRANCH  
N/CS33  
439 WEST YORK STREET  
NORFOLK, VA 23510-1114



**ATLANTIC HYDROGRAPHIC BRANCH  
EVALUATION REPORT FOR F00442 (1998)**

This Evaluation Report has been written to supplement and/or clarify the original Descriptive Report. Sections in this report refer to the corresponding sections of the Descriptive Report.

**D. AUTOMATED DATA ACQUISITION AND PROCESSING**

The following software was used to process data at the Atlantic Hydrographic Branch:

Hydrographic Processing System  
NADCON, version 2.10  
Siteworks, version 2.01  
MicroStation 95, version 5.05  
I/RAS B, version 5.01

The smooth sheet was plotted using an Hewlett Packard DesignJet 2500CP plotter.

**H. CONTROL STATIONS**

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD 83). Office processing of this survey is based on these values. The smooth sheet has been annotated with ticks showing the computed mean shift between the NAD 83 and the North American Datum of 1927 (NAD 27).

To place this survey on the NAD 27, move the projection lines 0.403 seconds (12.433 meters or 1.24 mm at the scale of the survey) north in latitude, and 1.381 seconds (32.743 meters or 3.27 mm at the scale of the survey) east in longitude.

**J. SHORELINE**

Brown shoreline originates with NOS chart 12314, 29<sup>th</sup> edition, dated April 4, 1998, and is for orientation purposes only.

**L. JUNCTIONS**

This survey does not junction with any contemporary surveys. Present survey depths are in harmony with the charted hydrography to the north, east, south and west.



**M. COMPARISON WITH PRIOR SURVEYS**

A comparison with prior surveys was not done during office processing in accordance with section 4. of the memorandum titled "Changes to Hydrographic Survey Processing", dated May 24, 1995.

**O. COMPARISON WITH CHART 12314 29<sup>th</sup> Edition, Apr.4/98)****Hydrography**

The charted hydrography originates with the prior surveys and requires no further consideration. The hydrographer makes adequate chart comparisons in sections N. and O. of the Descriptive Report.

The present survey is adequate to supersede the charted hydrography within the common area.

**CONTROLLING DEPTHS**

There are no conflicts between the charted controlling depths and the present survey depths.

**P. ADEQUACY OF SURVEY**

This is an adequate hydrographic/side scan sonar survey. No additional work is recommended.

**S. MISCELLANEOUS**

Chart compilation was done by Atlantic Hydrographic Branch personnel, in Norfolk, Virginia. Compilation data will be forwarded to Marine Chart Division, Silver Spring, Maryland.

The following NOS Chart was used for compilation of the present survey:

12314 (29th Ed., Apr 4/98)



*Robert Snow*

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**Robert Snow**

Cartographic Technician  
Verification of Field Data  
Evaluation and Analysis



APPROVAL SHEET  
F00442

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, development of critical depths, cartographic symbolization, and verification or disapproval of charted data. The digital data have been completed and all revisions and additions made to the smooth sheet during survey processing have been entered in the digital data for this survey. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

Deborah A. Bland

Deborah A. Bland  
Cartographer,  
Atlantic Hydrographic Branch

Date: 29 APR 1999

I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.

Andrew L. Beaver

Andrew L. Beaver  
Lieutenant Commander, NOAA  
Chief, Atlantic Hydrographic Branch

Date: 5/4/99

\*\*\*\*\*

Final Approval:

Approved: Samuel P. De Bow, Jr.

Samuel P. De Bow, Jr.  
Commander, NOAA  
Chief, Hydrographic Surveys Division

Date: May 26, 1999



**Final Zoning for OPR D902-AHP-98**  
**Delaware River - Tacony-Palmyra Bridge**  
**Sheet F00442**

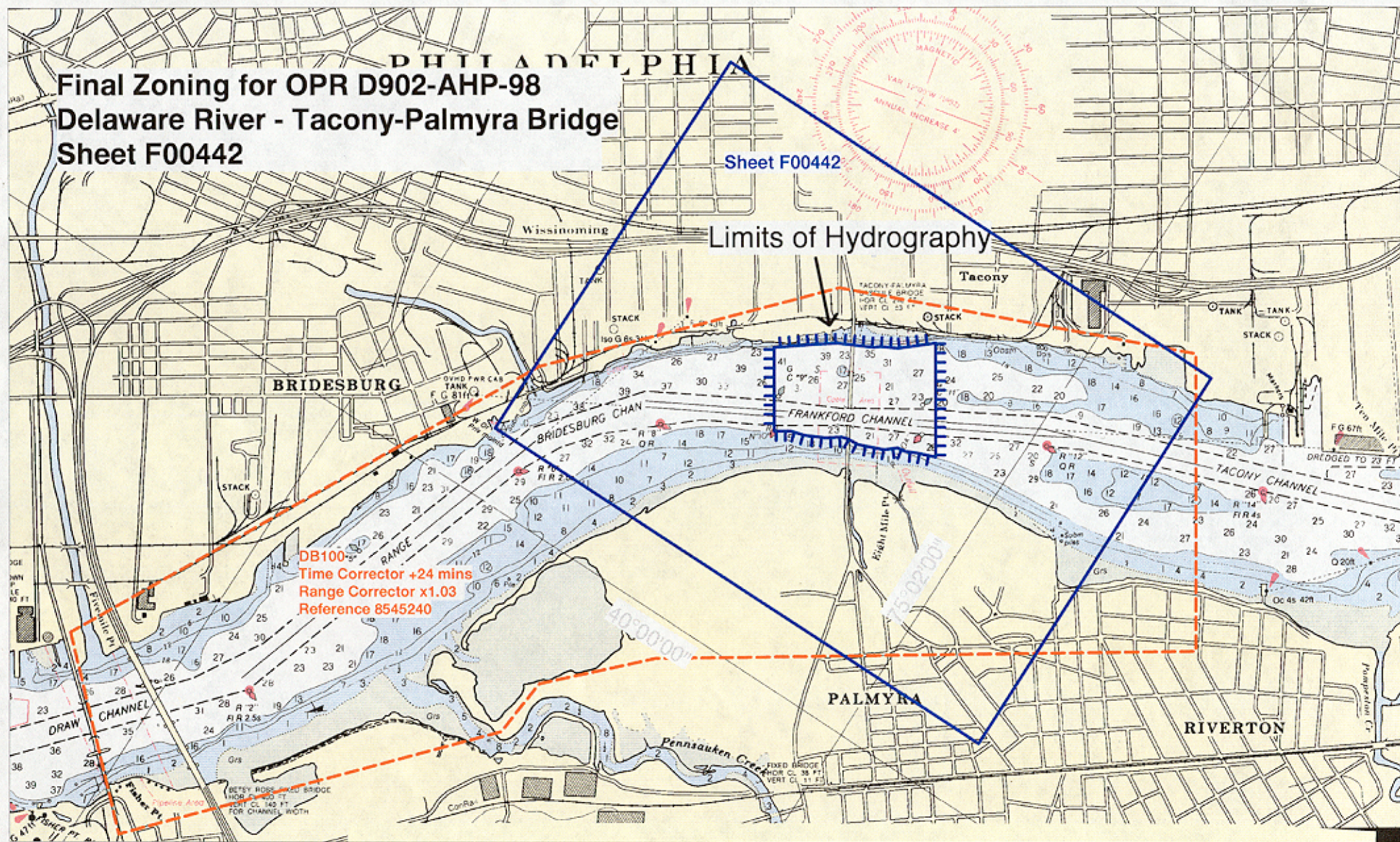
Sheet F00442

Limits of Hydrography

DB100  
Time Corrector +24 mins  
Range Corrector x1.03  
Reference 8545240

40°00'00"

75°02'00"





75° 03' 00"

75° 02' 30"

75° 02' 00"

F00442  
 PENNSYLVANIA - NEW JERSEY  
 DELAWARE RIVER  
 VICINITY OF TACONY - PALMYRA BRIDGE  
 JULY 7 - 8, 1998  
 SCALE: 1:10,000  
 HORIZONTAL DATUM: NAD 1983  
 VERTICAL DATUM: SOUNDINGS IN FEET AT MLLW  
 SHEET 1 OF 1

PHILADELPHIA

DELAWARE RIVER

40° 01' 00"

FRANKFORD CHANNEL

EIGHT MILE POINT

40° 00' 30"

75° 02' 30" W

NAD 27 40° 00' 30" N

CHECKED BY: RS  
02/05/99

PALMYRA

Brown shoreline originates with NOS chart 12314, 29th ED., Apr. 4/98  
and is for orientation purposes only.

75° 03' 00"

75° 02' 30"

75° 02' 00"



