

C. VERTICAL AND HORIZONTAL CONTROL *See Also H-Cell Report*

C.1 VERTICAL CONTROL

The tidal datum for this project is Mean Lower Low Water (MLLW). The operating National Water Level Observation Network (NWLON) stations at Reedy Point, DE (8551910) and Philadelphia, PA (8545240) served as datum control for the survey area including determination at each subordinate station. The operating stations at Marcus Hook, PA (8540433), Tacony-Palmyra (8538886), Reedy Point, DE (8551910), and Philadelphia, PA (8545240) provided residuals for this project. A Request for Approved Tides was sent to N/OPS1 on October 29, 2009 (Appendix III). Verified tides from the N/OPS1 CO-OPS website were downloaded and applied to all sounding data via TCARI in Pydro. *Concur.*

C.2 HORIZONTAL CONTROL

The horizontal datum used for this survey is the North American Datum of 1983 (NAD 83), projected using UTM zone 18. *Concur.*

Sounding positional control was determined using the Global Positioning System (GPS) corrected by U.S. Coast Guard differential GPS (DGPS) beacon stations. The DGPS beacon used for this survey was Reedy Point, DE. No horizontal control stations were established for this survey.

Horizontal dilution of precision (HDOP) was monitored during acquisition, and did not exceed 4.00. Adequate satellite coverage was maintained throughout the survey period.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : December 29, 2009

HYDROGRAPHIC BRANCH: Atlantic
HYDROGRAPHIC PROJECT: S-D903-NRT5-2009
HYDROGRAPHIC SHEET: H12152

LOCALITY: Delaware River, New Castle, DE
TIME PERIOD: October 26 - December 8, 2009

TIDE STATION USED: Tacony-Palmyra Bridge, NJ 853-8886
Lat. 40° 0.7' N Long. 75° 2.6' W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.028 meters

TIDE STATION USED: Marcus Hook, PA 854-0433
Lat. 39° 48.7' N Long. 75° 24.6' W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.720 meters

TIDE STATION USED: Philadelphia, PA 854-5240
Lat. 39° 56.0' Long. 75° 8.5'

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.887 meters

TIDE STATION USED: Reedy Point, DE 855-1910
Lat. 39° 33.5' Long. 75° 34.4'

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.683 meters

REMARKS: RECOMMENDED Grid

Please use the TCARI grid "D903NRT52009Final" as the final grid for project S-D903-NRT5-2009, H12152, during the time period between October 26 - December 8, 2010.

Refer to attachments for grid information.

Note 1: Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time on the 1983-2001 National Tidal Datum Epoch (NTDE).

Note 2:

Peter J. Stone

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