

C. HORIZONTAL AND VERTICAL CONTROL

A complete description of the horizontal and vertical control for survey H12239 can be found under the OPR-E349-KR-10 *Horizontal and Vertical Control Report*, submitted under separate cover. A complete description of GPS (Global Positioning System) post-processing methodology for survey H12239 can be found in the OPR-E349-KR-10 DAPR, submitted under separate cover. A summary of horizontal and vertical control for this survey follows.

Real-time navigation logged during acquisition was overwritten with a post-processed navigation solution created from Applanix POSpac MMS using the SmartBase option. A GPS base station with a dual frequency (L1/L2) receiver was established on Smith Island in Ewell, Maryland, and another in Airedele, Maryland, to enable post-processing. These two stations were augmented by GPS reference stations from the National Geodetic Survey (NGS) National and Cooperative Continually Operating Reference Stations (CORS) to form a GPS network for use in SmartBase processing. Table 7 lists the reference stations used in the network and their approximate distance from the survey area. North American Datum of 1983 (NAD83) coordinates of the base stations are included in the OPR-E349-KR-10 *Horizontal and Vertical Control Report*.

Table 7. GPS Reference Stations Used During SmartBase Processing

Station	Data Provider	Approximate Distance to Survey Area
AIRD	DEA	10km
EWELL	DEA	20m
MDSI	NGS	30km
HNPT	NGS	60km
VAWI	NGS	70km
VIMS	NGS	70km
VAGP	NGS	90km
CORB	NGS	100km
DEDS	NGS	100km

C1. Vertical Control

The vertical datum for this project is Mean Lower-Low Water (MLLW). Soundings were reduced to MLLW using post-processed GPS derived water levels. The VDatum derived separation model, *Potomac.bin*, was used to reduce NAD83 ellipsoid heights to MLLW as described in the OPR-E349-KR-10 DAPR. The separation model has been included in the digital deliverables. When the model file was used in the tide reduction process in CARIS HIPS it was inadvertently misspelled. A query of the GPS Tide Datum in HIPS will show the file *Potamic.bin*.

Traditional zoning from water level stations was not used for sounding reduction in this survey, though zoning provided by the Center for Operational Oceanographic Products and Services (CO-OPS) and verified water level files for the survey have been included with the digital deliverables.