

### ***C. Vertical And Horizontal Control***

The vertical control datum of this project is mean lower low water (MLLW). The horizontal control datum is the North American Datum of 1983 (NAD83). All soundings are therefore corrected to MLLW, and all positions are on NAD83. Fieldsheets were projected into UTM Zone 3 North.

Sounding data were tide corrected using final MLLW to NAD83 ellipsoid separation values. A separation model was developed by JOA that utilized the GPS to MLLW datum separations computed at installed tide stations at Quinhagak, AK (946-5831) and Popokamute, AK (946-6057) and new stations at Bethel, AK (946-6477), Lomavik Slough, AK (946-6328) and Helmick Point, AK (946-6153). Short duration tide gauges were installed at the project RTK sites and their separation values computed and utilized in the model as well. The separation model, which is included with the project CARIS deliverables, was applied using CARIS HIPS' "Compute GPSTide" routine to all lines.

The separation model’s filename is “JOA\_Final\_MLLW\_Sep\_Model\_20101206.txt”. MLLW to NAD83 ellipsoid separations in this sheet ranged from 10.911 m to 11.622 m.

Tide zones were not provided by NOAA for this project. JOA computed tide zones and provided verified, smoothed tides for project but these were not used on the final data. They were used for comparison purposes only.

Preliminary positions were determined using Real Time Kinematic (RTK) GPS. NAD83-based position corrections were broadcast from project base stations. The base stations also logged dual frequency GPS data at a 1 Hz interval which was periodically downloaded and used to post-process the positions.

Final positions were post-processed in Applanix POSPac, which utilized inertial and dual frequency GPS data logged continuously on the survey vessels along with the base station data to produce a post-processed kinematic (PPK) smoothed best estimate of trajectory (SBET) file. PPK SBETs were loaded into all survey lines except as noted in the table below. This replaced all RTK navigation and GPS heights with the PPK solution.

Vessel / Sensor	Julian Day	Line Name	Comment
3-LatentSea_8101	2010-199	0030_-_3C06	Applicable SBET not readable by HIPS. However, the navigation and GPS height records were exported to text file and loaded into the lines in HIPS’ Generic Data Parser.
		to 0036_-_3C06	
		3C-199-MBXL01	

*Table 9 – Lines that were loaded with GPS height and navigation through Generic Data Parser*

Refer to the project [DAPR](#) for more information regarding PPK processing methods. Refer to the project [HVCR](#) for details regarding specific base stations, base station confidence checks, and derivation of the MLLW separation model.