

## C. VERTICAL AND HORIZONTAL CONTROL

Refer to the Horizontal and Vertical Control Report for a detailed description of the horizontal and vertical control used during this survey. A summary of horizontal and vertical control used for the survey follows.

### C.1 VERTICAL CONTROL

Vertical control for this survey was based on MLLW at the National Water Level Observation Network (NWLON) station at Sitka, AK (9451600).

Station details are as follows:

Gauge	Location	NAD83	
		Latitude (N)	Longitude (W)
9451600	Sitka Sound Seafood Dock	57° 03.1'	135° 20.5'

### C.2 ZONING

Tide zones that cover the extent of the survey were derived from tide zone coordinates supplied by NOAA. Each of these tide zones use time and range correctors relative to the Sitka tide station. These are as follows:

Tide Zone	GS Identifier	Time Corrector	Range Corrector	Reference Station
PAC296	TA1	-6 minutes	x1.04	9451600
SA227	TA2	-12 minutes	x1.06	9451600
SA250	TA3	-12 minutes	x1.03	9451600
SA267	TA4	-12 minutes	x1.03	9451600
SA250A	TA5	-12 minutes	x1.02	9451600

For final tide application, the time and range correctors were applied to the smoothed tidal data provided by JOA. Soundings were then reduced to MLLW using these corrected tides. An analysis of depth benchmark and crossline comparisons, and overlaps of the mainlines of sounding concluded that final tide zoning was adequate.

The derived value for the difference between MLLW and MHW at the Sitka tide gauge is 2.79m. From the final zoning, a range factor of 1.02 and 1.03 was applicable for Sheet F, resulting in a MHW value of 2.865m.

### C.3 HORIZONTAL CONTROL

Data collection and processing were conducted on the AS and GS in World Geodetic System (WGS84) on Universal Transverse Mercator (Northern Hemisphere) projection UTM (N) in Zone 8, Central Meridian 135° W. This data was post-processed and all soundings are positioned relative to the North American Datum 1983 (NAD83). All units are in meters.

#### C.3.1 LADS Local GPS Base Station – Ketchikan

Real-time positions were determined using an Ashtech GG24 GPS receiver on the aircraft, operating in autonomous GPS mode. A local GPS base station was established by JOA on the roof of the Best Western Hotel in Ketchikan, AK on April 10, 2007, in order to post-process KGPS positions following survey flights.

The derived NAD83 coordinates for the local GPS base station are:

NAD83		UTM (N) Zone 8		
Latitude (N)	Longitude (W)	Easting (m)	Northing (m)	Ellipsoidal Height (m)
55° 21' 18.1747"	131° 41' 28.1482"	709 747.774	6 139 286.936	12.85

Post-processed KGPS positions were determined offline using data logged at the local GPS base station and on the aircraft. This data was processed with Waypoint GrafNav software to calculate a KGPS position solution for the survey flights. The post-processed KGPS positions were imported into the GS and applied to all soundings. This provided increased sounding position accuracy from the real-time autonomous GPS.