

**SUBJECT:** Kensington South Carolina NDGPS Site Operational Assessment

**DATE:** 19-23 September 2011

**INSPECTOR:** CWO Greg Sandness

**PURPOSE:** Validate advertised NDGPS coverage of the Kensington NDGPS site. Validate required RTCM message delivery. Test differential correction accuracy versus a predetermined survey monument.

**EQUIPMENT:** DNAV 212 INVICTA Receiver  
Invicta GPS Receiver  
MBA-2 Receive Antenna

**PARAMETERS:**

Frequency	292 KHz
Forward Output Power	500W
Transmission Rate	100 baud
Field Strength/Range	75 $\mu$ V/m (37.5dB $\mu$ V/m) at 200 km

**SITE PHOTO:**



## RESULTS

### Signal Strength:

DNAV readings were taken at 200 km from the Kensington NDGPS site on both North and South of the site respectively. At both points, the signal strength and signal-to-noise ratio (SNR) were satisfactory in meeting the advertised coverage. Additionally, the measured coverage closely matches the predicted coverage plot of Kensington. In figure 1 below, the range ring is set to the 200 km advertised range. Green points represent areas of satisfactory signal strength and SNR, while red points represent areas of unsatisfactory signal strength or SNR.

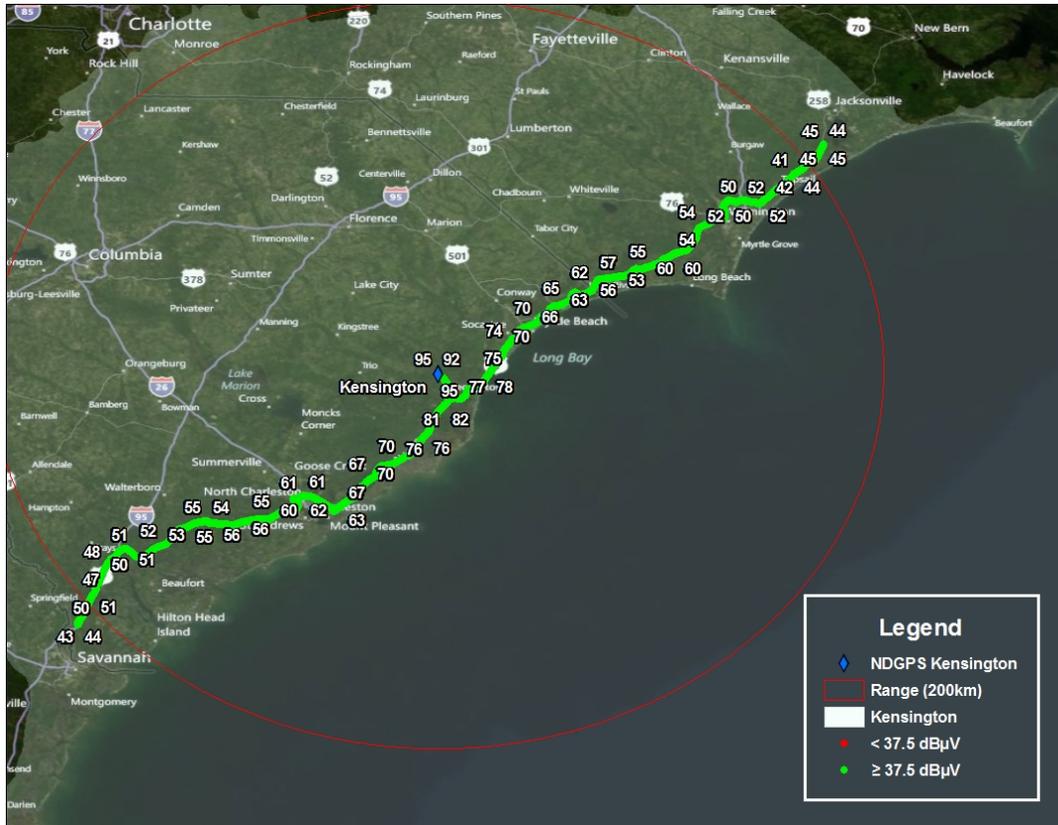


Figure 1.

### Far-Field Signal Strength Reading 1:

Receiver:	DNAV 212
Antenna:	MBA-2
Position	33° 28.36'N 079° 15.42'W
Signal Strength	84dBμV/m
SNR	23dB

### Far-Field Signal Strength Reading 2:

Receiver:	DNAV 212
Antenna:	MBA-2
Position	33° 24.13'N 079° 19.45'W
Signal Strength	82dBμV/m
SNR	22dB

**RTCM Message Verification:**

RTCM message were collected from both sides of the NDGPS site utilizing an Invicta GPS Receiver. Not all required message traffic was confirmed and was noted to be reviewed with the NAVCEN Watchstander.

Side A

<b>Type 3</b>	None
<b>Type 7</b>	None
<b>Type 9</b>	X
<b>Type 16</b>	None
<b>Misc</b>	N/A

Side B

<b>Type 3</b>	X
<b>Type 7</b>	None
<b>Type 9</b>	X
<b>Type 16</b>	None
<b>Misc</b>	N/A

**Accuracy Validation:**

Data was collected for 15 minutes on each side. Positional data was then averaged and compared to the actual monument position to check the horizontal accuracy of the correction.

<b>NGS Monument ID:</b>	<b>DD1504</b>
Monument LAT:	33° 32' 39.29196" N
Monument LON:	079° 1' 23.44466" W

Side A

<b>Averaged LAT:</b>	33° 32' 39.3438" N
<b>Averaged LON:</b>	79° 1' 23.4834" N
<b>Distance from DGPS Site:</b>	30.45 km
<b>Distance from Monument:</b>	1.89 m (6.19 feet)
<b>Bearing from Monument:</b>	328.08°

Side B

<b>Averaged LAT:</b>	33° 32' 39.3198" N
<b>Averaged LON:</b>	79° 1' 23.4486" N
<b>Distance from DGPS Site:</b>	30.42 km
<b>Distance from Monument:</b>	.87 m (2.84 feet)
<b>Bearing from Monument:</b>	353.27°

**OPERATIONAL RECOMMENDATION:** Analysis of coverage is consistent with current OPORDER and predicted coverage plot. No changes/updates required at this time.