

**APPENDIX B**  
**HORIZONTAL & VERTICAL CONTROL INFORMATION**



**VICINITY MAP** Not to Scale

Reproduced from Louisiana 2005 DOQQ

**Station Name: "TE34 SM 04"**

**Location:** From the intersection of State Highway 3219 and State Highway 3127 south of Lagan, Louisiana, proceed westerly on State Highway 3127 for approximately 0.7 mile to the monument on the left, approximately 382 feet westerly of a gravel oilfield road leading south to Cut Grass Coulee Oilfield. The Monument is located 43.3 feet southerly from the centerline of the highway and 25.8 feet northerly from the north edge of a canal. Permission is required for Right of entry from Burlington Resources, POC: Jeff Deblieux at (985) 853-3009 or (985) 879-1517.

**Monument Description:** NGS Style floating sleeve monument; 9/16" stainless steel rods driven 60 feet to refusal, set in a sand filled 6" PVC pipe with access cover set flush with the ground.

**Stamping:** TE34-SM-04

**Installation Date:** May 2004 **Date of Survey:** June 2008

**Monument Established By:** JCLS

**For:** JCLS

**Adjusted NAD83 Geodetic Position (NSRS2007)**

Lat. 29°21'45.47779" N  
Long. 090°59'34.13005" W

**Adjusted NAD83 Datum LSZ (1702) Ft (NSRS2007)**

N= 313,874.11  
E= 3,389,307.21

**Adjusted NAVD88 Height (2006.81)**

Elevation = 2.99 feet (0.911 mtrs)


*Ellipsoid Height = -23.939 mtrs.  
Geoid03 Height = -24.850 mtrs. (2004.65)*

**FOR REFERENCE ONLY**

**LCZ Adjusted NAVD88 Height (Geoid99)**  
Elevation = 3.43 feet (1.045 mtrs)



NOTE: This form intended for field use. Unsolicited data submitted to NGS must be converted to bluebook format.

 <p>GPS STATION OBSERVATION LOG April 16, 2003</p>	Station Designation: (check applicable: __ FBN __ CBN __ PAC __ SAC __ BM) <b>TE 34 SM 04</b>	Station PID, if any:	Date (UTC): <b>10 FEB 2011</b>
	General Location:	Airport ID, if any:	Station 4-Character ID: <b>41</b>

Project Name: <b>LOST LAKE</b>	Project Number: <b>GPS-</b>	Station Serial # (SSN):	Session ID: (A,B,C etc) <b>A</b>
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NAD83 Latitude 0	NAD83 Longitude 0	NAD83 Ellipsoidal Height meters	Agency Full Name: <b>PYBORG ODOM</b> Operator Full Name: Phone #: ( ) e-mail address:
Observation Session Times (UTC): Sched. Start _____ Stop _____		NAVD88 Orthometric Ht. meters	
Actual Start <b>10:10</b> Stop <b>15:47</b>		GEOID99 Geoid Height meters	

Receiver Brand & Model: <b>TRIMBLE 4700</b> P/N: <b>35846-16</b> S/N: <b>22022367</b> Firmware Version:	Antenna Code*, Brand & Model: <b>TRIMBLE ZYPHER GEO.</b> P/N: <b>41249-00</b> S/N: Cable Length, meters: <b>10</b>	Antenna plumb before session? <input checked="" type="checkbox"/> (N) Circle Antenna plumb after session? <input checked="" type="checkbox"/> (N) Yes or No Antenna oriented to true North? <input checked="" type="checkbox"/> (N) -If no, Weather observed at antenna ht. <input checked="" type="checkbox"/> (N) explain Antenna ground plane used? <input checked="" type="checkbox"/> (N) "
<input type="checkbox"/> CamCorder Battery, <input checked="" type="checkbox"/> 12V DC, <input type="checkbox"/> 110V AC, <input type="checkbox"/> Other	Vehicle is Parked _____ meters _____ (direction) from antenna.	Antenna radome used? <input checked="" type="checkbox"/> (Y/N) If yes, Eccentric occupation (>0.5 mm)? <input checked="" type="checkbox"/> (Y/N) describe. Any obstructions above 10'? <input checked="" type="checkbox"/> (Y/N) Use Radio interference source nearby <input checked="" type="checkbox"/> (Y/N) Vis. form

Tripod or Antenna Mount: Check one: <input type="checkbox"/> Fixed-Leg Tripod, <input type="checkbox"/> Collapsible-leg tripod <input type="checkbox"/> Fixed Mount Brand & Model: P/N: <b>HIXAV</b> S/N: Last Adjustment date:  Psychrometer (if used) Brand & Model:  P/N: <b>N/A</b> S/N: Last Calibration or check Date:	<b>** ANTENNA HEIGHT **</b>		Before Session Begins:	After Session Ends:		
			Meters	Feet	Meters	Feet
	A= Datum point to Top of Tripod (Tripod Height)					
	B= Additional offset to ARP if any (Tribrach/Spacer)					
	H= Antenna Height = A + B = Datum Point to Antenna Reference Point (ARP)					

Meters = Feet x (0.3048)  
Height Entered Into Receiver = **2.000** meters. Note &/or sketch ANY unusual conditions. Be Very Explicit as to where and how Measured!

Barometer (if used) Brand & Model: S/N: <b>N/A</b>	Weather Data	Weather Codes	Time (UTC)	Dry-Bulb Temp		WetBulb Temp		Rel. % Humidity	Atm. Pressure		
				Fahrenheit	Celsius	Fahrenheit	Celsius		inches Hg	millibar	
	Before										
	Middle										
After											


Remarks, Comments on Problems, Sketches, Pencil Rubbing, etc:

Weather codes are required. Weather data are optional but encouraged. \*Antenna code comes from ant\_info file furnished by project coordinator.

Data File Name(s): <b>23670410.DAT</b> (Standard NGS Format = aaaadddd.xxx) where aaaa=4-Character ID, ddd=Day of Year, s=Session ID, xxx=file dependant extension	Updated Station Description: <input type="checkbox"/> Attached <input type="checkbox"/> Submitted earlier Visibility Obstruction Form: <input type="checkbox"/> Attached <input type="checkbox"/> Submitted earlier Photographs of Station: <input type="checkbox"/> Attached <input type="checkbox"/> Submitted earlier Pencil Rubbing of Mark: <input type="checkbox"/> Attached	LOG CHECKED BY:
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Table of	CODE	PROBLEM	VISIBILITY	TEMPERATURE	CLOUD COVER	WIND
Weather	0	did not occur	Good, over 15 miles	Normal, 32° F- 80° F	Clear, below 20%	Calm, under 5mph (8km/h)
Codes	1	did occur	Fair, 7-15 miles	Hot, over 80° F (27 C)	Cloudy, 20% to 70%	Moderate, 5 to 15 mph
	2	- not used -	Poor, under 7 miles	Cold, below 32° F (0 C)	Overcast, over 70%	Strong, over 15 mph (24km/h)
Examples:	00000 = No problem, good visibility, normal temp, clear, calm wind			12121 = Problems, poor visibility, hot, overcast, moderate wind		

NOTE: This form intended for field use. Unsolicited data submitted to NGS must be converted to bluebook format.

 <p>GPS STATION OBSERVATION LOG April 16, 2003</p>	Station Designation: (check applicable: __ FBN __ CBN __ PAC __ SAC __ BM) <b>TE 34 SMO4</b>	Station PID, if any:	Date (UTC): <b>11 FEB 2011</b>
	General Location:	Airport ID, if any:	Station 4-Character ID: <b>42</b>

Project Name: <b>LOST LAKE</b>	Project Number: <b>GPS-</b>	Station Serial # (SSN):	Session ID:(A,B,C etc) <b>A</b>
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NAD83 Latitude 0	NAD83 Longitude 0	NAD83 Ellipsoidal Height meters	Agency Full Name: <b>PYBLRN LODM</b> Operator Full Name: Phone #: ( ) e-mail address:
Observation Session Times (UTC): Sched. Start <b>08:23</b> Stop _____		NAVD88 Orthometric Ht. meters	
Actual Start <b>08:23</b> Stop <b>14:04</b>		GEOID99 Geoid Height meters	

Receiver Brand & Model: <b>TRIMBLE 4700</b> P/N: <b>35846-16</b> S/N: <b>22022367</b> Firmware Version:	Antenna Code*, Brand & Model: <b>TRIMBLE ZYPHER GEO.</b> P/N: <b>41249-00 +GP</b> S/N: Cable Length, meters: <b>10</b>	Antenna plumb before session? <input checked="" type="radio"/> (N) Circle Antenna plumb after session? <input checked="" type="radio"/> (N) Yes or No Antenna oriented to true North? <input checked="" type="radio"/> (N) -If no, explain Weather observed at antenna ht. <input checked="" type="radio"/> (N) Antenna ground plane used? <input checked="" type="radio"/> (N)
<input type="checkbox"/> CamCorder Battery, <input checked="" type="checkbox"/> 12V DC, <input type="checkbox"/> 110V AC, <input type="checkbox"/> Other	Vehicle is Parked _____ meters _____ (direction) from antenna.	Antenna radome used? <input checked="" type="radio"/> (Y/N) If yes, describe. Eccentric occupation (>0.5 mm)? <input checked="" type="radio"/> (Y/N) Use Any obstructions above 10'? <input checked="" type="radio"/> (Y/N) Use Radio interference source nearby <input checked="" type="radio"/> (Y/N) Vis. form

Tripod or Antenna Mount: Check one: <input type="checkbox"/> Fixed-Leg Tripod, <input type="checkbox"/> Collapsible-leg tripod, <input type="checkbox"/> Fixed Mount Brand & Model: <b>HIXON</b> P/N: S/N: Last Adjustment date:  Psychrometer (if used) Brand & Model:  P/N: <b>N/A</b> S/N: Last Calibration or check Date:	<b>** ANTENNA HEIGHT **</b>		Before Session Begins: Meters	Feet	After Session Ends: Meters	Feet
	A= Datum point to Top of Tripod (Tripod Height)					
	B=Additional offset to ARP if any (Tribrach/Spacer)					
	H= Antenna Height = A + B = Datum Point to Antenna Reference Point (ARP)					
	Meters = Feet x (0.3048) Height Entered Into Receiver = <b>2.00</b> meters.		Note &/or sketch ANY unusual conditions. Be Very Explicit as to where and how Measured!			

Barometer (if used) Brand & Model:  S/N: <b>N/A</b>	Weather Data	Weather Codes	Time (UTC)	Dry-Bulb Temp		WetBulb Temp		Rel. % Humidity	Atm. Pressure		
				Fahrenheit	Celsius	Fahrenheit	Celsius		inches Hg	millibar	
	Before										
	Middle										
After											

Remarks, Comments on Problems, Sketches, Pencil Rubbing, etc:

Weather codes are required. Weather data are optional but encouraged. \*Antenna code comes from ant\_info file furnished by project coordinator.

Data File Name(s): <b>23670420.DAT</b> (Standard NGS Format = aaaadddd.xxx) where aaaa=4-Character ID, ddd=Day of Year, s=Session ID, xxx=file dependant extension	Updated Station Description: <input type="checkbox"/> Attached <input type="checkbox"/> Submitted earlier Visibility Obstruction Form: <input type="checkbox"/> Attached <input type="checkbox"/> Submitted earlier Photographs of Station: <input type="checkbox"/> Attached <input type="checkbox"/> Submitted earlier Pencil Rubbing of Mark: <input type="checkbox"/> Attached	LOG CHECKED BY:
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Table of Weather Codes	CODE	PROBLEM	VISIBILITY	TEMPERATURE	CLOUD COVER	WIND
	0	did not occur	Good, over 15 miles	Normal, 32° F- 80° F	Clear, below 20%	Calm, under 5mph (8km/h)
1	did occur	Fair, 7-15 miles	Hot, over 80° F (27 C)	Cloudy, 20% to 70%	Moderate, 5 to 15 mph	
2	- not used -	Poor, under 7 miles	Cold, below 32° F (0 C)	Overcast, over 70%	Strong, over 15 mph (24km/h)	

Examples: 00000 = No problem, good visibility, normal temp, clear, calm wind      12121 = Problems, poor visibility, hot, overcast, moderate wind

Verification of TE 74 SM 04  
Observed Feb. 10, 2012

From: "opus" <opus@NGS.NOAA.GOV>  
To: <todom@pyodom.com>  
Subject: OPUS solution : 23670410.11o 000164936  
Date: Thursday, February 17, 2011 9:27 AM

FILE: 23670410.11o 000164936

NGS OPUS SOLUTION REPORT  
=====

All computed coordinate accuracies are listed as peak-to-peak values.  
For additional information: <http://www.ngs.noaa.gov/OPUS/about.html#accuracy>

USER: todom@pyodom.com DATE: February 17, 2011  
RINEX FILE: 2367041q.11o TIME: 15:26:28 UTC

SOFTWARE: page5 1009.28 master2.pl 1215103 START: 2011/02/10 16:10:00  
EPHEMERIS: igr16224.eph [rapid] STOP: 2011/02/10 21:47:00  
NAV FILE: brdc0410.11n OBS USED: 12721 / 12887 : 99%  
ANT NAME: TRM41249.00 NONE # FIXED AMB: 42 / 42 : 100%  
ARP HEIGHT: 2.00 OVERALL RMS: 0.011(m)

REF FRAME: NAD\_83(CORS96)(EPOCH:2002.0000) ITRF00 (EPOCH:2011.1118)

X:	-96393.935(m)	0.012(m)	-96394.652(m)	0.012(m)
Y:	-5562384.759(m)	0.040(m)	-5562383.264(m)	0.040(m)
Z:	3108981.856(m)	0.015(m)	3108981.646(m)	0.015(m)
LAT:	29 21 45.47831	0.008(m)	29 21 45.49597	0.008(m)
E LON:	269 0 25.86998	0.011(m)	269 0 25.84244	0.011(m)
W LON:	90 59 34.13002	0.011(m)	90 59 34.15756	0.011(m)
EL HGT:	-23.890(m)	0.042(m)	-25.285(m)	0.042(m)
ORTHO HGT:	0.902(m)	0.072(m)	[NAVD88 (Computed using GEOID09)]	

	UTM COORDINATES	STATE PLANE COORDINATES
	UTM (Zone 15)	SPC (1702 LA S)
Northing (Y) [meters]	3249837.130	95669.036
Easting (X) [meters]	694834.369	1033062.904
Convergence [degrees]	0.98450515	0.17026404
Point Scale	1.00006842	0.99998733
Combined Factor	1.00007218	0.99999109

US NATIONAL GRID DESIGNATOR: 15RXN9483449837(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DL9074	FSHS FRANKLIN HIGH SCH CORS ARP	N294819.103	W0913008.052	69596.1
DJ9603	LWES LAKEWOOD ELMENTRY CORS ARP	N295401.295	W0902057.833	86226.0
DH7121	GRIS GRAND ISLE CORS ARP	N291555.883	W0895726.262	101165.8

NEAREST NGS PUBLISHED CONTROL POINT

AU3090	VOSS 1934	N292142.762	W0905936.516	105.8
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BASE STATION INFORMATION

STATION NAME: fshs a 2 (Franklin High Sch; Franklin, Louisiana USA)  
MONUMENT: NO DOMES NUMBER

XYZ	-145210.9090	-5537098.0140	3151657.5709	MON @ 1997.0000 (M)
XYZ	-0.0121	-0.0008	-0.0029	VEL (M/YR)
NEU	0.0000	0.0000	0.0000	MON TO ARP (M)
NEU	0.0003	0.0005	0.0714	ARP TO L1 PHASE CENTER (M)
NEU	-0.0004	0.0001	0.0682	ARP TO L2 PHASE CENTER (M)
XYZ	-0.1707	-0.0113	-0.0409	VEL TIMES 14.1106 YRS
XYZ	0.0000	0.0000	0.0000	MON TO ARP

XYZ	-0.0011	-0.0618	0.0357	ARP TO L1 PHASE CENTER
XYZ	-145211.0809	-5537098.0871	3151657.5657	L1 PHS CEN @ 2011.1118
XYZ	-0.0000	0.0000	0.0000	+ XYZ ADJUSTMENTS
XYZ	-145211.0809	-5537098.0871	3151657.5657	NEW L1 PHS CEN @ 2011.1118
XYZ	-145211.0797	-5537098.0253	3151657.5300	NEW ARP @ 2011.1118
XYZ	-145211.0797	-5537098.0253	3151657.5300	NEW MON @ 2011.1118
LLH	29 48 19.12135	268 29 51.91958	-15.7942	NEW L1 PHS CEN @ 2011.1118
LLH	29 48 19.12134	268 29 51.91956	-15.8656	NEW ARP @ 2011.1118
LLH	29 48 19.12134	268 29 51.91956	-15.8656	NEW MON @ 2011.1118
STATION NAME: lwes a 2 (Lakewood Elmentry; Luling, Louisiana USA)				
MONUMENT: NO DOMES NUMBER				
XYZ	-33746.0173	-5533652.9285	3160795.4432	MON @ 1997.0000 (M)
XYZ	-0.0137	-0.0013	-0.0018	VEL (M/YR)
NEU	0.0000	0.0000	0.0000	MON TO ARP (M)
NEU	0.0003	0.0005	0.0714	ARP TO L1 PHASE CENTER (M)
NEU	-0.0004	0.0001	0.0682	ARP TO L2 PHASE CENTER (M)
XYZ	-0.1933	-0.0183	-0.0254	VEL TIMES 14.1106 YRS
XYZ	0.0000	0.0000	0.0000	MON TO ARP
XYZ	0.0001	-0.0617	0.0359	ARP TO L1 PHASE CENTER
XYZ	-33746.2105	-5533653.0086	3160795.4537	L1 PHS CEN @ 2011.1118
XYZ	0.0000	0.0000	0.0000	+ XYZ ADJUSTMENTS
XYZ	-33746.2105	-5533653.0086	3160795.4537	NEW L1 PHS CEN @ 2011.1118
XYZ	-33746.2106	-5533652.9468	3160795.4178	NEW ARP @ 2011.1118
XYZ	-33746.2106	-5533652.9468	3160795.4178	NEW MON @ 2011.1118
LLH	29 54 1.31386	269 39 2.13846	-17.0331	NEW L1 PHS CEN @ 2011.1118
LLH	29 54 1.31385	269 39 2.13844	-17.1045	NEW ARP @ 2011.1118
LLH	29 54 1.31385	269 39 2.13844	-17.1045	NEW MON @ 2011.1118
STATION NAME: gris a 2 (Grand Isle; Grand Isle, Louisiana USA)				
MONUMENT: NO DOMES NUMBER				
XYZ	4149.8806	-5568493.9731	3099600.3283	MON @ 1997.0000 (M)
XYZ	-0.0135	-0.0013	-0.0016	VEL (M/YR)
NEU	0.0000	0.0000	0.0000	MON TO ARP (M)
NEU	-0.0001	0.0005	0.1078	ARP TO L1 PHASE CENTER (M)
NEU	-0.0005	0.0006	0.1269	ARP TO L2 PHASE CENTER (M)
XYZ	-0.1905	-0.0183	-0.0226	VEL TIMES 14.1106 YRS
XYZ	0.0000	0.0000	0.0000	MON TO ARP
XYZ	0.0006	-0.0941	0.0526	ARP TO L1 PHASE CENTER
XYZ	4149.6907	-5568494.0855	3099600.3583	L1 PHS CEN @ 2011.1118
XYZ	-0.0000	-0.0000	-0.0000	+ XYZ ADJUSTMENTS
XYZ	4149.6907	-5568494.0855	3099600.3583	NEW L1 PHS CEN @ 2011.1118
XYZ	4149.6901	-5568493.9914	3099600.3057	NEW ARP @ 2011.1118
XYZ	4149.6901	-5568493.9914	3099600.3057	NEW MON @ 2011.1118
LLH	29 15 55.90105	270 2 33.71032	-16.8992	NEW L1 PHS CEN @ 2011.1118
LLH	29 15 55.90105	270 2 33.71030	-17.0070	NEW ARP @ 2011.1118
LLH	29 15 55.90105	270 2 33.71030	-17.0070	NEW MON @ 2011.1118
REMOTE STATION INFORMATION				
1				
STATION NAME: 2367				
MONUMENT: NO DOMES NUMBER				
XYZ	-96394.5771	-5562385.1004	3108982.5223	MON @ 2011.1114 (M)
NEU	-0.0003	-0.0005	1.9839	MON TO ARP (M)
NEU	0.0003	0.0005	0.0714	ARP TO L1 PHASE CENTER (M)
NEU	-0.0004	0.0001	0.0682	ARP TO L2 PHASE CENTER (M)
XYZ	-0.0305	-1.7289	0.9725	MON TO ARP
XYZ	-0.0006	-0.0621	0.0353	ARP TO L1 PHASE CENTER
XYZ	-96394.6081	-5562386.8914	3108983.5301	L1 PHS CEN @ 2011.1118
BASELINE NAME: fshs 2367				
XYZ	-0.0771	1.8451	-0.8818	+ XYZ ADJUSTMENTS
XYZ	-96394.6853	-5562385.0463	3108982.6483	NEW L1 PHS CEN @ 2011.1118
XYZ	-96394.6847	-5562384.9842	3108982.6131	NEW ARP @ 2011.1118
XYZ	-96394.6542	-5562383.2553	3108981.6405	NEW MON @ 2011.1118
LLH	29 21 45.49596	269 0 25.84236	-23.2403	NEW L1 PHS CEN @ 2011.1118
LLH	29 21 45.49595	269 0 25.84234	-23.3117	NEW ARP @ 2011.1118
LLH	29 21 45.49596	269 0 25.84236	-25.2956	NEW MON @ 2011.1118
BASELINE NAME: lwes 2367				
XYZ	-0.0683	1.8520	-0.8804	+ XYZ ADJUSTMENTS
XYZ	-96394.6765	-5562385.0394	3108982.6497	NEW L1 PHS CEN @ 2011.1118
XYZ	-96394.6759	-5562384.9773	3108982.6144	NEW ARP @ 2011.1118
XYZ	-96394.6454	-5562383.2484	3108981.6419	NEW MON @ 2011.1118
LLH	29 21 45.49611	269 0 25.84268	-23.2458	NEW L1 PHS CEN @ 2011.1118
LLH	29 21 45.49610	269 0 25.84266	-23.3172	NEW ARP @ 2011.1118
LLH	29 21 45.49611	269 0 25.84268	-25.3011	NEW MON @ 2011.1118

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BASELINE NAME:  gris  2367
XYZ      -0.0798      1.8116      -0.8667  + XYZ ADJUSTMENTS
XYZ      -96394.6879  -5562385.0798  3108982.6633  NEW L1 PHS CEN @ 2011.1118
XYZ      -96394.6873  -5562385.0177  3108982.6281  NEW ARP @ 2011.1118
XYZ      -96394.6569  -5562383.2888  3108981.6556  NEW MON @ 2011.1118
LLH  29 21 45.49585  269  0 25.84228  -23.2037  NEW L1 PHS CEN @ 2011.1118
LLH  29 21 45.49584  269  0 25.84226  -23.2751  NEW ARP @ 2011.1118
LLH  29 21 45.49585  269  0 25.84228  -25.2590  NEW MON @ 2011.1118

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G-FILES

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Axx2011 210 11 210
B2011 2101610 11 2102146 1 page5 v1009.28IGS      226 1 2 27NGS      2011 217IFDDFX
Iant_info.003      NGS      20110124
C00090001 -488164255 27 252852300 27 426758895 28 X0411A2367X0411AFSHS
D 1 2 -4535954 1 3 -8675905 2 3 323671

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Axx2011 210 11 210
B2011 2101610 11 2102146 1 page5 v1009.28IGS      226 1 2 27NGS      2011 217IFDDFX
Iant_info.003      NGS      20110124
C00090002 626484349 22 287303016 27 518137759 23 X0411A2367X0411ALWES
D 1 2 3811472 1 3 7307171 2 3 -2068508

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Axx2011 210 11 210
B2011 2101610 11 2102146 1 page5 v1009.28IGS      226 1 2 27NGS      2011 217IFDDFX
Iant_info.003      NGS      20110124
C00090003 1005443470 26 -61107026 21 -93813498 12 X0411A2367X0411AGRIS
D 1 2 475190 1 3 -2442279 2 3 -8963289

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POST-FIT RMS BY SATELLITE VS. BASELINE

	OVERALL	02	03	05	06	09	10	12	14
fshs-2367	0.011	0.020	...	0.012	0.017	0.012	...	...	0.013
	15	18	19	21	22	25	26	27	29
fshs-2367	0.015	0.009	...	0.010	0.011	0.014	0.010	0.015	0.009
	31								
fshs-2367	0.017								
	OVERALL	02	03	05	06	09	10	12	14
lwes-2367	0.012	0.020	...	0.014	0.017	0.013	...	0.016	0.016
	15	18	19	21	22	25	26	27	29
lwes-2367	0.018	0.010	...	0.009	0.012	0.017	0.010	0.015	0.010
	31								
lwes-2367	0.015								
	OVERALL	02	03	05	06	09	10	12	14
gris-2367	0.009	0.012	...	0.011	0.015	0.008	...	0.013	0.012
	15	18	19	21	22	25	26	27	29
gris-2367	0.017	0.007	...	0.008	0.009	0.012	0.008	0.011	0.007
	31								
gris-2367	0.011								

OBS BY SATELLITE VS. BASELINE

	OVERALL	02	03	05	06	09	10	12	14
fshs-2367	4204	111	...	224	247	412	...	...	137
	15	18	19	21	22	25	26	27	29
fshs-2367	58	603	...	673	393	119	352	413	425
	31								
fshs-2367	37								
	OVERALL	02	03	05	06	09	10	12	14
lwes-2367	4260	128	...	224	245	423	...	28	137
	15	18	19	21	22	25	26	27	29
lwes-2367	58	612	...	673	384	118	353	424	425
	31								
lwes-2367	28								
	OVERALL	02	03	05	06	09	10	12	14
gris-2367	4257	128	...	224	240	413	...	28	137
	15	18	19	21	22	25	26	27	29
gris-2367	58	612	...	673	400	117	353	412	425

gris-2367| 31  
37

Covariance Matrix for the xyz OPUS Position (meters^2).  
0.0000041978 -0.0000000174 -0.0000000805  
-0.0000000174 0.0000042200 -0.0000000733  
-0.0000000805 -0.0000000733 0.0000032378

Covariance Matrix for the enu OPUS Position (meters^2).  
0.0000041984 -0.0000000778 -0.0000000231  
-0.0000000778 0.0000034078 -0.0000003789  
-0.0000000231 -0.0000003789 0.0000040494

Horizontal network accuracy = 0.00477 meters.  
Vertical network accuracy = 0.00395 meters.

Derivation of NAD 83 vector components

Position of reference station ARP in NAD\_83(CORS96)(EPOCH:2002.0000).

	Xa(m)	Ya(m)	Za(m)	
FSHS	-145210.36101	-5537099.51215	3151657.73690	2002.00
LWES	-33745.47743	-5533654.43408	3160795.61743	2002.00
GRIS	4150.42129	-5568495.48857	3099600.50905	2002.00

Position of reference station monument in NAD\_83(CORS96)(EPOCH:2002.0000).

	Xr(m)	Yr(m)	Zr(m)	
FSHS	-145210.36101	-5537099.51215	3151657.73690	2002.00
LWES	-33745.47743	-5533654.43408	3160795.61743	2002.00
GRIS	4150.42129	-5568495.48857	3099600.50905	2002.00

Velocity of reference station monument in NAD\_83(CORS96)(EPOCH:2002.0000).

	Vx (m/yr)	Vy (m/yr)	Vz (m/yr)
FSHS	0.00160	0.00050	-0.00070
LWES	-0.00000	0.00000	-0.00000
GRIS	-0.00000	0.00000	0.00010

Vectors from unknown station monument to reference station monument in NAD\_83(CORS96)(EPOCH:2002.0000).

	Xr-X= DX(m)	Yr-Y= DY(m)	Zr-Z= DZ(m)	
FSHS	-48816.42601	25285.24685	42675.88090	2002.00
LWES	62648.45757	28730.32492	51813.76143	2002.00
GRIS	100544.35629	-6110.72957	-9381.34695	2002.00

STATE PLANE COORDINATES - U.S. Survey Foot

	SPC (1702 LA S)
Northing (Y) [feet]	313874.163
Easting (X) [feet]	3389307.210
Convergence [degrees]	0.17026404
Point Scale	0.99998733
Combined Factor	0.99999109

\*\* Orthometric Heights Above Future Geopotential Datum.

Prototype orthometric heights are now being made available as a precursor to the completion of GRAV-D and the replacement of NAVD 88 with a new geopotential reference system. The following height reflects the current best estimate of the true orthometric height, based on the existing gravimetric geoid model. This height is subject to change as data and modeling for the gravimetric geoid change throughout the lifetime of the GRAV-D project, or as new realizations of the ITRF are adopted. However, at the completion of GRAV-D, these heights will supersede the NAVD 88 heights

APPROX ORTHO HGT: 0.787 (m) [PROTOTYPE (Computed using USGG2009,GRS80,ITRF2000)]

This position and the above vector components were computed without any knowledge by the National Geodetic Survey regarding the equipment or field operating procedures used.





NEU	-0.0004	0.0001	0.0682	ARP TO L2 PHASE CENTER (M)
XYZ	-0.1708	-0.0113	-0.0409	VEL TIMES 14.1132 YRS
XYZ	0.0000	0.0000	0.0000	MON TO ARP
XYZ	-0.0011	-0.0618	0.0357	ARP TO L1 PHASE CENTER
XYZ	-145211.0809	-5537098.0871	3151657.5657	L1 PHS CEN @ 2011.1143
XYZ	0.0000	0.0000	0.0000	+ XYZ ADJUSTMENTS
XYZ	-145211.0809	-5537098.0871	3151657.5657	NEW L1 PHS CEN @ 2011.1143
XYZ	-145211.0798	-5537098.0253	3151657.5300	NEW ARP @ 2011.1143
XYZ	-145211.0798	-5537098.0253	3151657.5300	NEW MON @ 2011.1143
LLH	29 48 19.12135	268 29 51.91958	-15.7942	NEW L1 PHS CEN @ 2011.1143
LLH	29 48 19.12134	268 29 51.91956	-15.8656	NEW ARP @ 2011.1143
LLH	29 48 19.12134	268 29 51.91956	-15.8656	NEW MON @ 2011.1143

STATION NAME: lwes a 2 (Lakewood Elmentry; Luling, Louisiana USA)

MONUMENT: NO DOMES		NUMBER		
XYZ	-33746.0173	-5533652.9285	3160795.4432	MON @ 1997.0000 (M)
XYZ	-0.0137	-0.0013	-0.0018	VEL (M/YR)
NEU	0.0000	0.0000	0.0000	MON TO ARP (M)
NEU	0.0003	0.0005	0.0714	ARP TO L1 PHASE CENTER (M)
NEU	-0.0004	0.0001	0.0682	ARP TO L2 PHASE CENTER (M)
XYZ	-0.1934	-0.0183	-0.0254	VEL TIMES 14.1132 YRS
XYZ	0.0000	0.0000	0.0000	MON TO ARP
XYZ	0.0001	-0.0617	0.0359	ARP TO L1 PHASE CENTER
XYZ	-33746.2105	-5533653.0086	3160795.4536	L1 PHS CEN @ 2011.1143
XYZ	0.0000	0.0000	0.0000	+ XYZ ADJUSTMENTS
XYZ	-33746.2105	-5533653.0086	3160795.4537	NEW L1 PHS CEN @ 2011.1143
XYZ	-33746.2106	-5533652.9468	3160795.4178	NEW ARP @ 2011.1143
XYZ	-33746.2106	-5533652.9468	3160795.4178	NEW MON @ 2011.1143
LLH	29 54 1.31387	269 39 2.13846	-17.0331	NEW L1 PHS CEN @ 2011.1143
LLH	29 54 1.31385	269 39 2.13844	-17.1045	NEW ARP @ 2011.1143
LLH	29 54 1.31385	269 39 2.13844	-17.1045	NEW MON @ 2011.1143

STATION NAME: gris a 2 (Grand Isle; Grand Isle, Louisiana USA)

MONUMENT: NO DOMES		NUMBER		
XYZ	4149.8806	-5568493.9731	3099600.3283	MON @ 1997.0000 (M)
XYZ	-0.0135	-0.0013	-0.0016	VEL (M/YR)
NEU	0.0000	0.0000	0.0000	MON TO ARP (M)
NEU	-0.0001	0.0005	0.1078	ARP TO L1 PHASE CENTER (M)
NEU	-0.0005	0.0006	0.1269	ARP TO L2 PHASE CENTER (M)
XYZ	-0.1905	-0.0183	-0.0226	VEL TIMES 14.1132 YRS
XYZ	0.0000	0.0000	0.0000	MON TO ARP
XYZ	0.0006	-0.0941	0.0526	ARP TO L1 PHASE CENTER
XYZ	4149.6906	-5568494.0855	3099600.3583	L1 PHS CEN @ 2011.1143
XYZ	-0.0000	-0.0000	-0.0000	+ XYZ ADJUSTMENTS
XYZ	4149.6906	-5568494.0855	3099600.3583	NEW L1 PHS CEN @ 2011.1143
XYZ	4149.6901	-5568493.9915	3099600.3057	NEW ARP @ 2011.1143
XYZ	4149.6901	-5568493.9915	3099600.3057	NEW MON @ 2011.1143
LLH	29 15 55.90104	270 2 33.71031	-16.8992	NEW L1 PHS CEN @ 2011.1143
LLH	29 15 55.90105	270 2 33.71030	-17.0070	NEW ARP @ 2011.1143
LLH	29 15 55.90105	270 2 33.71030	-17.0070	NEW MON @ 2011.1143

#### REMOTE STATION INFORMATION

MONUMENT: NO DOMES		NUMBER		
XYZ	-96394.5880	-5562385.1109	3108982.5270	MON @ 2011.1140 (M)
NEU	-0.0003	-0.0005	1.9839	MON TO ARP (M)
NEU	0.0003	0.0005	0.0714	ARP TO L1 PHASE CENTER (M)
NEU	-0.0004	0.0001	0.0682	ARP TO L2 PHASE CENTER (M)
XYZ	-0.0305	-1.7289	0.9725	MON TO ARP
XYZ	-0.0006	-0.0621	0.0353	ARP TO L1 PHASE CENTER
XYZ	-96394.6190	-5562386.9019	3108983.5348	L1 PHS CEN @ 2011.1143

MONUMENT: NO DOMES		NUMBER		
XYZ	-0.0741	1.8733	-0.8826	+ XYZ ADJUSTMENTS
XYZ	-96394.6931	-5562385.0286	3108982.6522	NEW L1 PHS CEN @ 2011.1143
XYZ	-96394.6926	-5562384.9665	3108982.6169	NEW ARP @ 2011.1143
XYZ	-96394.6621	-5562383.2376	3108981.6444	NEW MON @ 2011.1143
LLH	29 21 45.49634	269 0 25.84205	-23.2537	NEW L1 PHS CEN @ 2011.1143
LLH	29 21 45.49634	269 0 25.84203	-23.3251	NEW ARP @ 2011.1143
LLH	29 21 45.49634	269 0 25.84205	-25.3090	NEW MON @ 2011.1143

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BASELINE NAME: lwes 2367
XYZ      -0.0509      1.8708      -0.8778  + XYZ ADJUSTMENTS
XYZ      -96394.6700  -5562385.0311  3108982.6569  NEW L1 PHS CEN @ 2011.1143
XYZ      -96394.6694  -5562384.9691  3108982.6217  NEW ARP @ 2011.1143
XYZ      -96394.6389  -5562383.2401  3108981.6492  NEW MON @ 2011.1143
LLH 29 21 45.49645  269 0 25.84291  -23.2495  NEW L1 PHS CEN @ 2011.1143
LLH 29 21 45.49643  269 0 25.84289  -23.3209  NEW ARP @ 2011.1143
LLH 29 21 45.49645  269 0 25.84291  -25.3048  NEW MON @ 2011.1143

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BASELINE NAME: gris 2367
XYZ      -0.0744      1.8350      -0.8739  + XYZ ADJUSTMENTS
XYZ      -96394.6934  -5562385.0669  3108982.6609  NEW L1 PHS CEN @ 2011.1143
XYZ      -96394.6929  -5562385.0049  3108982.6256  NEW ARP @ 2011.1143
XYZ      -96394.6624  -5562383.2759  3108981.6531  NEW MON @ 2011.1143
LLH 29 21 45.49598  269 0 25.84207  -23.2160  NEW L1 PHS CEN @ 2011.1143
LLH 29 21 45.49597  269 0 25.84205  -23.2874  NEW ARP @ 2011.1143
LLH 29 21 45.49598  269 0 25.84207  -25.2713  NEW MON @ 2011.1143

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G-FILES

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Axx2011 211 11 211
B2011 2111422 11 21120 4 1 page5 v1009.28IGS 226 1 2 27NGS 2011 217IFDDFX
Iant_info.003 NGS 20110124
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D 1 2 -4867744 1 3 -8196295 2 3 593779

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Iant_info.003 NGS 20110124
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D 1 2 4270728 1 3 7713108 2 3 -919359

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Axx2011 211 11 211
B2011 2111422 11 21120 4 1 page5 v1009.28IGS 226 1 2 27NGS 2011 217IFDDFX
Iant_info.003 NGS 20110124
C00090003 1005443525 25 -61107155 20 -93813474 11 X0421A2367X0421AGRIS
D 1 2 -711066 1 3 -1103518 2 3 -8608950

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POST-FIT RMS BY SATELLITE VS. BASELINE

	OVERALL	02	03	04	05	06	09	10	12
fshs-2367	0.012	0.014	...	0.017	0.013	0.018	0.014	0.011	0.011
	14	15	18	21	22	25	26	27	29
fshs-2367	0.015	0.014	0.011	0.012	0.013	0.009	0.012	0.017	0.010
lwes-2367	0.013	0.014	...	0.013	0.017	0.018	0.016	0.011	0.020
	14	15	18	21	22	25	26	27	29
lwes-2367	0.020	0.012	0.011	0.012	0.014	0.013	0.013	0.016	0.010
gris-2367	0.010	0.009	...	0.013	0.019	0.016	0.011	0.009	0.009
	14	15	18	21	22	25	26	27	29
gris-2367	0.014	0.010	0.009	0.010	0.010	0.010	0.009	0.010	0.008

OBS BY SATELLITE VS. BASELINE

	OVERALL	02	03	04	05	06	09	10	12
fshs-2367	4355	319	...	93	64	130	228	180	237
	14	15	18	21	22	25	26	27	29
fshs-2367	115	215	413	470	194	315	496	271	615
lwes-2367	4394	332	...	92	64	130	226	180	237
	14	15	18	21	22	25	26	27	29
lwes-2367	115	215	413	488	202	317	496	272	615
gris-2367	4379	332	...	93	64	129	228	180	237
	14	15	18	21	22	25	26	27	29
gris-2367	115	215	412	488	193	316	496	265	616

Covariance Matrix for the xyz OPUS Position (meters<sup>2</sup>).  
 0.0000041711 -0.0000000235 -0.0000000258  
 -0.0000000235 0.0000035578 -0.0000000454  
 -0.0000000258 -0.0000000454 0.0000027244

Covariance Matrix for the enu OPUS Position (meters<sup>2</sup>).  
 0.0000041717 -0.0000000281 -0.0000000009  
 -0.0000000281 0.0000028835 -0.0000003306  
 -0.0000000009 -0.0000003306 0.0000033981

Horizontal network accuracy = 0.00461 meters.  
 Vertical network accuracy = 0.00361 meters.

Derivation of NAD 83 vector components

Position of reference station ARP in NAD\_83(CORS96)(EPOCH:2002.0000).

	Xa(m)	Ya(m)	Za(m)	
FSHS	-145210.36101	-5537099.51215	3151657.73690	2002.00
LWES	-33745.47743	-5533654.43408	3160795.61743	2002.00
GRIS	4150.42129	-5568495.48857	3099600.50905	2002.00

Position of reference station monument in NAD\_83(CORS96)(EPOCH:2002.0000).

	Xr(m)	Yr(m)	Zr(m)	
FSHS	-145210.36101	-5537099.51215	3151657.73690	2002.00
LWES	-33745.47743	-5533654.43408	3160795.61743	2002.00
GRIS	4150.42129	-5568495.48857	3099600.50905	2002.00

Velocity of reference station monument in NAD\_83(CORS96)(EPOCH:2002.0000).

	Vx (m/yr)	Vy (m/yr)	Vz (m/yr)
FSHS	0.00160	0.00050	-0.00070
LWES	-0.00000	0.00000	-0.00000
GRIS	-0.00000	0.00000	0.00010

Vectors from unknown station monument to reference station monument in NAD\_83(CORS96)(EPOCH:2002.0000).

	Xr-X= DX(m)	Yr-Y= DY(m)	Zr-Z= DZ(m)	
FSHS	-48816.42401	25285.23385	42675.87790	2002.00
LWES	62648.45957	28730.31192	51813.75843	2002.00
GRIS	100544.35829	-6110.74257	-9381.34995	2002.00

STATE PLANE COORDINATES - U.S. Survey Foot

	SPC (1702 LA S)
Northing (Y) [feet]	313874.192
Easting (X) [feet]	3389307.203
Convergence [degrees]	0.17026403
Point Scale	0.99998733
Combined Factor	0.99999109

\*\* Orthometric Heights Above Future Geopotential Datum.

Prototype orthometric heights are now being made available as a precursor to the completion of GRAV-D and the replacement of NAVD 88 with a new geopotential reference system. The following height reflects the current best estimate of the true orthometric height, based on the existing gravimetric geoid model. This height is subject to change as data and modeling for the gravimetric geoid change throughout the lifetime of the GRAV-D project, or as new realizations of the ITRF are adopted. However, at the completion of GRAV-D, these heights will supersede the NAVD 88 heights

APPROX ORTHO HGT: 0.777 (m) [PROTOTYPE (Computed using USGG2009,GRS80,ITRF2000)]

This position and the above vector components were computed without any knowledge by the National Geodetic Survey regarding the equipment or field operating procedures used.