GROUND CONTROL SURVEY REPORT

GROUND TRUTH SURVEY
FOR LIDAR CONTROL

PROJECT TITLE:	FY 2006 RUTLAND RANCH TOPOGRAPHIC MAPPING (SB19)
PURCHASE ORDER:	06POSOW0610
WORK ORDER NAME:	RUTLAND RANCH LiDAR
WORK ORDER NUMBER:	1
CONSULTANT NAME:	3001, Inc.
PROJECT MANAGERS:	EKATERINA FITOS, District's Project Manager KERMIT LEWIS, Consultant's Project Manager

Services provided by:

3001, INC. THE GEOSPATIAL COMPANY
501 Robert Blvd. 2nd Floor
Slidell, Louisiana 70458

3001®
the geospatial company

January 2007

Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899

Attn: Jim Owens, PSM

Re: Rutland Ranch LIDAR

This photogrammetric mapping ground control survey is certified to the Southwest Florida Water Management Standards applicable for the work, as set forth in Chapter 61G17-6, Florida Adminstrative Code.

Stephen L. Hebert, P.L.S.

CONTENTS

ABSTRACT

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This report documents the GPS ground surveys conducted in support of LIDAR data collection for the Rutland Ranch LIDAR project (SB19). The data was collected between March 13 and March 17, 2006. The ground control stations were established utilizing two Trimble 5700 GPS receivers, two Trimble 4000 series recievers, two Trimble Compact L1/L2 antennas with ground plane and two Trimble Zephyr Geodetic antennas. There were no problems encountered during this survey.

Following the control network surveys, surveys were conducted at 7 sites utilizing the base stations established in the static network. These surveys established "Ground Truth" data at each site on different surface types, including dirt, trees/brush, mowed grass, weeds/short grass, tall grass and thick brush.

Statistical comparisons were made between ground truth points collected in the survey and airborne LIDAR points which fell within 3 feet of the ground truth points. These statistics can be seen on pages 11-14. Comparisons were also made between the survey points and the LIDAR derived terrain surface. These comparisons provide an additional verification of the LIDAR data against the survey data.

The horizontal and vertical datums used for this project are listed below:

Coordinate System: US State Plane
Zone: Florida West 0902
Horizontal Datum: NAD83
Vertical Datum: NAVD88
Geoid Model: Geoid03
Units: US Survey Feet

SURVEY METHODOLOGY

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Prior to beginning the survey collection, a reconnaissance was done of the existing control in the project area, and surrounding areas. Based on the results of the findings, the controls to be included in the network were selected based on their locations, horizontal and vertical orders, and their accessibility. All control monuments can be found in the Fully-Constrained Adjustment table, found in Section 4-B, and can also be seen on the GPS Network Map shown in Section 4-A.

After the static GPS network was completed, the groundtruthing data points were collected using a total station and data collector. The groundtruthing points can be seen in Section 5. This data was collected from base stations tied into the static GPS network, and additional "check-in" points were collected and compared to positions established in the static network. The groundtruthing data was then processed and used to verify the LIDAR positions. The LIDAR point comparisions can be seen on pages 11-14. All survey data was collected and processed by Morgan & Eklund, Inc.

The horizontal and vertical datums used for this project are listed below:

Coordinate System: US State Plane
Zone: Florida West 0902
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MAIN REPORT

STATIC GPS SUMMARY

The static GPS network was planned to ensure that each established monument was tied to two existing control monuments. The control monuments were selected based on their locations, horizontal and vertical orders, and accessibility.

In addition, the static GPS network was established to verify the compatibility and correlation of existing published NGS controls in the project area. Horizontal and vertical constraints were selected based on the order of accuracy and correlation of the controls selected.

PRELIMINARY ANALYSIS

The baselines were processed using Trimble Geomatics Offices's baseline processing module, WAVE (*Weighted Ambiguity Vector Estimator*). Ionosphere-free fixed solutions were found to provide the best results. Preliminary blunder detections were undertaken using "Redundant Vectors" and Global Network Closures and any extremely large errors were eliminated.

MINIMALLY CONSTRAINED ADJUSTMENT

The data are then processed using a minimally constrained geodetic control network to test the network internally, without external constraints, and produce a statistical summary. The statistics from this process are required to be within the tolerance outlined in the Geometric Geodetic Accuracy Standards and Specifications for using GPS Relative Positioning Techniques, published by the FGCC. These tolerances are represented as ellipsoids showing the margin of error value on a graph of the theoretical points, covariance values that indicate the degree of error of the vectors relative to the other vectors in the network, and a chi-squared test that compares the predicted variance determined through a least-squares analysis to the observed variance. The summary is evaluated to eliminate vectors that are outside of the error tolerances to be replaced with redundant vectors that are within the tolerances until all tolerances are met.

FULLY CONSTRAINED ADJUSTMENT

The quality of the existing horizontal controls is assessed before undertaking the constrained adjustment. Geodetic inverses between the published NAD83 Coordinates of existing stations were compared with the geodetic inverses derived from the minimally constrained least square adjustment results. This distance analysis is especially useful, since it provides a datum invariant means of comparison.

Once the minimally constrained network satisfies the requirements of the above tests, the highest order control points in the control network are selected with an optimum spatial

relationship to fully constrain the network to known control points, and have their published values entered as the position for those points and the network re-adjusted. The fully constrained report is given in Section 4-B. The same statistical tests are rerun on the adjusted network, as well as visually comparing adjusted values of geodetic control points to published values of control points not used as constraints. Again, the summary is evaluated to identify vectors outside of the tolerances and constraining points reselected to obtain the best fit to the geoid where all vectors are within the prescribed tolerances.

ERROR ELLIPSES

The adjustment results show that the a posteriori variance factor of the network was close to 1.0, as should be desired, and passed the χ_2 test. None of the residual components in the network were flagged for possible rejection under the τ-max test at the 0.05 level of significance. The relative confidence ellipses reveal that the horizontal positional accuracy between all directly connected pairs of stations in the network were better than (1:100,000) at the 95% level of confidence. The horizontal and vertical Error ellipses are included in this report in Section 4-C.

GROUND TRUTH SUMMARY

Surveys were conducted to establish ground truth data at representative sites throughout the project area. These sites were selected on the basis of the various types of ground surfaces and vegetation covers that would be encountered by the LIDAR surveys. As a quality control measure, a number of “check-in” points consisted of published horizontal and vertical control points within the area. The base stations used to collect survey data were included in the static GPS network, and were selected on the basis of their having an unobstructed view of the sky, as well as being in a location considered favorable for collecting ground truth data. The vertical and horizontal accuracy of each base station was determined by the statistical tests performed in the least squares adjustment process.

SAMPLE POINTS / TEST POINTS

The test points were distributed and categorized into sites as shown in the Map of Ground Truth Locations attached in this report (Section 5-A). These sites were selected on the basis of various types of ground surfaces and vegetation covers. At the time of LIDAR data acquisition, checkpoints were collected on surfaces with dirt, trees/brush, mowed grass, weeds/short grass, tall grass and thick brush.

DATA ANALYSIS

Data analysis was accomplished by comparing ground truth checkpoints with LIDAR points from the edited data set, which were within 3 feet horizontally from the ground truth points. The only exception to this were the ground truth points collected under tree canopy, where comparisons were made with LIDAR pulses that fell within 4 feet of the check points. This is because fewer LIDAR pulses are able to reach the ground in heavily forested areas, so the point spacing is larger than in cleared areas. Based on the number of returns and the density of points in this project, it was not necessary to compare to anything further away than 3 feet from the ground truth points. Note that the edited LIDAR points are simply a subset of the raw LIDAR points. The points that fell above the ground surface on vegetation canopies, buildings, or other obstructions were removed from the data set. Comparisons were also made between the survey points and the LIDAR derived terrain surface. These comparisons provide an additional verification of the LIDAR data against the survey data.

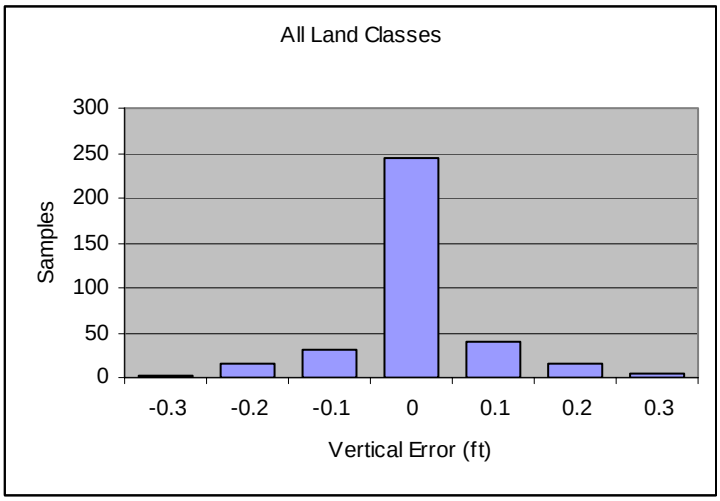
LIDAR POINT COMPARISON

The result of these comparisons of these values indicated a Vertical Root Mean Square Error (RMSEz) of 0.111 feet, which equates to Vertical Accuracy of 0.218 feet at the 95 percent confidence level.

OVERALL ACCURACY

A comparison of these values indicated a Vertical Root Mean Square Error (RMSEz) of 0.111 feet. This is within the vertical accuracy tolerance. The mean elevation difference for all points is 0.007 feet. Skewness is -0.074, indicating an approximately normal distribution. Descriptive statistics and a histogram of the vertical error distribution for all samples are shown below.

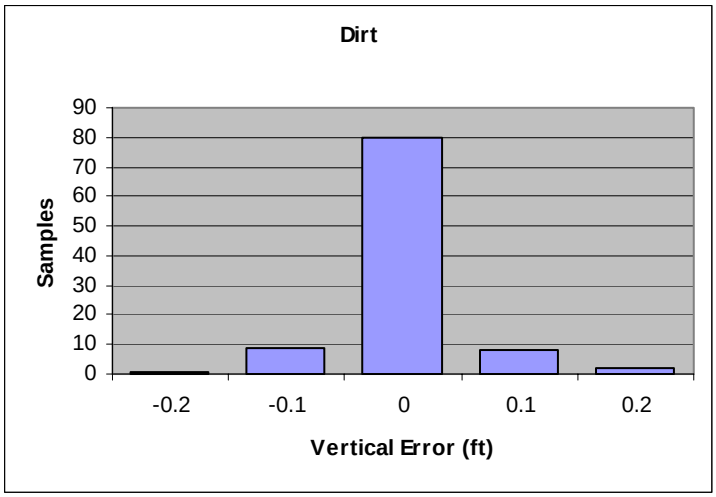
All Land Classes (ft)	
RMSEz	0.111
Mean	0.007
Standard Error	0.006
Median	0.010
Mode	0.020
Standard Deviation	0.111
Sample Variance	0.012
Kurtosis	1.061
Skewness	-0.074
Range	0.680
Minimum	-0.350
Maximum	0.330
Count	354



DIRT

This set includes only those points that were collected in areas of dirt surfaces. The resulting RMSEz is 0.079 feet, which is within the accuracy specification. The skewness value is 0.338.

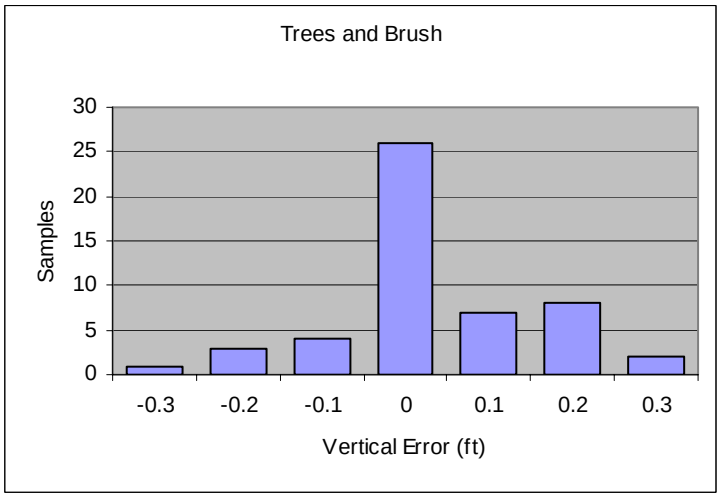
Dirt (ft)	
RMSEz	0.079
Mean	0.004
Standard Error	0.008
Median	0.005
Mode	0.020
Standard Deviation	0.079
Sample Variance	0.006
Kurtosis	1.480
Skewness	0.338
Range	0.480
Minimum	-0.200
Maximum	0.280
Count	100



TREES AND BRUSH

This set includes only those points that were collected in areas of trees and brush surfaces. The resulting RMSEz is 0.160 feet, which is within the accuracy specification. The skewness value is -0.318.

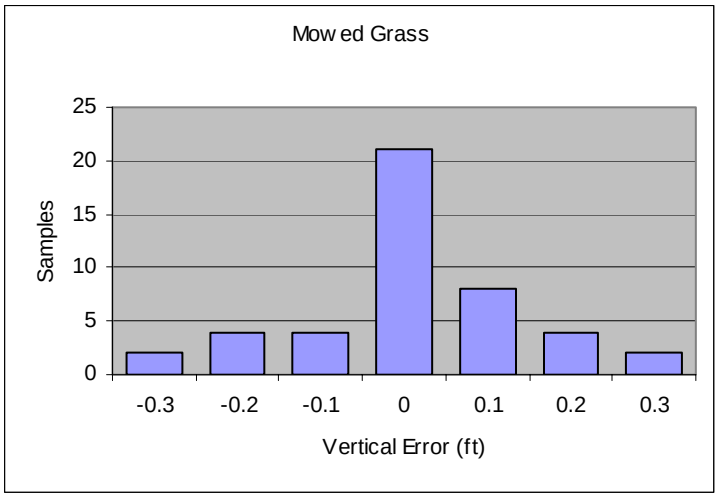
Trees and Brush (ft)	
RMSEz	0.160
Mean	0.054
Standard Error	0.021
Median	0.070
Mode	0.090
Standard Deviation	0.152
Sample Variance	0.023
Kurtosis	-0.107
Skewness	-0.318
Range	0.630
Minimum	-0.300
Maximum	0.330
Count	51



MOWED GRASS

This set includes only those points that were collected in areas of mowed grass. The resulting RMSEz is 0.160 feet, which is within the accuracy specification. The skewness is -0.298.

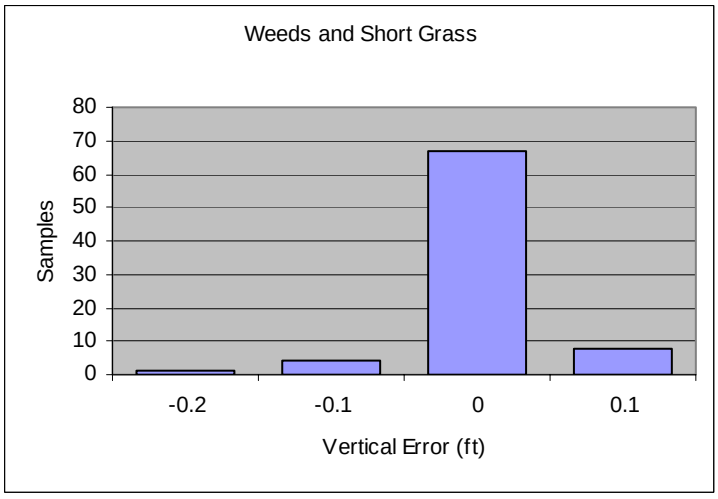
Mowed Grass (ft)	
RMSEz	0.160
Mean	0.007
Standard Error	0.024
Median	0.010
Mode	-0.040
Standard Deviation	0.161
Sample Variance	0.026
Kurtosis	-0.102
Skewness	-0.298
Range	0.660
Minimum	-0.350
Maximum	0.310
Count	45



WEEDS AND SHORT GRASS

This set includes only those points that were collected in areas of weeds and short grass surfaces. The resulting RMSEz is 0.069 feet, which is within the accuracy specification. The skewness is -0.480.

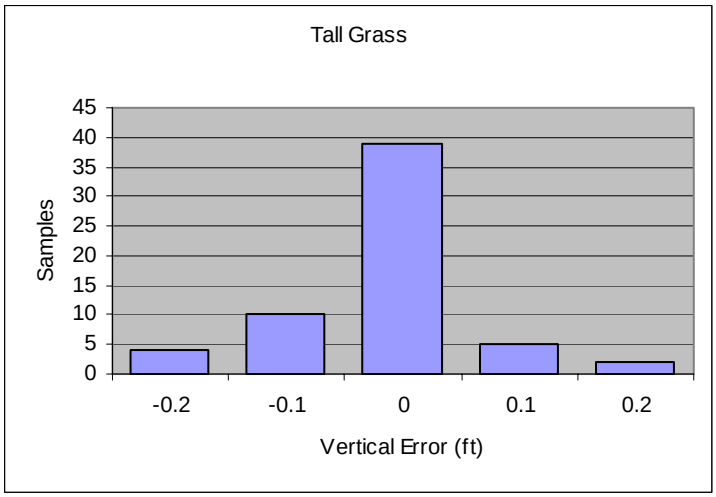
Weeds and Short Grass (ft)	
RMSEz	0.069
Mean	0.013
Standard Error	0.008
Median	0.020
Mode	-0.010
Standard Deviation	0.068
Sample Variance	0.005
Kurtosis	1.165
Skewness	-0.480
Range	0.390
Minimum	-0.210
Maximum	0.180
Count	80



TALL GRASS

This set includes only those points that were collected in areas with tall grass surfaces. The resulting RMSEz is 0.107 feet, which is within the accuracy specification.
The skewness is -0.036.

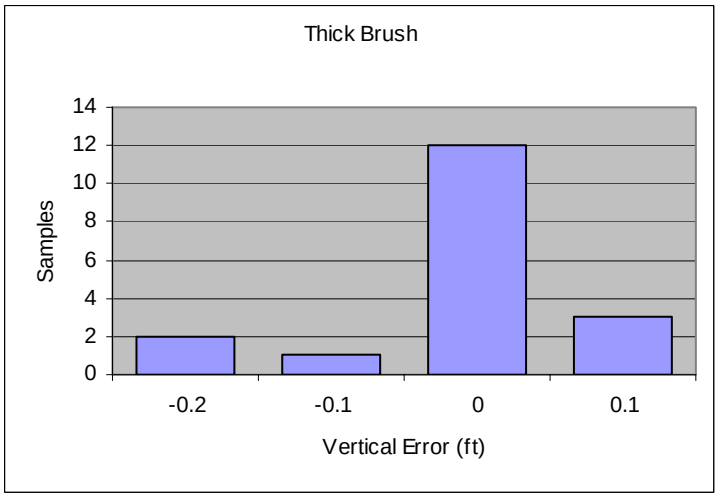
Tall Grass (ft)	
RMSEz	0.107
Mean	-0.021
Standard Error	0.014
Median	-0.020
Mode	-0.050
Standard Deviation	0.105
Sample Variance	0.011
Kurtosis	-0.174
Skewness	-0.036
Range	0.490
Minimum	-0.240
Maximum	0.250
Count	60



THICK BRUSH

This set includes only those points that were collected in areas with thick brush surfaces. The resulting RMSEz is 0.116 feet, which is within the accuracy specification. The skewness is -0.440.

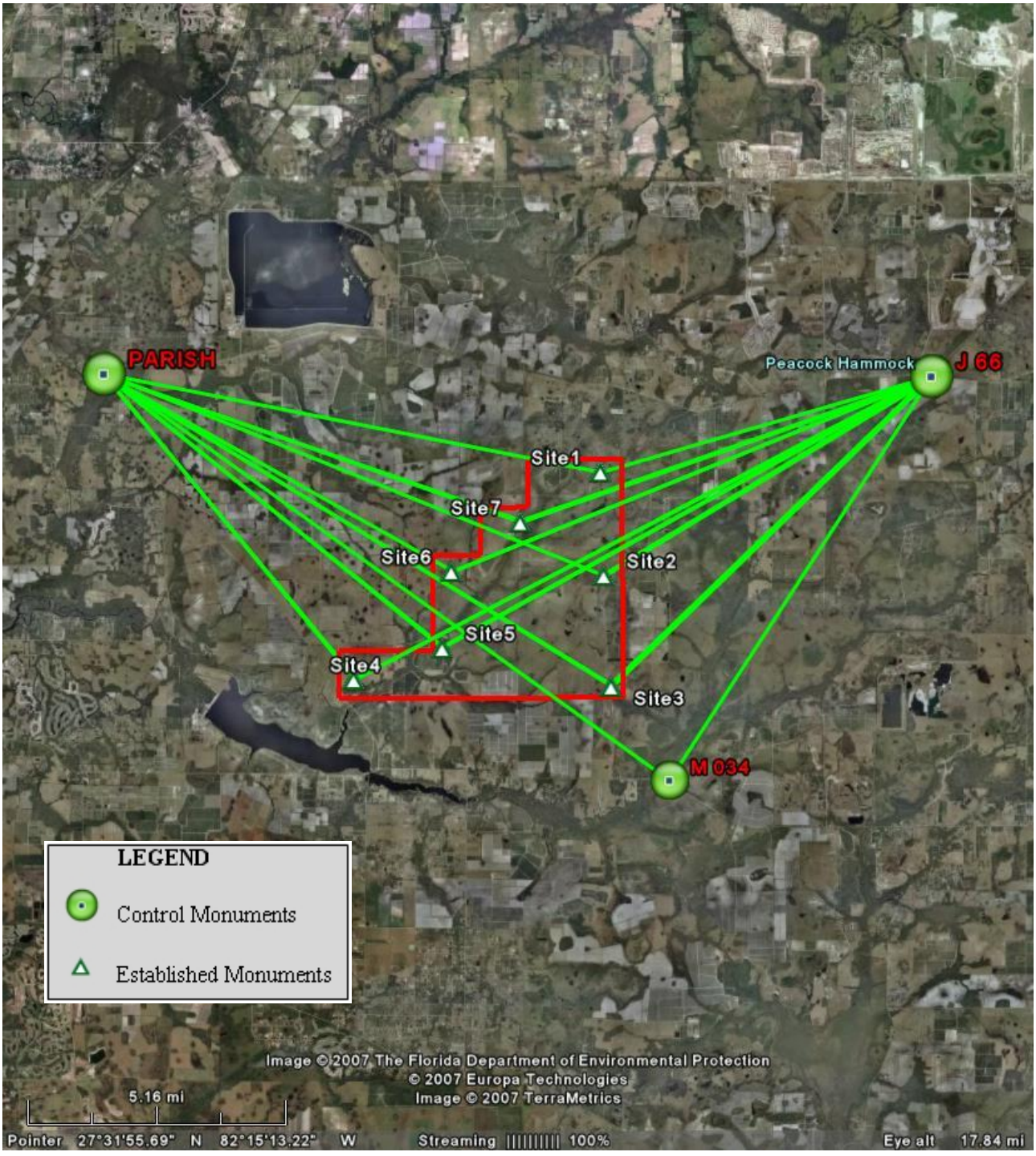
Thick Brush	
RMSEz	0.116
Mean	-0.034
Standard Error	0.027
Median	-0.010
Mode	-0.070
Standard Deviation	0.114
Sample Variance	0.013
Kurtosis	-0.133
Skewness	-0.440
Range	0.410
Minimum	-0.260
Maximum	0.150
Count	18



GPS NETWORK

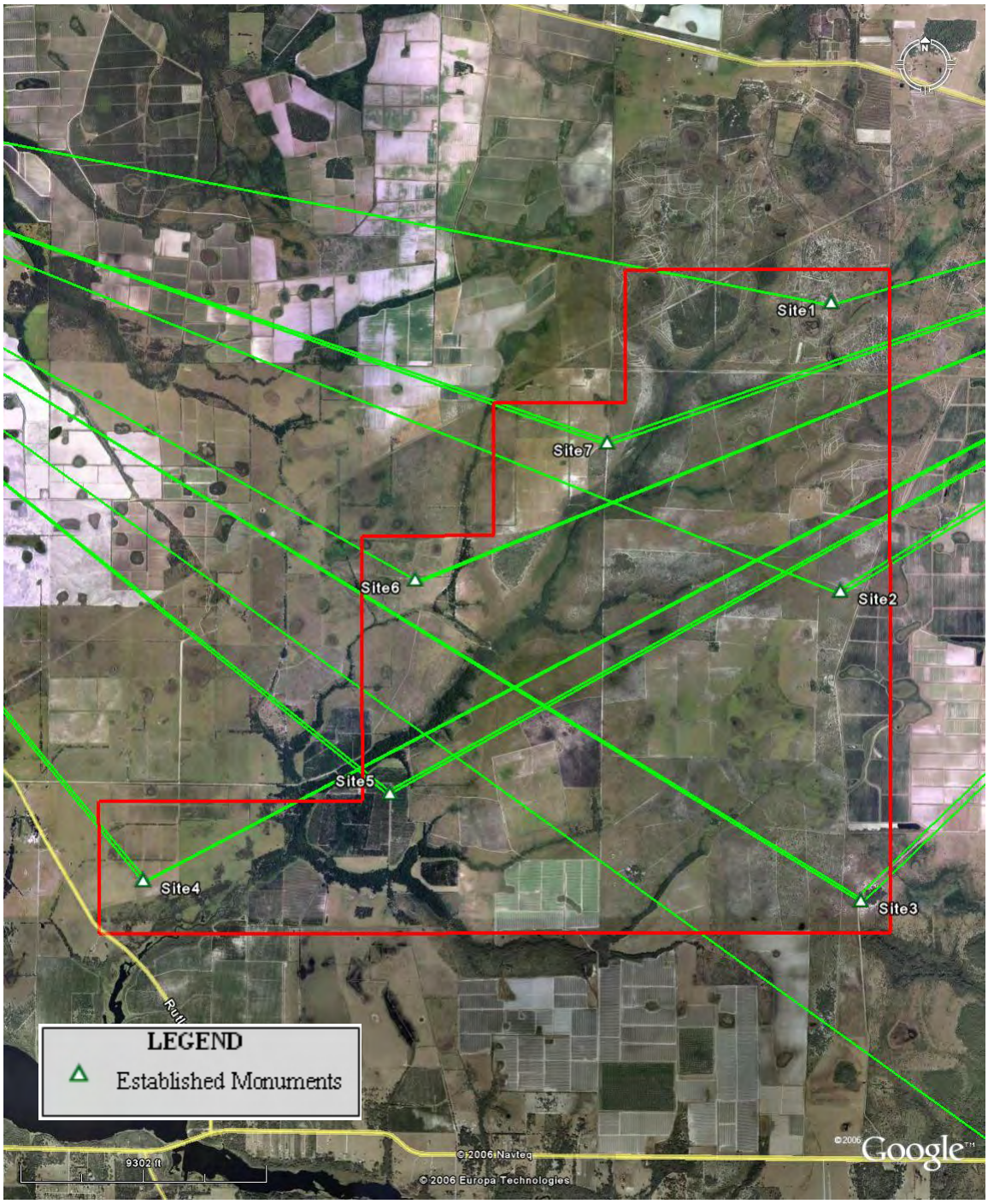
A. GPS Network Map

GPS Network Map

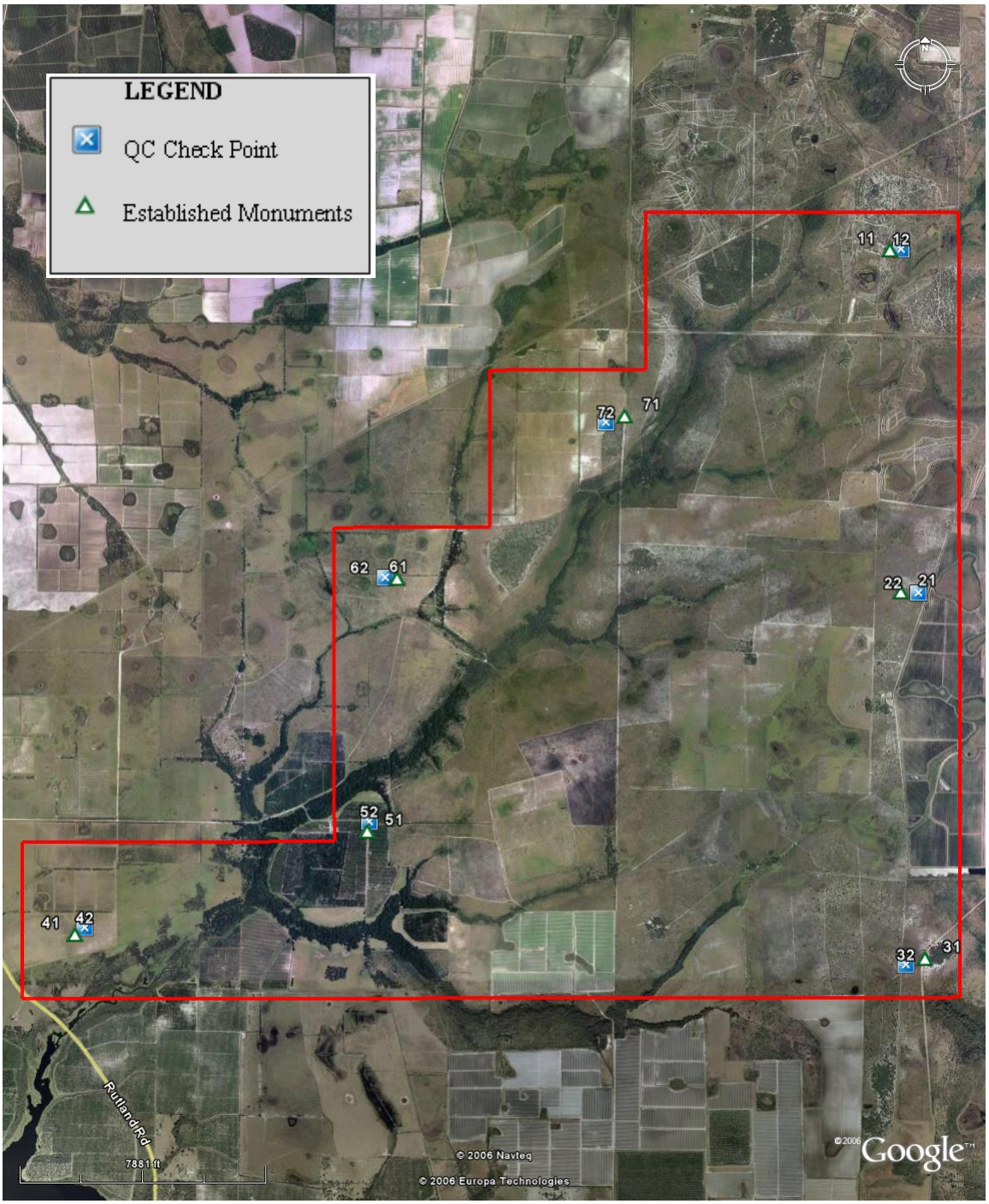


This map shows the GPS baselines processed for this network. The control monuments can be distinguished from the newly established monuments (see the legend above). The project area can be seen more closely on the next page. A hardcopy of this map is included as Attachment A.

GPS Network Map
Project Area



QC Check Points



The check points can be seen in the above map. The QC procedures are described in Section 3, in the Ground Truth Summary. A hardcopy of this map is included as Attachment B.

B. Fully Constrained

Rutland Ranch LIDAR Ground Truth
GPS Control Network
Fully-Constrained Adjustment

Coordinate System: US State Plane
Zone: Florida West 0902
Horizontal Datum: NAD83
Geoid Model: Geoid03
Units: US Survey Feet

Name	Latitude	Longitude	Northing	Easting	Elevation	Ellip Ht	Northing error	Easting error	Ellip error	Fixed
PARISH	27 35 26.78573	82 23 19.48556	1184128.47	530251.00	32.44	-48.829	0.00	0.00	0.00	LLe
J 66	27 35 24.31722	82 07 07.08764	1183699.78	617740.30	125.36	43.559	0.03	0.03	0.00	e
M 054	27 28 24.15903	82 12 15.06782	1141307.49	589960.45	76.49	-4.758	0.00	0.00	0.08	LLe
11	27 33 46.23078	82 13 34.78360	1173843.37	582839.93	124.84	43.235	0.03	0.03	0.08	
12	27 33 45.89186	82 13 32.43946	1173808.76	583050.83	123.92	42.314	0.03	0.03	0.08	
21	27 31 58.51304	82 13 30.97208	1162965.15	583163.17	122.04	40.55	0.03	0.03	0.08	
22	27 31 58.43495	82 13 28.31329	1162956.83	583402.50	122.70	41.209	0.03	0.03	0.08	
31	27 30 02.97086	82 13 22.31636	1151296.07	583921.39	103.43	22.081	0.03	0.03	0.08	
32	27 30 00.01074	82 13 23.41549	1150997.33	583821.88	102.32	20.975	0.03	0.03	0.08	
41	27 30 10.38741	82 18 24.42452	1152103.07	556719.52	73.30	-7.925	0.03	0.03	0.08	
42	27 30 10.79644	82 18 21.47967	1152143.72	556984.79	73.10	-8.127	0.03	0.03	0.08	
51	27 30 42.99112	82 16 40.45871	1155373.40	566088.47	77.81	-3.508	0.03	0.03	0.08	
52	27 30 45.46581	82 16 40.26345	1155623.26	566106.61	77.48	-3.841	0.03	0.03	0.08	
61	27 32 02.79626	82 16 29.83102	1163430.17	567063.23	83.77	2.355	0.03	0.03	0.08	
62	27 32 02.69670	82 16 32.05074	1163420.56	566863.39	84.05	2.636	0.03	0.03	0.08	
71	27 32 53.97721	82 15 08.98760	1168583.06	574351.22	113.09	31.582	0.03	0.03	0.08	
72	27 32 51.61788	82 15 09.15497	1168344.84	574335.67	112.00	30.495	0.03	0.03	0.08	

ERRORS ARE REPORTED AT THE 95% CONFIDENCE LEVEL.

C. Error Ellipses

Point Error Ellipses

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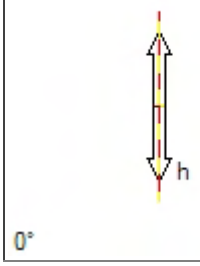	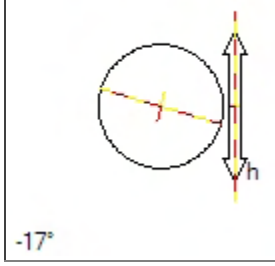	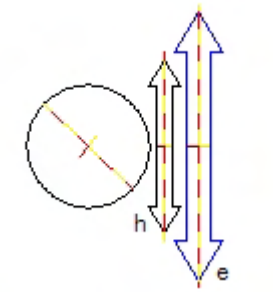
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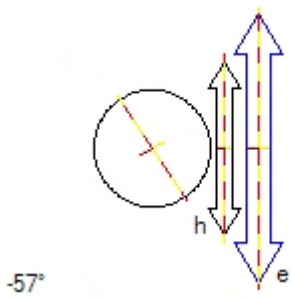	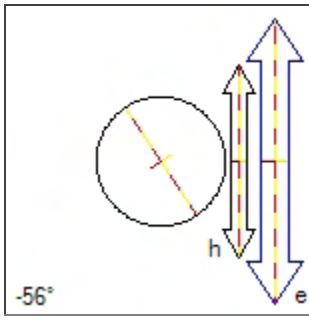	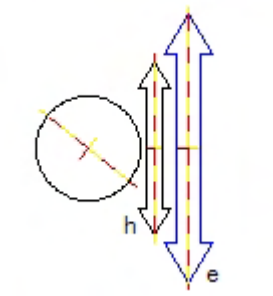
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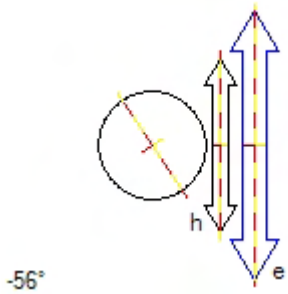	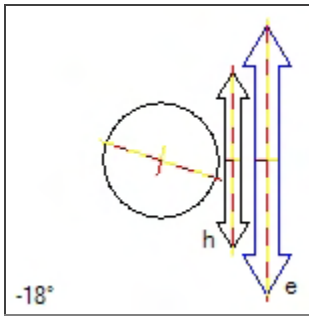	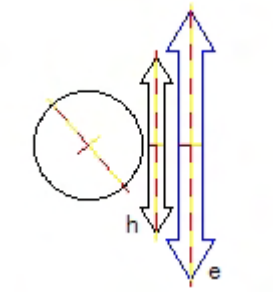
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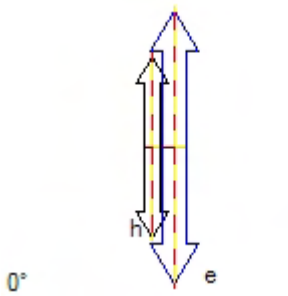	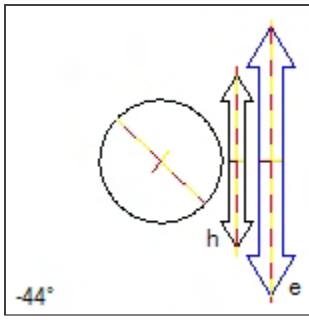	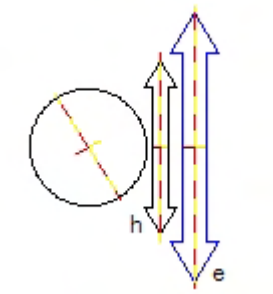
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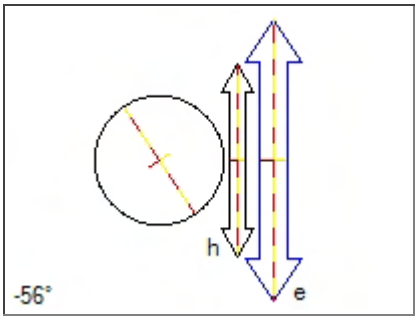	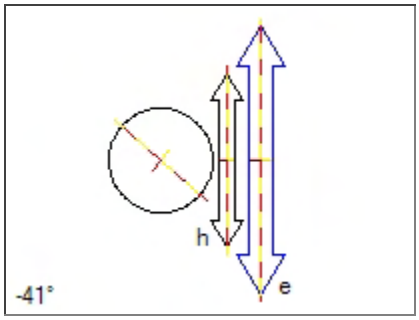	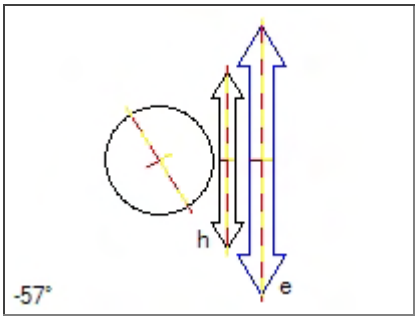
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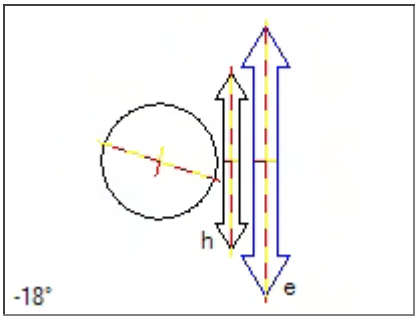
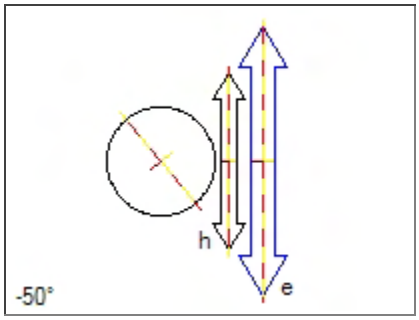
12	**72**	
		
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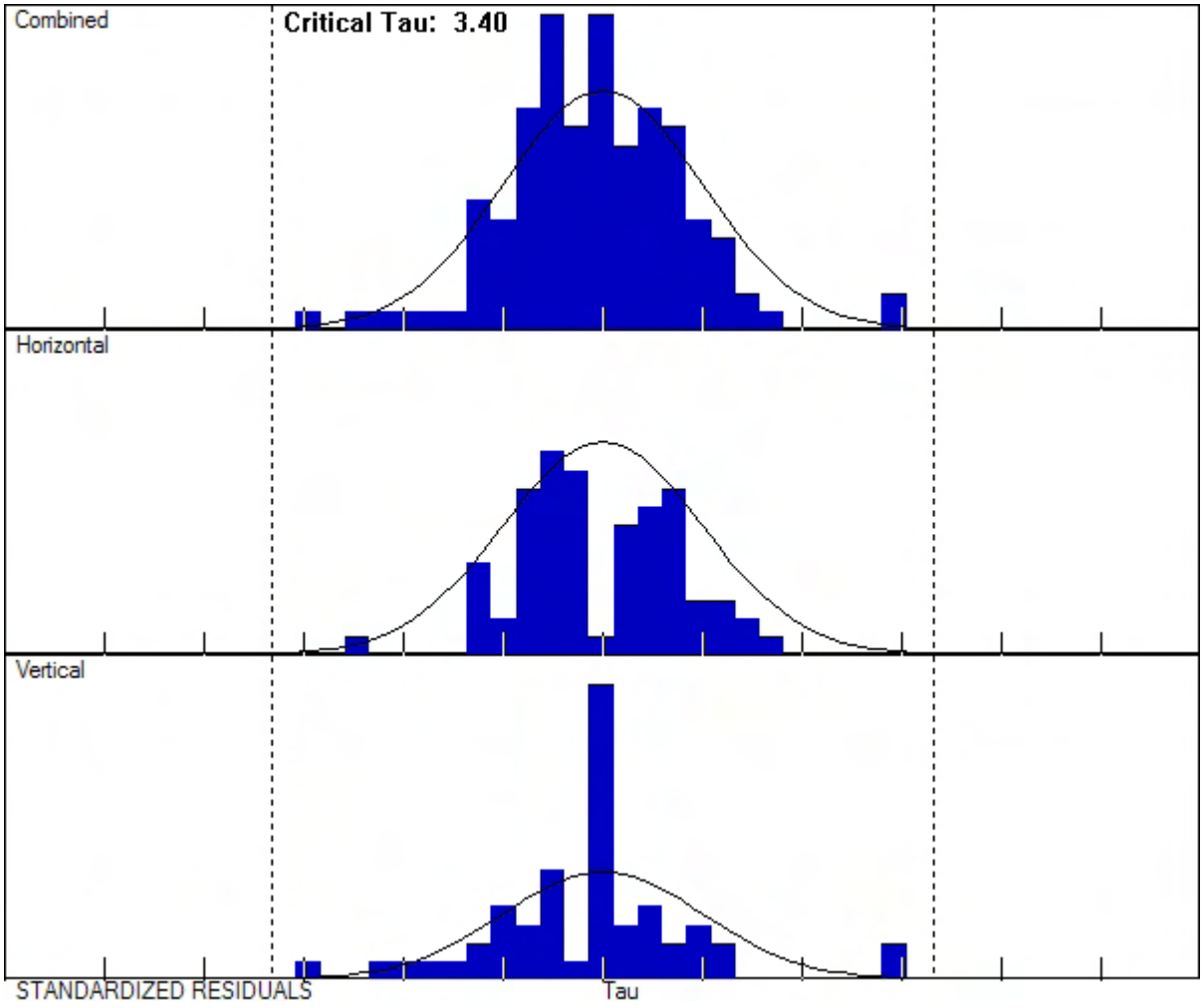
D. Histograms of Standardized Residuals

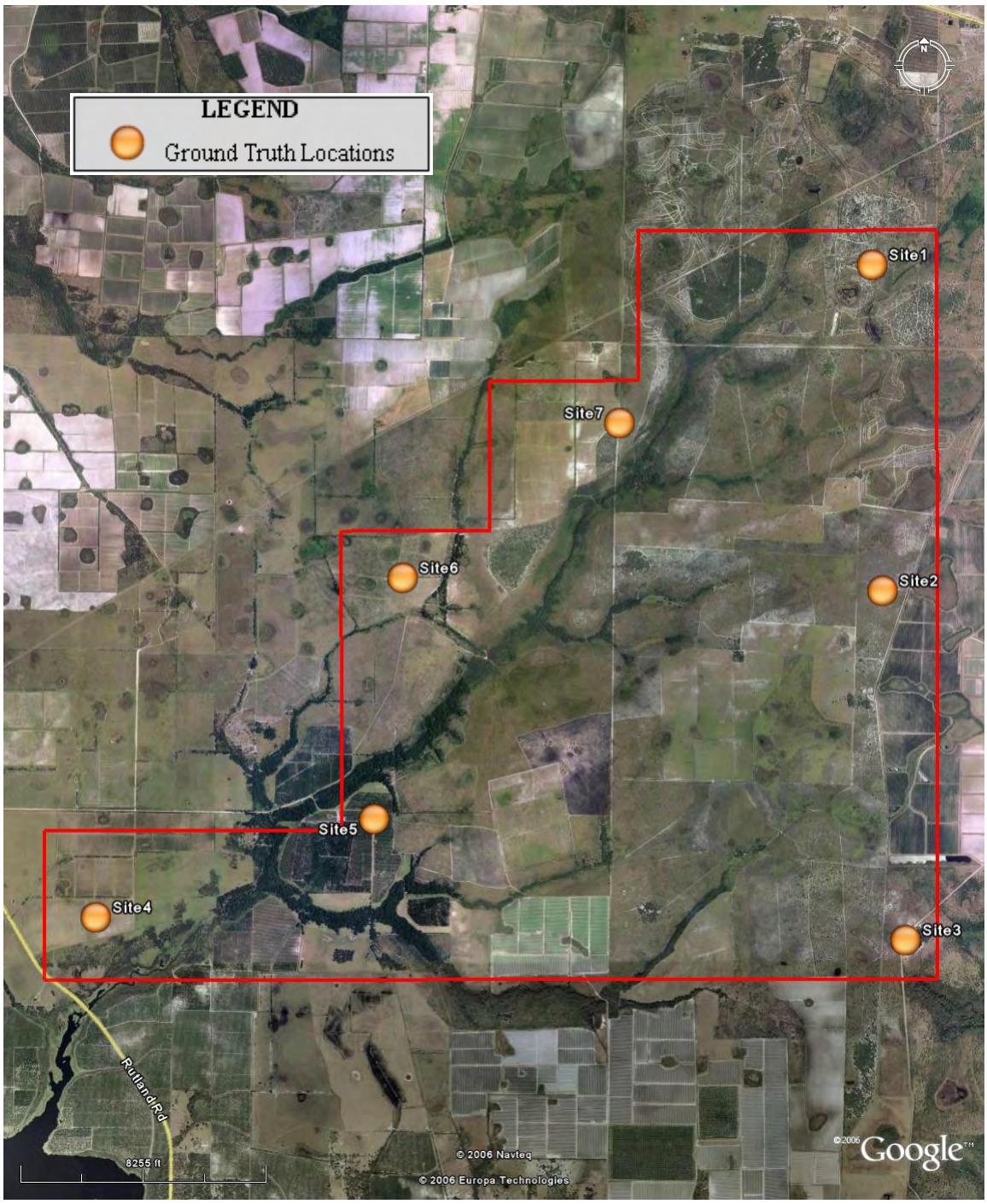
Histograms of Standardized Residuals



GROUND TRUTH SURVEY

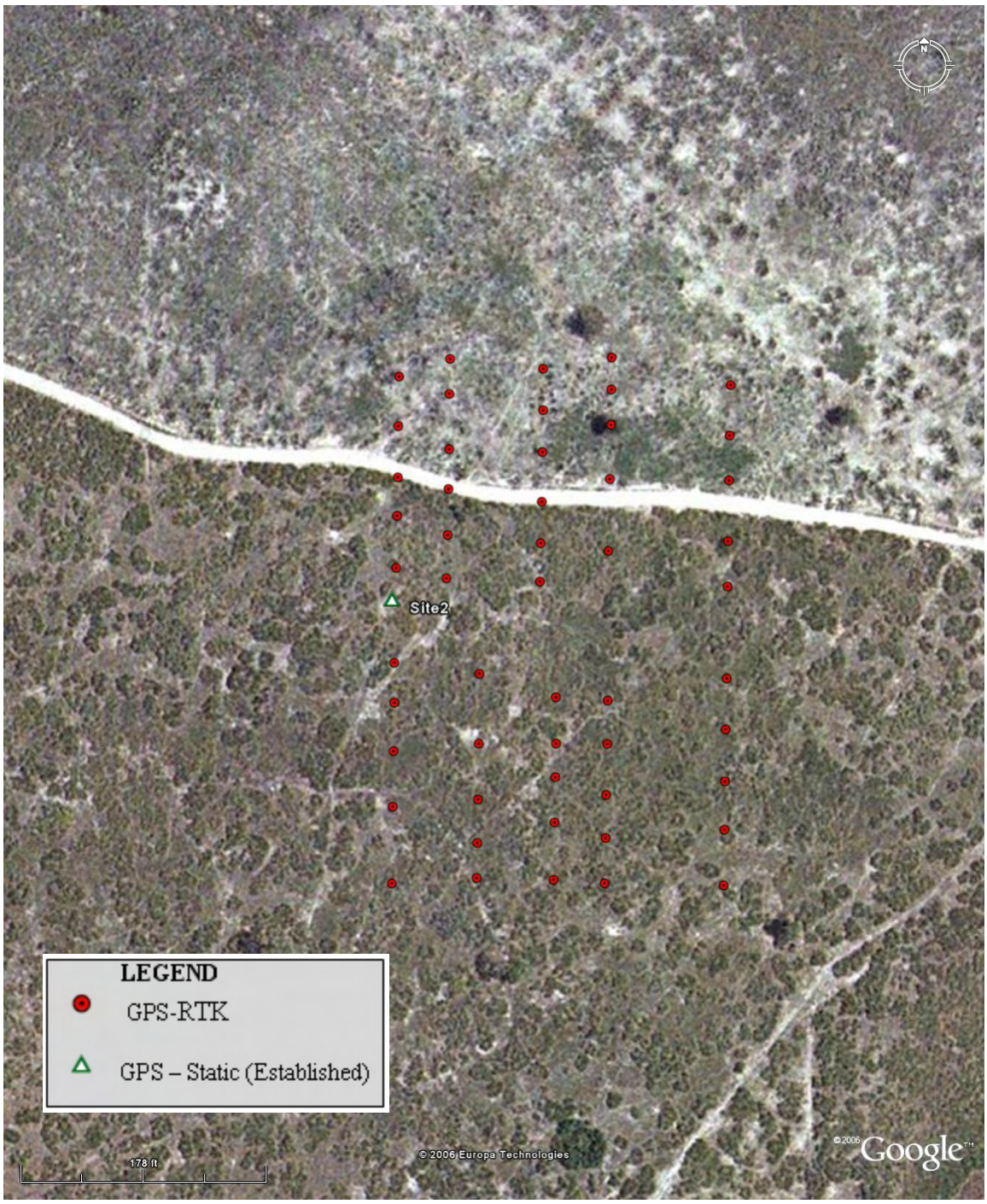
A. Map of Ground Truth Locations

Rutland Ranch Ground Control Areas



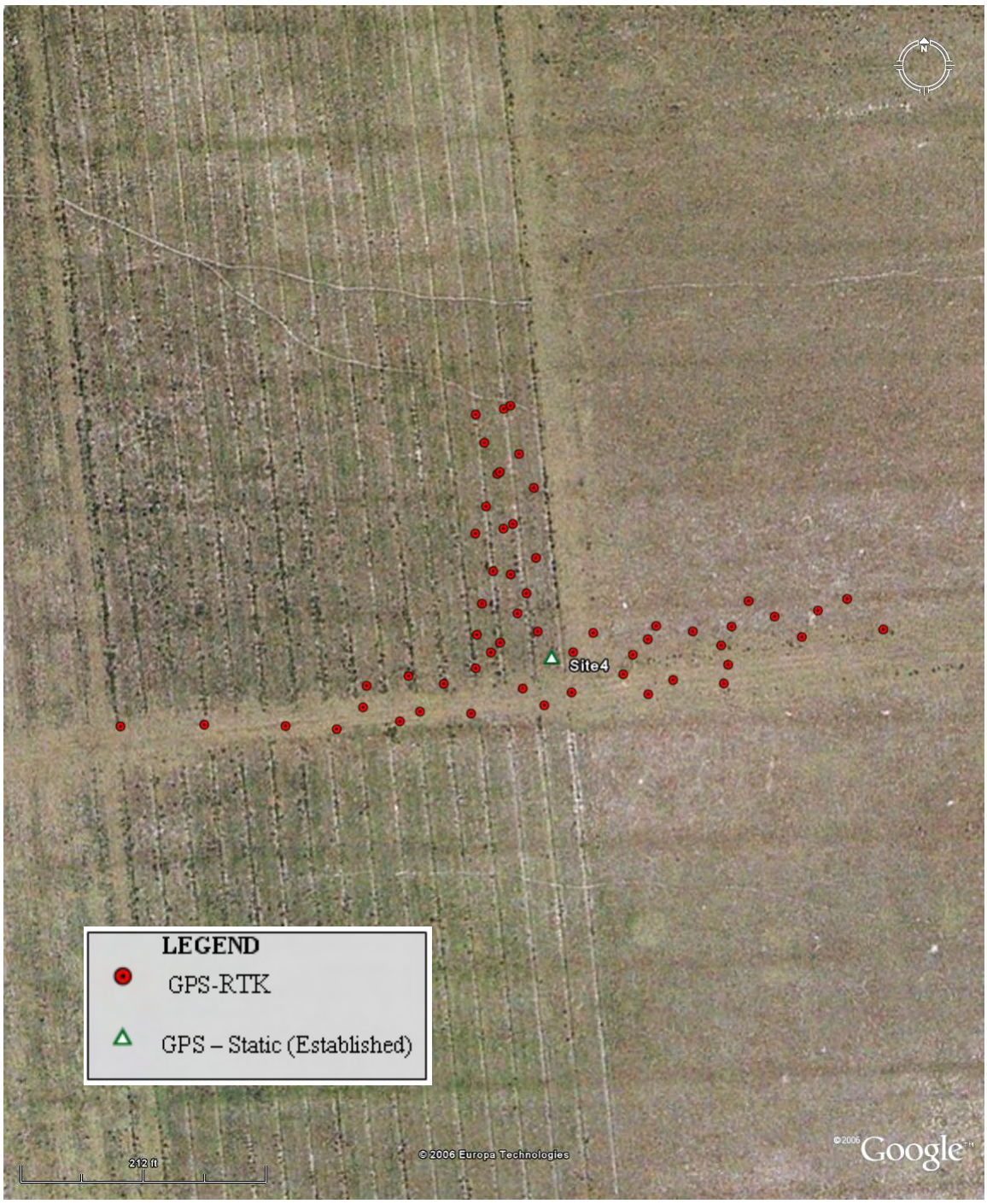
SITE 1 - Ground Truth Points

SITE 2 - Ground Truth Points



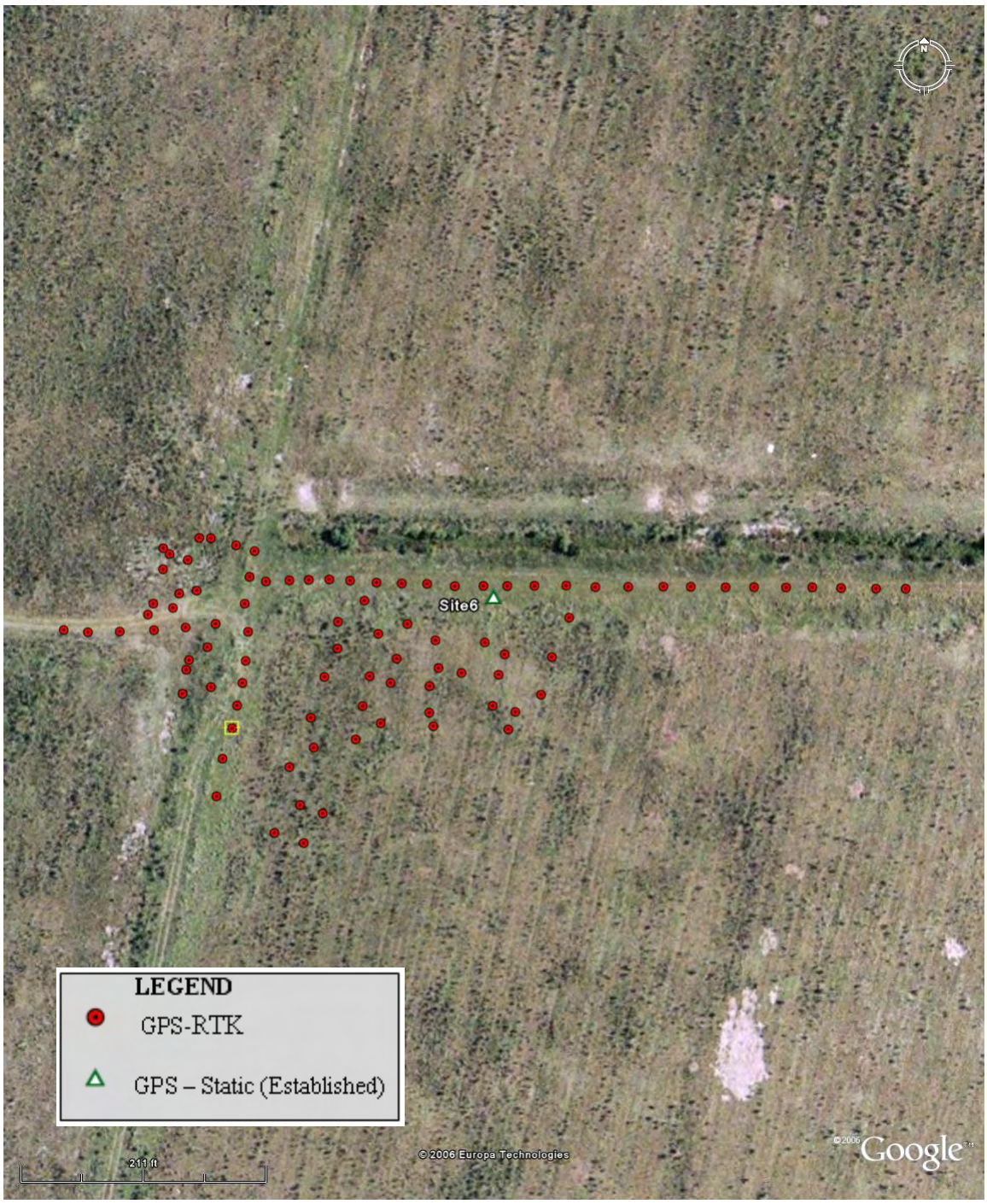
SITE 3 - Ground Truth Points

SITE 4 - Ground Truth Points

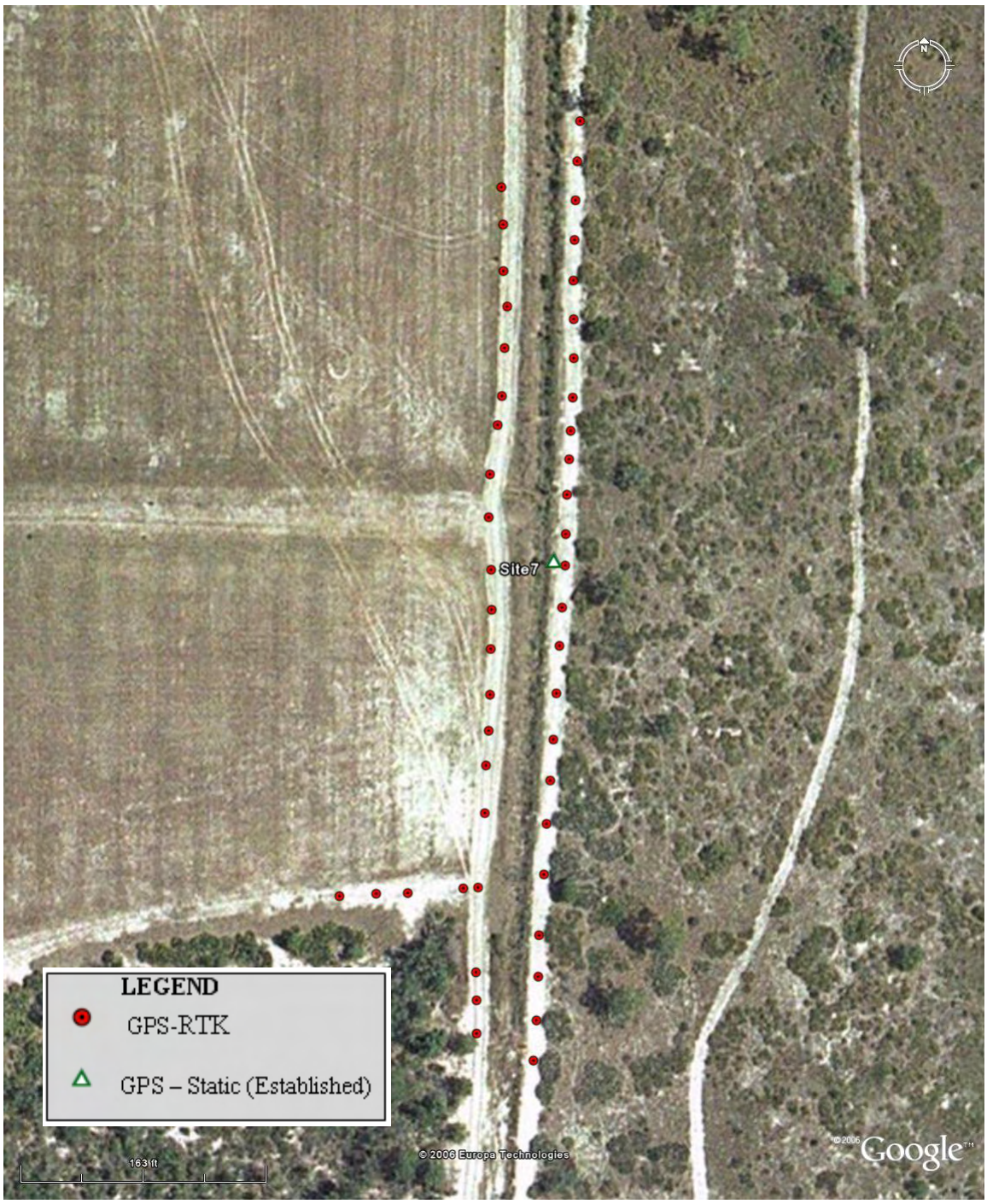


SITE 5 - Ground Truth Points

SITE 6 - Ground Truth Points



SITE 7 - Ground Truth Points



B. Ground Truth Analysis of LIDAR Points

Ground Check-Point Descriptive Codes

Surface Type		Sky Visibility		Surface Slope		Confidence	
1	Dirt	1	Open	1	Flat	1	Good
2	Sand	2	Part open	2	Slight Slope	2	Fair
3	Asphalt	3	Covered	3	Slope	3	Bad
4	Concrete						
5	Tall Grass						
6	Mowed Grass						
7	Trees and Brush						
8	Weeds and short grass						
9	Thick brush						
A	Thick cut grass						
B	Cultivated field - unplowed						
C	Limestone						
D	Trees and grass						
E	Gravel						
F	Brush and grass						

This table shows how the four character descriptive codes are assigned to each survey point in the ground control.

Example: 2111 = sand, open sky, flat slope, good confidence

GROUND TRUTH ANALYSIS
Comparison of LIDAR Points to RTK Ground-Truth Points

Horizontal units = US Survey Feet (US State Plane, Florida West, NAD83)
Vertical units = US Survey feet (NAVD88 – Geoid03)

Survey X	Survey Y	Survey Z	LIDAR X	LIDAR Y	LIDAR Z	dx	dy	dz	dist	Code
583781.47	1150881.85	101.85	583781.57	1150884.31	101.87	-0.10	-2.46	-0.02	2.46	1111
583790.94	1150932.27	102.18	583789.71	1150933.95	102.17	1.23	-1.68	0.01	2.08	1111
583797.63	1151005.80	102.55	583796.44	1151003.93	102.53	1.19	1.87	0.02	2.22	1111
583829.16	1151097.26	102.70	583830.16	1151099.73	102.69	-1.00	-2.47	0.01	2.66	1111
583865.60	1151168.65	102.62	583865.73	1151168.53	102.72	-0.13	0.12	-0.10	0.18	1111
583872.61	1151251.35	102.87	583872.98	1151251.44	102.79	-0.37	-0.09	0.08	0.38	1111
583912.71	1151324.94	103.63	583911.36	1151324.83	103.48	1.35	0.11	0.15	1.35	1111
583939.67	1151406.56	103.89	583939.71	1151407.18	103.87	-0.04	-0.62	0.02	0.62	1111
583950.51	1151460.11	104.22	583951.32	1151460.10	104.20	-0.81	0.01	0.02	0.81	1111
583977.27	1151492.30	104.22	583975.44	1151492.68	104.26	1.83	-0.38	-0.04	1.87	1111
584010.32	1151515.49	103.74	584010.12	1151513.71	103.81	0.20	1.78	-0.07	1.79	1111
556489.43	1152043.56	73.31	556488.68	1152042.18	73.39	0.75	1.38	-0.08	1.57	1111
556347.15	1152043.59	73.15	556347.48	1152045.43	73.10	-0.33	-1.84	0.05	1.87	1111
556419.36	1152044.85	73.35	556420.08	1152043.89	73.36	-0.72	0.96	-0.01	1.20	1111
556605.04	1152055.29	73.26	556604.96	1152056.19	73.36	0.08	-0.90	-0.10	0.90	1111
556556.24	1152059.36	73.33	556557.09	1152059.28	73.29	-0.85	0.08	0.04	0.85	1111
556736.28	1152071.42	72.99	556737.57	1152071.12	73.03	-1.29	0.30	-0.04	1.32	1111
556693.96	1152075.04	73.15	556693.67	1152074.17	73.10	0.29	0.87	0.05	0.92	1111
556824.21	1152081.83	72.93	556824.97	1152080.67	73.13	-0.76	1.16	-0.20	1.39	1111
556781.09	1152086.93	72.93	556780.94	1152089.20	72.93	0.15	-2.27	0.00	2.27	1111
556871.83	1152094.94	72.79	556871.49	1152097.17	72.77	0.34	-2.23	0.02	2.26	1111
556674.48	1152114.54	73.28	556674.87	1152114.92	73.29	-0.39	-0.38	-0.01	0.54	1111
556683.68	1152173.01	73.32	556683.11	1152170.30	73.33	0.57	2.71	-0.01	2.77	1111
556677.55	1152212.29	73.30	556678.77	1152214.79	73.36	-1.22	-2.50	-0.06	2.78	1111
556674.59	1152260.90	73.21	556674.15	1152261.54	73.26	0.44	-0.64	-0.05	0.78	1111
556678.11	1152314.91	73.25	556678.02	1152312.49	73.20	0.09	2.42	0.05	2.42	1111
574336.62	1168250.78	110.84	574334.91	1168251.70	110.89	1.71	-0.92	-0.05	1.94	1111
574298.75	1168268.76	110.91	574298.00	1168269.41	110.92	0.75	-0.65	-0.01	0.99	1111
574338.69	1168277.38	110.96	574337.86	1168275.55	111.06	0.83	1.83	-0.10	2.01	1111
574298.78	1168290.81	111.67	574296.39	1168290.54	111.71	2.39	0.27	-0.04	2.41	1111
574339.97	1168306.39	111.08	574339.50	1168305.27	111.22	0.47	1.12	-0.14	1.21	1111
574298.43	1168309.38	111.99	574299.51	1168311.28	111.97	-1.08	-1.90	0.02	2.19	1111
574340.53	1168333.87	111.62	574340.19	1168332.64	111.61	0.34	1.23	0.01	1.28	1111
574207.56	1168360.05	112.05	574207.48	1168360.00	112.11	0.08	0.05	-0.06	0.09	1111
574232.02	1168361.62	111.55	574230.41	1168362.06	111.58	1.61	-0.44	-0.03	1.67	1111
574253.07	1168362.02	111.53	574251.90	1168361.02	111.55	1.17	1.00	-0.02	1.54	1111
574290.08	1168365.10	111.80	574288.84	1168365.84	111.52	1.24	-0.74	0.28	1.44	1111
574299.99	1168365.59	111.44	574299.28	1168366.82	111.38	0.71	-1.23	0.06	1.42	1111
574343.88	1168374.17	111.85	574341.53	1168375.48	111.81	2.35	-1.31	0.04	2.69	1111
574345.67	1168407.72	111.78	574342.95	1168407.67	111.71	2.72	0.05	0.07	2.72	1111
574304.57	1168414.90	111.75	574304.53	1168415.84	111.71	0.04	-0.94	0.04	0.94	1111

574348.23	1168436.44	111.99	574347.01	1168437.95	111.91	1.22	-1.51	0.08	1.94	1111
574305.40	1168446.54	112.35	574306.00	1168447.17	112.14	-0.60	-0.63	0.21	0.87	1111
574350.33	1168463.60	112.15	574349.34	1168461.01	112.14	0.99	2.59	0.01	2.77	1111
574307.26	1168469.54	112.54	574306.66	1168471.68	112.40	0.60	-2.14	0.14	2.22	1111
574308.17	1168493.45	112.78	574307.09	1168494.25	112.93	1.08	-0.80	-0.15	1.34	1111
574352.42	1168494.22	112.47	574351.34	1168493.33	112.50	1.08	0.89	-0.03	1.40	1111
574308.67	1168523.74	112.87	574308.69	1168525.78	112.86	-0.02	-2.04	0.01	2.04	1111
574354.52	1168525.72	112.42	574357.22	1168525.84	112.24	-2.70	-0.12	0.18	2.70	1111
574309.41	1168549.72	112.96	574308.96	1168549.37	112.99	0.45	0.35	-0.03	0.57	1111
574356.34	1168551.14	112.42	574357.45	1168552.65	112.34	-1.11	-1.51	0.08	1.87	1111
574309.09	1168576.26	113.30	574308.86	1168578.80	113.29	0.23	-2.54	0.01	2.55	1111
574358.46	1168578.99	112.69	574357.84	1168577.78	112.60	0.62	1.21	0.09	1.36	1111
574358.91	1168599.82	112.87	574360.27	1168597.56	112.80	-1.36	2.26	0.07	2.64	1111
574307.55	1168610.96	112.96	574308.69	1168610.42	112.99	-1.14	0.54	-0.03	1.26	1111
574359.78	1168625.92	112.58	574360.14	1168623.19	112.57	-0.36	2.73	0.01	2.75	1111
574308.43	1168639.17	112.45	574308.63	1168640.28	112.30	-0.20	-1.11	0.15	1.13	1111
574361.23	1168649.41	112.78	574360.46	1168650.45	112.73	0.77	-1.04	0.05	1.29	1111
574362.18	1168668.08	112.89	574363.52	1168669.77	112.83	-1.34	-1.69	0.06	2.16	1111
574313.58	1168671.50	112.88	574314.73	1168671.41	112.93	-1.15	0.09	-0.05	1.15	1111
574363.54	1168689.81	112.96	574363.32	1168691.92	112.99	0.22	-2.11	-0.03	2.12	1111
574316.45	1168690.65	113.06	574315.42	1168688.51	113.06	1.03	2.14	0.00	2.37	1111
574364.18	1168715.50	112.91	574365.55	1168715.94	112.83	-1.37	-0.44	0.08	1.44	1111
574318.28	1168722.30	113.32	574319.22	1168723.02	113.22	-0.94	-0.72	0.10	1.18	1111
574364.15	1168741.20	113.00	574363.19	1168743.23	112.99	0.96	-2.03	0.01	2.25	1111
574320.14	1168749.69	113.41	574321.65	1168749.14	113.58	-1.51	0.55	-0.17	1.61	1111
574363.99	1168766.71	113.11	574364.01	1168768.43	113.02	-0.02	-1.72	0.09	1.72	1111
574317.62	1168773.07	113.72	574319.75	1168772.40	113.58	-2.13	0.67	0.14	2.23	1111
574364.79	1168793.46	112.97	574366.04	1168795.10	112.86	-1.25	-1.64	0.11	2.06	1111
574317.54	1168803.75	113.80	574318.50	1168805.76	113.84	-0.96	-2.01	-0.04	2.23	1111
574365.50	1168819.60	113.01	574365.25	1168820.04	112.99	0.25	-0.44	0.02	0.51	1111
574316.42	1168828.32	113.74	574316.60	1168827.88	113.78	-0.18	0.44	-0.04	0.48	1111
574366.74	1168845.32	113.14	574365.81	1168845.89	113.12	0.93	-0.57	0.02	1.09	1111
574368.68	1168871.82	113.05	574368.44	1168873.35	113.06	0.24	-1.53	-0.01	1.55	1111
566072.08	1155124.91	78.03	566070.26	1155124.66	78.22	1.82	0.25	-0.19	1.84	1121
566072.74	1155148.00	77.67	566070.46	1155148.84	77.66	2.28	-0.84	0.01	2.43	1121
566073.64	1155170.39	77.72	566072.03	1155172.36	77.69	1.61	-1.97	0.03	2.54	1121
566074.26	1155192.99	77.35	566075.70	1155192.64	77.33	-1.44	0.35	0.02	1.48	1121
566074.70	1155218.73	78.04	566072.13	1155218.29	78.08	2.57	0.44	-0.04	2.61	1121
566076.20	1155243.22	78.29	566076.03	1155245.03	78.31	0.17	-1.81	-0.02	1.82	1121
566078.17	1155265.66	77.78	566078.23	1155265.67	77.76	-0.06	-0.01	0.02	0.06	1121
566078.90	1155289.24	78.23	566078.00	1155287.29	78.25	0.90	1.95	-0.02	2.15	1121
566079.09	1155312.76	78.04	566079.51	1155311.66	78.08	-0.42	1.10	-0.04	1.18	1121
566079.87	1155335.00	77.86	566082.50	1155334.89	77.89	-2.63	0.11	-0.03	2.63	1121
566079.88	1155335.01	77.86	566082.50	1155334.89	77.89	-2.62	0.12	-0.03	2.62	1121
566080.52	1155357.91	77.54	566077.87	1155357.56	77.49	2.65	0.35	0.05	2.67	1121
566081.23	1155379.37	77.31	566079.64	1155377.61	77.43	1.59	1.76	-0.12	2.37	1121
566082.21	1155401.88	77.54	566082.46	1155404.18	77.43	-0.25	-2.30	0.11	2.31	1121
566082.39	1155424.15	77.52	566082.89	1155422.59	77.53	-0.50	1.56	-0.01	1.64	1121
566082.68	1155447.48	77.92	566081.41	1155445.52	77.99	1.27	1.96	-0.07	2.34	1121

566083.36	1155469.86	77.50	566082.56	1155470.16	77.53	0.80	-0.30	-0.03	0.85	1121
566083.57	1155492.90	77.67	566082.89	1155492.11	77.76	0.68	0.79	-0.09	1.04	1121
566082.68	1155514.96	77.54	566081.38	1155516.19	77.49	1.30	-1.23	0.05	1.79	1121
566082.37	1155537.00	77.33	566080.07	1155536.43	77.30	2.30	0.57	0.03	2.37	1121
566081.17	1155559.87	77.43	566083.09	1155560.98	77.53	-1.92	-1.11	-0.10	2.22	1121
566079.34	1155582.26	77.61	566081.81	1155581.61	77.62	-2.47	0.65	-0.01	2.55	1121
566075.49	1155605.17	77.45	566075.64	1155606.41	77.49	-0.15	-1.24	-0.04	1.25	1121
566064.60	1155628.56	76.84	566065.21	1155628.00	76.90	-0.61	0.56	-0.06	0.83	1121
566050.52	1155649.25	77.81	566050.11	1155649.98	77.82	0.41	-0.73	-0.01	0.84	1121
566027.14	1155661.77	77.94	566028.99	1155661.24	77.92	-1.85	0.53	0.02	1.92	1121
566899.05	1163218.91	83.83	566900.41	1163216.77	83.83	-1.36	2.14	0.00	2.54	5111
566886.81	1163283.98	83.91	566888.56	1163281.83	84.09	-1.75	2.15	-0.18	2.77	5111
566907.85	1163300.53	83.87	566909.53	1163301.05	83.79	-1.68	-0.52	0.08	1.76	5111
566943.85	1163307.47	83.85	566943.29	1163308.27	83.60	0.56	-0.80	0.25	0.98	5111
566965.42	1163321.25	83.77	566963.79	1163320.93	83.92	1.63	0.32	-0.15	1.66	5111
566905.28	1163326.11	83.84	566906.84	1163325.66	83.96	-1.56	0.45	-0.12	1.62	5111
567061.72	1163335.82	83.57	567062.22	1163333.47	83.46	-0.50	2.35	0.11	2.40	5111
566949.98	1163335.98	83.70	566950.77	1163334.12	83.83	-0.79	1.86	-0.13	2.02	5111
567103.33	1163345.30	83.79	567105.00	1163344.59	83.86	-1.67	0.71	-0.07	1.81	5111
566795.07	1163346.84	83.06	566793.42	1163348.36	83.04	1.65	-1.52	0.02	2.24	5111
566819.63	1163352.50	83.95	566819.34	1163353.05	83.99	0.29	-0.55	-0.04	0.62	5111
567007.40	1163352.71	84.07	567006.58	1163352.82	84.28	0.82	-0.11	-0.21	0.83	5111
566973.98	1163355.75	83.81	566974.32	1163357.35	83.86	-0.34	-1.60	-0.05	1.64	5111
566917.11	1163360.96	83.94	566917.37	1163363.29	84.09	-0.26	-2.33	-0.15	2.34	5111
566955.92	1163361.55	83.47	566955.43	1163361.55	83.69	0.49	0.00	-0.22	0.49	5111
567066.83	1163362.27	83.62	567068.91	1163362.83	83.53	-2.08	-0.56	0.09	2.15	5111
567034.85	1163363.89	83.66	567036.17	1163364.90	83.69	-1.32	-1.01	-0.03	1.66	5111
566797.56	1163367.20	83.07	566797.06	1163367.36	82.87	0.50	-0.16	0.20	0.52	5111
566799.74	1163375.50	83.15	566800.41	1163377.66	83.14	-0.67	-2.16	0.01	2.26	5111
566979.26	1163376.38	83.71	566980.49	1163375.76	83.66	-1.23	0.62	0.05	1.38	5111
567112.68	1163377.35	83.70	567113.07	1163378.91	83.73	-0.39	-1.56	-0.03	1.61	5111
566928.46	1163385.24	83.88	566929.15	1163385.07	83.99	-0.69	0.17	-0.11	0.71	5111
566815.73	1163386.47	83.71	566815.43	1163385.73	83.66	0.30	0.74	0.05	0.80	5111
567055.02	1163390.04	83.94	567057.03	1163390.06	83.86	-2.01	-0.02	0.08	2.01	5111
567012.57	1163392.04	83.79	567012.05	1163391.60	83.73	0.52	0.44	0.06	0.68	5111
566963.48	1163397.72	83.68	566965.40	1163395.74	83.92	-1.92	1.98	-0.24	2.76	5111
566988.55	1163406.07	84.00	566987.58	1163404.69	83.89	0.97	1.38	0.11	1.69	5111
566928.86	1163408.01	84.42	566928.20	1163406.99	84.38	0.66	1.02	0.04	1.21	5111
567127.64	1163411.17	83.81	567126.82	1163410.43	83.86	0.82	0.74	-0.05	1.10	5111
566764.92	1163414.56	82.67	566764.15	1163415.88	82.78	0.77	-1.32	-0.11	1.53	5111
566951.67	1163426.10	84.05	566951.10	1163426.94	84.25	0.57	-0.84	-0.20	1.02	5111
566792.38	1163432.45	83.15	566793.75	1163433.27	83.20	-1.37	-0.82	-0.05	1.60	5111
566807.38	1163435.00	83.34	566805.53	1163436.12	83.50	1.85	-1.12	-0.16	2.16	5111
566778.61	1163453.27	82.95	566777.34	1163455.15	82.97	1.27	-1.88	-0.02	2.27	5111
566799.94	1163461.24	83.19	566801.33	1163462.14	83.07	-1.39	-0.90	0.12	1.66	5111
566784.28	1163466.36	83.05	566782.86	1163467.46	83.14	1.42	-1.10	-0.09	1.80	5111
566778.88	1163471.27	83.06	566780.69	1163469.39	83.23	-1.81	1.88	-0.17	2.61	5111
566841.45	1163473.65	83.54	566841.71	1163471.39	83.53	-0.26	2.26	0.01	2.27	5111
566819.81	1163479.74	83.31	566818.88	1163478.25	83.40	0.93	1.49	-0.09	1.76	5111

583740.80	1151008.49	101.66	583742.40	1151007.70	101.54	-1.60	0.79	0.12	1.78	5211
583896.84	1151012.57	102.04	583895.68	1151011.35	102.07	1.16	1.22	-0.03	1.68	5211
583743.44	1151127.47	101.62	583741.65	1151126.08	101.57	1.79	1.39	0.05	2.27	5211
583950.98	1151144.78	102.33	583949.98	1151145.37	102.30	1.00	-0.59	0.03	1.16	5211
583963.95	1151202.24	102.57	583961.30	1151203.11	102.53	2.65	-0.87	0.04	2.79	5211
583693.92	1151226.77	101.33	583695.88	1151228.73	101.25	-1.96	-1.96	0.08	2.77	5211
583998.78	1151263.78	102.61	583997.26	1151263.35	102.66	1.52	0.43	-0.05	1.58	5211
583684.90	1151328.84	101.59	583684.95	1151327.85	101.77	-0.05	0.99	-0.18	0.99	5211
584032.80	1151340.75	103.18	584033.28	1151338.48	103.15	-0.48	2.27	0.03	2.32	5211
583965.10	1151348.80	102.94	583962.55	1151348.45	102.89	2.55	0.35	0.05	2.57	5211
583770.97	1151384.78	102.12	583769.73	1151382.47	102.07	1.24	2.31	0.05	2.62	5211
583992.19	1151386.36	103.06	583991.61	1151386.97	103.08	0.58	-0.61	-0.02	0.84	5211
583831.86	1151390.31	102.51	583833.18	1151388.61	102.56	-1.32	1.70	-0.05	2.15	5211
583983.87	1151413.61	103.27	583984.49	1151411.51	103.31	-0.62	2.10	-0.04	2.19	5211
583879.65	1151440.24	102.87	583878.36	1151439.23	102.95	1.29	1.01	-0.08	1.64	5211
584010.60	1151443.27	103.38	584011.56	1151441.59	103.35	-0.96	1.68	0.03	1.93	5211
584025.94	1151499.92	103.84	584025.05	1151497.60	103.84	0.89	2.32	0.00	2.48	5211
583885.41	1151523.34	103.14	583886.20	1151524.43	103.15	-0.79	-1.09	-0.01	1.35	5211
583818.92	1151560.46	103.09	583818.42	1151558.65	103.05	0.50	1.81	0.04	1.88	5211
583915.97	1151569.65	103.20	583916.38	1151568.00	103.08	-0.41	1.65	0.12	1.70	5211
583966.06	1151660.13	103.66	583966.55	1151661.67	103.71	-0.49	-1.54	-0.05	1.62	5211
583162.14	1162759.29	122.17	583160.32	1162757.19	122.01	1.82	2.10	0.16	2.78	6111
583279.43	1162761.60	122.10	583279.41	1162762.21	122.11	0.02	-0.61	-0.01	0.61	6111
583223.67	1162763.08	122.24	583223.83	1162763.06	122.28	-0.16	0.02	-0.04	0.16	6111
583224.21	1162788.36	122.30	583223.08	1162788.78	122.18	1.13	-0.42	0.12	1.21	6111
583317.24	1162791.79	122.15	583315.60	1162790.00	122.18	1.64	1.79	-0.03	2.43	6111
583403.49	1162797.53	122.22	583401.72	1162798.43	122.47	1.77	-0.90	-0.25	1.99	6111
583280.26	1162803.06	122.24	583281.61	1162800.95	122.28	-1.35	2.11	-0.04	2.50	6111
583163.01	1162814.70	122.24	583164.94	1162812.90	122.34	-1.93	1.80	-0.10	2.64	6111
583224.77	1162819.70	122.36	583226.75	1162820.02	122.41	-1.98	-0.32	-0.05	2.01	6111
583317.73	1162822.89	122.31	583316.42	1162823.20	122.57	1.31	-0.31	-0.26	1.35	6111
583280.89	1162835.73	122.26	583280.13	1162836.68	122.24	0.76	-0.95	0.02	1.22	6111
583163.68	1162854.78	122.33	583165.73	1162853.45	122.44	-2.05	1.33	-0.11	2.44	6111
583318.60	1162859.66	122.33	583316.71	1162860.27	122.60	1.89	-0.61	-0.27	1.99	6111
583281.48	1162860.01	122.22	583282.36	1162857.52	122.57	-0.88	2.49	-0.35	2.64	6111
583225.39	1162860.03	122.35	583227.02	1162860.89	122.44	-1.63	-0.86	-0.09	1.84	6111
583404.46	1162869.91	122.33	583404.31	1162868.87	122.67	0.15	1.04	-0.34	1.05	6111
583164.22	1162889.74	122.23	583163.96	1162890.65	122.38	0.26	-0.91	-0.15	0.95	6111
583319.04	1162890.90	122.42	583317.73	1162891.41	122.67	1.31	-0.51	-0.25	1.41	6111
583281.43	1162893.35	122.26	583282.99	1162892.13	122.28	-1.56	1.22	-0.02	1.98	6111
583225.97	1162910.40	122.38	583225.67	1162911.88	122.34	0.30	-1.48	0.04	1.51	6111
583406.07	1162973.02	122.54	583405.53	1162972.64	122.51	0.54	0.38	0.03	0.66	6111
583202.14	1162979.36	121.96	583203.13	1162976.94	121.95	-0.99	2.42	0.01	2.61	6111
583165.75	1162986.96	121.99	583166.52	1162988.49	121.88	-0.77	-1.53	0.11	1.71	6111
583319.67	1162998.92	122.23	583321.63	1162999.41	121.98	-1.96	-0.49	0.25	2.02	6111
583270.58	1163004.60	122.06	583269.37	1163003.61	121.82	1.21	0.99	0.24	1.56	6111
583406.50	1163005.78	122.40	583405.72	1163008.24	122.38	0.78	-2.46	0.02	2.58	6111
583203.14	1163010.59	121.93	583204.21	1163008.37	121.82	-1.07	2.22	0.11	2.46	6111
583166.54	1163024.52	122.01	583166.78	1163025.03	121.78	-0.24	-0.51	0.23	0.56	6111

583271.47	1163034.45	122.05	583270.78	1163032.61	121.85	0.69	1.84	0.20	1.97	6111
583203.78	1163043.78	121.91	583205.43	1163043.28	121.78	-1.65	0.50	0.13	1.72	6111
583407.30	1163049.58	122.37	583409.23	1163050.20	122.47	-1.93	-0.62	-0.10	2.03	6111
583320.86	1163050.79	122.27	583320.39	1163050.23	122.31	0.47	0.56	-0.04	0.73	6111
583167.07	1163052.27	121.99	583166.81	1163051.48	121.98	0.26	0.79	0.01	0.83	6111
583271.99	1163070.34	122.06	583271.47	1163069.29	121.75	0.52	1.05	0.31	1.17	6111
583204.35	1163072.53	121.91	583205.03	1163072.48	121.82	-0.68	0.05	0.09	0.68	6111
583407.89	1163082.03	122.33	583407.56	1163079.43	122.34	0.33	2.60	-0.01	2.62	6111
583167.41	1163089.20	121.95	583168.98	1163089.47	121.78	-1.57	-0.27	0.17	1.59	6111
583321.82	1163089.90	122.23	583321.93	1163089.40	121.92	-0.11	0.50	0.31	0.51	6111
583272.56	1163100.49	122.02	583272.23	1163102.99	121.92	0.33	-2.50	0.10	2.52	6111
583204.63	1163112.40	121.84	583202.28	1163111.91	121.88	2.35	0.49	-0.04	2.40	6111
583322.07	1163115.39	122.18	583321.96	1163115.59	122.05	0.11	-0.20	0.13	0.23	6111
583408.60	1163118.40	122.28	583407.33	1163118.93	122.21	1.27	-0.53	0.07	1.38	6111
583168.17	1163124.96	121.89	583169.57	1163127.27	121.92	-1.40	-2.31	-0.03	2.70	6111
583205.15	1163137.67	121.81	583207.07	1163137.60	121.72	-1.92	0.07	0.09	1.92	6111
583322.37	1163138.45	122.18	583323.60	1163140.32	122.24	-1.23	-1.87	-0.06	2.24	6111
566144.25	1155330.61	77.51	566142.37	1155329.58	77.72	1.88	1.03	-0.21	2.14	7211
566005.38	1155337.17	77.66	566005.10	1155339.78	77.79	0.28	-2.61	-0.13	2.62	7211
566176.12	1155358.42	77.69	566174.03	1155356.97	77.69	2.09	1.45	0.00	2.54	7211
566128.42	1155381.43	77.79	566128.89	1155380.27	78.08	-0.47	1.16	-0.29	1.25	7211
566023.73	1155431.58	77.55	566026.03	1155431.94	77.36	-2.30	-0.36	0.19	2.33	7211
566008.54	1155450.49	77.49	566008.51	1155448.84	77.56	0.03	1.65	-0.07	1.65	7211
566005.58	1155478.01	77.48	566006.77	1155476.13	77.59	-1.19	1.88	-0.11	2.22	7211
566013.93	1155509.95	77.60	566012.02	1155508.42	77.72	1.91	1.53	-0.12	2.45	7211
566121.25	1155513.42	78.17	566121.57	1155515.83	78.41	-0.32	-2.41	-0.24	2.43	7211
566009.01	1155540.14	77.52	566009.83	1155541.09	77.43	-0.82	-0.95	0.09	1.25	7211
566040.27	1155543.34	76.81	566041.45	1155540.96	76.84	-1.18	2.38	-0.03	2.66	7211
566115.81	1155592.13	77.36	566116.68	1155593.65	77.66	-0.87	-1.52	-0.30	1.75	7211
583065.21	1173641.17	123.08	583065.73	1173641.98	123.10	-0.52	-0.81	-0.02	0.96	7211
583150.34	1173666.83	122.75	583151.75	1173667.01	122.67	-1.41	-0.18	0.08	1.42	7211
583043.74	1173668.42	123.48	583043.29	1173667.34	123.39	0.45	1.08	0.09	1.17	7211
583124.20	1173680.63	122.91	583123.05	1173682.43	122.67	1.15	-1.80	0.24	2.14	7211
583040.84	1173699.46	123.60	583041.71	1173697.39	123.33	-0.87	2.07	0.27	2.25	7211
583127.05	1173701.48	123.06	583127.47	1173702.01	123.03	-0.42	-0.53	0.03	0.68	7211
583137.00	1173728.64	122.97	583137.55	1173728.56	123.00	-0.55	0.08	-0.03	0.56	7211
582958.66	1173728.71	124.07	582958.22	1173726.10	124.15	0.44	2.61	-0.08	2.65	7211
583111.99	1173735.95	123.25	583112.19	1173733.84	123.23	-0.20	2.11	0.02	2.12	7211
582996.37	1173736.25	123.97	582996.27	1173734.56	123.65	0.10	1.69	0.32	1.69	7211
582788.92	1173745.05	124.71	582789.75	1173746.40	124.70	-0.83	-1.35	0.01	1.58	7211
583048.55	1173747.64	123.67	583050.44	1173748.24	123.46	-1.89	-0.60	0.21	1.98	7211
582823.62	1173754.65	124.71	582823.90	1173754.64	124.44	-0.28	0.01	0.27	0.28	7211
582749.83	1173759.32	124.96	582750.77	1173761.14	124.84	-0.94	-1.82	0.12	2.05	7211
583100.93	1173759.73	123.23	583099.62	1173757.33	123.26	1.31	2.40	-0.03	2.73	7211
582934.84	1173769.02	124.32	582933.94	1173766.48	124.21	0.90	2.54	0.11	2.69	7211
583021.94	1173778.33	123.88	583022.75	1173779.97	123.79	-0.81	-1.64	0.09	1.83	7211
583097.96	1173791.58	123.48	583099.39	1173791.32	123.39	-1.43	0.26	0.09	1.45	7211
582739.27	1173791.67	125.13	582738.79	1173794.40	125.07	0.48	-2.73	0.06	2.77	7211
582889.62	1173794.68	124.54	582889.42	1173797.22	124.47	0.20	-2.54	0.07	2.55	7211

582694.59	1173814.40	125.15	582696.57	1173814.71	125.00	-1.98	-0.31	0.15	2.00	7211
582736.90	1173842.48	125.23	582738.01	1173842.76	125.07	-1.11	-0.28	0.16	1.14	7211
582997.31	1173843.69	124.00	582998.18	1173844.50	124.15	-0.87	-0.81	-0.15	1.19	7211
583068.39	1173843.72	123.79	583067.83	1173841.09	123.79	0.56	2.63	0.00	2.69	7211
582676.02	1173859.94	125.64	582675.44	1173860.61	125.62	0.58	-0.67	0.02	0.89	7211
582997.75	1173863.99	124.21	582998.80	1173866.25	124.15	-1.05	-2.26	0.06	2.49	7211
582922.44	1173874.65	124.49	582920.78	1173874.98	124.51	1.66	-0.33	-0.02	1.69	7211
583098.24	1173876.68	123.83	583099.62	1173877.21	123.88	-1.38	-0.53	-0.05	1.48	7211
582865.42	1173879.25	124.86	582864.94	1173881.84	124.57	0.48	-2.59	0.29	2.63	7211
582971.98	1173887.84	124.27	582972.00	1173889.51	124.21	-0.02	-1.67	0.06	1.67	7211
583062.48	1173916.09	123.96	583061.33	1173914.94	123.75	1.15	1.15	0.21	1.63	7211
582960.96	1173923.48	124.45	582962.51	1173921.77	124.38	-1.55	1.71	0.07	2.31	7211
582898.08	1173936.22	124.77	582896.70	1173933.94	124.44	1.38	2.28	0.33	2.67	7211
583033.81	1173938.50	124.15	583032.33	1173939.12	124.05	1.48	-0.62	0.10	1.60	7211
582894.31	1173967.05	124.92	582892.80	1173968.45	124.84	1.51	-1.40	0.08	2.06	7211
583024.49	1173977.60	124.37	583024.88	1173977.90	124.11	-0.39	-0.30	0.26	0.49	7211
582993.41	1174028.97	124.78	582993.29	1174030.26	124.54	0.12	-1.29	0.24	1.30	7211
582958.74	1174035.28	125.15	582957.79	1174036.00	124.97	0.95	-0.72	0.18	1.19	7211
582978.40	1174067.03	124.92	582979.28	1174066.68	124.84	-0.88	0.35	0.08	0.95	7211
556533.49	1152040.74	73.60	556534.12	1152041.30	73.65	-0.63	-0.56	-0.05	0.84	8111
556587.68	1152046.97	73.47	556586.91	1152047.79	73.39	0.77	-0.82	0.08	1.12	8111
556649.32	1152053.42	73.62	556649.35	1152056.03	73.65	-0.03	-2.61	-0.03	2.61	8111
556712.61	1152060.40	73.34	556712.44	1152060.92	73.26	0.17	-0.52	0.08	0.55	8111
556802.59	1152069.69	73.49	556802.99	1152071.87	73.49	-0.40	-2.18	0.00	2.22	8111
556559.37	1152077.83	73.53	556556.86	1152077.81	73.59	2.51	0.02	-0.06	2.51	8111
556868.12	1152078.76	73.21	556867.42	1152079.29	73.26	0.70	-0.53	-0.05	0.88	8111
556625.80	1152079.25	73.41	556624.25	1152080.83	73.43	1.55	-1.58	-0.02	2.21	8111
556595.41	1152086.04	73.46	556595.44	1152084.80	73.52	-0.03	1.24	-0.06	1.24	8111
556653.39	1152092.59	73.49	556653.84	1152092.41	73.52	-0.45	0.18	-0.03	0.48	8111
556789.36	1152103.67	73.13	556790.65	1152104.58	73.00	-1.29	-0.91	0.13	1.58	8111
556737.58	1152106.04	73.21	556736.16	1152106.36	73.26	1.42	-0.32	-0.05	1.46	8111
556666.53	1152106.16	73.44	556666.57	1152106.26	73.52	-0.04	-0.10	-0.08	0.11	8111
556865.78	1152111.62	73.19	556868.08	1152110.95	73.23	-2.30	0.67	-0.04	2.40	8111
556802.29	1152116.99	73.17	556801.61	1152114.62	73.10	0.68	2.37	0.07	2.47	8111
556935.57	1152118.67	73.25	556933.76	1152119.54	73.13	1.81	-0.87	0.12	2.01	8111
556654.49	1152121.39	73.61	556655.94	1152120.40	73.49	-1.45	0.99	0.12	1.76	8111
556755.00	1152122.69	73.32	556755.55	1152122.73	73.20	-0.55	-0.04	0.12	0.55	8111
556841.16	1152123.69	73.08	556839.40	1152124.11	73.06	1.76	-0.42	0.02	1.81	8111
556706.91	1152124.01	73.20	556705.35	1152125.35	73.13	1.56	-1.34	0.07	2.06	8111
557005.76	1152124.97	73.05	557005.32	1152125.09	73.00	0.44	-0.12	0.05	0.46	8111
556874.63	1152127.77	73.00	556875.59	1152127.52	73.06	-0.96	0.25	-0.06	0.99	8111
556809.41	1152128.49	73.06	556810.17	1152131.13	73.06	-0.76	-2.64	0.00	2.75	8111
556911.71	1152136.28	73.05	556910.27	1152135.95	73.00	1.44	0.33	0.05	1.48	8111
556689.51	1152139.56	73.29	556688.58	1152141.10	73.33	0.93	-1.54	-0.04	1.80	8111
556949.01	1152141.38	73.12	556947.70	1152141.30	73.06	1.31	0.08	0.06	1.31	8111
556658.93	1152148.02	73.47	556656.50	1152147.83	73.43	2.43	0.19	0.04	2.44	8111
556889.01	1152149.68	72.99	556888.32	1152150.55	73.20	0.69	-0.87	-0.21	1.11	8111
556974.02	1152151.22	72.94	556976.58	1152151.57	73.06	-2.56	-0.35	-0.12	2.58	8111
556697.23	1152156.79	73.33	556697.67	1152158.69	73.43	-0.44	-1.90	-0.10	1.95	8111

556668.67	1152175.79	73.40	556670.11	1152173.55	73.29	-1.44	2.24	0.11	2.66	8111
556705.59	1152187.07	73.22	556703.97	1152188.34	73.23	1.62	-1.27	-0.01	2.06	8111
556653.36	1152208.12	73.36	556653.18	1152206.09	73.43	0.18	2.03	-0.07	2.04	8111
556685.77	1152216.25	73.42	556686.55	1152215.77	73.39	-0.78	0.48	0.03	0.92	8111
556662.62	1152231.34	73.35	556664.34	1152231.32	73.29	-1.72	0.02	0.06	1.72	8111
556703.88	1152247.14	73.22	556704.20	1152244.84	73.23	-0.32	2.30	-0.01	2.32	8111
556672.45	1152259.16	73.36	556672.77	1152258.46	73.33	-0.32	0.70	0.03	0.77	8111
556691.24	1152276.24	73.49	556689.80	1152274.99	73.49	1.44	1.25	0.00	1.91	8111
556661.31	1152285.92	73.30	556663.35	1152284.77	73.26	-2.04	1.15	0.04	2.34	8111
556653.99	1152310.11	73.22	556653.77	1152308.98	73.23	0.22	1.13	-0.01	1.15	8111
556683.81	1152317.73	73.32	556685.47	1152317.77	73.36	-1.66	-0.04	-0.04	1.66	8111
566824.13	1163259.09	84.18	566822.88	1163256.86	84.19	1.25	2.23	-0.01	2.56	8111
566829.45	1163291.24	84.09	566830.72	1163289.17	84.05	-1.27	2.07	0.04	2.43	8111
566837.72	1163317.26	84.28	566840.01	1163317.55	84.25	-2.29	-0.29	0.03	2.31	8111
566846.62	1163356.01	84.18	566845.78	1163356.10	84.19	0.84	-0.09	-0.01	0.84	8111
566849.42	1163374.90	84.14	566849.65	1163374.84	83.96	-0.23	0.06	0.18	0.24	8111
566713.88	1163399.59	82.61	566714.68	1163401.64	82.51	-0.80	-2.05	0.10	2.20	8111
566851.46	1163399.76	83.70	566849.78	1163401.71	83.69	1.68	-1.95	0.01	2.57	8111
566740.59	1163400.06	82.56	566742.14	1163400.36	82.55	-1.55	-0.30	0.01	1.58	8111
566769.85	1163401.21	82.64	566772.39	1163401.15	82.61	-2.54	0.06	0.03	2.54	8111
566693.16	1163401.54	82.58	566693.49	1163399.94	82.68	-0.33	1.60	-0.10	1.63	8111
566797.19	1163403.43	82.92	566798.21	1163402.33	82.78	-1.02	1.10	0.14	1.50	8111
566823.07	1163406.50	83.59	566824.19	1163406.50	83.56	-1.12	0.00	0.03	1.12	8111
566848.55	1163423.72	83.82	566847.55	1163425.69	83.79	1.00	-1.97	0.03	2.21	8111
567416.88	1163435.21	83.73	567414.51	1163434.48	83.76	2.37	0.73	-0.03	2.48	8111
567391.40	1163435.34	83.81	567391.94	1163436.48	83.76	-0.54	-1.14	0.05	1.26	8111
567361.35	1163435.92	83.79	567359.92	1163435.20	83.73	1.43	0.72	0.06	1.60	8111
567314.03	1163436.58	83.75	567314.06	1163437.27	83.73	-0.03	-0.69	0.02	0.69	8111
567336.66	1163436.63	83.67	567336.82	1163435.89	83.66	-0.16	0.74	0.01	0.76	8111
567262.07	1163436.80	83.91	567261.23	1163439.17	83.89	0.84	-2.37	0.02	2.51	8111
567286.54	1163436.91	83.87	567286.53	1163438.88	83.89	0.01	-1.97	-0.02	1.97	8111
567150.21	1163437.25	83.68	567149.78	1163437.11	83.66	0.43	0.14	0.02	0.45	8111
567232.17	1163437.33	83.95	567233.28	1163437.93	83.96	-1.11	-0.60	-0.01	1.26	8111
567178.39	1163437.38	83.85	567180.36	1163438.62	83.83	-1.97	-1.24	0.02	2.33	8111
567208.62	1163437.52	83.87	567208.02	1163440.06	83.83	0.60	-2.54	0.04	2.61	8111
567029.39	1163438.35	83.81	567027.90	1163438.58	83.73	1.49	-0.23	0.08	1.51	8111
567074.43	1163438.36	83.89	567073.05	1163440.59	83.83	1.38	-2.23	0.06	2.62	8111
567097.86	1163438.49	83.61	567098.34	1163436.68	83.66	-0.48	1.81	-0.05	1.87	8111
567054.03	1163438.51	83.79	567051.52	1163439.04	83.73	2.51	-0.53	0.06	2.57	8111
567125.12	1163438.59	83.81	567126.49	1163438.16	83.83	-1.37	0.43	-0.02	1.44	8111
567005.55	1163440.32	83.83	567004.67	1163440.42	83.86	0.88	-0.10	-0.03	0.89	8111
566983.73	1163440.70	83.81	566981.21	1163440.75	83.76	2.52	-0.05	0.05	2.52	8111
566962.06	1163441.48	83.83	566964.32	1163440.55	83.83	-2.26	0.93	0.00	2.44	8111
566867.02	1163442.66	84.07	566865.34	1163443.60	83.99	1.68	-0.94	0.08	1.93	8111
566939.30	1163443.28	84.20	566940.50	1163443.57	84.19	-1.20	-0.29	0.01	1.23	8111
566887.21	1163443.59	83.94	566886.82	1163445.80	84.12	0.39	-2.21	-0.18	2.24	8111
566903.91	1163443.94	84.16	566905.20	1163443.93	84.09	-1.29	0.01	0.07	1.29	8111
566921.53	1163444.27	84.08	566922.09	1163445.08	84.09	-0.56	-0.81	-0.01	0.98	8111
566852.97	1163446.69	83.82	566853.79	1163447.57	83.73	-0.82	-0.88	0.09	1.20	8111

566857.37	1163468.66	83.85	566858.22	1163470.41	83.79	-0.85	-1.75	0.06	1.95	8111
583882.05	1150936.28	101.74	583880.13	1150934.74	101.71	1.92	1.54	0.03	2.46	9211
583729.72	1150950.77	101.40	583727.60	1150950.26	101.38	2.12	0.51	0.02	2.18	9211
583931.05	1150999.45	101.75	583931.57	1150996.91	101.74	-0.52	2.54	0.01	2.59	9211
583702.62	1151001.62	101.39	583704.51	1151001.08	101.61	-1.89	0.54	-0.22	1.97	9211
583986.66	1151011.35	102.10	583988.66	1151012.99	102.00	-2.00	-1.64	0.10	2.59	9211
584003.41	1151050.72	102.23	584001.59	1151051.63	102.30	1.82	-0.91	-0.07	2.03	9211
583750.33	1151066.83	101.86	583752.70	1151065.35	101.94	-2.37	1.48	-0.08	2.79	9211
584043.77	1151079.28	102.36	584044.60	1151080.57	102.36	-0.83	-1.29	0.00	1.53	9211
583700.22	1151155.32	101.05	583701.98	1151156.95	101.31	-1.76	-1.63	-0.26	2.40	9211
584064.20	1151157.08	102.62	584064.81	1151156.00	102.62	-0.61	1.08	0.00	1.24	9211
583763.72	1151207.46	101.42	583766.25	1151207.11	101.44	-2.53	0.35	-0.02	2.55	9211
584077.87	1151221.09	102.94	584078.29	1151222.43	102.79	-0.42	-1.34	0.15	1.40	9211
584071.61	1151282.17	103.48	584069.24	1151282.57	103.35	2.37	-0.40	0.13	2.40	9211
583723.64	1151288.01	101.84	583725.11	1151287.79	101.80	-1.47	0.22	0.04	1.49	9211
584095.87	1151337.92	103.29	584096.60	1151337.85	103.38	-0.73	0.07	-0.09	0.73	9211
584083.43	1151400.45	103.60	584082.36	1151401.04	103.67	1.07	-0.59	-0.07	1.22	9211
583657.90	1151436.40	101.93	583659.76	1151434.47	102.00	-1.86	1.93	-0.07	2.68	9211
583718.23	1151575.08	102.58	583716.29	1151573.61	102.79	1.94	1.47	-0.21	2.43	9211

CONTROL MARK DATA SHEETS

AG9159 **
AG9159 DESIGNATION - M 054
AG9159 PID - AG9159
AG9159 STATE/COUNTY- FL/MANATEE
AG9159 USGS QUAD - MYAKKA CITY NW (1987)
AG9159
AG9159 *CURRENT SURVEY CONTROL
AG9159 _____
AG9159* NAD 83(1999)- 27 28 24.15903(N) 082 12 15.06782(W) ADJUSTED
AG9159* NAVD 88 - 23.3 (meters) 76. (feet) VERTCON
AG9159 _____
AG9159 X - 768,130.982 (meters) COMP
AG9159 Y - -5,610,541.043 (meters) COMP
AG9159 Z - 2,924,852.568 (meters) COMP
AG9159 LAPLACE CORR- -0.52 (seconds) DEFLEC99
AG9159 ELLIP HEIGHT- -1.43 (meters) (06/12/02) GPS OBS
AG9159 GEOID HEIGHT- -24.77 (meters) GEOID03
AG9159
AG9159 HORZ ORDER - FIRST
AG9159 ELLP ORDER - FOURTH CLASS I
AG9159
AG9159.The horizontal coordinates were established by GPS observations
AG9159.and adjusted by the National Geodetic Survey in June 2002..
AG9159
AG9159.The NAVD 88 height was computed by applying the VERTCON shift value to
AG9159.the NGVD 29 height (displayed under SUPERSEDED SURVEY CONTROL.)
AG9159
AG9159.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AG9159
AG9159.The Laplace correction was computed from DEFLEC99 derived deflections.
AG9159
AG9159.The ellipsoidal height was determined by GPS observations
AG9159.and is referenced to NAD 83.
AG9159
AG9159.The geoid height was determined by GEOID03.
AG9159
AG9159; North East Units Scale Factor Converg.
AG9159;SPC FL W - 347,871.219 179,820.304 MT 0.99994620 -0 05 39.1
AG9159;UTM 17 - 3,039,444.762 381,025.779 MT 0.99977472 -0 33 20.2
AG9159
AG9159! - Elev Factor x Scale Factor = Combined Factor
AG9159!SPC FL W - 1.00000022 x 0.99994620 = 0.99994642
AG9159!UTM 17 - 1.00000022 x 0.99977472 = 0.99977494
AG9159
AG9159 SUPERSEDED SURVEY CONTROL
AG9159
AG9159 NAD 83(1990)- 27 28 24.15720(N) 082 12 15.06718(W) AD( ) 1
AG9159 ELLIP H (05/01/91) -1.30 (m) GP( ) 4 1
AG9159 NAD 83(1986)- 27 28 24.15823(N) 082 12 15.08130(W) AD( ) 1
AG9159 NGVD 29 (10/26/89) 23.6 (m) 77. (f) GPS OBS
AG9159
AG9159.Superseded values are not recommended for survey control.
AG9159.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AG9159.See file dsdata.txt to determine how the superseded data were derived.
AG9159
AG9159_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RLL8102639445(NAD 83)

AG9159_MARKER: DH = HORIZONTAL CONTROL DISK
AG9159_SETTING: 2 = OBJECT DRIVEN INTO GROUND
AG9159_SP_SET: OBJECT DRIVEN INTO GROUND
AG9159_MAGNETIC: B = BAR MAGNET IMBEDDED IN MONUMENT
AG9159_STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY
AG9159_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AG9159+SATELLITE: SATELLITE OBSERVATIONS - 1987
AG9159
AG9159 HISTORY - Date Condition Report By
AG9159 HISTORY - 1987 MONUMENTED FL-081
AG9159
AG9159 STATION DESCRIPTION
AG9159
AG9159'DESCRIBED BY MANATEE COUNTY FLORIDA 1987 (TMJ)
AG9159'THE STATION IS LOCATED 23 MILES EAST OF BRADENTON AND 15 MILES
AG9159'SOUTHEAST OF PARRISH.
AG9159'
AG9159'TO REACH THE STATION FROM S.R. 64 AND S.R. 675 (KIBLER ROAD NORTH),
AG9159'GO EAST APPROX. 6 MILES ON S.R. 64 UNTIL JUST INTO THE CURVE, THE
AG9159'STATION IS APPROX. 291 FEET NORTH OF THE CENTERLINE OF S.R. 64 AND
AG9159'APPROX. 49 FEET SOUTH OF THE FENCE WHICH IS THE SOUTH LINE OF SECT.
AG9159'33, T 34 S, R 22 E.
AG9159'
AG9159'THE STATION IS A 3-1/4 INCH DIAMETER ALUMINUM DISK STAMPED---MANATEE
AG9159'COUNTY GEOGRAPHIC INFORMATION SYSTEM GIS 054---. DISK IS SET ON ONE
AG9159'THREE FOOT SECTION OF BERNSTEN TS-R-3 ROD ATTACHED TO TWO THREE FOOT
AG9159'SECTIONS OF BERNSTEN HDR-R-3 ROD HAMMERED TO REFUSAL. THE STATION IS
AG9159'TWELVE INCHES BELOW GROUND SURFACE. IT IS APPROXIMATELY 334 FEET
AG9159'NORTHEAST FROM THE NORTH EDGE OF PAVEMENT OF S R 64 AND 19.3 FEET
AG9159'SOUTH FROM AN E-W FENCE. A CARSONITE WITNESS POST WAS SET AT STATION.
AG9159'
AG9159'THE STATION IS REFERENCED BY THREE IRON ROD AND CAPS. THE STATION
AG9159'BEARS N15E 42.00 FEET FROM AN IRON ROD AND CAP STAMPED---LB 3679---.
AG9159'THE STATION BEARS S03W 39.72 FEET FROM AN IRON ROD AND CAP STAMPED---
AG9159'---LB 3679---. THE STATION BEARS N90E 83.69 FEET FROM AN IRON ROD AND
AG9159'CAP STAMPED---G.I.S. REF. PT.---.
AG9159'
AG9159'THE AZIMUTH IS STAMPED---MANATEE COUNTY GEOGRAPHIC INFORMATION SYSTEM
AG9159'AZIMUTH 054---. THE MARK IS 0.99 MILES WEST FROM THE STATION. THE
AG9159'AZIMUTH MARK IS 12 INCHES BELOW THE GROUND SURFACE, LOCATED 27 FEET
AG9159'SOUTH OF THE SOUTH EDGE OF PAVEMENT OF S R 64. THE MARK BEARS N82E
AG9159'103.29 FEET FROM A NAIL AND DISK STAMPED---LB 3679---SET IN A POWER
AG9159'POLE. THE MARK BEARS S51E 50.74 FEET FROM A NAIL AND DISK STAMPED---
AG9159'---LB 3679---SET IN THE SOUTH EDGE OF PAVEMENT OF S R 64. THE MARK
AG9159'BEARS S43W 36.21 FEET FROM A NAIL AND DISK STAMPED---LB 3679---SET
AG9159'IN THE SOUTH EDGE OF PAVEMENT OF S R 64. A CARSONITE WITNESS POST WAS
AG9159'SET AT THE AZIMUTH MARK.

AG6295 **********
AG6295 DESIGNATION - PARISH
AG6295 PID - AG6295
AG6295 STATE/COUNTY- FL/MANATEE
AG6295 USGS QUAD - PARRISH (1987)
AG6295
AG6295 *CURRENT SURVEY CONTROL
AG6295 _____
AG6295* NAD 83(1999)- 27 35 26.78573(N) 082 23 19.48556(W) ADJUSTED
AG6295* NAVD 88 - 9.889 (meters) 32.44 (feet) ADJUSTED
AG6295 _____
AG6295 X - 749,256.374 (meters) COMP
AG6295 Y - -5,607,014.103 (meters) COMP
AG6295 Z - 2,936,382.026 (meters) COMP
AG6295 LAPLACE CORR- -1.47 (seconds) DEFLEC99
AG6295 ELLIP HEIGHT- -14.86 (meters) (05/31/01) GPS OBS
AG6295 GEOID HEIGHT- -24.77 (meters) GEOID03
AG6295 DYNAMIC HT - 9.874 (meters) 32.39 (feet) COMP
AG6295 MODELED GRAV- 979,142.4 (mgal) NAVD 88
AG6295
AG6295 HORZ ORDER - B
AG6295 VERT ORDER - SECOND CLASS I
AG6295 ELLP ORDER - FIFTH CLASS I
AG6295
AG6295.The horizontal coordinates were established by GPS observations
AG6295.and adjusted by the National Geodetic Survey in May 2001..
AG6295
AG6295.The orthometric height was determined by differential leveling
AG6295.and adjusted by the National Geodetic Survey in June 1991..
AG6295
AG6295.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AG6295
AG6295.The Laplace correction was computed from DEFLEC99 derived deflections.
AG6295
AG6295.The ellipsoidal height was determined by GPS observations
AG6295.and is referenced to NAD 83.
AG6295
AG6295.The geoid height was determined by GEOID03.
AG6295
AG6295.The dynamic height is computed by dividing the NAVD 88
AG6295.geopotential number by the normal gravity value computed on the
AG6295.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AG6295.degrees latitude (g = 980.6199 gals.).
AG6295
AG6295.The modeled gravity was interpolated from observed gravity values.
AG6295
AG6295; North East Units Scale Factor Converg.
AG6295;SPC FL W - 360,923.081 161,620.828 MT 0.99995935 -0 10 48.2
AG6295;SPC FL W - 1,184,128.47 530,251.00 sFT 0.99995935 -0 10 48.2
AG6295;UTM 17 - 3,052,641.079 362,934.916 MT 0.99983190 -0 38 35.9
AG6295
AG6295! - Elev Factor x Scale Factor = Combined Factor
AG6295!SPC FL W - 1.00000233 x 0.99995935 = 0.99996168
AG6295!UTM 17 - 1.00000233 x 0.99983190 = 0.99983423
AG6295
AG6295: Primary Azimuth Mark Grid Az

AG6295:SPC FL W - GILLETTE 272 00 24.4
AG6295:UTM 17 - GILLETTE 272 28 12.1
AG6295
AG6295|---|
AG6295| PID Reference Object Distance Geod. Az |
AG6295| dddmmss.s |
AG6295| AG6297 PARISH RM 1 49.384 METERS 04457 |
AG6295| CW7780 PARISH AZ MK 0672119.1 |
AG6295| CW7781 PARISH RM 2 40.380 METERS 11817 |
AG6295| AG1570 MANATEE NOCATEE CRATE CO TANK APPROX.18.9 KM 2350245.2 |
AG6295| AG1572 MANATEE MUN TANK APPROX.19.6 KM 2360541.1 |
AG6295| AG1575 BRADENTON MUN PUMPING STA TANK APPROX.20.4 KM 2381412.3 |
AG6295| AG1267 PARISH 1934 TP 1 1944 249.898 METERS 23903 |
AG6295| AG1574 BRADENTON FLORIDA PWR CORP STK APPROX.20.5 KM 2391501.5 |
AG6295| AG2435 ELLENTON MUNICIPAL TANK APPROX.15.8 KM 2403314.4 |
AG6295| AG8529 GILLETTE APPROX.13.7 KM 2714936.2 |
AG6295| AG1282 SUN CITY POWER CO TANK APPROX.13.3 KM 3182712.2 |
AG6295| AG6296 PARISH RM 3 20.679 METERS 32302 |
AG6295|---|
AG6295
AG6295 SUPERSEDED SURVEY CONTROL
AG6295
AG6295 ELLIP H (04/20/00) -14.83 (m) GP( ) 3 2
AG6295 NAD 83(1990)- 27 35 26.78425(N) 082 23 19.48476(W) AD( ) B
AG6295 ELLIP H (09/13/90) -14.72 (m) GP( ) 4 1
AG6295 NAD 83(1986)- 27 35 26.78868(N) 082 23 19.49797(W) AD( ) 1
AG6295 NAD 27 - 27 35 25.65949(N) 082 23 20.16047(W) AD( ) 1
AG6295 NAVD 88 (10/04/92) 9.89 (m) 32.4 (f) LEVELING 3
AG6295 NGVD 29 (??/??/92) 10.176 (m) 33.39 (f) ADJ UNCH 2 0
AG6295
AG6295.Superseded values are not recommended for survey control.
AG6295.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AG6295.See file dsdata.txt to determine how the superseded data were derived.
AG6295
AG6295_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RLL6293552641(NAD 83)
AG6295_MARKER: DD = SURVEY DISK
AG6295_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
AG6295_SP_SET: CONCRETE POST
AG6295_STAMPING: PARISH 1934
AG6295_MARK LOGO: CGS
AG6295_PROJECTION: FLUSH
AG6295_MAGNETIC: N = NO MAGNETIC MATERIAL
AG6295_STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY
AG6295_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AG6295+SATELLITE: SATELLITE OBSERVATIONS - August 31, 2004
AG6295
AG6295 HISTORY - Date Condition Report By
AG6295 HISTORY - 1934 MONUMENTED CGS
AG6295 HISTORY - 1943 GOOD CGS
AG6295 HISTORY - 1954 GOOD CGS
AG6295 HISTORY - 1958 GOOD CGS
AG6295 HISTORY - 1960 GOOD CGS
AG6295 HISTORY - 1972 GOOD NGS
AG6295 HISTORY - 1972 GOOD NGS
AG6295 HISTORY - 1981 GOOD FL-057
AG6295 HISTORY - 19870424 GOOD

AG6295 HISTORY - 19890302 GOOD NGS
AG6295 HISTORY - 19910806 GOOD GEOBAS
AG6295 HISTORY - 19951228 GOOD NGS
AG6295 HISTORY - 19990405 GOOD USGS
AG6295 HISTORY - 20000228 GOOD FLDT
AG6295 HISTORY - 20010426 GOOD FL-057
AG6295 HISTORY - 20011113 GOOD JCLS
AG6295 HISTORY - 20020531 GOOD FLDEP
AG6295 HISTORY - 20040831 GOOD JCLS
AG6295
AG6295 STATION DESCRIPTION
AG6295
AG6295'DESCRIBED BY COAST AND GEODETIC SURVEY 1934 (GLA)
AG6295'THIS STATION IS ABOUT 14.5 MILES NE FROM PALMETTO, 2.3 MILES
AG6295'EASTWARD FROM PARISH RAILROAD STATION, 60 FEET N OF THE CENTER
AG6295'LINE OF STATE HIGHWAY 32, 36 FEET NE OF A 20-INCH OAK TREE
AG6295'(TRIANGULAR BLAZE), 33 PACES W OF THE CENTER LINE OF SAND ROAD
AG6295'AND PROJECTS 3 INCHES.
AG6295'
AG6295'SURFACE, UNDERGROUD, REFERENCE, AND AZIMUTH MARKS ARE STANDARD
AG6295'BRONZE DISKS SET IN CONCRETE.
AG6295'
AG6295'REFERENCE MARK NO. 1 IS NE OF THE STATION, 3.5 FEET W OF THE
AG6295'FENCE LINE, 7 FEET E OF THE CENTER LINE OF THE SAND ROAD, 120
AG6295'FEET N OF THE CENTER LINE OF STATE HIGHWAY 32, AND PROJECTS 12
AG6295'INCHES.
AG6295'
AG6295'REFERENCE MARK NO. 2 IS SE OF THE STATION, 1 FOOT W OF THE
AG6295'FENCE LINE, 53 FEET S OF THE CENTER LINE OF STATE HIGHWAY 32 AND
AG6295'PROJECTS 10 INCHES.
AG6295'
AG6295'AZIMUTH MARK IS ENE OF THE STATION, 41 FEET S OF THE CENTER
AG6295'LINE OF THE HIGHWAY, 2.5 FEET N OF FENCE LINE AND PROJECTS 12
AG6295'INCHES.
AG6295'
AG6295'TO REACH GO E ON STATE HIGHWAY 32 FOR 2.3 MILES FROM THE PARISH
AG6295'RAILROAD STATION TO THE STATION ON THE N SIDE OF THE ROAD.
AG6295'
AG6295'177.6 FEET BETWEEN THE REFERENCE MARKS.
AG6295
AG6295 STATION RECOVERY (1943)
AG6295
AG6295'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1943 (RLS)
AG6295'RECOVERED AS DESCRIBED, EXCEPT FOR THE FOLLOWING DISCREPANCIES--
AG6295'
AG6295'1. THE STATION IS FLUSH WITH THE GROUND. IT DOES NOT PROJECT
AG6295'3 INCHES.
AG6295'
AG6295'2. REFERENCE MARK 1 IS 9 FEET E OF THE CENTER LINE OF DIRT
AG6295'ROAD, NOT 7 FEET.
AG6295'
AG6295'3. REFERENCE MARK 1 IS 109 FEET N OF CENTER LINE OF STATE
AG6295'HIGHWAY 32, NOT 120 FEET N OF IT.
AG6295
AG6295 STATION RECOVERY (1954)
AG6295

AG6295'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1954 (IRR)
AG6295'STATION AND REFERENCE MARKS 1 AND 2 RECOVERED IN GOOD
AG6295'CONDITION. THE AZIMUTH MARK WAS FOUND LYING ON THE SHOULDER OF
AG6295'THE ROAD, DESTROYED.
AG6295'
AG6295'THE DESCRIPTION IS ADEQUATE WITH THE FOLLOWING CORRECTIONS--
AG6295'
AG6295'STATE HIGHWAY 32 HAS BEEN RENUMBERED 62.
AG6295'
AG6295'THE MARK IS FLUSH WITH THE GROUND AND COVERED WITH SAND AND
AG6295'TRASH. A 4- BY 4-IN. CONCRETE WITNESS POST WAS SET 11.3 FT.
AG6295'TO THE SE AND PROJECTS 18 IN.
AG6295
AG6295 STATION RECOVERY (1958)
AG6295
AG6295'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1958 (ALW)
AG6295'THIS STATION WAS RECOVERED IN JUNE 1958. THE STATION AND
AG6295'REFERENCE MARK 1 WERE FOUND TO BE IN GOOD CONDITION. REFERENCE
AG6295'MARK 2 WAS SEARCHED FOR BUT NOT RECOVERED. IT MAY HAVE BEEN
AG6295'DESTROYED BY HIGHWAY CONSTRUCTION. THE AZIMUTH MARK WAS FOUND
AG6295'DESTROYED. THE POST WAS FOUND BROKEN OFF. THE DISK WAS
AG6295'RECOVERED. REFERENCE MARK 3 WAS SET.
AG6295'
AG6295'THE STATION IS LOCATED 2.3 MI. E OF PARISH, 0.25 MI. W OF A
AG6295'CURVE IN THE HIGHWAY, 160 YD. W OF A SMALL FARM POND, 290 YD. W
AG6295'OF A JUNCTION WITH AN OILED ROAD LEADING N, 58 FT. N OF THE
AG6295'CENTERLINE OF STATE HIGHWAY 62, 10.3 FT. N OF A FENCE, 129 FT. W
AG6295'OF A T-FENCE CORNER, 118 FT. W OF THE W END OF A WIRE GATE, 129
AG6295'FT. W OF A FENCE LEADING N, 34 FT. NE OF AN 18-IN. DEAD OAK TREE
AG6295'AND 1.8 FT. E OF A CONCRETE WITNESS POST. A TRIANGULATION
AG6295'STATION DISK SET IN THE TOP OF A ROUND CONCRETE POST WHICH IS
AG6295'FLUSH WITH THE GROUND, STAMPED PARISH 1934.
AG6295'
AG6295'REFERENCE MARK 1 IS 161.97 FT. OR 49.369 M. NE OF THE STATION,
AG6295'3 FT. E OF A N AND S FENCE, 64 FT. N OF A T-FENCE CORNER, 111 FT.
AG6295'N OF THE CENTERLINE OF THE HIGHWAY AND 69 FT. N OF THE W END OF
AG6295'A WIRE GATE. A REFERENCE MARK DISK SET IN THE TOP OF A ROUND
AG6295'CONCRETE POST WHICH PROJECTS 1.0 FT. ABOVE THE GROUND, STAMPED
AG6295'PARISH NO 1 1934.
AG6295'
AG6295'REFERENCE MARK 3 IS 67.820 FT. OR 20.670 M. N OF THE STATION,
AG6295'79 FT. N-NE OF AN 18-IN. DEAD OAK TREE, 124 FT. N OF THE CENTERLINE
AG6295'OF THE HIGHWAY, 77 FT. N OF A FENCE, 157 FT. W OF A FENCE
AG6295'AND 159 FT. W-NW OF A FENCE. A REFERENCE MARK DISK SET IN THE
AG6295'TOP OF A SQUARE CONCRETE POST WHICH PROJECTS 0.1 FT. ABOVE THE
AG6295'GROUND, STAMPED PARISH NO 3 1934.
AG6295'
AG6295'TO REACH THE STATION FROM THE JUNCTION OF STATE HIGHWAY 62 AND
AG6295'U.S. HIGHWAY 301 AT PARISH, GO 2.3 MI. E ALONG STATE HIGHWAY 62
AG6295'TO A T-FENCE CORNER AND THE STATION ON THE LEFT.
AG6295
AG6295 STATION RECOVERY (1960)
AG6295
AG6295'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1960 (WRK)
AG6295'THE STATION, R.M. 1 AND R.M. 3 WERE RECOVERED AS DESCRIBED IN JUNE
AG6295'1958 AND WERE FOUND IN GOOD CONDITION. STEEL WITNESS POSTS WERE

AG6295'SET BY ALL MARKS.
AG6295
AG6295 STATION RECOVERY (1972)
AG6295
AG6295'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1972 (LFS)
AG6295'STATION MARK, REFERENCE MARK 1 AND 3 WERE RECOVERED AND FOUND IN
AG6295'GOOD CONDITION. THE AZIMUTH MARK WAS SEARCHED FOR BUT NOT FOUND
AG6295'AND APPARENTLY WAS DESTROYED WHEN STATE HIGHWAY 60 WAS WIDENED. THE
AG6295'DISTANCE TO REFERENCE MARK 1 CHECKED THE ORIGINAL DESCRIPTION.
AG6295'DUE TO LACK OF DATA, A COMPLETE NEW DESCRIPTION FOLLOWS.
AG6295'
AG6295'STATION IS ABOUT 23 MILES SOUTHEAST OF SAINT PETERSBURG, 25 MILES
AG6295'SOUTH-SOUTHEAST OF TAMPA, 20 MILES NORTHEAST OF SARASOTA, 2-1/4
AG6295'MILES EAST OF PARRISH AND ON PROPERTY OWNED BY THE MAYOR OF
AG6295'PARRISH.
AG6295'
AG6295'TO REACH THE STATION FROM THE JUNCTION OF U.S. HIGHWAY 301 AND
AG6295'STATE HIGHWAY 62 IN PARRISH, GO EAST ON STATE HIGHWAY 62 FOR 2.35
AG6295'MILES TO A GATE ON LEFT AND STATION.
AG6295'
AG6295'STATION MARK, A STANDARD DISK STAMPED PARISH 1934, IS SET IN
AG6295'THE TOP OF A 12-INCH CYLINDRICAL CONCRETE MONUMENT THAT IS
AG6295'SET FLUSH WITH THE GROUND SURFACE. IT IS 148 FEET WEST-NORTHWEST
AG6295'OF A 12-INCH PINE TREE, 131 FEET WEST-NORTHWEST OF THE FENCE
AG6295'CORNER ON THE EAST SIDE OF THE GATE, 58 FEET NORTH OF THE CENTER
AG6295'OF STATE HIGHWAY 62, 11 FEET NORTH OF A 4-INCH SQUARE CONCRETE
AG6295'RIGHT-OF-WAY POST, 10 FEET NORTH OF A BARBED WIRE FENCE, 1.8
AG6295'FEET EAST OF A 4-INCH SQUARE CONCRETE RIGHT-OF-WAY MARKER
AG6295'POST, 1.5 FEET WEST OF A METAL WITNESS POST AND 1 FOOT NORTH
AG6295'OF A METAL WITNESS POST.
AG6295'
AG6295'REFERENCE MARK 1, A STANDARD DISK STAMPED PARISH NO 1 1934, IS
AG6295'SET IN THE TOP OF A 12-INCH CYLINDRICAL CONCRETE MONUMENT THAT
AG6295'PROJECTS 9-INCHES ABOVE THE GROUND SURFACE. IT IS 108 FEET NORTH
AG6295'OF THE CENTER OF STATE HIGHWAY 62, 64 FEET NORTHEAST OF THE FENCE
AG6295'CORNER, 63 FEET NORTH-NORTHWEST OF THE 12-INCH PINE TREE, 2 FEET
AG6295'SOUTHEAST OF A FENCE, 1.3 FEET NORTHEAST OF A METAL WITNESS POST
AG6295'AND ABOUT THE SAME ELEVATION AS THE STATION MARK.
AG6295'
AG6295'REFERENCE MARK 3, A STANDARD DISK, STAMPED PARISH NO 3 1934, IS
AG6295'SET IN THE TOP OF AN 8-INCH SQUARE PRECAST CONCRETE MONUMENT THAT
AG6295'IS SET FLUSH WITH THE GROUND SURFACE. IT IS 161 FEET NORTHWEST
AG6295'OF THE FENCE CORNER, 125 FEET NORTH OF THE CENTER OF STATE
AG6295'HIGHWAY 62, 77 FEET NORTH OF THE RIGHT-OF-WAY FENCE, 1 FOOT EAST
AG6295'OF A METAL WITNESS POST AND ABOUT THE SAME ELEVATION AS THE
AG6295'STATION MARK.
AG6295'
AG6295'AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN
AG6295'2.35 MILES EAST OF PARRISH.
AG6295
AG6295 STATION RECOVERY (1972)
AG6295
AG6295'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1972
AG6295'2.4 MI E FROM PARRISH.
AG6295'2.35 MILES EAST ALONG STATE HIGHWAY 62 FROM ITS JUNCTION WITH
AG6295'U.S. HIGHWAY 301 IN PARRISH, 148 FEET WEST-NORTHWEST OF A

AG6295'12-INCH PINE TREE, 131 FEET WEST-NORTHWEST OF A FENCE CORNER,
AG6295'58 FEET NORTH OF THE CENTER OF STATE HIGHWAY 62, 11 FEET NORTH
AG6295'OF A 4-INCH SQUARE CONCRETE RIGHT-OF-WAY POST, 10 FEET NORTH OF A
AG6295'BARBED-WIRE FENCE, 1.8 FEET EAST OF A 4-INCH SQUARE CONCRETE
AG6295'RIGHT-OF-WAY POST, 1.5 FEET WEST OF A METAL WITNESS POST AND
AG6295'1 FOOT NORTH OF A METAL WITNESS POST. A STANDARD DISK SET
AG6295'IN THE TOP OF A 12-INCH CYLINDRICAL CONCRETE MONUMENT THAT IS
AG6295'SET FLUSH WITH THE GROUND SURFACE.
AG6295
AG6295 STATION RECOVERY (1981)
AG6295
AG6295'RECOVERY NOTE BY HILLSBOROUGH COUNTY FLORIDA 1981 (SW)
AG6295'PARISH 1934 RECOVERED GOOD.
AG6295'
AG6295'STA. PARISH VERTICALLY OBSTRUCTED BY POWER LINE.
AG6295'
AG6295'RM NO. 3 CLEAR.
AG6295'
AG6295'RM NO. 1 NEEDS WITNESS REPLACED.
AG6295'
AG6295'DISTANCE AND DIRECTION FROM NEAREST TOWN--2.3 MILES EAST OF PARISH.
AG6295
AG6295 STATION RECOVERY (1987)
AG6295
AG6295'RECOVERED 1987
AG6295'RECOVERED IN GOOD CONDITION.
AG6295
AG6295 STATION RECOVERY (1989)
AG6295
AG6295'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1989
AG6295'THE STATION IS LOCATED ABOUT 37.0 KM (23.00 MI) SOUTHEAST OF ST.
AG6295'PETERSBURG, 3.7 KM (2.30 MI) EAST OF PARRISH, IN SECTION 22, T 33 S, R
AG6295'19 E. OWNERSHIP--UNKNOWN.
AG6295'TO REACH THE STATION FROM THE JUNCTION OF U.S. HIGHWAY 301 AND STATE
AG6295'HIGHWAY 62 IN PARRISH, GO EAST FOR 3.94 KM (2.45 MI) ON HIGHWAY 62 TO
AG6295'THE STATION ON LEFT.
AG6295'LOCATED 0.24 KM (0.15 MI) WEST FROM THE JUNCTION OF STATE HIGHWAY 62
AG6295'AND KEEN ROAD, 17.68 M (58.0 FT) NORTH FROM THE APPROXIMATE CENTER OF
AG6295'HIGHWAY 62, 2.96 M (9.7 FT) NORTH FROM A BARBED WIRE FENCE, 2.90 M
AG6295'(9.5 FT) WEST FROM A UTILITY POLE, 0.55 M (1.8 FT) EAST FROM A
AG6295'RIGHT-OF-WAY MARKER AND 0.30 M (1.0 FT) NORTH FROM A METAL WITNESS
AG6295'POST.
AG6295'DESCRIBED BY R.L. TAYLOR.
AG6295
AG6295 STATION RECOVERY (1991)
AG6295
AG6295'RECOVERY NOTE BY GEOBASE CONTROL INCORPORATED 1991
AG6295'RECOVERED IN GOOD CONDITION.
AG6295
AG6295 STATION RECOVERY (1995)
AG6295
AG6295'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1995 (CFS)
AG6295'THE STATION IS LOCATED ABOUT 23.00 MI (37.01 KM) SOUTHEAST OF ST.
AG6295'PETERSBURG, 2.35 MI (3.78 KM) EAST OF PARRISH, IN SECTION 22, T 33 S,
AG6295'R 19 E. OWNERSHIP -- UNKNOWN. TO REACH THE STATION FROM THE JUNCTION
AG6295'OF U.S. HIGHWAY 301 AND STATE HIGHWAY 62 IN PARRISH, GO EAST ON STATE

AG6295'HIGHWAY 62 FOR 2.35 MI (3.78 KM) TO THE STATION ON THE LEFT. LOCATED
AG6295'0.15 MI (0.24 KM) WEST OF STATE HIGHWAY 62 AND KEEN ROAD JUNCTION,
AG6295'58.0 FT (17.7 M) NORTH FROM THE APPROXIMATE CENTER OF STATE HIGHWAY
AG6295'62, 9.7 FT (3.0 M) NORTH OF A BARBED WIRE FENCE, 9.5 FT (2.9 M) WEST
AG6295'OF A UTILITY POLE, 1.8 FT (0.5 M) EAST OF A 4-INCH CONCRETE
AG6295'RIGHT-OF-WAY MARKER, AND 1.0 FT (0.3 M) NORTH OF A METAL WITNESS POST.
AG6295'RECOVERED IN GOOD CONDITION.
AG6295
AG6295 STATION RECOVERY (1999)
AG6295
AG6295'RECOVERY NOTE BY US GEOLOGICAL SURVEY 1999
AG6295'RECOVERED AS DESCRIBED.
AG6295
AG6295 STATION RECOVERY (2000)
AG6295
AG6295'RECOVERY NOTE BY FLORIDA DEPARTMENT OF TRANSPORTATION 2000 (CDM)
AG6295'RECOVERED AS DESCRIBED.
AG6295
AG6295 STATION RECOVERY (2001)
AG6295
AG6295'RECOVERY NOTE BY HILLSBOROUGH COUNTY FLORIDA 2001 (RJA)
AG6295'THE STATION IS LOCATED IN MANATEE COUNTY, FLORIDA, ABOUT 23.0 MILES
AG6295'SOUTHEAST OF ST.PETERSBURG AND 2.3 MILES EAST OF PARISH, IN SECTION
AG6295'22, TOWNSHIP 33 SOUTH, RANGE 19 EAST. OWNERSHIP---UNKNOWN THE STATION
AG6295'IS A 12 INCH ROUND CONCRETE MONUMENT. FLUSH WITH THE GROUND. TO
AG6295'REACH THE STATION FROM THE INTERSECTION OF U.S. HWY. 301 AND S.R. 62
AG6295'IN PARRISH, PROCEED EAST ON S.R.62 FOR 2.3 MILES TO THE STATION ON
AG6295'THE LEFT (NORTH) SIDE OF THE ROAD. 15.00 MILES WEST OF C.R.39.
AG6295'
AG6295'1.0 FT NORTH OF A METAL WITNESS POST AND NGS SIGN. 46.5 FT NORTH OF A
AG6295'NAIL AND HILLS COUNTY DISK IN THE NORTH EDGE OF PAVEMENT OF S.R.62.
AG6295'9.7 FT NORTH OF A BARBED WIRE FENCE. 9.7 FT WEST OF A WOOD UTILITY
AG6295'POLE (NO NUMBERS). 1.8 FT EAST OF A CONCRETE RIGHT-OF-WAY MONUMENT.
AG6295'11.0 FT NORTH-NORTHWEST OF A CONCRETE RIGHT-OF-WAY MONUMENT.
AG6295
AG6295 STATION RECOVERY (2001)
AG6295
AG6295'RECOVERY NOTE BY JOHN CHANCE LAND SURVEYS INC 2001
AG6295'RECOVERED IN GOOD CONDITION.
AG6295
AG6295 STATION RECOVERY (2002)
AG6295
AG6295'RECOVERY NOTE BY FL DEPT OF ENV PRO 2002 (BPJ)
AG6295'RECOVERED AS DESCRIBED.
AG6295'
AG6295
AG6295 STATION RECOVERY (2004)
AG6295
AG6295'RECOVERY NOTE BY JOHN CHANCE LAND SURVEYS INC 2004
AG6295'RECOVERED IN GOOD CONDITION.

AG6331 **
AG6331 DESIGNATION - J 66
AG6331 PID - AG6331
AG6331 STATE/COUNTY- FL/MANATEE
AG6331 USGS QUAD - DUETTE (1987)
AG6331
AG6331 *CURRENT SURVEY CONTROL
AG6331 _____
AG6331* NAD 83(1990)- 27 35 24.31578(N) 082 07 07.08764(W) ADJUSTED
AG6331* NAVD 88 - 38.211 (meters) 125.36 (feet) ADJUSTED
AG6331 _____
AG6331 LAPLACE CORR- -0.46 (seconds) DEFLEC99
AG6331 GEOID HEIGHT- -24.93 (meters) GEOID03
AG6331 DYNAMIC HT - 38.154 (meters) 125.18 (feet) COMP
AG6331 MODELED GRAV- 979,144.7 (mgal) NAVD 88
AG6331
AG6331 HORZ ORDER - SECOND
AG6331 VERT ORDER - SECOND CLASS 0
AG6331
AG6331.The horizontal coordinates were established by classical geodetic methods
AG6331.and adjusted by the National Geodetic Survey in May 1991..
AG6331
AG6331.The orthometric height was determined by differential leveling
AG6331.and adjusted by the National Geodetic Survey in June 1991..
AG6331
AG6331.The Laplace correction was computed from DEFLEC99 derived deflections.
AG6331
AG6331.The geoid height was determined by GEOID03.
AG6331
AG6331.The dynamic height is computed by dividing the NAVD 88
AG6331.geopotential number by the normal gravity value computed on the
AG6331.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AG6331.degrees latitude (g = 980.6199 gals.).
AG6331
AG6331.The modeled gravity was interpolated from observed gravity values.
AG6331
AG6331; North East Units Scale Factor Converg.
AG6331;SPC FL W - 360,792.370 188,287.620 MT 0.99994287 -0 03 17.8
AG6331;SPC FL W - 1,183,699.63 617,740.30 sFT 0.99994287 -0 03 17.8
AG6331;UTM 17 - 3,052,294.835 389,595.515 MT 0.99975046 -0 31 05.3
AG6331
AG6331! - Elev Factor x Scale Factor = Combined Factor
AG6331!SPC FL W - 0.99999791 x 0.99994287 = 0.99994078
AG6331!UTM 17 - 0.99999791 x 0.99975046 = 0.99974837
AG6331
AG6331 SUPERSEDED SURVEY CONTROL
AG6331
AG6331 NAD 83(1986)- 27 35 24.31565(N) 082 07 07.10682(W) AD( ) 2
AG6331 NAD 27 - 27 35 23.18688(N) 082 07 07.78706(W) AD( ) 2
AG6331 NGVD 29 (??/??/92) 38.484 (m) 126.26 (f) ADJ UNCH 2 0
AG6331
AG6331.Superseded values are not recommended for survey control.
AG6331.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AG6331.See file dsdata.txt to determine how the superseded data were derived.
AG6331
AG6331_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RLL8959652295(NAD 83)

AG6331_MARKER: DB = BENCH MARK DISK
AG6331_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
AG6331_SP_SET: SET IN TOP OF CONCRETE MONUMENT
AG6331_STAMPING: J 66 1934
AG6331_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
AG6331+STABILITY: SURFACE MOTION
AG6331_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AG6331+SATELLITE: SATELLITE OBSERVATIONS - November 25, 2003
AG6331
AG6331 HISTORY - Date Condition Report By
AG6331 HISTORY - 1937 MONUMENTED CGS
AG6331 HISTORY - 1959 GOOD NGS
AG6331 HISTORY - 1962 GOOD NGS
AG6331 HISTORY - 20031125 GOOD FL-105
AG6331
AG6331 STATION DESCRIPTION
AG6331
AG6331'DESCRIBED BY COAST AND GEODETIC SURVEY 1937
AG6331'SEE STATION JUNCTION
AG6331
AG6331 STATION RECOVERY (1959)
AG6331
AG6331'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1959
AG6331'19.3 MI E FROM PARRISH.
AG6331'19.3 MILES EAST ALONG STATE HIGHWAY 62 FROM THE POST OFFICE AT
AG6331'PARRISH, 10.8 MILES WEST OF THE RAILROAD CROSSING AT FORT GREEN
AG6331'SPRINGS, 0.2 MILE EAST OF A SCHOOL, AT A JUNCTION WITH STATE
AG6331'HIGHWAY 37, 36 FT. NORTH OF THE CENTER LINE OF STATE HIGHWAY 62,
AG6331'117 FT. SOUTHEAST OF THE CENTER LINE OF STATE HIGHWAY 37, 56 FT.
AG6331'EAST OF A FENCE CORNER, 80 FT. SOUTHEAST OF A FENCE, 0.8 FT.
AG6331'NORTH OF A FENCE, 1.6 FT. EAST OF A STEEL WITNESS POST, SET IN
AG6331'THE TOP OF A CONCRETE POST WHICH PROJECTS 0.3 FT. ABOVE THE GROUND.
AG6331
AG6331 STATION RECOVERY (1962)
AG6331
AG6331'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1962
AG6331'RECOVERED IN GOOD CONDITION.
AG6331
AG6331 STATION RECOVERY (2003)
AG6331
AG6331'RECOVERY NOTE BY POLK COUNTY FLORIDA 2003 (RWY)
AG6331'RECOVERED AS DESCRIBED. RECOVERY NOTE BY POLK COUNTY PROPERTY
AG6331'APPRAISER GIS DEPARTMENT.

SURVEY INFORMATION

A. Field Personnel

The following field personnel worked on this GPS network, and related survey collection:

Party Chief: J. VanderSluis
Instrument Man: C. Thomas
Instrument Man: C. Holmes

The point of contact for survey related questions is:

Josh Hardy
Operations Supervisor
(985) 661-3001

B. GPS Logsheets

GPS SESSION FORM — **MORGAN & EKLUND, INC.**

CLIENT NO.	Project Name	Date
	RITLAND RANCH LIDAR GROUND TRUTHING — MANATEE COUNTY	3-15-06

COMMISSION NO.	Agency/AE Firm	Operator Name
5447.03	MORGAN & EKLUND, INC.	CHRIS THOMAS

Monument Name/Designation	Exact Stamping (*include photo in survey report*)
PARISH	'PARISH 1934'

Monument No./PID	Agency Cast in Disk	File Name (*receiver generated*)
	CGS	94570740

Receiver Manufacturer	Receiver Model	Receiver Serial No.
TRIMBLE	4000 SSE	3504A09457
Data Collector Manufacturer	**Data Collector Model**	**Data Collector Serial No.**
N/A	N/A	N/A
Antenna Part No.	**Antenna Model**	**Antenna Serial No.**
22020-00	COMPACT L1/L2 WITH GP	02200122660

Starting Antenna Height in Feet				Starting Antenna Height Meters				Type of Measurement (*circle one*)
1	2	3	AVG	1	2	3	AVG	ANTENNA BASE (SLANT)
5.32	5.33	5.32	5.32					

Ending Antenna Height in Feet				Ending Antenna Height in Meters				Type of Measurement (*circle one*)
1	2	3	AVG	1	2	3	AVG	ANTENNA BASE (SLANT)
5.32	5.33	5.32	5.32					

Antenna Reference Point (*include and reference a dimensioned diagram in Survey Report*)
e.g., bottom edge of notch in ground plane, Page 5, Figure 2

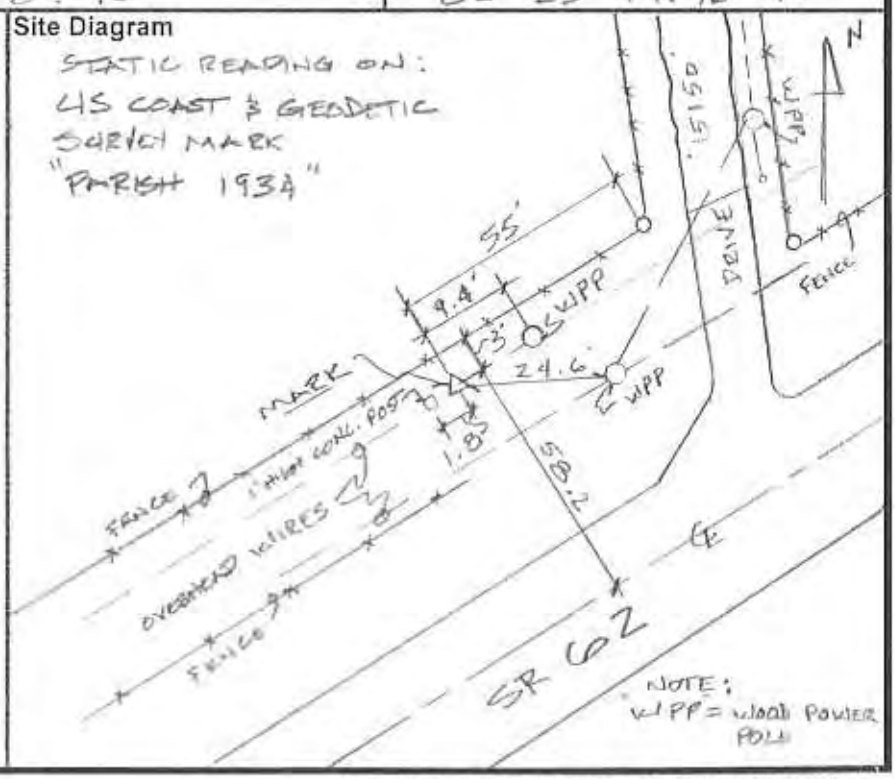
BOTTOM EDGE OF NOTCH IN GROUND PLANE

Start Date (UTC LOCAL)	Start Time (UTC LOCAL)	Approx. Lat. (*if available*)
3-15-06	10:45	27° 35' 26.90" N
End Date (UTC LOCAL)	**End Time (UTC LOCAL)**	**Approx. Lon. (*if available*)**
3-15-06	18:40	82° 23' 19.46" W

Describe any abnormalities and/or problems encountered during the session, include time of occurrence and duration.

Site Diagram

STATIC READING ON:
US COAST & GEODETIC SURVEY MARK "PARISH 1934"



ALL FIELDS REQUIRED UNLESS OTHERWISE NOTED

GPS SESSION FORM — **MORGAN & EKLUND, INC.**

CLIENT NO.	Project Name	Date
3001 INC.	Rutland Ranch	3/15/06
COMMISSION NO.	**Agency/AE Firm**	**Operator Name**
5447 03	MORGAN & EKLUND, INC.	Calvin Holmes

Monument Name/Designation: US Coast & Geodetic Survey Mark

Exact Stamping (*include photo in survey report*): J66 1934

Monument No./PID	Agency Cast in Disk	File Name (*receiver generated*)
J 66	CM	98450740

Receiver Manufacturer	Receiver Model	Receiver Serial No.
Trimble	4000 SSE	3508A09845
Data Collector Manufacturer	**Data Collector Model**	**Data Collector Serial No.**
N/A	N/A	N/A
Antenna Part No.	**Antenna Model**	**Antenna Serial No.**
22020-00	Compact L1/L2 with GP	0220082013

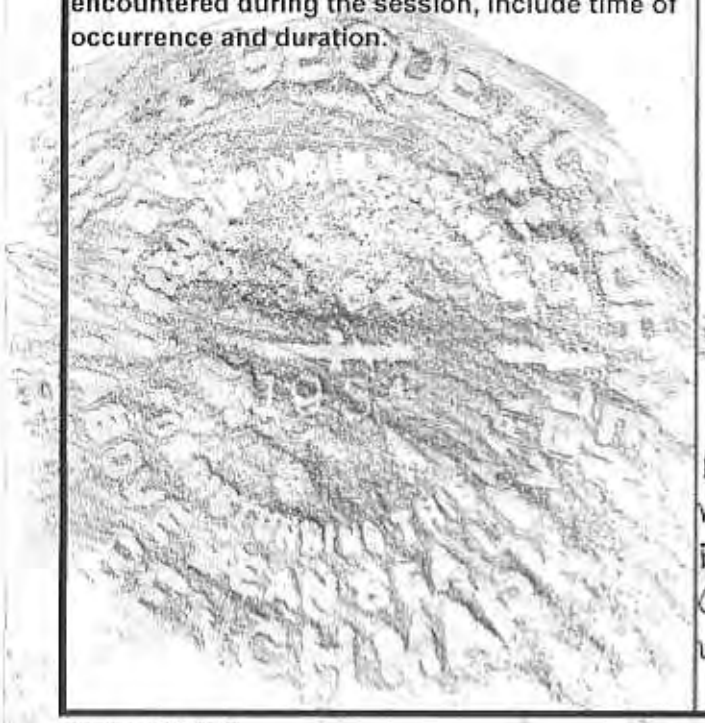
Starting Antenna Height in Feet	Starting Antenna Height Meters	Type of Measurement (*circle one*)
1 2 3 AVG	1 2 3 AVG	ANTENNA BASE SLANT
	2.00 m	

Ending Antenna Height in Feet	Ending Antenna Height in Meters	Type of Measurement (*circle one*)
1 2 3 AVG	1 2 3 AVG	ANTENNA BASE SLANT
	2.00 m	

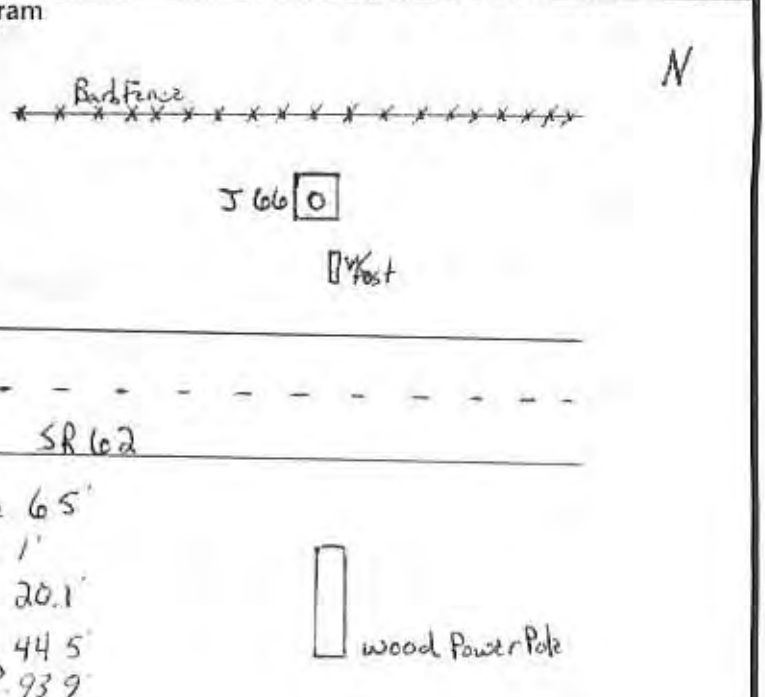
Antenna Reference Point (*include and reference a dimensioned diagram in Survey Report*)
e.g., bottom edge of notch in ground plane, Page 5, Figure 2

Start Date (UTC LOCAL)	Start Time (UTC LOCAL)	Approx. Lat. (*if available*)
3/15/06	11 10	37°35'24.43" N
End Date (UTC LOCAL)	**End Time (UTC LOCAL)**	**Approx. Lon. (*if available*)**
3/15/06	18 43	082°07'07.08" W

Describe any abnormalities and/or problems encountered during the session, include time of occurrence and duration.



Site Diagram



ALL FIELDS REQUIRED UNLESS OTHERWISE NOTED

GPS SESSION FORM **MORGAN & EKLUND, INC.**

CLIENT NO.	Project Name	Date
3001, Inc.	Rutland Ranch Lidar Groundtruthing	3/15/06
COMMISSION NO.	**Agency/AE Firm**	**Operator Name**
5447.03	MORGAN & EKLUND, INC.	J. VanderSluis

Monument Name/Designation	Exact Stamping (*include photo in survey report*)
31	Morgan & Eklund PT. 31
Monument No./PID	**Agency Cast in Disk** / **File Name** (*receiver generated*)
	MET / 06170740

Receiver Manufacturer	Receiver Model	Receiver Serial No.
Trimble	5700	0220220617
Data Collector Manufacturer	**Data Collector Model**	**Data Collector Serial No.**
Antenna Part No.	**Antenna Model**	**Antenna Serial No.**
	Zephyr Geo	11885696

Starting Antenna Height in Feet	Starting Antenna Height Meters	Type of Measurement (*circle one*)
1 2 3 AVG	1 2 3 AVG	ANTENNA BASE SLANT
6.9	2.00	
Ending Antenna Height in Feet	**Ending Antenna Height in Meters**	**Type of Measurement** (*circle one*)
1 2 3 AVG	1 2 3 AVG	ANTENNA BASE SLANT
6.9		

Antenna Reference Point (*include and reference a dimensioned diagram in Survey Report*)
e.g., bottom edge of notch in ground plane, Page 5, Figure 2

Ant Phase Center

Start Date (UTC LOCAL)	Start Time (UTC LOCAL)	Approx. Lat. (*if available*)
3/15/06	13:30	
End Date (UTC LOCAL)	**End Time (UTC LOCAL)**	**Approx. Lon.** (*if available*)
3/15/06	14:15	

Describe any abnormalities and/or problems encountered during the session, include time of occurrence and duration.

Site Diagram

version 20020912

ALL FIELDS REQUIRED UNLESS OTHERWISE NOTED

GPS SESSION FORM **MORGAN & EKLUND, INC.**

CLIENT NO.	Project Name	Date
3001, Inc.	Rutland Ranch Lidar Groundtruthing	3/14/06
COMMISSION NO.	**Agency/AE Firm**	**Operator Name**
	MORGAN & EKLUND, INC.	J. VanderSluis

Monument Name/Designation	Exact Stamping (*include photo in survey report*)
32	Morgan & Eklund PT. 32
Monument No./PID	**Agency Cast in Disk** / **File Name (*receiver generated*)**
	MME / 11830741

Receiver Manufacturer	Receiver Model	Receiver Serial No.
Trimble	5700	0220271183
Data Collector Manufacturer	**Data Collector Model**	**Data Collector Serial No.**
Antenna Part No.	**Antenna Model**	**Antenna Serial No.**
	Zephyr	12200400

Starting Antenna Height in Feet				Starting Antenna Height Meters				Type of Measurement (*circle one*)	
1	2	3	AVG	1	2	3	AVG	ANTENNA BASE	SLANT
			7.041						
Ending Antenna Height in Feet				**Ending Antenna Height in Meters**				**Type of Measurement (*circle one*)**	
1	2	3	AVG	1	2	3	AVG	ANTENNA BASE	SLANT
			7.041						

Antenna Reference Point (*include and reference a dimensioned diagram in Survey Report*)
e.g., bottom edge of notch in ground plane, Page 5, Figure 2

Ant. Phase Center

Start Date (UTC LOCAL)	Start Time (UTC LOCAL)	Approx. Lat. (*if available*)
3/14/06	13.30	
End Date (UTC LOCAL)	**End Time (UTC LOCAL)**	**Approx. Lon. (*if available*)**
3/14/06	14.15	

Describe any abnormalities and/or problems encountered during the session, include time of occurrence and duration.

Site Diagram

ALL FIELDS REQUIRED UNLESS OTHERWISE NOTED

GPS SESSION FORM **MORGAN & EKLUND, INC.**

CLIENT NO.	Project Name	Date
3001, Inc.	Rutland Ranch Lidar Groundtruthing	3/15/06
COMMISSION NO.	**Agency/AE Firm**	**Operator Name**
5442.03	MORGAN & EKLUND, INC.	J. VanderSluis

Monument Name/Designation	Exact Stamping (*include photo in survey report*)
22	Morgan & Eklund PLS

Monument No./PID	Agency Cast in Disk	File Name (*receiver generated*)
	M+E	11830742

Receiver Manufacturer	Receiver Model	Receiver Serial No.
Trimble	5700	0220271183
Data Collector Manufacturer	**Data Collector Model**	**Data Collector Serial No.**
Antenna Part No.	**Antenna Model**	**Antenna Serial No.**
	Zephyr	12200400

Starting Antenna Height in Feet	Starting Antenna Height Meters	Type of Measurement (*circle one*)
1 2 3 AVG 7.041	1 2 3 AVG 2.100m	ANTENNA BASE SLANT
Ending Antenna Height in Feet	**Ending Antenna Height in Meters**	**Type of Measurement (*circle one*)**
1 2 3 AVG 7.041	1 2 3 AVG 2.100m	ANTENNA BASE SLANT

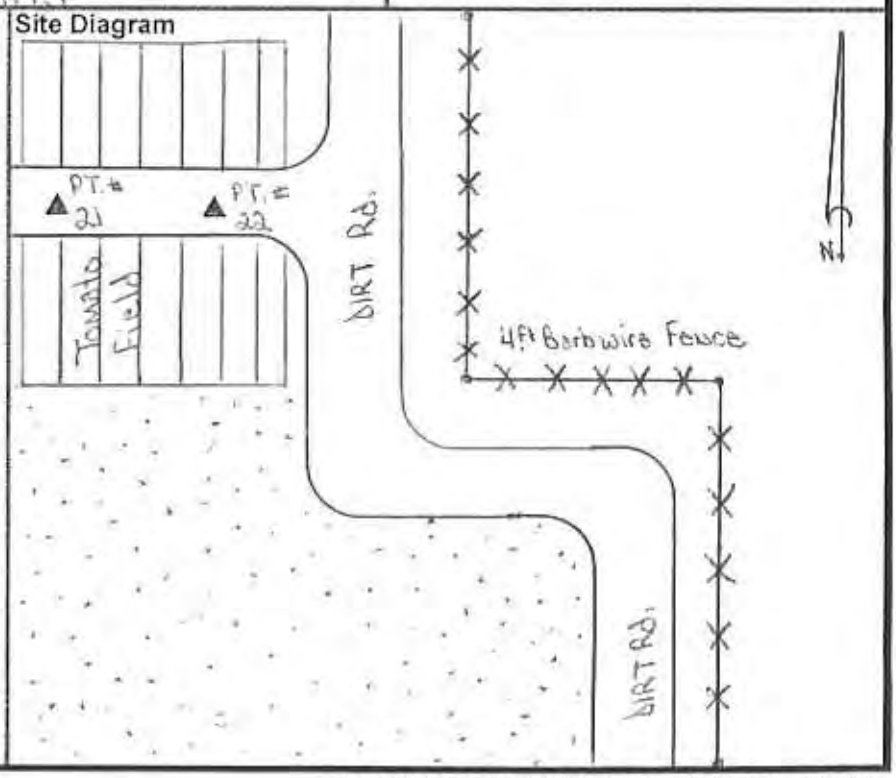
Antenna Reference Point (*include and reference a dimensioned diagram in Survey Report*)
e.g., bottom edge of notch in ground plane, Page 5, Figure 2

Ant. Phase Center

Start Date (UTC LOCAL)	Start Time (UTC LOCAL)	Approx. Lat. (*if available*)
3/15/06	14.45	
End Date (UTC LOCAL)	**End Time (UTC LOCAL)**	**Approx. Lon. (*if available*)**
3/15/06	15.15	

Describe any abnormalities and/or problems encountered during the session, include time of occurrence and duration.

Site Diagram



ALL FIELDS REQUIRED UNLESS OTHERWISE NOTED

GPS SESSION FORM

MORGAN & EKLUND, INC.

CLIENT NO.	Project Name	Date
3002, Inc.	Rutland Ranch Lidar Groundtruthing	3/15/06
COMMISSION NO.	**Agency/AE Firm**	**Operator Name**
5447.03	MORGAN & EKLUND, INC.	J. VanderSluis
Monument Name/Designation	**Exact Stamping** (*include photo in survey report*)	
21	Morgan & Eklund Pt. 21	
Monument No./PID	**Agency Cast in Disk**	**File Name** (*receiver generated*)
	M+E	06170342

Receiver Manufacturer	Receiver Model	Receiver Serial No.
Trimble	Tr. 5700	0220270617
Data Collector Manufacturer	**Data Collector Model**	**Data Collector Serial No.**
+	+	~~06~~
Antenna Part No.	**Antenna Model**	**Antenna Serial No.**
	Zephyr Geo	11885696

Starting Antenna Height in Feet				Starting Antenna Height Meters				Type of Measurement (*circle one*)	
1	2	3	AVG	1	2	3	AVG	ANTENNA BASE	SLANT
			6.92M				2.00m		
Ending Antenna Height in Feet				**Ending Antenna Height in Meters**				**Type of Measurement** (*circle one*)	
1	2	3	AVG	1	2	3	AVG	ANTENNA BASE	SLANT
			~~6.92M~~				2.00m		

Antenna Reference Point (*include and reference a dimensioned diagram in Survey Report*)

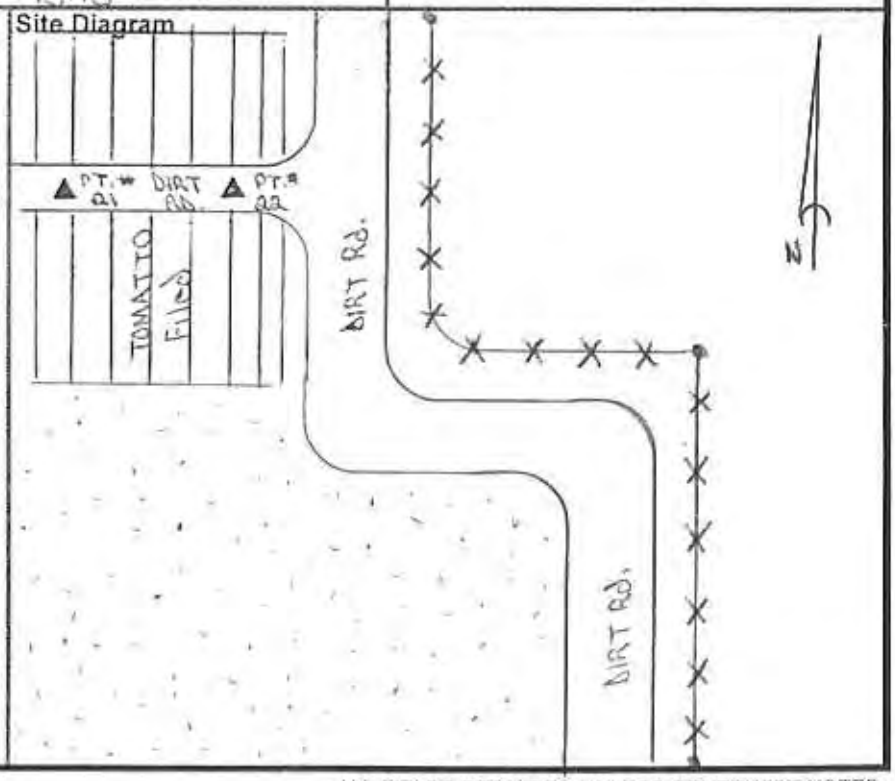
e.g., bottom edge of notch in ground plane, Page 5, Figure 2

Ant. Phase Center

Start Date (UTC LOCAL)	Start Time (UTC LOCAL)	Approx. Lat. (*if available*)
3/15/06	14:45	
End Date (UTC LOCAL)	**End Time (UTC LOCAL)**	**Approx. Lon. (*if available*)**
3/15/06	15:15	

Describe any abnormalities and/or problems encountered during the session, include time of occurrence and duration.

Site Diagram



ALL FIELDS REQUIRED UNLESS OTHERWISE NOTED

GPS SESSION FORM **MORGAN & EKLUND, INC.**

CLIENT NO.	Project Name	Date
3001, Inc.	Rutland Ranch Lidar Groundtruthing	3/15/06
COMMISSION NO.	**Agency/AE Firm**	**Operator Name**
6447.03	MORGAN & EKLUND, INC.	J. VanderSluis
Monument Name/Designation	**Exact Stamping** (*include photo in survey report*)	
41	Morgan & Eklund PT. 41	
Monument No./PID	**Agency Cast in Disk**	**File Name** (*receiver generated*)
	MH	11830243

Receiver Manufacturer	Receiver Model	Receiver Serial No.
Trimble	5700	0220271183
Data Collector Manufacturer	**Data Collector Model**	**Data Collector Serial No.**
Antenna Part No.	**Antenna Model**	**Antenna Serial No.**
	Zephyr	13200400

Starting Antenna Height in Feet				Starting Antenna Height Meters				Type of Measurement (*circle one*)
1	2	3	AVG	1	2	3	AVG	ANTENNA BASE SLANT
			7.041				~~2.601~~	
Ending Antenna Height in Feet				**Ending Antenna Height in Meters**				**Type of Measurement** (*circle one*)
1	2	3	AVG	1	2	3	AVG	ANTENNA BASE SLANT
			7.041				~~2.601~~	

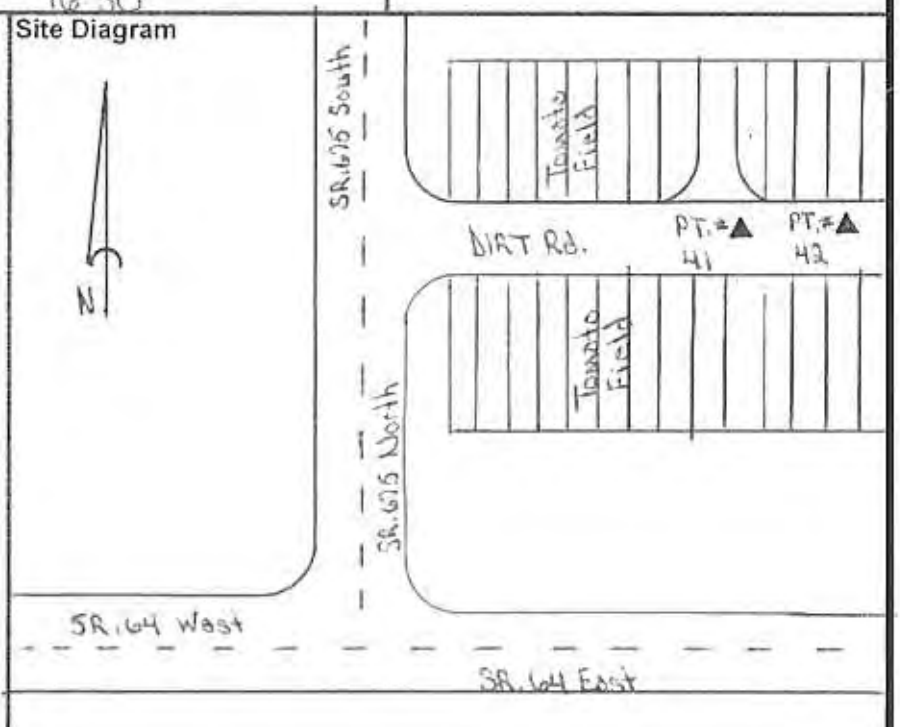
Antenna Reference Point (*include and reference a dimensioned diagram in Survey Report*)
e.g., bottom edge of notch in ground plane, Page 5, Figure 2

Ant. Phase Center

Start Date (UTC LOCAL)	Start Time (UTC LOCAL)	Approx. Lat. (*if available*)
3/15/06	15:45	
End Date (UTC LOCAL)	**End Time (UTC LOCAL)**	**Approx. Lon. (*if available*)**
3/15/06	16:30	

Describe any abnormalities and/or problems encountered during the session, include time of occurrence and duration.

Site Diagram



ALL FIELDS REQUIRED UNLESS OTHERWISE NOTED

GPS SESSION FORM **MORGAN & EKLUND, INC.**

CLIENT NO.	Project Name	Date
3001, Inc.	Rutland Ranch Lidar Groundtruthing	3/15/06
COMMISSION NO.	**Agency/AE Firm**	**Operator Name**
5447.03	MORGAN & EKLUND, INC.	J. VanderSluis
Monument Name/Designation		**Exact Stamping** (*include photo in survey report*)
42		Morgan & Eklund PT. 42
Monument No./PID	**Agency Cast in Disk**	**File Name** (*receiver generated*)
	MME	06170343

Receiver Manufacturer	Receiver Model	Receiver Serial No.
Trimble	5700	0220270617
Data Collector Manufacturer	**Data Collector Model**	**Data Collector Serial No.**
Antenna Part No.	**Antenna Model**	**Antenna Serial No.**
	Zephyr Geo	11885691a

Starting Antenna Height in Feet				Starting Antenna Height Meters				Type of Measurement (*circle one*)
1	2	3	AVG	1	2	3	AVG	ANTENNA BASE SLANT
			6.74					
Ending Antenna Height in Feet				**Ending Antenna Height in Meters**				**Type of Measurement** (*circle one*)
1	2	3	AVG	1	2	3	AVG	ANTENNA BASE SLANT
			6.74					

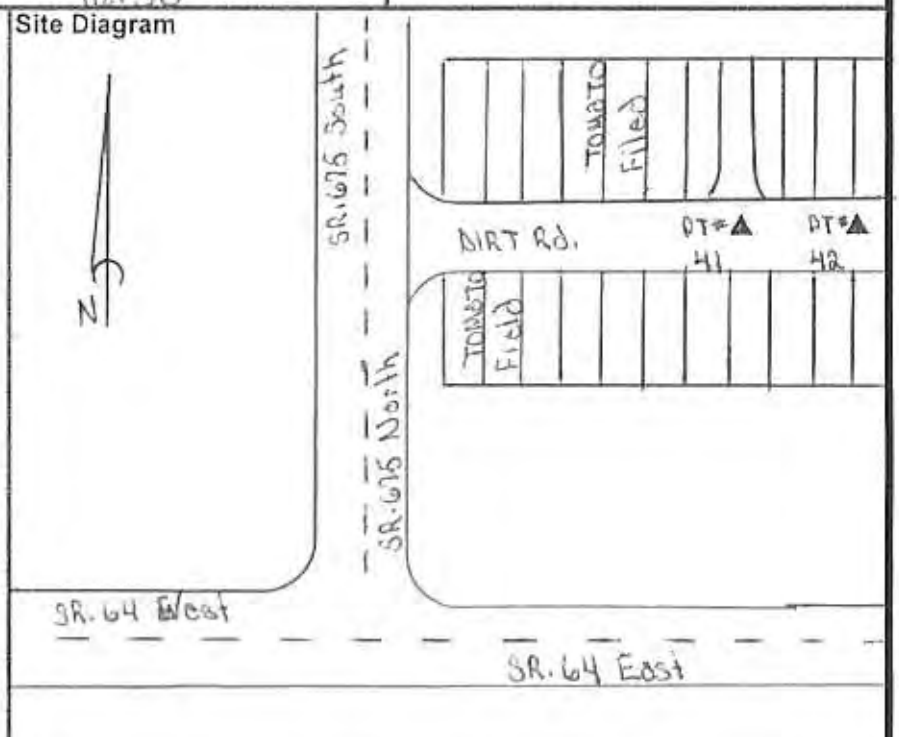
Antenna Reference Point (*include and reference a dimensioned diagram in Survey Report*)
e.g., bottom edge of notch in ground plane, Page 5, Figure 2

Ant. Phase Center

Start Date (UTC LOCAL)	Start Time (UTC LOCAL)	Approx. Lat. (*if available*)
3/15/06	15:45	
End Date (UTC LOCAL)	**End Time (UTC LOCAL)**	**Approx. Lon. (*if available*)**
3/15/06	16:30	

Describe any abnormalities and/or problems encountered during the session, include time of occurrence and duration.

Site Diagram



ALL FIELDS REQUIRED UNLESS OTHERWISE NOTED

GPS SESSION FORM **MORGAN & EKLUND, INC.**

CLIENT NO.	Project Name	Date
3001, Inc.	Rutland Ranch Lidar Groundtruthing	3/15/06
COMMISSION NO.	**Agency/AE Firm**	**Operator Name**
5447.03	MORGAN & EKLUND, INC.	J. VanderSluis
Monument Name/Designation		**Exact Stamping** (*include photo in survey report*)
61		Morgan & Eklund PT. 61
Monument No./PID	**Agency Cast in Disk**	**File Name** (*receiver generated*)
	MET	06170744

Receiver Manufacturer	Receiver Model	Receiver Serial No.
Trimble	5700	0220270617
Data Collector Manufacturer	**Data Collector Model**	**Data Collector Serial No.**
Antenna Part No.	**Antenna Model**	**Antenna Serial No.**
	Zephyr Geo	11895696

Starting Antenna Height in Feet	Starting Antenna Height Meters	Type of Measurement (*circle one*)
1 2 3 AVG	1 2 3 AVG	ANTENNA BASE SLANT
6.74		
Ending Antenna Height in Feet	**Ending Antenna Height in Meters**	**Type of Measurement** (*circle one*)
1 2 3 AVG	1 2 3 AVG	ANTENNA BASE SLANT
6.74		

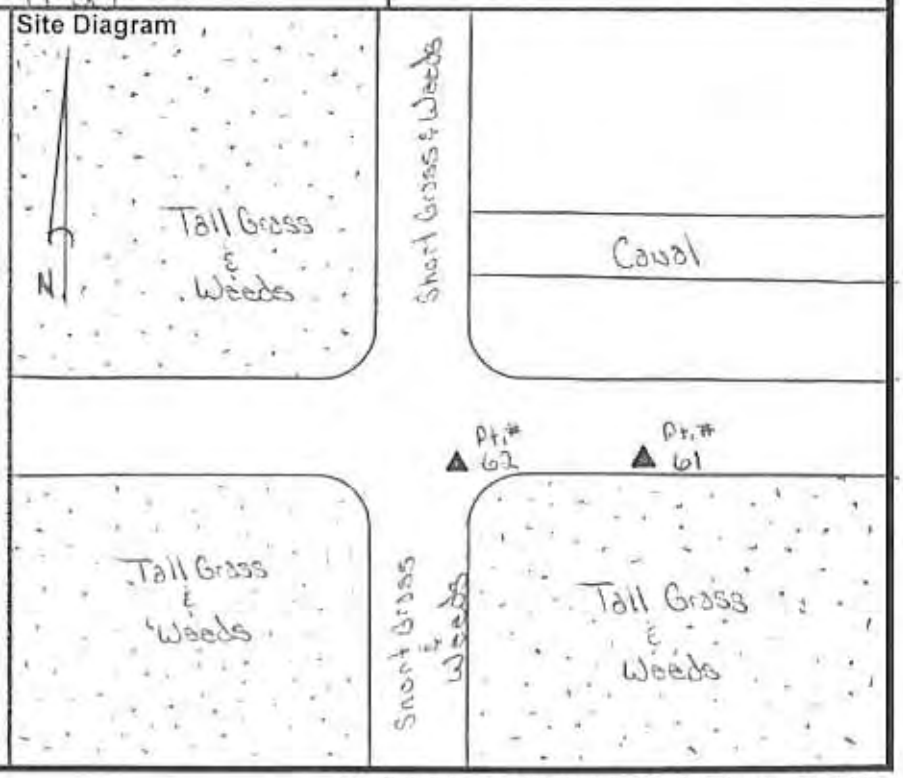
Antenna Reference Point (*include and reference a dimensioned diagram in Survey Report*)
e.g., bottom edge of notch in ground plane, Page 5, Figure 2

Ant. Phase Center

Start Date (UTC LOCAL)	Start Time (UTC LOCAL)	Approx. Lat. (*if available*)
3/15/06	12:00	
End Date (UTC LOCAL)	**End Time (UTC LOCAL)**	**Approx. Lon.** (*if available*)
3/15/06	12:30	

Describe any abnormalities and/or problems encountered during the session, include time of occurrence and duration.

Site Diagram



ALL FIELDS REQUIRED UNLESS OTHERWISE NOTED

GPS SESSION FORM **MORGAN & EKLUND, INC.**

CLIENT NO.	Project Name	Date
3001, Inc.	Rutland Ranch Groundtruthing	3/15/06
COMMISSION NO.	**Agency/AE Firm**	**Operator Name**
5447.03	MORGAN & EKLUND, INC.	J. VanderSluis
Monument Name/Designation	**Exact Stamping** (*include photo in survey report*)	
62	Morgan & Eklund PT, 62	
Monument No./PID	**Agency Cast in Disk**	**File Name** (*receiver generated*)
	NAE	11830744

Receiver Manufacturer	Receiver Model	Receiver Serial No.
Trimble	5700	0220291183
Data Collector Manufacturer	**Data Collector Model**	**Data Collector Serial No.**
Antenna Part No.	**Antenna Model**	**Antenna Serial No.**
	Zephyr	13200400

Starting Antenna Height in Feet				Starting Antenna Height Meters				Type of Measurement (*circle one*)
1	2	3	AVG	1	2	3	AVG	ANTENNA BASE SLANT
			7.041					
Ending Antenna Height in Feet				**Ending Antenna Height in Meters**				**Type of Measurement** (*circle one*)
1	2	3	AVG	1	2	3	AVG	ANTENNA BASE SLANT
			7.041					

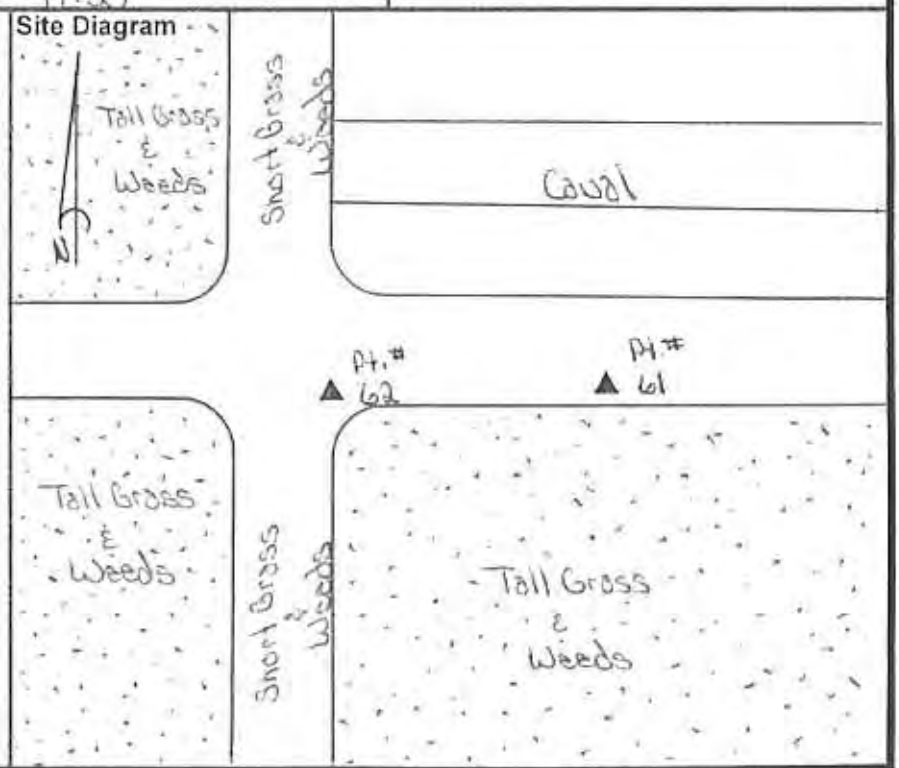
Antenna Reference Point (*include and reference a dimensioned diagram in Survey Report*)
e.g., bottom edge of notch in ground plane, Page 5, Figure 2

Ant Phase Center

Start Date (UTC LOCAL)	Start Time (UTC LOCAL)	Approx. Lat. (*if available*)
3/15/06	17:00	
End Date (UTC LOCAL)	**End Time (UTC LOCAL)**	**Approx. Lon.** (*if available*)
3/15/06	17:30	

Describe any abnormalities and/or problems encountered during the session, include time of occurrence and duration.

Site Diagram



ALL FIELDS REQUIRED UNLESS OTHERWISE NOTED

GPS SESSION FORM **MORGAN & EKLUND, INC.**

CLIENT NO.	Project Name	Date
3001, Inc.	Rutland Ranch Lidar Groundbreaking	3/15/06
COMMISSION NO.	**Agency/AE Firm**	**Operator Name**
5442.03	MORGAN & EKLUND, INC.	J. VanderSluis

Monument Name/Designation	Exact Stamping (*include photo in survey report*)
51	Morgan & Eklund Pt. 51
Monument No./PID	**Agency Cast in Disk** / **File Name** (*receiver generated*)
	M+E / 06170745

Receiver Manufacturer	Receiver Model	Receiver Serial No.
Trimble	5700	0320290617
Data Collector Manufacturer	**Data Collector Model**	**Data Collector Serial No.**
Antenna Part No.	**Antenna Model**	**Antenna Serial No.**
	Zephyr Geo	11885696

Starting Antenna Height in Feet	Starting Antenna Height Meters	Type of Measurement (*circle one*)
1 2 3 AVG: 6.24	1 2 3 AVG	ANTENNA BASE SLANT
Ending Antenna Height in Feet	**Ending Antenna Height in Meters**	**Type of Measurement** (*circle one*)
1 2 3 AVG: 6.24	1 2 3 AVG	ANTENNA BASE SLANT

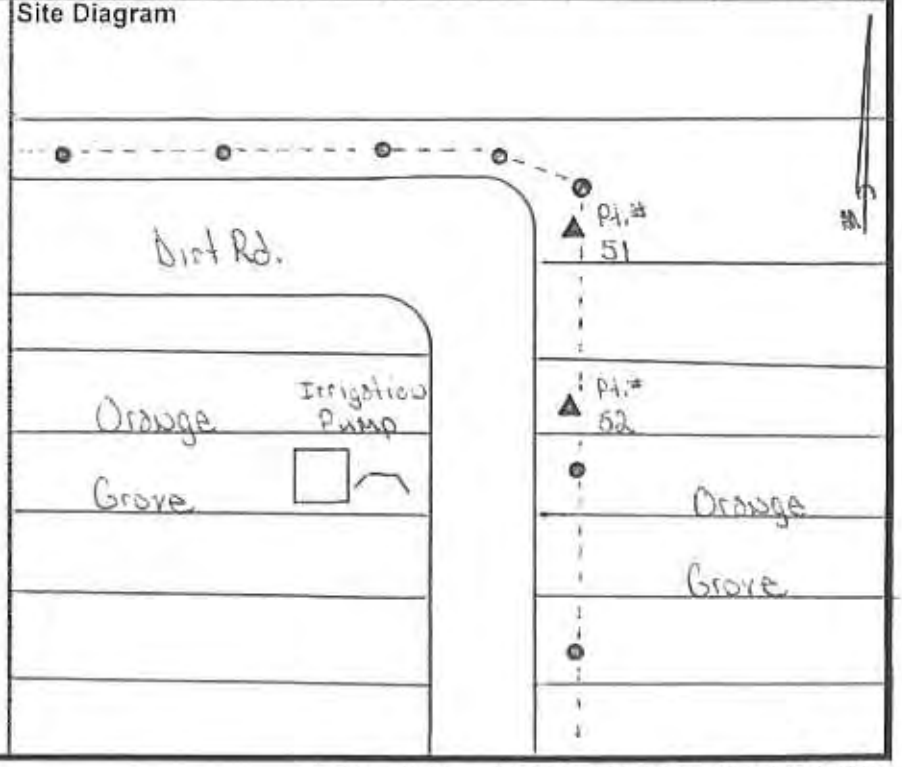
Antenna Reference Point (*include and reference a dimensioned diagram in Survey Report*)
e.g., bottom edge of notch in ground plane, Page 5, Figure 2

Ant. Phase Center

Start Date (UTC LOCAL)	Start Time (UTC LOCAL)	Approx. Lat. (*if available*)
3/15/06	18:00	
End Date (UTC LOCAL)	**End Time (UTC LOCAL)**	**Approx. Lon.** (*if available*)
3/15/06	18:45	

Describe any abnormalities and/or problems encountered during the session, include time of occurrence and duration.

Site Diagram



ALL FIELDS REQUIRED UNLESS OTHERWISE NOTED

GPS SESSION FORM **MORGAN & EKLUND, INC.**

CLIENT NO.	Project Name	Date
3001, Inc.	Rutland Ranch Lidar Groundtruthing	3/15/06
COMMISSION NO.	**Agency/AE Firm**	**Operator Name**
6447.03	MORGAN & EKLUND, INC.	J. VanderSluis
Monument Name/Designation		**Exact Stamping** (*include photo in survey report*)
52		Morgan & Eklund Pt. 52
Monument No./PID	**Agency Cast in Disk**	**File Name** (*receiver generated*)
	M+E	11830745

Receiver Manufacturer	Receiver Model	Receiver Serial No.
Trimble	5700	0220271183
Data Collector Manufacturer	**Data Collector Model**	**Data Collector Serial No.**
Antenna Part No.	**Antenna Model**	**Antenna Serial No.**
	Zephyr	12200400

Starting Antenna Height in Feet				Starting Antenna Height Meters				Type of Measurement (*circle one*)
1	2	3	AVG	1	2	3	AVG	ANTENNA BASE SLANT
			7.041					
Ending Antenna Height in Feet				**Ending Antenna Height in Meters**				**Type of Measurement** (*circle one*)
1	2	3	AVG	1	2	3	AVG	ANTENNA BASE SLANT
			7.041					

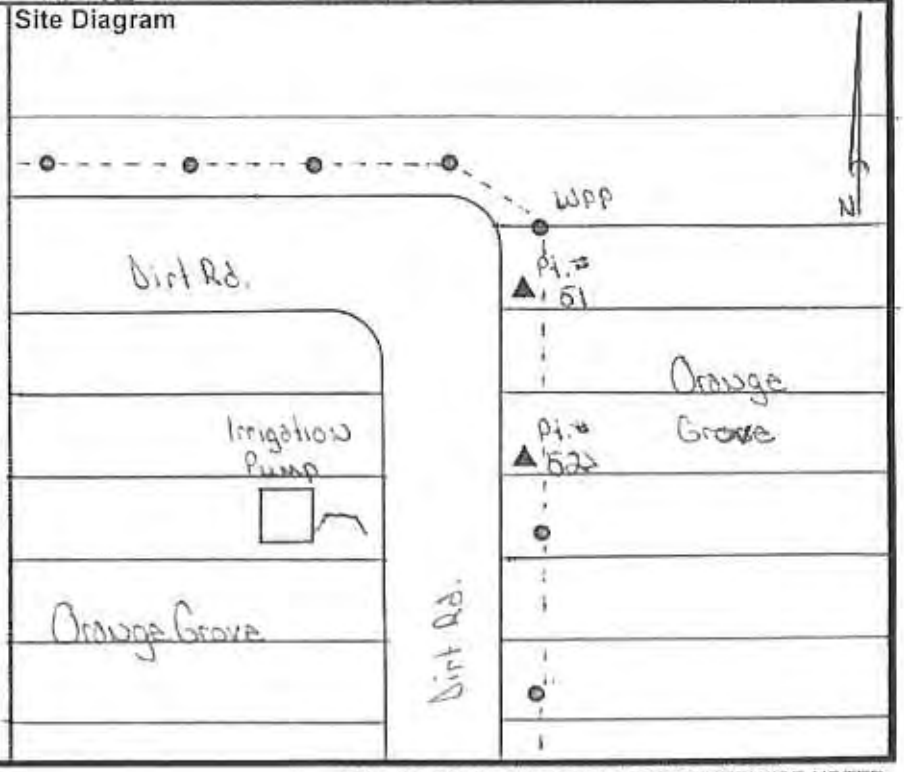
Antenna Reference Point (*include and reference a dimensioned diagram in Survey Report*)
e.g., bottom edge of notch in ground plane, Page 5, Figure 2

Ant. Phase Center

Start Date (UTC LOCAL)	Start Time (UTC LOCAL)	Approx. Lat. (*if available*)
3/15/06	18:00	
End Date (UTC LOCAL)	**End Time (UTC LOCAL)**	**Approx. Lon. (*if available*)**
3/15/06	18:45	

Describe any abnormalities and/or problems encountered during the session, include time of occurrence and duration.

Site Diagram



ALL FIELDS REQUIRED UNLESS OTHERWISE NOTED

GPS SESSION FORM **MORGAN & EKLUND, INC.**

CLIENT NO.	Project Name	Date
3001 INC	RUTLAND RANCH	3/16/06
COMMISSION NO.	**Agency/AE Firm**	**Operator Name**
5447 03	MORGAN & EKLUND, INC.	Calvin Holmes
Monument Name/Designation		**Exact Stamping** (*include photo in survey report*)
US. Coast & Geodetic Survey Mark		J 66 1934
Monument No./PID	**Agency Cast in Disk**	**File Name** (*receiver generated*)
J 66	CM	98450750

Receiver Manufacturer	Receiver Model	Receiver Serial No.
Trimble	4000 SSI	3508A0 9845
Data Collector Manufacturer	**Data Collector Model**	**Data Collector Serial No.**
N/A	N/A	N/A
Antenna Part No.	**Antenna Model**	**Antenna Serial No.**
22020-00	Compact L-1/L2 with GP	02300820 03

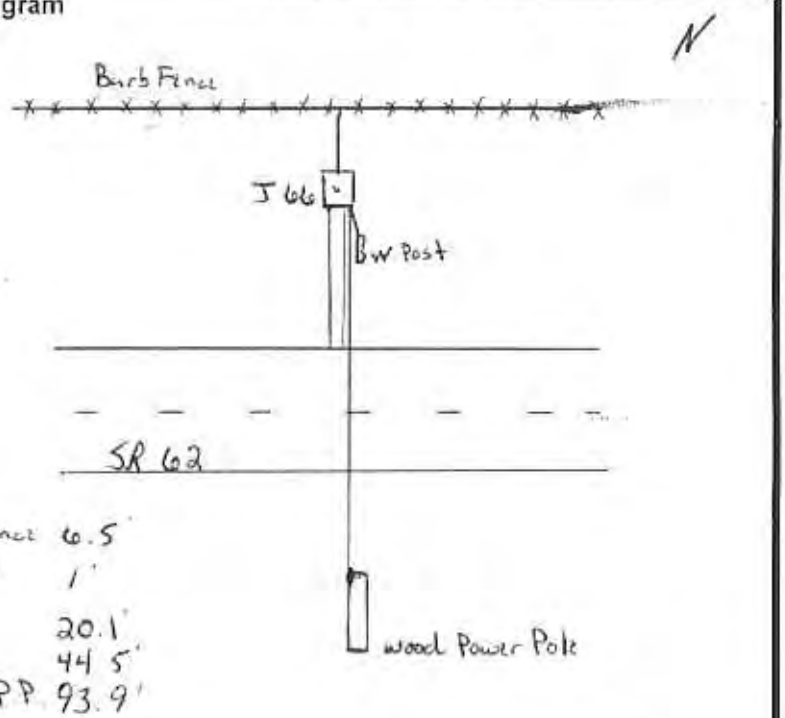
Starting Antenna Height in Feet	Starting Antenna Height Meters	Type of Measurement (*circle one*)
1 2 3 AVG: 6.56	1 2 3 AVG: 2.00 m	(ANTENNA BASE) SLANT
Ending Antenna Height in Feet	**Ending Antenna Height in Meters**	**Type of Measurement** (*circle one*)
1 2 3 AVG: 6.56	1 2 3 AVG: 2.00 m	(ANTENNA BASE) SLANT

Antenna Reference Point (*include and reference a dimensioned diagram in Survey Report*)
e.g., bottom edge of notch in ground plane, Page 5, Figure 2

Start Date (UTC LOCAL)	Start Time (UTC LOCAL)	Approx. Lat. (*if available*)
3/16/06	10 05	27° 35' 24.43" N
End Date (UTC LOCAL)	**End Time (UTC LOCAL)**	**Approx. Lon. (*if available*)**
3/16/06	12 00	082° 07' 07.10" W

Describe any abnormalities and/or problems encountered during the session, include time of occurrence and duration.

Site Diagram



Barb Fence 6.5'
W. Post 1'
EOP 20.1'
CL 44.5'
Wood PP 93.9'

ALL FIELDS REQUIRED UNLESS OTHERWISE NOTED

GPS SESSION FORM

MORGAN & EKLUND, INC.

CLIENT NO.	Project Name	Date
	RUTLAND RANCH LIDAR GROUND TRUTHING - MANATEE COUNTY	3-16-06

COMMISSION NO.	Agency/AE Firm	Operator Name
5447.03	MORGAN & EKLUND, INC.	CHRIS THOMAS

Monument Name/Designation	Exact Stamping (*include photo in survey report*)
US COAST & GEODETIC SURVEY MARK	PARISH 1934

Monument No./PID	Agency Cast in Disk	File Name (*receiver generated*)
	?	94570750

Receiver Manufacturer	Receiver Model	Receiver Serial No.
TRIMBLE	4000 SSE	3504A09457
Data Collector Manufacturer	**Data Collector Model**	**Data Collector Serial No.**
N/A	N/A	N/A
Antenna Part No.	**Antenna Model**	**Antenna Serial No.**
22020-00	COMPACT L1/L2 W/GP	02200122460

Starting Antenna Height in Feet				Starting Antenna Height Meters				Type of Measurement (*circle one*)
1	2	3	AVG	1	2	3	AVG	ANTENNA BASE (SLANT)
5.525	5.525	5.525	5.525				1.684M	

Ending Antenna Height in Feet				Ending Antenna Height in Meters				Type of Measurement (*circle one*)
1	2	3	AVG	1	2	3	AVG	ANTENNA BASE (SLANT)
5.52	5.52	5.52	5.52					

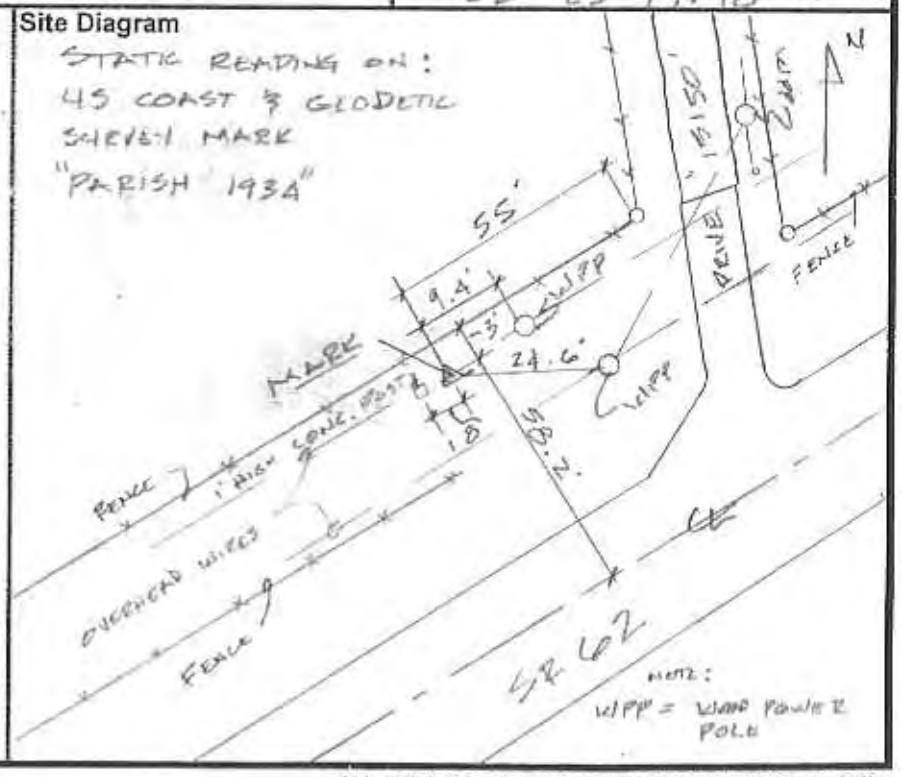
Antenna Reference Point (*include and reference a dimensioned diagram in Survey Report*)
e.g., bottom edge of notch in ground plane, Page 5, Figure 2

BOTTOM EDGE OF NOTCH IN GROUND PLANE

Start Date (UTC LOCAL)	Start Time (UTC LOCAL)	Approx. Lat. (*if available*)
3-16-06	10:00	27° 35' 26.89" N
End Date (UTC LOCAL)	**End Time (UTC LOCAL)**	**Approx. Lon. (*if available*)**
3-16-06	12:00	82° 29' 19.48" W

Describe any abnormalities and/or problems encountered during the session, include time of occurrence and duration.

Site Diagram



ALL FIELDS REQUIRED UNLESS OTHERWISE NOTED

GPS SESSION FORM **MORGAN & EKLUND, INC.**

CLIENT NO.	Project Name	Date
3001, Inc.	Rutland Ranch Lidar Groundtruthing	3/16/06
COMMISSION NO.	**Agency/AE Firm**	**Operator Name**
5447.03	MORGAN & EKLUND, INC.	J. VanderStuis
Monument Name/Designation		**Exact Stamping** (*include photo in survey report*)
//		Morgan & Eklund Pt. 11
Monument No./PID	**Agency Cast in Disk**	**File Name** (*receiver generated*)
	M+E	0617075 1

Receiver Manufacturer	Receiver Model	Receiver Serial No.
Trimble	5700	0220270617
Data Collector Manufacturer	**Data Collector Model**	**Data Collector Serial No.**
Antenna Part No.	**Antenna Model**	**Antenna Serial No.**
	Zephyr Geo	11885696

Starting Antenna Height in Feet	Starting Antenna Height Meters	Type of Measurement (*circle one*)
1 2 3 AVG	1 2 3 AVG	ANTENNA BASE SLANT
6.7	2.00	
Ending Antenna Height in Feet	**Ending Antenna Height in Meters**	**Type of Measurement** (*circle one*)
1 2 3 AVG	1 2 3 AVG	ANTENNA BASE SLANT
6.7		

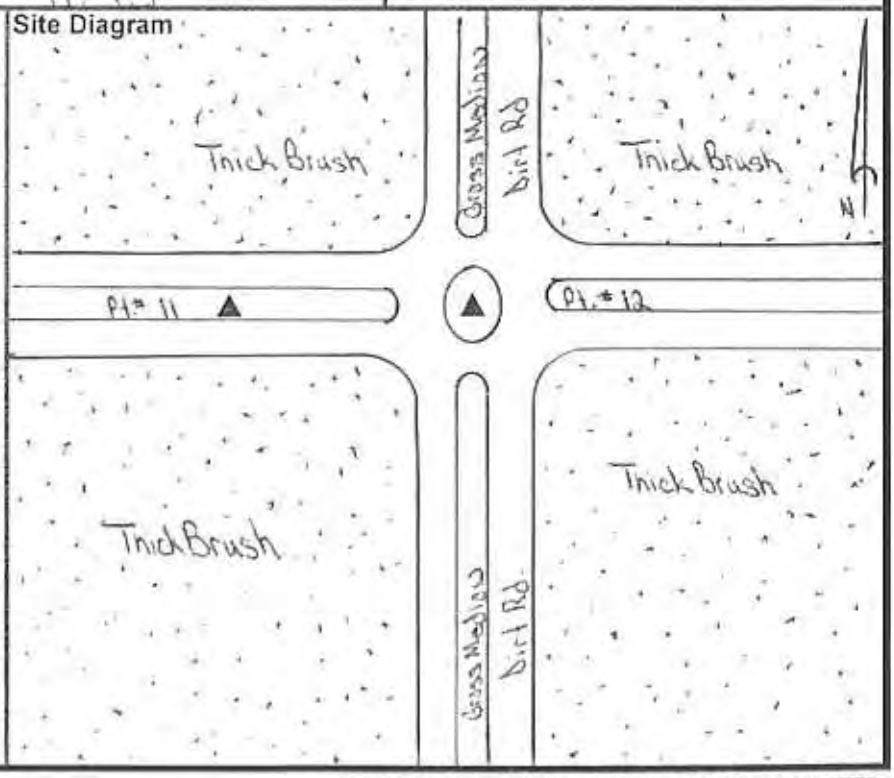
Antenna Reference Point (*include and reference a dimensioned diagram in Survey Report*)
e.g., bottom edge of notch in ground plane, Page 5, Figure 2

Ant. Phase Center

Start Date (UTC LOCAL)	Start Time (UTC LOCAL)	Approx. Lat. (*if available*)
3/16/06	11.15	
End Date (UTC LOCAL)	**End Time (UTC LOCAL)**	**Approx. Lon.** (*if available*)
3/16/06	11.45	

Describe any abnormalities and/or problems encountered during the session, include time of occurrence and duration.

Site Diagram



ALL FIELDS REQUIRED UNLESS OTHERWISE NOTED

GPS SESSION FORM **MORGAN & EKLUND, INC.**

CLIENT NO.	Project Name	Date
3001, Inc.	Rutland Ranch Lidar Groundtruthing	3/16/06
COMMISSION NO.	**Agency/AE Firm**	**Operator Name**
5447.03	MORGAN & EKLUND, INC.	J. VanderSluis

Monument Name/Designation	Exact Stamping (*include photo in survey report*)
12	Morgan & Eklund Pt. 12

Monument No./PID	Agency Cast in Disk	File Name (*receiver generated*)
	M+E	11830751

Receiver Manufacturer	Receiver Model	Receiver Serial No.
Trimble	5700	0220271183
Data Collector Manufacturer	**Data Collector Model**	**Data Collector Serial No.**
Antenna Part No.	**Antenna Model**	**Antenna Serial No.**
	Zephyr	12200400

Starting Antenna Height in Feet				Starting Antenna Height Meters				Type of Measurement (*circle one*)	
1	2	3	AVG	1	2	3	AVG	ANTENNA BASE	SLANT
			7.044				2.10		

Ending Antenna Height in Feet				Ending Antenna Height in Meters				Type of Measurement (*circle one*)	
1	2	3	AVG	1	2	3	AVG	ANTENNA BASE	SLANT
			7.044						

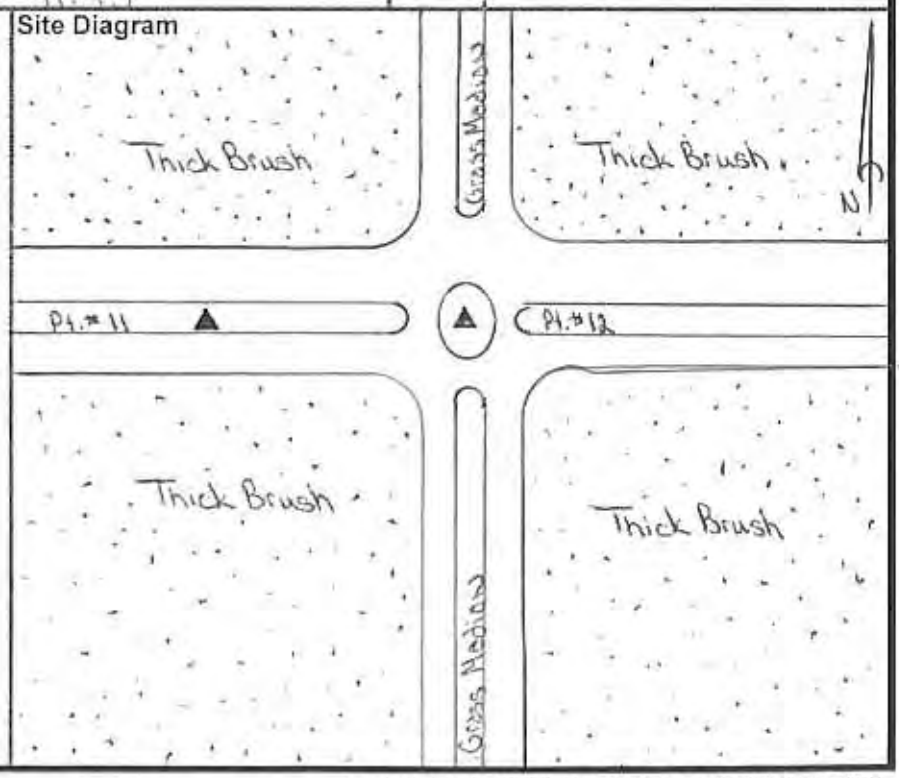
Antenna Reference Point (*include and reference a dimensioned diagram in Survey Report*)
e.g., bottom edge of notch in ground plane, Page 5, Figure 2

Ant Phase Center

Start Date (UTC LOCAL)	Start Time (UTC LOCAL)	Approx. Lat. (*if available*)
3/16/06	11.15	
End Date (UTC LOCAL)	**End Time (UTC LOCAL)**	**Approx. Lon. (*if available*)**
3/16/06	11.45	

Describe any abnormalities and/or problems encountered during the session, include time of occurrence and duration.

Site Diagram



ALL FIELDS REQUIRED UNLESS OTHERWISE NOTED

GPS SESSION FORM

MORGAN & EKLUND, INC.

CLIENT NO.	Project Name	Date
3001, Inc.	Rutland Ranch Lidar Groundtruthing	3/16/06
COMMISSION NO.	**Agency/AE Firm**	**Operator Name**
5442.03	MORGAN & EKLUND, INC.	J. VanderSluis

Monument Name/Designation: 71

Exact Stamping (*include photo in survey report*): Morgan & Eklund Pt. 71

Monument No./PID	Agency Cast in Disk	File Name (*receiver generated*)
	ME	06170750

Receiver Manufacturer	Receiver Model	Receiver Serial No.
Trimble	5700	0320270617
Data Collector Manufacturer	**Data Collector Model**	**Data Collector Serial No.**
Antenna Part No.	**Antenna Model**	**Antenna Serial No.**
	Zephyr Geo	11885696

Starting Antenna Height in Feet (1 / 2 / 3 / AVG)	Starting Antenna Height Meters (1 / 2 / 3 / AVG)	Type of Measurement (*circle one*)
6.9	2.00	(ANTENNA BASE) SLANT
Ending Antenna Height in Feet (1 / 2 / 3 / AVG)	**Ending Antenna Height in Meters** (1 / 2 / 3 / AVG)	**Type of Measurement** (*circle one*)
6.9		ANTENNA BASE SLANT

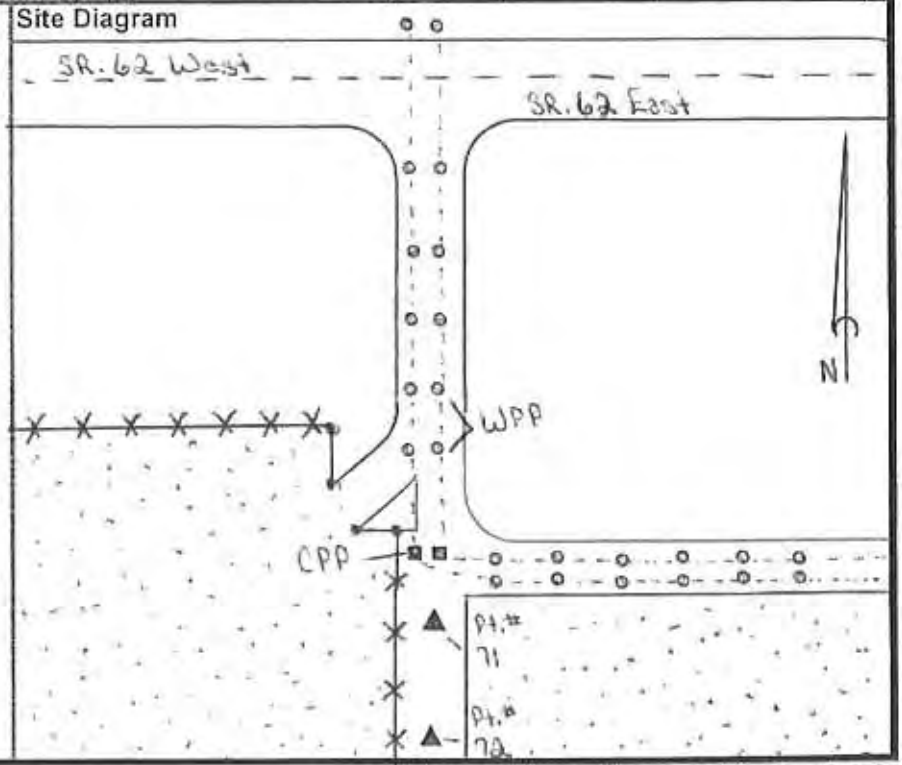
Antenna Reference Point (*include and reference a dimensioned diagram in Survey Report*)
e.g., bottom edge of notch in ground plane, Page 5, Figure 2

Ant. Phase Center

Start Date (UTC LOCAL)	Start Time (UTC LOCAL)	Approx. Lat. (*if available*)
3/16/06	10:15	
End Date (UTC LOCAL)	**End Time (UTC LOCAL)**	**Approx. Lon. (*if available*)**
3/16/06	10:45	

Describe any abnormalities and/or problems encountered during the session, include time of occurrence and duration.

Site Diagram



ALL FIELDS REQUIRED UNLESS OTHERWISE NOTED

GPS SESSION FORM **MORGAN & EKLUND, INC.**

CLIENT NO.	Project Name	Date
3001, Inc.	Rutland Ranch Lidar Groundtruthing	3/16/06
COMMISSION NO.	**Agency/AE Firm**	**Operator Name**
5447.03	MORGAN & EKLUND, INC.	J. VanderSluis

Monument Name/Designation	Exact Stamping (*include photo in survey report*)
72	Morgan & Eklund Pt. 72
Monument No./PID	**Agency Cast in Disk** / **File Name** (*receiver generated*)
	N/A / 11830750

Receiver Manufacturer	Receiver Model	Receiver Serial No.
Trimble	5700	0220271183
Data Collector Manufacturer	**Data Collector Model**	**Data Collector Serial No.**
Antenna Part No.	**Antenna Model**	**Antenna Serial No.**
	Zephyr	12004480

Starting Antenna Height in Feet	Starting Antenna Height Meters	Type of Measurement (*circle one*)
1 2 3 AVG: ~~7.041~~	1 2 3 AVG: 2.10	(ANTENNA BASE) SLANT
Ending Antenna Height in Feet	**Ending Antenna Height in Meters**	**Type of Measurement** (*circle one*)
1 2 3 AVG: ~~7.041~~	1 2 3 AVG: 2.10	(ANTENNA BASE) SLANT

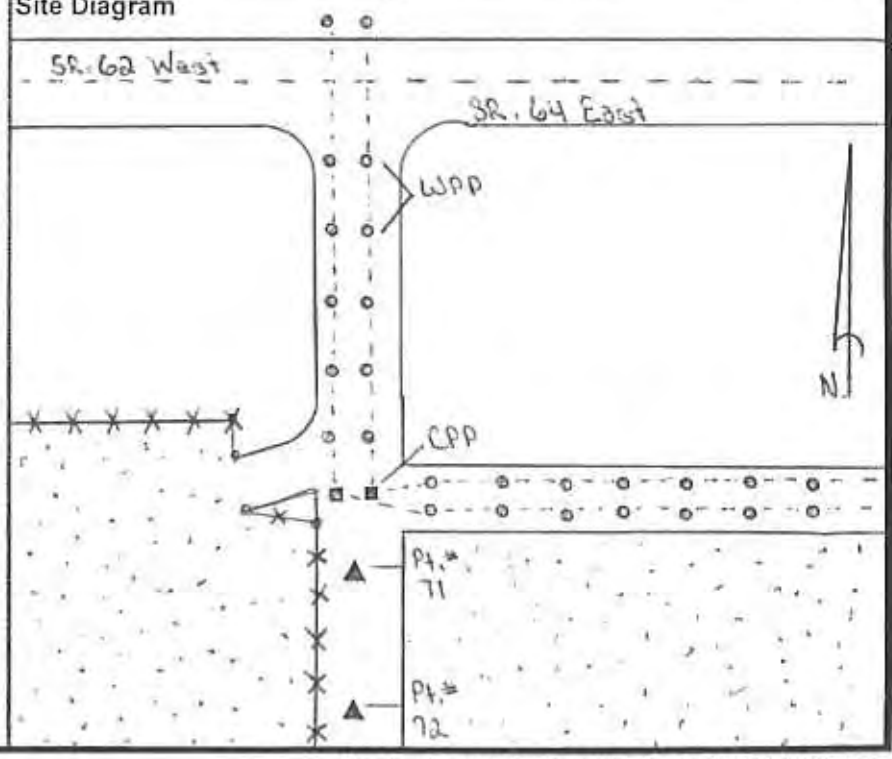
Antenna Reference Point (*include and reference a dimensioned diagram in Survey Report*)
e.g., bottom edge of notch in ground plane, Page 5, Figure 2

~~Ant Phase Center~~

Start Date (UTC LOCAL)	Start Time (UTC LOCAL)	Approx. Lat. (*if available*)
3/16/06	10:15	
End Date (UTC LOCAL)	**End Time (UTC LOCAL)**	**Approx. Lon.** (*if available*)
3/16/06	10:45	

Describe any abnormalities and/or problems encountered during the session, include time of occurrence and duration.

Site Diagram



ALL FIELDS REQUIRED UNLESS OTHERWISE NOTED

C. Field Notes

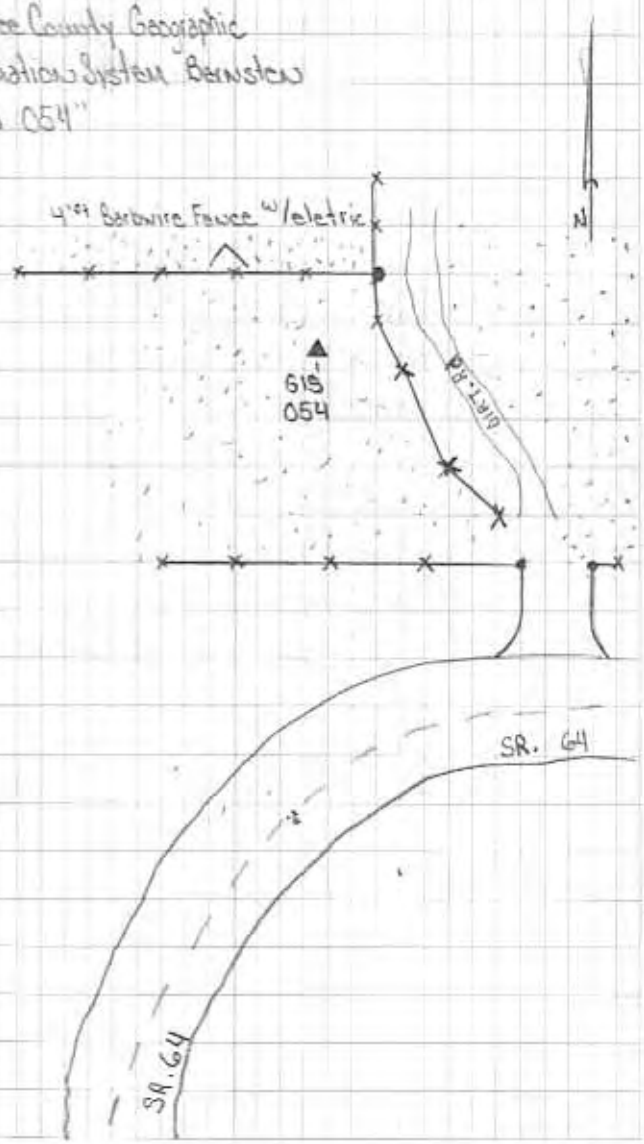
3/14/06 5447.03
J. VanderSluis 3001, Inc.
C. Thomas Rutland Ranch Lidar Groundtruthing
C. Holmes Manatee County

PT no. 3
PID AG9159
Trimble 5700
Recv. Ser#: 0320271183
Ant. Ser#: 1220040
Ant. Hgt: 2.041 (Ant. Phase Center

Start Time: 12:15
End. Time: 13:00

Ref.
46' S. of 4# Barbwire Fence
48' S./SW. of Wood Fence Post
54' S./SW. of Wood Fence Post w/ electric
3' S. of Composite Witness Post
45' W. of 2 track Dirt Rd.

Manatee County Geographic Information System Benchmark "GIS 054"



3/14/06 5447.03

3002, Inc.

Rutland Ranch Lidar Groundtruthing

Manatee County

Trimble 5700

PT# 31 Base Snº 0220270617

"Ant. Snº 11885696 Zephyr Geo

"Ant. Hgt: 6.137

PT# 32 Recr. Snº 0220271183

"Ant. Snº 12000400 Zephyr

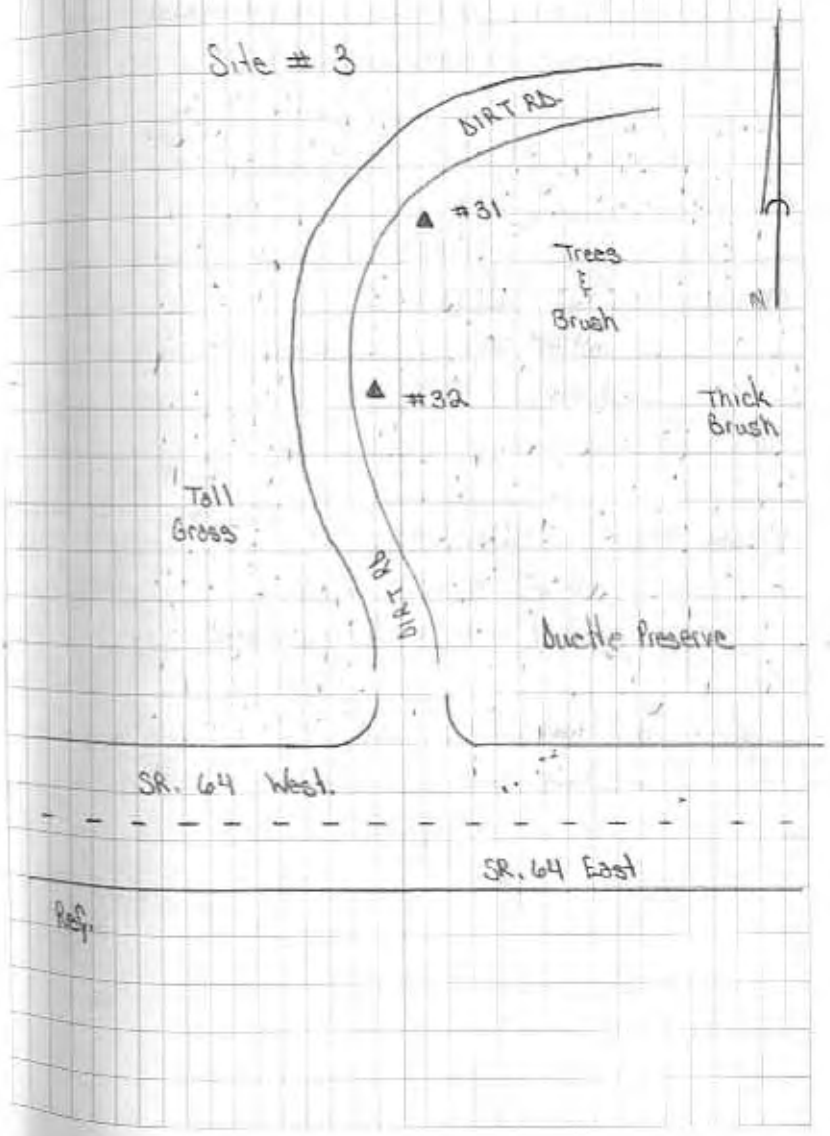
"Ant. Hgt: 7.041 (Ant. Phase Center

Start Time: 13:30

End Time: 14:15

Ref.

1/13



3/14/06

5449.03

3001, Inc.

Rutland Ranch Lidar Groundtruthing

Manatee County

Trimble 5700

pt# 21 Base Sn:# 0220270610

Ant.Sn:# 11885696 Zephyr Geo

Ant.Hgt:

pt# 22 Recv.Sn:# 0220271183

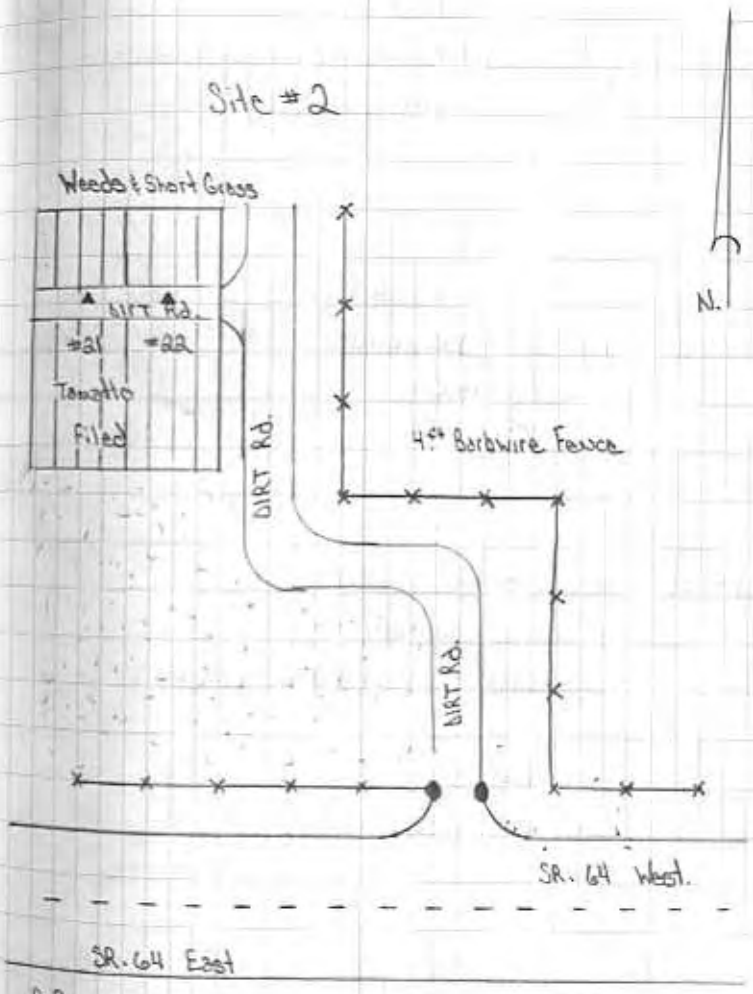
Ant Sn:# 12200400 Zephyr

Ant.Hgt: 7.041 (Ant. Phase Center)

Start Time: 14:45

End Time: 15:15

Site # 2



3/14/06 5449.03

3001, Inc.

Rutland Ranch Lidar Groundtruthing

Manatee County

Trimble 5700

pt.# 42 Base Sn#: 0220270617

Ant. Sn#: 11885696

Ant. Hgt: 6.767

pt.# 41 Recv. Sn#: 0220271183

Ant. Sn# 12200400

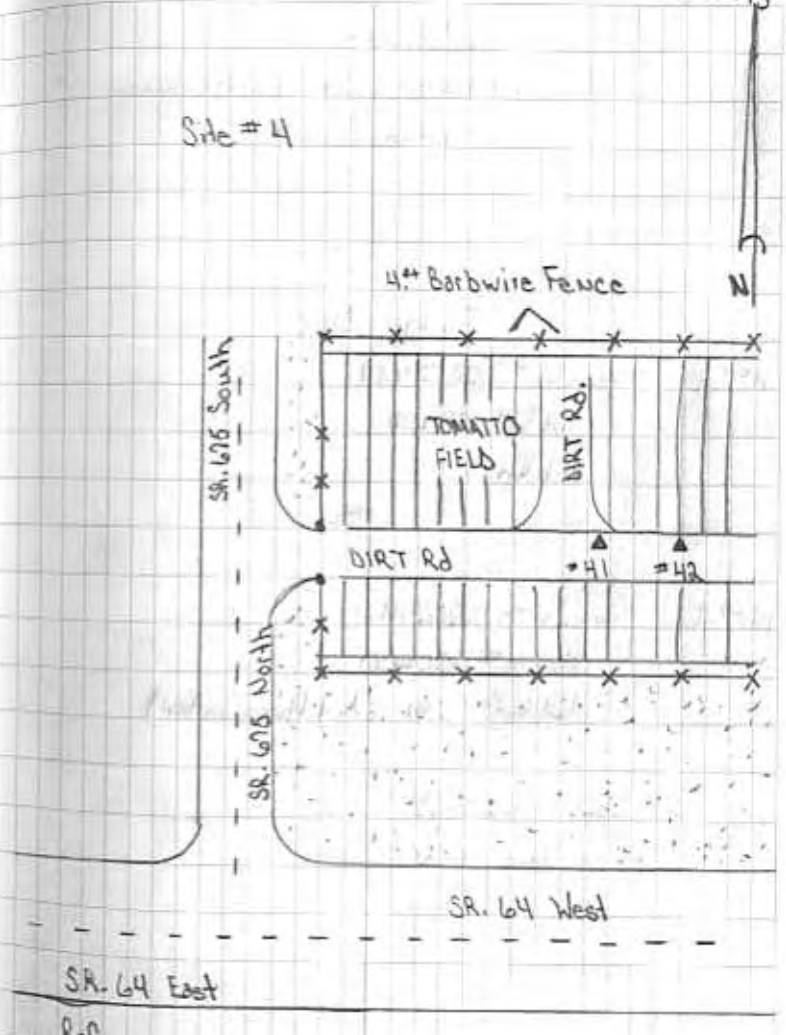
Ant. Hgt: 7.041 (Ant. Phase Center)

Start Time: 15:45

End Time: 16:30

1/15

Site # 4



3/15/06 5447.03

3001, Inc.

Rutland Ranch Lidar Groundtruthing

Manatee County

Trimble 5700

pt#61 Base Sn.* 0220270617

" Ant. Sn* 1188596 Zephyr Geo

" Ant. Hgt: 6.7'

pt#62 Recv. Sn#: 0220271183

" Ant. Sn* 13200400 Zephyr

" Ant. Hgt: 7.041 (Ant. Phase Center)

Start Time: 17:00

End Time: 17:30

1/16

Site #6

N

Two Track Dirt Rd.

Trees & Brush

Canal

Canal

Two Track Dirt Rd.

▲ (Mowed Grass)

▲

#62

#61

Tall Grass

Ref.

3/15/06 5447.03

3001, Inc.

Rutland Ranch Lidar Groundtruthing

Maricopa County

Trimble 5700

pt.# 51 Base Sw.# 0220270613

" Ant. Sw.# 11885696 Zephyr Geo

" Ant. Hgt: 6.7

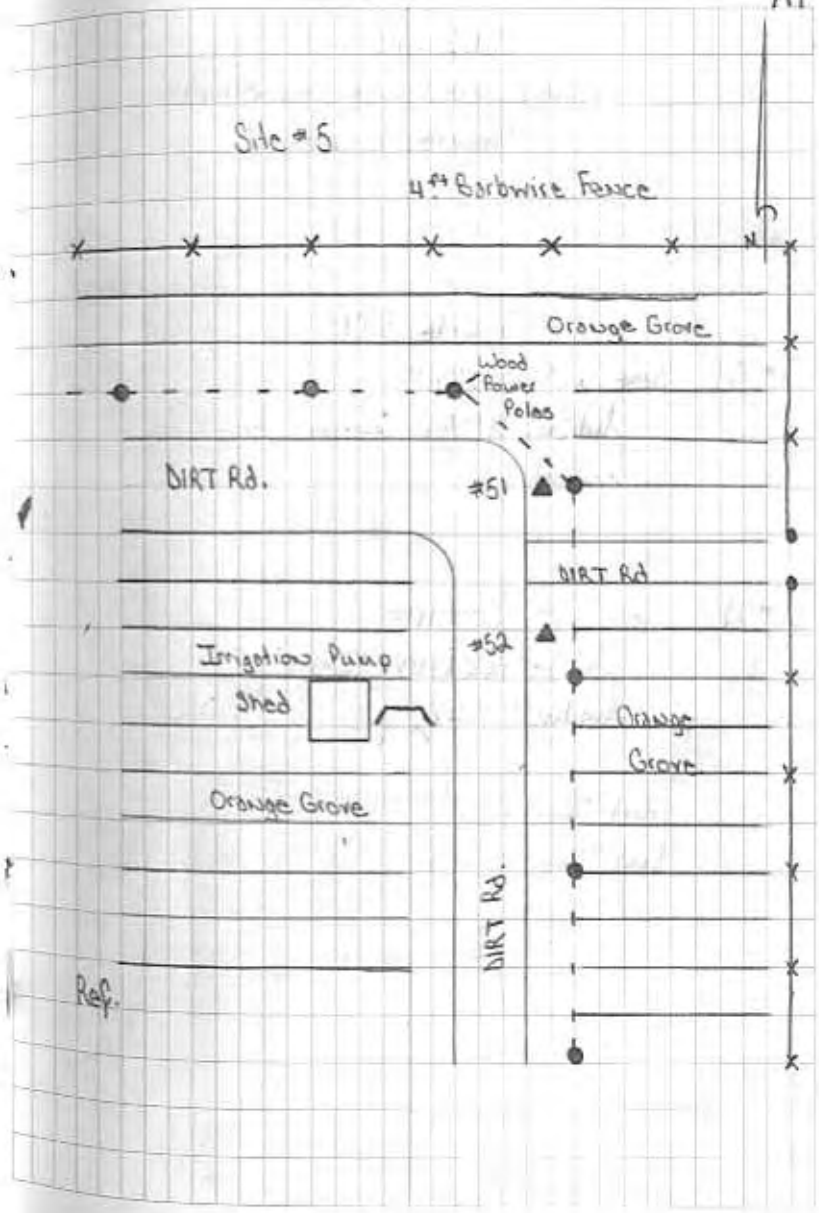
pt.# 52 Recv. Sw.# 0220271183

" Ant. Sw.# 12200400 Zephyr

" Ant. Hgt: 7.041 (Ant. Phase Center)

Start Time: 18:00

End Time: 18.45



3/16/06 5447.03

3001, Inc.

Rutland Ranch Lidar Groundtruthing

Manatee County

Trimble 5700

pt# 71 Base Ser#: 0220270617

Ant. Ser#: 11885696 Zephyr. Geo

Ant. Hgt: 6.7

pt# 72 Recv. Ser#: 0220271183

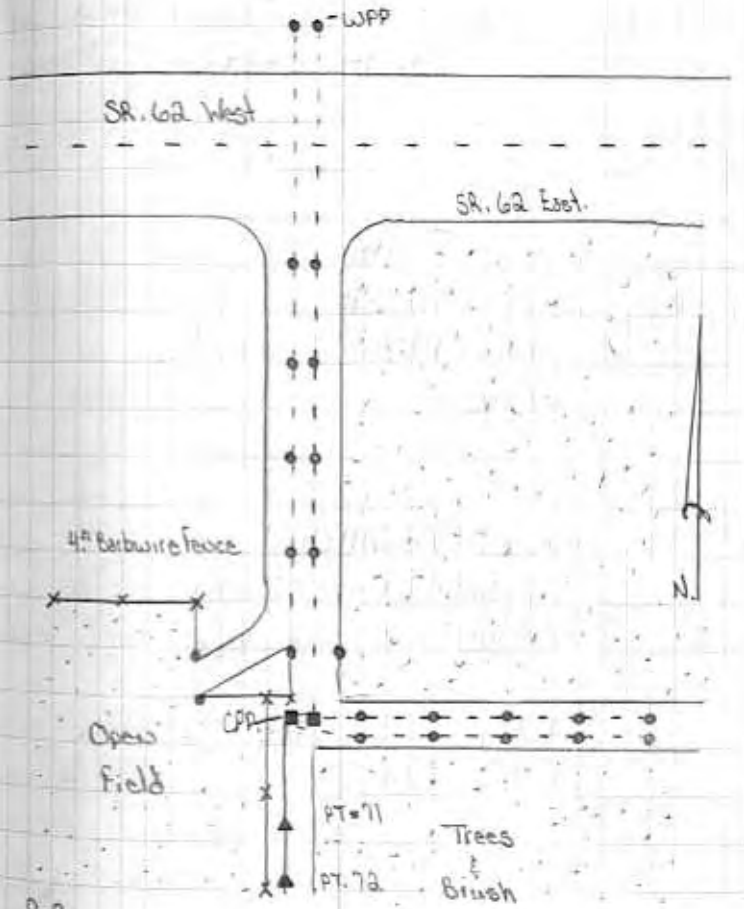
Ant. Ser#: 12200400 Zephyr.

Ant. Hgt: 7.041

Start Time: 10:15

End Time: 10:45

Site #7



3/16/03 5447.03

3001, Inc.

Rutland Ranch Lidar Groundtruthing

Manatee County

Trimble 5700

pt#10 Base Ser#: 0220270617

Ant.Ser#: 11885696 Zephyr Geo

Ant.Hgt: 6.7

pt#11 Recv. Ser#: 0220271183

Ant.Ser#: 12200400 Zephyr.

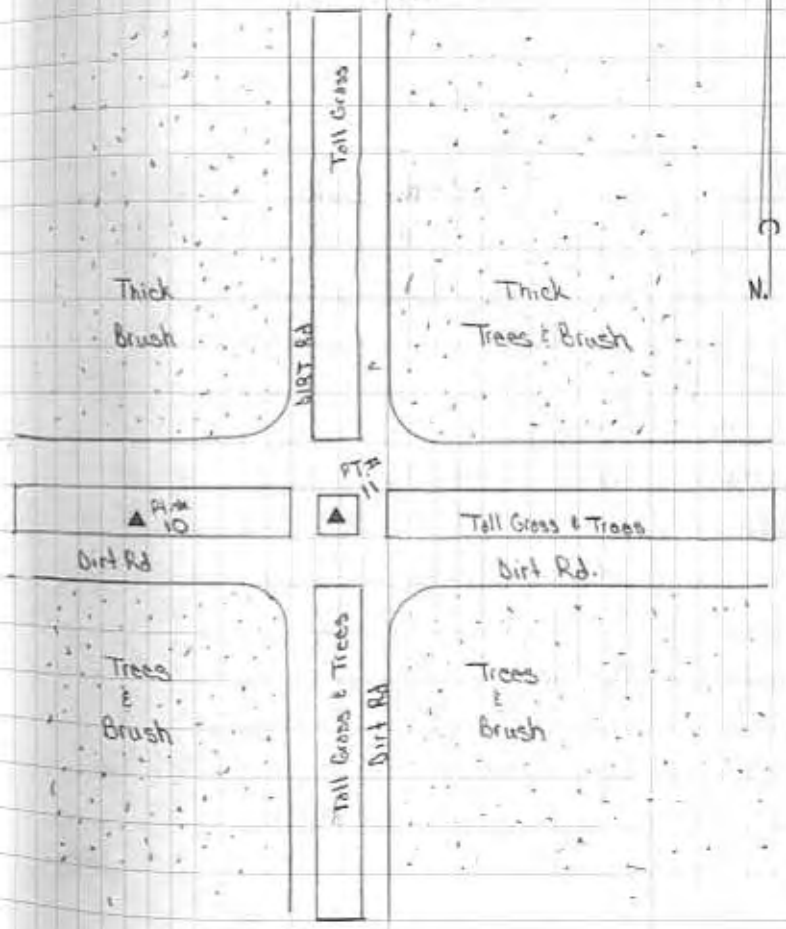
Ant.Hgt: 2.041

Start Time: 11:15

End Time: 11:45

1/19

Site #1



3/16/06 5447.03

J. VanderSluis
C. Thomas
C. Holmes

3001, Inc.
Rutland Ranch Lidar Groundtruthing
Manatee County

Topo Site #1

⊼ @ pt# 11 BS @ pt# 12 w/00-00-00
HI = 5.49 HR = 5.35
BSD =

PT.#	HR =	Desc.	
1000	5.35	BSCK	IR w/alum. cap "Morgan & Eklund" Pt.# 12
1001-1049	6.00	7211	3"+ Palmetto & Oak Trees
1050	5.35	BSCK	IR w/alum. cap "Morgan & Eklund" Pt.# 12

3/16/06

5447.03

3001, Inc.

Rutland Ranch Lidar Groundtruthing

Manatee County

Topo Site # 7

TC pt.#71 BSC pt: 72 w/00-00-00

HI = 5.29 HR = 5.17

BSD = 238.47

PT.#	HR.=	Desc.
1051	5.17	BSCK
1052-1099	6.00	1111
1100	↓	CIB 025
1101	5.17	BSCK

Ref.

IR w/alum. cap "Morgan & Eklund PT.# 72

Dirt Rd.

Manatee County Geographic Information

IR w/alum. cap "Morgan & Eklund PT # 72

3/16/06

3001, Inc.
Rutland Ranch Lidar Ground Truthing
Manatee County

Topo Site #2

TE @ pt.# 21 BS @ pt.# 22 W/00-00-00
HI = 5.42 HR = 5.52
BSb = 239.50

PT #	HR =	Desc.
1102	5.52	BSCK
1103-1154	6.00	GRD
1155	5.52	BSCK

Ref.
IR W/alum. cap "Morgan & Eklund Pt.# 22
Mowed Grass between Tomatto Filed
IR W/alum. cap "Morgan & Eklund Pt.# 22

3/17/06 6447.03
J. VanderSluis 3001, Inc.
C. Thomas Rutland Ranch Lidar Ground Truthing
C. Holmes Navajo County

Topo Site #6

TP pt.# 61 BSE pt.# 62 W 100-00-00
HI = 5.25 HR = 5.10
BSE = 200.00

PT #	HR =	Desc.
1156	5.10	BSCK
1157-1207	6.00	SLLL
1208-1247	7.00	BLLL
1248	5.10	BSCK

Ref.
IR w/alum. cap "Morgan & Eklund. Pg. 62
Tall Grass & Weeds
Weeds & Short Grass
IR w/alum. cap "Morgan & Eklund Pg. 62

3/17/06 5447.03

3001, Inc.

Rutland Ranch Lidar Ground Truthing

Manatee County

Topo Site # 5

Te @ pt # 51 BSe pt # 52 w/00-00 ∞

HI = 5.45 HR = 5.05

BSb = 250.52

PT #	HR. =	Desc.
1249	5.05	BSCK
1250-1275	7.00	1121
1276-1301	↓	7211
1302	5.05	BSCK

Ref.

IR w/alum. cap "Morgan & Eklund Pt. 52"

Dirt Road

Orange Trees & Brush

IR w/alum. cap "Morgan & Eklund Pt. 52"

3/17/06

5447.03

3001, Inc.

Rutland Ranch Lidar Groundstructuring

Manatee County

Topo Site # 4

TC pt.# 41 | BSC pt.# 42 w/00-00-00

HI = 5.21 | HR = 5.48

BSD = 268.38

PT.#	HR=	Desc.
1303	5.48	BSCK
1304 - 1344	6.00	8111
1345 - 1359	↓	1111
1360	5.48	BSCK

Ref:

IR w/alum. cap "Morgan & Eklund Pt. 42"

Weeds & Short Grass

Dirt Rd.

IR w/alum. cap "Morgan & Eklund Pt. 42"

3/17/06 5449.03

3001, Inc.

Rutland Ranch Lidar Groundtruthing

Manatee County

Topo Site # 3

↑ @ pt.# 31 ESE pt.# 32 w/00-00-00

HI = 5.80 HR = 5.00

BSD = 314.90

PT.#	HR=	Desc.
1361	5.00	BSCK
1362-1382	6.00	9211
1383-1403	↓	5211
1404-1414	↓	1111
1415	5.00	BSCK

Ref.

IR w/alum. cap "Morgan & Eklund Pt. 32"

5th Palmettos & Oak Trees

3rd Tall Grass & Brush

Dirt Rd.

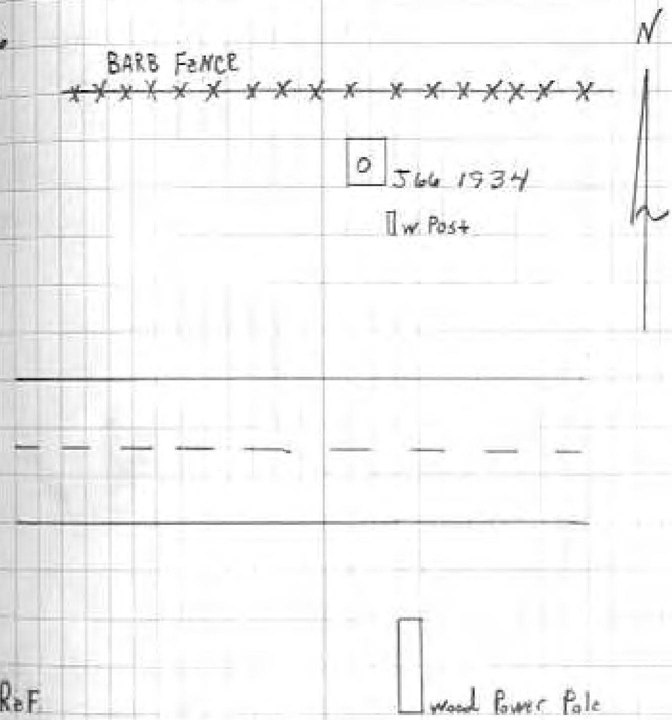
IR w/alum. cap "Morgan & Eklund Pt. 32."

MAN 1/26

3/16/06	Kirtland Ranch Ground Truthing
544703	Control Recon
JV	
CT	Pt No. 2
CH	PID AG6331

Found as Described

J66
1934



REF.

6.5' S. of Barbwire Fence
1' NW of Witness Post
20.1' N of EOP
44.5' N of Center Line
93.9' NW of Wood Power Pole

3001, INC.

RUTLAND RANCH LIDAR GROUNDTRUTHING

MANATEE COUNTY

PT NO 1

N10 466295

TRIMBLE 4000SSE

RECV. SN# 3504A09457

11 ANT. SN# 022D012260

RECV. ANT HGT = 5.52', 1.684 m

START TIME: 10:00

END TIME: 12:00

REF.

55' W/SW OF WOOD FENCE POST

9.4' W/SW OF WOOD POWER POLE

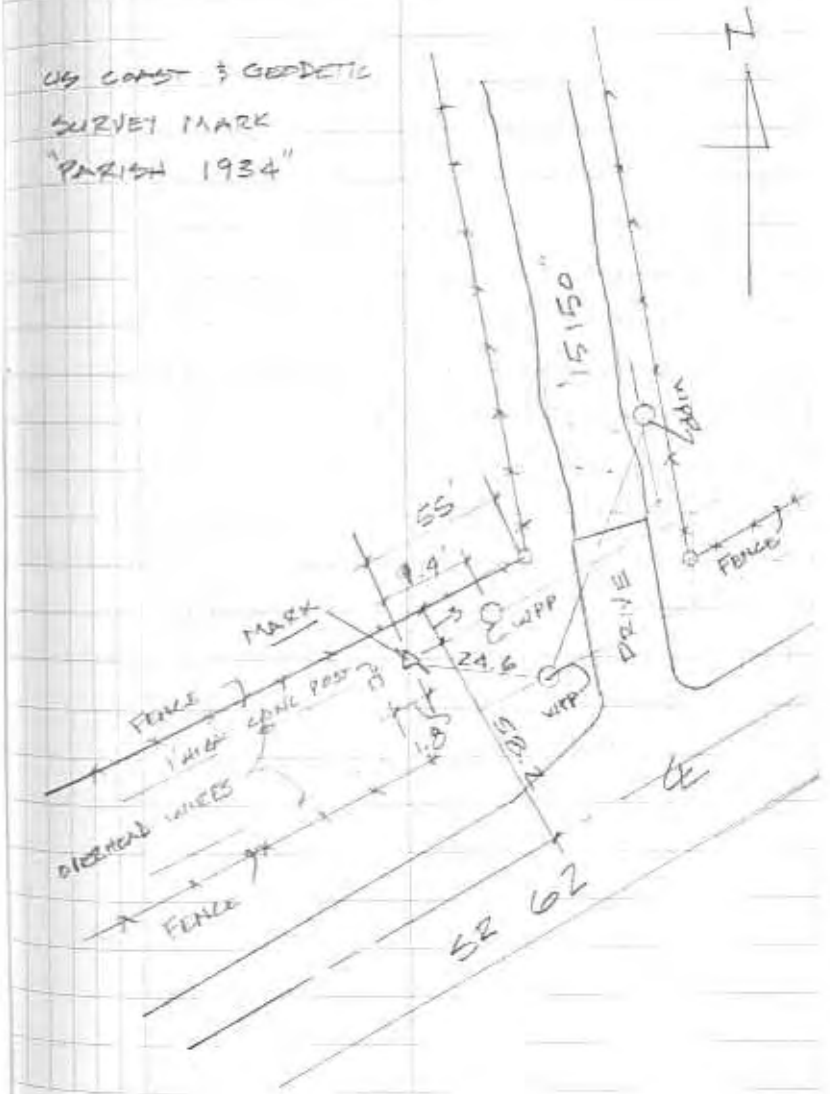
24.6' W OF ANOTHER WOOD POWER POLE

58.2' N/NW OF CL OF 'SE 62'

3' S. OF BARBWIRE FENCE

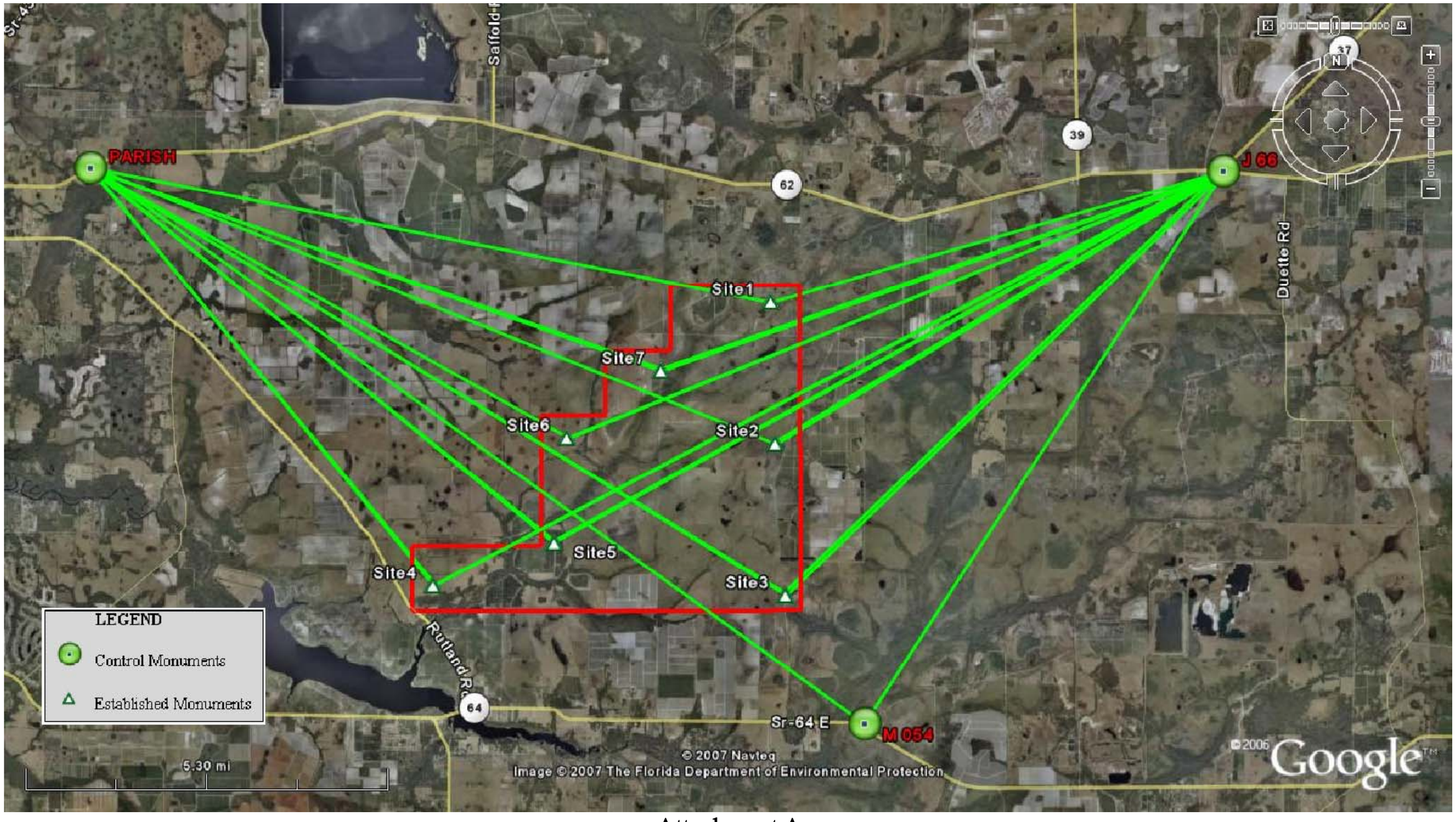
1.8' E. OF A CONC POST

USC&GS GEODETIC SURVEY MARK "PARISH 1934"



ATTACHMENT A

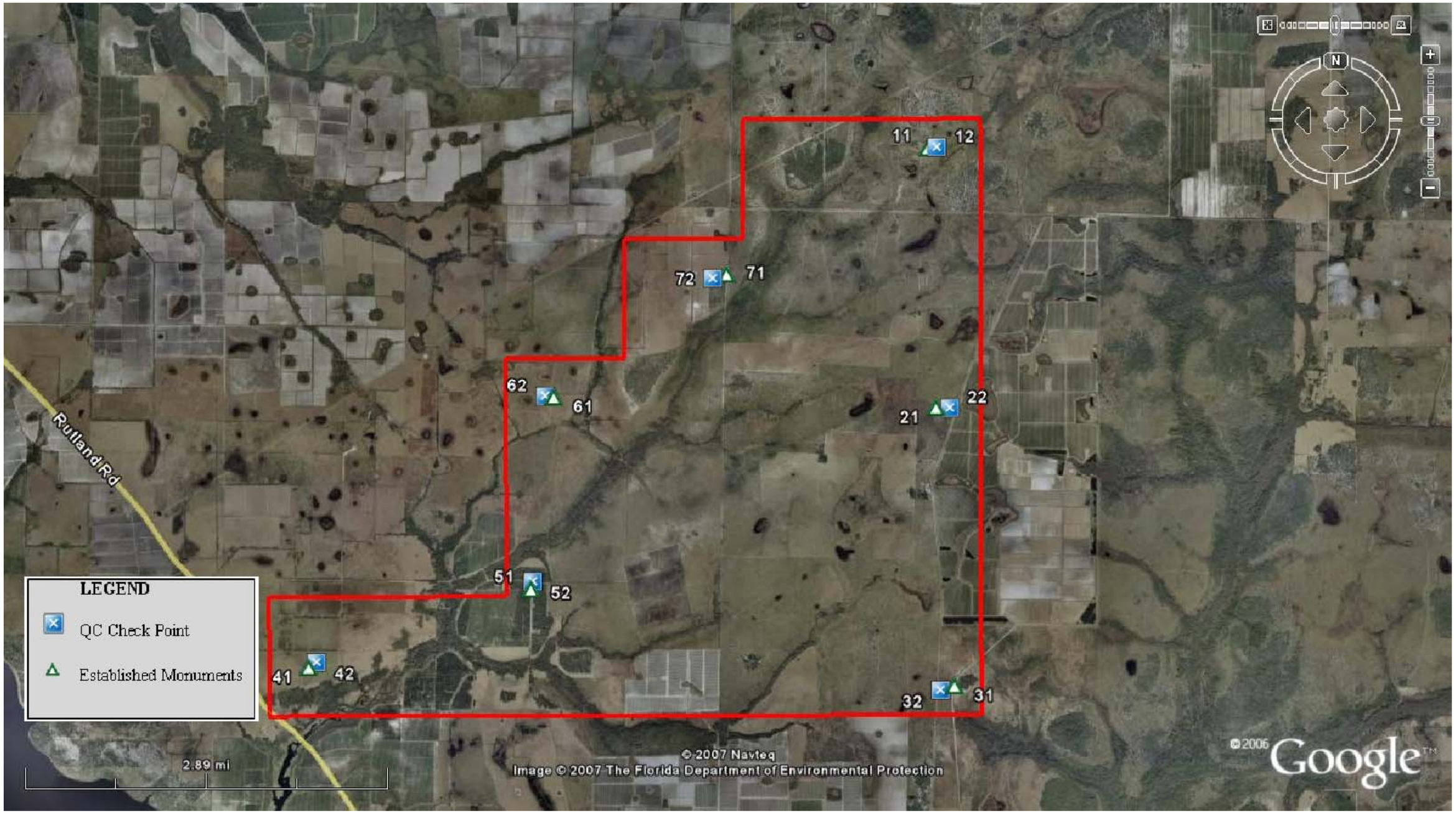
Rutland Ranch LiDAR
GPS Network Map



Attachment A

ATTACHMENT B

Rutland Ranch LiDAR
QC Check Point Map



Attachment B