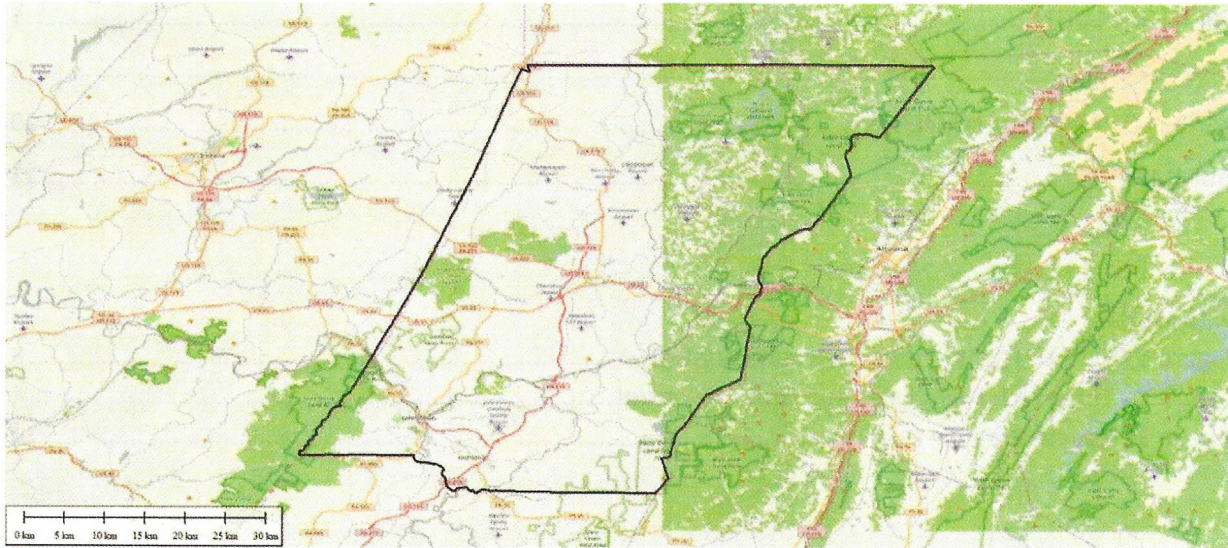


CAMBRIA IMAGERY  
FUGRO/SKYLINE  
2017-2018

# REPORT OF SURVEY CAMBRIA COUNTY, PA



Performed by:

**TerraSurv**

For:



**Terrasurv Project #17023**

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# REPORT OF SURVEY CAMBRIA COUNTY, PA

## INTRODUCTION

Terrasurv, Inc of Pittsburgh, PA was tasked by Fugro Earthdata with performing a control survey in support of oblique imagery collection covering Cambria County, Pennsylvania. The project consisted of two Ground Sample Distances (GSD): three inch (7.5 cm) and six inch (15 cm). The map in figure 1 shows the layout of the ground control and the flight lines for the six inch imagery, and figure 2 shows the layout for the three inch imagery. GCP stations were set in pairs.

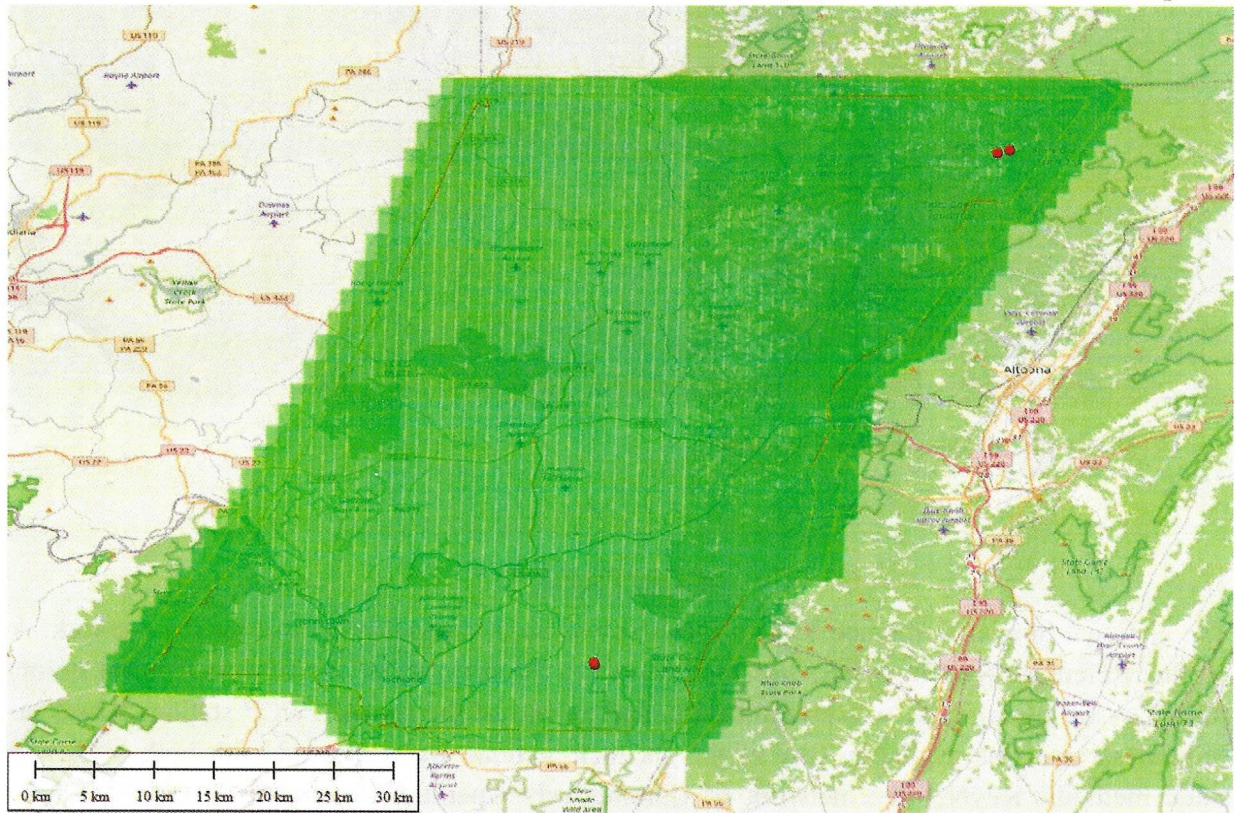


Figure 1 - Six Inch Flight Lines and Ground Control

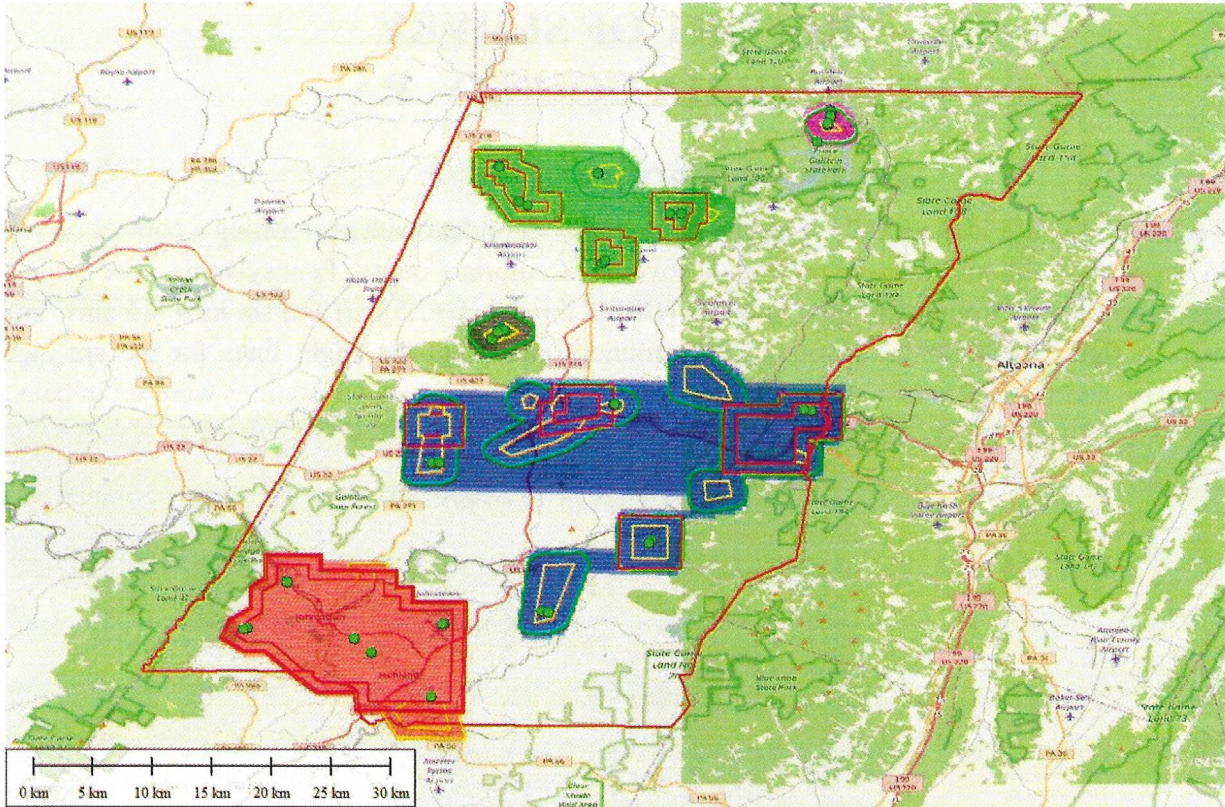


Figure 2 - Three inch Flight Lines and Ground Control

## CONTROL

The National Spatial Reference System (NSRS) was used to provide control for the network. A Virtual Reference System (VRS) was used to survey the majority of the Ground Control Points (GCP). A temporary base was established to survey two of the six inch GCP stations where no cellular service was available. One of the six inch stations was surveyed with both VRS and static methods. KeyNet is a network of Continuously Operating Reference Stations (CORS) network operated by a private entity under a subscription model. This network is aligned with the CORS of the National Spatial Reference System (NSRS).

The horizontal datum was the North American Datum of 1983 – NAD83 (2011), epoch 2010.0. The vertical datum was the North American Vertical Datum of 1988 (NAVD88), realized with GEOID12B.

## STATIONS

There were a total of 50 GCP stations, 46 for the three inch imagery, and four for the six inch imagery. Table 1 lists the GCP stations surveyed, including the four Continuously Operating Reference Stations (CORS) and the temporary base (17023Z).

**Table 1 - Station List**

Station Name	GPSID	USGS Quadrangle	Description
COLGCP01A	17023AA	COLVER	ID=northeast corner of a concrete drive on the south side of Twenty Row Road
COLGCP01B	17023AB	COLVER	ID=southeast corner of a concrete inlet on the north edge of Twenty Row Road
COLGCP02A	17023AC	COLVER	ID=southwest corner of a concrete drive on the north side of Coleman Ave
COLGCP02B	17023AD	COLVER	ID=northwest corner of a concrete drive on the south side of Coleman Ave
COLGCP03A	17023AE	COLVER	ID=northeast corner of a concrete driveway to #965 9th Ave
COLGCP03B	17023AF	COLVER	ID=inside corner of a concrete walk on the south side of the horseshoe pits and north of beach volley ball court
COLGCP04A	17023AG	COLVER	ID=northeast corner of a concrete pad for a shed in the northwest corner of a parking lot for an apartment building
COLGCP04B	17023AH	COLVER	ID=northeast corner of a stop bar on 5th Ave and north side of Reese Ave
EBEGCP01A	17023AI	NANTY GLO	ID=northwest corner of a concrete walk to Pike Grace Church on the south side of Pike Road
EBEGCP01A	17023AJ	NANTY GLO	ID=northwest tip of a concrete drive for #147 Bald Eagle Street
EBEGCP02A	17023AK	EBENSBURG	ID=northwest corner of a concrete walk in front of the Cambria Medical Park
EBEGCP02B	17023AL	EBENSBURG	ID=northeast corner of a concrete walk intersection in front of the Cambria Medical Park
EBEGCP03A	17023AM	CRESSON	ID=southeast corner of a concrete walk intersection on the west side of North Main Street and a park
EBEGCP03B	17023AN	CRESSON	ID=southwest corner of a concrete walk on the north side of Chestnut Street and in front of Penn Crest Bank
EBEGCP04A	17023AO	EBENSBURG	ID=southwest corner of a concrete walk on the south side of Mountain Road
EBEGCP04B	17023AP	EBENSBURG	ID=southwest corner of a concrete walk on the north edge of a walk on the north side of Johnson Ave
EBEGCP05A	17023AQ	GEISTOWN	ID=southwest corner of a concrete walk on the north west of the Forest Hills School District Office
EBEGCP05B	17023AR	GEISTOWN	ID=southeast corner of a concrete drive on the northwest side of Grove Street
GLEGCP01A	17023AS	COALPORT	ID=southeast corner of a concrete walk in front of White township Office on the west side of Beaver Valley Road
GLEGCP01B	17023AT	COALPORT	ID=southeast corner of a concrete walk on the south side of a church on the corner of Beaver Valley Road and Church Hill Road
GLEGCP02A	17023AU	COALPORT	ID=southeast corner of the western concrete walk on a bridge over Dutch Run on Beaver Valley Road
GLEGCP02B	17023AV	COALPORT	ID=southeast corner of a concrete walk on the south side of a small church and on the east side of Beaver Valley Road
GLEGCP03A	17023AW	COALPORT	ID=inside corner of concrete walks at the northeast corner of Glendale high School
GLEGCP03B	17023AX	COALPORT	ID=northeast corner of a concrete walk and curb on the north part of a parking lot for Glendale High School
GLEGCP04A	17023AY	COALPORT	ID=northeast corner of a concrete walk in front of a bathroom building at a boat launch parking area
GLEGCP04B	17023AZ	COALPORT	ID=southeast corner of a walk at the north edge of a concrete parking pad at the boat launch
JOHGCP01A	17023BA	JOHNSTOWN	ID=inside corner of concrete walks on the southeast quad of the intersection of Strayer Street and Dorothy Ave
JOHGCP01B	17023BB	JOHNSTOWN	ID=northeast corner of a concrete walk on the south side of Decker Ave and east side of Strayer Street
JOHGCP02A	17023BC	JOHNSTOWN	ID=southwest tip of a concrete drive to #101 Jeffery Drive

Station Name	GPSID	USGS Quadrangle	Description
JOHGCP02B	17023BD	JOHNSTOWN	ID=southeast corner of a concrete drive to #111 Jeffery Drive
JOHGCP03A	17023BE	JOHNSTOWN	ID=northeast corner of a paint stripe at a curb on the north side of Bedford Street in front of SKS Associates Inc
JOHGCP03B	17023BF	JOHNSTOWN	ID=southwest corner of a concrete drive and walk on the north side of Bedford Street opposite Evolution Gym
JOHGCP04A	17023BG	GEISTOWN	ID=northeast corner of a concrete walk on the southeast corner of the PA National Guard Building on the north side of Airport Road
JOHGCP04B	17023BH	GEISTOWN	ID=southwest corner of a concrete walk in front of the PA National Guard building on the north side Airport Road
JOHGCP05A	17023BI	GEISTOWN	ID=northwest corner of a concrete walk in the parking lot for Richland High School
JOHGCP05B	17023BJ	GEISTOWN	ID=southeast inside corner of a concrete walk intersection in front of the Richland High School Field house
SPAGCP01A	17023BK	BARNESBORO	ID=northwest corner of a concrete drive apron on the north side of US219 at #1907
SPAGCP01B	17023BL	BARNESBORO	ID=southeast corner of a brick walk on the north edge of a concrete walk on the north side of US219
SPAGCP02A	17023BM	HASTINGS	ID=southwest corner of a concrete walk on the north side of 3rd Ave and on the south side of an entrance drive to MC Bank
SPAGCP02B	17023BN	HASTINGS	ID=west corner of a concrete walk on the northeast quad of the intersection of Beaver Street and 3rd Ave
SPAGCP03A	17023BO	BARNESBORO	ID=northwest corner of a concrete walk on the north side of US219 and east side of 13th Street
SPAGCP03B	17023BP	BARNESBORO	ID=southeast corner of a concrete walk at concrete curb on the south side of US219 and just south of 20th Street
SPAGCP04A	17023BQ	HASTINGS	ID=western inside corner of walks by a playground and on the north side of a drive to apartments
SPAGCP04B	17023BR	HASTINGS	ID=northwest corner of a concrete walk and brick on the southeast quad of the intersection of Magee Ave and 5th Ave
SPAGCP05A	17023BS	CARROLLTOWN	ID=southwest corner of a concrete pad for a storage building on the southeast side of US219
SPAGCP05B	17023BT	CARROLLTOWN	ID=northeast corner of a concrete drive on the west side of Church Street
CAMGCP01A	17023CA	BEAVERDALE	ID=southwest corner of a brick and concrete pad at the southeast quad of the intersection of Coulter Street and Roberts Ave
CAMGCP01B	17023CB	BEAVERDALE	ID=northwest inside corner of an intersection of walks on the north side of Coulter Street and west side of Dunlo Dip Road
CAMGCP02A	17023CC	BLANDBURG	ID=northwest corner of an inlet grate on the east side of Skyline Drive
CAMGCP02B	17023CD	BLANDBURG	ID=southwest tip of a concrete drive on the east side of Post Office Ave
	17023Z	BLANDBURG	Temporary base
	PL7B	INDIANA	CORS
	PLI6	NANTY GLO	CORS
	PSU1	STATE COLLEGE	CORS
	SAM1	HOLLIDAYSBURG	CORS

## METHODOLOGY

The field survey was done by using the KeyNet Virtual Reference Station Network. In the VRS method, a GPS receiver (Trimble R8 GNSS) equipped with a data connection is used as a rover to occupy each survey point. Data is received via the cellular network for a “virtual” reference station nearby. The data is processed in real time to compute a position and elevation for the unknown station. The rover is positioned from the nearest physical CORS point and the vector data is stored in a data collector as a vector from this position, along with statistical data for the

solution. Each point was surveyed two times in succession, separated by a new initialization. Table 2 summarizes the VRS data, precisions in meters):

**Table 2 - VRS Occupations**

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
17023Z	17023CD	04/20/2017 19:06:00	19:09:20	0.002	0.004	15	1.0
17023Z	17023CD	04/20/2017 19:09:44	19:13:03	0.002	0.003	15	0.8
17023Z	17023CC	04/20/2017 19:19:10	19:22:31	0.004	0.007	12	1.4
17023Z	17023CC	04/20/2017 19:22:57	19:26:12	0.004	0.006	13	1.1
SAM1	17023CC	04/20/2017 19:29:36	19:32:43	0.007	0.011	14	1.4
SAM1	17023CC	04/20/2017 19:33:35	19:36:38	0.038	0.059	12	1.6
SAM1	17023Z	04/20/2017 20:01:12	20:04:52	0.005	0.008	14	1.3
SAM1	17023AS	04/20/2017 20:26:18	20:29:23	0.006	0.009	14	1.5
SAM1	17023AS	04/20/2017 20:30:37	20:33:38	0.006	0.009	14	1.5
SAM1	17023AS	04/20/2017 20:34:14	20:37:16	0.006	0.009	14	1.5
SAM1	17023AT	04/20/2017 20:41:09	20:44:15	0.007	0.012	14	1.4
SAM1	17023AT	04/20/2017 20:44:37	20:47:38	0.006	0.009	14	1.4
SAM1	17023AU	04/20/2017 20:52:53	20:57:00	0.006	0.009	13	1.7
SAM1	17023AU	04/20/2017 20:59:48	21:02:49	0.008	0.011	14	1.4
SAM1	17023AU	04/20/2017 21:03:10	21:06:11	0.007	0.010	14	1.4
SAM1	17023AV	04/20/2017 21:08:57	21:12:33	0.007	0.011	11	2.1
SAM1	17023AV	04/20/2017 21:12:54	21:14:19	0.010	0.016	13	1.6
SAM1	17023AV	04/20/2017 21:19:02	21:22:39	0.009	0.015	12	2.1
SAM1	17023AW	04/20/2017 21:26:23	21:29:33	0.007	0.009	14	1.4
SAM1	17023AW	04/20/2017 21:29:52	21:32:54	0.009	0.012	14	1.4
SAM1	17023AX	04/20/2017 21:35:34	21:39:15	0.008	0.010	13	1.5
SAM1	17023AX	04/20/2017 21:39:33	21:42:44	0.013	0.017	13	1.5
SAM1	17023AY	04/20/2017 21:47:40	21:50:42	0.008	0.011	13	1.6
SAM1	17023AY	04/20/2017 21:50:59	21:54:01	0.009	0.012	12	1.8
SAM1	17023AZ	04/20/2017 21:55:10	21:58:18	0.005	0.010	13	1.6
SAM1	17023AZ	04/20/2017 21:58:39	22:01:43	0.005	0.010	13	1.6
PLI6	17023AI	04/24/2017 13:36:05	13:39:22	0.003	0.005	12	1.3
PLI6	17023AI	04/24/2017 13:40:55	13:45:01	0.004	0.005	13	1.6
PLI6	17023AJ	04/24/2017 13:55:39	13:58:44	0.004	0.007	11	1.6
PLI6	17023AJ	04/24/2017 13:59:06	14:02:11	0.004	0.006	12	1.5
PLI6	17023AB	04/24/2017 14:25:13	14:28:16	0.007	0.013	13	1.8
PLI6	17023AB	04/24/2017 14:28:53	14:31:55	0.005	0.010	12	2.0
PLI6	17023AA	04/24/2017 14:33:11	14:36:15	0.005	0.008	14	1.5
PLI6	17023AA	04/24/2017 14:37:29	14:41:03	0.005	0.009	14	1.6
PLI6	17023AG	04/24/2017 14:47:03	14:50:11	0.005	0.009	14	1.6
PLI6	17023AG	04/24/2017 14:50:28	14:53:47	0.006	0.011	15	1.5
PLI6	17023AH	04/24/2017 15:00:23	15:03:28	0.006	0.010	15	1.5
PLI6	17023AH	04/24/2017 15:04:20	15:06:11	0.007	0.012	15	1.5
PLI6	17023AD	04/24/2017 15:10:40	15:13:48	0.006	0.011	14	1.7
PLI6	17023AD	04/24/2017 15:14:04	15:17:13	0.006	0.011	14	1.4
PLI6	17023AC	04/24/2017 15:18:14	15:21:28	0.006	0.010	13	1.4
PLI6	17023AC	04/24/2017 15:21:45	15:24:47	0.005	0.008	14	1.7
PLI6	17023AE	04/24/2017 15:33:58	15:37:06	0.005	0.008	14	1.6
PLI6	17023AE	04/24/2017 15:38:49	15:41:52	0.005	0.010	14	1.4
PLI6	17023AF	04/24/2017 15:45:18	15:48:25	0.006	0.010	13	1.7
PLI6	17023AF	04/24/2017 15:48:50	15:51:59	0.006	0.010	13	1.7
PLI6	17023BS	04/24/2017 16:08:11	16:11:22	0.006	0.008	17	1.3
PLI6	17023BS	04/24/2017 16:12:11	16:15:12	0.008	0.011	16	1.3
PLI6	17023BT	04/24/2017 16:17:56	16:20:58	0.006	0.009	16	1.6
PLI6	17023BT	04/24/2017 16:24:06	16:27:10	0.008	0.011	16	1.6
PLI6	17023BO	04/24/2017 16:53:36	16:56:41	0.007	0.011	14	1.5
PLI6	17023BO	04/24/2017 16:57:30	17:00:31	0.008	0.012	14	1.6
PLI6	17023BP	04/24/2017 17:04:54	17:07:56	0.007	0.013	14	1.7
PLI6	17023BP	04/24/2017 17:08:21	17:11:23	0.006	0.011	13	1.8
PLI6	17023BL	04/24/2017 17:22:05	17:25:13	0.011	0.024	11	3.4
PLI6	17023BL	04/24/2017 17:25:37	17:28:38	0.006	0.013	11	3.4
PLI6	17023BL	04/24/2017 17:28:58	17:31:59	0.008	0.017	11	2.2
PL7B	17023BK	04/24/2017 17:35:42	17:38:46	0.006	0.013	13	1.7
PL7B	17023BK	04/24/2017 17:39:14	17:42:20	0.007	0.014	14	1.6
PL7B	17023BK	04/24/2017 17:42:40	17:45:48	0.006	0.013	13	1.7
PLI6	17023BM	04/24/2017 17:59:46	18:02:48	0.007	0.019	13	2.1