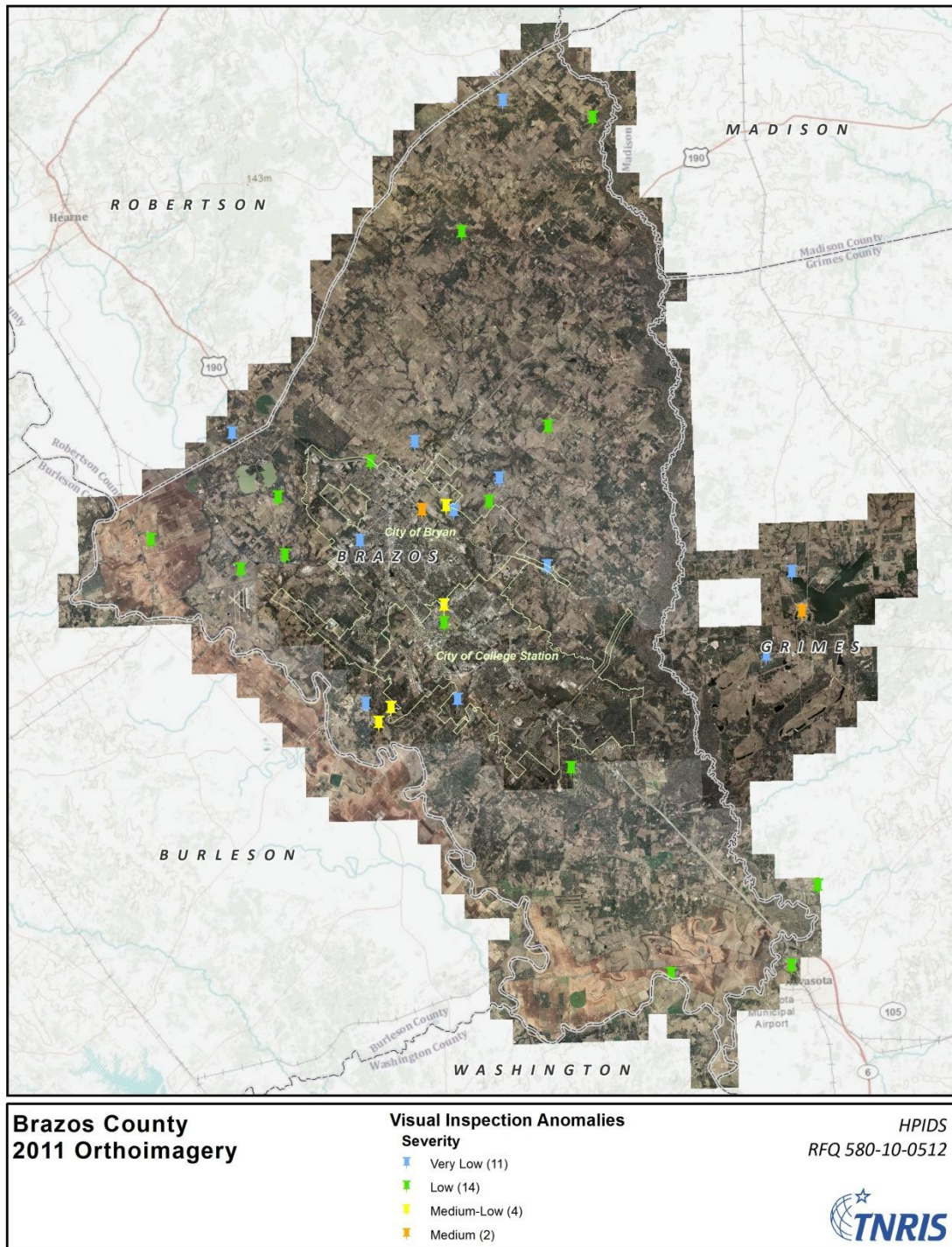


Final Data Inspection Report

HPIDS #580100512 – Brazos County and portions of Grimes County Orthoimagery



Every 1-foot DO4Q GeoTIFF was visually inspected by an analyst at 1:1500. Likewise, every 6-inch DO4Q GeoTIFF was inspected at 1:750. TNRIS inspected the GeoTIFFs in the natural color combination (123 or RGB) and spot-checked the color infrared (412 or IRRG) combination. Generally, artifacts discovered in the natural color combination will be apparent in the color infrared combination. Any anomalies found were very minor in nature and for the most part, fall within the original set of project specifications. A point shapefile of the minor **31 anomalies** accompany this report. A lidar data inspection checklist is included in a separate table.

1. Vendor

Kucera International, Inc. – Willoughby, Ohio
Project contact – Scott Antalovich

2. Camera system(s)

*Orthoimagery capture with a Vexcel Imaging **UltraCam X** digital frame camera and simultaneous lidar capture with a Leica Geosystems **ALS60***

3. Data acquisition time frame

*AOI 1 6-inch acquired on **1/6/11** and AOI 2 1-foot acquired **1/21 – 1/22/11**. Leaf-off conditions.*

4. Deliverables

6-inch DO4Qs (AOI 1):

243 GeoTIFF (4-band)
243 JPEG2000 (4-band)
243 MrSid (3-band)

6-inch Mosaic (AOI 1):

1 MrSid (3-band)

1-foot DO4Qs (AOI 2):

534 GeoTIFF (4-band)
534 JPEG2000 (4-band)
534 MrSid (3-band)

1-foot Mosaic (AOI 2):

1 MrSid (3-band)

1 pt/sq m - target Lidar:

243 Las (AOI 1)
534 Las (AOI 2)

5. Delivery dates

5/3/11 - AOI 2 1-foot GeoTIFFs
6/16/11 – AOI 1 6-inch GeoTIFFs

6/24/11 – All Compressed Products

7/22/11 – Lidar

8/1/11 – Metadata

6. Data format(s)
GeoTIFF, JPEG2000, MrSid Gen 3, Las
7. File naming convention
Correct – DDDD_Q_QQ_3Q_4Q_yyyymmdd.format
8. Spectral resolution
4-band RGBIR GeoTIFF and JPEG2000
3-band RGB MrSid
9. Pixel resolution
6-inch (AOI 1)
1-foot (AOI 2)
10. Radiometric resolution
Unsigned 8-bit
11. Histograms
Normal – did not observe any clipping
12. Projected
Yes – State Plane Texas Central FIPS 4203, NAD 1983, US Foot
13. Projection defined
This depends on the data format and software used to read the data. See attached summary of Final Data Compatibility Results.
14. Orthorectified
Yes – Building lean is minimal to none. Very nice.
15. Image footprint
DO4Q, 64th USGS quad
Mosaics – One per AOI
16. Image buffer
770 – 900 feet (spec is 300 feet)

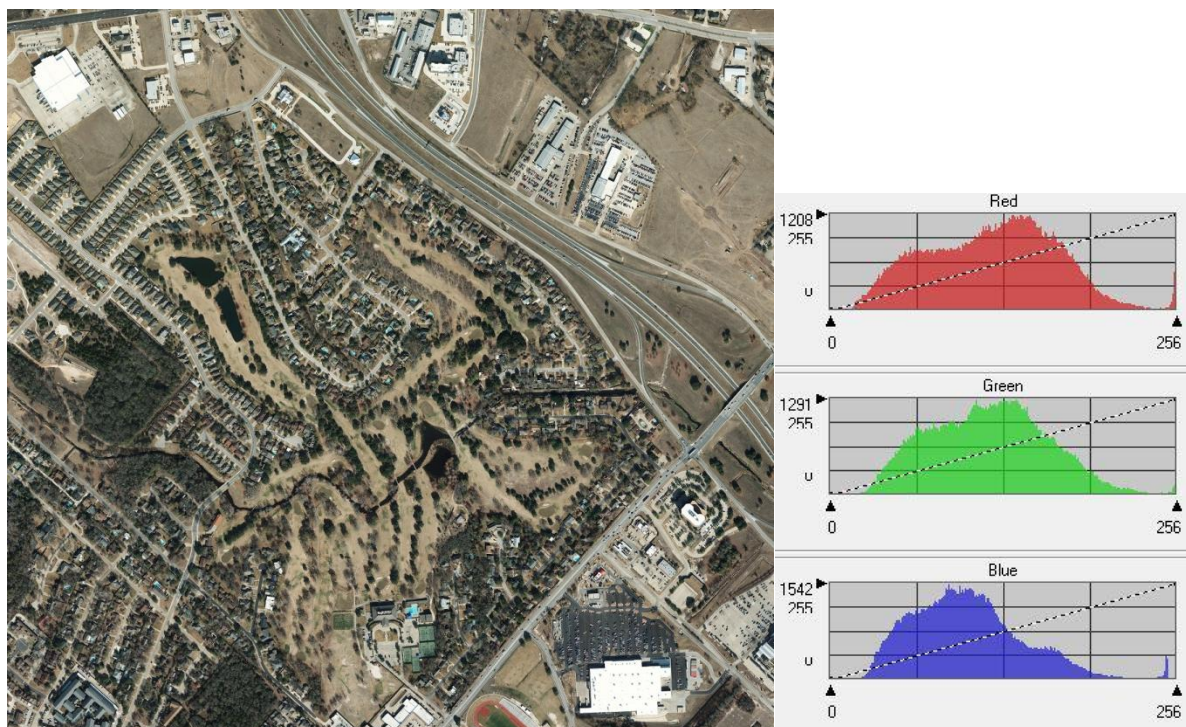
17. Image compression
None on GeoTIFFs
15:1 on DO4Q JPEG2000s & MrSids
100:1 on AOI 1 6-inch MrSid Mosaic
80:1 on AOI 2 1-foot MrSid Mosaic
18. Hue / Saturation / Brightness / Contrast
Very good(!) Very nice Natural Color color balance. Some minor pixel blooming evident on white rooftops, examples below. One small grouping of DO4Qs that appeared darker than the rest – thick forest. Color infrared balance a little too blue/green but a major improvement over original samples.
19. Detail in shadow / Shadow length
Good
20. Sharpness
Excellent and very clear.
21. Artifacts / Noise
Very minor: Consistent RGB diagonal pattern in some very fine crop rows—evident in both natural color & color infrared. Several instances of glare from metal rooftops. Silos lean obscuring a path/road. One instance of wavy highway roads underneath brand new bridge.
22. Smearing / Wavy or mismatched features / Building lean
No wavy bridges, just one set of wavy highway roads under a new bridge
Buildings look excellent
No smearing detected
23. Seamlines
Seamlines are barely detectable.
24. Cloud cover / Haze / Smoke
Cloud free. Eight minor smoke plumes detected – Six from fires and Two from industrial plants.
25. Data voids
None detected
26. Index(es)
Perfect---- acquisition date, filenames, and flying height included
27. Metadata
Perfect

28. Horizontal accuracy

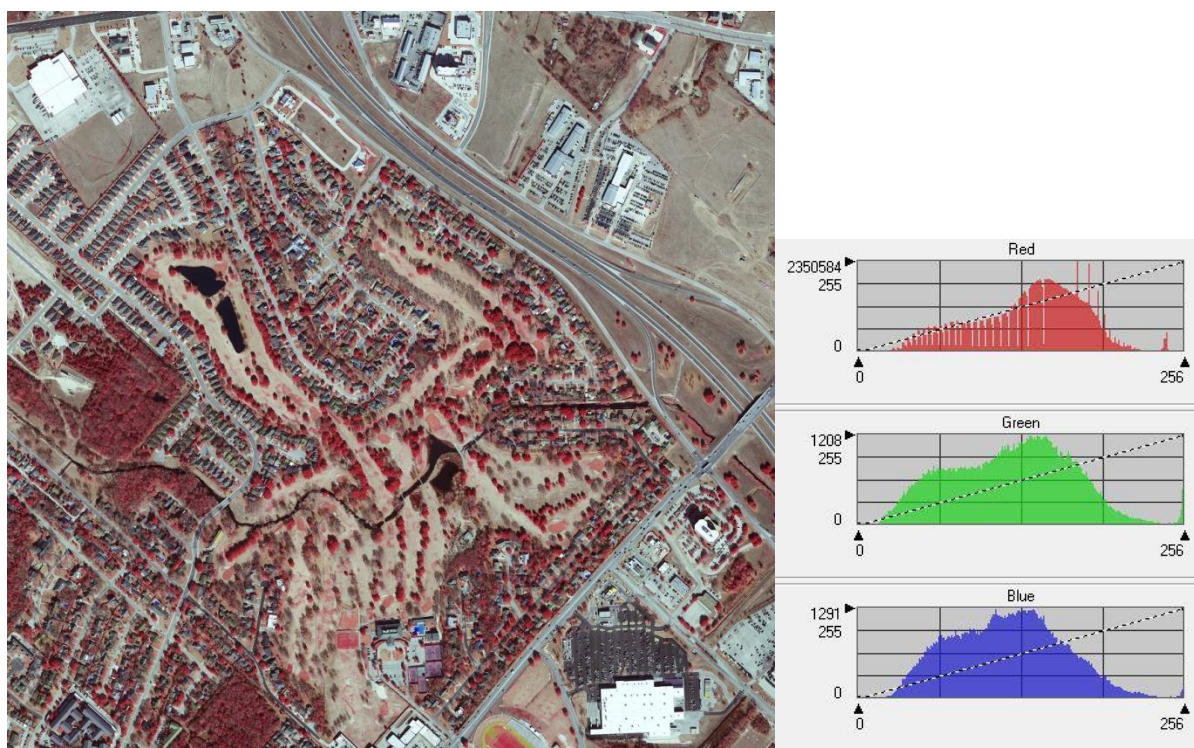
From Kucera International, Inc.--- Horizontal accuracy requirement is defined by TNRIS as 1 to 3 ft for the 0.5 ft resolution imagery and 3 to 5 ft for the 1.0 ft resolution imagery. Horizontal RMSE for the 0.5' resolution orthoimagery tested **0.47 feet** at the 95% confidence level. Horizontal RMSE for the 1.0' resolution orthoimagery tested **3.54 feet** at the 95% confidence level. RMSE calculated in accordance with Geospatial Positioning Accuracy Standards Part 3: National Standard for Spatial Data Accuracy, FGDC-STD-007.3-1998. RMSE values are calculated for ground control points based on guidelines established in FGDC-STD-007.3-1998 Geospatial Positioning Accuracy Standards Part3: National Standard for Spatial Data Accuracy. Measured x and y positions of the control in the final orthoimage are entered into an Excel spreadsheet along with the surveyed positions of the control points. RMSE_X and RMSE_Y are calculated and a subsequent horizontal RMSE derived for the dataset to meet the NSSDA accuracy requirement.

Not enough control check points in state archive to warrant an appropriate accuracy assessment by TNRIS. Although observations were made in the 1-foot dataset and offsets range 1.25 – 2.50 feet.

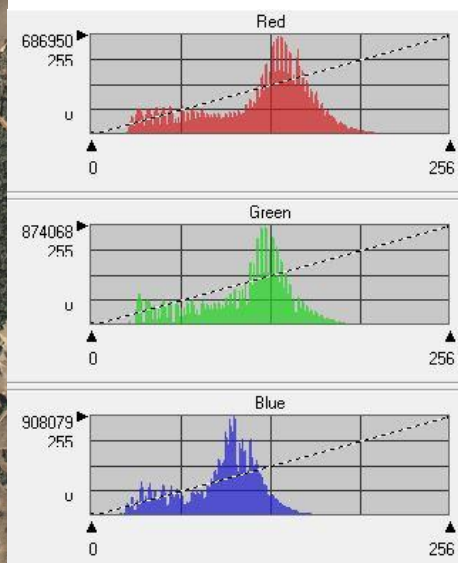
Representative images and histograms



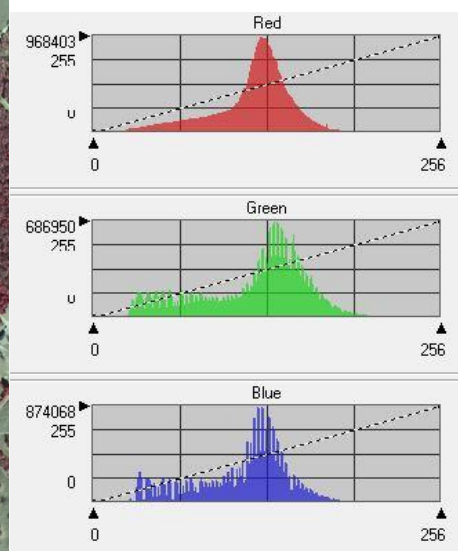
Histogram Example – 3096_22_3_b_3, 6-inch, 1:6000, NC, GeoTIFF



Histogram Example – 3096_22_3_b_3, 6-inch, 1:6000, CIR, GeoTIFF



Histogram Example – 3096_06_4_d_2, 1-foot, 1:6000, NC, GeoTIFF



Histogram Example – 3096_06_4_d_2, 1-foot, 1:6000, CIR, GeoTIFF



Very nice orthorectification and color balance, sharpness – 3096_22_4_c_2, 6-inch, 1:750, NC



Nice detail in shadows and color balance, sharpness – 3096_30_1_d_2, 6-inch, 1:750, NC



Nice clarity, sharpness, color balance – 3096_06_4_b_2, 1-foot, 1:1500, NC



Nice clarity, sharpness – 3096_06_4_b_2, 1-foot, 1:1500, CIR



Very nice clarity, sharpness, color balance – 3096_24_4_d_2, 6-inch, 1:800, CIR



Very nice clarity, sharpness, color balance – 3096_24_4_d_2, 6-inch, 1:800, NC

Sample Anomalies from Visual Inspection

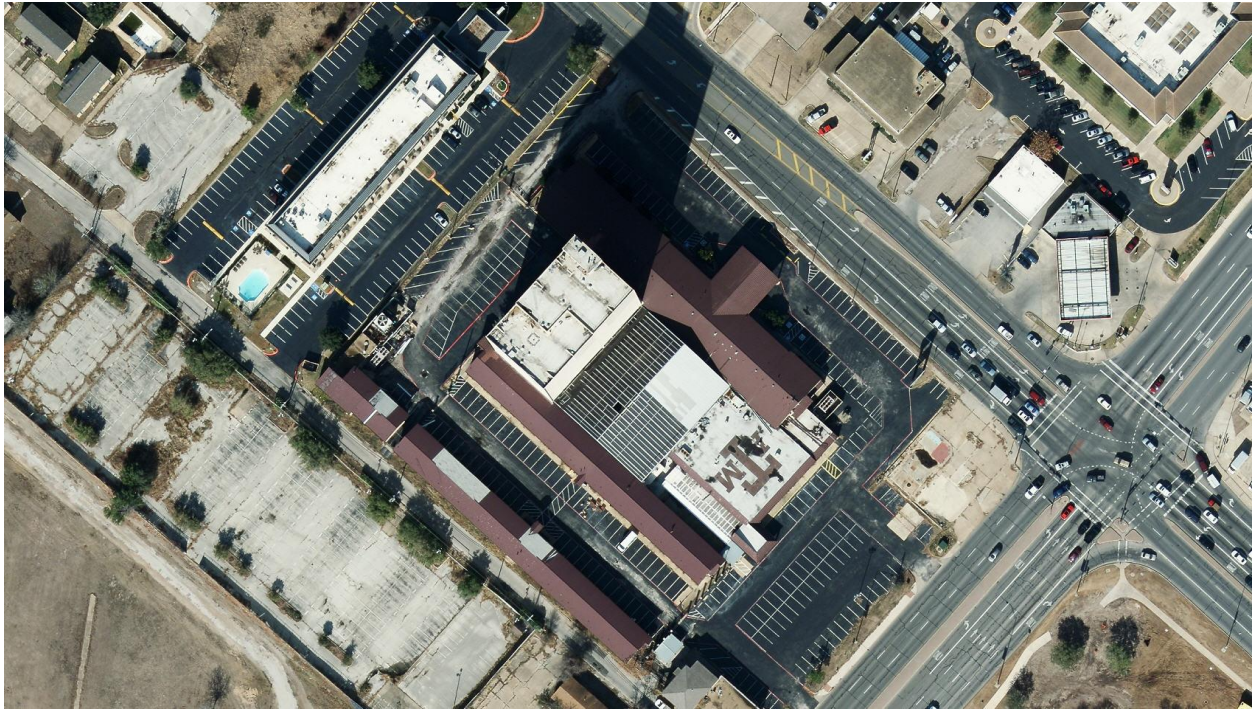
NOTE: None of the following examples are representative of the entire dataset. They are simply minor outliers.



Somewhat dark and dull in this handful of DO4Qs – 3096_29_2_d_4, 6-inch, 1:750, NC



Slight building lean, meets spec. – 3096_30_1_b_1, 6-inch, 1:750, NC



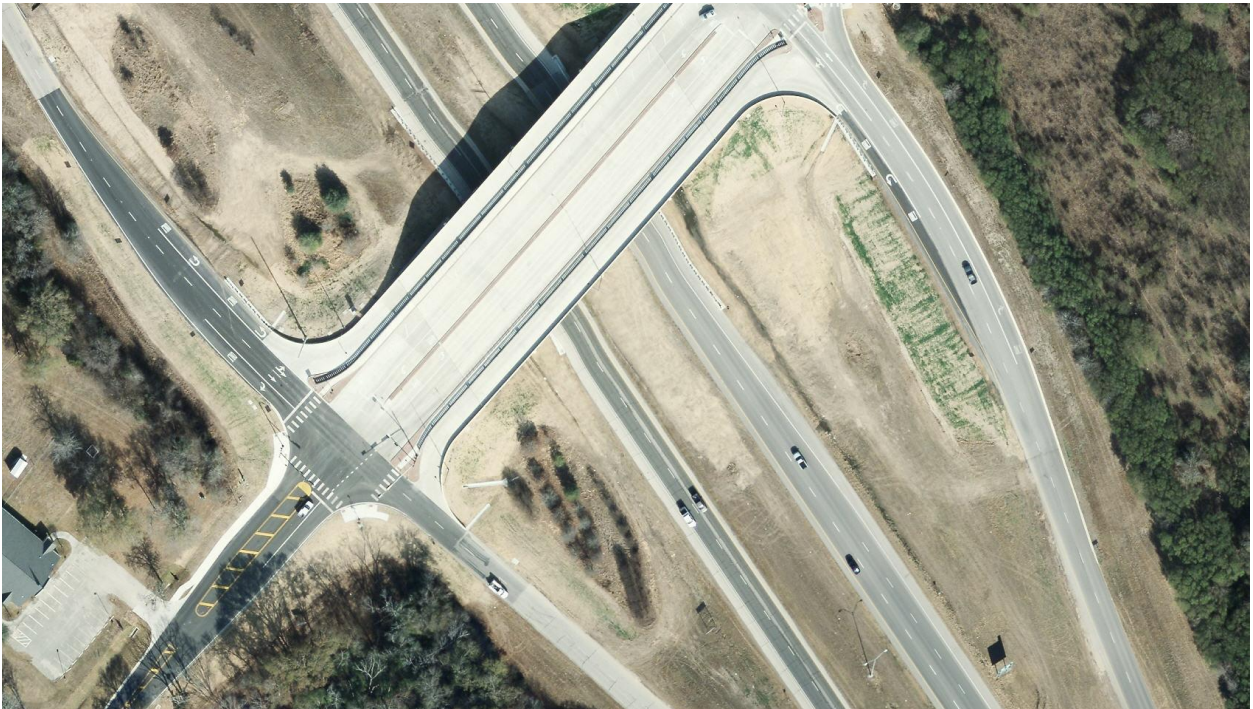
Dark shadow, some detail lost – 3096_22_3_d_3, 6-inch, 1:750, NC



Power line glare offset – 3096_24_3_d_3, 6-inch, 1:750, NC



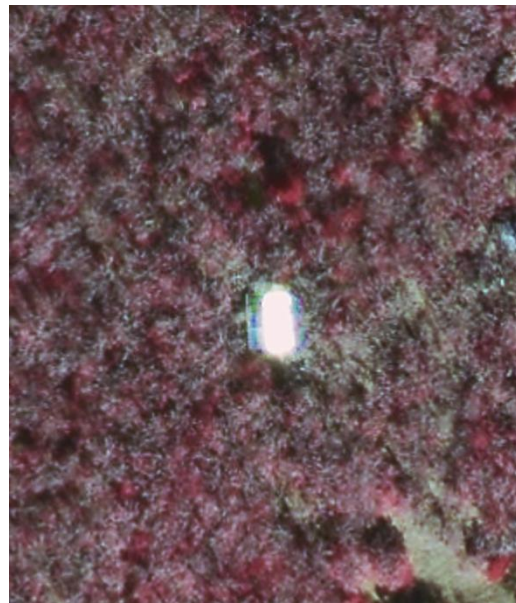
Silos lean obscuring road/path around them – 3096_32_1_b_1, 6-inch, 1:750, NC



Wavy roads under new bridge – 3096_22_3_a_2, 6-inch, 1:750, NC



Rainbow effect in cropland – 3096_20_4_a_2, 1-foot, 1:1500, NC



Roof glare – 3096_14_1_b_4, 1-foot, 1:500, NC & CIR



Steam and smoke – 3096_21_1_d_4, 1-foot, 1:1000, NC & 3096_21_3_b_4, 1-foot, 1:3800, NC



White saturated roofs – 3096_31_3_c_1, 1-foot, 1:1500, NC

Final Data Compatibility Results

GEO TIFF – 4-BAND

ArcGIS 10.0	y	Projection defined
Imagine 2011	y	Projection defined
MARS 7	y	NA
QGIS 1.7.0	y	Projection defined

JPEG2000 – 4-BAND

ArcGIS 10.0	y	Projection defined
Imagine 2011	n	Data have major offsets
MARS 7	n	Bottom third missing
QGIS 1.7.0	y	Projection defined

MRSID – 3-BAND

ArcGIS 10.0	y	Projection defined
Imagine 2011	y	Projection defined
MARS 7	y	NA
QGIS 1.7.0	y	Projection defined