

# VBMP Rapid Response Product

## VIRGINIA BASE MAPPING PROGRAM

Sanborn's technology and experience deliver top-quality rapid response data acquisition and orthoimagery & LiDAR production services. Rapid response requests involve limited areas, short notice, rapid delivery, and are typically requested to support planning or emergency response activities related to natural or cultural events and disasters.

### Capability

Sanborn has the resources to support our rapid response program. We recognize that timely, consistent, and quality collection of aerial imagery is essential in an emergency situation. Sanborn owns multiple fixed-wing aircraft and leases additional aircraft that are customizable to federal, state, and local programs.

The Sanborn aerial team provides the following benefits:

- Extensive sensor/camera resources to ensure collection within the annual windows of opportunity
- State-of-the-art digital sensors to provide a variety of collection options
- High performance aircraft
- AGPS/IMU units available to collect direct exterior orientation data for digital sensors

### Process Flow

Final decisions on data acquisition are dependent on timing, area, proximity of resources, and resource availability. Sanborn's production operations assume full responsibility for the orthorectification/LiDAR production tasks. This eliminates any potential delays associated with the use of subcontractors.

Sanborn will mobilize to the project site within 24 hours of receiving the .shp file for the area of interest. Delivery of orthoimagery and LiDAR products begin within 72 hours of acquisition.

### Orthoimagery Product

Resolution	1.0-ft.
Type	4-band (RGB,NIR) or 3-band
Bit depth	16-bit
File format	GeoTiff
Map Scale	1" = 200' map scale
Accuracy Standard	+/- 6.6'

### Ortho Process with 24-Hour Notice

1. Receive work order/project areas in .shp file format
2. Identify sensor and mobilize within 24 hours based on availability and proximity to project area of interest
3. Flight and logistics planning occurs in parallel sequence
4. Collection begins within 24-36 hours
5. Data collected sent overnight to office for processing
6. ABGPS post processed within 48 hours in order to allow access to base station data
7. Rapid Response production team tasked (run 2 shifts)
8. Ortho products delivered within 48-72+ hours from capture date

### Ortho Process with 21-Day Notice

1. Receive work order / project areas in shp file format
2. Identify sensor and determine collection window availability
3. Proximity to project area of interest
4. Flight and logistics planning occurs in office
5. Flight plans given to customer for review/approval
6. Collection window scheduled
7. Data collected sent overnight to office for processing
8. Geo-referenced stereo pairs available within 48 hours
9. Ortho production team scheduled
10. Ortho products delivered within 6 weeks from capture

### LiDAR Product

Standard	1.4M avg. point spacing
Vertical Accuracy	Bare-earth: 18.5cm RMSE Vegetation: 37cm RMSE
Horizontal Accuracy	One-meter RMSE
File format	Bare Earth in .LAS or ASCII
Filtering	Automated w/minimum performance for bare earth: 89% artifacts removed / 90% outliers removed 90% vegetation removed / 93% building removed

### LiDAR Process with 24-Hour Notice

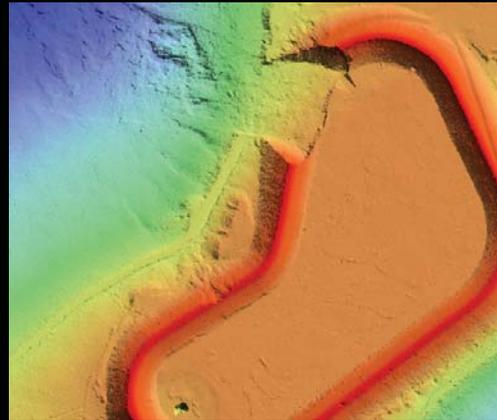
1. Receive work order/project areas
2. Rapid response mobilize within 24 hours
3. Planning and control established during this time
4. Collection 1 to 12 hours depending on area and point density (based on 2 to 100 Sq. miles)
5. Coverage check and LiDAR verification
6. On site calibration and processing (8 hours to calibrate and process to raw LiDAR)
7. Filtering (10 minutes for every 2 square miles)
8. Bare earth output or other products as required

### LiDAR Process with 21-Day Notice

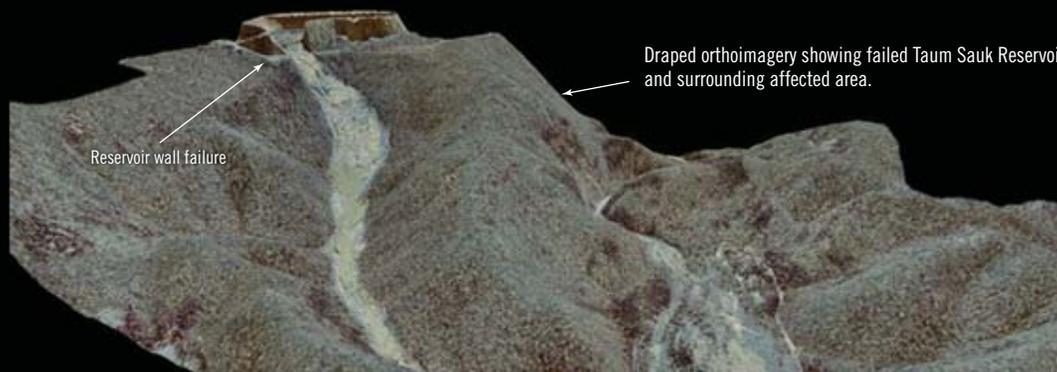
1. Receive work order / project areas
2. Planning and control established in office
3. Collection 1 to 12 hours depending on area and point density (based on 2 to 100 Sq. miles).
4. Coverage check and LiDAR verification in Field
5. Calibration and processing in Sanborn Office (8 hours to calibrate and process to raw LiDAR)
6. Filtering (10 minutes for every 2 Sq. miles)
7. Bare earth output or other products delivered as required
8. About 30 working days for delivery but can be adjusted for needs



Orthoimagery of failed Taum Sauk Reservoir



LiDAR imagery of failed Taum Sauk Reservoir



Reservoir wall failure

Draped orthoimagery showing failed Taum Sauk Reservoir and surrounding affected area.

**Experience**

Sanborn has completed dozens of rapid response projects, among them: the search for Steve Fossett, the recent San Diego Wild Fires, and Taum Sauk Dam break in Missouri. In all cases detailed below, not only did we mobilize within 24 hours, but we also provided geo-referenced imagery to the client in a 48-72 hour window.

**Taum Sauk Dam, Missouri (LiDAR) Above**

In the early morning hours of December 14, 2005, in the heart of the Missouri Ozarks, a 20-foot wall of water rushed down into the east fork of the Black River. The flood was caused by the catastrophic failure of the Taum Sauk Hydroelectric Plant Upper Reservoir. Within 24 hours following the dam failure, the Minnesota DNR and the USGS contacted Sanborn to deploy an aircraft and LiDAR sensor to the afflicted area. Sanborn mobilized immediately on December 16, 2005, and successfully completed the mission over a 31.4 square mile area system that evening. Sanborn delivered the completed bald-earth DEM within two weeks of the original data acquisition.

**Search for Steve Fossett (Digital Imagery)**

Sanborn provided 1-foot ortho data to aid in the search and rescue of world-famous aviator, Steve Fossett. We were onsite within five hours of notice to proceed and collected more than 1,300 square miles of imagery. Deliveries were staged daily; and all data were delivered within 48 hours of final flight missions. Sanborn's rapid response team orthorectified and delivered more than 3,500 images.

**San Diego County (Digital Imagery)**

In the Fall of 2007, San Diego County, California contracted with Sanborn to provide rapid response services in support of their wildfire emergency situation which included up-to-date maps of fire perimeters showing wildfire risk. Sanborn worked directly with multiple emergency management professionals to draft a contract and scope of work. Once the scope of work was finalized and contract executed, Sanborn mobilized within a 24-hour period of time. Sanborn delivered 4-band compressed stereo imagery immediately and completed additional photogrammetric tasks such as DEM generation and orthophoto rectification.

**About Sanborn**

With a rich tradition of mapping dating back to 1866, Sanborn provides comprehensive end-to-end geospatial solutions. Sanborn offers products and services that satisfy diverse and evolving customer needs for GIS software systems, application development, systems integration, and spatial analysis and modeling. Leveraging precision remote sensing techniques, Sanborn also supports a wide range of applications and users. Sanborn's solutions are founded on a strong legacy of innovative geospatial data collection and processing capabilities. An internationally recognized company, Sanborn has multiple U.S. offices with customers worldwide. For more information, visit [www.sanborn.com](http://www.sanborn.com).