

Vermont Society of Land Surveyors  
Spring Seminar

# New Technology Survey Applications

Data Management for a Surveying Company  
*“...the way we do business”*



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*SGC Engineering, LLC*

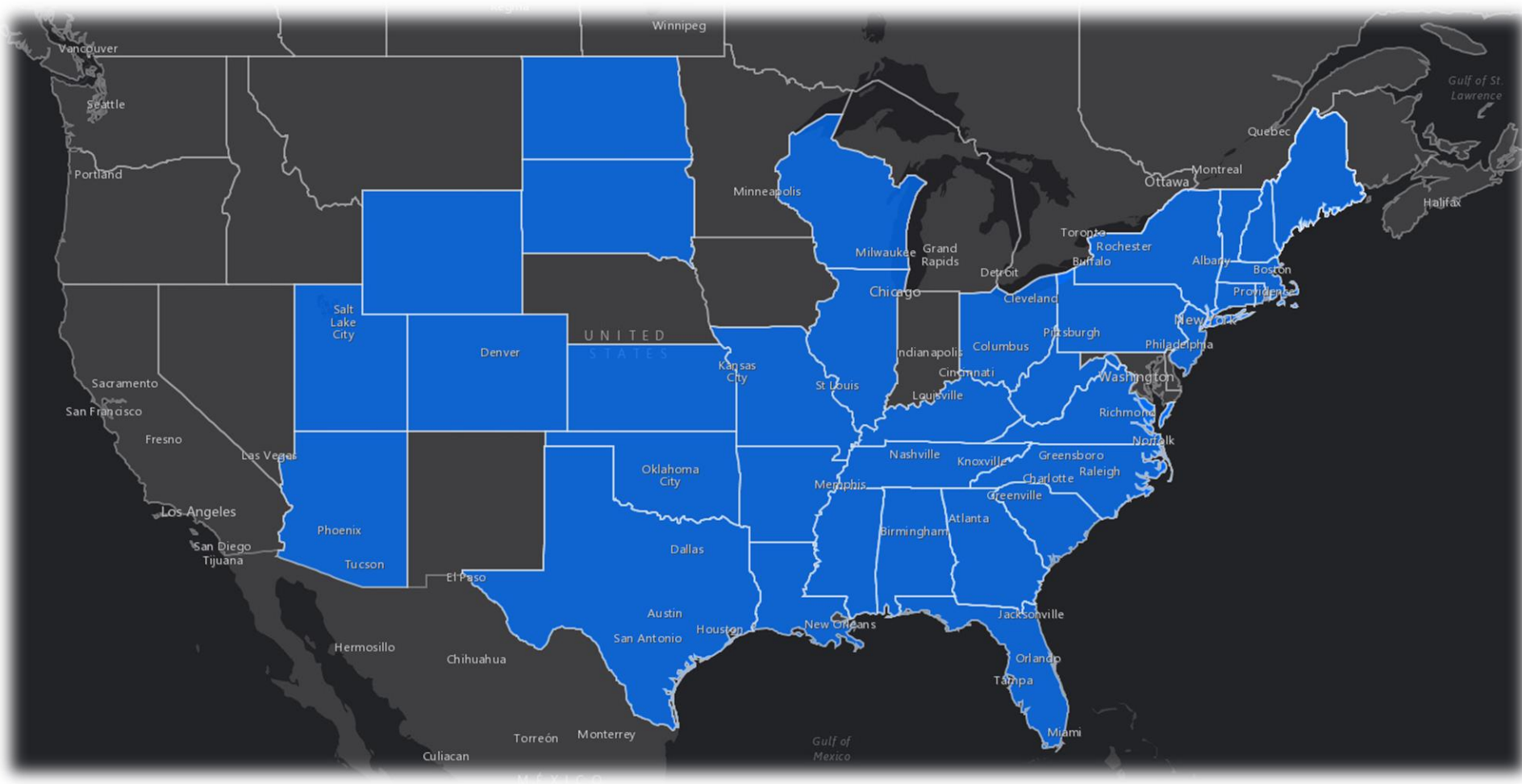
# Surveying and GIS/Data Management

## Agenda

- Part I - Surveying, GIS, and Data Management
  - Business Operations
  - Projects
  - Technology
  
- Part II – New Technology
  - High Density Terrestrial Scanning
  - Unmanned Aerial Systems
  - Unmanned Hydro Systems

# Professional Surveyor Licensure

SGC Individuals Licensed or Pending – **Is This a GIS?**



# Spatial Data Management

## ArcGIS Online – Cloud GIS

Home Gallery Map Scene Groups My Content My Organization




The screenshot displays the ArcGIS Online interface. At the top, there is a navigation bar with links: Home, Gallery, Map, Scene, Groups, My Content, and My Organization. To the right of the navigation bar is a search icon and a grid icon. Below the navigation bar is a large banner area. The banner is divided into three sections: the left section shows the SGC logo over a background of a surveying instrument; the middle section shows a map with various data layers; the right section shows the text "GIS Online" in large blue letters over a background of a construction site. Below the banner is a row of four project viewer thumbnails. Each thumbnail has a title, a subtitle, and a description. The thumbnails are: 1. "Project Viewer" for "Sabal Construction" with a subtitle "Project Viewer"; 2. "Project Viewer" for "Access Northeast" with a subtitle "AccessNE Internal Project Viewer"; 3. "Project Viewer" for "AIM Construction" with a subtitle "AIM Internal Project Viewer"; 4. "InFocus Project Viewer" for "SGC Projects" with a subtitle "SGC Projects Viewer". Each thumbnail also features the SGC logo and a blue "Ap" icon.

# Right of Way Boundary Surveys (VAoT)

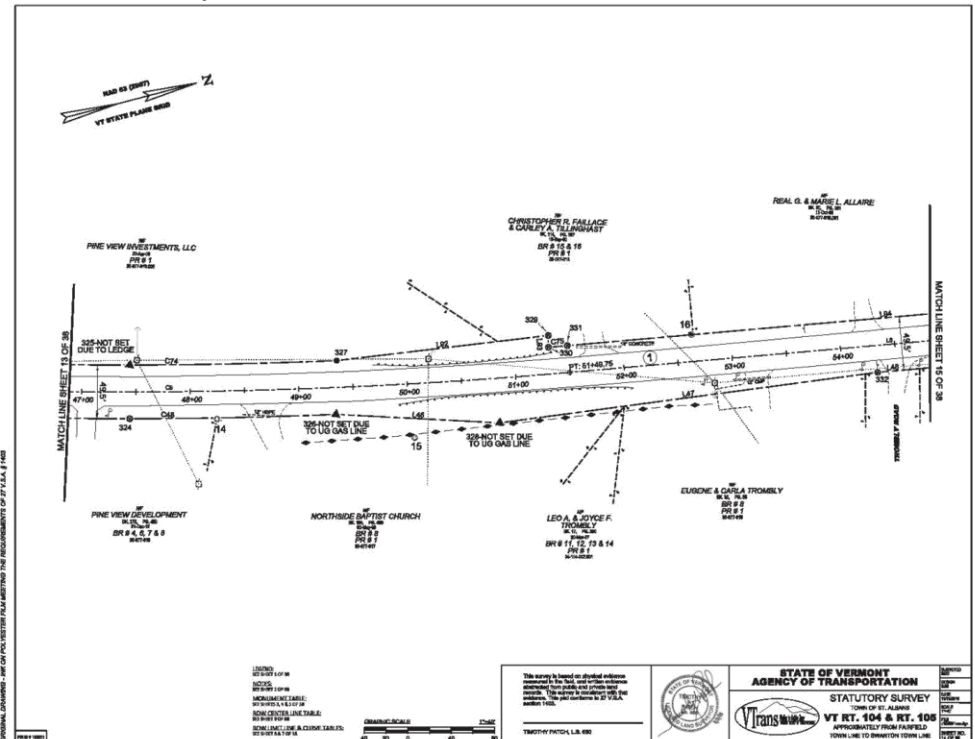
## Survey / GIS / Data Management

### Recent SGC Projects

- **Marshfield** – US 2 – 8.2 miles (2014-2015)
- **St Albans** – VT 104 & VT 105 – 4.6 miles (2015-2016)
- **Swanton** – VT 105 – 3.9 miles (2015-2016)

### Agency Defined Project Tasks

- Land Owner Notifications
- Road Records Research
- Owner Records Research
- Field Investigation
- Geodetic Network
- Location Survey
- Analysis of Survey Results
- Legal Support
- Statutory Survey
- Publication of Survey Results





# Pipeline Overview

## Lifecycle of a Pipeline Survey Project

- Preliminary Survey
- Boundary Survey and Plats
- Construction Staking
- Materials Tally
- As-built Survey

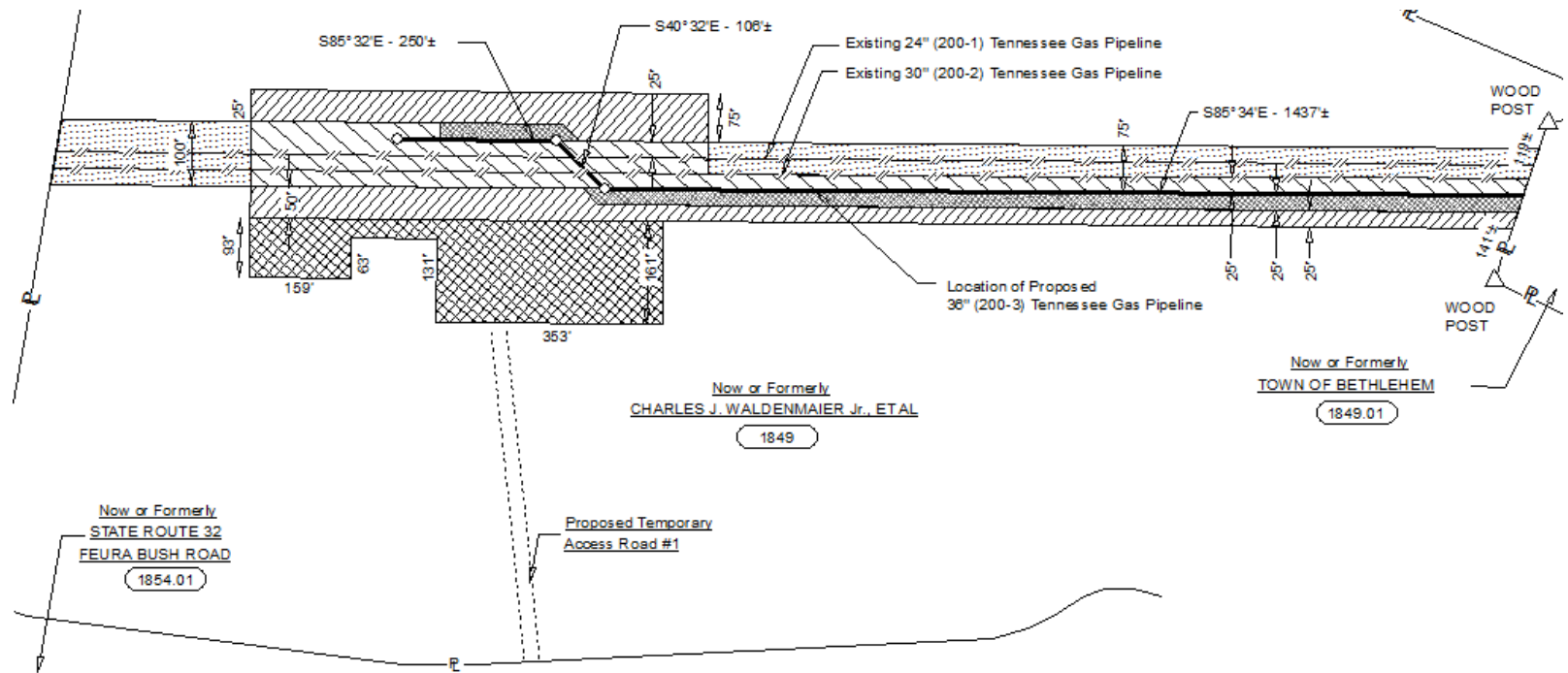




# Legal Survey- Plat Development

## Consistent Workflow and Automated Process Results in Timely Delivery

- CAD and GIS integration to maximize each platform's strengths
- Utilize staff to their highest and best use (compilers, drafters, GIS, etc.)
- Manage iterations of centerline, workspaces, etc.
- Mitigate potential human errors of repetitive updates



PLAT: 1849  
SCALE: 1"=250'  
ROTATION: 11

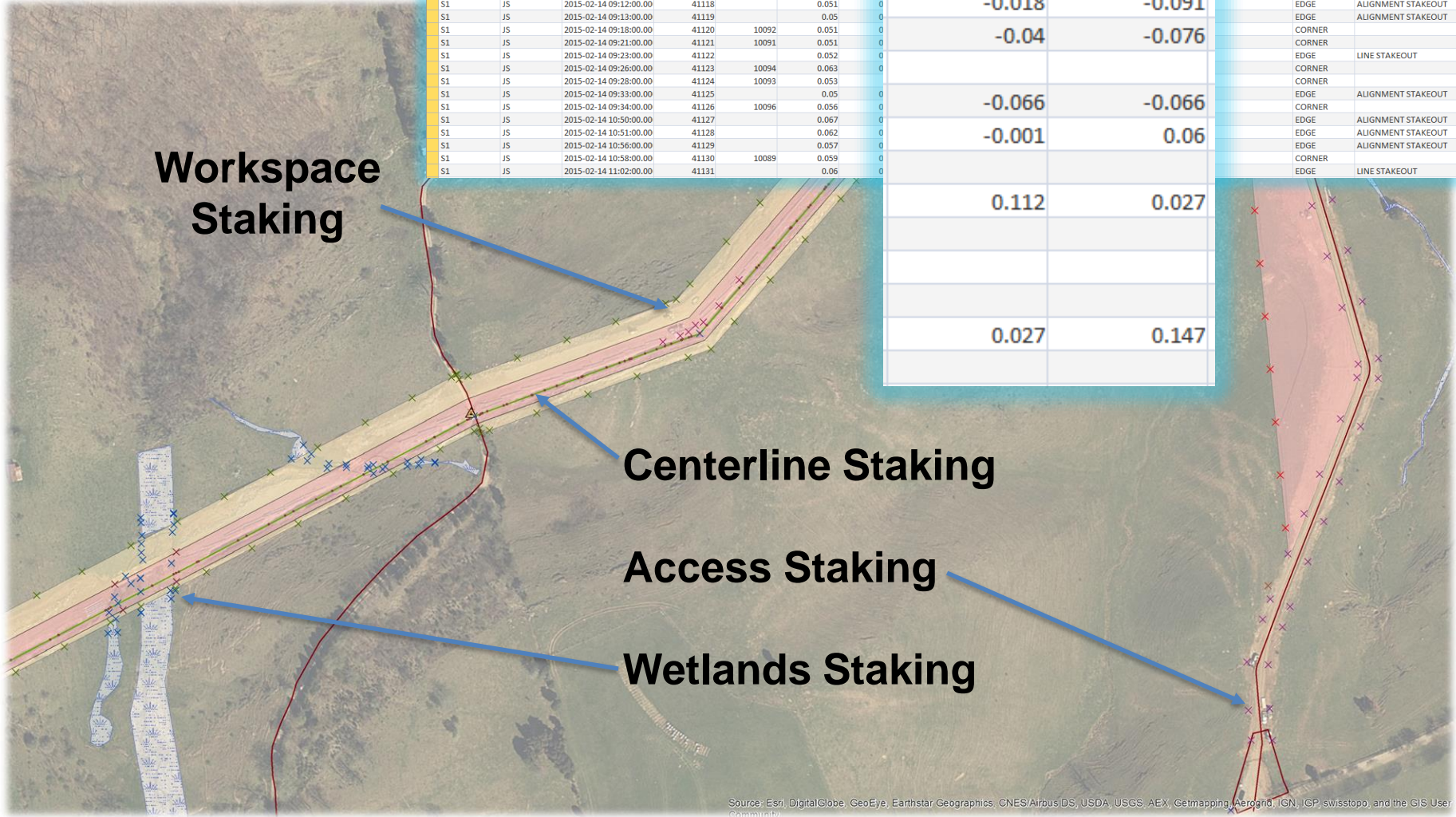


# Construction Staking

SpreadLoop	SurveyedBy	SurveyedTS	PtNum	DesignPtNum	HPrecision	VPrecision
S1	JS	2015-02-14 09:09:00.00	41117	10095	0.054	0
S1	JS	2015-02-14 09:12:00.00	41118		0.051	0
S1	JS	2015-02-14 09:13:00.00	41119		0.05	0
S1	JS	2015-02-14 09:18:00.00	41120	10092	0.051	0
S1	JS	2015-02-14 09:21:00.00	41121	10091	0.051	0
S1	JS	2015-02-14 09:23:00.00	41122		0.052	0
S1	JS	2015-02-14 09:26:00.00	41123	10094	0.063	0
S1	JS	2015-02-14 09:28:00.00	41124	10093	0.053	0
S1	JS	2015-02-14 09:33:00.00	41125		0.05	0
S1	JS	2015-02-14 09:34:00.00	41126	10096	0.056	0
S1	JS	2015-02-14 10:50:00.00	41127		0.067	0
S1	JS	2015-02-14 10:51:00.00	41128		0.062	0
S1	JS	2015-02-14 10:56:00.00	41129		0.057	0
S1	JS	2015-02-14 10:58:00.00	41130	10089	0.059	0
S1	JS	2015-02-14 11:02:00.00	41131		0.06	0

DeltaNorth	DeltaEasting
-0.033	-0.105
-0.018	-0.091
-0.04	-0.076
-0.066	-0.066
-0.001	0.06
0.112	0.027
0.027	0.147

eCode	Attribute1	Attribute3
CORNER		
EDGE	ALIGNMENT STAKEOUT	
EDGE	ALIGNMENT STAKEOUT	
CORNER		
CORNER		
EDGE	LINE STAKEOUT	
CORNER		
CORNER		
EDGE	ALIGNMENT STAKEOUT	
CORNER		
EDGE	ALIGNMENT STAKEOUT	
EDGE	ALIGNMENT STAKEOUT	
EDGE	ALIGNMENT STAKEOUT	
CORNER		
EDGE	LINE STAKEOUT	



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogard, IGN, JGP, swisstopo, and the GIS User Community



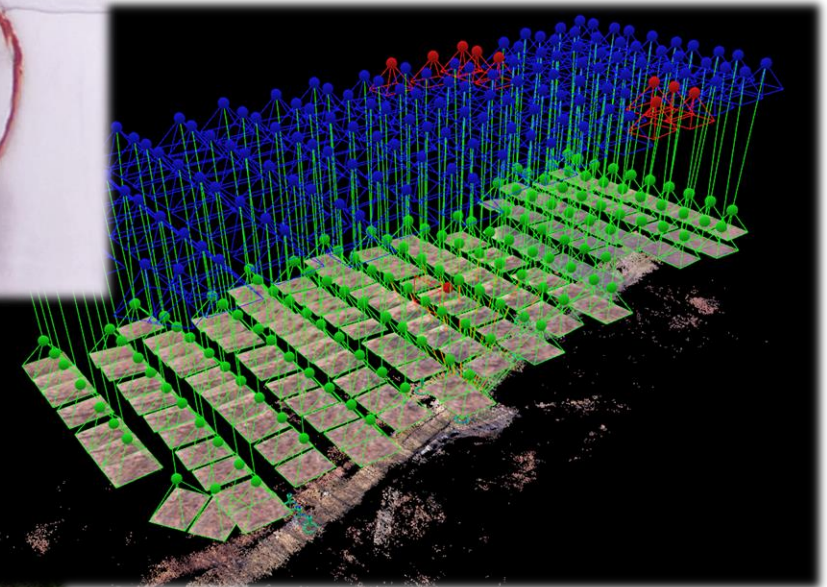
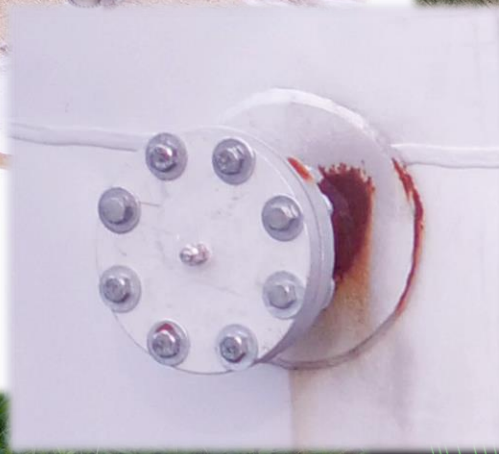
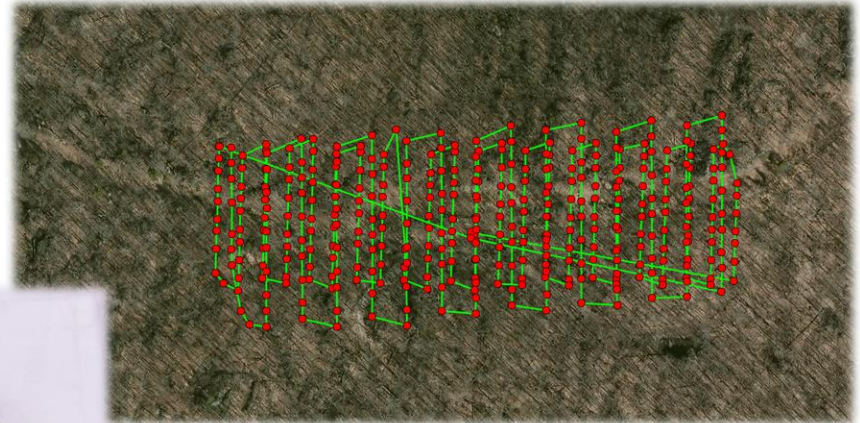
# Pipe Tally - Verifiable, Traceable and Complete (VTC)





# Emerging Technology- UAVs (Drones)

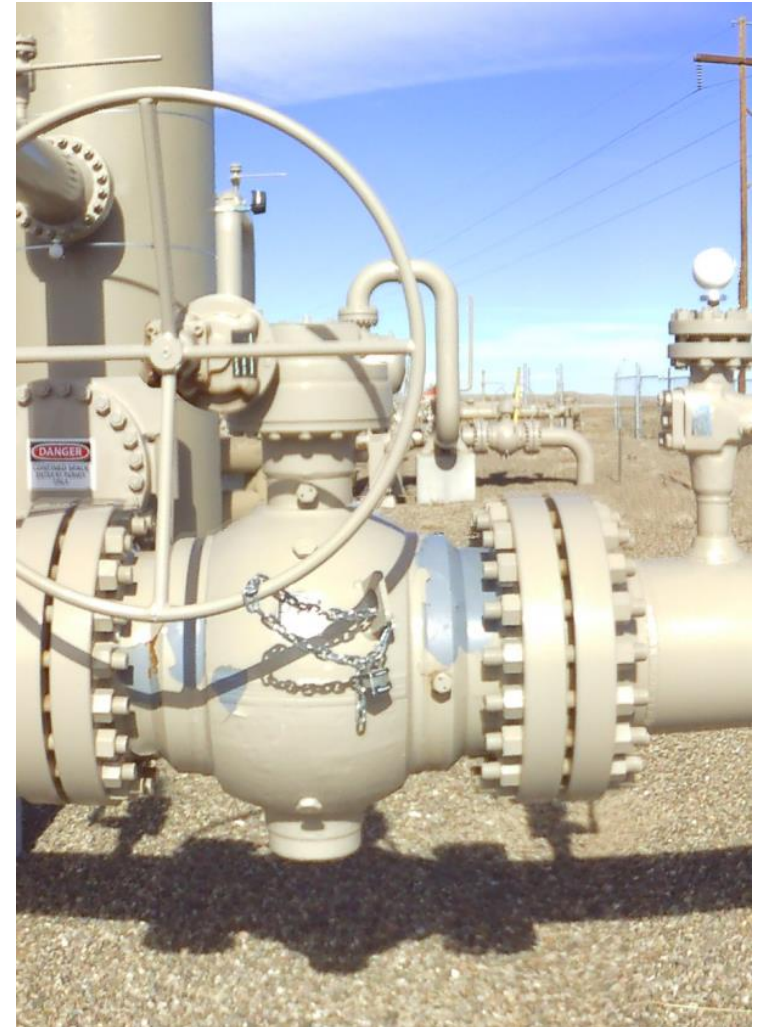
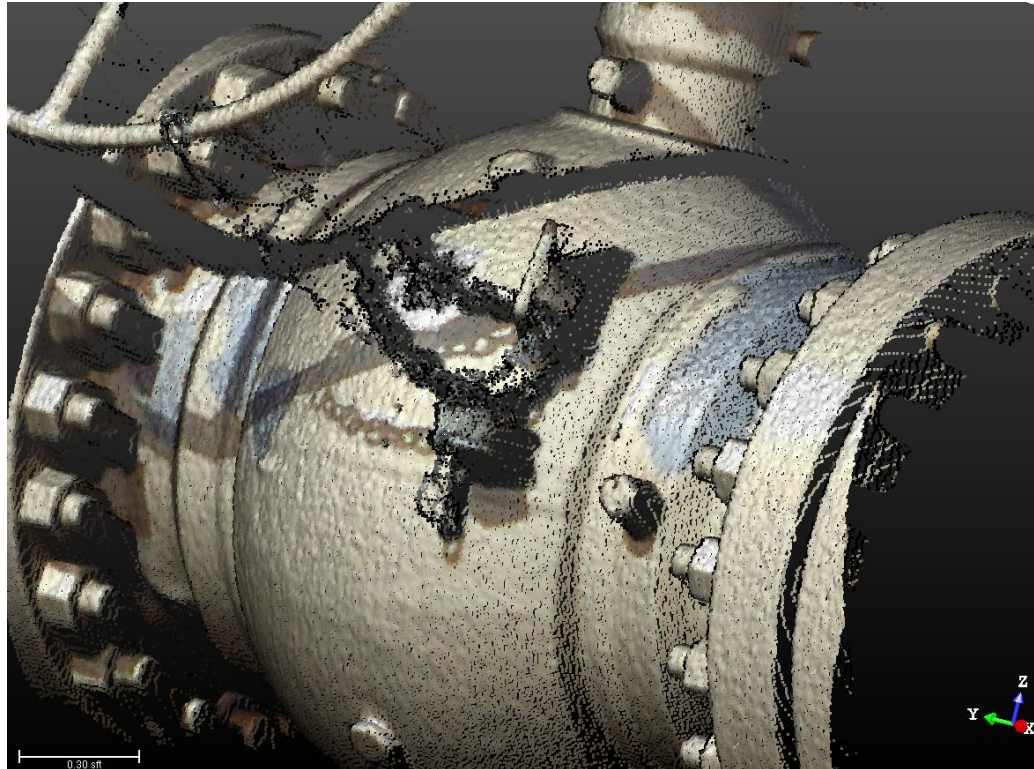
Safe Hi-res Inspections, Survey Controlled, Photo Overlap and Processing





# Asset Management

**Detect Anomalies Such As Coating Defects From Point Cloud Data Sets**





# Emerging Technology- Hydrographic & Waterbody Surveys

Safe, Efficient, and Accurate with a Fast and Easy Deployment



Thank You

Comments and Questions?

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