



VERTICALIMAGES
AERIAL PERSPECTIVE



SURVIA

DRONES - HOW THEY CAN HELP IN INDUSTRIAL FACILITY



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VERTICAL IMAGES

the largest provider of unmanned aircraft services in the Czech Republic

1.000 flight hours / 10.000 take-offs per year, pilot school, UAV sales



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cooperation between Vertical Images and SkyMaps (geodets, image processing specialists)

huge potential to solve industrial inspections, mapping and surveing tasks



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REFRENCES

SIEMENS, CEMEX, LIAPOR, HEXION, CABOT, SKODA AUTO ...



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WHY USE THE RPAS/DRONES

efficiency, flexibility, speed, safety

new options, new solutions



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APPLICATIONS

VERTICAL IMAGES
Aerial Photography & Video
www.verticalimages.com

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Aerial Photography & Video
www.verticalimages.com



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VISUAL INSPECTION

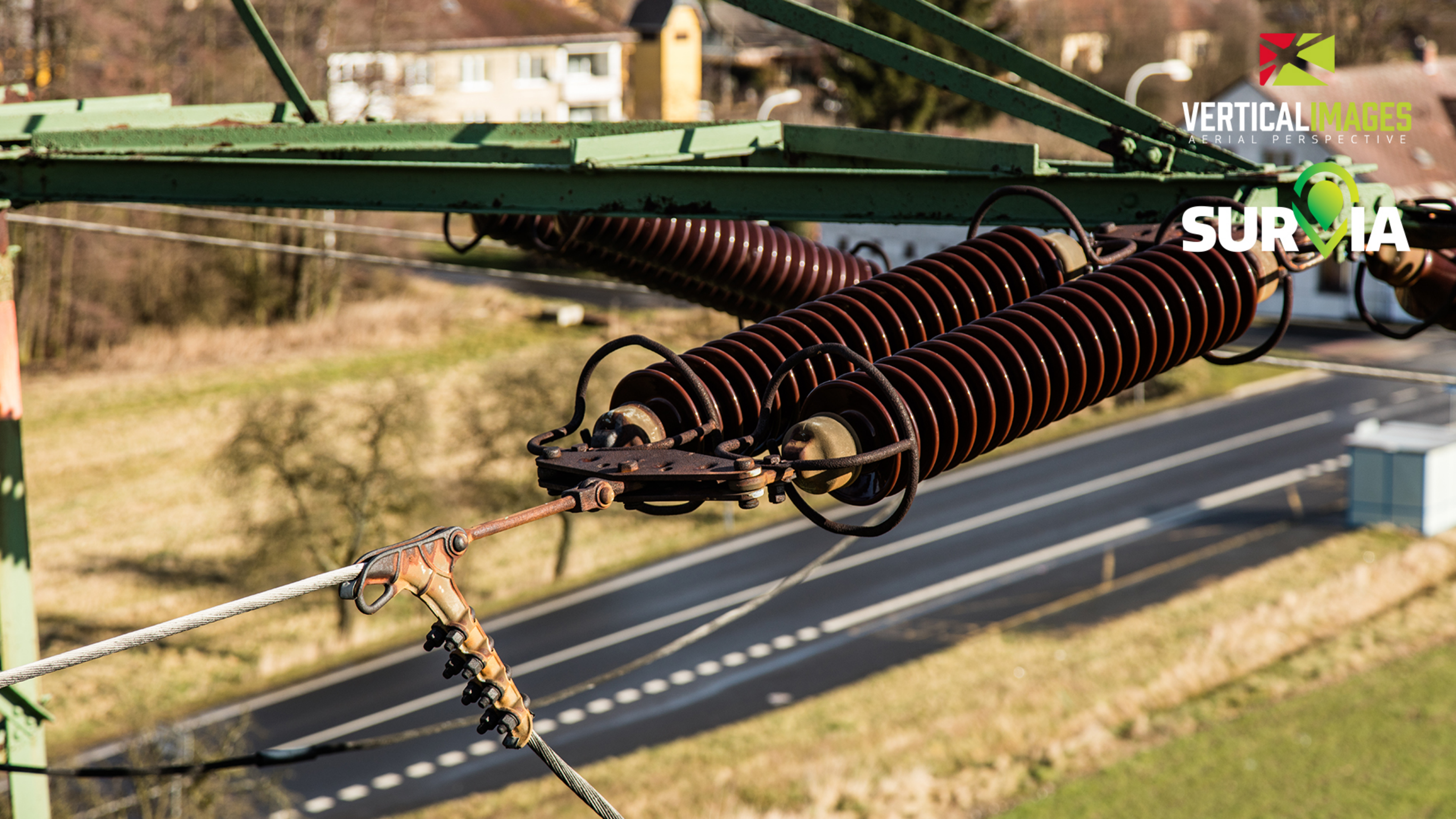
photos and high definition video (photo 50MPx, video 4K)

photos are georeferenced, exact location, map creation and 3D models, measurements



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INFRARED THERMAL IMAGING INSPECTION

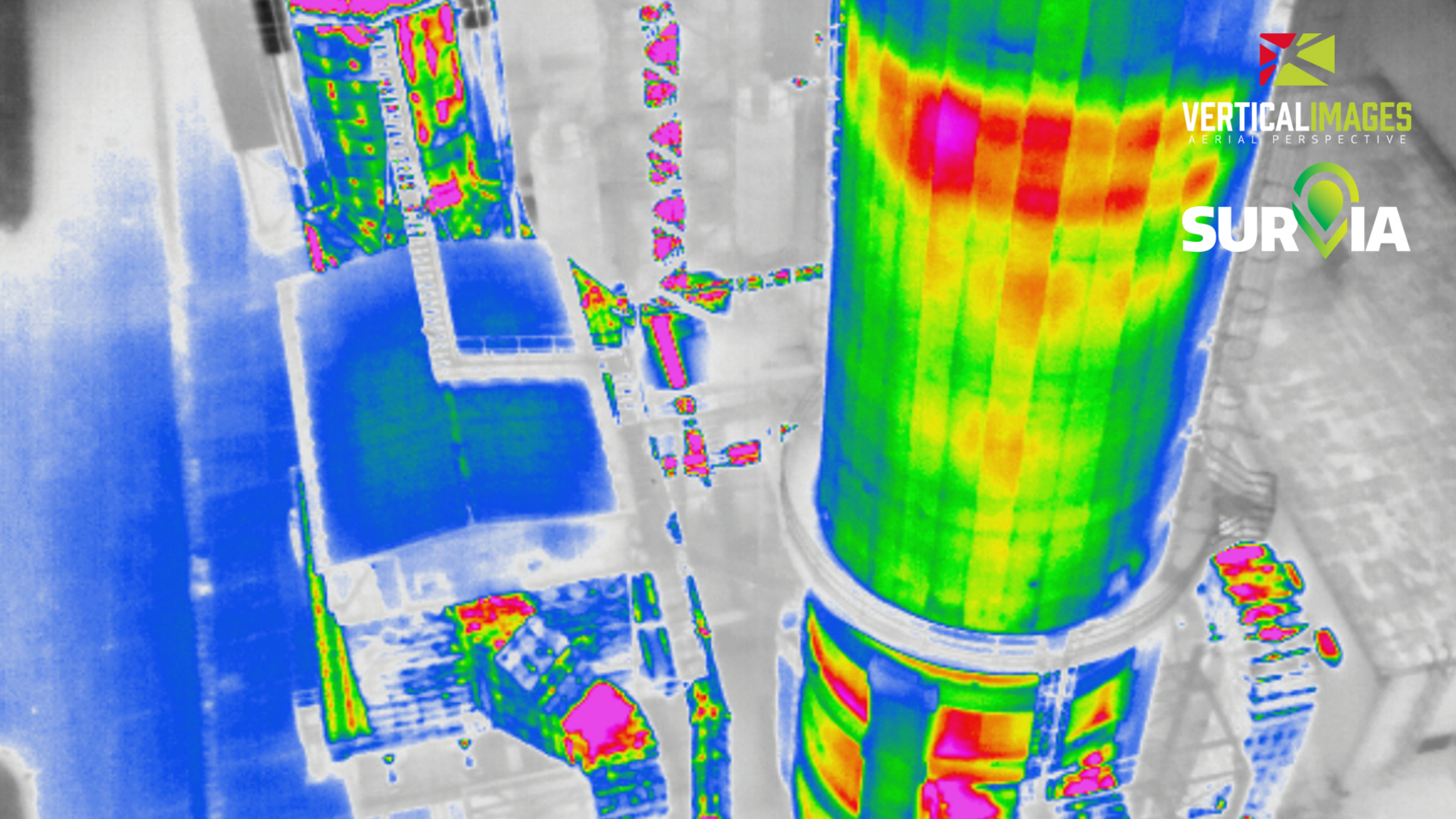
high resolution, full remote control, integrated visual camera, GPS

new applications, maps, 3D models, fully radiometric photos and videos, software



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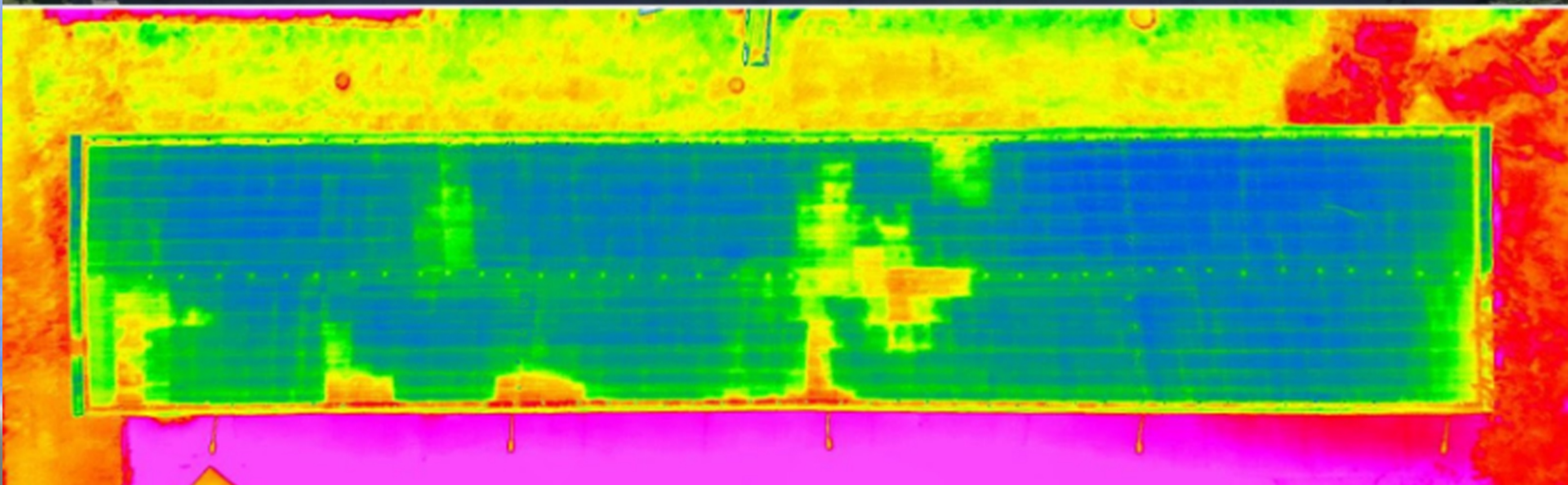
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LASER SCANNING AND PHOTOGRAMMETRY

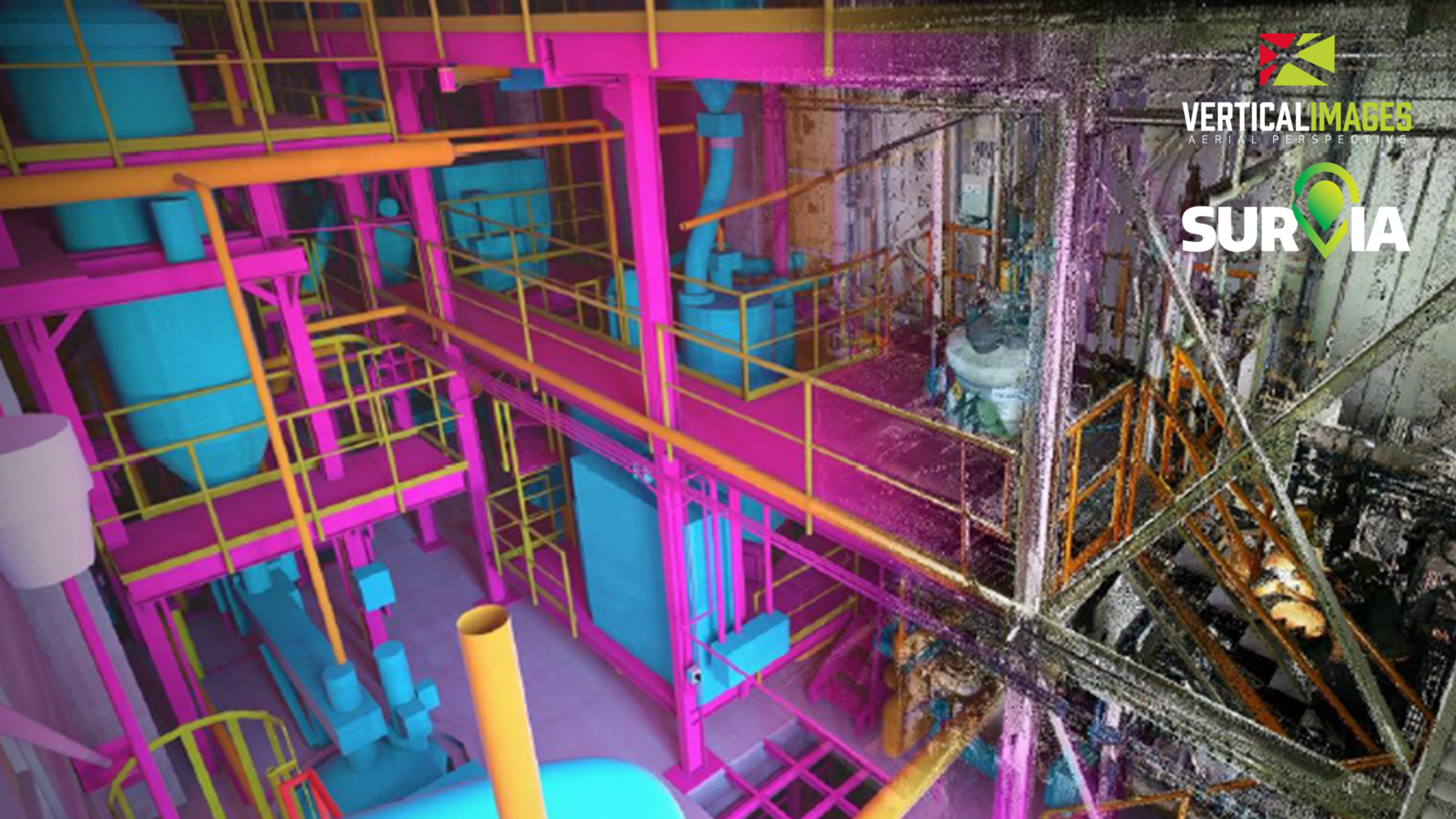
detailed 3D object model, 3D vector draft, 2D vector draft

output for other programs (AUTOCAD, etc.)



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DATA PROCESSING - BASIS OF SUCCESS

flying is not difficult, it is difficult to create data that makes sense and are actionable

georeferencing, specialized software for analyzing, presenting and archiving data

Close file Save Image to proj Save Project Load Project

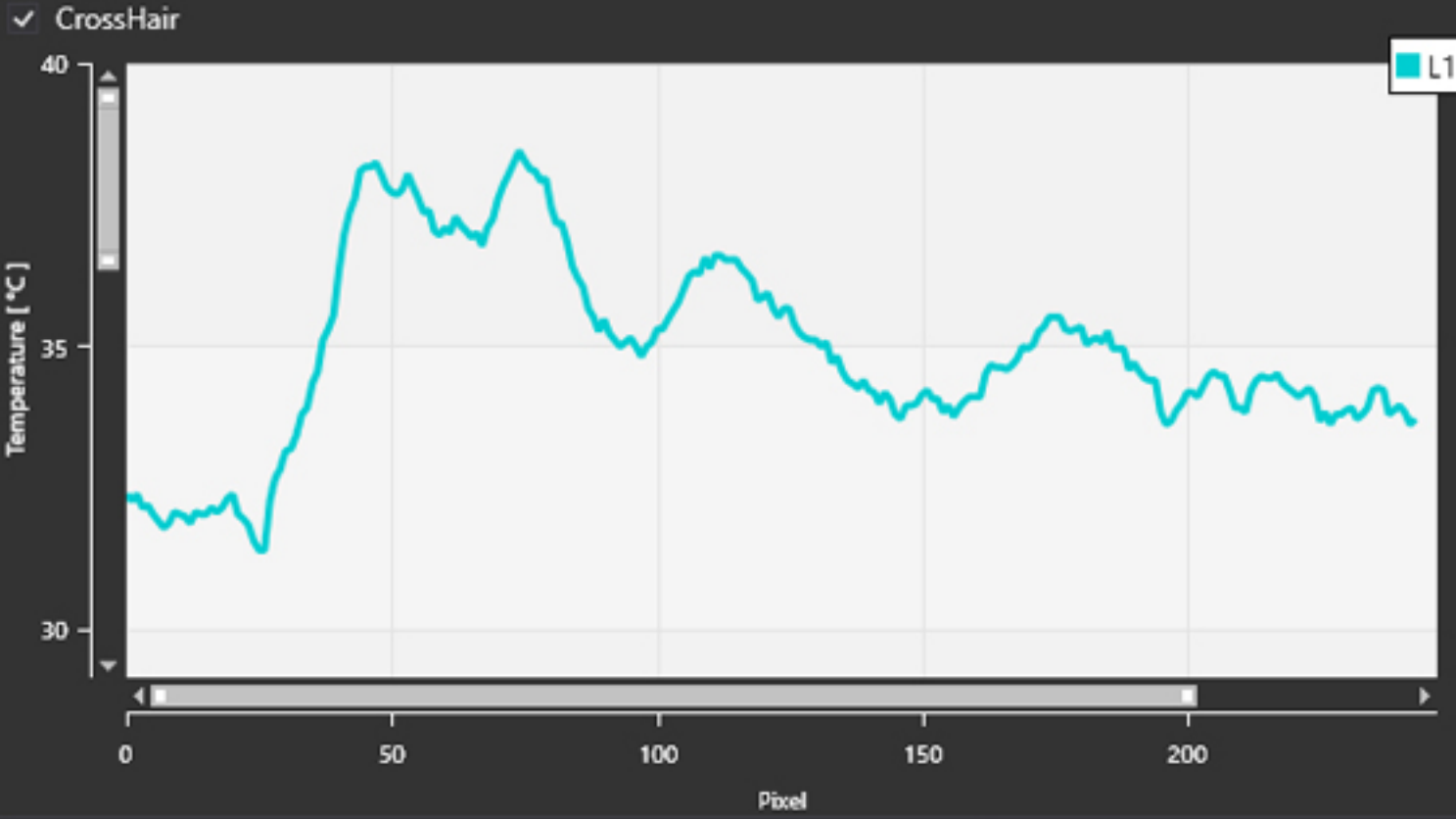
- MyComputer
- Desktop
 - britannia bts
 - KOMINY
 - cemex
 - thermo
 - 13-14-27-421.part01.wseq
 - 13-14-27-421.part02.wseq
 - 13-22-05-595_radiometric.jj
 - 13-22-15-896_radiometric.jj
 - 13-23-11-597_radiometric.jj
 - 13-23-32-181_radiometric.jj
 - 13-24-15-138_radiometric.jj
 - plocha
 - podklady-CEPA
- Documents

1.3x
Fill
100%

Image setup

Palette LoadedPalette
Custom palette Create
Interpolation
Emissivity 0,95
Reflected temperature 20 °C
Advanced settings

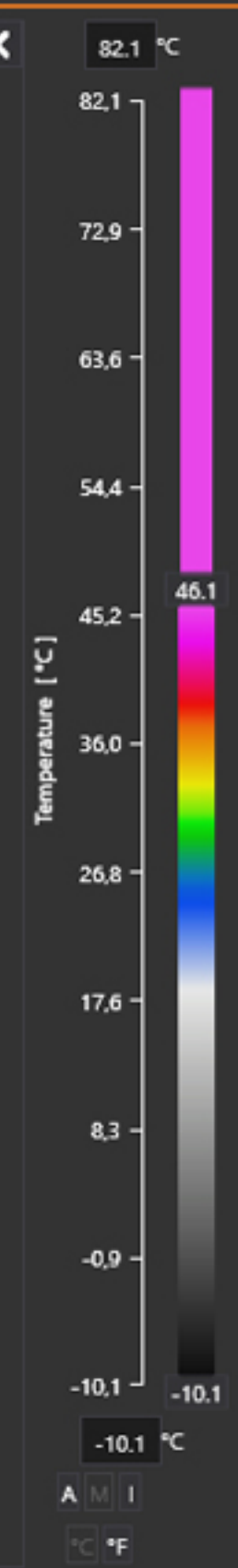
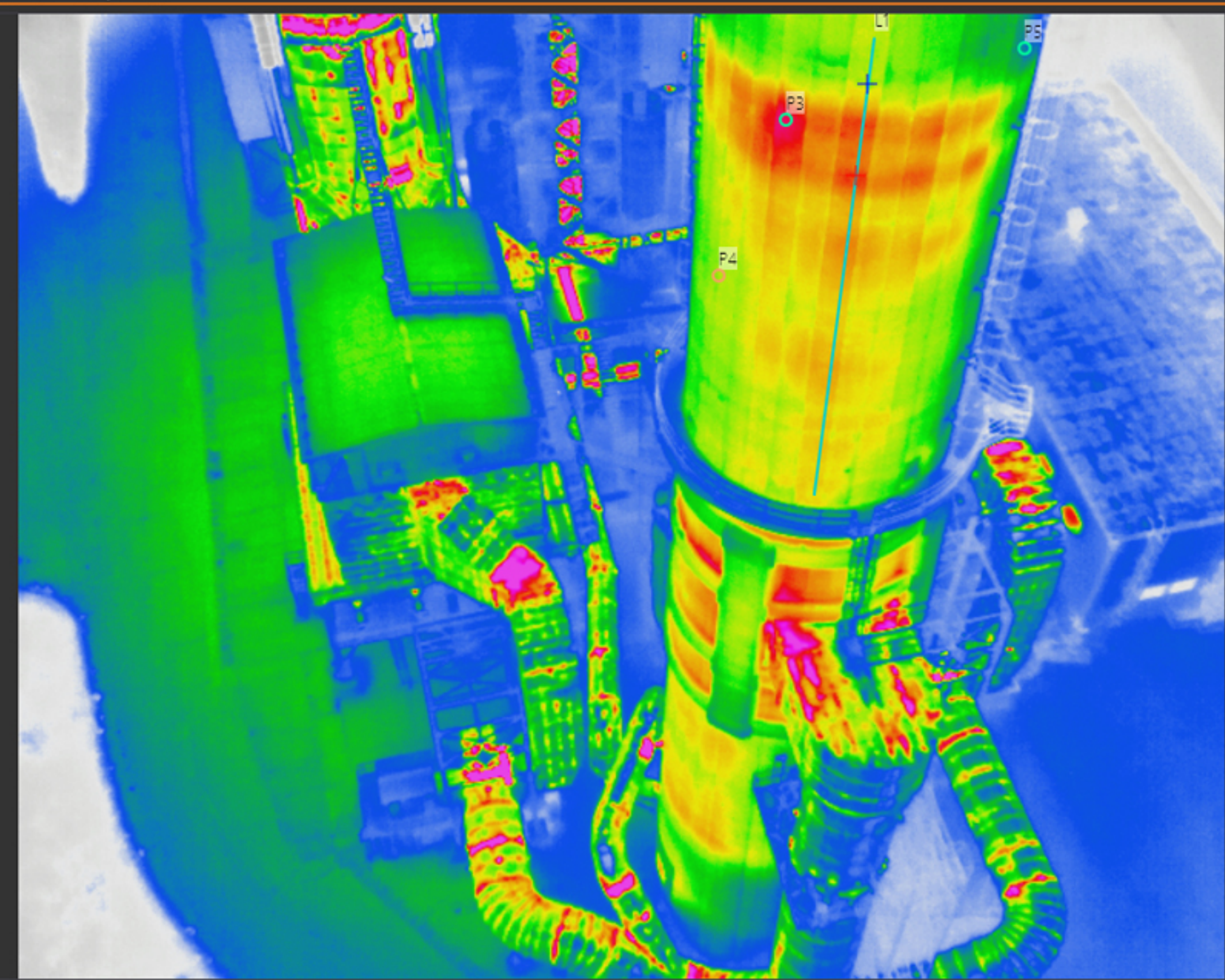
Thermal profile Histogram



Time graphs

CrossHair Relative time Frame skip 1

No ROI selected



ROIs

Name	∅	MAX	MIN	LIM	TP	H	SC
P3		40.6	--	--			
P4		32.2	--	--			
P5		27.0	--	--			
L1		34.9	38.4	31.4			

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Thermolmage

Filename	13-24-15-138_radiometric.jpg
Camera	WIRIS640
Serial number	138316
Capture date	09.08.2016 13:24
Resolution	640x512
Emissivity	0,95
Reflected temperature	20,0°C
Latitude	49.895783
Longitude	15.643566
Altitude	491.9m
Speed	3.8km/h
Track	0°
WIRIS version	1.2.0
Show on map	Copy GPS coordination to Clipboard

Close file Save Image to proj
Save Project Load Project

- MyComputer
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 - 13-14-27-421.part01.wseq
 - 13-14-27-421.part02.wseq
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Image setup

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Custom palette Create

Interpolation ✓

Emissivity 0,95

Reflected temperature 20 °C

Advanced settings

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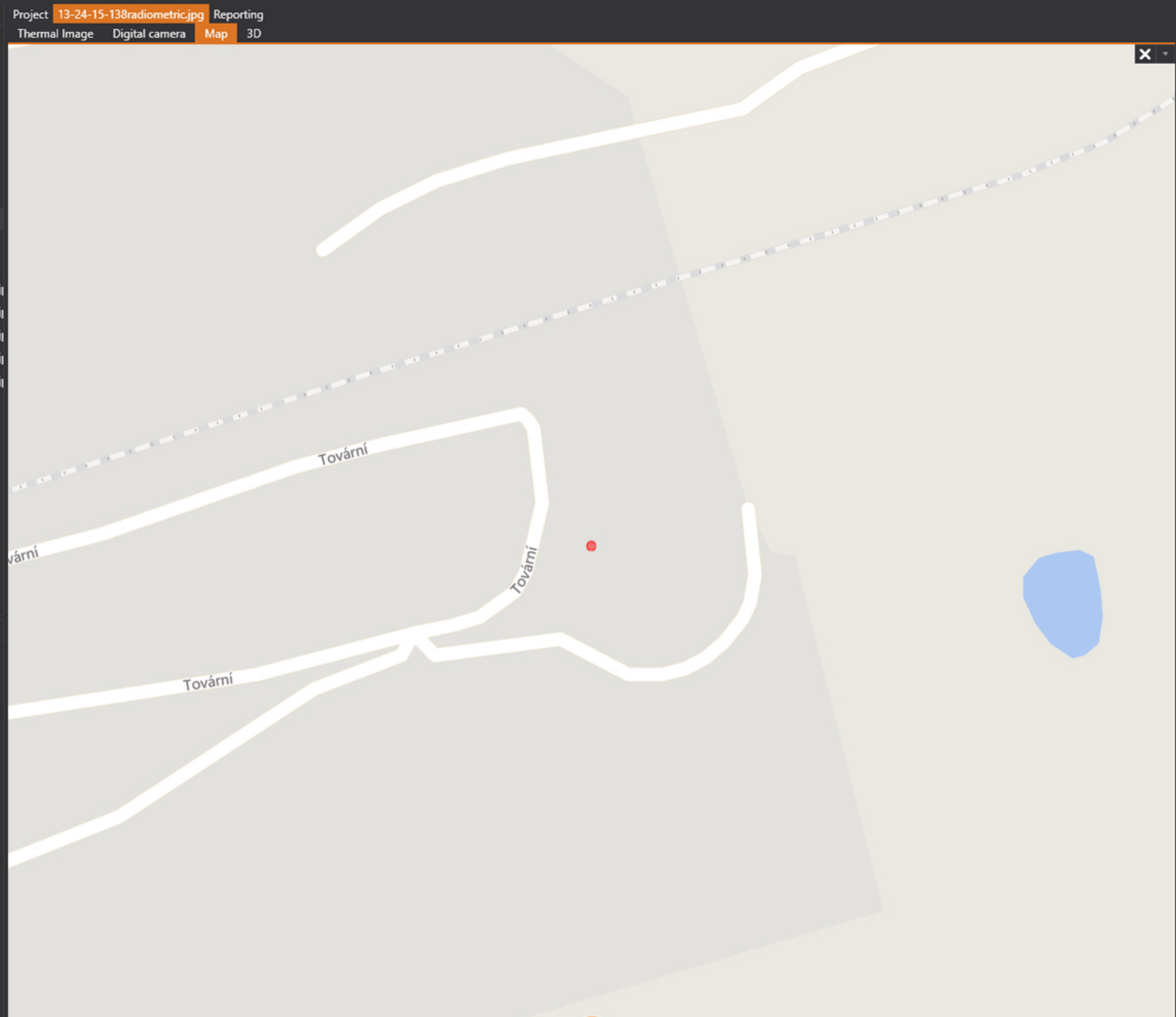
SURVIA

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Thermal camera

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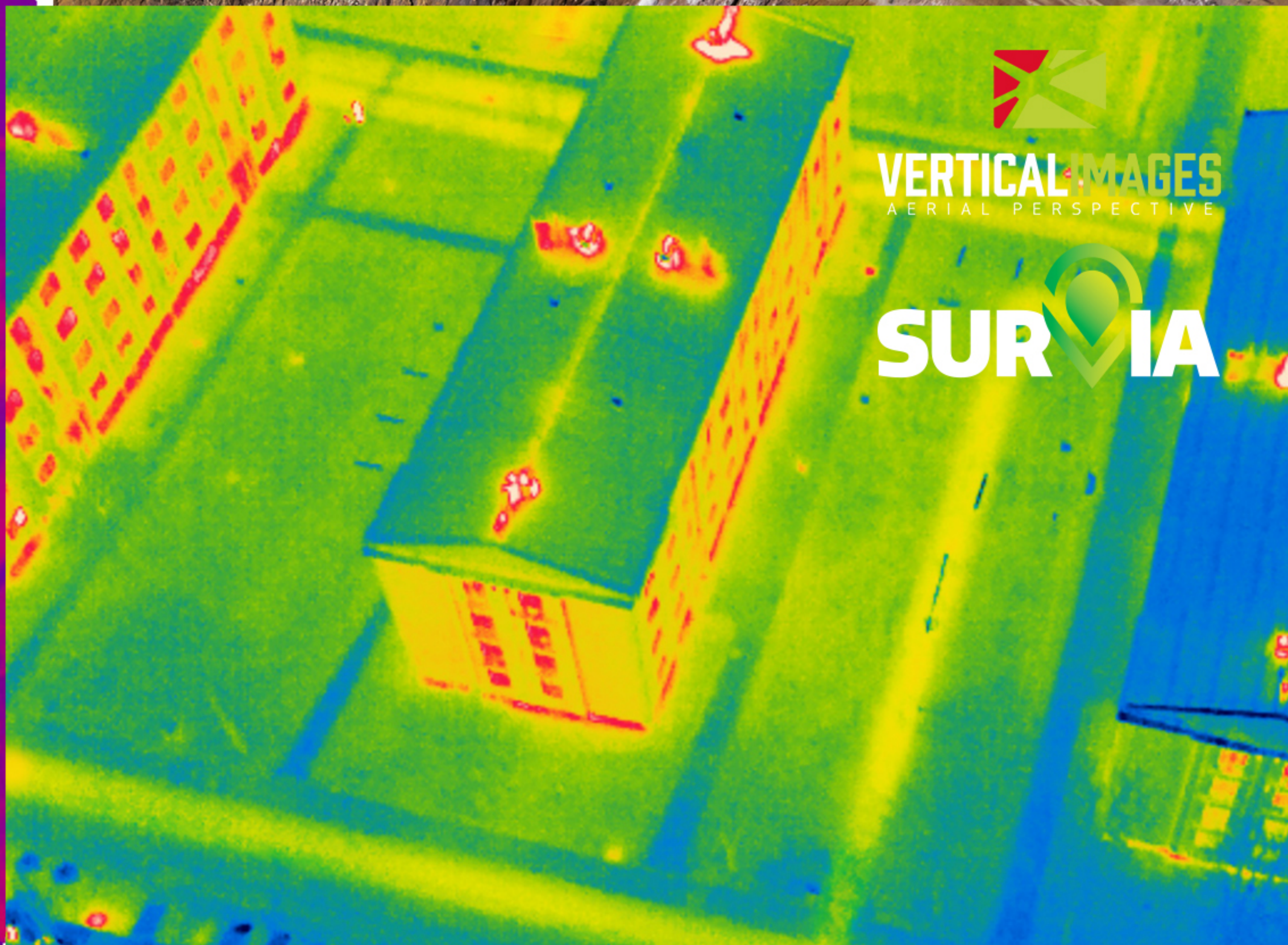
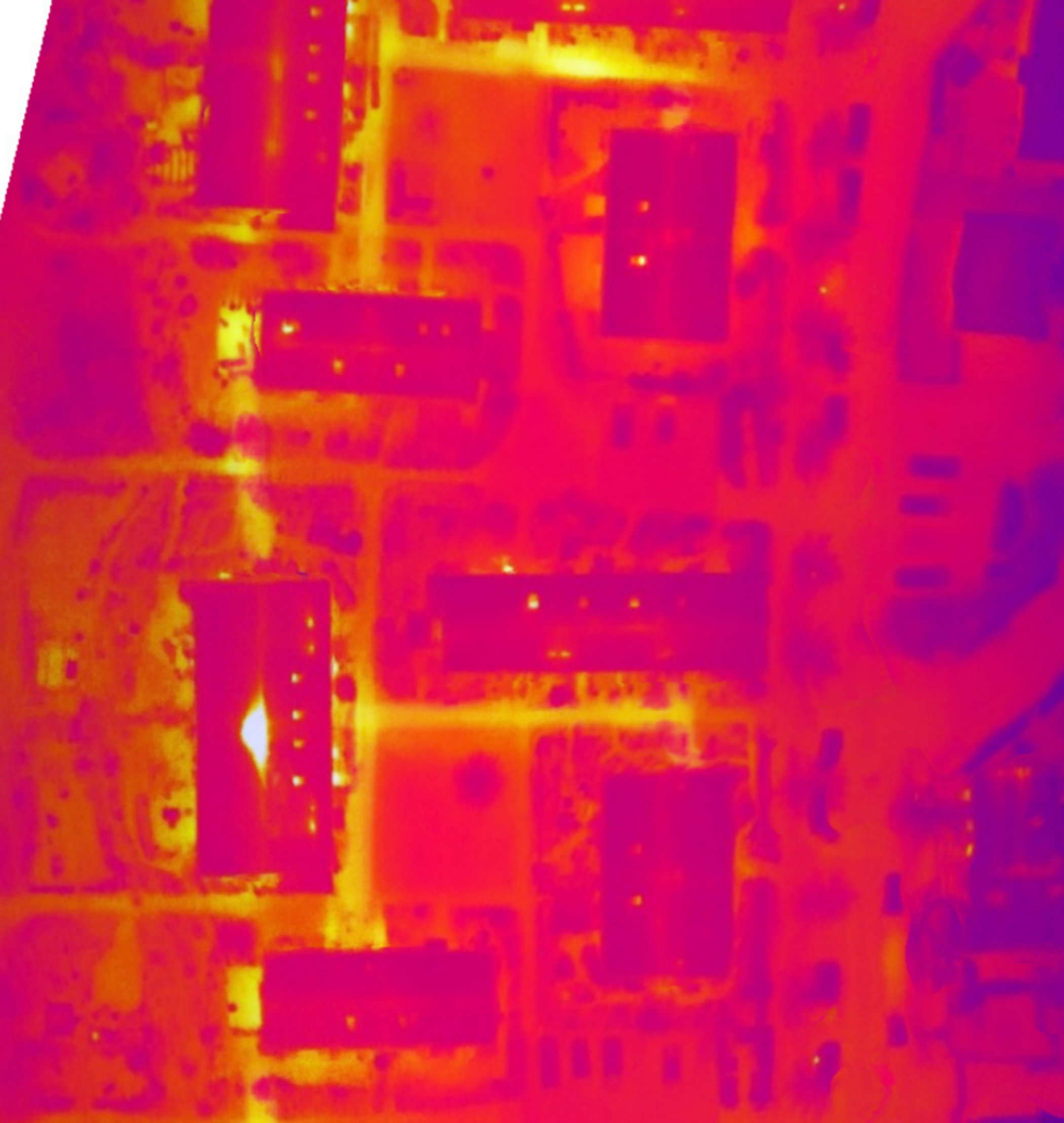


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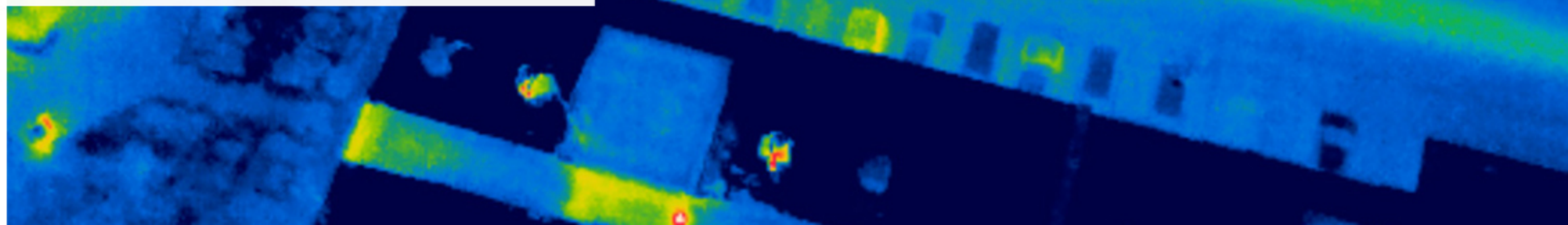
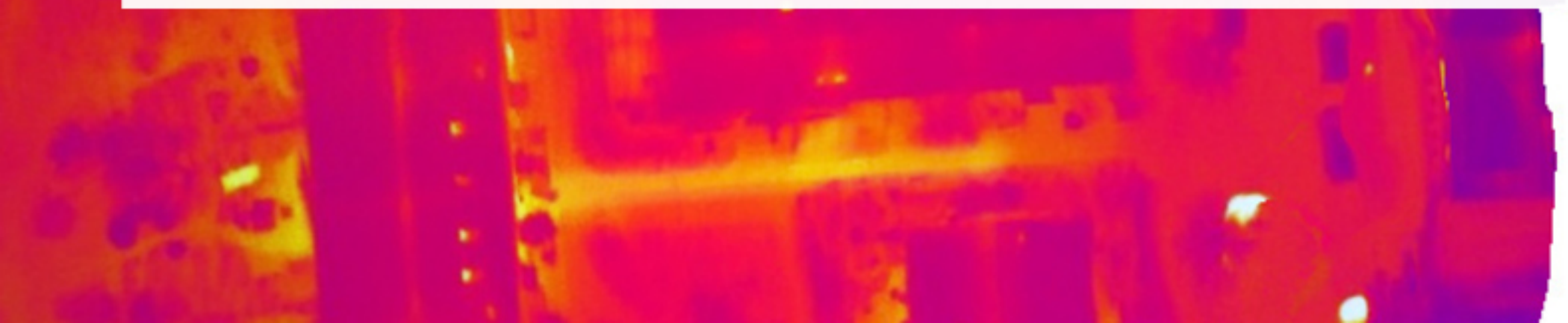
EXAMPLES OF SUCCESSFUL USE OF DRONES



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searching for underground pipelines and their failures

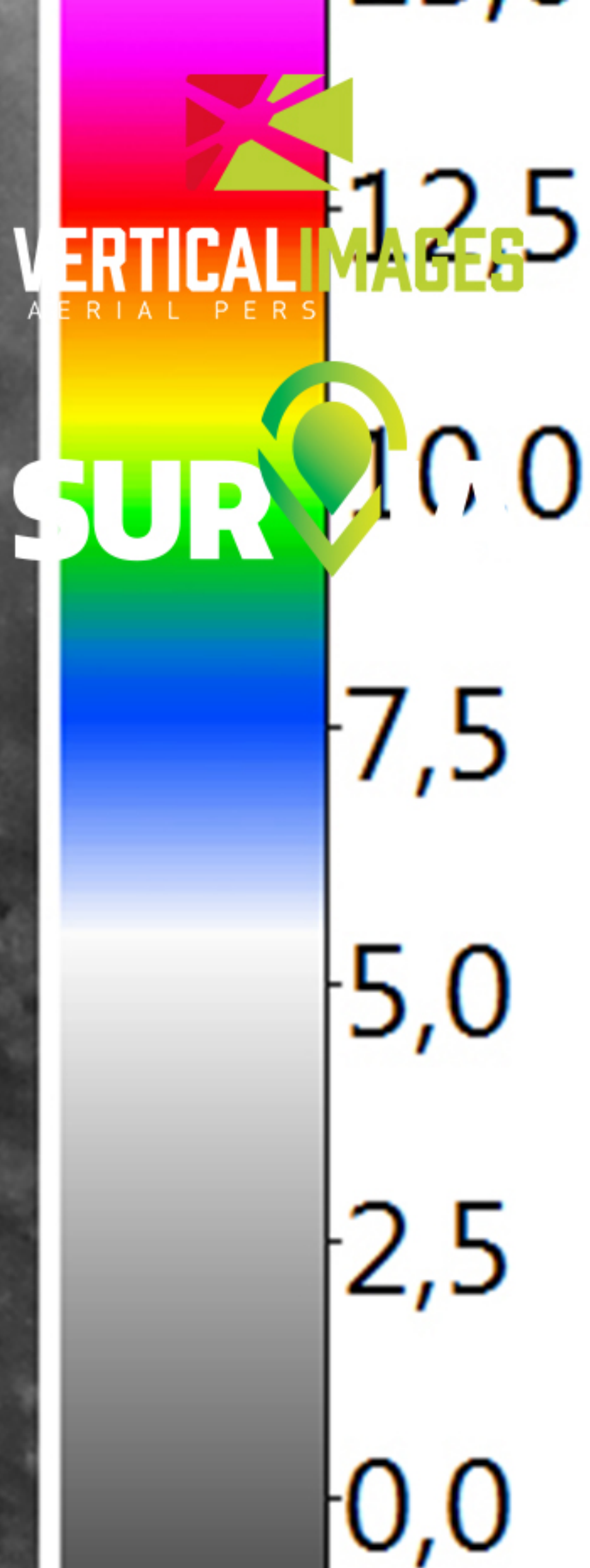




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searching for underground pipelines and their failures



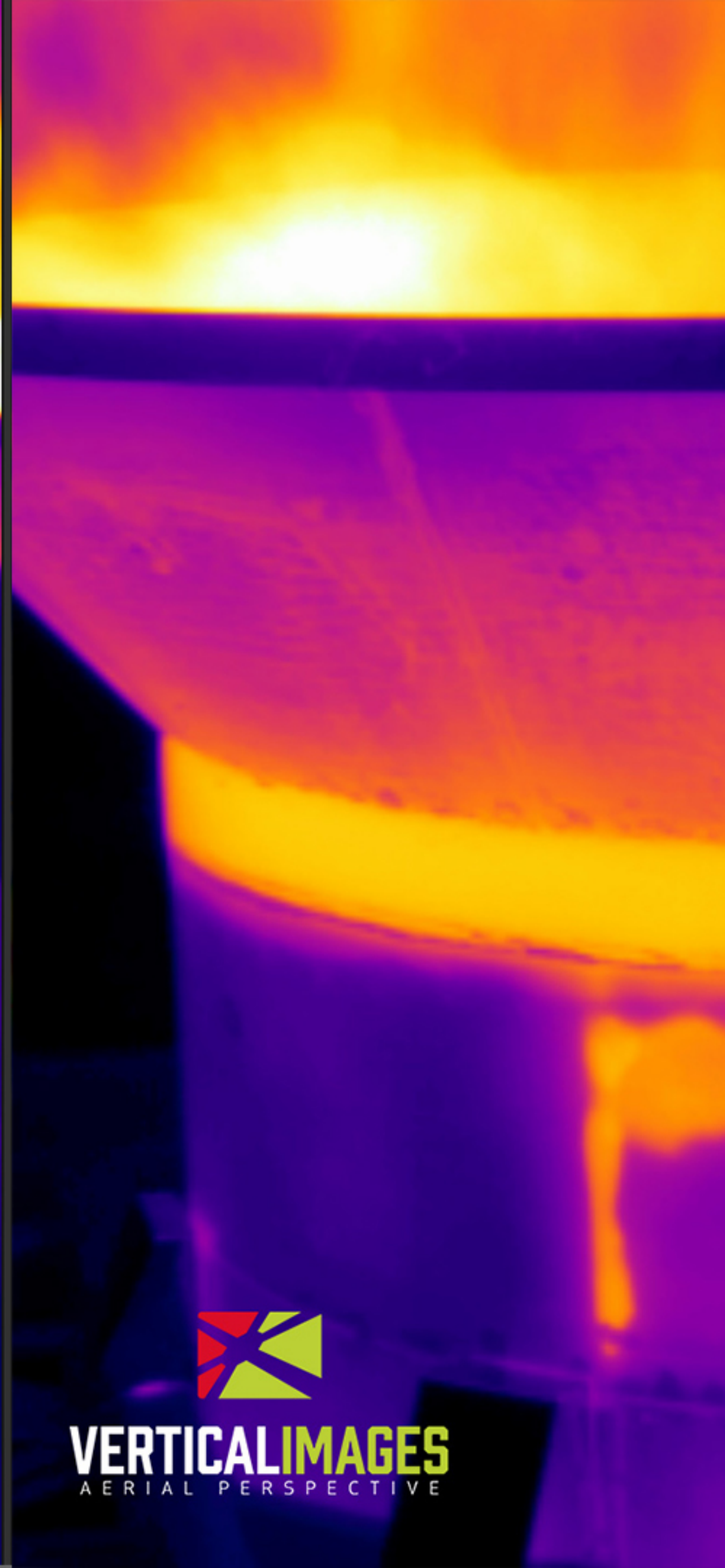
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6,4°C

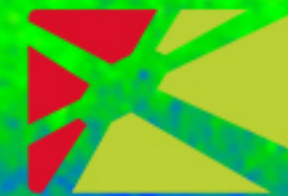
23,1°C

localization of pipeline failures



live flare inspections





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thermal insulation inspections



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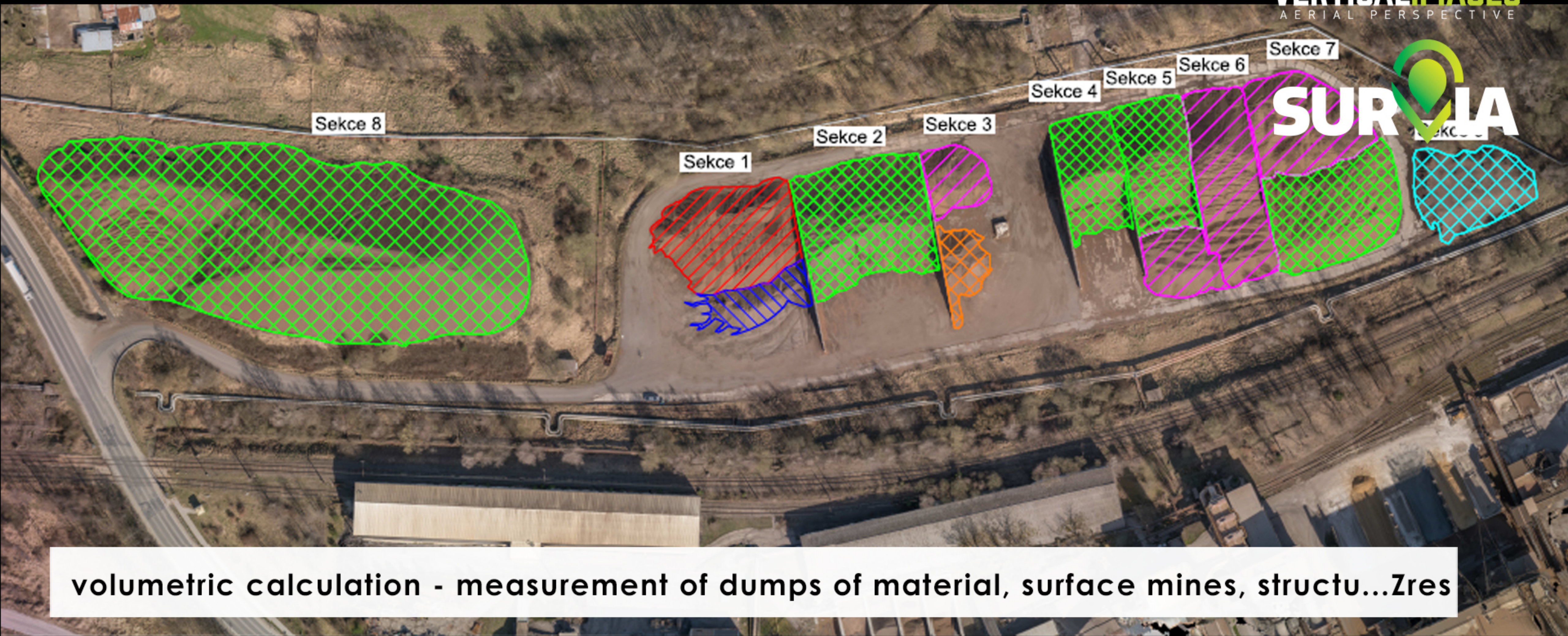
volumetric calculation - measurement of dumps of material, surface mines, structures



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volumetric calculation - measurement of dumps of material, surface mines, structu...Zres



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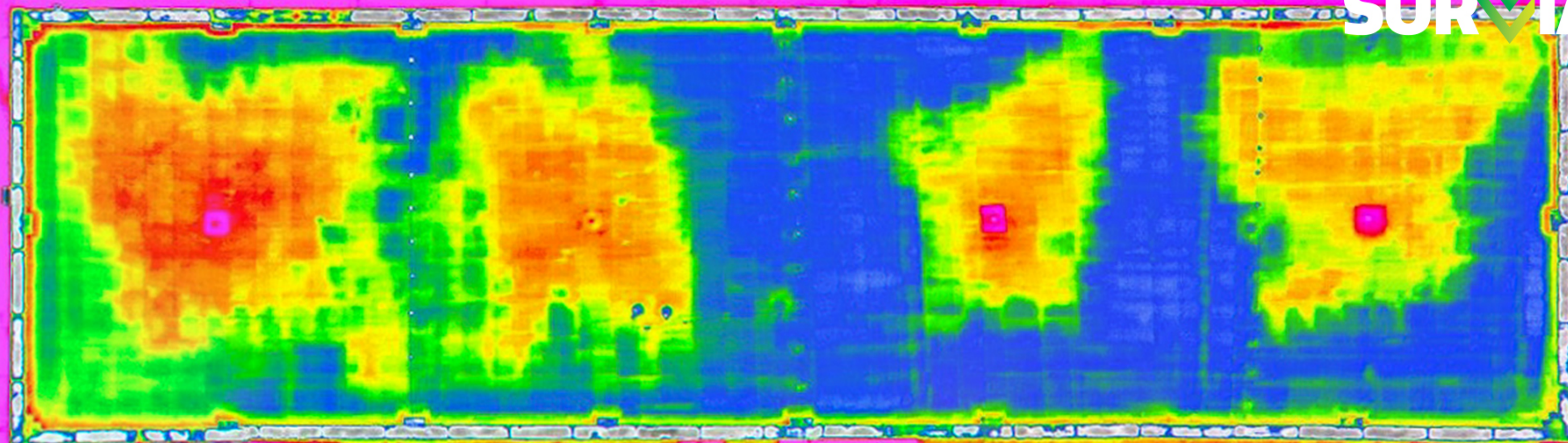
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technology control



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flat roof insulation faults - leakage location



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FUTURE?



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AUTONOMOUS DATA ACQUISITION AND PROCESSING

autonomous flying robots gathering data and processing them into actionable data

automated inspections, automated inventory control, automated facility protection...



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THANK YOU FOR YOUR ATTENTION

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www.verticalimages.cz, www.survia.cz