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Lethbridge



## Vulcan County Missing Graves Project Deliverables

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# Where did this all start?

- Graves can go unmarked for any number of reasons:
  - Markers can be lost to time or damaged and not replaced.
  - Records can be lost.
  - Old maps can become damaged or misplaced or just be inaccurate.
  - Sometimes people were buried without anyone recording the event.
- It seems odd in our time, but was not uncommon in the past.





# First Contact



Can Remote Sensing technology provide a solution?



Research can't guarantee results.



Students benefit from real world experience.



Everyone likes to spend time in graveyards at 4 am...right?



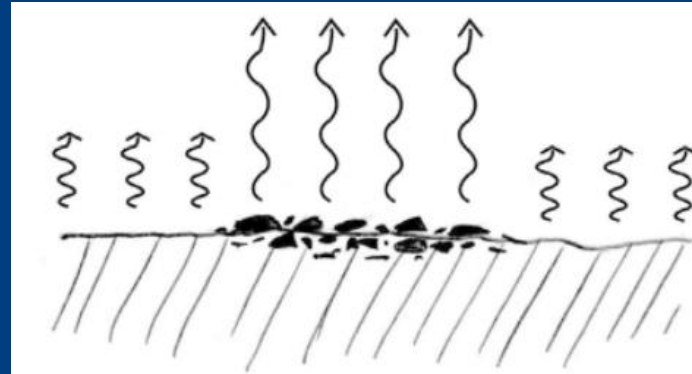
## Why might this work?

- Earth surface materials can absorb and re-radiate energy at different rates.
  - Asphalt is hotter than grass in the summer.
  - Rock is colder than soil in the morning – but warmer in the afternoon.
  - Disturbed soil can also show thermal differences.

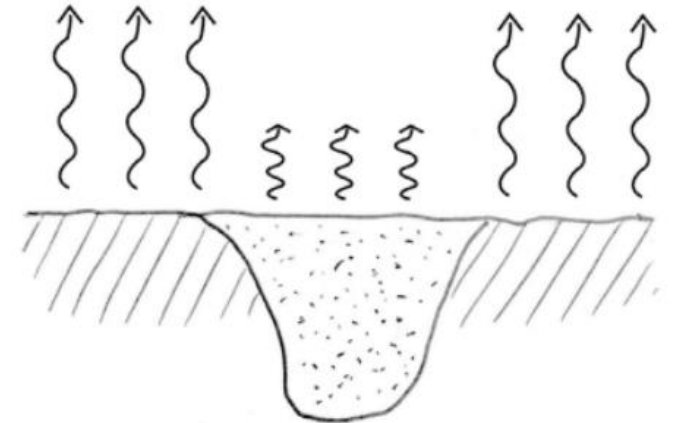


# Existing Archaeological Research

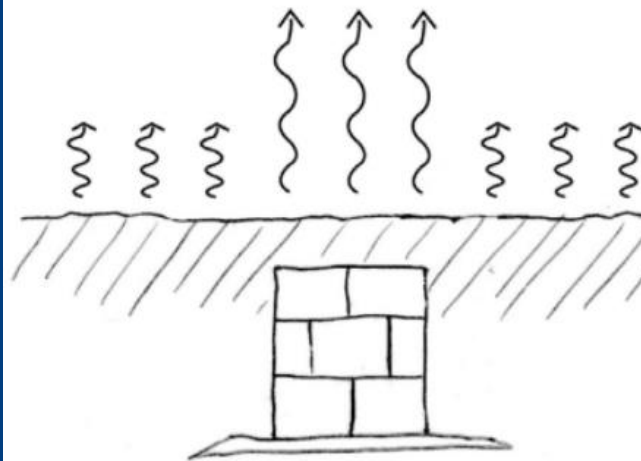
- Ongoing PhD research of Tammi Mills
- Looking for buried archeological features.



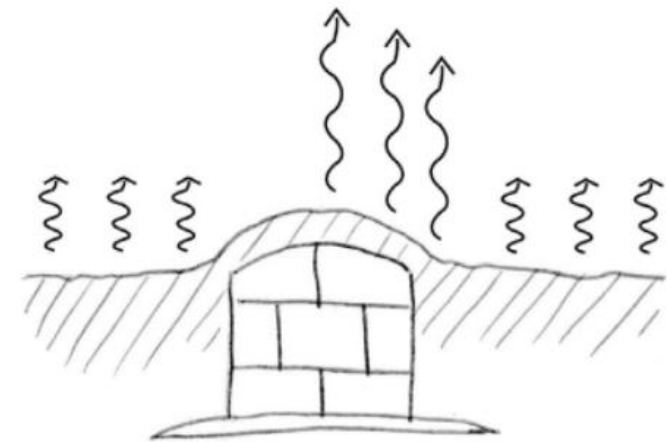
a. Concentrations of artifacts



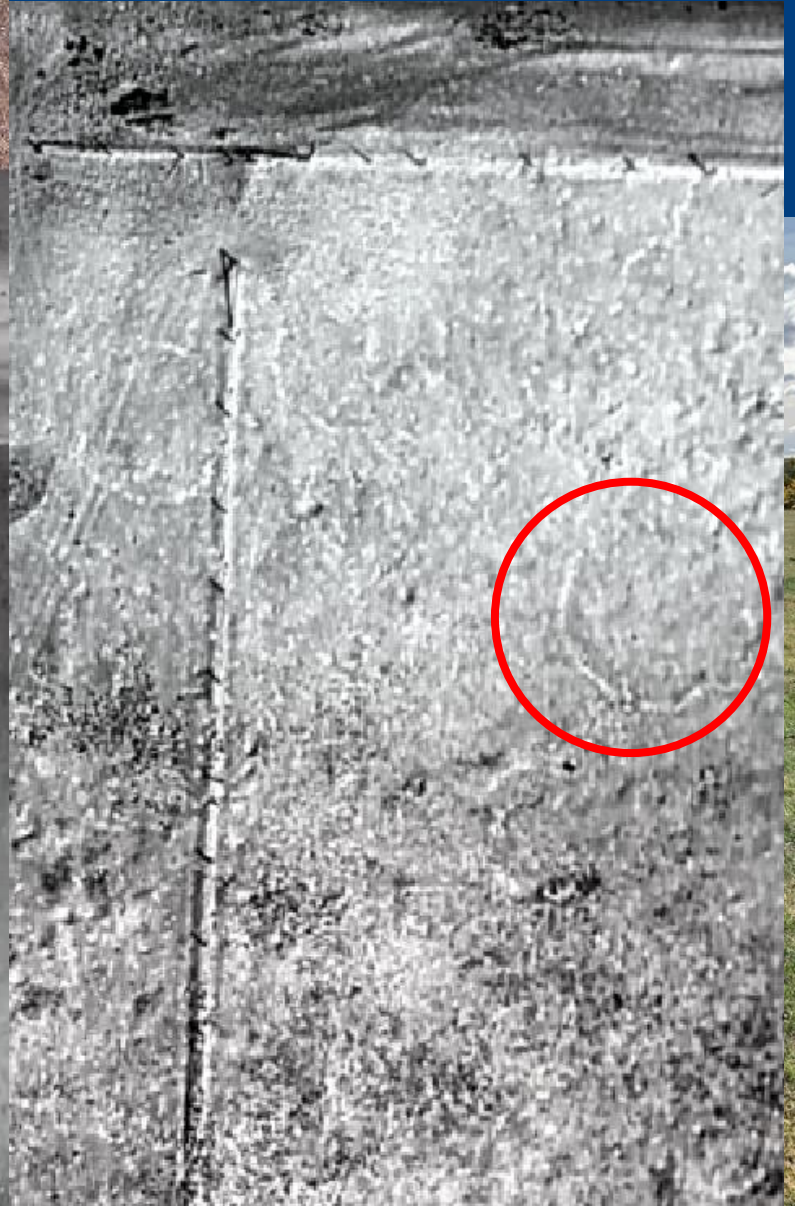
b. Pits, ditches, and earthworks



c. Subsurface architecture



d. Subtle topographic features



# Thermal Survey



# We're going to try...we don't know if it will work!

- Image in the morning and afternoon.
- Try to cover as many cemeteries as possible.
- Hire a student.

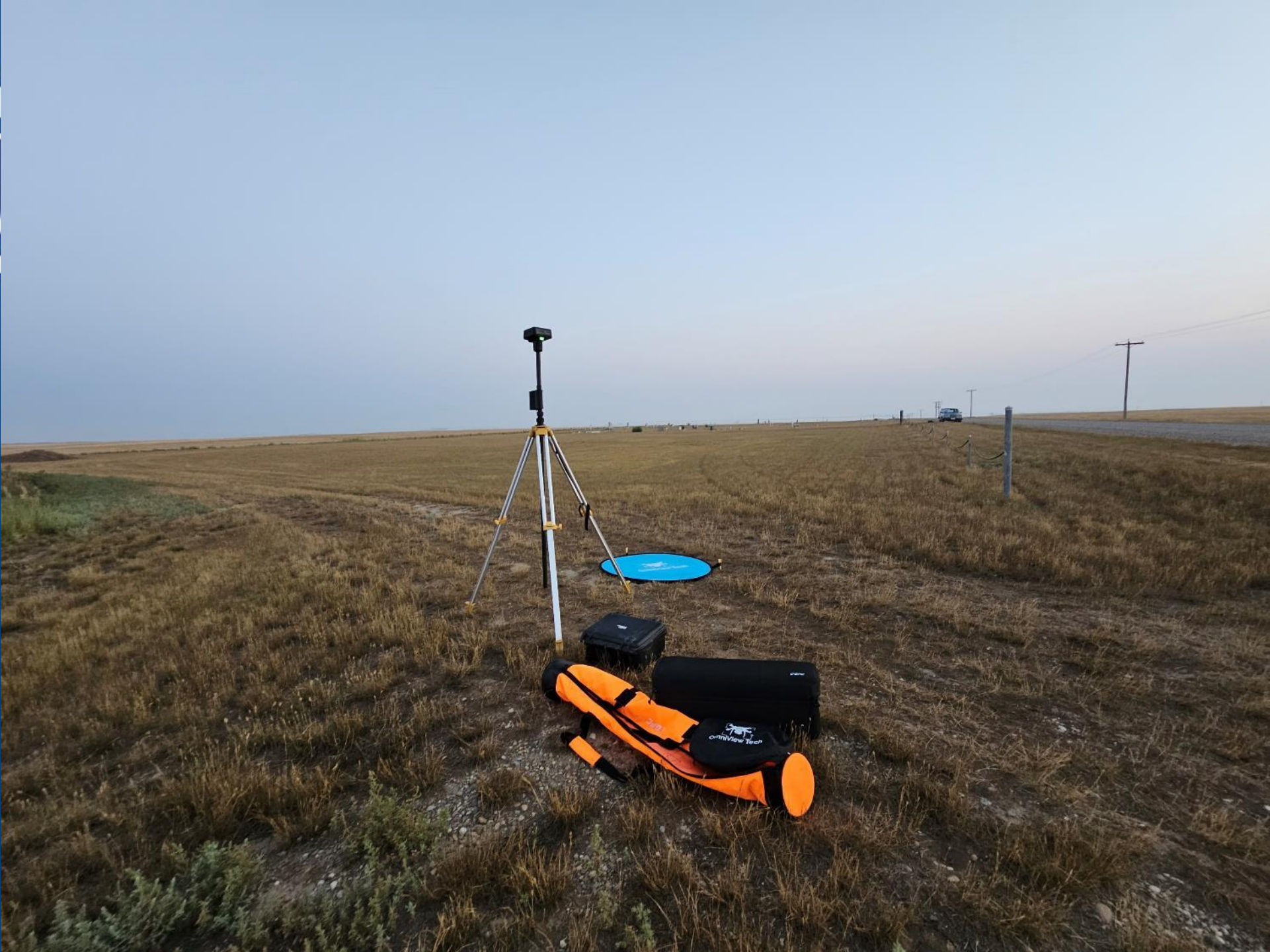


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


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Each cemetery will have a map showing the empty, marked and unmarked graves.



### Legend

-  Empty
-  Marked
-  Marked Unnamed
-  Unmarked

“???” means that the name is unknown





Travers cemetery.  
Sometimes the  
graves don't  
match the grid.

“Suspected”  
graves are added.  
Locations of  
graves from  
thermal and  
terrain analysis.  
They don't have  
any matching  
records.

N  
0 5 10 Meters  
Paul Brown, Ohio College  
University of South Florida  
Perkalian County  
Legend  
Travers Cemetery

Travers Cemetery North Section  
WIP Map



N  
0 5 10 Meters  
Paul Brown, Ohio College  
University of South Florida  
Perkalian County  
Legend  
Travers Cemetery

Travers Cemetery North Section  
WIP Map

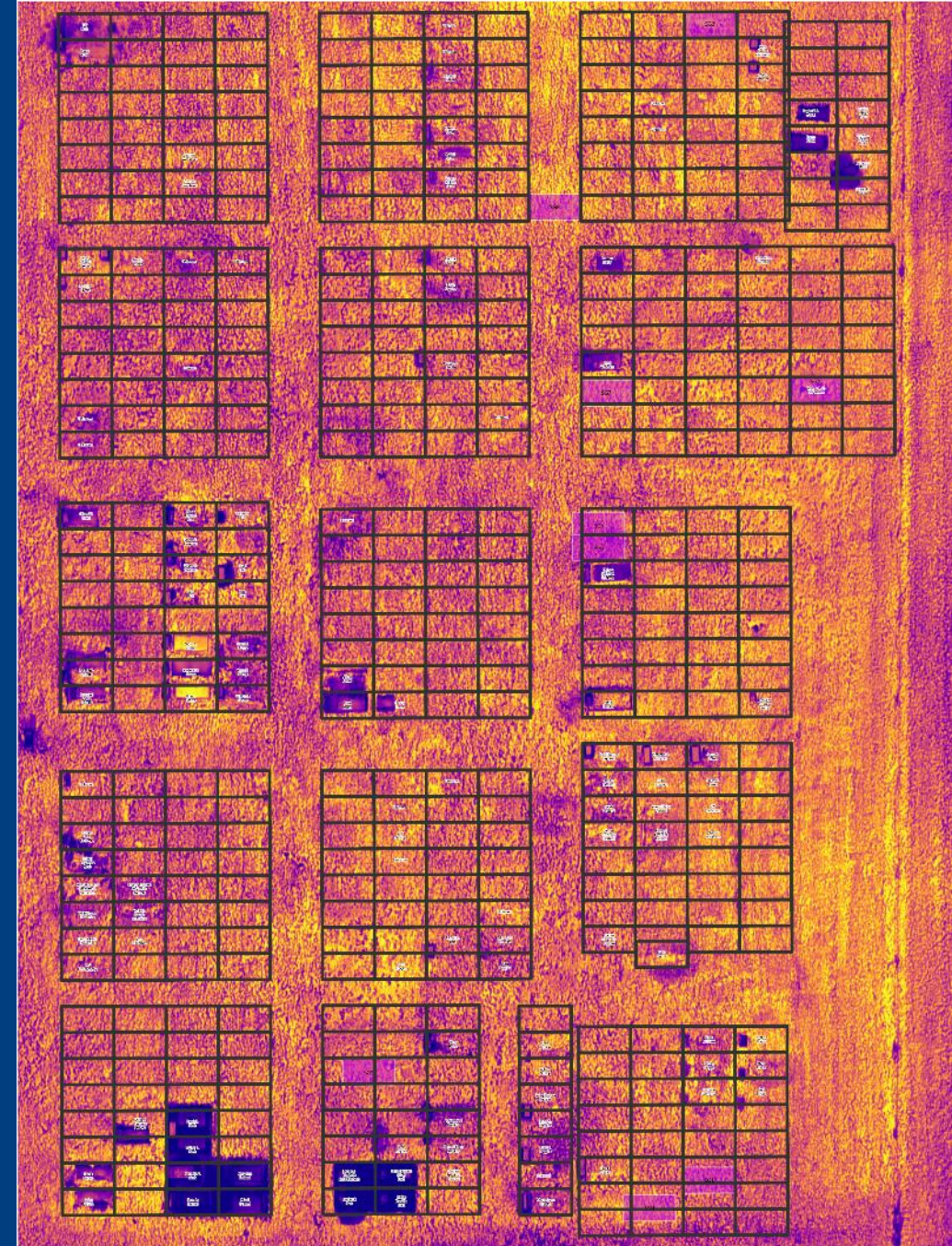


Travers Cemetery North Section  
WIP DTM

Legend  
 Travers Cemetery

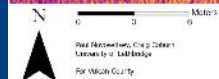
Digital Terrain  
Model (DTM)  
(left) and thermal  
(right) products.

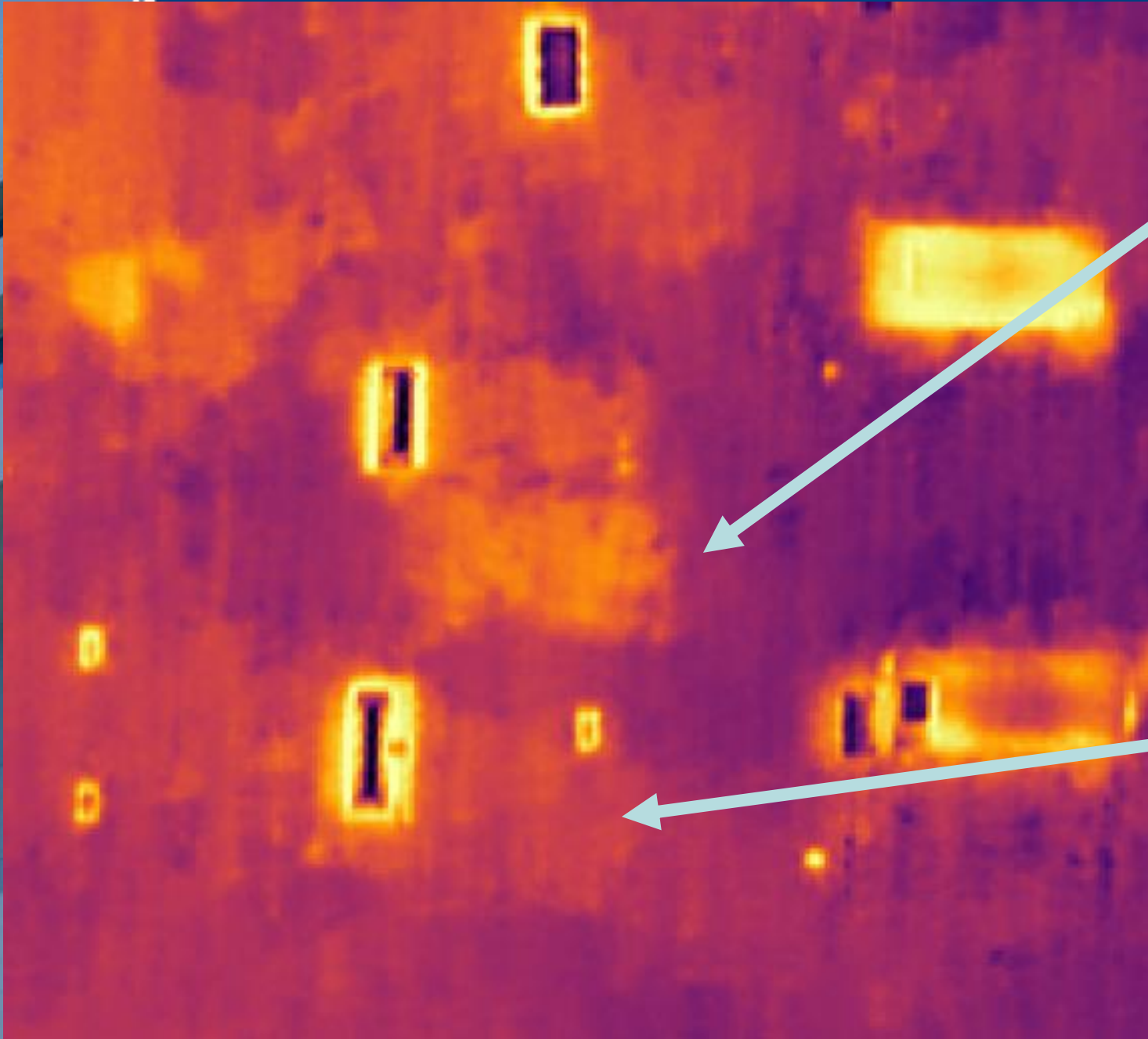
These are not  
definitive and  
would require  
other techniques  
outside the  
scope of this  
project to be  
sure.



Travers Cemetery North Section  
WIP Thermal Orthoimage

Legend  
 Travers Cemetery





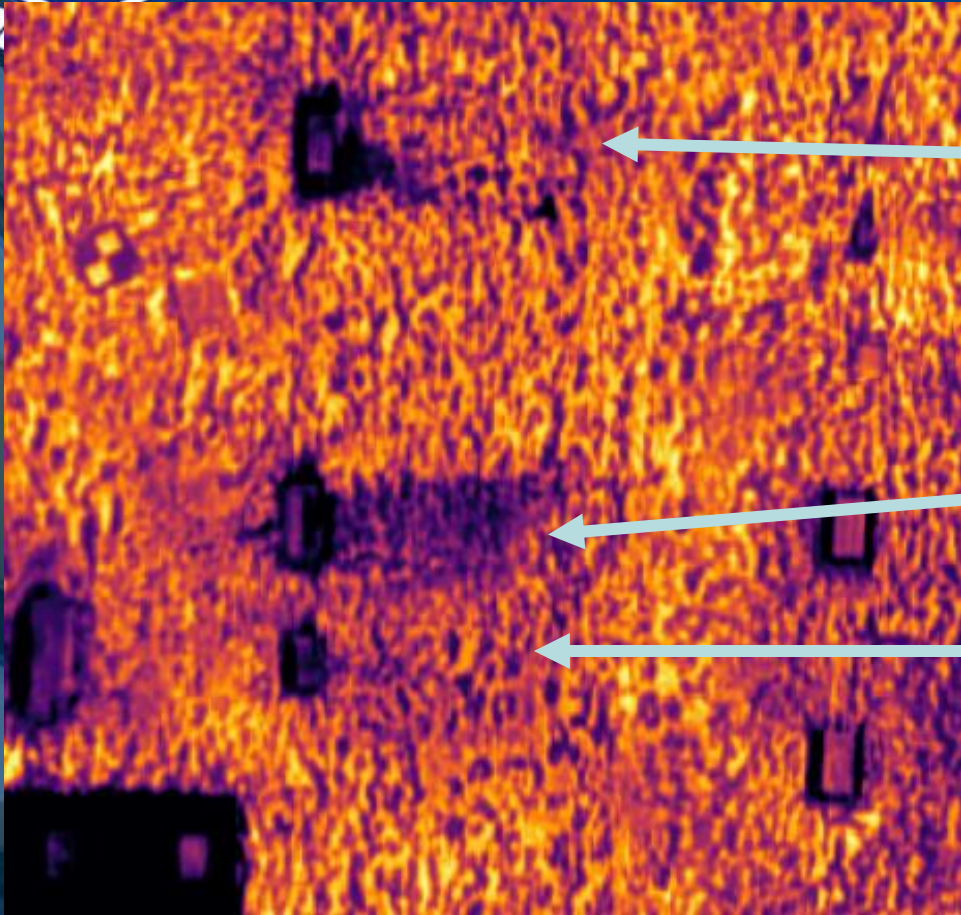
**Some non-concrete graves are easily visible in the thermal**

- These graves are usually more recent.

**Others are not as visible.**



# We are trying to estimate maximum age of graves visible in thermal



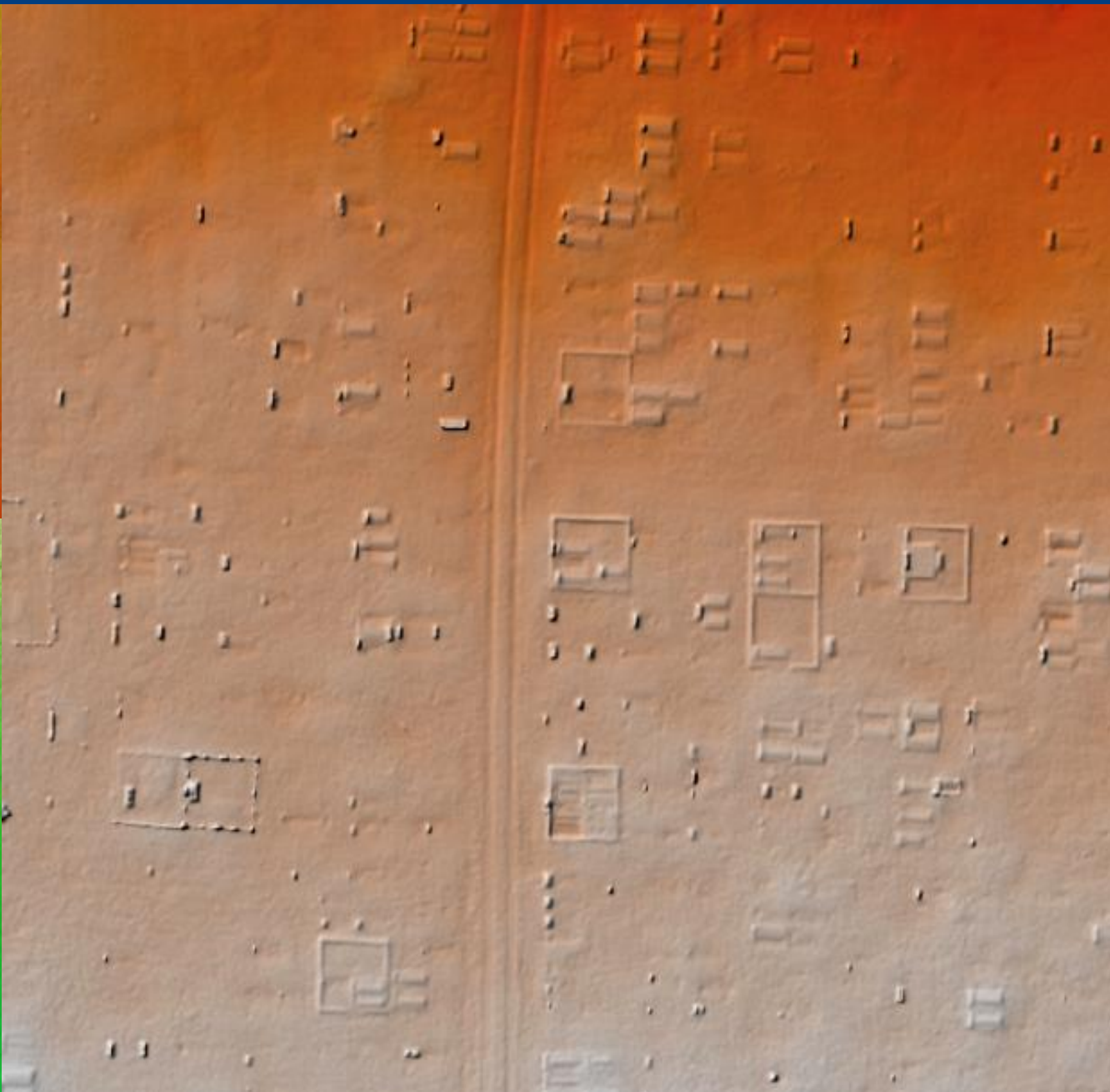
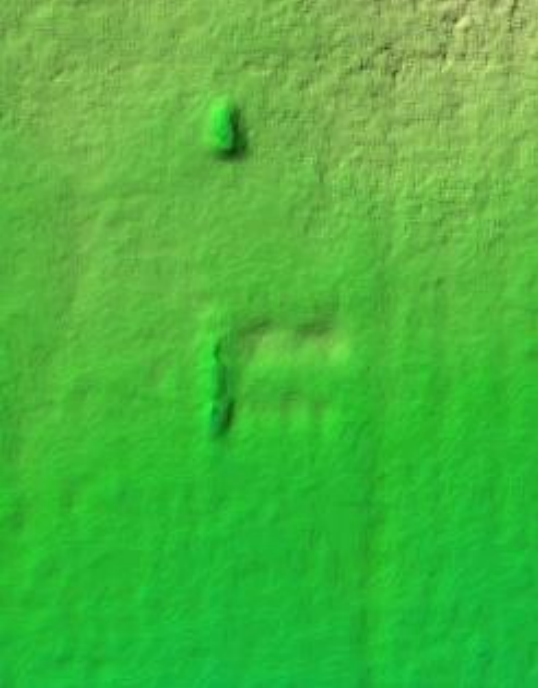
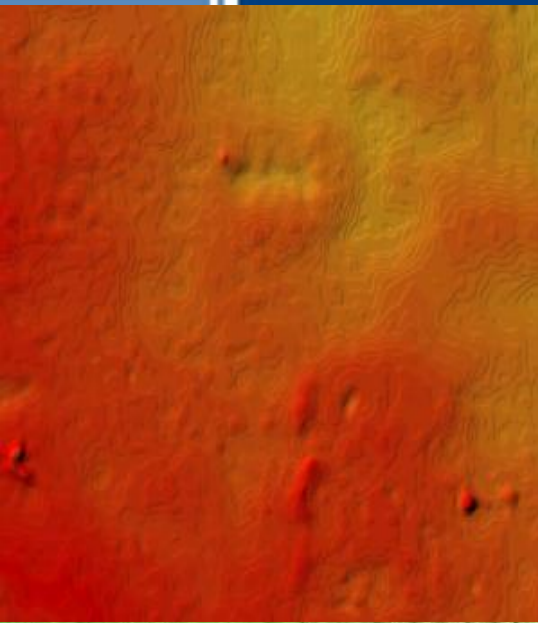
1935, 88  
Years

2008, 15  
Years

1976, 47  
Years

- This is affected by many factors such as
  - type of soil
  - climate
  - type of casket
  - etc.
- This may help us estimate age of discovered graves if the results are consistent, potential future work.





**Elevation data can help us see surface features like mounds or depressions**

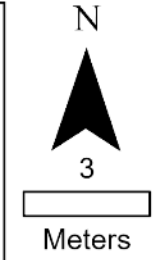
▪

Frank T. Brewrink		Belle T. Budd	Elmer Budd	1. Lvall, George Dickey	2. Jennifer Jane (Harrison) Makrecky		John McLellan	John Crow		Alma Lund	Gladys Lund			Edward Edey
Anna M. Brewrink		Lina L. Budd	Edward Budd	3. Ettie B. Bastin	Daniel Burwash	Farrell E. Dickey	1	Betsy McLellan	Nellie Francis Crow		Gustaf Lund	Gus Lund		Margaret Edey
	Bert Edwards			William Thompson	Georgina Burwash	Jean (Burwash) Dickey					Annie Vogt			
	Homer Edwards			Christy J. Thompson			John Burwash							
Jack Weston Hardy	Ralph Leslie Hardy		Edgar Nugent	Ernest Nugent	Linda Nugent	Joan Jetta (Bastin) Harrison			Olaf Follestad	Saddie Helen Stephens				
Frank Russel Hardy	Henry L. Paisley			Emilie Buchanan	Helen M. Bastin		2	Ethel Leah McLeod					Gayle Deanne Plourd 7.	Bertha M. (Fleming) Plourd 8.
George Hardy		William H. Stange			Phyllis V. Kulpas			Anna Arabella McLeod		Carrie Follestad			Hubert Paul Plourd 9.	
Bertha Paisley	Baby Fetterly	Leonard Stange	Emmanuel Shilling	Kathleen Patricia Nugent	Edith M. Nugent	John H. Bastin	3 4	Wellington McLeod		Hede Follestad			W. M. Gloer	H. Laine

4. Edward Allen Bastin

Donna Ruth Kushner		Thomas Lee Percell	Lawrence Doyle	John O'Neil		Margaret O'Neil		Baby Wilson			John McLaughlin			Theo Ingwersen	Beverly Laine		
Audrey Verna Baldwin						Lily Schoonover						Charles H. Rozander				Henry Plourd	9 8 7
Arthur Baldwin						Hugh E. Blue	Percy Fowler	Edith Hartwick				Thyra M. Rozander				Signa S. Plourd	
William Keith Sparkes							Thomas Fowler					M.B. Rozander		Margaret Wintori			
William G. Lee Baldwin				Unknown					Annie Viola McLeod		Goldie McGinnis			Euphemia Knox			
Lenora K. Baldwin			Zaccheus Chidester						Margaret May McLeod	George & Baby McGinnis				Robert Knox			
Alice Baldwin				Greene G. Dockery						Stella McGinnis		Julia Ellen Plourd		Julia McLean	Unknown		
Arhtur W. Baldwin	Baby Baldwin		Katherine A. Chidester	Bryan Hewitt Dockery			Irene Puzzi					Felix Vincent Plourd			Flora McLean	Mary E. McFalls	

Carl August Lyckman	Elsie Lyckman		Howard Johnson					Ivy Parkinson Cumming						Baby Talbot			
Johanna Augusta Lyckman				Harvey Warden		James Henry Rollins				David Howard McLeod							
Amanda C. Lyckman	Johan Arvid Lyckman		J.B. Smith												Clara Shaw		Suspected Janet Blue
				J. C. Warden						5. Norman D. McLeod					Billy and William Shaw		Lawrence H. Blue
										6. Norma A. McLeod							
Nels Nelson								Leo Stanley Nielson		Margret A. Lee				Angus McLeod			
										James F. Lee						Stokes	
	C.M. Karlson		Mrs. Clayton Turner	Babies Griffin		Isabell Hill	Phyllis K. Clark			Rebecca McLeod	6			John McLeod			
			Clayton Turner	Frank F. Griffin		W. N. Hill	Keith C. Clark		Cecil N. Jacobson	5	Donald McLeod			Agnes McLeod			H. Kellogg



Carmangay Cemetery WIP Map  
Sections 1, 4 & 5

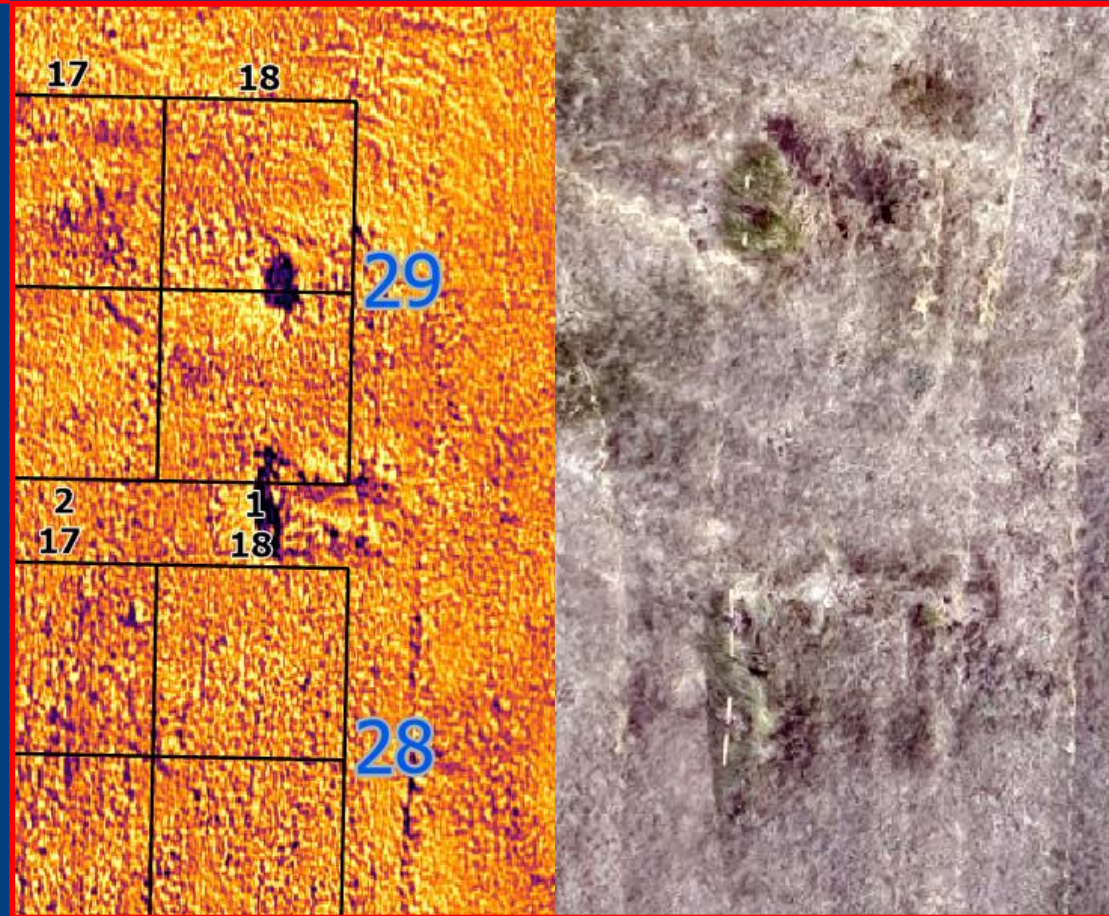
Arrowwood, Bowville, Travers, and Carmangay cemeteries have a layout layout with updated records as well as the “suspected graves” map.

Lomond, Milo and Anastasia will be finished by the end of April.



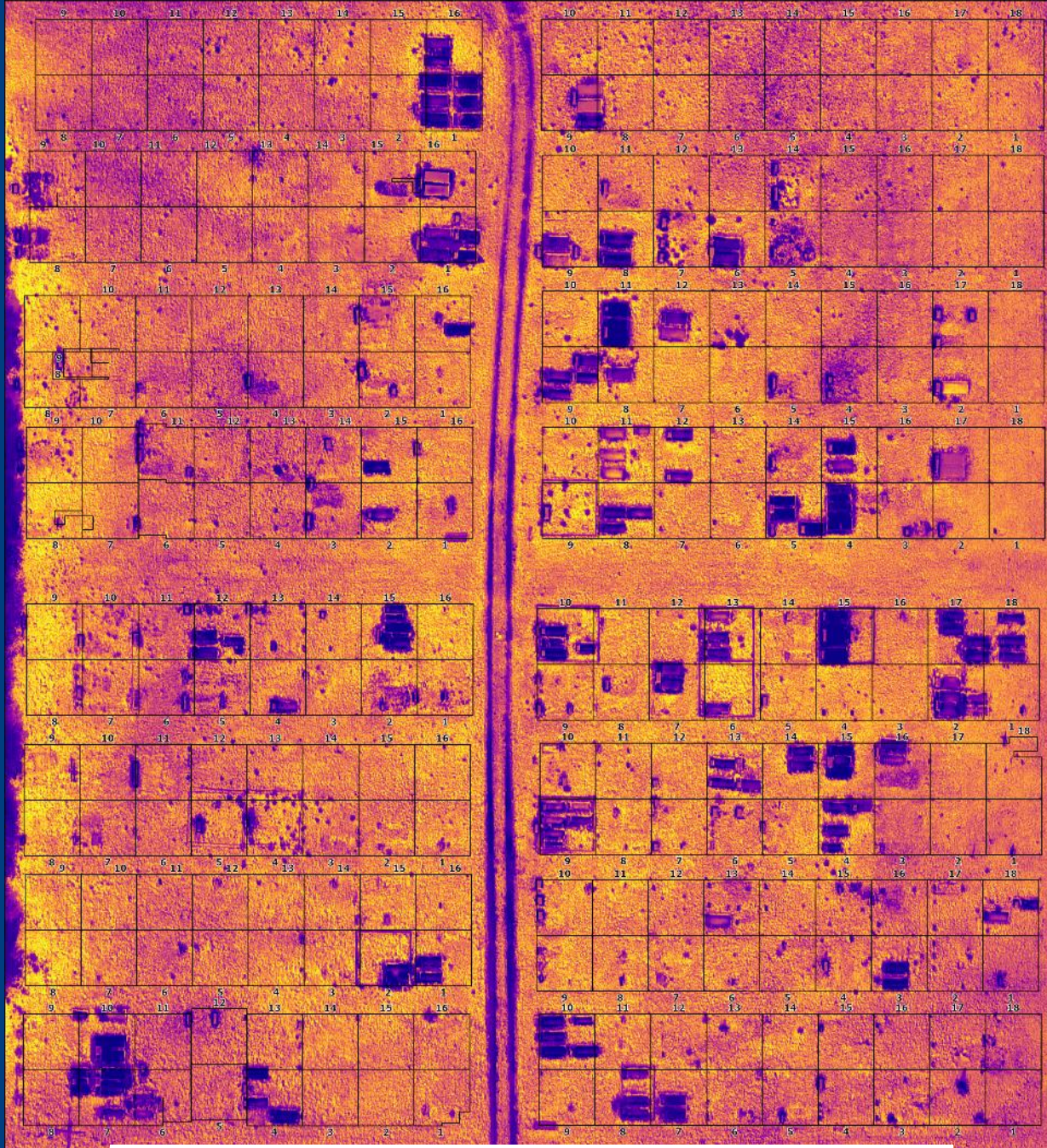
# Carmangay

The three marked graves in the far  
north corner





Carmangay South - RGB



Carmangay South - Thermal



Carmangay South - RGB



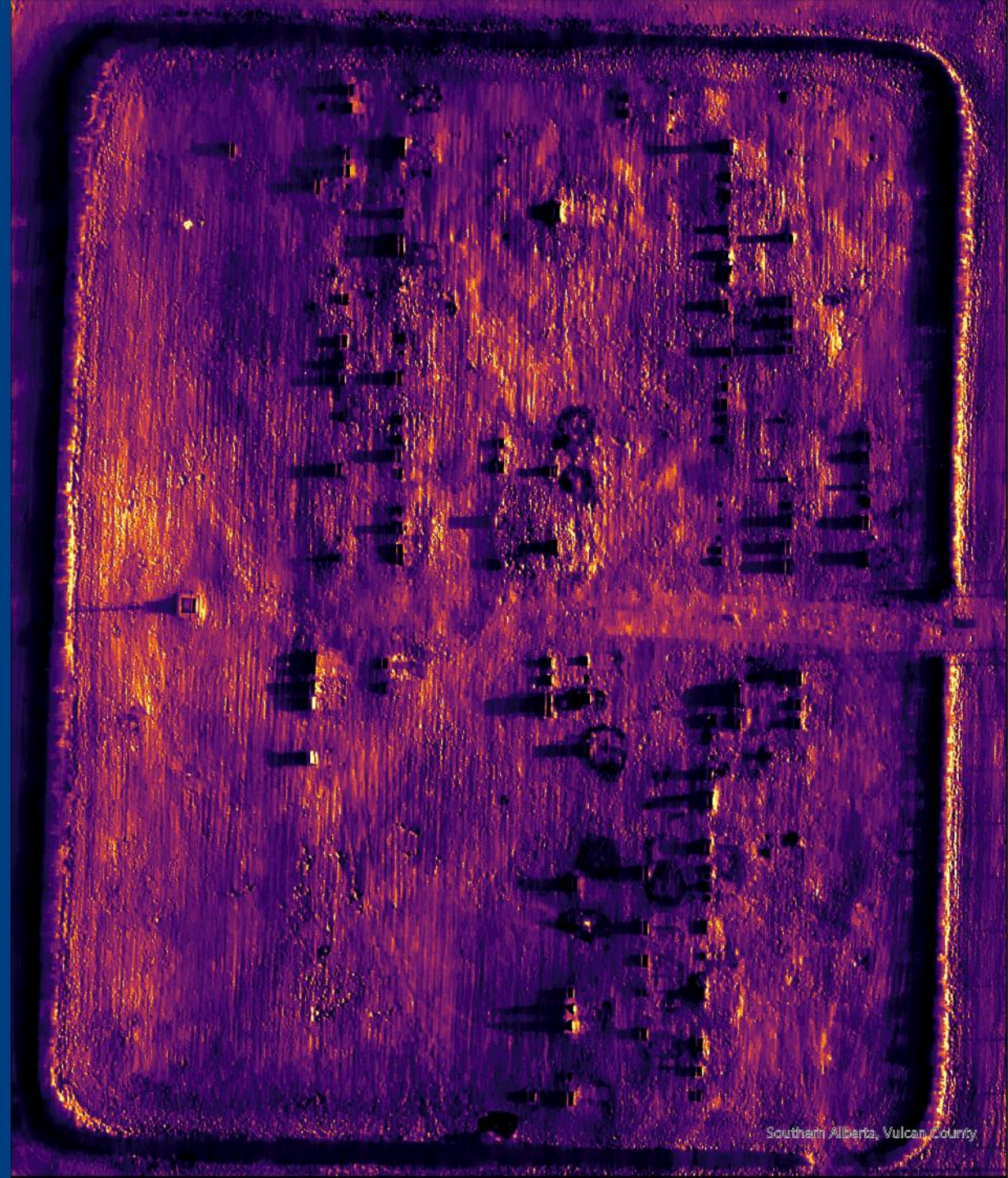
Carmangay South – Surface Model

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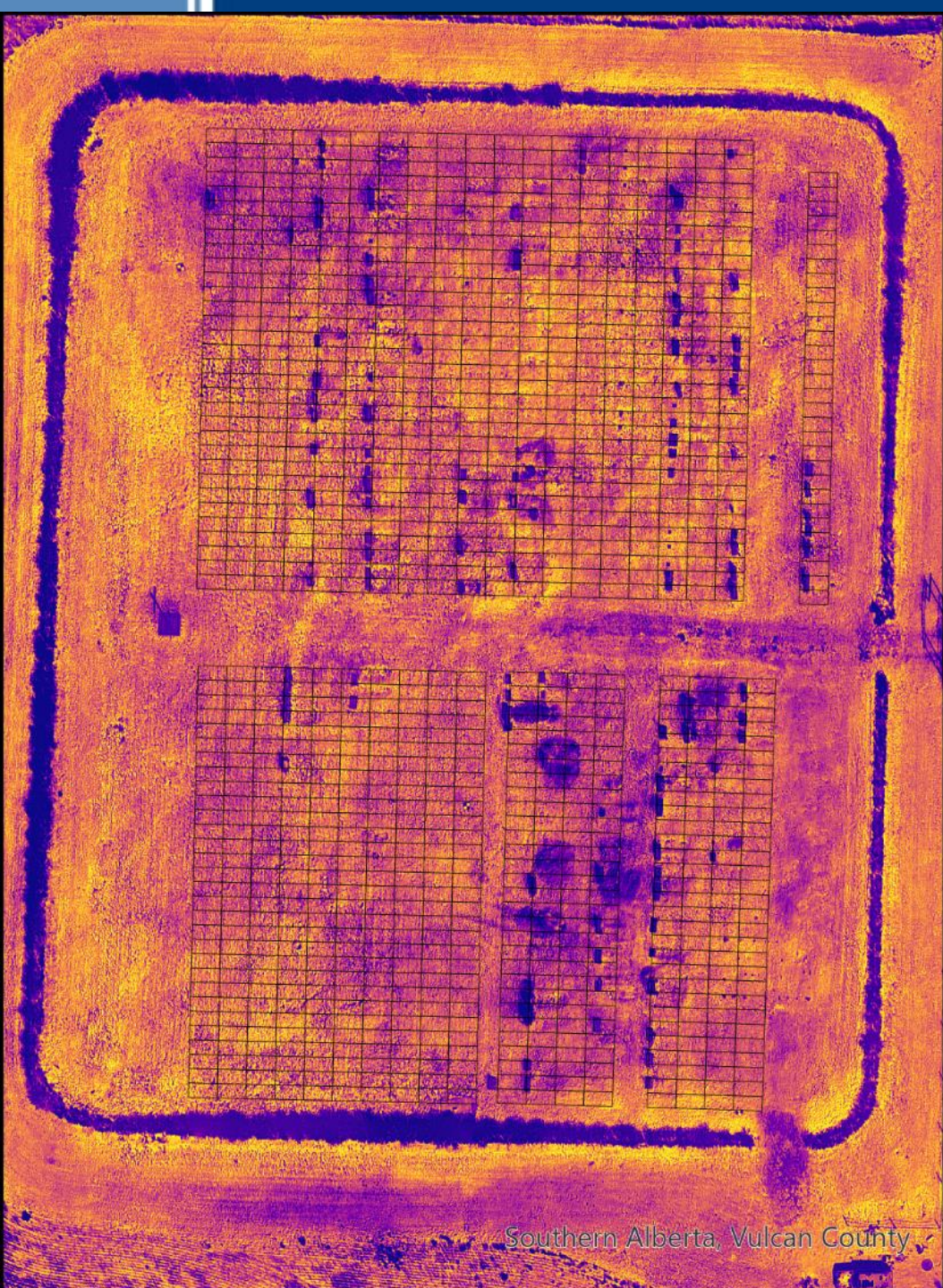


Milo

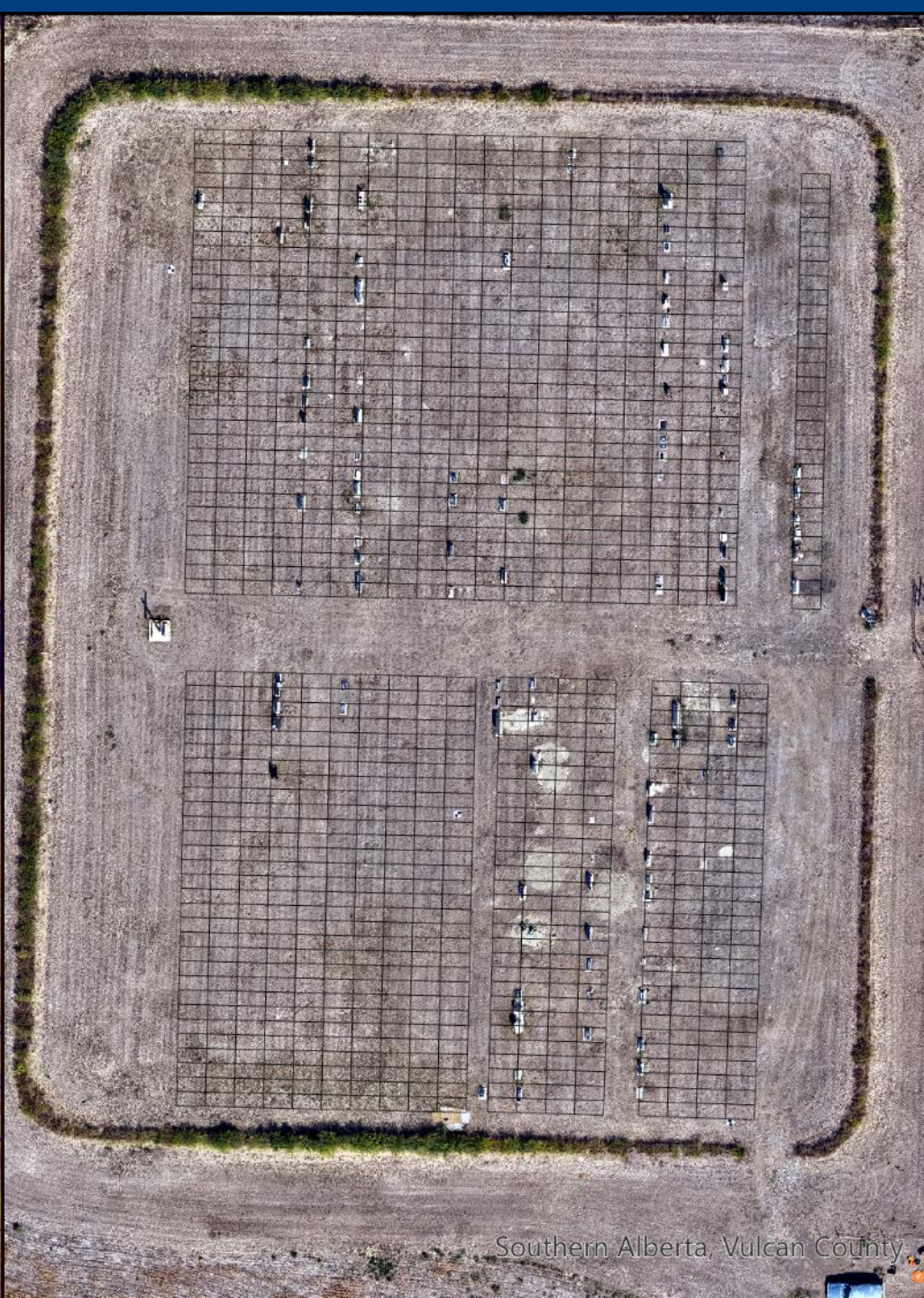
Thermal Shadows in O Perfect  
Peace Cemetery during sunrise



Southern Alberta, Vulcan County



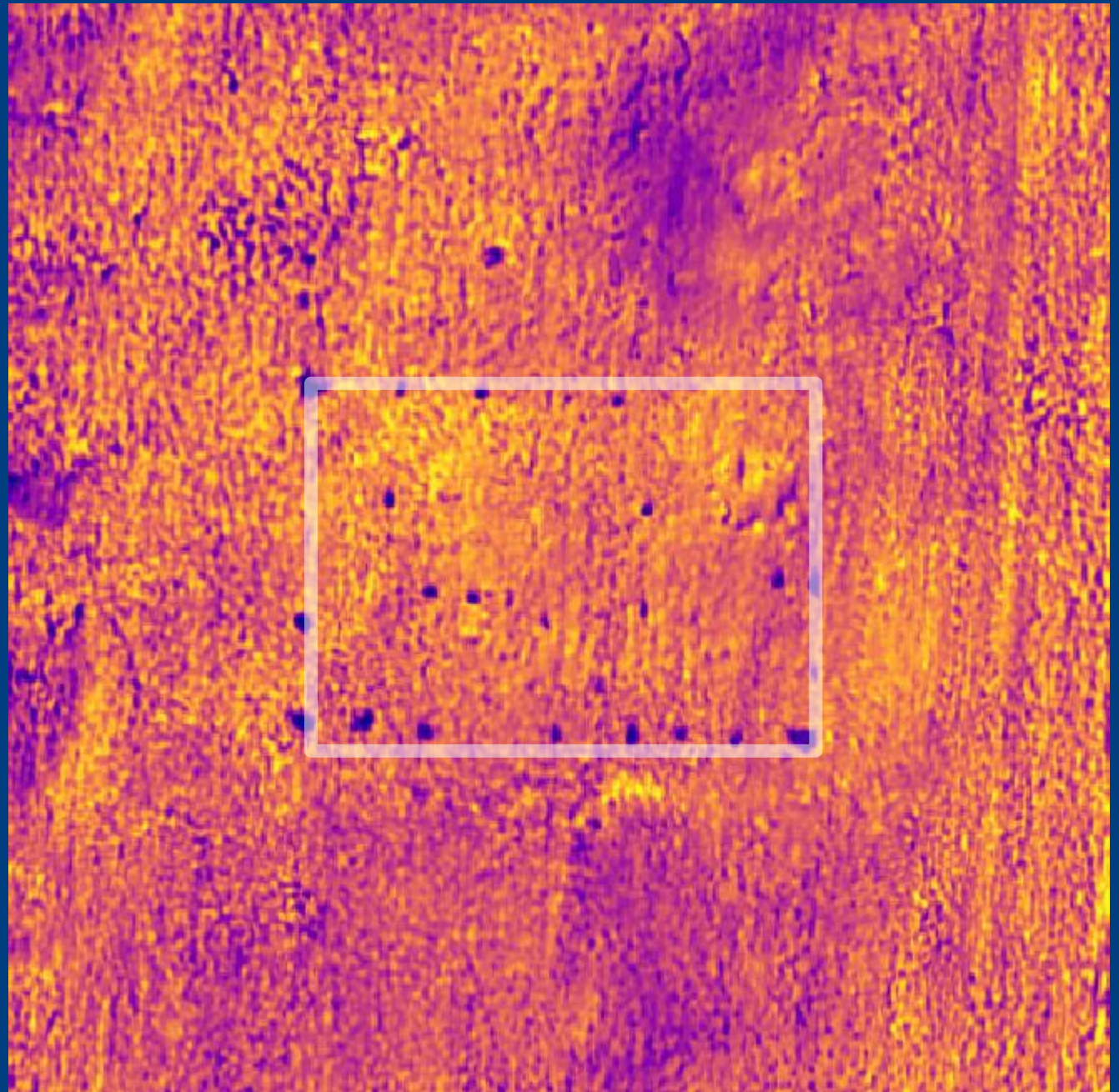
Southern Alberta, Vulcan County



Southern Alberta, Vulcan County

# Milo

The provided map didn't conform well to the layout on the ground - once the shown grid will be complete, the two maps will be rectified.



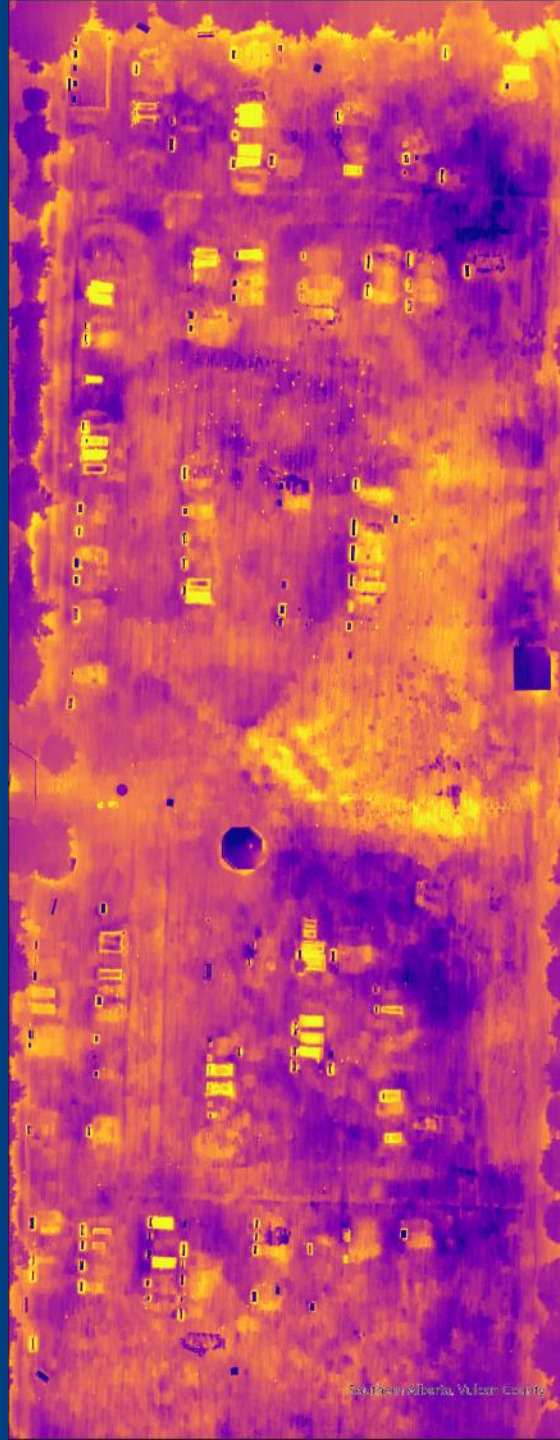
## Milo

Note the old church outlined by stones. Barely noticeable in RGB imagery (below).





Southern Algeria, Vilcanutins



Southern Siberia, Vukar, Croatia

# Arrowwood

Consistent results, some regions of interest noted. These will all be annotated on a new layer (not shown).

Reserved For Margaret Gail Thompson	Joseph M. Weins
William Ronald Thompson	W. A. (Tony) Nyman
Irwin Wesley Swanson	
Deriesh Burrell	
George Burrell	
Linda Fay Barnes	
Sarah Anderson	Chester A. Armey
Andrew Anderson	Thurza M. Armey
Henry Anderson	

# Arrowwood

- Irwin Swanson's grave doesn't appear to have anyone unmarked next to it.



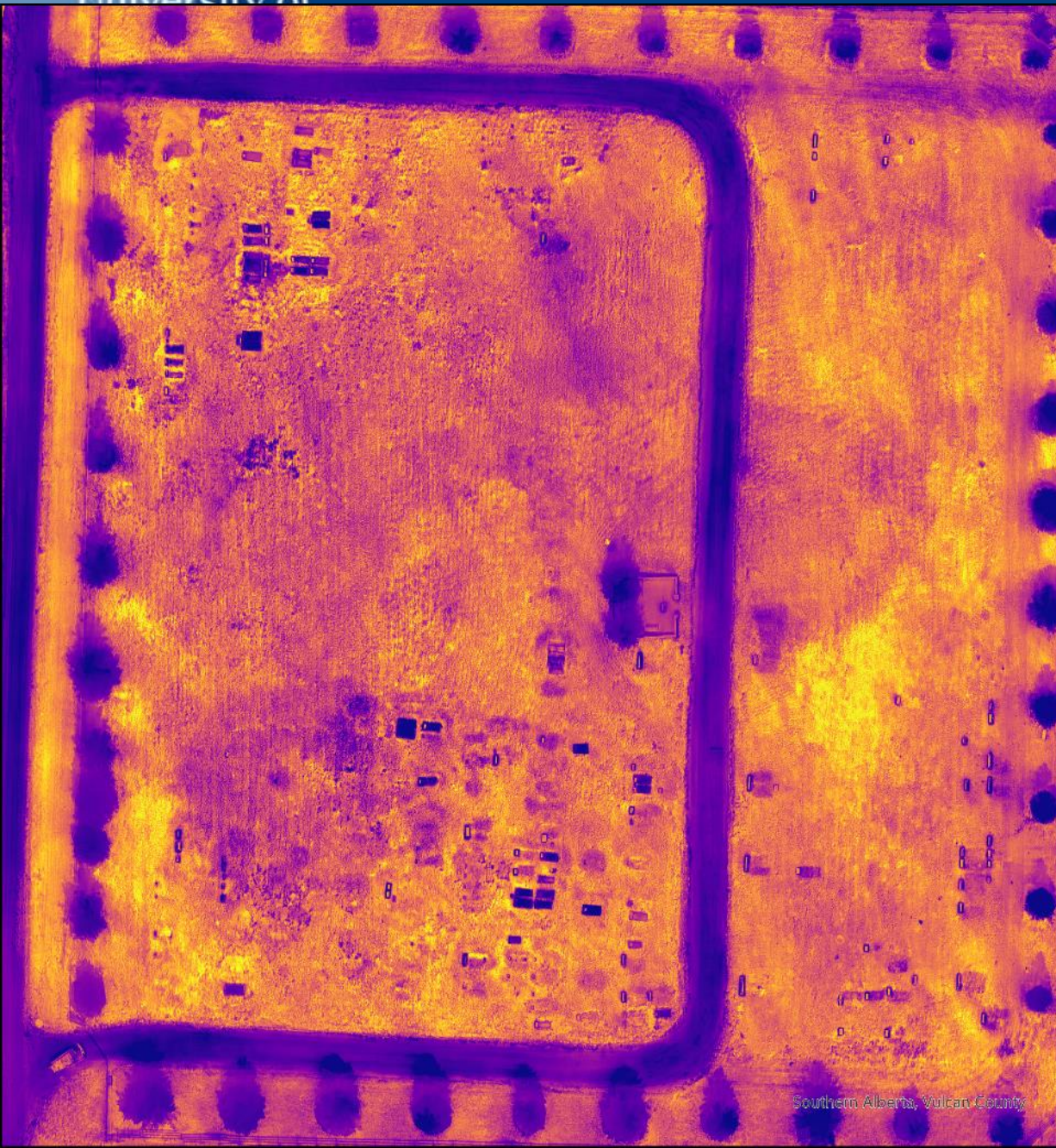
# Bowville

Very good records.

Only one unmarked grave (in orange)

# Lomond

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Southern Alberta, Vulcan County



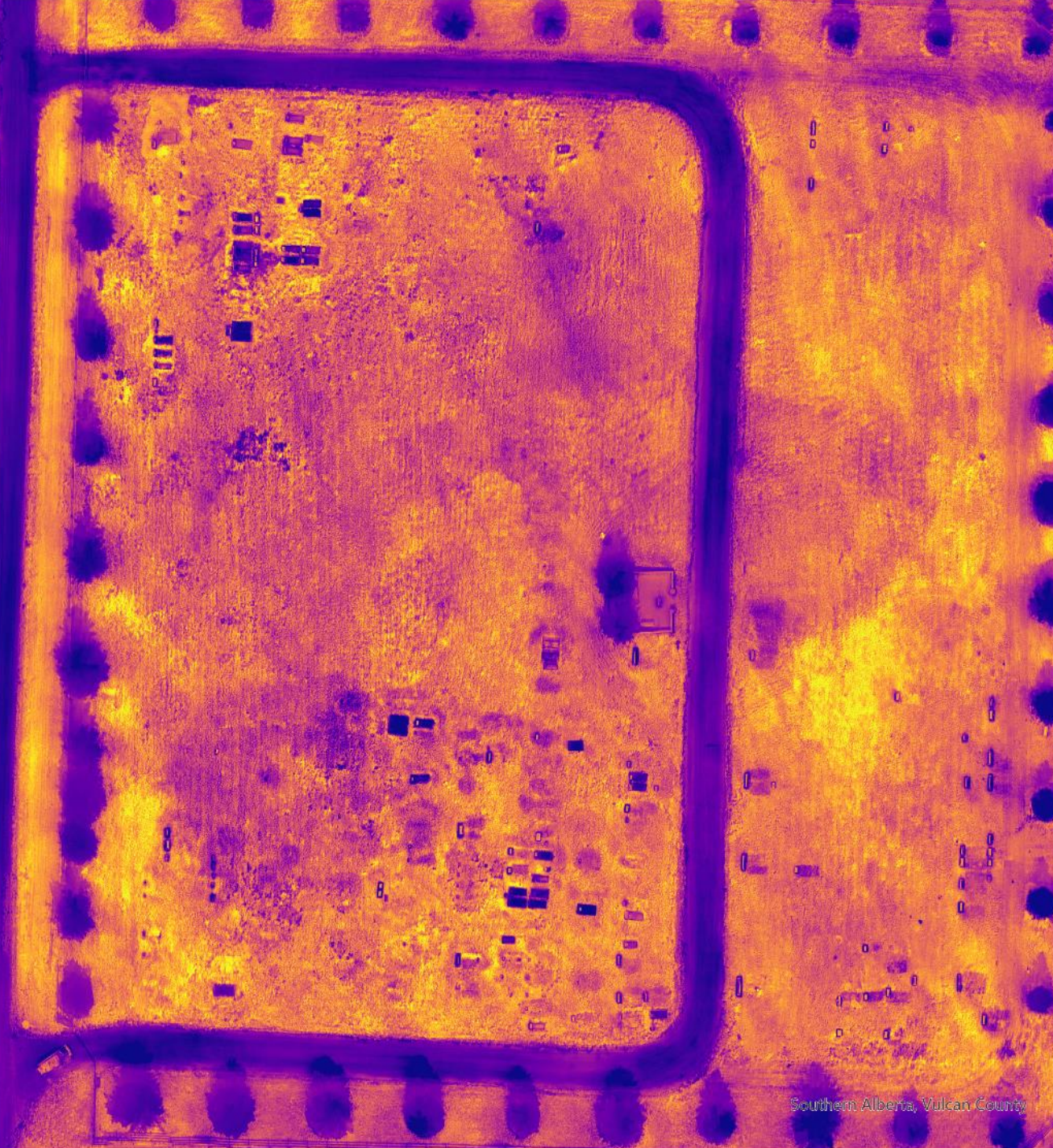
Southern Alberta, Vulcan County

# Lomond

A lot of interesting features visible in thermal.

No grid with records created yet (will be done in April).

Complex surface with a lot of burrows and rocks.



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# Questions?

