

DIGITAL MAPPING TECHNIQUES 2022

The following was presented at DMT'22
May 22 - 25, 2022

The contents of this document are provisional

See Presentations and Proceedings
from the DMT Meetings (1997-2022)

<http://ngmdb.usgs.gov/info/dmt/>

The Butte Mining District

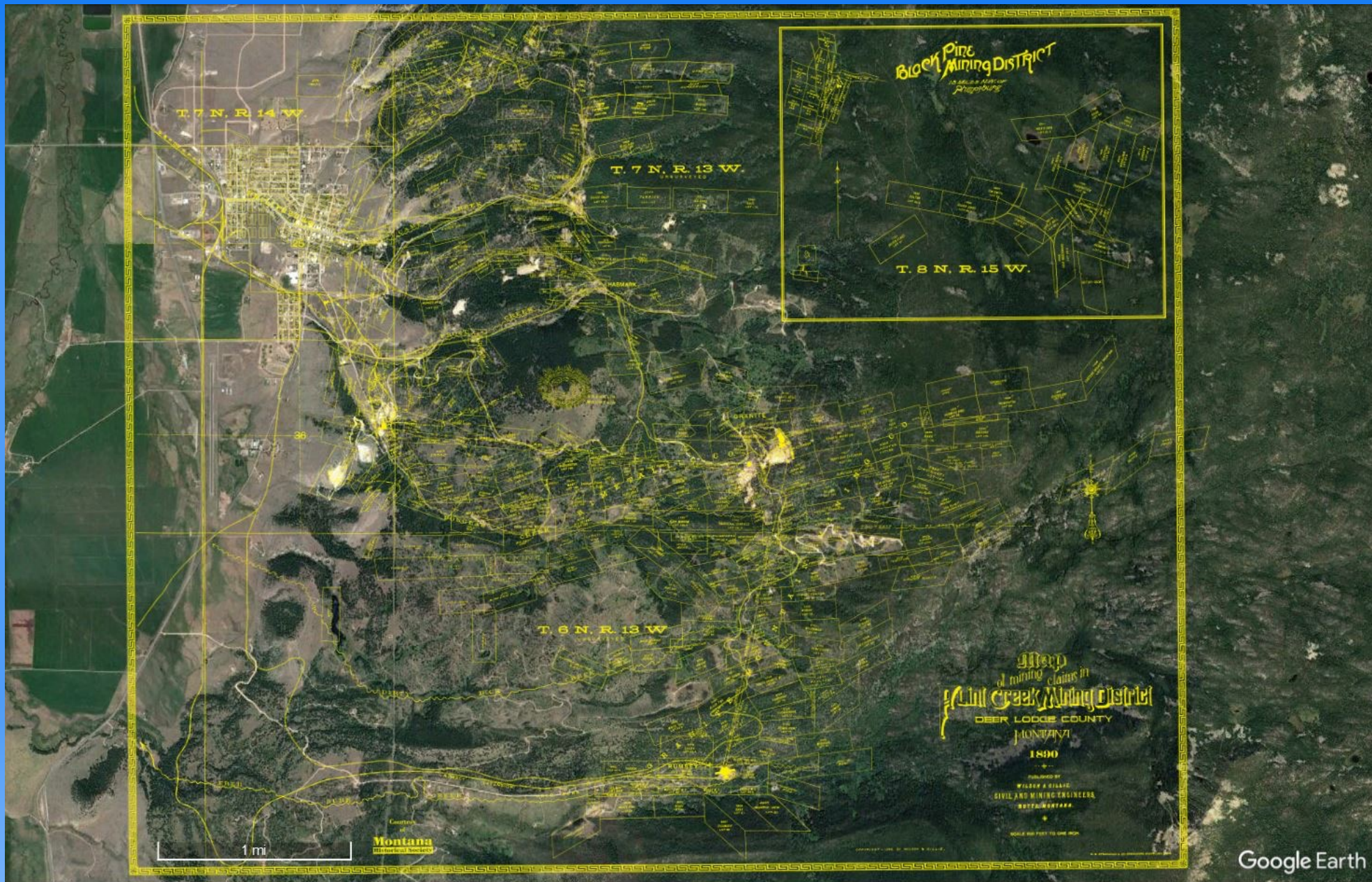
Merging Google Earth with ArcGIS Pro

In the Beginning

The Google Earth side of my work started in 2014 by “pinning” map locations to get Latitude and Longitude information for our current database.

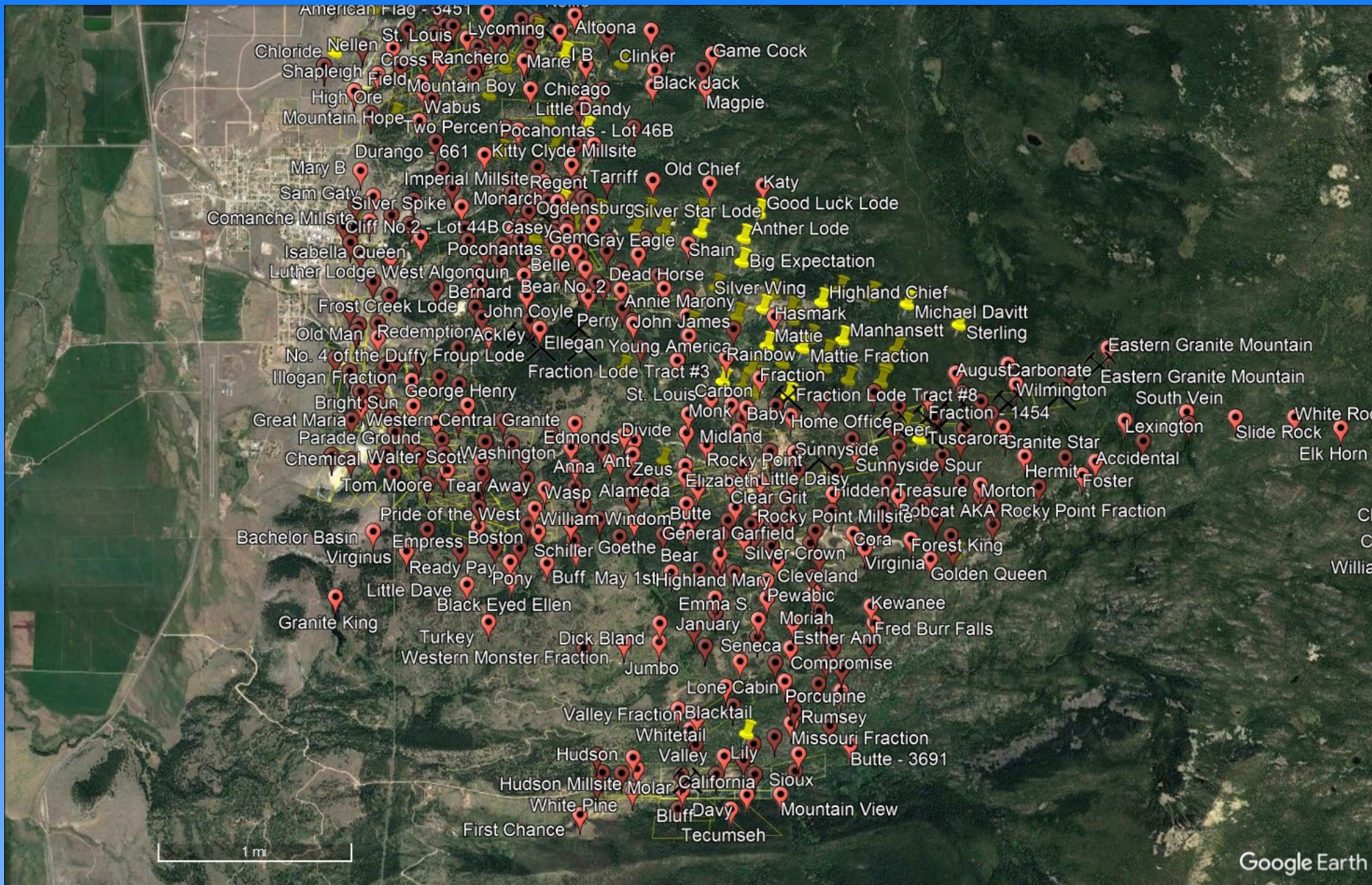
2014

The MBMG Data Preservation Department was working with the Montana Historical Society scanning a small collection of historical maps in the Flint Creek Mining District and the claims shown on the maps had to be Geo-referenced.



Flint Creek Mining District Map - 1890



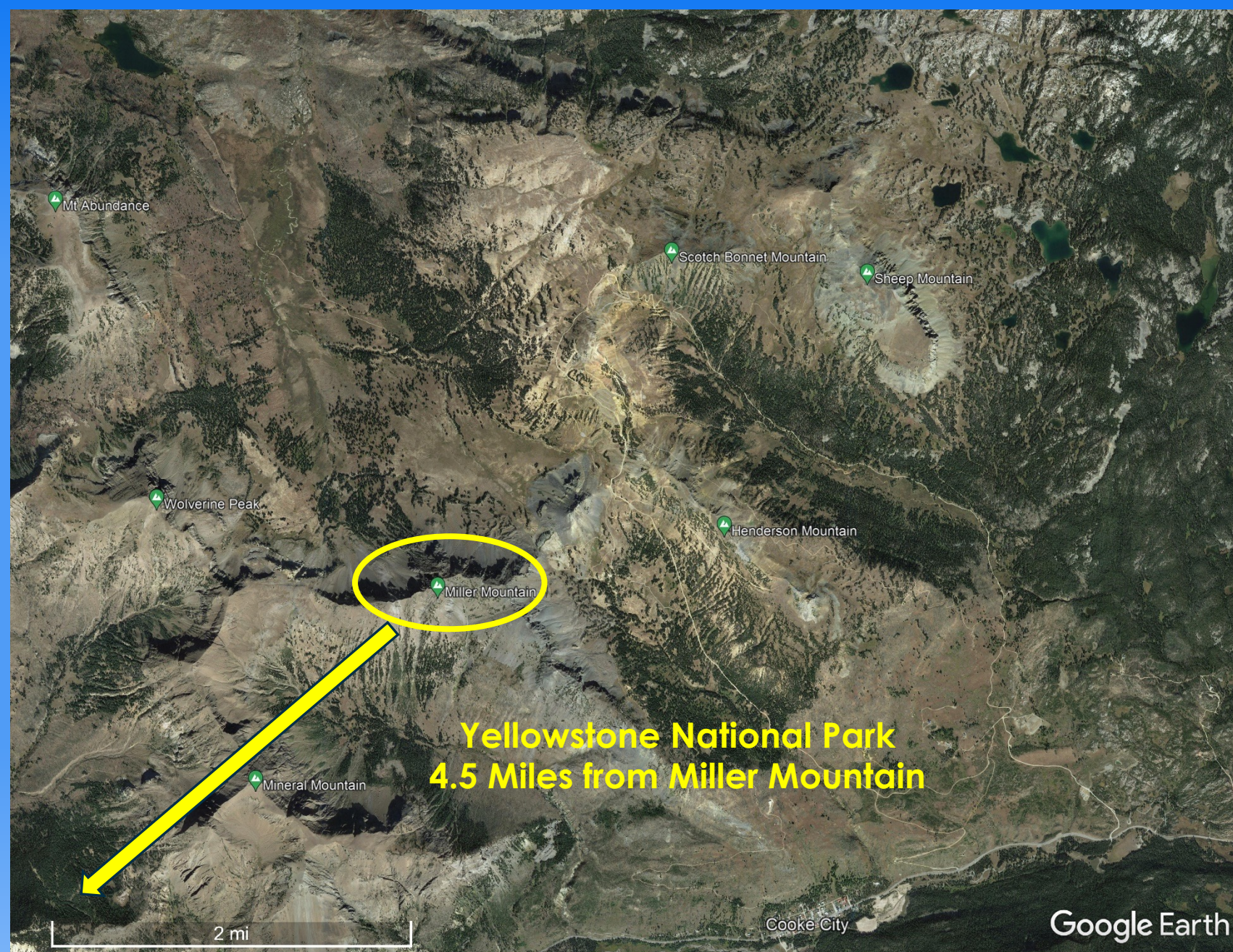


Flint Creek Mining District Claims from 1890 map.



2015

The MBMG acquired a substantial amount of information from the U.S. Forest Service. Again, the mining claims within the New World Project had to be geo-referenced, so “pinning” claim locations was again a great way to keep track claims that the location was completed for.

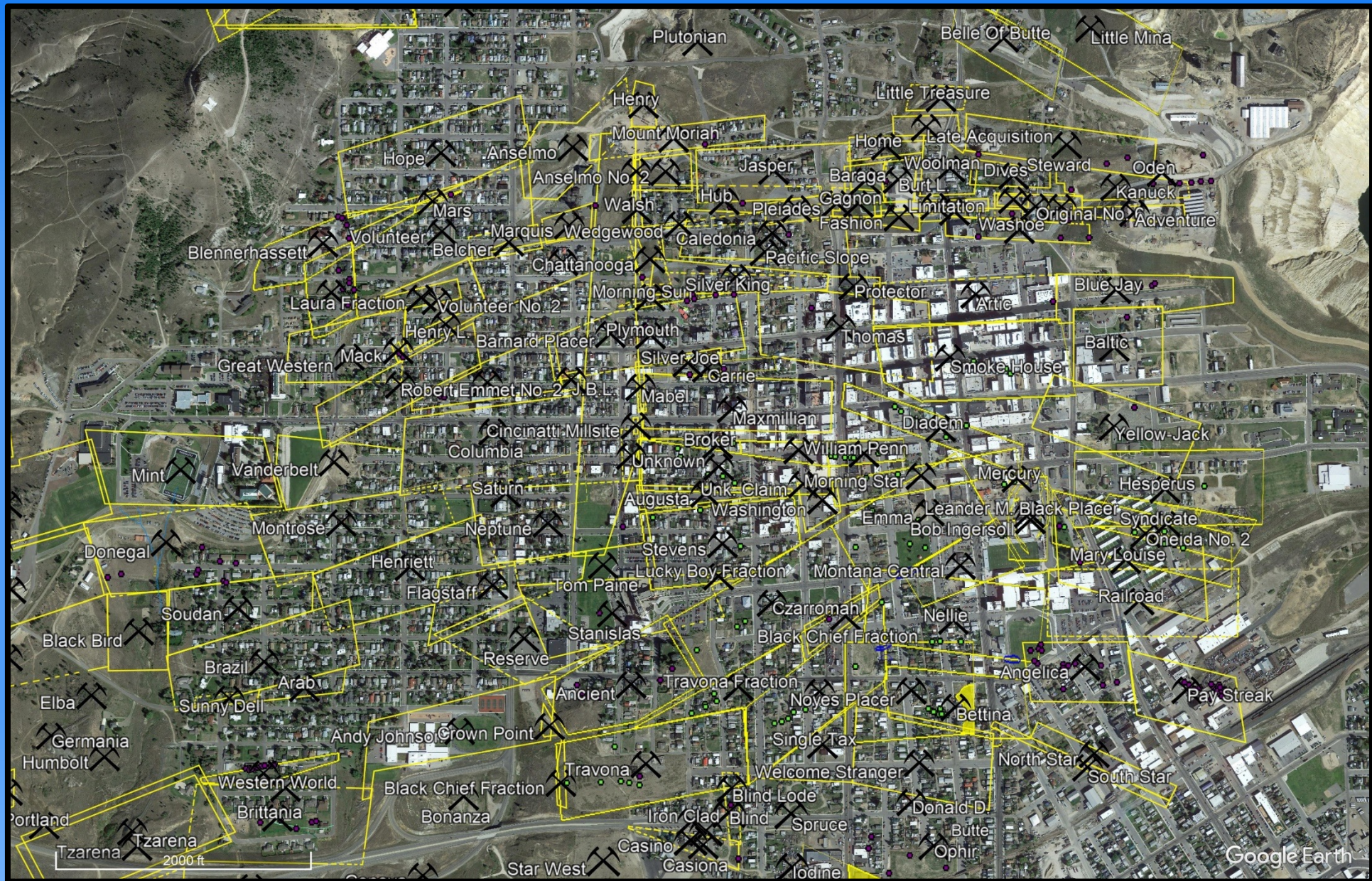


New World Mining District – Cooke City, Mt

Over 1,740 mining claims have been verified throughout Montana in the MBMG Mines database.

709 of these locations are located in the Butte Mining District

To keep track of the mine shafts and mining claims in the Butte District, I reverted back to “pinning” the locations, but, I added outlines of the claims also.



T3N R8W Sections 12 & 13 are a small portion of the Butte Mining District.

Search

Drawing Order

- P-25 Layers to 200'
- Silver Bow County
 - T1N R7W Sec. 17
 - T1N R7W Sec. 18
 - T1N R7W Sec. 19
 - T2N R7W Sec. 03
 - T1N R8W Sec. 02
 - T2N R8W Sec. 01
 - T2N R8W Sec. 02
 - T3N R7W Sec. 04
 - T3N R7W Sec. 05
 - T3N R7W Sec. 10
 - T3N R7W Sec. 18
 - T3N R7W Sec. 33
 - T3N R7W Sec. 34
 - T3N R8W Sec. 01
 - T3N R8W Sec. 09
 - T3N R8W Sec. 10
 - T3N R8W Sec. 11
 - T3N R8W Sec. 12
 - T3N R8W Sec. 13
 - T3N R8W Sec. 14
 - T3N R8W Sec. 15
 - T3N R8W Sec. 21
 - T3N R8W Sec. 22
 - T3N R8W Sec. 24
 - T4N R7W Sec. 31
 - T4N R8W Sec. 36
- Montana Mask
- World Imagery

Pop-up

- ▲ Polygons (1)
 - T3N R8W Sec. 13 - Outline
- ▲ Points (1)
 - Emma
- ▲ Polygons (1)
 - Emma

Points - Emma

PopUpInfo [Emma - Montana Bureau of Mines & Geology Link](#)

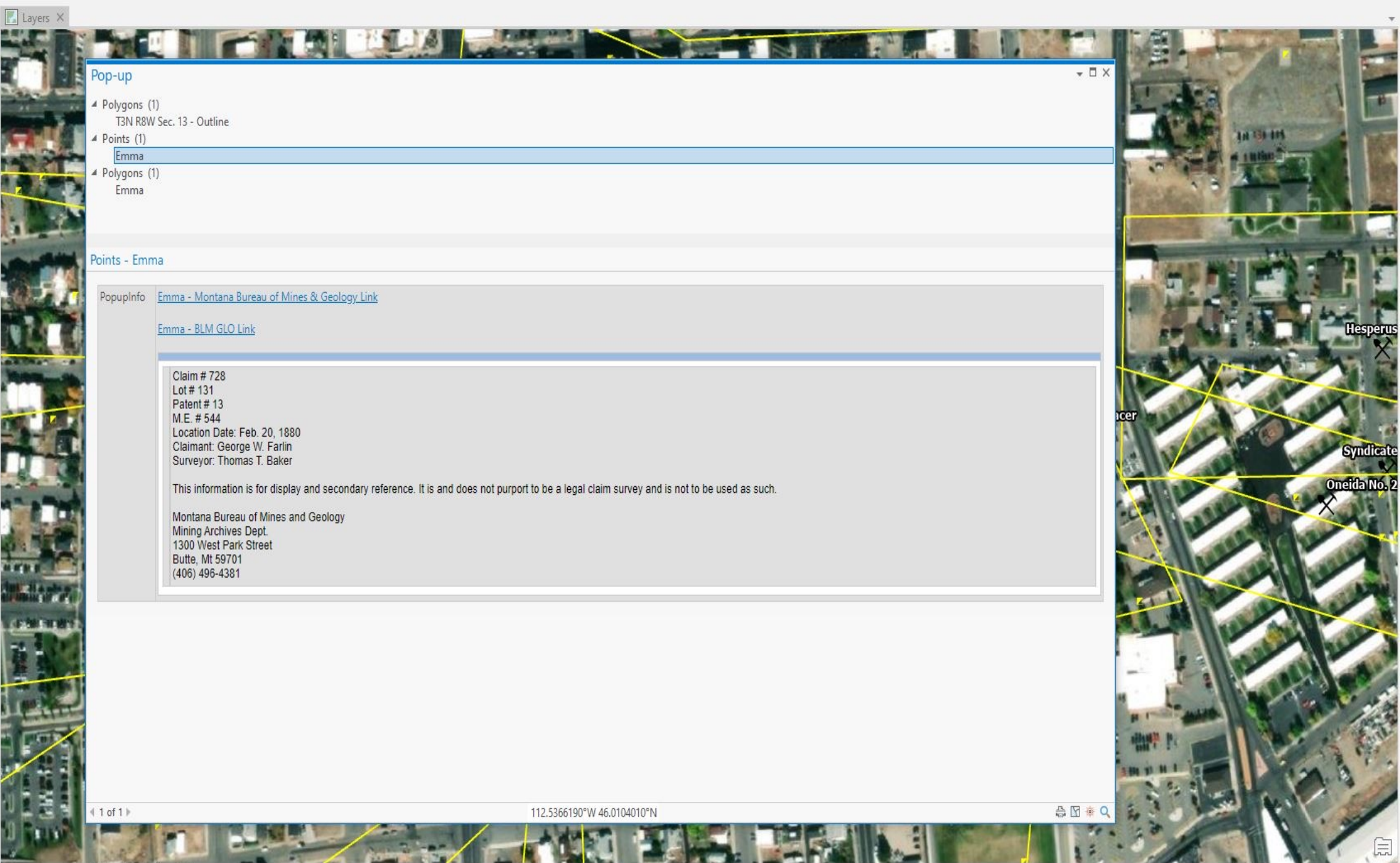
[Emma - BLM GLO Link](#)

Claim # 728
 Lot # 131
 Patent # 13
 M.E. # 544
 Location Date: Feb. 20, 1880
 Claimant: George W. Farlin
 Surveyor: Thomas T. Baker

This information is for display and secondary reference. It is and does not purport to be a legal claim survey and is not to be used as such.

Montana Bureau of Mines and Geology
 Mining Archives Dept.
 1300 West Park Street
 Butte, Mt 59701
 (406) 496-4381

1 of 1 | 112.5366190°W 46.0104010°N



Search

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- P-25 Layers to 200'
- Silver Bow County
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 - T1N R7W Sec. 18
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 - T3N R7W Sec. 05
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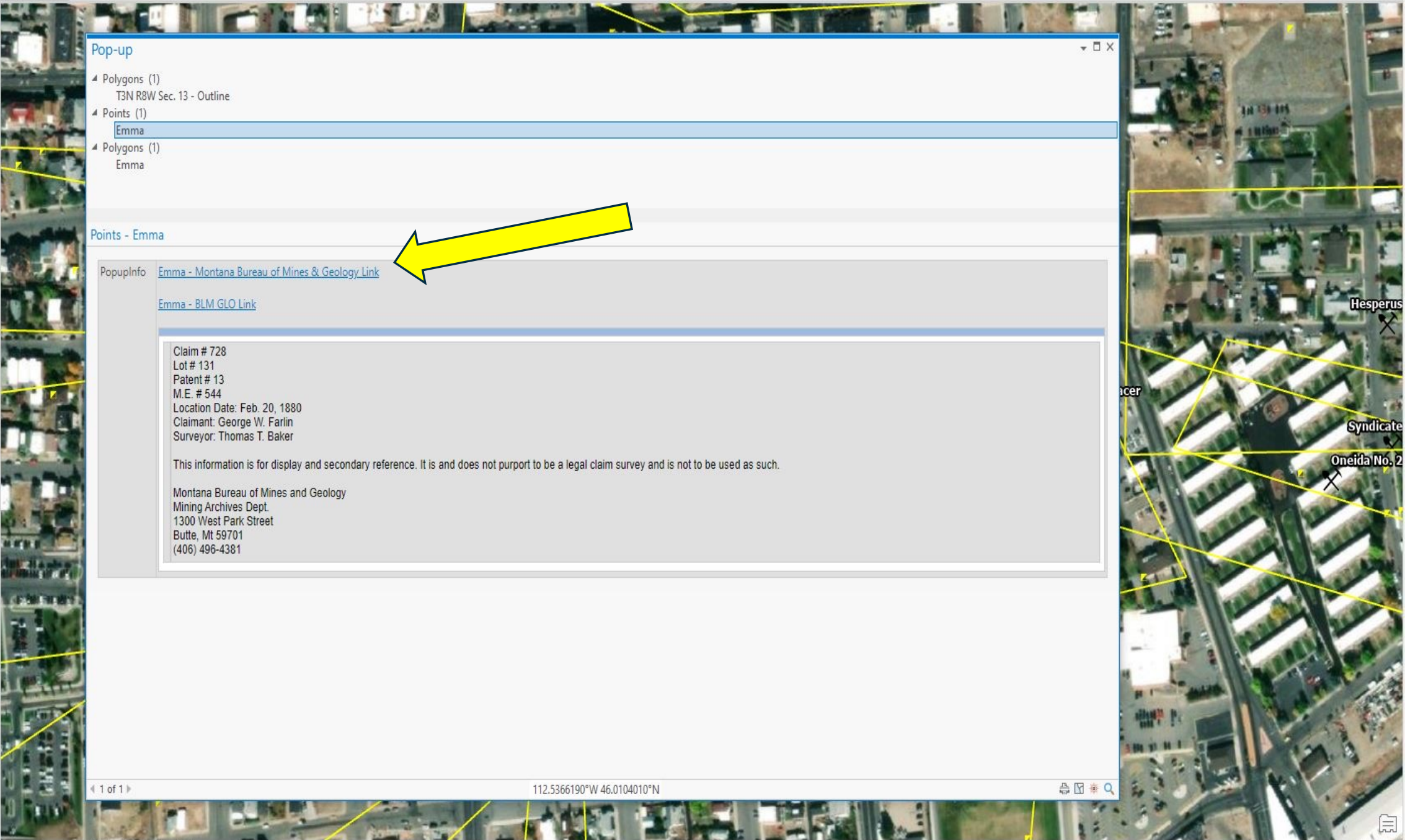
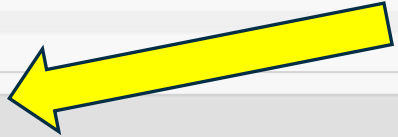
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The table below lists the data available in the MBMG Mining Archives database for the requested record.

| Archive Id | Claim Name | Claim Number | Claim Type | MILS # |
|------------|------------|--------------|------------|--------|
| 9968 | EMMA | 728 | LODE | |

| Latitude | Longitude | GeoMethod | Datum |
|-----------|-------------|--------------|-------|
| 46.010401 | -112.536619 | GOOGLE EARTH | WGS84 |

| County | District | Township | Range | Section(s) |
|------------|----------------------------|----------|-------|------------|
| SILVER BOW | BUTTE* - AKA SUMMIT VALLEY | 03N | 08W | 13 |

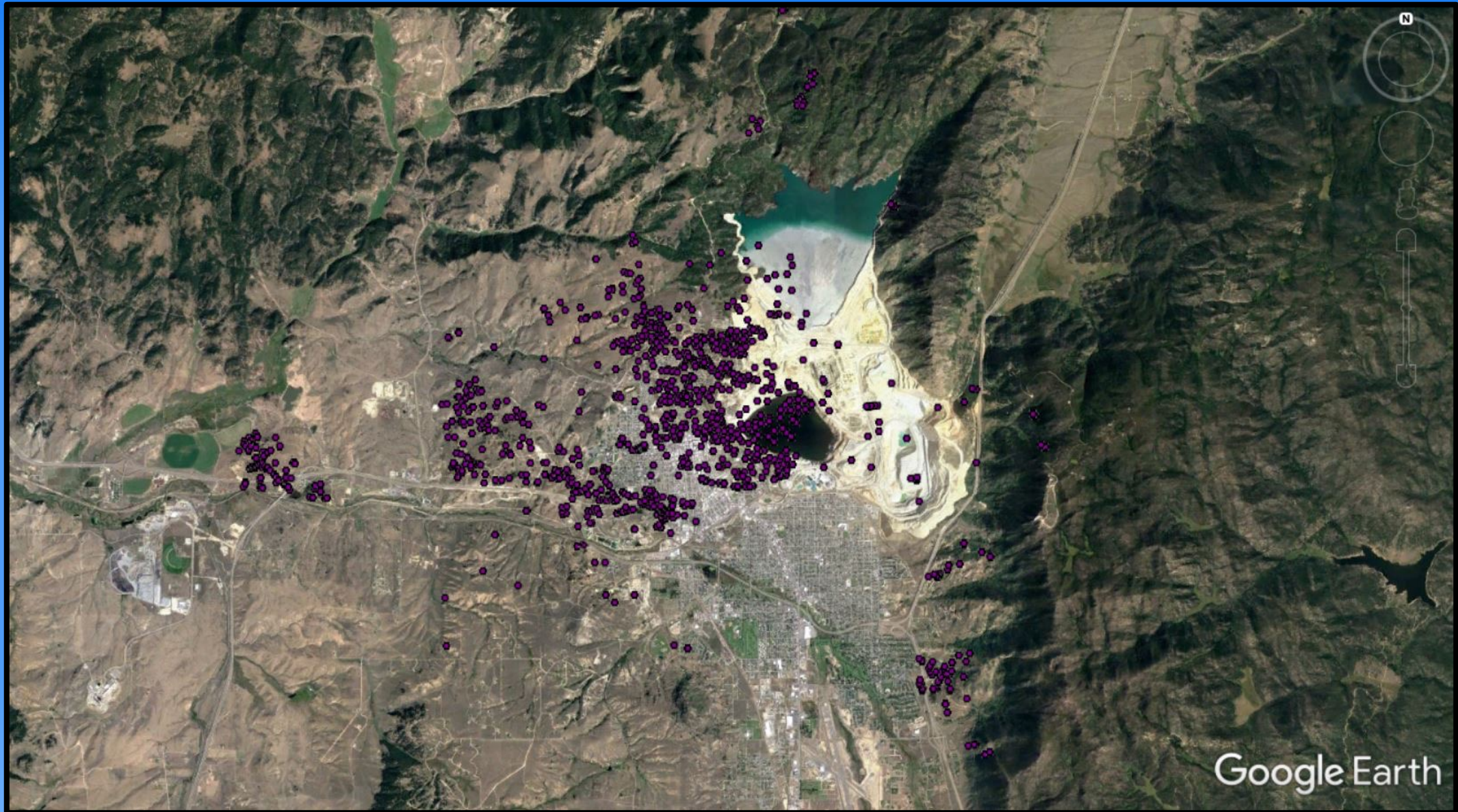
| Id | Opt | Associated Name | County | State | District |
|------|----------------------|-----------------|------------|-------|----------------------------|
| 3463 | View | EMMA | SILVER BOW | MT | BUTTE* - AKA SUMMIT VALLEY |

This record has been related to the following Property File records

| Id | Opt | Title |
|-------|----------------------|---|
| 924 | View | CLAIM MAP OF T3N R7W (PORTION) |
| 4577 | View | EMMA MINE - VERTICAL CROSS SECTION SHOWING MINERAL LOCATIONS AS DETERMINED ANDERSON-YOUNG GEOPHYSICAL PROSPECTING BEAMS - INTERSECT COORDINATES 29904 N. / 26923 E. |
| 17324 | View | MAP OF BUTTE MINES PRODUCING MANGANESE ORES OR CONTAINING MANGANESE ORES SUSCEPTIBLE OF EXPLOITATION |
| 434 | View | MAP OF BUTTE MINES PRODUCING MANGANESE ORES OR CONTAINING MANGANESE ORES SUSCEPTIBLE OF EXPLOITATION - 434 |
| 55462 | View | MAP OF MINING CLAIMS - BUTTE AND VICINITY (1913) - 55462 |
| 10449 | View | MAP SHOWING RELATIVE LOCATION OF THE SURPRISE AND SANDWICH LODES |
| 10254 | View | PLAT OF THE BLACK CHIEF FRACTION - SURVEY NO. 2647 |
| 10258 | View | PLAT OF THE EMMA LODE MINING CLAIM OF GEORGE F. FARLIN AND JOSEPH A. FARLIN - 10258 |
| 4578 | View | SHOWING MINERAL LOCATIONS - PLANE N 20° W - BEAMS NOS. 1, 2, & 4 |

This record has been related to the following Map File records

The links will allow a user to access all information that the MBMG or the Bureau of Land Management have on the mine claim.



Besides the 709 claim locations, I currently have accumulated 1,429 possible hazard locations within the Butte Mining District.



Each hazard location is interactive and will give the end user information on where the hazard originated from.

Search

Drawing Order

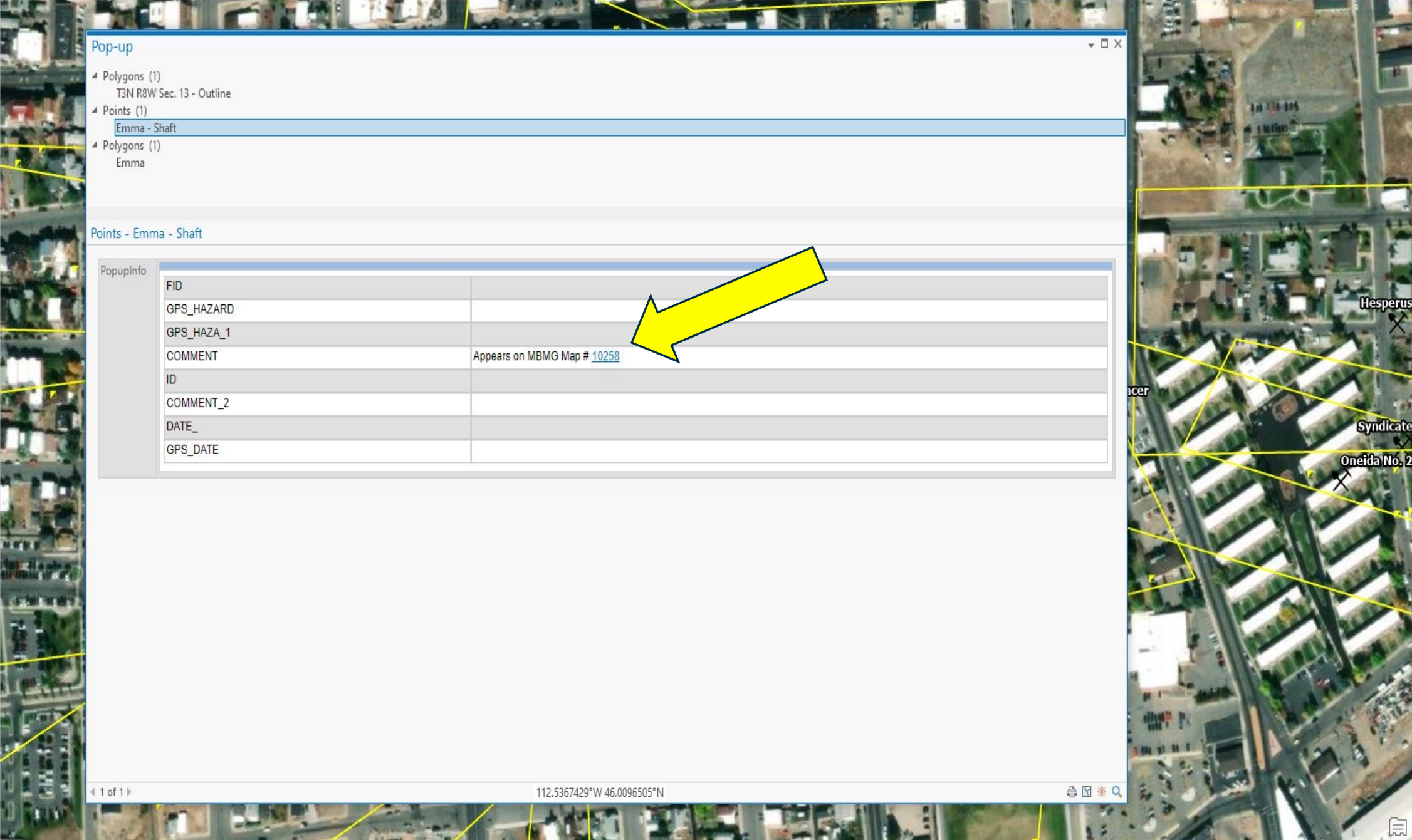
- P-25 Layers to 200'
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Pop-up

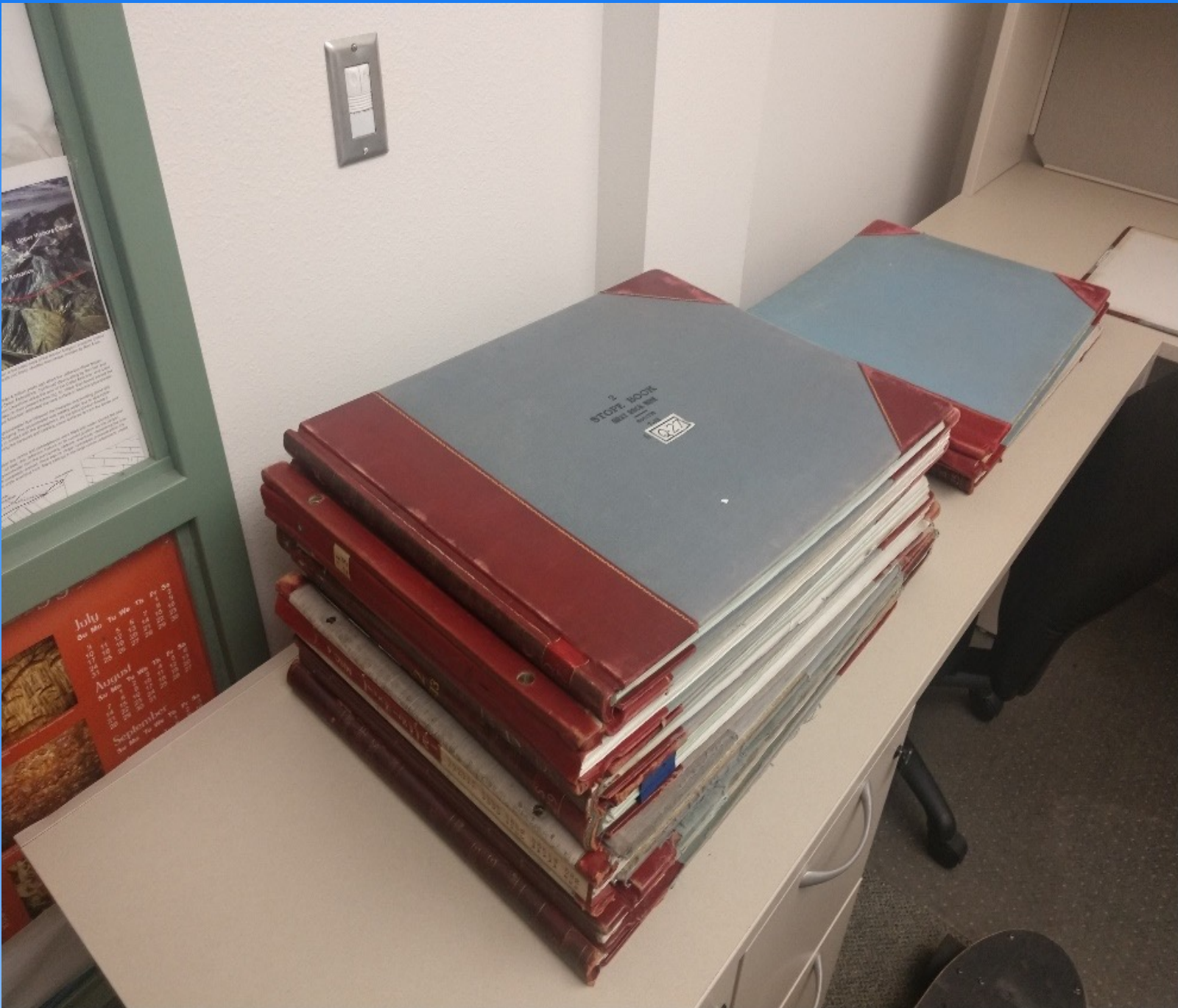
- ▲ Polygons (1)
 - T3N R8W Sec. 13 - Outline
- ▲ Points (1)
 - Emma - Shaft
- ▲ Polygons (1)
 - Emma

Points - Emma - Shaft

| PopupInfo | |
|------------|---|
| FID | |
| GPS_HAZARD | |
| GPS_HAZA_1 | |
| COMMENT | Appears on MBMG Map # 10258 |
| ID | |
| COMMENT_2 | |
| DATE_ | |
| GPS_DATE | |



The database kept getting larger and larger until the Butte Stope Book grant came along! Then hazard locations started to become abundant.



Started out as a
NGGDPP Priority 2 Grant
(July 2019 to July 2020)

**Sponsored by the National
Geological and Geophysical
Data Preservation Program
(NGGDPP)**

**Received grant due to a portion of the
collection being in danger of theft or
destruction**

Unique to Butte's mining heritage

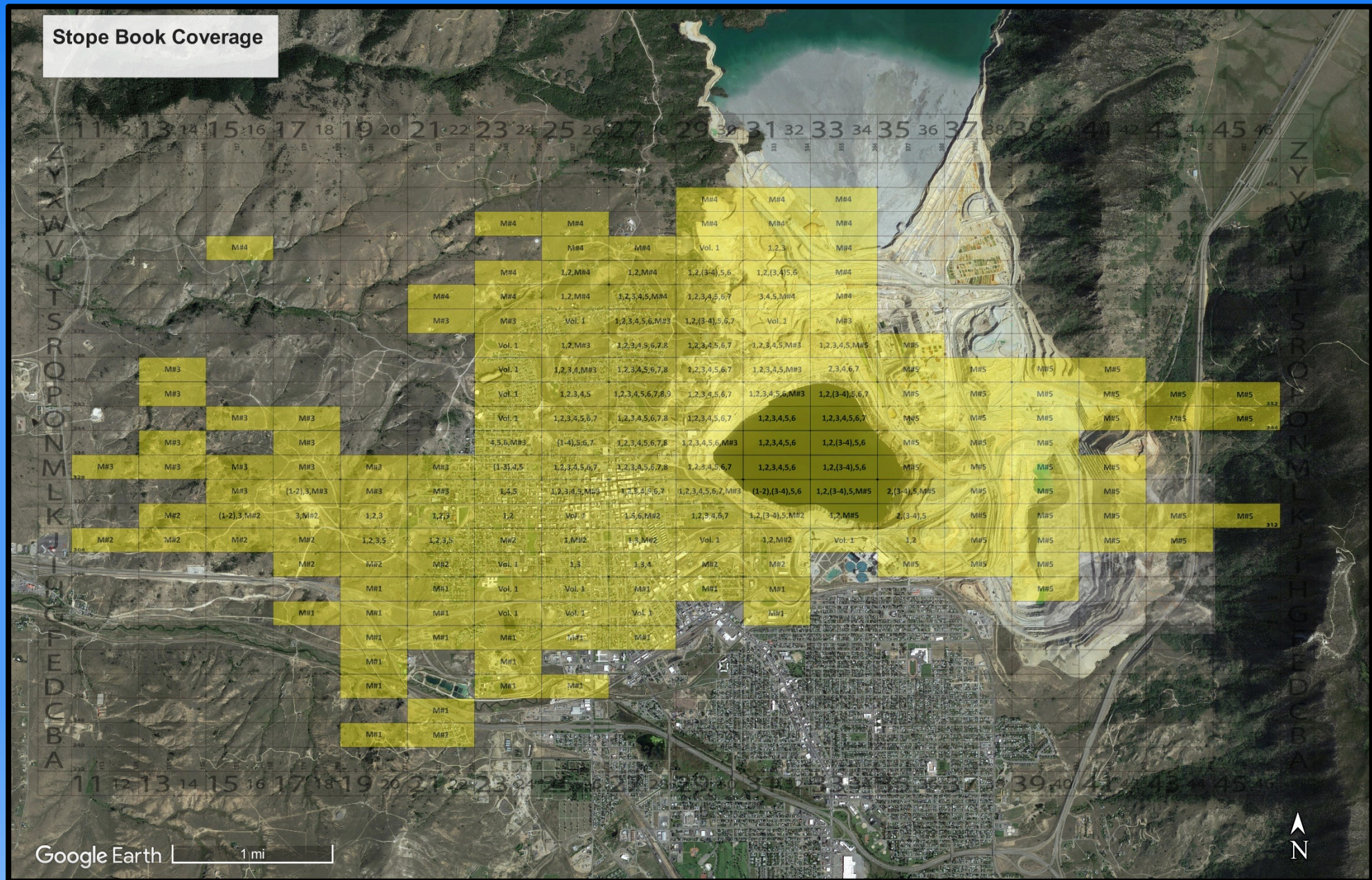
**Holds underground mining data
(workings) from early 1880's to 1987**

**If lost, the information could not
be replaced or reduplicated**

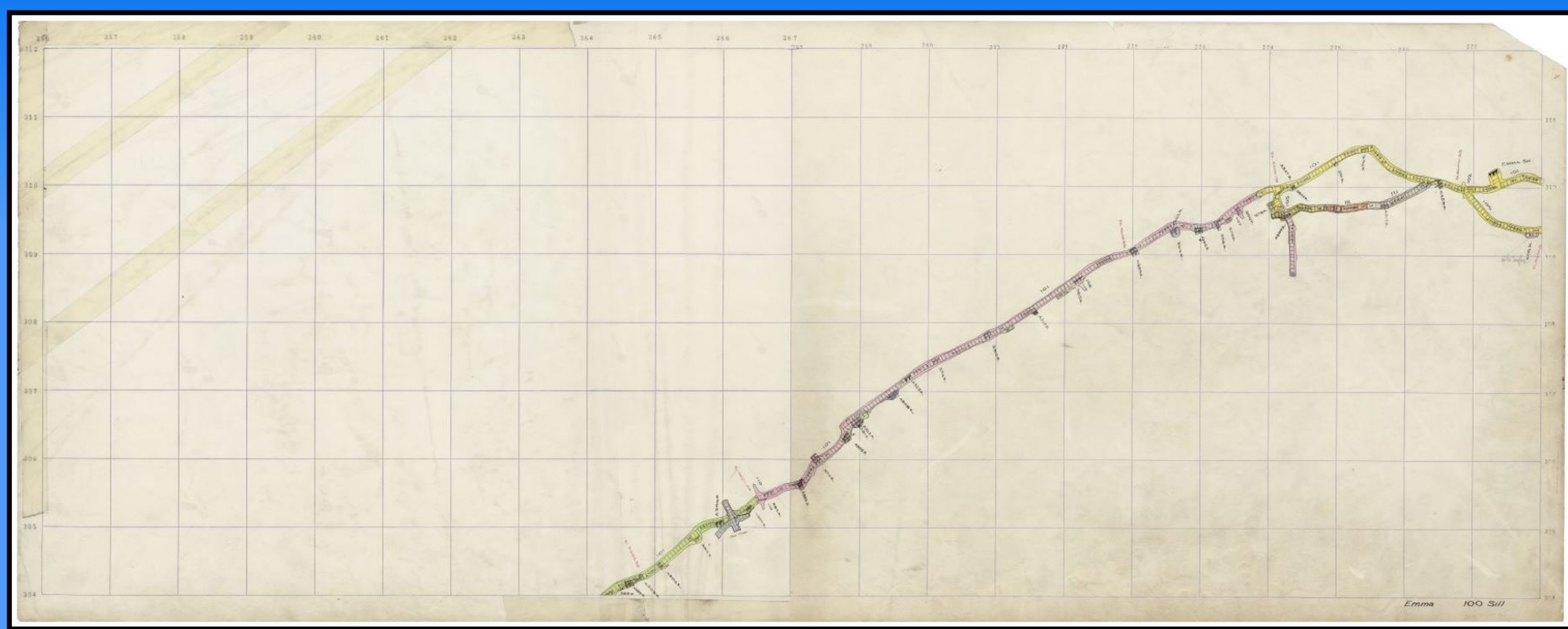


There are 353 Stope Books that cover a total of approximately 12.19 square miles of surface space and hold the workings of every mine within the index guide.

Stope Book Coverage



Index Guide Footprint of area covered by the Stope Book collection (in yellow)



Emma Mine – 100 Sill Stope Book Page

Each book footprint covers 16,600 square feet
of surface and 6.67' of elevation.

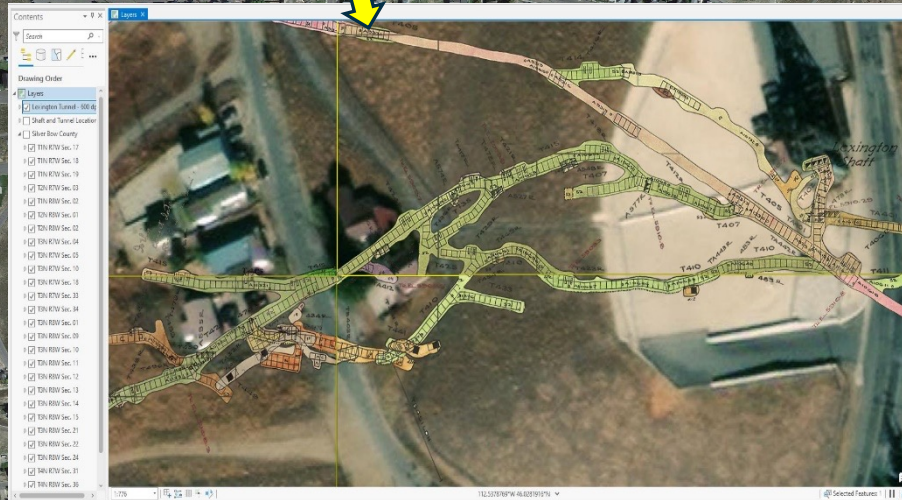
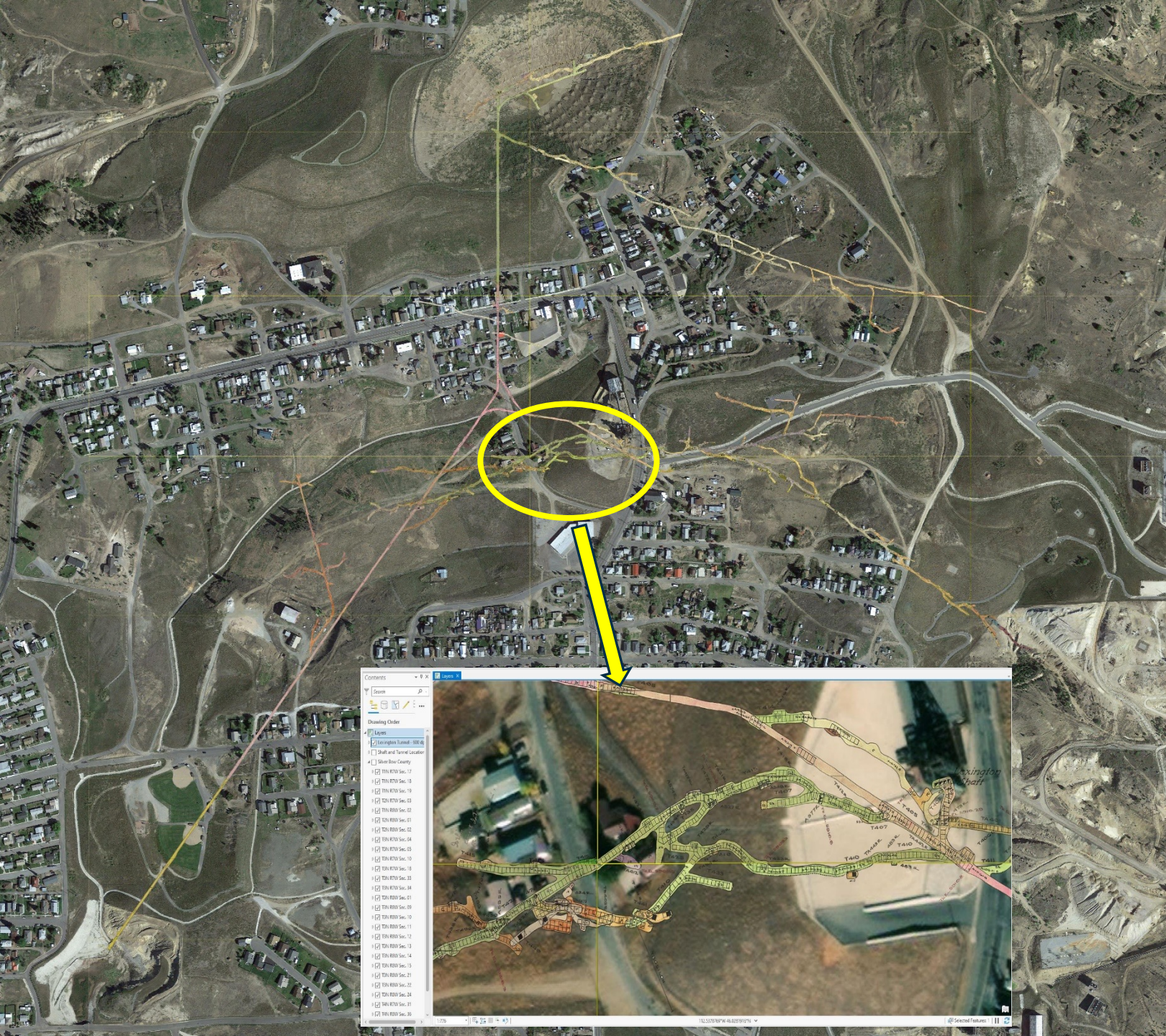


Emma Mine

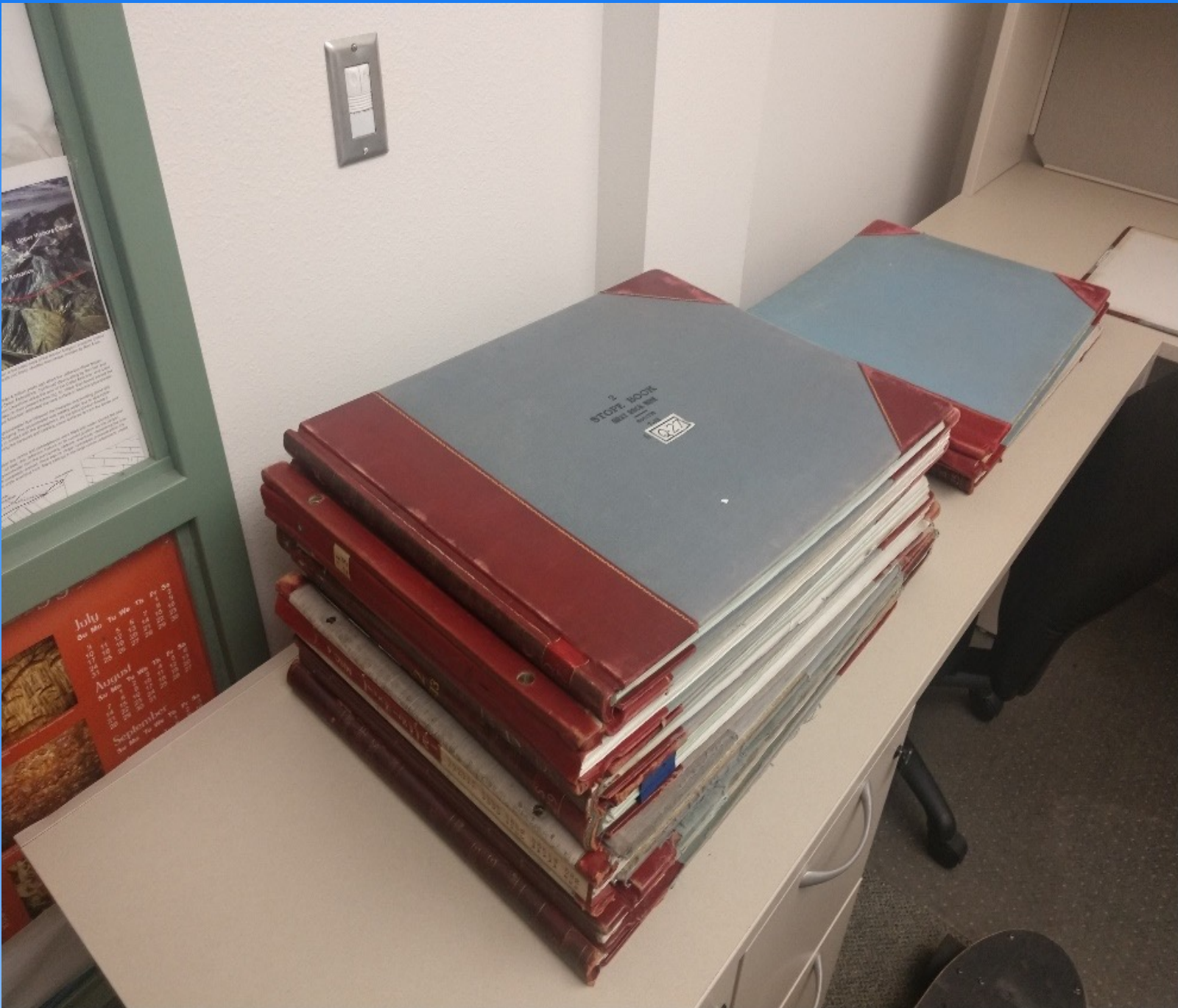
Surface to 200 Sill

The brighter the yellow, the more vertical the workings are.

Eventually, I hope to include full color mine “workings” in ArcPro!



Hopefully, the base files I create will be used by professionals in other MBMG projects, such as Earth MRI, the Groundwater Information Center (GWIC), and the Abandoned Mines Inventory (AIM).



New Funding

NGGDPP Priority 1 Grant (July 2022 to June 2023)

With our upcoming grant, we will be scanning 156 Stope Books that are currently reside at Montana Resources.

When completed, we will have a total of 202 out of 303 total books scanned.

**One question you may be asking
yourself is**

**Why are these “Stope Books”
so important to the Butte Mining District?**

Subsidence, my fellow mappers!

Subsidence!!



Look out down below: Four-foot sinkhole opens in Butte back yard

By John Grant Emleigh Of The Montana Standard Aug 14, 2013



Dave Lummi talks Tuesday about a deep sinkhole that opened up in his backyard at 423 Iron Street recently. The Travona Mine in the background may be the source of the hole that will soon be filled and capped.

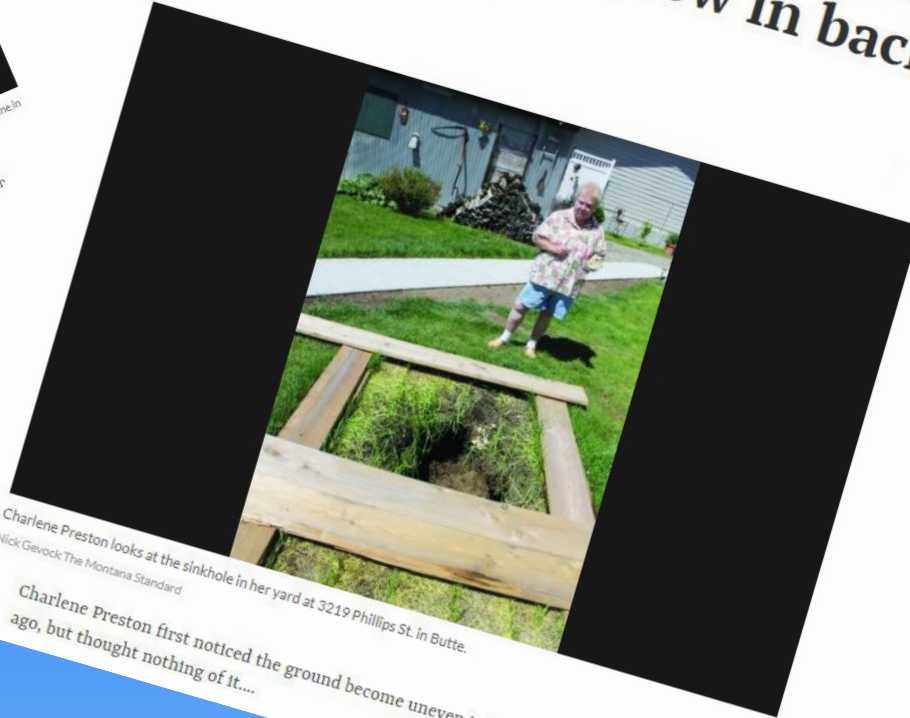
What started as a 4-foot sinkhole in the backyard soon developed into a well that disappears into the guts of the Earth.

Tom Malloy, the reclamation manager for Butte-Silver Bow County, re-sinkhole in the backyard of a residence in the 400 block of Iron Street the hole opened into a slope that was likely attached to the near?

City crews planned to fill the hole Tuesday with a concrete.

How deep is it? Butte homeowner watches sinkhole grow in back yard

By Nick Gevock of The Montana Standard Aug 6, 2012



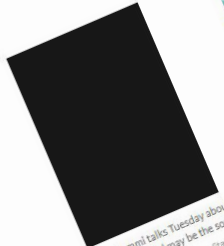
Charlene Preston looks at the sinkhole in her yard at 3219 Phillips St. in Butte.

Nick Gevock/The Montana Standard

Charlene Preston first noticed the ground become uneven in her back yard over a year ago, but thought nothing of it...

Look out down below: Four-foot sinkhole opens in Butte back yard

By John Grant Emeigh of The Montana Standard Aug 14, 2013



Dave Lummi talks Tuesday about a deep sink the background may be the source of the h
Water History / The Montana Standard

What started as
disappears intr
Tom Malloy
sinkhole in
the hole /
City cr

Spring equals sinkhole

By John Grant Emeigh of The Montana Standard Apr 9, 2011



Bob Chansler fills a sink hole with water on a street on Butte's North Side while fellow Butte-Silver Bow road department workers, from left, Tom Loggins and Jim Petritz, and county reclamation director Tom Malloy look on Friday. The hole occurred that morning after an abandoned mineshaft collapsed on 16th Street near Walkerville Avenue. Crews filled the hole with water to see if it would collapse further, and then filled it with concrete and soil.

John Grant Emeigh / The Montana Standard

How deep is it? Butte homeowner watches sinkhole grow in back yard

By Nick Gevock of The Montana Standard



k yard over a year

Look out down below: Four-foot sinkhole opens in Butte back yard

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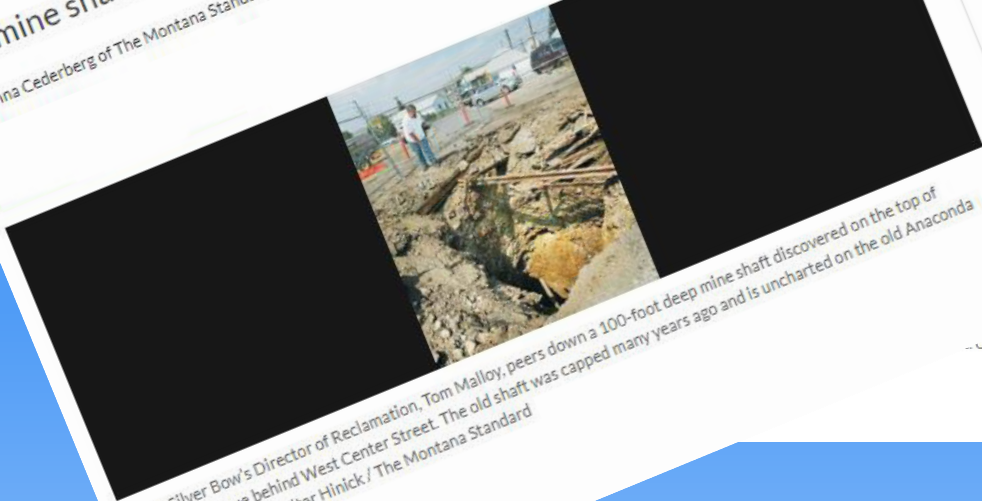


Spring

Sinking in deep

Old mine shaft opens leaving 100-foot deep sinkhole in Uptown street hole

By Jenna Cederberg of The Montana Standard - 08/07/2007 Aug 6, 2007



Butte-Silver Bow's Director of Reclamation, Tom Malloy, peers down a 100-foot deep mine shaft discovered on the top of Missoula Avenue behind West Center Street. The old shaft was capped many years ago and is uncharted on the old Anaconda Company records. Walter Hinick / The Montana Standard

How deep is it? Butte homeowner watches sinkhole grow in back yard

By N... Gevock of The Montana Standard



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Look out down below: Four-foot sinkhole opens in Butte back yard

By John Grant Emeigh of The Montana Standard - Aug 14, 2013



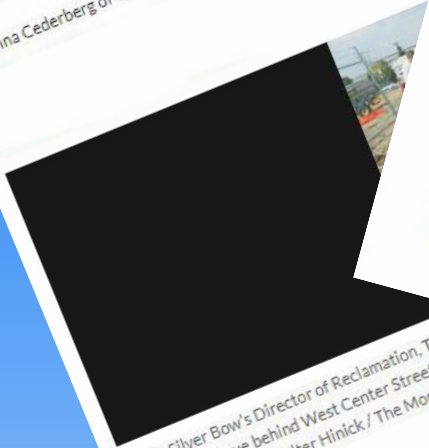
Spring

By John

Sinking in deep

Old mine shaft opens leaving 100-foot de

By Jenna Cederberg of The Montana Standard - 08/07/2007 Aug 6, 2007



Butte-Silver Bow's Director of Reclamation, Tom Malloy, stands behind West Center Street. The old shaft was discovered Saturday. Walter Hinick / The Montana Standard

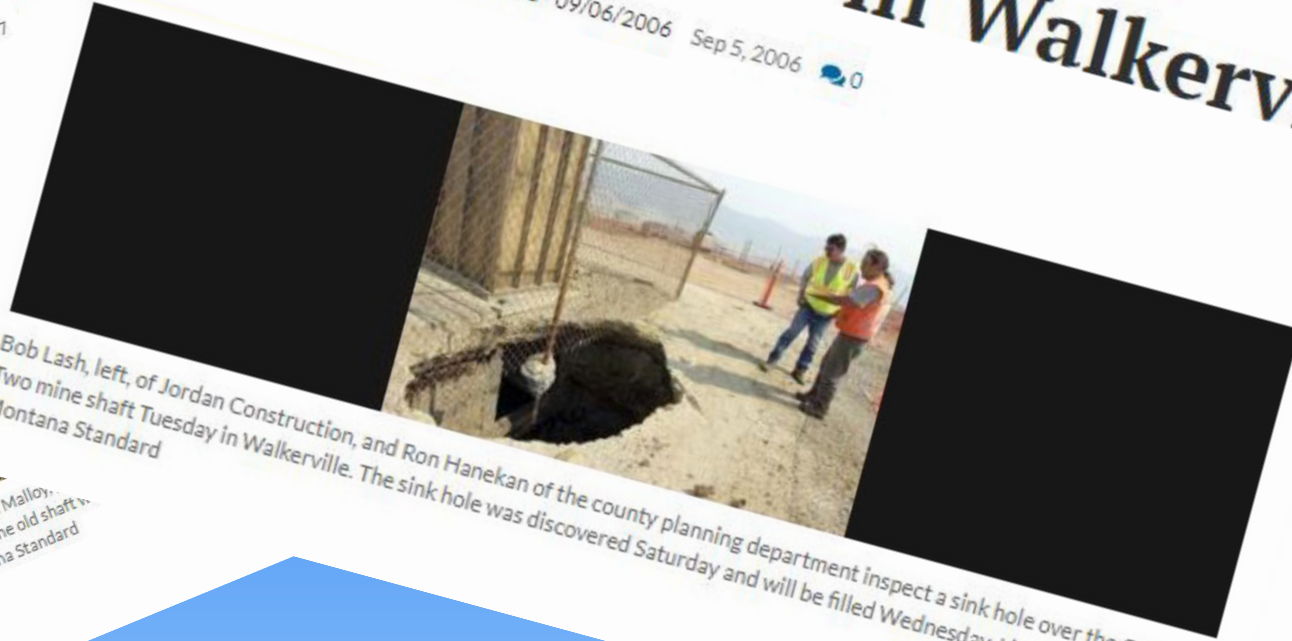
How deep is it? Butte homeowner watches sinkhole grow in back yard

By Nick Gevock of The Montana Standard

hole

Mine shaft opens in Walkerville

By John Grant Emeigh of The Montana Standard - 09/06/2006 Sep 5, 2006



Bob Lash, left, of Jordan Construction, and Ron Hanekan of the county planning department inspect a sink hole over the Corra Corra mine shaft Tuesday in Walkerville. The sink hole was discovered Saturday and will be filled Wednesday. Lisa Kunkel / The Montana Standard

1-hole

Old mine shaft 'surfaces' beneath swing set in Butte

By MIKE SMITH For The Gazette Apr 7, 2016



Butte-Silver Bow Reclamation Manager Tom Malloy peers into a man-made 100-year-old shaft Thursday morning that was discovered in the backyard of a home in the 800 block of North Montana Street. He says it is likely an old mine discovery shaft that was later used as a sewage dump by a nearby billiard hall and saloon that existed a century ago.

Walter Hinick/Montana Standard

Look out

Sinking

Old mine

By Jenna Cedert

Homeowner
back yard

ilkerville



the Corra
Kunkel / The

TOPICAL

30-foot sinkhole opens up in Butte resident's backyard

SUSAN DUNLAP susan.dunlap@mtstandard.com Nov 26, 2018



A bedroom was over this spot before the hole opened up on a June night. The homeowners had just had the bedroom torn down a couple of months before.





Tony Roth
Map Technician
Data Preservation

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aroth@mtech.edu | mbmg.mtech.edu



Questions?

