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Benson Tech
Portland, Oregon

Resource Mining in SW Colorado and its Effect on Human Activity and the Landscape

Overview: In this lesson, students will analyze primary source maps (geologic- 1877 and current-historical-1893 and event-based-2015) to see how mineral availability and extraction altered the human and physical landscape.

Essential Geographic Question: How and why do the natural resources influence human activity? How and why do humans alter the natural landscape?

Prior knowledge and understanding (from classwork): watersheds, water cycle, latitude and longitude, map reading, mineral bearing rock and experience with at least one geologic map.

National Geography Standards:
STANDARD 14: How human actions modify the physical environment.
STANDARD 15: How physical systems affect human systems.
STANDARD 16: The changes that occur in the meaning, use, distribution, and importance of resources

Oregon Geography Content Standards:
HS.16. Analyze the interconnectedness of physical and human regional systems (e.g., a river valley and culture, water rights/use in regions, choice/impact of settlement locations) and their interconnectedness to global communities.

Next Generation Science Standards: ESS-3-1 Construct an explanation based on evidence for how the availability of natural resources........ has influenced human activity.

Common Core State Standards
ELA/Literacy: RST.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media in order to address a question or solve a problem. (?)
WHST.9-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

Objectives: In completing this activity
1) students should be able to identify and describe the distribution of mineral rich areas using a geologic map
2) identify place names that reflect the human interest/interaction in this area from historical maps
3) extract key events in this area from text and other media
and 4) summarize human and landscape interaction in the context of mining in SW Colorado
Grade Levels: 11-12 Time: 4 x 90 minute periods

Possible Extensions:

10th grade US history, use Map Analysis tool for Fischer and Hayden maps.

TAG students, offer the opportunity to expand the final project to a map and timeline, or map and written summary answering the Geographic Question.

Materials:

Poster paper or large whiteboard (Days 1 & 2)
Tape or magnets (Day 3)
Markers (All Days)
Sticky Note, variety of colors (Day 3)
Laptops, chromebooks or computer availability for Day 3
Copies of Student Answer Sheets (SAS) 1, 2, 3, and 4
Copies of Map Analysis Tool (MAT) for Days 1-2
Variety of materials available for Day 4
Large Venn Diagrams
Poster paper
Printer paper
Pens
Colored pencils
A few laptops/Chromebooks
Rulers
Blackline master of SW Colorado

Primary Sources:

Title Geological and geographical atlas of Colorado and portions of adjacent territory, Sheets XV and XVII
Hayden, F. V. (Ferdinand Vandeveer), 1829-1887.

Created / Published [New York] J. Bien, lith., 1877.

Complete Map (Sheet XV)
Section, example

https://www.loc.gov/resource/g4311cm.gct00080/?sp=17

Fischer 1893 Map of SW Colorado, printed in sections to allow legibility
Title Map of Southwestern Colorado
Fischer, Emil B.

Created / Published [S.l. : s.n.], 1893.

Complete Map

Section, example

https://www.loc.gov/item/2009582400/

Geologic Map of Colorado, USGS, downloaded and printed (optional)

http://ngmdb.usgs.gov/Prodesc/proddesc_9518.htm

Materials:

Class Set of Photos and Articles: (Day 3)
Durango Water and Summer Activities

(http://www.durango.org/discover-durango/outdoor-recreation/)

Silverton Quadrangle Map

http://www.mininghistoryassociation.org/Meetings/Ouray/USGS%20B%20182%20Map%201901.jpg

Article: Animas River Closing Following Contaminated Water Spill from Gold King Mine


Congressional Document: 1879, Establishment of Postal Routes, pages 1, 4-5 to include introduction and Colorado


Picture: San Juan Historical Marker Sign: Graysill Mines
http://www.traveljournals.net/pictures/179299.html

Description and Map: Durango Uranium Mill Site

http://clui.org/ludb/site/durango-uranium-mill-site

Article: Gold King (this


Colorado Map, 1885

http://www.usgwarhives.net/maps/colorado/statemap/cow1885.jpg
Procedure:

Note: Student Answer Sheets 1-4 (formative assessment) should be collected and held by the teacher, or if returned to give feedback for discussion, should be REcollected to be held for the Day 4, when the student can use them for the Summative Assessment.

Day 1: Students should be able to identify and describe the distribution of mineral rich areas using a geologic map

Day 1 Materials:
One MAT per student
Hayden’s XV Map, printed in sections or as a large map: one section or one complete map per group
Poster paper or whiteboard per group
Markers
Student Answer Sheet #1: One Exit Ticket per student

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Students</th>
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<tbody>
<tr>
<td>1. Anticipatory Set: Project a picture of jewelry that relates to your specific class. Ideas are below. ◊ What is the price of this jewelry? Other metals? ◊ Prompt for more in depth answers if no student includes an environmental cost: ◊ How much was the miner/jeweler/salesperson, etc. paid? ◊ Who made the jewelry? ◊ In which country did the gold originate? ◊ Was it obtained legally? Etc.</td>
<td>Brainstorm the “cost,” as individuals, pairs then share with the class.</td>
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<tr>
<td>Teacher</td>
<td>Students</td>
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<tr>
<td>1. Explain that students will be using maps and articles to look at a metal rich area of SW Colorado to see how and why humans and natural resources interact.</td>
<td>Form groups</td>
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<tr>
<td>2. Divide students into groups of 3</td>
<td>Contribute to answering question: “What is an observation?”</td>
</tr>
<tr>
<td>3. Pass out blown up sections of Hayden’s geologic map of SW Colorado so that each part of the entire map is covered. See Appendix E for full size images or Primary Source URLs at end of Material’s List. (Better quality images are attained with URLs)</td>
<td>As a group, make observations using the Map Analysis Tool. Record observations as group on poster sized paper or group whiteboard.</td>
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<tr>
<td>4. Project the Map Analysis Tool (MAT- See Appendix C), review what an observation is. Pass out MATs for each student and give students time to make and record observations.</td>
<td></td>
</tr>
</tbody>
</table>
5. Circulate and answer questions.  
   Distinguish observation vs reflection if needed.

6. Bring class back together as group.

7. Now it’s time to “Reflect” using your Map Analysis Tool:

8. Circulate in class to answer questions and keep kids on track, focused on patterns, purpose and motivation.

9. Bring students back together to share their reflections.

10. Prompt class to identify any common reflections of pattern, purpose and motivation.  
    ***See Possible Answer Sheet, Appendix F

11. Return to the MAT, the Questions column. Review the questions with the class.

12. Teacher circulates, keeps students focused on answering the questions, as well as forming their  

Share observations.

Answer questions with class.

Use map section to answer reflection questions. Record answers on group paper.

Each group shares their reflections.

Identify anything they notice groups have in common, or any insightful reflection.

Students answer the questions from the MAT as a group on their whiteboard/poster.
own questions.

13. Bring students back together, discuss answers and student questions.

14. If using map sections (as opposed to class set of large maps of Hayden’s XV sheet), direct students to assemble pieces into whole map.

15. Pass out individual answer sheets: Student Answer Sheet (SAS) for “Exit Ticket.”
   See below or Appendix A

   Share information and questions.

   Work together to assemble map.

   Students examine entire map and identify: Which minerals are included, why? Where minerals are located, why? The purpose of the map.

   Individually, students answer questions before they leave.

Student Answer Sheet#1: Exit Ticket

Name: _______________________________________________

Which minerals are included on the map? Why?

Where are the minerals located? Why?

What is the purpose of this map?
**Day 2:** Students will identify place names that reflect the human interest/interaction in this area from historical maps

**Day 2 Materials:**

One MAT per student

Fischer 1893 Map of SW Colorado, printed in sections or as a large map: one section or one complete map per group

Poster paper or whiteboard per group

Markers

Student Answer Sheet #2: One Exit Ticket per student

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Students</th>
</tr>
</thead>
</table>
| 1. Introduce Fischer 1893 Map of SW Colorado on screen (See link (better quality) on Materials List or Appendix E) | Look at map on screen.  
Make a quick observation. Some students share their answers.  |
| 2. Review observations by asking students to make a brief observation and tell their neighbor |  |
| 3. Acknowledge all answers, distinguish observation from reflection. | Consider how places get their names..tell their neighbor and then share with class.  |
| 4. Pose question for “Think, Pair, Share” activity: How do places get their names? |  |
| 5. Choose student/volunteer to record answers on board. | Student-volunteer writes answers on board.  |
| 6. Acknowledge all answers. |  |
| Prompt when necessary to emphasize that what humans value will often determine a place name. |
| Form groups |
| 7. Divide students into groups of 3 |
| 8. Pass out blown up sections of Fischer’s 1893 Map of SW Colorado so that each part of the entire map is covered. (if you have entire maps printed and they’re legible, give each group one complete map) |
| As a group, make observations using the Map Analysis Tool. Record observations as group on poster sized paper or group whiteboard. |
| 9. Pass out to each student a MAT |
| 10. Circulate and answer questions. Distinguish observation vs reflection if needed. |
| Share observations. Answer questions with class. |
| 11. Bring class back together as group. |
| 12. Distinguish observation from reflection- |
| Using section of map, answer reflection questions from MAT. Record answers on group paper. |
| 13. Now it’s time to “Reflect” using your Map Analysis tool: |
| “Focus on why an area might have a particular name. Why were some things singled out to label.” |
| 14. Circulate in class to answer |
questions and keep kids on track, focused on themes, human-environment interaction and physical environment

15. Bring students back together to share their reflections.

16. Prompt class to identify any common reflections on
   ◊ themes,
   ◊ human-environment interaction,
   ◊ the physical environment.

17. Return to the MAT, the Questions column. Review the questions with the class.

18. Teacher circulates, keeps students focused on answering the questions, as well as forming their own questions.

19. Bring students back together, discuss answers and student questions.

20. If using map sections (as opposed to class set of large maps of Fischer’s 1893 Map), direct students to assemble pieces into whole map.

21. Pass out individual answer sheets: Student Answer Sheet#2 (SAS) for “Exit Ticket.” (See below or

   Each group shares their reflections.

   Identify anything they notice groups have in common, or any insightful reflection.

   Students answer the Questions from the MAT as a group on their whiteboard/poster.

   Share information and questions.

   Work together to assemble map.

   Students examine entire map and identify: place names and how they reflect human interest and experience
Student Answer Sheet #2: Exit Ticket

Name: ___________________________  Period: ___________  Date: ________

What are some types of place names you found on the map? Give examples.

What other items were labeled on the map? Why?

What items might have been left off? Why?

What do you think is the purpose of this map? How do you know that?

How do humans create the landscape?
**Day 3:** Students will extract key events in this area from text and other media; and student will summarize human and landscape interaction in the context of mining in SW Colorado

Materials:

- Sticky notes, in a variety of colors
- Class Set of Photos and Articles arranged around the classroom at different stations - in plastic sleeves if possible
- Tape or magnets
- Class set of laptops, ChromeBooks, or reserve the computer lab for the second half of the class.
- Student Answer Sheet #3, one per student

**Thumbnails and Links for Gallery Walk Class Set:**

**Durango Water and Summer Activities** (See below or Appendix D)

(http://www.durango.org/discover-durango/outdoor-recreation/)

**Silverton Quadrangle Map**

http://www.mininghistoryassociation.org/Meetings/Ouray/USGS%20B%20182%20Map%201901.jpg

**Article: Animas River Closing Following Contaminated Water Spill from Gold King Mine**

Congressional Document: 1879, Establishment of Postal Routes, pages 1, 4-5 to include introduction and Colorado

Picture: San Juan Historical Marker Sign: Graysill Mines
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Description and Map: Durango Uranium Mill Site
http://clui.org/ludb/site/durango-uranium-mill-site

Article: Gold King
<table>
<thead>
<tr>
<th>Teacher</th>
<th>Students</th>
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</thead>
<tbody>
<tr>
<td>1. Project an interesting photo to introduce “Gallery Walk,” as an activity that allows students to make observations about a variety of media: photos, articles, maps, etc.</td>
<td>Participate in introduction to “Gallery Walk,” and get directions.</td>
</tr>
<tr>
<td>2. Directions:</td>
<td>Students rotate from one station to the next, making observations.</td>
</tr>
<tr>
<td>As students make observations, they write them on a “sticky note,” and then leave it at that station.</td>
<td></td>
</tr>
<tr>
<td>3. Write at least one observation for each station.</td>
<td>Individuals read comments/observations.</td>
</tr>
<tr>
<td>Example: (GoldKing Mine Spill) The spill was caused by a governmental agency trying to clean up the mine waste. Example: (Silverton Quadrangle) Map includes the following: gulches, mines, tunnels</td>
<td>Student(s) decide where that item falls on the timeline.</td>
</tr>
<tr>
<td>4. Pass out sticky notes, instruct students to start.</td>
<td></td>
</tr>
<tr>
<td>5. Call out switch, every 3-4 minutes to allow students to visit each station.</td>
<td>Students decide how items should be ordered and give reasons.</td>
</tr>
<tr>
<td>6. While students are making observations, draw a timeline across the board. Have tape or magnets available to secure the gallery item to the whiteboard.</td>
<td></td>
</tr>
<tr>
<td>7. Call for student attention, and have a student read many of the observations at one station.</td>
<td></td>
</tr>
<tr>
<td>8. As each gallery item is described, ask when did that occur? Have student bring item to board to add to timeline.</td>
<td></td>
</tr>
<tr>
<td>9. Items can be moved or rearranged as</td>
<td></td>
</tr>
</tbody>
</table>


<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>students discuss and discover information- this should be student led, as much as possible.</strong></td>
<td></td>
</tr>
<tr>
<td>10. Provide Students with SAS #3, see below or Appendix A</td>
<td>Students draw and copy final timeline onto SAS #3</td>
</tr>
<tr>
<td>11. Have students get out laptops/Chromebooks or organize and go to lab.</td>
<td>Write name on SAS #4</td>
</tr>
<tr>
<td>12. Provide them with Student Answer Sheet #4 See below or Appendix A</td>
<td></td>
</tr>
<tr>
<td>13. All students open up internet and go to Google Maps.</td>
<td>All students open up internet and go to Google Maps.</td>
</tr>
<tr>
<td>14. If possible, teacher demonstrates this on screen as students do this on their own computers.</td>
<td></td>
</tr>
<tr>
<td>15. Zoom into Animas River and Durango.</td>
<td></td>
</tr>
<tr>
<td>16. Directions: Follow the Animas River upstream and look for signs of old mining activity.</td>
<td></td>
</tr>
<tr>
<td>17. While you are looking, make notes to answer these questions on SAS#4: How did the humans influence the landscape? How did the landscape influence humans?</td>
<td></td>
</tr>
<tr>
<td>18. Collect SAS#4</td>
<td>Turn in SAS#4</td>
</tr>
</tbody>
</table>
Student Answer Sheet#3 (Enlarge this and print this with landscape orientation)

Timeline of Events

Student Answer Sheet #4

What do you see that could be signs of old mining activity? Describe it- why do you think it’s related to mining? (Or sketch and label on the back of this paper).

How did the humans influence the landscape?

How did the landscape influence humans?
**Day 4:** Students will summarize human and landscape interaction in the context of mining in SW Colorado

Students choose the format they wish to communicate their answers to the following questions:

- Using SW Colorado as an example, please answer the following:

- **How and why** do the natural resources influence human activity? **Give examples, reasons and evidence.**

- **How and why** do humans alter the natural landscape? **Give examples, reasons and evidence.**

**Materials:**

Copies of the Summative Assessment Sheet

Copies of the scoring rubric for students

Poster Paper

Printer paper

Markers

Colored Pencils

Rulers

Laptops

Formats can include:

- Venn Diagram
- Annotated timeline
- Map
- Poster
- Short essay
- Comic
- Song-rap (must be performed that day)

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand back student work, SAS 1-4.</td>
<td>Receive formative assessments and</td>
</tr>
<tr>
<td>Using projector and printed assignment sheets,</td>
<td></td>
</tr>
<tr>
<td>review the assignment with students.</td>
<td></td>
</tr>
<tr>
<td>Emphasize ANY format listed is fine, as long as the questions are thoroughly answered.</td>
<td></td>
</tr>
<tr>
<td>Have maps out and available.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix A: Student Answer Sheets 1-4

Student Answer Sheet#1: Exit Ticket

Name: ________________________________

Which minerals are included on the map? Why?

Where are the minerals located? Why?

What is the purpose of this map?
Student Answer Sheet #2: Exit Ticket

Name: _______________________________  Period: ______________  Date: __________

What are some types of place names you found on the map? Give examples.

What other items were labeled on the map? Why?

What items might have been left off? Why?

What do you think is the purpose of this map? How do you know that?

How do humans create the landscape?
Student Answer Sheet #3 (Enlarge this and print this with landscape orientation)

Timeline of Events

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Student Answer Sheet #4

**What do you see** that could be signs of old mining activity? **Describe it**—**why** do you think it’s related to mining? *(Or sketch and label on the back of this paper).*

**How** did the humans influence the landscape?

**How** did the landscape influence humans?
Choose the format you wish to communicate their answers to the following questions:

- Using SW Colorado as an example, please answer the following:
  - How and why do humans alter the natural landscape? Give examples, reasons and evidence.

Formats can include:
- Venn Diagram
- Annotated timeline
- Map
- Poster
- Short essay
- Comic
- Song-rap (must be performed that day)
## Appendix B: Scoring Rubric for Summative Assessment

<table>
<thead>
<tr>
<th>Category</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify natural resources <strong>in SW Colorado</strong></td>
<td>Student clearly communicates types of natural resources, why they’re located in SW Colorado and how they’re useful to people.</td>
<td>Student clearly communicates types of natural resources and how they’re useful to people.</td>
<td>Student clearly communicates types of natural resources</td>
<td>Student incorrectly identifies natural resources</td>
</tr>
<tr>
<td>Identify how and why humans have altered the landscape <strong>in SW Colorado</strong></td>
<td>Student gives examples and clearly communicates how humans have altered the landscape of SW Colorado, gives clear and detailed reasons why it was altered</td>
<td>Student gives examples and clearly communicates how humans have altered the landscape of SW Colorado and give some reasons why it was altered</td>
<td>Student gives examples of how humans have altered the landscape of SW Colorado</td>
<td>Student does not identify how or why humans have altered the landscape</td>
</tr>
<tr>
<td>How and why do natural resources influence human activity?</td>
<td>Student identifies examples of and explains how natural resources influence human activity. Student identifies and gives examples of why natural resources influence human activity.</td>
<td>Student identifies examples of and explains how natural resources influence human activity. <strong>OR</strong> Student identifies and gives examples of why natural resources influence human activity.</td>
<td>Student identifies examples of natural resources <strong>OR</strong> explains how natural resources influence human activity.</td>
<td>Student does not correctly identify how natural resources influence human activity.</td>
</tr>
<tr>
<td>Summarize human and landscape interaction in the context of mining in SW Colorado</td>
<td>Student clearly expresses the reciprocal influences of human and landscape in SW Colorado.</td>
<td>Student begins to explore the reciprocal influences of human and landscape in SW Colorado.</td>
<td>Student has some misconceptions, but identifies some feature of reciprocal influence in SW Colorado.</td>
<td>Student does not attempt or incorrectly describes the human-landscape interaction in SW Colorado.</td>
</tr>
<tr>
<td>Quality of presentation or communication</td>
<td>The presentation adds to the clarity of the communication. The work is neat and legible.</td>
<td>The work is neat and legible.</td>
<td>The work is mostly neat and legible. Some areas are not clear.</td>
<td>The quality of the work keeps the reader from understanding.</td>
</tr>
</tbody>
</table>
Appendix C: Map Analysis Tool (MAT) for Historical and Geologic Maps:

Name: ____________________________  Period: ________  Date: ________________________

<table>
<thead>
<tr>
<th>Observe</th>
<th>Reflect</th>
<th>Question</th>
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<tbody>
<tr>
<td>What is the title of the map?</td>
<td>What was the most likely purpose for this</td>
<td>What is the significance of the date of the map?</td>
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<td></td>
<td>map?</td>
<td></td>
</tr>
<tr>
<td>What is the date of the map?</td>
<td>What patterns does the map show? (physical</td>
<td>How does this map illustrate</td>
</tr>
<tr>
<td></td>
<td>characteristics? Human patterns?</td>
<td>• human,</td>
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<tr>
<td>Who produced the map?</td>
<td>What was the motivation of the organization</td>
<td>• physical,</td>
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<tr>
<td></td>
<td>or person making the map?</td>
<td>• economic,</td>
</tr>
<tr>
<td>What words or symbols do you</td>
<td></td>
<td>• societal,</td>
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<tr>
<td>find?</td>
<td></td>
<td>• cultural</td>
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<tr>
<td>What do the colors represent?</td>
<td></td>
<td>• and political conditions</td>
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<td></td>
<td></td>
<td>for the time when the map was made?</td>
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<td>Other observations?</td>
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</table>

Your questions.......
Appendix D: Thumbnails of Primary Sources

Thumbnails and Links for Gallery Walk Class Set:

Durango Water and Summer Activities

(https://www.durango.org/discover-durango/outdoor-recreation/)

Silverton Quadrangle Map

http://www.mininghistoryassociation.org/Meetings/Ouray/USGS%20B%20182%20Map%201901.jpg

Article: Animas River Closing Following Contaminated Water Spill from Gold King Mine


Congressional Document: 1879, Establishment of Postal Routes, pages 1, 4-5 to include introduction and Colorado


Picture: San Juan Historical Marker Sign: Graysill Mines
Description and Map: Durango Uranium Mill Site

http://clui.org/ludb/site/durango-uranium-mill-site

Article: Gold King

Appendix E: Full Size Primary Sources.

Hayden’s 1877 Geology Map, Sheet XV
The Animas River is closing indefinitely following an accidental spill of more than one million gallons of contaminated water from the Gold King mine in southwestern Colorado, a La Plata County Sheriff told 7NEWS.

All watercraft including canoes, kayaks, tubes, rafts and other flotation devices from the north County line (San Juan County) to the South County line (Colorado/New Mexico state line) will not be allowed until further notice, La Plata County Sheriff Sean Smith said.

All watercraft within the location stated above must be removed, Smith added.

"This decision was made in the interest of public health after consultations with the Environmental Protection Agency (EPA), the Colorado Department of Health and Environment, San Juan Basin Health Department and representatives of the Southern Ute Indian Tribe," said Smith.

Smith said in a statement that EPA test results are expected within the next 24 to 48 hours, at which point the order will be re-evaluated.
The acidic mine water was traveling down the Animas River and was expected to hit the city limits of Durango at approximately 3 p.m. on Thursday.

"The EPA and State Division of Reclamation, Mining and Safety team working to investigate and address contamination at the Gold King Mine in San Juan County, Colo. unexpectedly triggered a large release of mine waste water into the upper portions of Cement Creek," according to a news release from the La Plata County Office of Emergency Management. "Initial estimates are that the release contained approximately 1 million gallons of water that was held behind unconsolidated debris near an abandoned mine portal."

County officials said while there were several workers at the mine at the time of the breach, no one was hurt.

However, they are asking that fishermen, rafters, boaters and other recreational users of the Animas River to avoid contact with the water until the mine water passes.

County officials said the acidic mine water contains high levels of sediment and metals.

"EPA teams are conducting sampling and visual observations today and will be monitoring river conditions over the next several days," county officials said. "The water associated with the release is obvious and highly discolored."

San Juan Corp., property owner of the Golden King Mine released the following statement:

The U.S. Environmental Protection Agency, operating under an access agreement obtained from the owner of the Gold King Mine, had begun an investigation regarding the source of contaminated water at the Gold King Mine last year. Upon suspending work last year, the USEPA backfilled the portal to the mine. On August 5th, 2015, while the USEPA was removing the backfill from the portal to the Gold King Mine to continue its investigation this year, the plug blew out releasing contaminated water behind the backfill into the Animas River.

Residents with questions about the water may call 970-385-8700.
The Gold King Mine is just outside Silverton. The mine started operations in 1887. According to NarrowGauge.org, the Gold King shipped more than $8 million in ore during its operations.
Silverton Quadrangle, Colorado
FORTY-FIFTH CONGRESS.  Sess. III.  Ch. 184.  1879.  

CHAP. 184. — An act to establish post routes. 

March 3, 1879.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following post routes, and the same are hereby established:

ALABAMA.

From Troy, via Indian Branch, to Selma.
From Grove Hill, via Waites Store, Jackson, Cherry's Mill and Partin's to Suggsville.
From Clayton to Solomon's Mill.
From Delta to Wedowee.
From Delta to Talladega.
From Point Clear, via Stapleton's Store and Magnolia, to Bon Secour.
From Cthon, via Sandy Bridge, Panola, Frazer's Shop Mothersheds II, to Salisbury.
From Montgomery to Carter's Hill.
From Elba via Old Town and Green Bay, to Cross Trails.
From Birmingham, via Doc Sneads and Calvary Williams, to Demopolis.
From Glennville, via Coweek, to Harris' Store.
From Lot, via Albertsville, to Brooksville.
From Vernon, via Bedford, to Quincy Mississippi.
From Holly Grove, to Rocky Plains.
From Skipperville, via Blue Springs to Clayton.
From Linden, via Sweetwater to Hoboken.
From Sumnerfield, via Oak Grove, Perryville, Severe Precinct, Pinedale, Calliger's Store and Morrowville, to Oakmulgee.
From Cambridge to Lanier's Store.
From Monroeville, via River Ridge, to Bell's Landing.
From Martin's Station, via Athens, McKinley and Shilo to Hoboken.
From Carrotton, via Staffords Mill, Alabama, to Columbus Mississippi.
From Carrollton, via Raleigh, to Romulus.
From Dick's Creek, via Calhouns Store to Union Springs.
From Delta to Lineville.
From Aurora to Crossville.
From Tuskegee, via Cotton Valley and Warrior's Stand, to Guerrytown.
From Chishall's Mills to Fort Payne.
From Florence Alabama, via the Savannah Road, to Lowreyville, Tennessee.
From Carrollton, via Speed's Mill, Raleigh, Cole's Store and Elmire's Store to Gordo.
From Okolona, via Shalaha to Nicholson's Store.
Colorado.

FROM ALTURAS TO CEDARVILLE.

COLORADO

From Helena to Makelville.
From Fairplay via Western Pass, Malta and Leadville to Oro City.
From Garland, via Conejos, Pegosa Springs Animas City and Hermosa, to Silverton.
From Silverton to San Miguel City.
From Ouray, Colorado, via San Miguel, Lower San Miguel, Castle Valley and Salina Canon, to Saline, Utah.
From Parrott City, via Mancos, to Dolores.
From Oro City, via Union Park, to Washington Gulch.
From Washington Gulch, via State River and East River, to Gunnison City.
From Poncho Springs, via Marshall Pass, Twelve-mile Bridge, and Gunnison City, to Ouray.
From Animas City, Colorado, via the Animas River, to Fort Wingate, New Mexico.
FORTY-FIFTH CONGRESS. SESS. III. CH. 184. 1879. 431

From Cheyenne Wells, via Goose Creek, to Henkelman’s Ranch.
From Boulder City to Balarat.
From Silverton to Ophir City.
From Greely, along the north side of Platte River, via Lemons, Weldon Valley, Morgan, and Pleasant Plain, to Buffalo.
From Hamilton, via Glen Charlotte, to Florissant.
From West Las Animas, via Purgatoire Valley, Nine-mile Bottom, and Trinidad, to Stonewall.
From Garland Colorado, to Fort Wingate, New Mexico.
From White River Agency to Los Pinos.
From Trinidad, via Pulaski, Bents Canon, to Las Animas.
From Alamosa, via Conejos, Los Pinos, Lower Crossing of Chama and Nacimiento, to Fort Wingate.
From Alamosa, via La Jova, to Conejos.
From Gunnison, via Crooksville, to Conchoetopah.
From Alamosa to Sangre de Christo via Medano Springs.
From Huerfano to Salt Creek.
From Fraser to Grande Lake.
From Ouray, via Placerville, Paradox Valley, La Sal, and old Mormon Fort, to Salidas.
From Trinidad, via Davis’s to Stonewall.
From Hartel to Platte Station.
From Lake City to Rose’s Cabin.
From Conejos, via Seleden, Manassa, and Serritos Alamosa.
From White River to Lake City.
From White River, via Grand River and Green River, to Adairsville.

Utah
From Parrott City to Adairsville Utah.
From Julesburg via Kit Carson to West Las Animas.
From White River to Fair Play.
From Parrott City to Fort Wingate New Mexico.
From Trinidad, via Stonewall, to Castella, New Mexico.
From Rosita to Silver Cliff.
From Colfax to Silver Cliff.
From Stonewall to Conejos.
From Alamosa, via Pagosa Springs, to Animas City.
From Hot Sulphur Springs, via Gunnison to Lake City.
From Lake City, via Capital City and Rose Cabin, to Ouray.
From Fairplay, via Mosquito Pass, to Leadville.
From Preston, via Ten-Mile Creek to Leadville.
From Hot Sulphur Springs, via Williams’ Fork and Blue River to Breckenridge.
From Georgetown via Argentine Pass, to Montezuma.
From Central City to Hot Sulphur Springs.
From Animas City, via Animas River to Farmington, New Mexico.
From Deer Trail, via Hittsons, Cole’s Ranch and mouth of Beaver Creek, to Wetzel’s.
From San Luis, via Fort Lowell, New Mexico, Washington Pass in Navajo Reservation, Ourabe, Arizona, William Grove Camp Mohave, and Camp Cady, to Mohave Station California.
From Leadville via Ten Mile to Breckenridge.
From Dixon to Hahn’s Peak.
From Hot Sulphur Springs, to Grand Lake.
From Silverton, via Ophir to San Miguel.
From Leadville, via Ten Mile Canyon, Carbonateville and Montezuma, to Georgetown.
From Walsenburg, via Butte Valley and Apache Creek to Green Horn.
From Pagosa Springs to Fort Wingate New Mexico.
Graysill Mines, San Juan National Forest Historical Marker
Uranium Mill at Durango, Colorado

THE CENTER FOR LAND USE INTERPRETATION

LAND USE DATABASE

DURANGO URANIUM MILL SITE

Uranium Mill at Durango, Colorado

At some of the sites listed under this resource may be found deposits of uranium.

The Durango Uranium Mill was one of the earliest uranium mines in Colorado. It was established in 1934 to produce uranium for nuclear reactor fuel. The mill and its facilities were leased to the Atomic Energy Commission in 1947. The mill was used to process uranium ore from the nearby Okie Mine. The mill was later abandoned and has since been left to deteriorate. The site is now managed by the U.S. Bureau of Land Management.

This site is located in the San Juan Mountains in southwestern Colorado. The mill was located on a hillside above the Animas River, which flows through the community of Durango. The site consists of a series of abandoned buildings and equipment, including milling equipment, storage tanks, and a waste-water treatment plant. The area around the mill is now used for recreational purposes, including hiking and bird-watching.

The site is located in a remote area, and access is limited to authorized personnel. Visitors should be prepared for rough terrain and challenging weather conditions. The area is also home to wildlife, including elk, deer, and bears, so visitors should take appropriate precautions.

The site is managed by the U.S. Bureau of Land Management. For more information, visit their website or contact the local field office.

The site is located in the Durango area, near the town of Durango. The site is approximately 10 miles southwest of Durango, on a dirt road off the main road. The site is located in a remote area, and access is limited to authorized personnel. Visitors should be prepared for rough terrain and challenging weather conditions. The area is also home to wildlife, including elk, deer, and bears, so visitors should take appropriate precautions. The site is managed by the U.S. Bureau of Land Management. For more information, visit their website or contact the local field office.
Gold King Mine's toxic spill

By Lorena Iníguez Elebee

AUGUST 14, 2015, 11:22 AM

This month 3 million gallons of toxic material from a defunct gold mine flowed into the Animas River in Colorado, raising concerns about the possible long-term damage from the spill. Here's how the disaster unfolded as the toxic plume made its way downriver.

Aug. 5
3 million gallons of mine waste are released after debris blocking the mine opening gives way during a clean-up operation.
What is in the mine waste?

The waste released from the Gold King Mine contains metal compounds that are linked to harmful side effects if consumed or someone comes into contact with them.

Arsenic: Stomach pain, nausea, vomiting, diarrhea, feet and hand numbness, partial paralysis and blindness.

Copper: Gastrointestinal distress to liver or kidney damage.

Lead: Delays in physical or mental development, kidney problems and high blood pressure.

Manganese: Affects visual reaction time, hand steadiness and eye-hand coordination.

Zinc: Diarrhea, abdominal pain or vomiting.

The mine waste got dilute during the process as it made its way through the Animas River.
Aug. 7
Farmington: All water intake pumps are shut down.

Aug. 7
At Gold King Mine, discharge rate: 740 gallons per minute.

Aug. 8
Plume reaches river confluence by morning
Gold King Mine discharge rate: 500 gallons per minute.

Plume
Speed: 4 mph
Appearance: Muddy orange

Navajo Dam’s water release is increased to dilute river contaminants.
SW Colorado Map for Final Project
Appendix F: Possible Answers for Hayden Map

Appendix C: Map Analysis Tool (MAT) for Historical and Geologic Maps:

<table>
<thead>
<tr>
<th>Observe</th>
<th>Reflect</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the title of the map?</td>
<td>What was the most likely purpose for this map?</td>
<td>What is the significance of the date of the map?</td>
</tr>
<tr>
<td>US Geological and Geographical Survey of the Territories, FV Hayden in Charge: SW Colorado and Parts of New Mexico, Arizona and Utah</td>
<td>Documenting geological and settlement patterns for interested miners and settlers.</td>
<td>-For the teacher (students will not necessarily have this background): Politics are changing the status of Native Americans with the Indian Appropriation Act. There is a gold Rush in the Dakotas, causing conflicts between Native Americans and trespassing miners. Mesa Verde was documented by Jackson in 1874.</td>
</tr>
<tr>
<td>What is the date of the map?</td>
<td>What patterns does the map show? (physical characteristics? Human patterns?)</td>
<td>How does this map illustrate</td>
</tr>
<tr>
<td>1874 &amp;’75</td>
<td>Northeastern part of map is comprised of “eruptive and</td>
<td>• human,</td>
</tr>
<tr>
<td></td>
<td>metamorphic rocks.” Sedimentary rocks dominate</td>
<td>• physical,</td>
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<tr>
<td></td>
<td>the rest of the map, exclusive of some “eruptive rock”</td>
<td>• economic,</td>
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<tr>
<td></td>
<td>areas in the southwest. Northeastern corner</td>
<td>• societal,</td>
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<tr>
<td></td>
<td>of map also shows greatest gradient.</td>
<td>• cultural,</td>
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<tr>
<td></td>
<td>Dendritic patterns show developed</td>
<td>• and political conditions</td>
</tr>
<tr>
<td></td>
<td>watersheds.</td>
<td>for the time when the map was made?</td>
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<td></td>
<td>The Native American reservation lands are in the</td>
<td>At the time this map was made, this part of North America was not</td>
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<tr>
<td></td>
<td>southern area of this map. Trails criss cross the</td>
<td>densely populated and a culturally diverse area, as evidenced in the</td>
</tr>
<tr>
<td></td>
<td>map. Few settled areas are shown. Native</td>
<td>place names. The economics were focused on mining and mineral</td>
</tr>
<tr>
<td></td>
<td>American ruins are shown.</td>
<td>extraction, as evidenced by the mineral focus of the maps, water</td>
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<tr>
<td></td>
<td>What was the motivation of the</td>
<td>availability and trails.</td>
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<td></td>
<td>organization or person making</td>
<td>Do you see any bias/perspective in this map?</td>
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<tr>
<td></td>
<td>the map?</td>
<td>This map only shows Indian Ruins, Burial Areas and general lands, not any permanent or seasonal settlements. It does include buildings in mining areas, and the focus of this map is mineral locations and earth resources.</td>
</tr>
<tr>
<td></td>
<td>Document mining potential based on geology and water resources</td>
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<td>Document present settlements</td>
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<td>What words or symbols do you find? (examples of types....not complete list of place names)</td>
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<td>Topographic lines</td>
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<td>State lines</td>
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<td>Latitude &amp; longitude</td>
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<td>Elevations</td>
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<td>Letters representing different rock types</td>
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<td>Mineral rich rocks</td>
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<td>Trails</td>
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<td>Towns</td>
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<td>Rivers</td>
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<td>Rios</td>
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<td>Mesas</td>
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<td>Plateaus</td>
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<td>Buttes</td>
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<td>Creeks</td>
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<td>Gulches</td>
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<td>Parks</td>
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<td>Peaks</td>
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<td>Sierras</td>
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<td>Mountains</td>
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<td>Passes</td>
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<td>Reservations</td>
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<td>Ruins</td>
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<tr>
<td>Caves</td>
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<tr>
<td>Towers</td>
<td>How does this map represent and/or illustrate geographic themes?</td>
<td>Your questions....... student led.</td>
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<tr>
<td>Water holes</td>
<td>How does this map represent and/or illustrate geographic themes?</td>
<td>HOW does this map represent and/or illustrate geographic themes?</td>
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<td>Springs</td>
<td>How does this map represent and/or illustrate geographic themes?</td>
<td>HOW does this map represent and/or illustrate geographic themes?</td>
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<td>Hot springs</td>
<td>How does this map represent and/or illustrate geographic themes?</td>
<td>HOW does this map represent and/or illustrate geographic themes?</td>
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<tr>
<td>Dry springs</td>
<td>How does this map represent and/or illustrate geographic themes?</td>
<td>HOW does this map represent and/or illustrate geographic themes?</td>
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<td>Coal</td>
<td>How does this map represent and/or illustrate geographic themes?</td>
<td>HOW does this map represent and/or illustrate geographic themes?</td>
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<tr>
<td>Place names include English, Spanish and a few Native American</td>
<td>How does this map represent and/or illustrate geographic themes?</td>
<td>HOW does this map represent and/or illustrate geographic themes?</td>
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<tr>
<td>What do the colors represent?</td>
<td>How does this map represent and/or illustrate geographic themes?</td>
<td>HOW does this map represent and/or illustrate geographic themes?</td>
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<tr>
<td>Rock types and ages, General categories including: Eruptive rocks, Mineral Areas, Archaean Paleozoic Jurassic Cretaceous Mesozoic Post-Cretaceous Cenozoic Quaternary</td>
<td>Physical systems: Distribution and types of rocks, topography, and hydrological systems</td>
<td>OTHER ideas about the map?</td>
</tr>
<tr>
<td>Physical systems: Distribution and types of rocks, topography, and hydrological systems</td>
<td>Physical systems: Distribution and types of rocks, topography, and hydrological systems</td>
<td>OTHER ideas about the map?</td>
</tr>
<tr>
<td>The majority of proper place names are Spanish, a close second are English and only a few are Native American.</td>
<td>Physical systems: Distribution and types of rocks, topography, and hydrological systems</td>
<td>OTHER ideas about the map?</td>
</tr>
</tbody>
</table>