University of Nevada, Reno
Statewide • Worldwide

GREAT BASIN SCIENCE SAMPLE AND RECORDS LIBRARY

Nevada Bureau of Mines and Geology
University of Nevada, Reno

on the Campus of the Desert Research Institute

GREAT BASIN SCIENCE SAMPLE AND RECORDS LIBRARY

Nevada Bureau of Mines and Geology
University of Nevada, Reno

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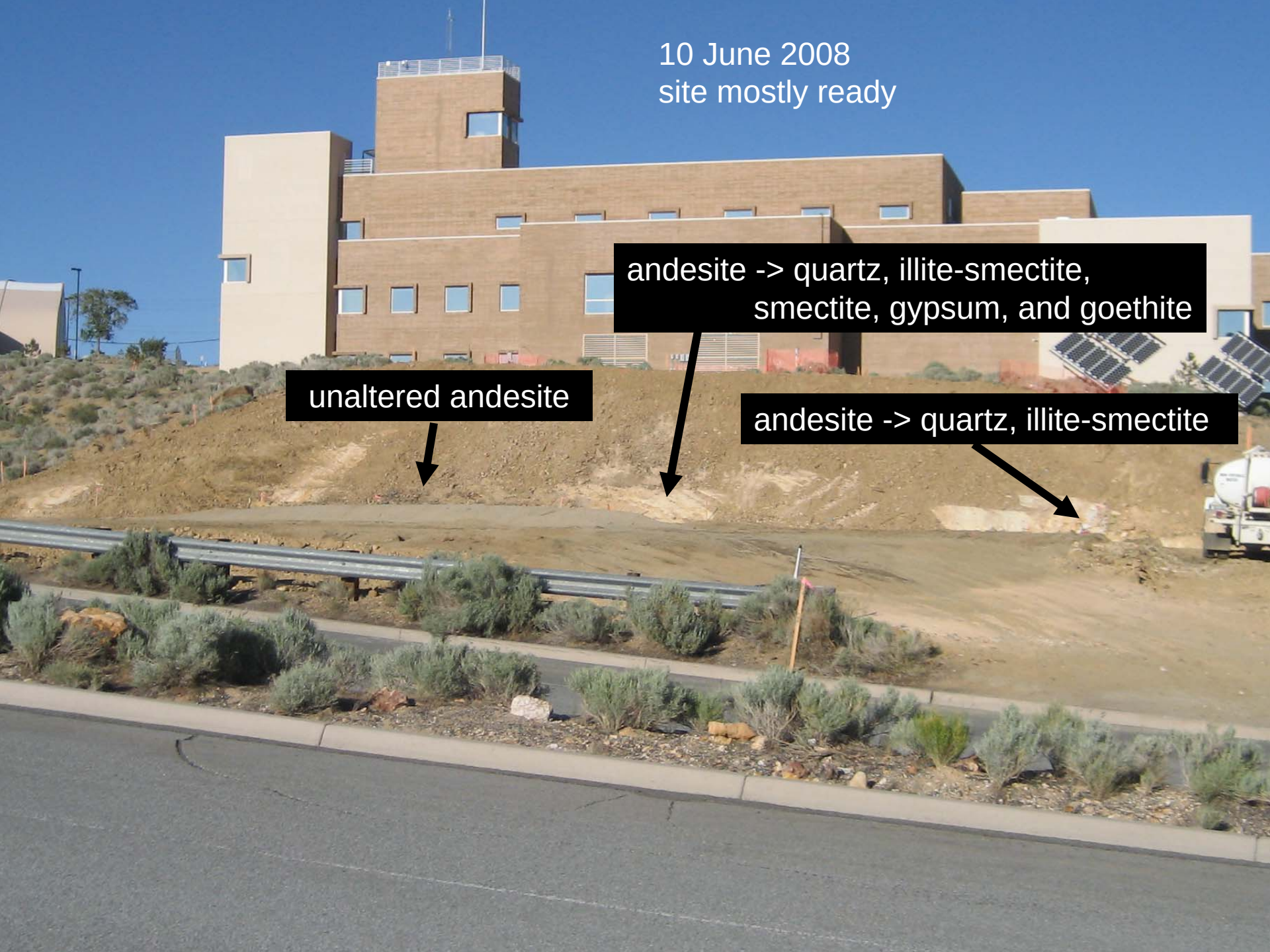
12 May 2008
before construction


22 May 2008
during site preparation


10 June 2008
site mostly ready


10 June 2008
site mostly ready
andesite -> quartz, illite-smectite,
smectite, gypsum, and goethite
unaltered andesite
andesite -> quartz, illite-smectite


12 June 2008
decomposed granite on pad


31 July 2008 – walls tilted up

15 August 2008 – roof being added

30 October 2008 – walls and windows nearly completed.


15 January 2009


12 May 2008
before construction

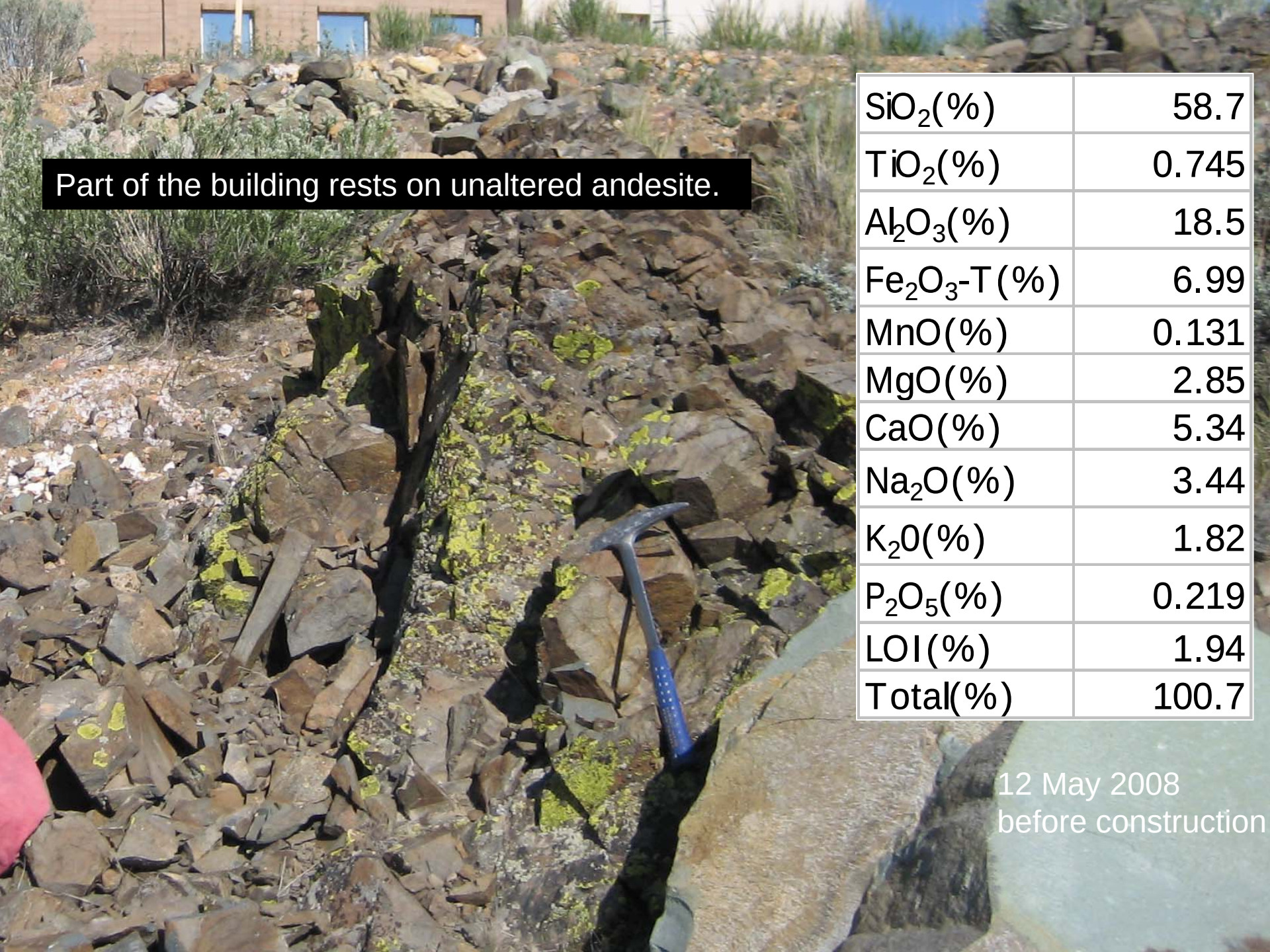

22 May 2008
during site preparation


10 June 2008
site mostly ready

31 July 2008 – new road connecting parking lots


15 January 2009


12 May 2008
before construction



SiO_2(%)	58.7
TiO_2(%)	0.745
Al_2O_3(%)	18.5
Fe_2O_3-T(%)	6.99
MnO(%)	0.131
MgO(%)	2.85
CaO(%)	5.34
Na_2O(%)	3.44
K_20(%)	1.82
P_2O_5(%)	0.219
LOI(%)	1.94
Total(%)	100.7

12 May 2008
before construction


22 May 2008
during site preparation

22 May 2008
during site preparation

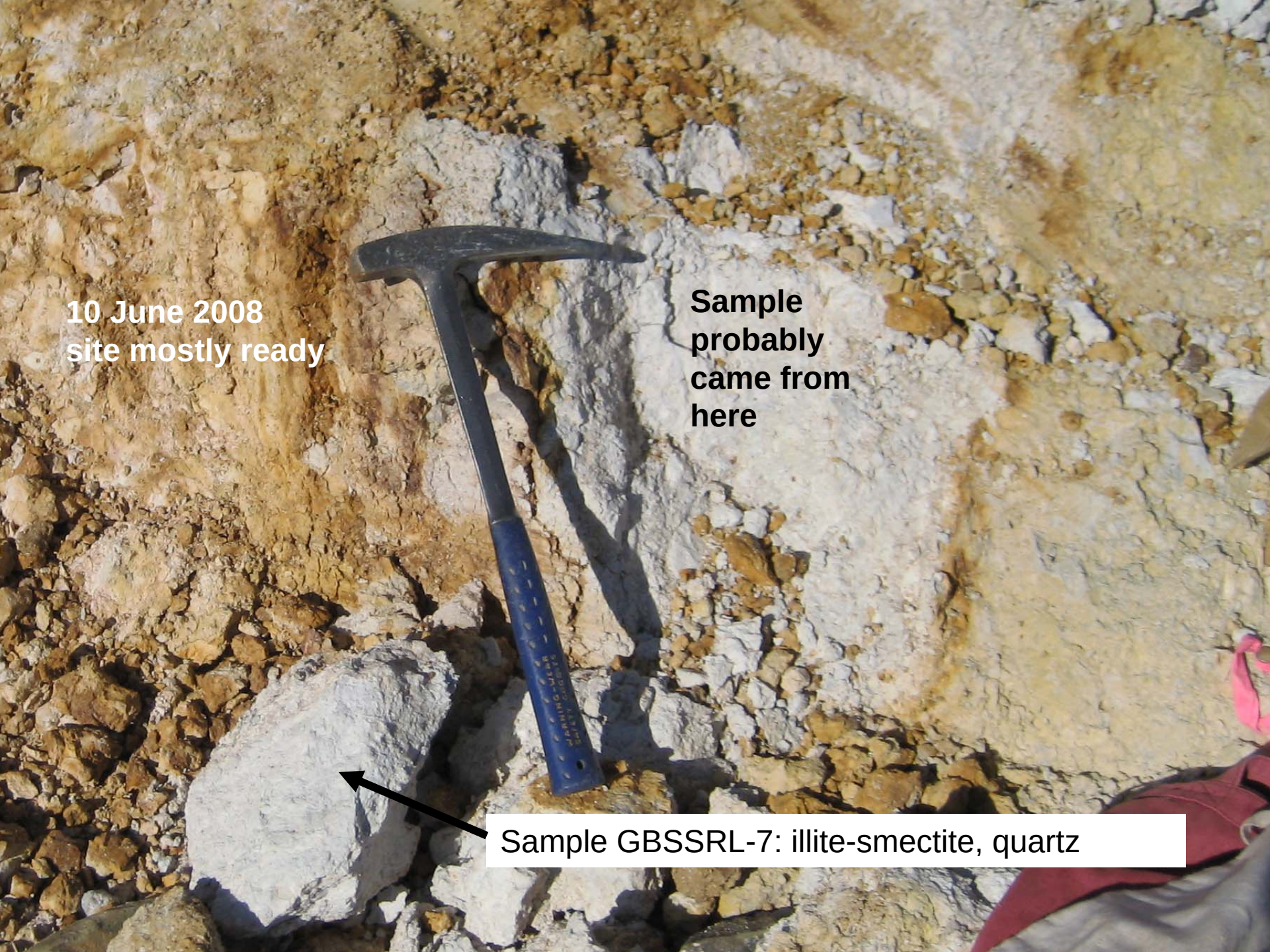

10 June 2008
site mostly ready


31 July 2008 – grading completed


Road cut into unaltered andesite
10 June 2008
site mostly ready


10 June 2008
site mostly ready
Sample GBSSRL-7


10 June 2008
site mostly ready


10 June 2008
site mostly ready
Sample probably came from here
Sample GBSSRL-7: illite-smectite, quartz


22 May 2008
Samples GBSSRL-2, 3, & 4 collected from the cut east of the new building


22 May 2008
during site preparation
Samples GBSSRL-2, 3, & 4 collected from the cut east of the new building

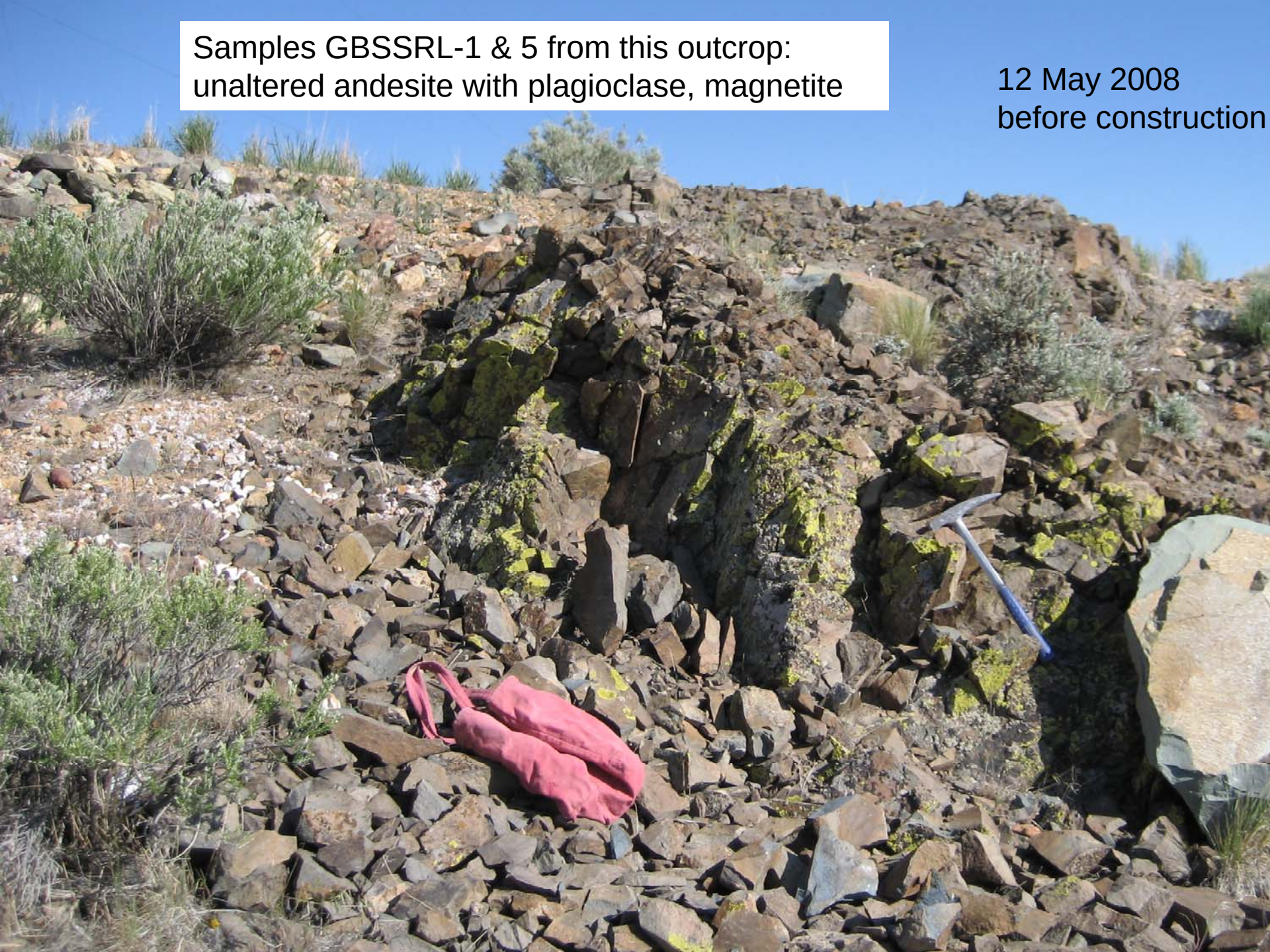

Samples GBSSRL-2, 3, & 4 from this cut
22 May 2008
during site preparation


2
3
4
Samples GBSSRL-2, 3, & 4 from this cut
22 May 2008
during site preparation


Samples GBSSRL-2: illite-smectite, smectite, quartz, gypsum
22 May 2008
during site preparation


Samples GBSSRL-3: illite-smectite, smectite, quartz, gypsum
22 May 2008
during site preparation


Samples GBSSRL-4: illite-smectite, quartz, gypsum
22 May 2008
during site preparation


Samples GBSSRL-1 & 5 from this outcrop:
unaltered andesite with plagioclase, magnetite
12 May 2008
before construction

Hole for septic sump, 12 June 2008, illustrating 2 feet of decomposed granite above hydrothermally altered andesite

Ed Sloane and Mike Klein, Kleinfelder, on 2 feet of decomposed granite on top of natural rock, 12 June 2008. Above this will be 6 inches of aggregate, then the 6-inch reinforced concrete pad.


Virginia Range
Slide Mountain
Mt. Rose
Looking south, 12 June 2008

pouring concrete
19 June 2008

footing for elevator shaft
19 June 2008


Peavine Peak
looking W 19
June 2008


Verdi Range
CB Concrete
looking WSE at
elevator shaft
19 June 2008

19 June 2008

drain off NW corner


Mount Rose
looking S from NW corner
19 June 2008


looking east
19 June 2008


looking SE
19 June 2008


looking E
19 June 2008


looking E
19 June 2008

south wall, looking E
19 June 2008


NE corner drain
19 June 2008

NE corner
19 June 2008

looking W
19 June 2008


Peavine Peak
looking W
19 June 2008
DEERE


~ 18 July 2008, smoke from California fires


~ 18 July 2008, smoke from California fires
SKY TRAK

~ 18 July 2008, smoke from California fires


~ 18 July 2008, smoke from California fires
BRUTE

29 July 2008 – tilt-up concrete going into place

29 July 2008 – tilt-up concrete going into place

29 July 2008 – tilt-up concrete going into place

30 July 2008 – tilt-up concrete going into place

31 July 2008 – looking east at the west and south walls

31 July 2008 – looking north at the south wall

31 July 2008 – looking northwest at the south and east walls

31 July 2008 – looking southwest at the east and north walls

31 July 2008 – tilt-up concrete walls


31 July 2008 – tilt-up concrete walls
and openings for utilities

31 July 2008 – tilt-up concrete walls and openings for utilities

15 August 2008 – crane for installing roof, looking WSW

15 August 2008 – crane for installing roof, looking W at Peavine Peak

15 August 2008 – roof under construction, looking SW

15 August 2008 – roof under construction, looking NE

15 August 2008 – roof under construction, looking W at SW corner

2 September 2008 – interior taking shape, looking NE at W & S sides

15 January 2009


Skylights
Second floor
2 September 2008


Insulation
DEERE
2 September 2008

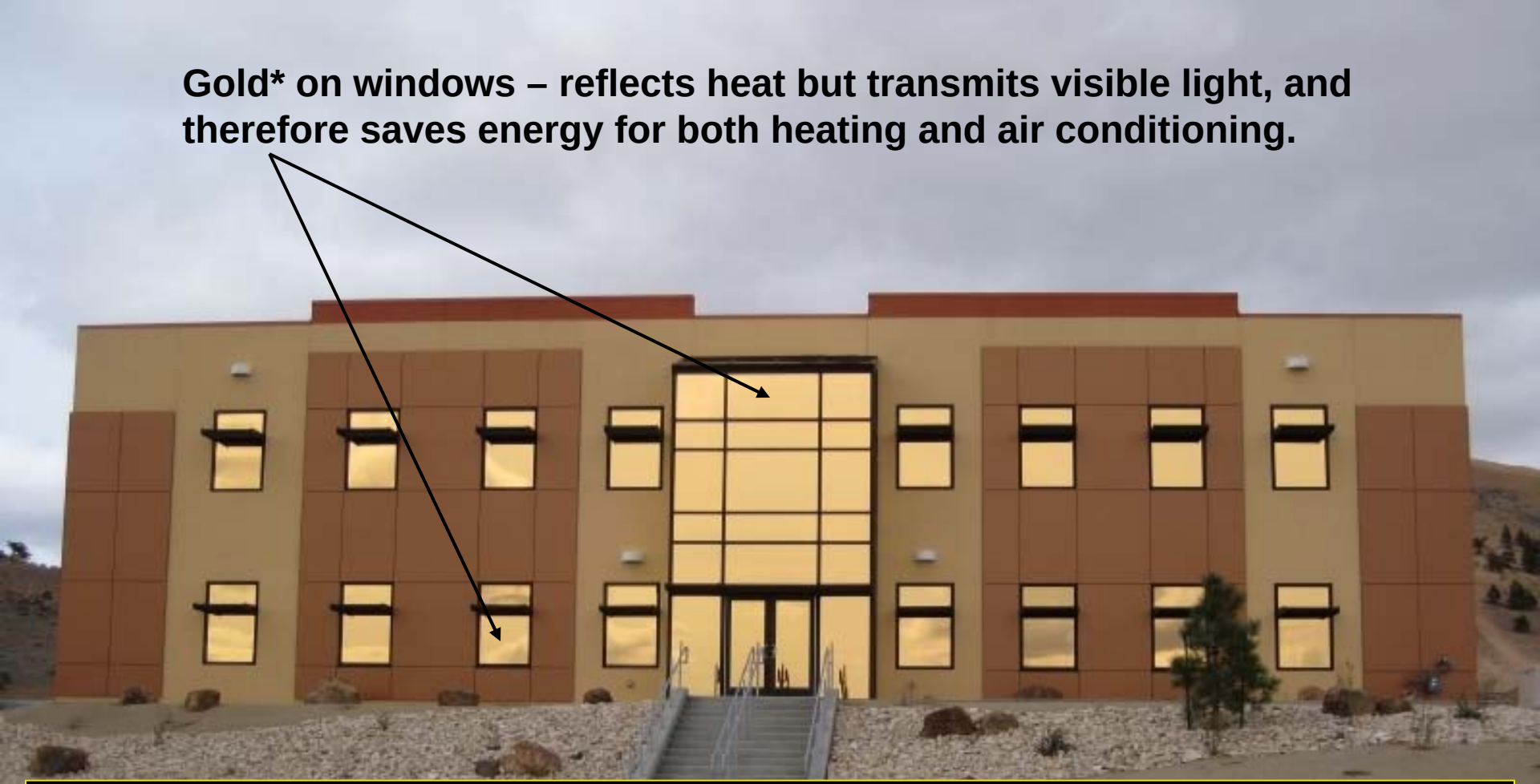
2 September 2008

2 September 2008 – first floor

30 October 2008 – walls and windows nearly completed.


Gold* on windows – reflects heat but transmits visible light, and therefore saves energy for both heating and air conditioning.
25 March 2009 – ready to move in.
*Nevada produced 78% of the gold in the U.S. and 8% of the world's gold last year. We are in the biggest gold-mining boom ever, and Nevada is in the forefront.

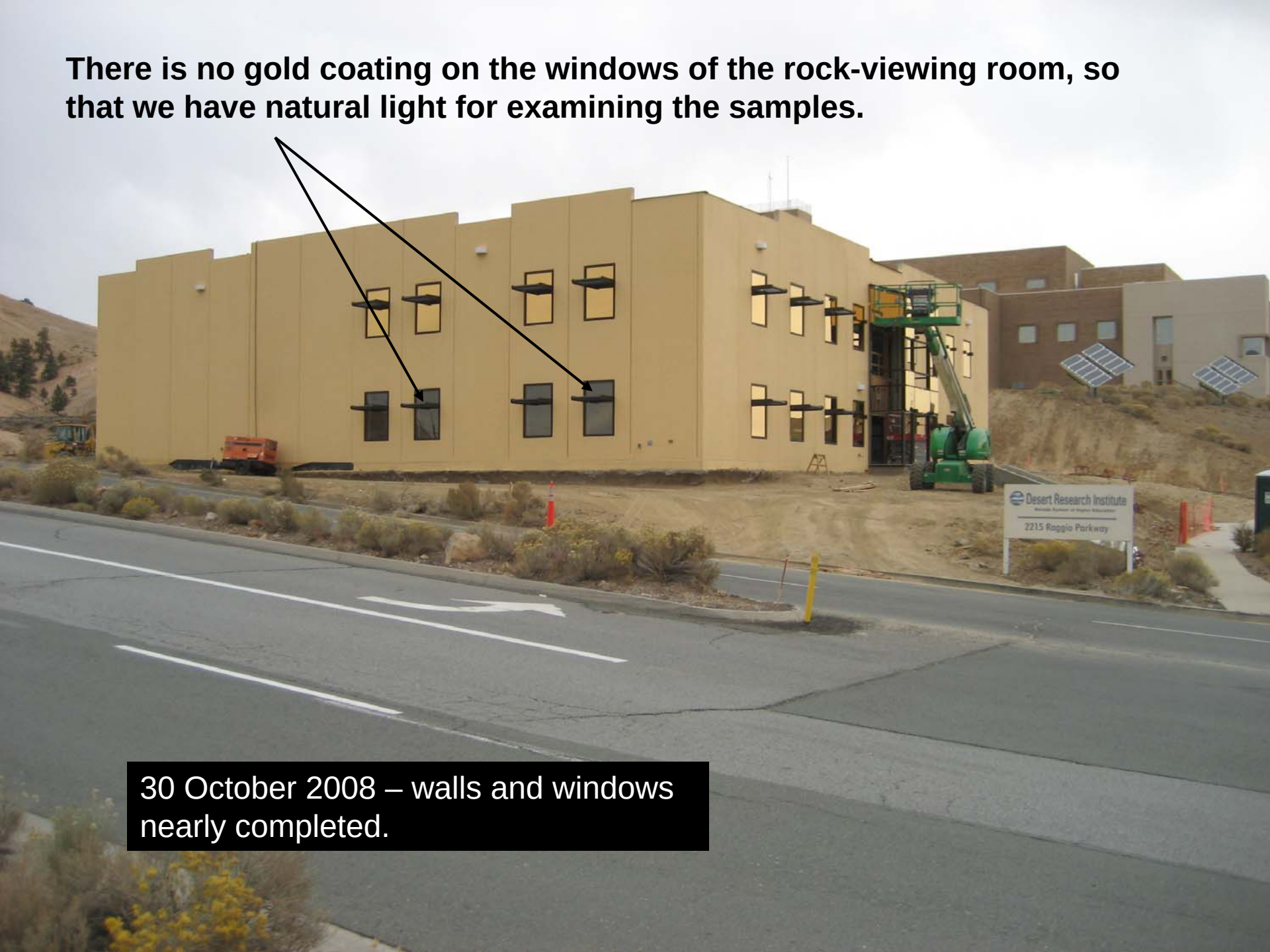
Gold* on windows – reflects heat but transmits visible light, and therefore saves energy for both heating and air conditioning.



[26 windows x (4 ft x 6 ft)/window + 20 ft x 20 ft for vestibule] x $(1\ m/3.2808\ ft)^2$ x [1.73×10^{-8} m thick gold coating] x 19.3 metric tons/m^3 x 3.21507×10^4 troy ounces/metric ton = **1.02 troy ounces of gold** on these windows.

*Nevada produced 78% of the gold in the U.S. and 8% of the world's gold last year. We are in the biggest gold-mining boom ever, and Nevada is in the forefront.

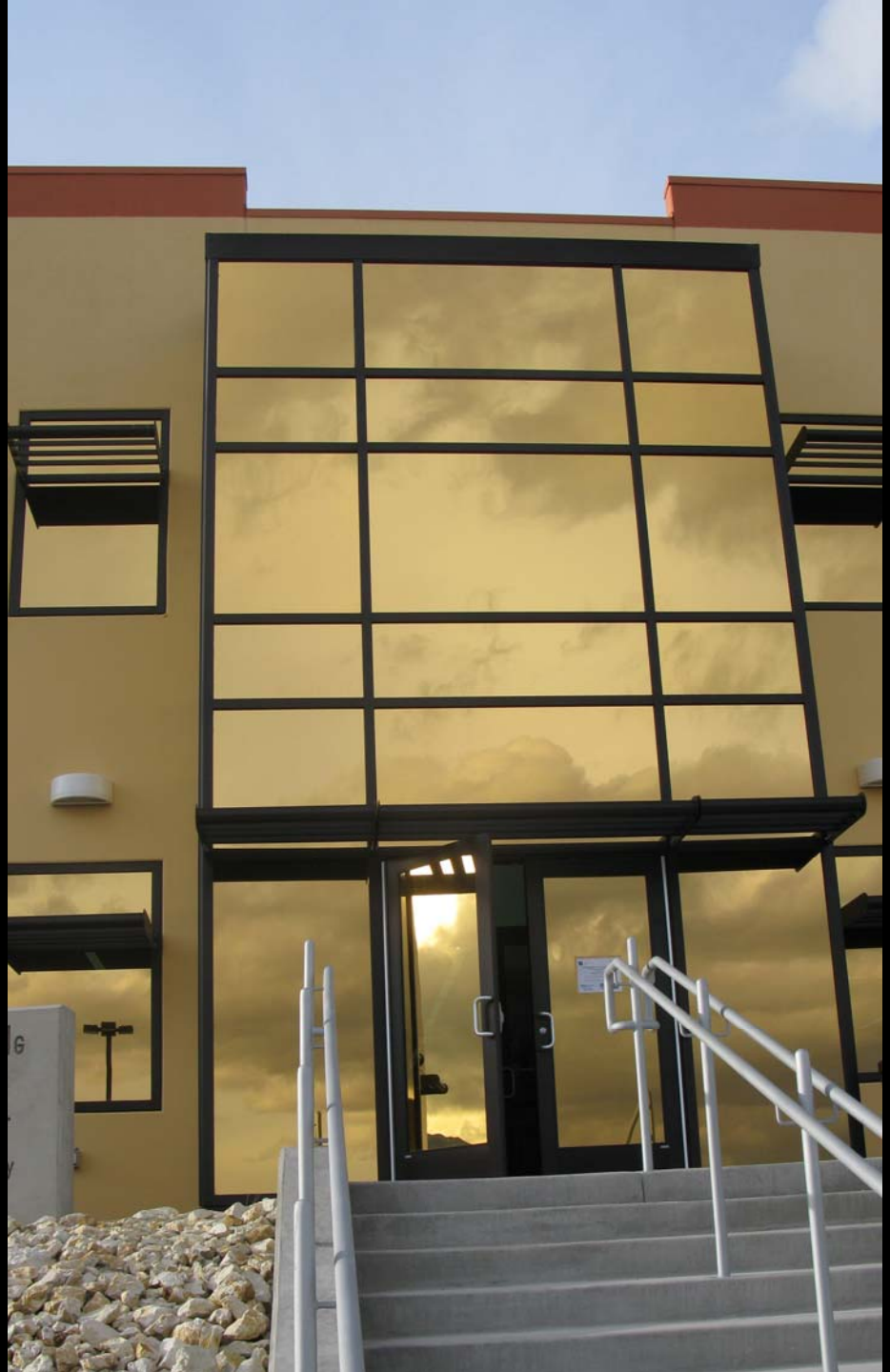
There is no gold coating on the windows of the rock-viewing room, so that we have natural light for examining the samples.



30 October 2008 – walls and windows nearly completed.

Heat-reflecting gold windows, 15 January 2009

4 May 2009



4 May 2009

4 May 2009

Geologist-photographer, Craig dePolo, in reflection, looking west

Skylights over the warehouse section, 15 January 2009

30 October 2008 – walls and windows nearly completed.


15 January 2009

30 October 2008 – walls and windows nearly completed.

30 October 2008 – looking west inside the warehouse at the back stairs

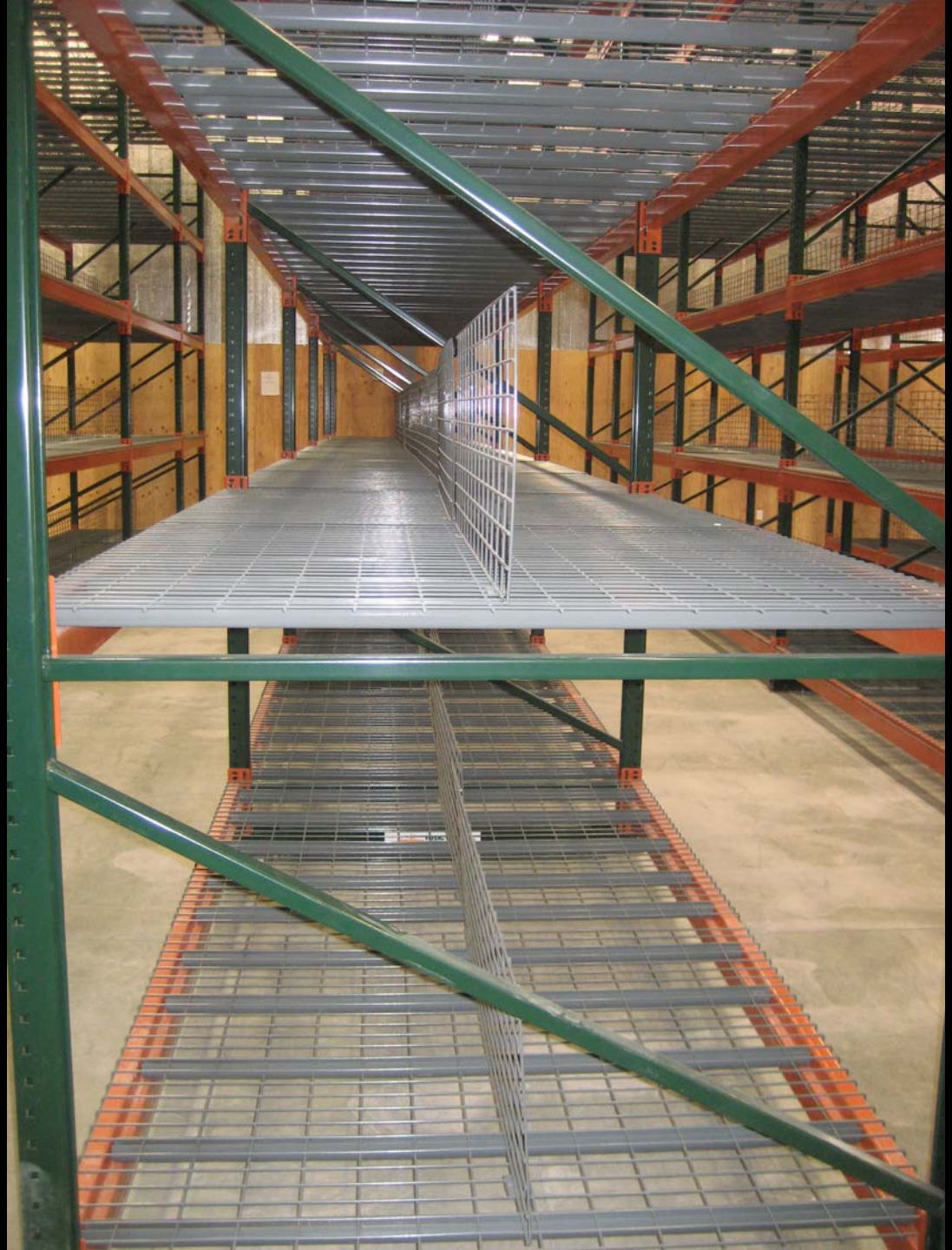
30 October 2008 – looking east inside the warehouse from the second floor

30 October 2008 – a restroom for every occasion –
we thought they were guidelines, but it’s really the Code.

Front stairs
15 January 2009

Back stairs
15 January 2009


TG office
15 January 2009



Racks for core boxes
15 January 2009

15 January 2009

Cuttings from oil, gas, and geothermal exploration and production wells
6 May 2009

Seismic base isolation for storage racks in the warehouse section,
6 May 2009


RIDG-U-RAK®
Seismic Base Isolation System
Patent No's. 7,249,442 & 7,263,806

4 May 2009

Order picker – one operator rides up and down with the core boxes and loads and unloads them using the steel platform with a wooden top.

6 May 2009

Roller rack for logging core in the rock-viewing room (without gold on these four windows), 6 May 2009

Binocular microscopes for looking at cuttings and other samples in the rock-viewing room
6 May 2009

Fume hood in rock preparation room
15 January 2009


Topographic maps, aerial photographs, and the
Jay A. Carpenter Mining District Files
(progressively scanned and placed on the web)

Scanning and quality-assurance checking of scanned maps, documents, and photos is done in the “employees only” section of the first-floor office area.

Publications are packaged and mailed from the “employee only” section.

The Records Library is open from 8:00 a.m. to 4:00 p.m., Monday-Friday.

Reception counter, 15 January 2009

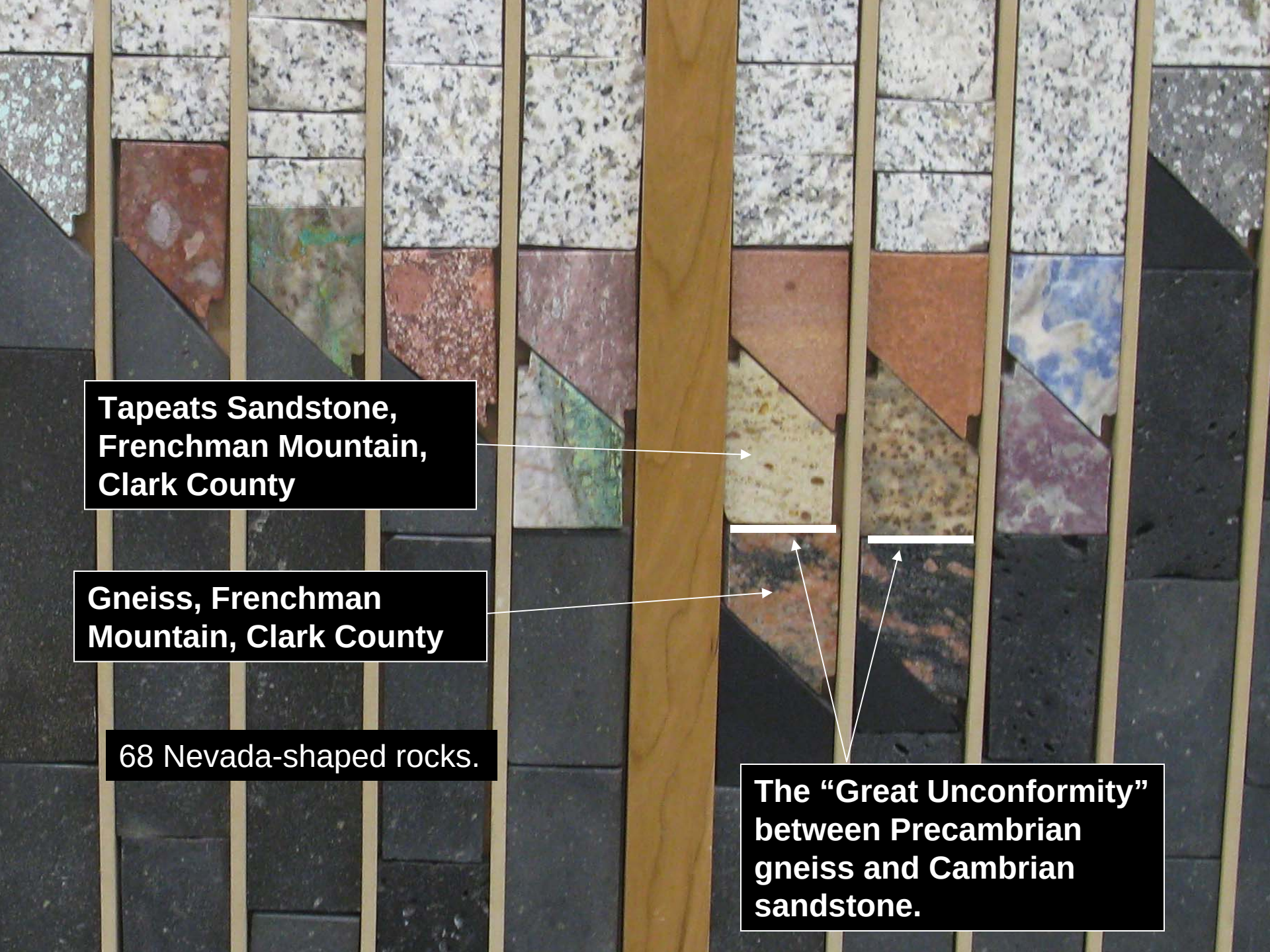

Gneiss counter top
(from India, but similar
to 1.7 Ga rock from
southern Nevada)

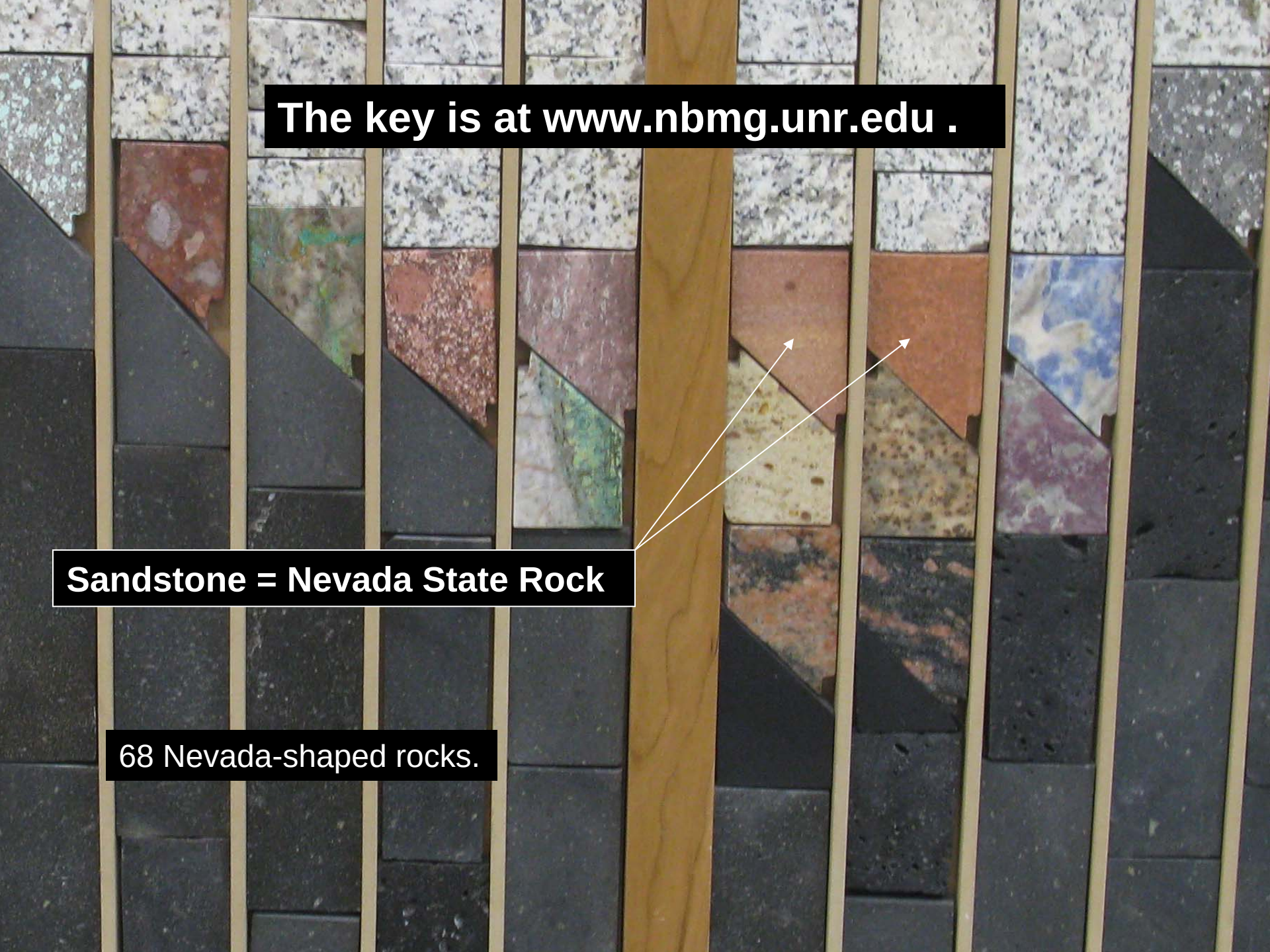
Reception counter, 4 March 2009
70 different rocks from Nevada in wooden core boxes.
Mountains = Miocene & Quaternary basalt
Sky = Cretaceous granite & granodiorite


68 Nevada-shaped rocks.


Gneiss, Frenchman Mountain, Clark County
68 Nevada-shaped rocks.

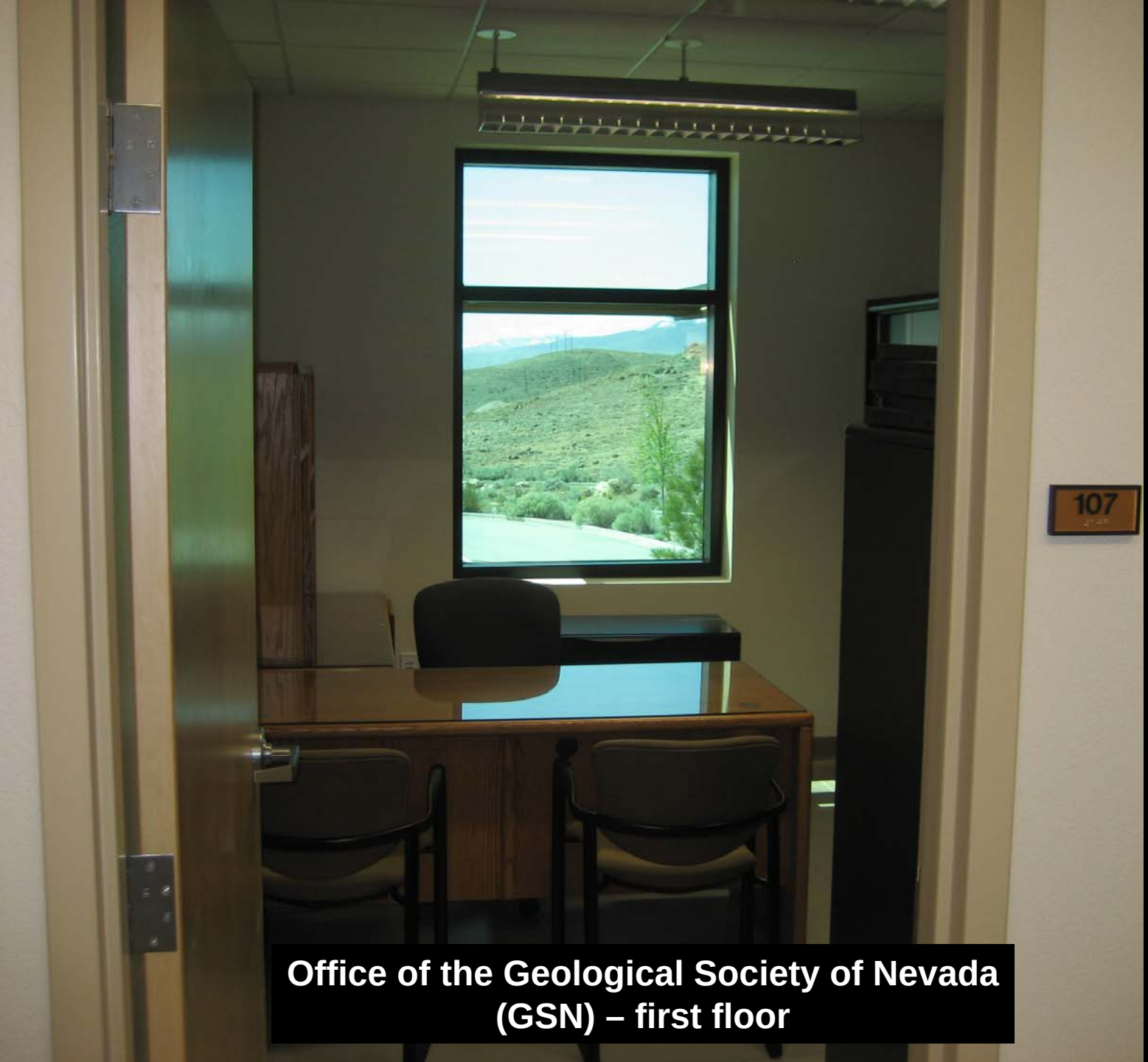

Tapeats Sandstone, Frenchman Mountain, Clark County
Gneiss, Frenchman Mountain, Clark County
68 Nevada-shaped rocks.


Tapeats Sandstone, Frenchman Mountain, Clark County
Gneiss, Frenchman Mountain, Clark County
68 Nevada-shaped rocks.
The “Great Unconformity” between Precambrian gneiss and Cambrian sandstone.


The key is at www.nbmg.unr.edu .
Sandstone = Nevada State Rock
68 Nevada-shaped rocks.

Main room for customers to examine files on the web, publications for sale, and historical aerial photographs (to be scanned)
6 May 2009


Cross sections accompanying the geologic map of Virginia City
GSN office
UNITED STATES GEOLOGICAL SURVEY
MAPS
Quaternary Faults in Nevada
Work area for geologic information specialists



Office of the Geological Society of Nevada (GSN) – first floor

6 May 2009

Office for the GSN 2010 Symposium – second floor
(temporary, while GSN has a second employee to help with the symposium),
6 May 2009

Storage area for publications and records of the Nevada Petroleum Society (NPS). Both GSN and NPS are education-oriented volunteer organizations whose publications, including field-trip guidebooks and symposium proceedings, complement the mission of the Nevada Bureau of Mines and Geology.

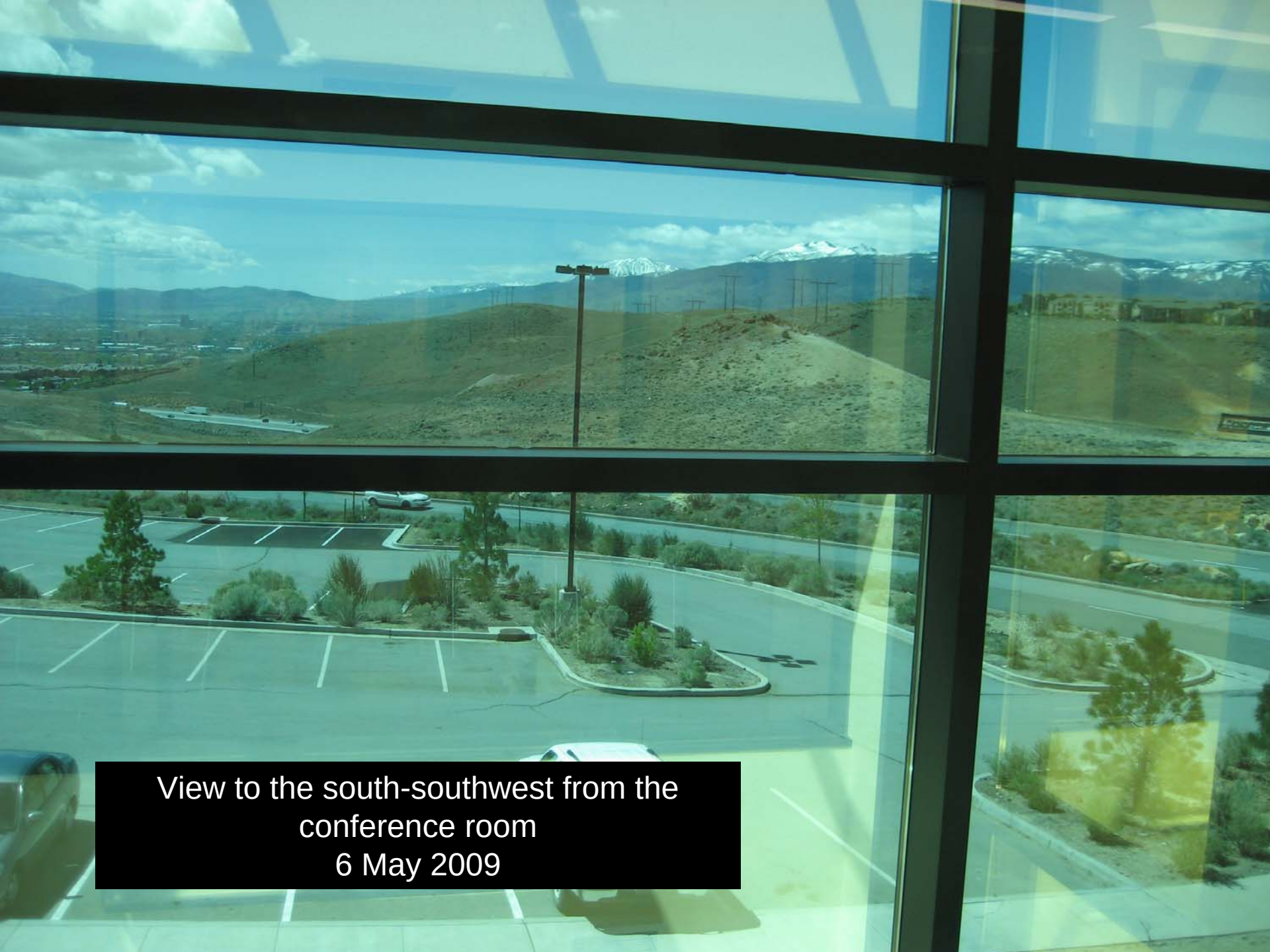
Break area on the second floor
6 May 2009

30 October 2008 – second-floor conference room.


6 May 2009


The building opened to the public on 27 April 2009, and the Nevada Commission on Mineral Resources held its 1 May 2009 meeting in the conference room.


MINERAL AND ENERGY RESOURCES AND POTENTIAL IN
MINERAL, ESMERALDA, LYON, AND DOUGLAS COUNTIES, NEVADA



View to the south-southwest from the conference room
6 May 2009

30 October 2008 – looking south from the second-floor conference room

Thanks to DRI (Steve Wells, Peter Ross and others), TSK (Mark Benzing), UNR-Facilities (Mike Bennett), West Coast Contractors (and their subcontractors)

Mark Benzing, TSK, and Mike Bennett, UNR-Facilities

Special thanks to Ron Hess, Chief Information Officer of the Nevada Bureau of Mines and Geology

SPECIAL THANKS TO SENATOR HARRY REID AND HIS STAFF,
AND THE U.S. DEPARTMENT OF ENERGY,
WHO HELPED WITH FUNDING FOR THE BUILDING.

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ALSO, SPECIAL THANKS TO THE NEVADA COMMISSION ON MINERAL RESOURCES AND THE NEVADA DIVISION OF MINERALS,
WHICH PROVIDED FUNDS FOR THE MOVE AND GETTING SAMPLES AND RECORDS IN ORDER.

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University of Nevada, Reno

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A few items needed to be fixed before signing off.
For example, note the second “e” in “Science” and the “e” in “Sample.”

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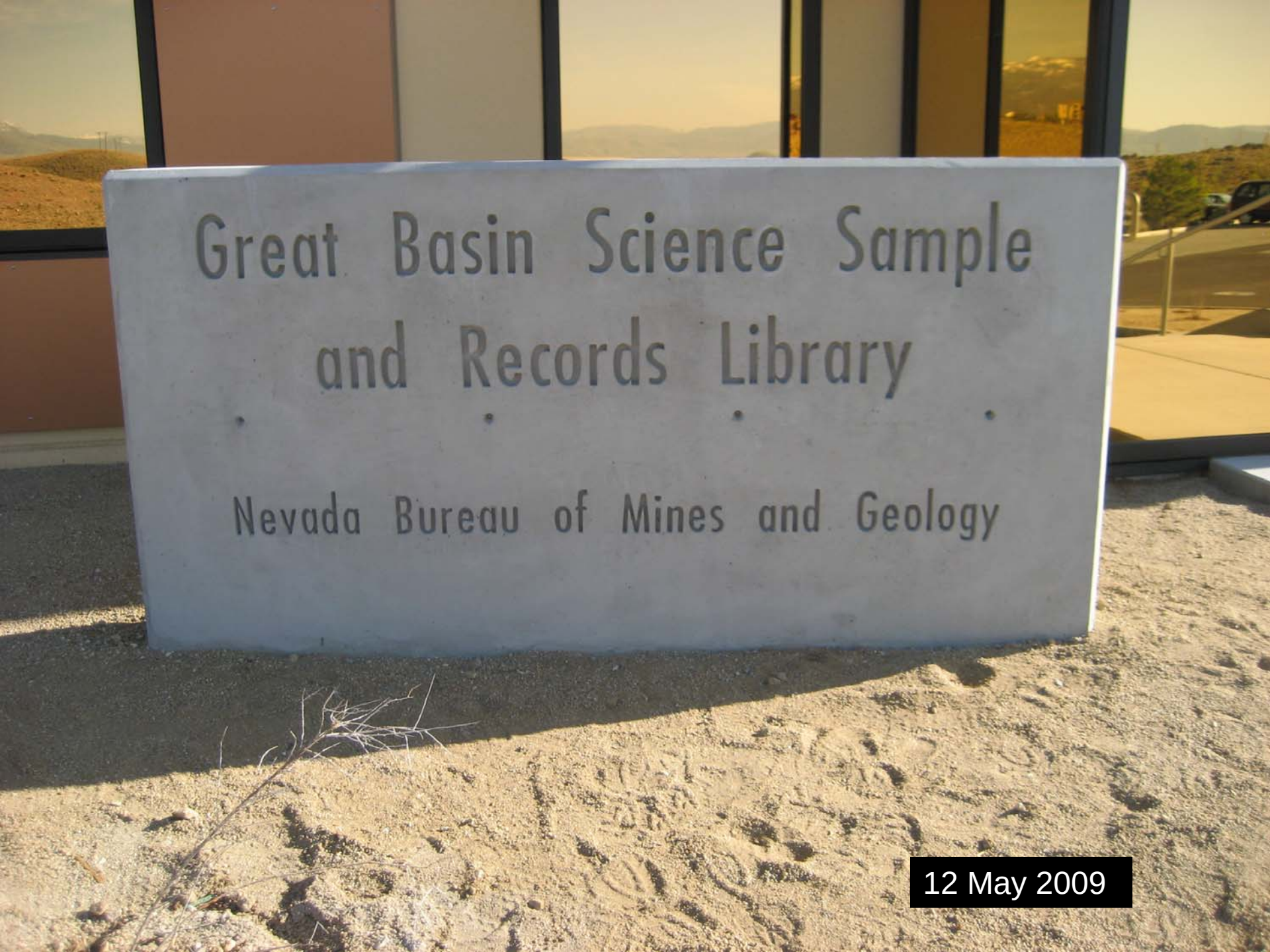
For example, note the second “e” in “Science” and the “e” in “Sample.”


Great Basin Science Sample
and Records Library
Nevada Bureau of Mines and Geology
6 May 2009


Great Basin Science Sample
and Records Library
Nevada Bureau of Mines and Geology
12 May 2009

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University of Nevada, Reno

on the Campus of the Desert Research Institute


2175
Great Basin Science Sample
and Records Library
5 August 2009


4 May 2009 – open house
and retirement celebration


4 May 2009

4 May 2009

4 May 2009

4 May 2009

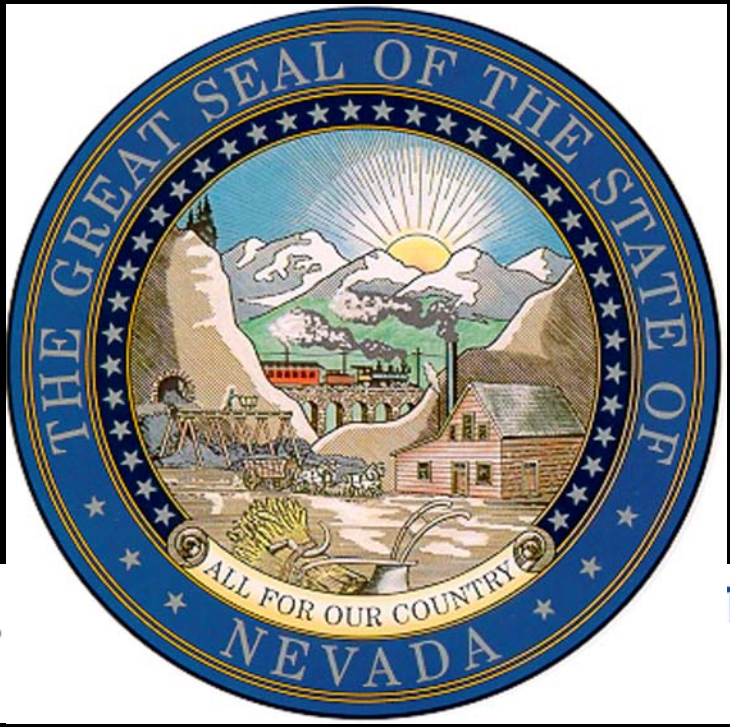
4 May 2009

4 May 2009

Geoscience Data Preservation in Nevada

Jon Price

Nevada Bureau of Mines and Geology



University of Nevada, Reno
Statewide • Worldwide

nbmg

AX core at the Greenwood Shaft, Pioche, Nevada

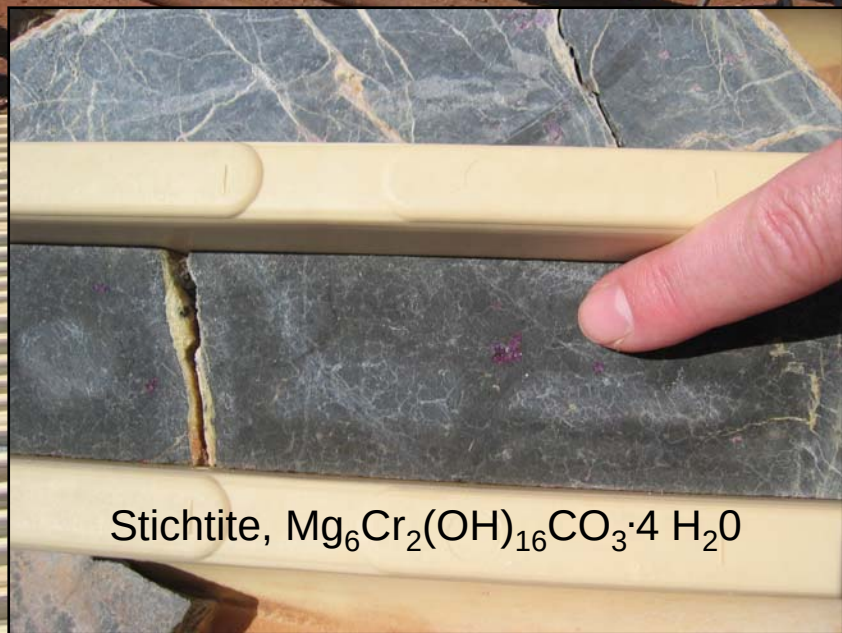
Honeymoom Well,
Western Australia

As geologists and engineers, we appreciate the importance of preserving drill core.

spinifex texture in ultramafic lava associated with Ni ore

Mt. Keith, Western Australia

As geologists and engineers, we also appreciate the importance of preserving data that relate to the core, surface geology, and subsurface geology.



Stichtite, $Mg_6Cr_2(OH)_{16}CO_3{\cdot}4\ H_20$

The applications of geoscience data preservation that are most relevant to Nevadans are:

- economic development and land management in areas of potential mineral and energy resource extraction and urban growth;

- assessment of ground-water resources and water-quality protection;

- minimization of environmental impacts from land disturbance;

- evaluation of natural hazards, particularly earthquakes, landslides, and floods;

- long-term monitoring of waste disposal sites and ground impacted by nuclear explosions;

- improvement of the scientific knowledge of Earth processes and expansion of research opportunities.

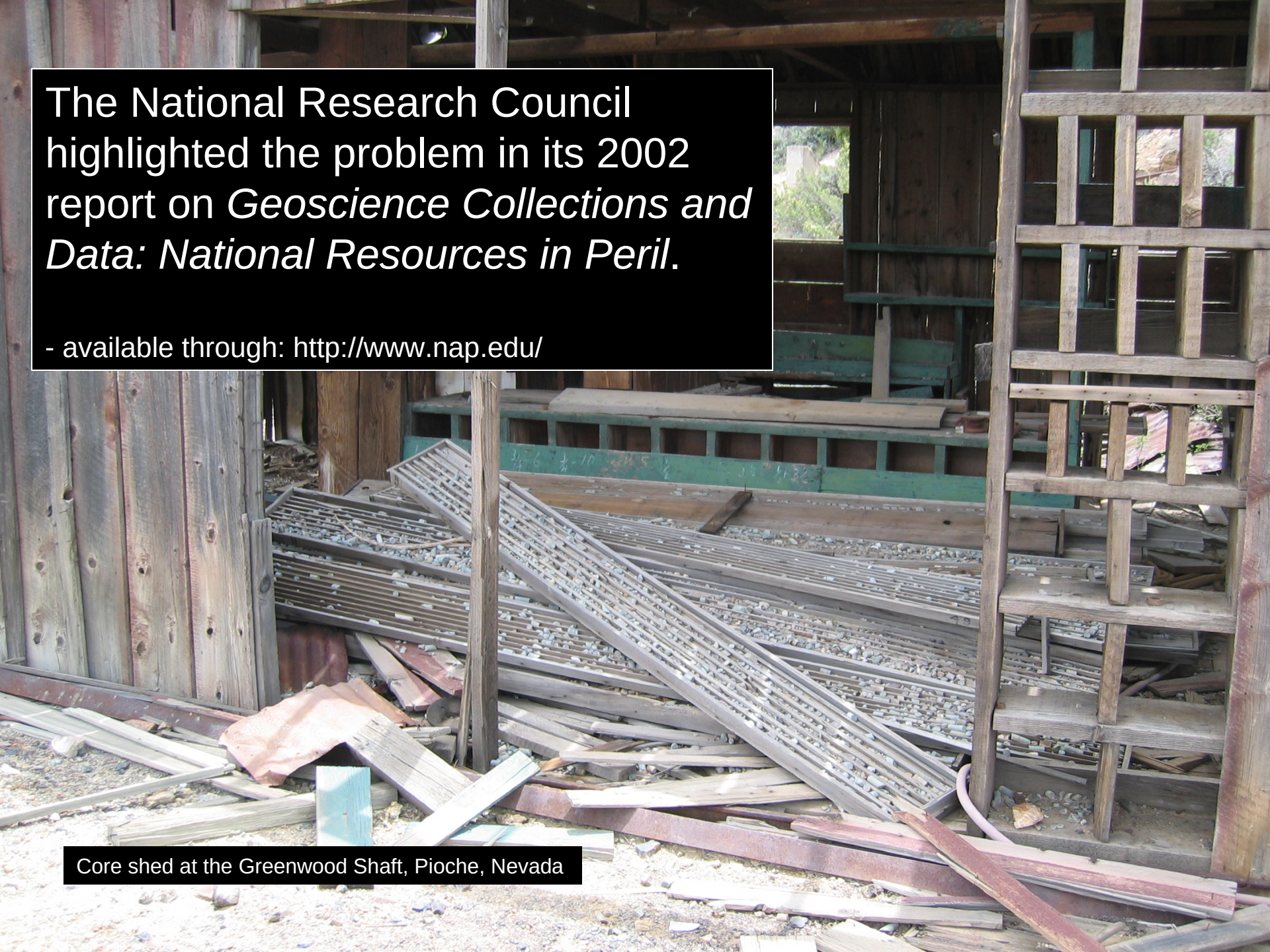

Tynagh mine, Ireland (in reclamation)
diamond drill core
rotary drill cuttings

Tynagh mine, Ireland (in reclamation)

Tynagh mine, Ireland (in reclamation)

Tynagh mine, Ireland (in reclamation)

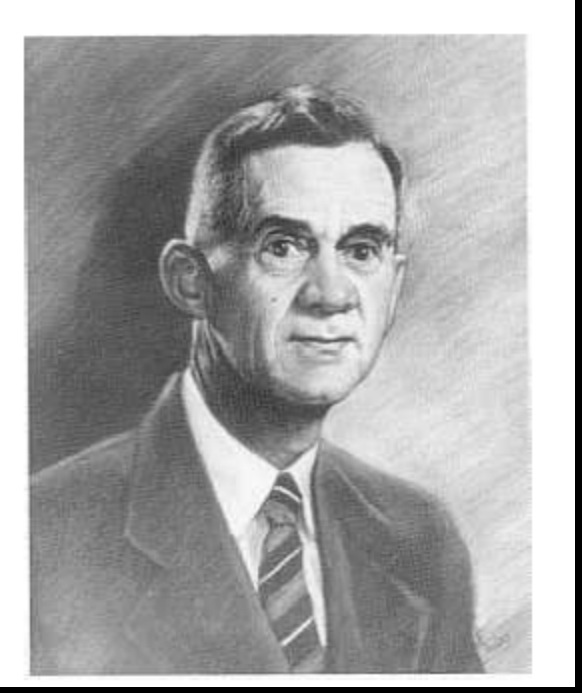
Tynagh mine, Ireland (in reclamation)



The National Research Council highlighted the problem in its 2002 report on *Geoscience Collections and Data: National Resources in Peril*.

- available through: http://www.nap.edu/

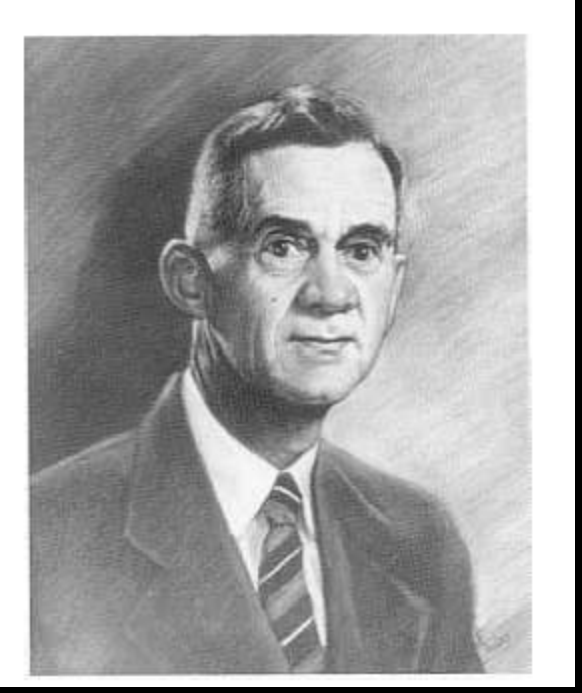
Core shed at the Greenwood Shaft, Pioche, Nevada



Jay A. Carpenter Fund

Jay A. Carpenter was the Director of the Nevada Bureau of Mines and Geology and Director of the Mackay School of Mines at the University of Nevada from 1939 until his retirement in 1951. He was a 1907 graduate of the Mackay School of Mines, and he worked in the mining industry in Tonopah, Belmont, and other Nevada camps before returning to the University as professor of mining in 1926. In 1929, his Nevada Bureau of Mines Bulletin on Mineral Resources of Southern Nevada helped in Nevada's fight for an allocation of power from Hoover Dam. In 1954, he was elected as an Honorary Member of the Association of American State Geologists.

On June 14, 2002, Mrs. Ann Burgess established the Jay A. Carpenter Fund through the University of Nevada, Reno Foundation in honor of her grandfather. The fund consists of two parts, an expendable fund and an endowment, the interest of which is used to support the function of the Nevada Bureau of Mines and Geology Information Office.

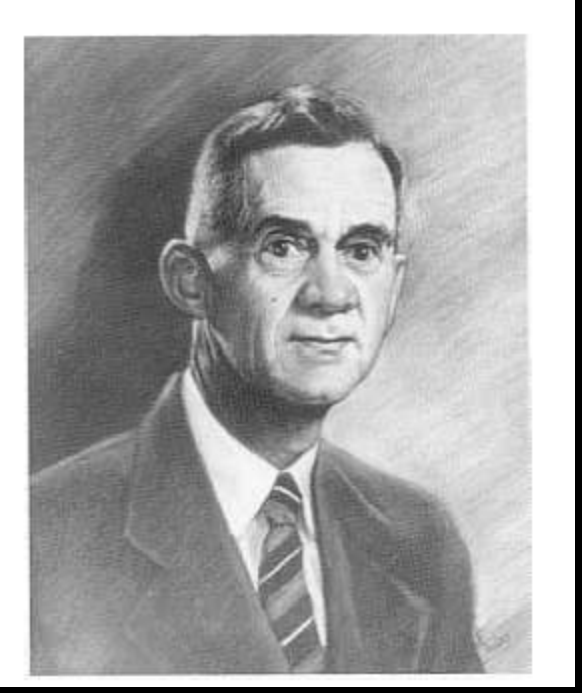


Jay A. Carpenter Fund

Thanks to the Jay A. Carpenter Fund, which was used to purchase our first wide-map scanner, and donations from the Nevada Division of Minerals, the Nevada Bureau of Mines and Geology has completed scanning of over 20,000 files in its Mining District holdings, including many large maps.

These are available on line through

http://www.nbmg.unr.edu/ .



Jay A. Carpenter Fund

We have many more files and maps to scan, and we plan to eventually run optical character recognition, making the files more easily searchable. We are also georeferencing the maps for use in GIS and on-line searches by location.

We need your help – with appropriations from the federal government (the land manager of 87% of the land in Nevada), state funds, and private donations AND with obtaining representative samples and data!

Select 50%

AASG

Association of American State Geologists

DATA PRESERVATION

AASG

The Association of American State Geologists (AASG) represents the State Geologists of the 50 United States and Puerto Rico. Founded in 1908, AASG seeks to advance the science and practical application of geology and related earth sciences in the United States and its territories, commonwealths, and possessions.

AASG and Preserving Geoscience Data

AASG strongly encourages Congress to fund the "National Geological and Geophysical Data Preservation Program Act of 2005," Section 315 of the Federal Energy Policy Act of 2005, at the fully authorized level of $30 million for each of 5 years. A key to domestic energy and mineral resource security lies in preservation of and ready public access to geologic samples and data that are already in existence. Volumes of expensive and difficult-to-obtain subsurface information (cores, cuttings, and geophysical data) are currently being disposed of by oil and gas and mineral exploration companies, and once these data are lost, they probably will never be replaced. These subsurface data, however, are critical to efficient and effective exploration and management of the nation's natural resources. In addition to exploration for oil and gas, subsurface data are used for development of unconventional energy sources, CO_2 sequestration, minerals exploration, preserving and developing water supplies, mitigating geologic hazards, training of a new generation of geologists and geophysicists, and any number of unanticipated applications.

Photo by Stephen M. Dickson, Maine Geological Survey.

It is both the immediacy of this disposal and the sacrifice of future benefits to the nation that concern AASG. Geoscience data and collections

- are critical to government and industry's discovery and development of the nation's energy, mineral, and water resources;
- support sound decisions on resource utilization, environmental protection, and disaster preparedness; and
- are essential to academic research and education of both informed citizens and future geoscientists.

Industry and government have made substantial investments to acquire geoscience data and collections. For example, core reposited at the U.S. Geological Survey's Core Research Center in Colorado is estimated to have a replacement value of $10 billion. Additionally, seismic data sets

Photo by David M. Stephens, Bureau of Economic Geology, The University of Texas at Austin.

1 of 2

The Association of American State Geologists has promoted geoscience sample and data preservation (see our position papers at http://www.stategeologists.org/PositionPapers/index.html) and funding for the National Geological and Geophysical Data Preservation Program of the U.S. Geological Survey (authorized in the Energy Policy Act of 2005 at a leve of $30 million per year, but not appropriated anywhere near that level.

We used the Austin Core Research Facility of the Texas Bureau of Economic Geology as our guide for the warehouse portion of our new building, which initially will be about 1/10th the size of the Texas facility.


Steel racks with core boxes stacked 18 feet high
Texas Bureau of Economic Geology facility in Austin, TX


Shorter boxes of cuttings (in our case mostly from oil and gas and geothermal wells, by regulation) are stored on the same racks.
Texas Bureau of Economic Geology facility in Austin, TX

An “order picker” forklift is used to move boxes from the racks to the viewing room.

Texas Bureau of Economic Geology facility in Austin, TX


NBMG will also have a good viewing room, with natural lighting.
Texas Bureau of Economic Geology facility in Austin, TX

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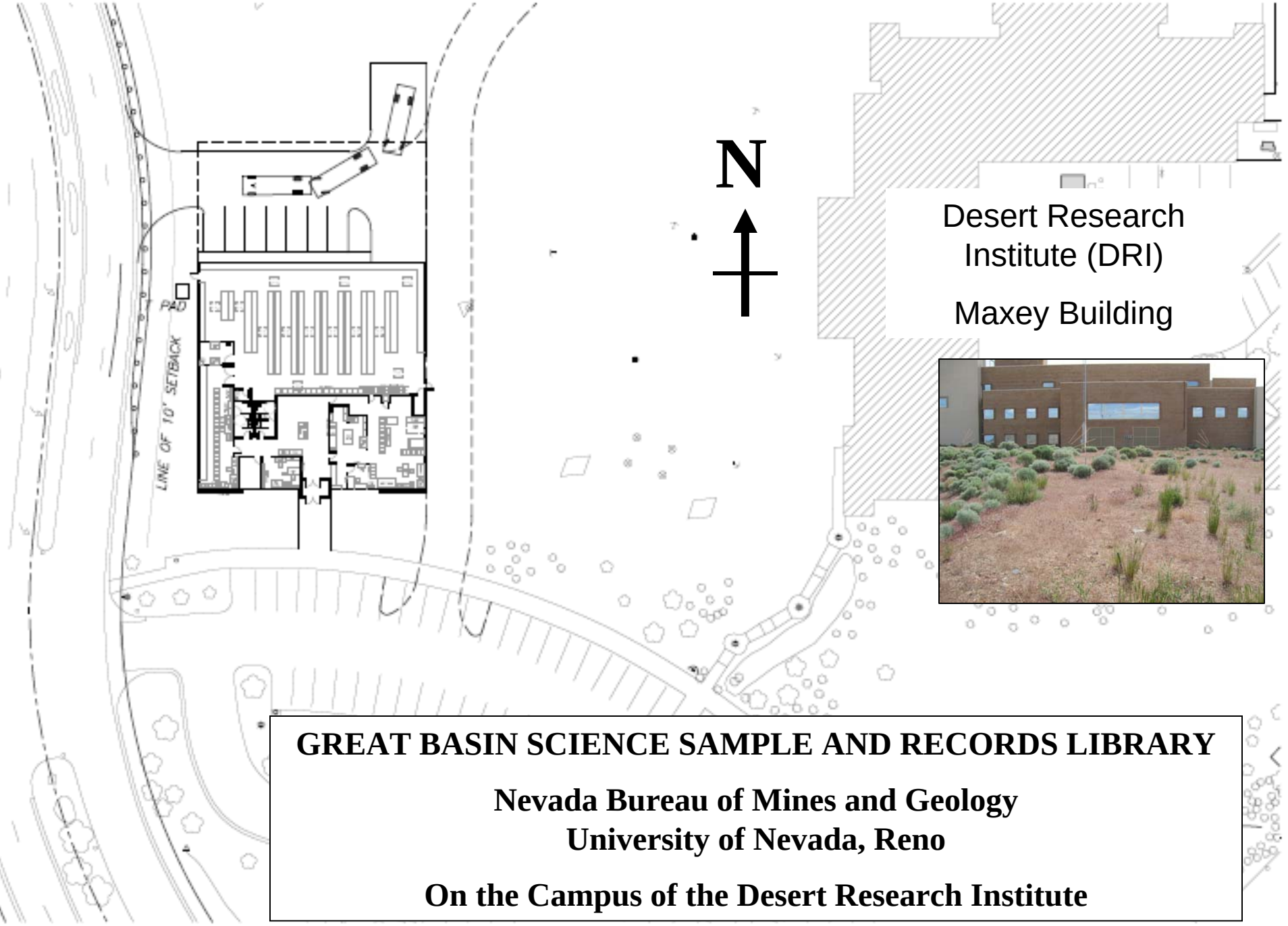

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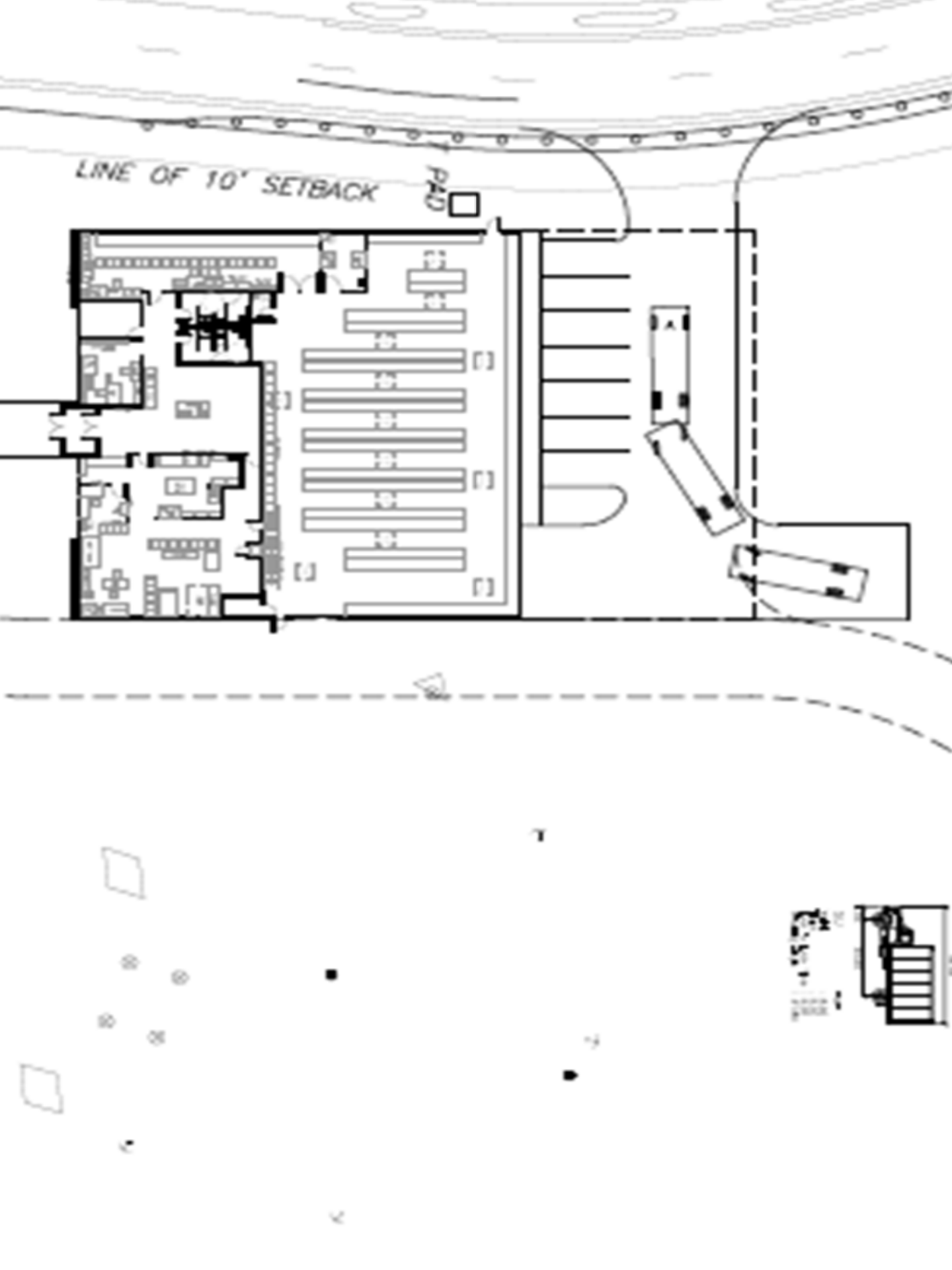
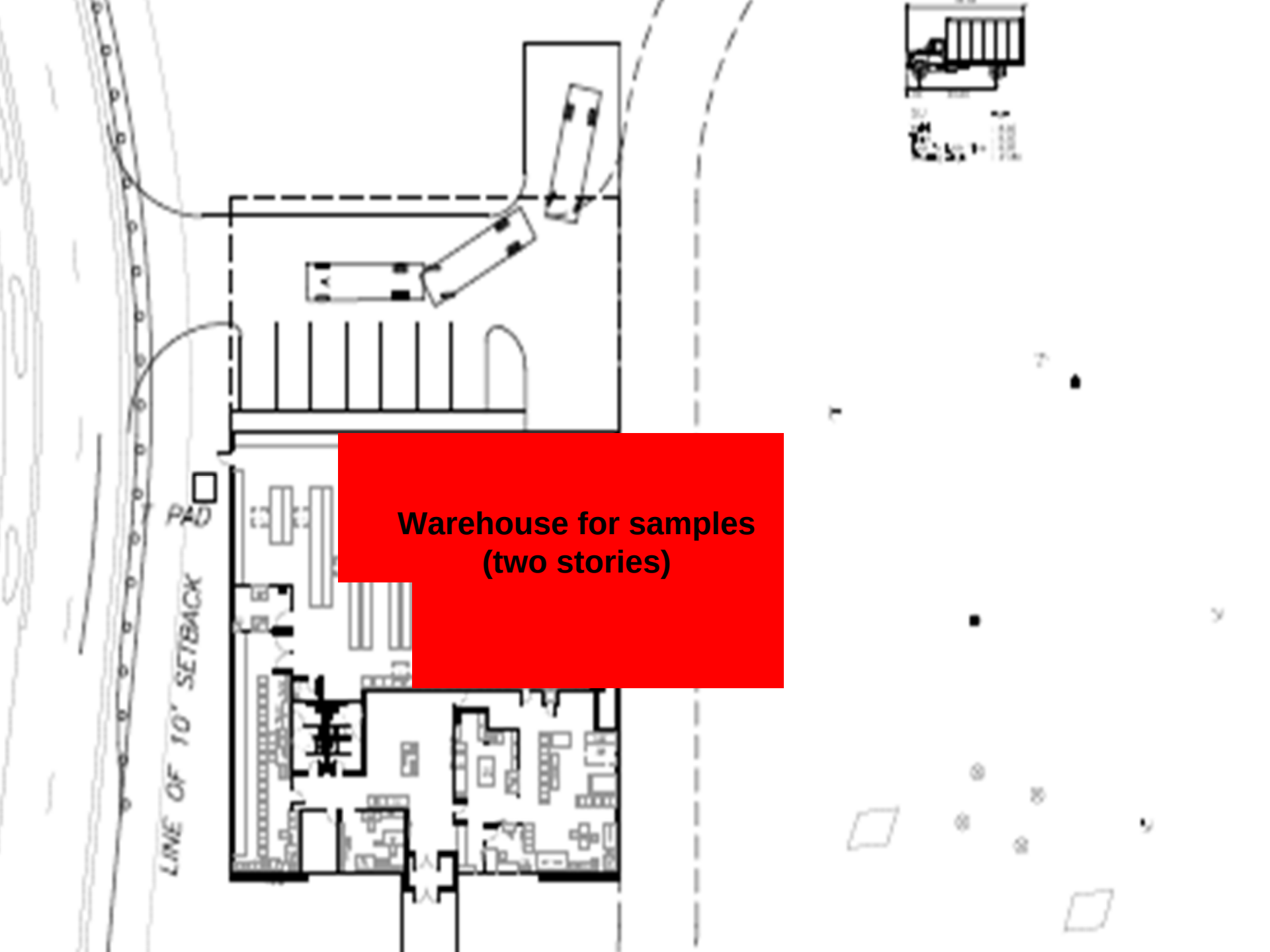
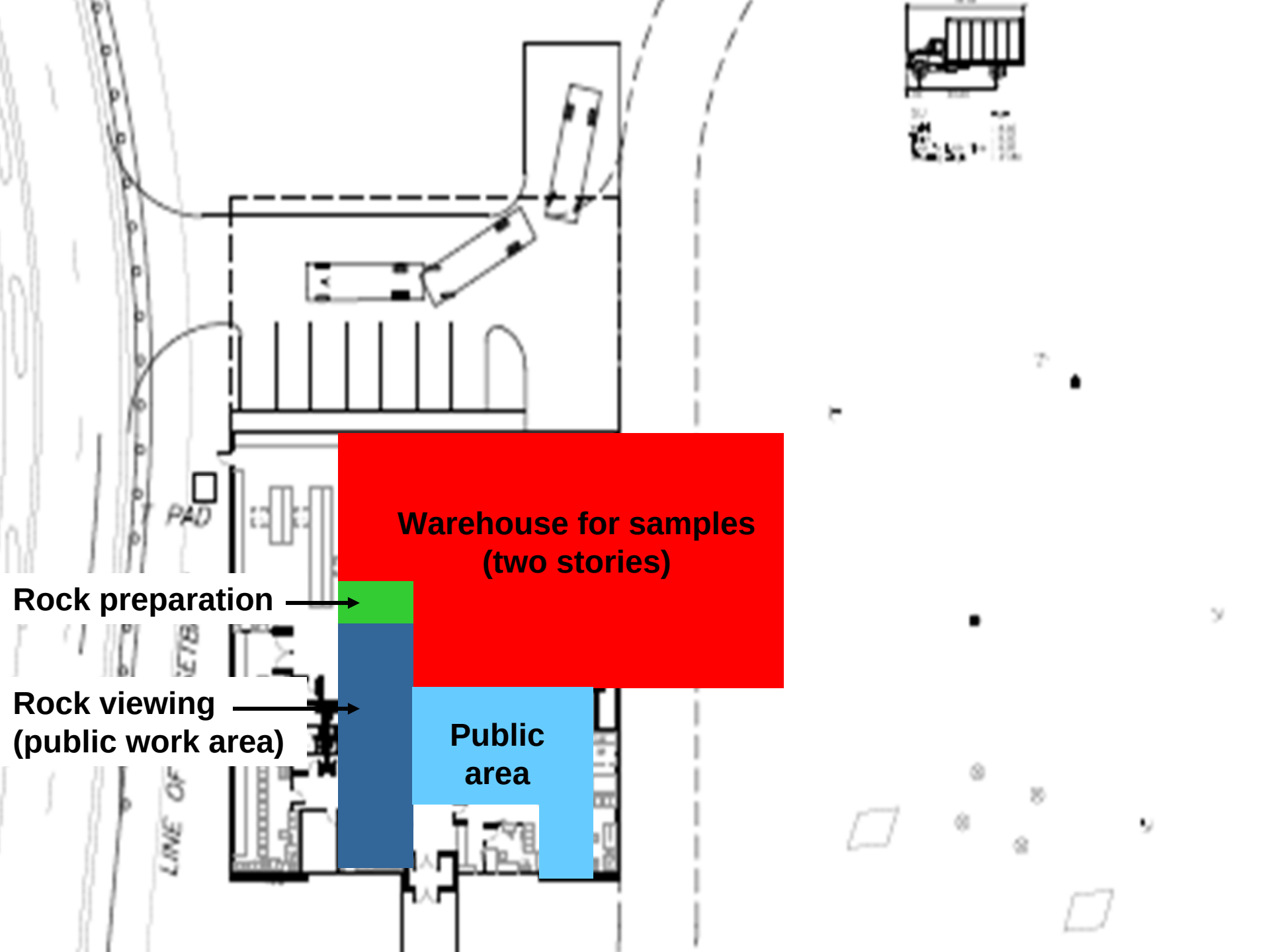
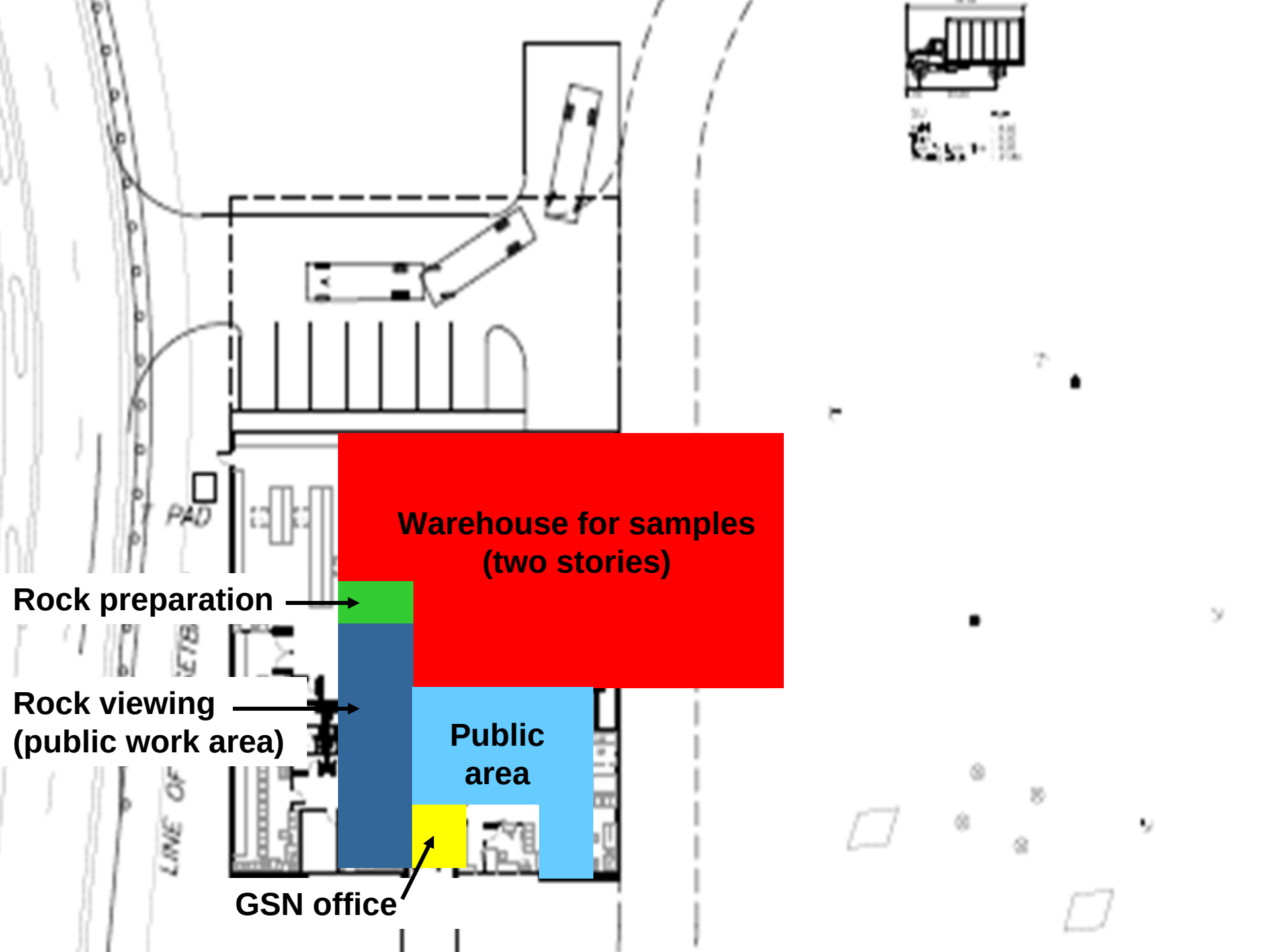
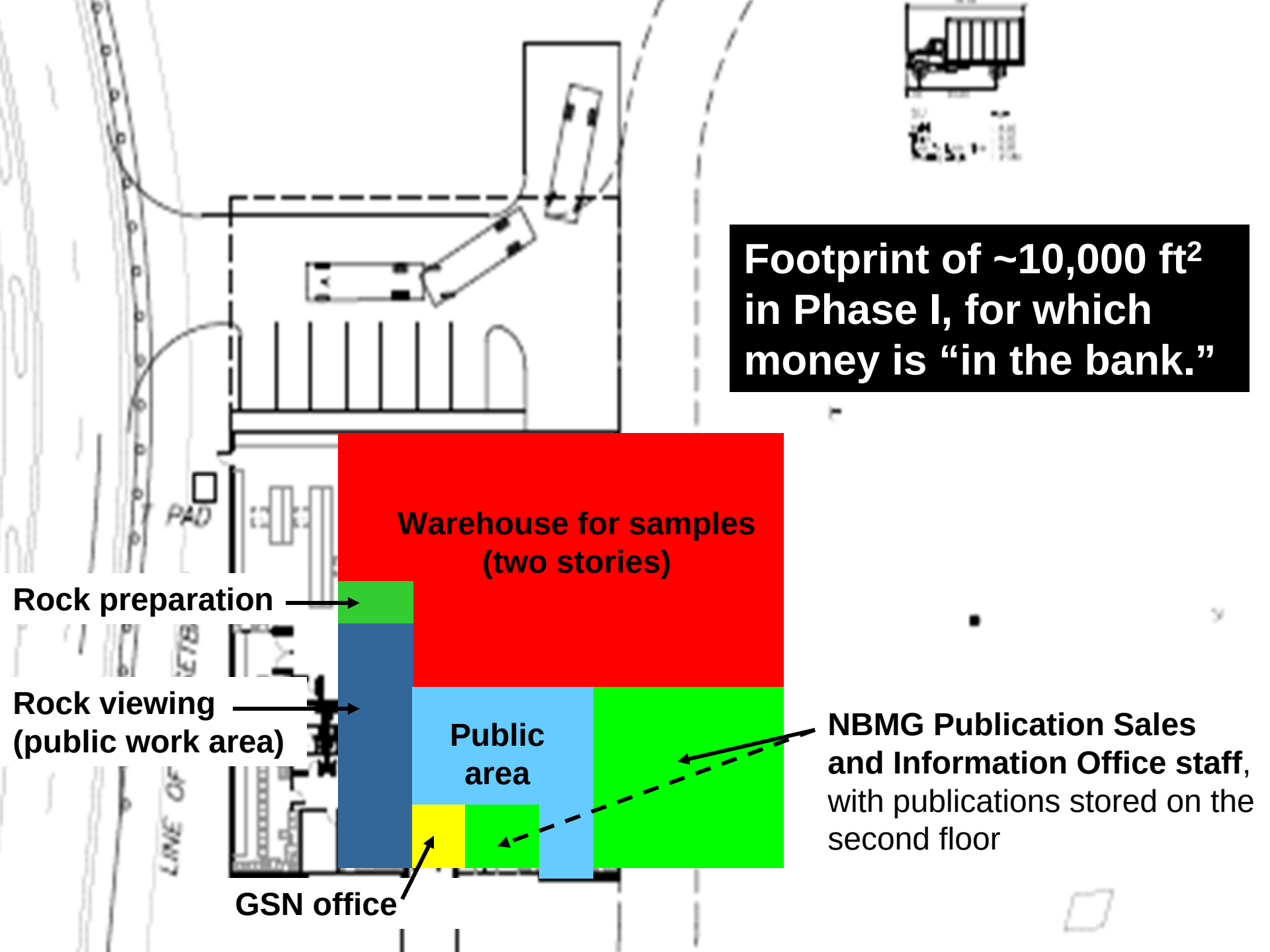
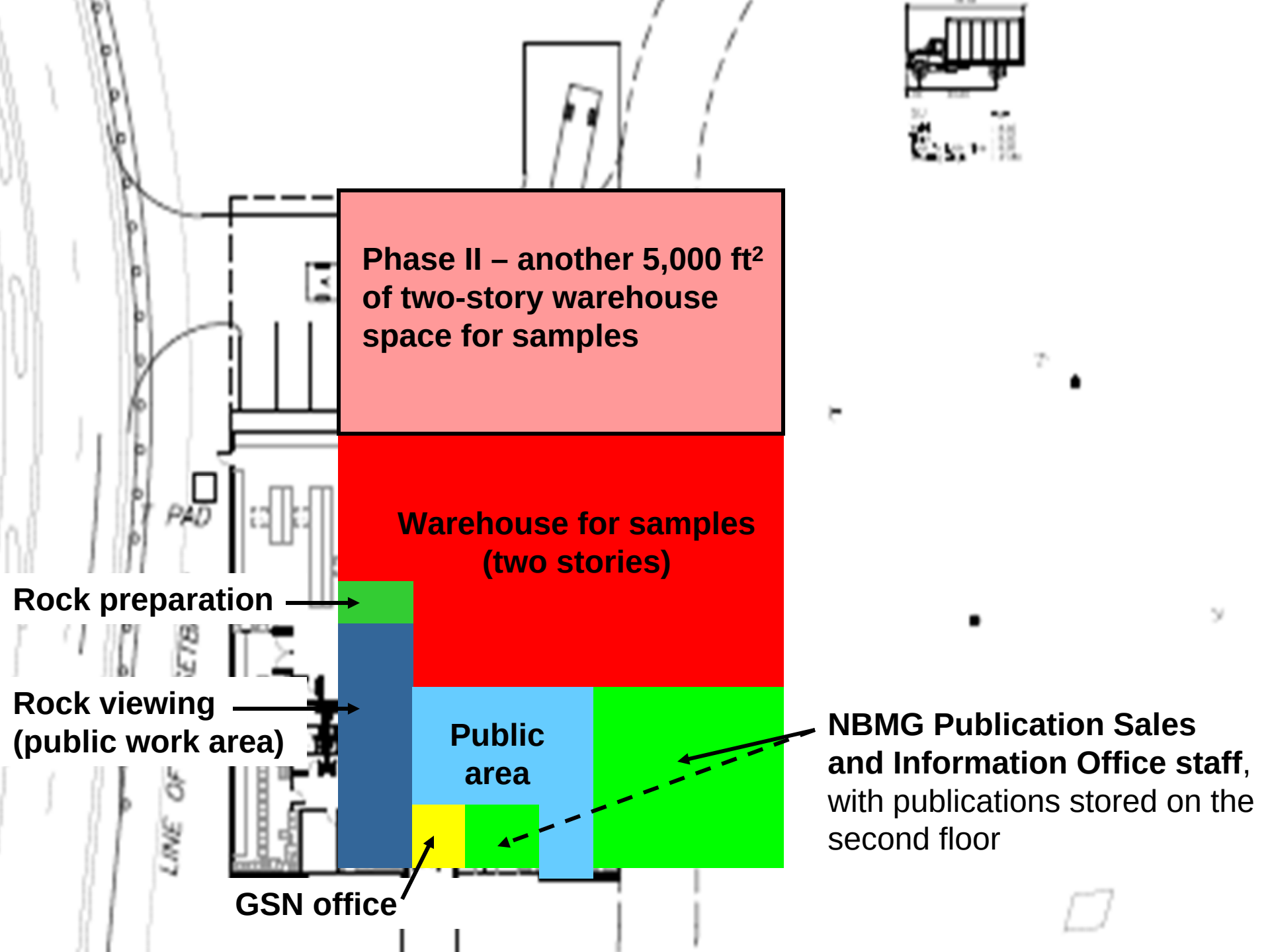

LINE OF 10' SETBACK
PAD


Warehouse for samples
(two stories)
PAD
LINE OF 10' SETBACK


Warehouse for samples
(two stories)
Rock preparation
Rock viewing
(public work area)
Public
area
PAD


Warehouse for samples
(two stories)
Rock preparation
Rock viewing
(public work area)
Public
area
GSN office
PAD


Footprint of ~10,000 ft²
in Phase I, for which
money is “in the bank.”
Warehouse for samples
(two stories)
Rock preparation
Rock viewing
(public work area)
Public
area
NBMG Publication Sales
and Information Office staff,
with publications stored on the
second floor
GSN office
PAD


Phase II – another 5,000 ft² of two-story warehouse space for samples
Warehouse for samples (two stories)
Rock preparation
Rock viewing (public work area)
Public area
NBMG Publication Sales and Information Office staff, with publications stored on the second floor
GSN office
PAD

Our vision for geoscience data preservation in Nevada:

1. **GREAT BASIN SCIENCE SAMPLE AND RECORDS LIBRARY in Reno, (staffed by State- and contract/grant-supported NBMG employees)**
2. **A facility in or near Elko (Great Basin College – Mike McFarlane)**
3. **A facility in southern Nevada (Nye County – DOE-supported?)**

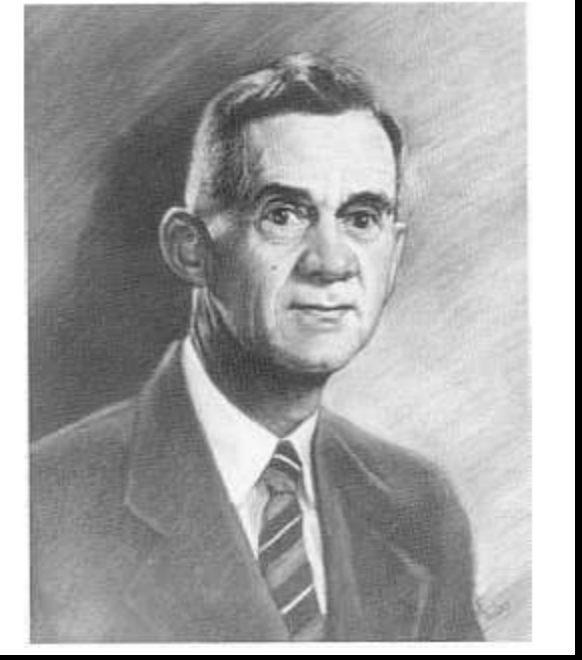
Our estimates of the initial costs for completion of the project are as follows:

Completion of facility in Reno (to expand it to 15,000 square feet – Phase II)
$ 2.2 million

Cost of digital data capture and selective acquisition of samples
from key localities throughout the State, $2.8 million for first 3 years ;
$ 2.8 million
plus $2 million per year for each of the following two years
$ 4.0 million

Facility on Nevada System of Higher Education land in or near Elko
$ 5.7 million
Facility on Nye County or federal land in southern Nevada
$ 4.0 million

TOTAL needs for Geoscience Collections and Data Preservation in Nevada
$18.7 million.



Jay A. Carpenter Fund

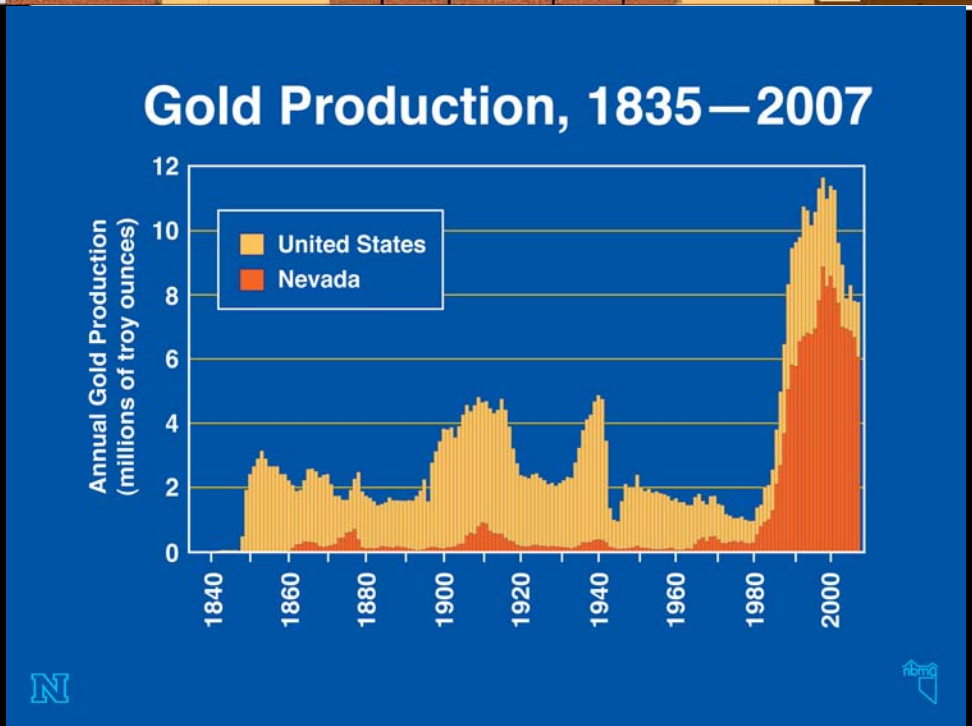
Thanks to the Jay A. Carpenter Fund, which was used to purchase our first wide-map scanner, and donations from the Nevada Division of Minerals, the Nevada Bureau of Mines and Geology has completed scanning of over 20,000 files in its Mining District holdings, including many large maps.

These are available on line through

http://www.nbmg.unr.edu/ .

We have many more files and maps to scan, and we plan to eventually run optical character recognition, making the files more easily searchable. We are also georeferencing the maps for use in GIS and on-line searches by location.

We need your help – with appropriations from the federal government (the land manager of 87% of the land in Nevada), state funds, and private donations
AND with obtaining representative samples and data.



We are in the midst of the biggest mining boom in history, and there will be more booms in the future.

We must preserve the data and samples.

Thank you!

University of Nevada, Reno
Statewide • Worldwide

THE GREAT SEAL OF THE STATE OF NEVADA
ALL FOR OUR COUNTRY

Mark Benzing, TSK, and Mike Bennett, UNR-Facilities

University of Nevada, Reno
Statewide • Worldwide

GREAT BASIN SCIENCE SAMPLE AND RECORDS LIBRARY

Nevada Bureau of Mines and Geology
University of Nevada, Reno

on the Campus of the Desert Research Institute

The Nevada Bureau of Mines and Geology staff operates the Great Basin Science Sample and Records Library for the public from 8 a.m. until 4 p.m., Monday through Friday.