

Establishing the Physical Footprint for Future Geoscience Research at DUSEL

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Submission for the South Dakota Science and Technology Authority
Preliminary Budget Request: \$58,031

Project Goal:

The goal of this proposal is to establish a scientific protocol that will assure a significant footprint from the existing mine will be maintained as part of DUSEL for future research activities.

Scientific and Engineering Justification:

Results of the Geoscience (Oct 5-6, 2001) and Microbiology workshops (Nov 30-Dec 1, 2001) that were held in Lead, SD indicated a preference that the entire mine be maintained for future research activities. As desirable as that may be, economic considerations render this an impractical approach. Therefore, a priority need is to establish a valid scientific protocol that will assure a significant footprint from the existing mine will be maintained as part of DUSEL for future research. Included in the footprint analysis will be the maintenance of existing scientific materials and the establishment of a DUSEL Geosciences Database. Research to be conducted under guidelines established from this proposal will identify the following:

- The available geologic database spanning 126 years (maps, documents, samples)
- Uses and maintenance of the existing core library for geoscience research
- Unique features of the mine that will be utilized for future scientific research activities
- Fracture occurrences and hydrologic flow patterns throughout the existing mine

Proposed Experiments:

Associated activities include portions of work that has already been performed, but will identify methods to access and utilize these stored databases. Much of the existing geologic database from the history of mining at Homestake has already been transferred to the SDSTA. This project will focus on cataloging the existing geologic maps, documents, etc., and establishing an electronic file server system for looking up various types of data. The existing core library has also been transferred to the SDSTA and research as part of this footprint project will utilize the core to determine probable areas in the mine to visit for potential retention purposes. These will include areas of high fracture density, high fluid flow, abnormal pressure regimes, etc. These areas will then be visited and the particular features from each site noted. In this way, a detailed survey of mine resources will be compiled. Depending on available resources (maps, etc) and access, as much of the existing mine as possible may require precursory survey. This work will be fundamental in the identification of resources deemed valuable enough to become part of the permanent DUSEL footprint.

SDSM&T PROPOSAL BUDGET

Establishing the Physical Footprint for Future Geoscience Research at DUSEL

Period: 2007 upon DUSEL 4850 lab opening

Estimated costs and are not approved.

	College Fiscal Year	Effort in Man-Mo Acad	Sumr	Monthly Salary Rate	First Period 6/1999-6/2000
A. SENIOR PERSONNEL					
1. Larry Stetler - PI	2007	1.000	1.500	\$7,493	<u>\$18,733</u>
Subtotal Senior Personnel					\$18,733
2. Students, MS	2007	1.300	1.500	\$2,493	\$6,980
	2008	1.300		\$2,692	<u>\$3,500</u>
Subtotal Graduate Students					\$10,480
B. FRINGE BENEFITS:					
1. Staff, 22.0 % of salaries and wages					\$4,121
2. Students, 8.0 % of salaries and wages					\$838
Subtotal Fringe Benefits					<u>\$4,959</u>
TOTAL SALARIES, WAGES, AND FRINGE BENEFITS:					\$34,172
C. TRAVEL					
1. Domestic					
a. To DUSEL					
1. Milage: 50 trips at 100 mi/trip: \$0.40/mi					<u>\$2,000</u>
TOTAL TRAVEL					\$2,000
D. CAPITAL EQUIPMWNT					
TOTAL CAPITAL EQUIPMENT					<u>\$0</u>
E. SUPPLIES AND MATERIALS					
a. misc.					<u>\$1,000</u>
TOTAL SUPPLIES AND MATERIALS					\$1,000
F. OTHER DIRECT COSTS					
a. Tuition Remission					\$8,005
F. TOTAL DIRECT COSTS:					\$45,177
G FACILITIES AND ADMINISTRATION - 44% of Total					
Salaries and Wages					<u>\$12,854</u>
H. TOTAL FUNDS REQUESTED					\$58,031

SURFACE LABS and SPACE

Experiment or Program Name: Establishing the Physical Footprint for Future Geoscience Research at DUSEL

Principal Investigator or Contact Person: Dr. Larry D. Stetler

Brief Summary: Establishing a protocol to identify existing portions of the mine to be retained as part of the permanent DUSEL footprint for future research activities.

1. Rooms or Functional Uses:

1 office/room for keeping records, etc. as the project proceeds. _____

2. General Information:

Probable Start (year) 2007

Duration Up 1 year

Occupancy (Peak/Avg) 2/1

3. Mechanical

Temperature

 Uncontrolled

X 20 +/- 5 deg. C (Air Cond.)

 other: _____

Humidity

 50% +/- 20%

X Uncontrolled

 other: _____

Air Filtration/Recirculation

(describe): _____

Special Fume Exhaust

requirements:

 flume hood in lab _____

Plumbing

 Industrial Hot/Cold Water

X Potable Hot/Cold Water

 High Purity/DI Water

 Steam/Condensate return

 Safety Shower/Eyewash

 Compressed Air

Cylinder Gases:

4. Electrical

Approx. total power (kW)

(Peak/Avg.) 120 VAC

Other electrical needs

(describe):

T-100, WiFi, _____

5. Chemicals:

 Bases

 Acids

 Solvents

 Radioisotopes

 Chemical inventory

storage

 Chemical waste storage

 Biological storage

 Radioisotope storage

 Cryogenics

 Hazardous/Special

Handling:

Other chemicals (describe):

6. Architectural: Special

needs:

Floors _____

Walls _____

Partitions _____

Clean room _____

Storage _____

Other: _____

7. Special Facilities:

Material Access _____

Access Schedule day time

Cleanliness _____

Security _____

Crane Access: _____

Data Communication: T-

100, WiFi _____

8. Laboratory, Machine

Tools, and

Other Equipment:

9. Other Needs or Requests:
