SCIENCE MINE
DIG INTO SCIENCE

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Mr. Padraig Cunneen
Members of the BNRC
65 East Broadway
Butte, MT 59701

I am Dr. Lois Podobnik, member of the Board of Directors of the Science Mine, and point-of-contact for grants and applications. Enclosed is a completed application for the Butte Area One Restoration Small Project Program for the proposed project entitled, ***"Extending the Public Outreach of Science Mine BNRC Exhibits."***

I hope that you will look favorably on this project which has involved serious planning and partnerships with an eye to conserving BNRC dollars and extending the impact of BNRC exhibits that are currently under construction at the Science Mine. Should you have any questions or require clarification on this proposal, please feel free to contact me. My contact information is: email – lopodobnik@hotmail.com; home phone – 565-5342; cell phone – 308-430-1303; address – 4824 Hutch Drive, Butte.

Thank you for your time and consideration in the review of this proposal.

Kind regards,

Lois Podobnik

Lois Podobnik, Ph.D.
Science Mine Board of Directors
Physicist & retired Provost of Chadron State College

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A. Contact Information:

Dr. Lois Podobnik, 4824 Hutch Drive, Butte MT 59701
lopodobnik@hotmail.com; Cell – 3084301303; Home – 406-565-5342.

B. Project Summary:

Title: "Extending the Public Outreach of Science Mine BNRC Exhibits"

Sponsor: The Science Mine (SM) is a hands-on science discovery center located at 36 East Granite in uptown Butte. It was incorporated as a 501(c)3 in 2008 and opened its doors in December 2011. In 2013 it underwent a significant strategic planning process. The Mine now operates with a Board of Directors that is implementing this plan, which includes grant writing for expansion of exhibits and public education. Board members are professional people with extensive backgrounds in chemistry, geology, engineering, physics, biology, construction trades, technology, business, and education.

The Science Mine promotes scientific literacy for children, adults and families by cultivating natural inquisitiveness and the love of play through hands-on exhibits that demonstrate a wide variety of science concepts. Its motto is "Dig into Science!" and it provides an environment where visitors of all ages can interact with exhibits and a wide variety of materials to safely make discoveries and become more comfortable with science and technology. The SM has a strong relationship with schools and youth organizations, and provides, by appointment, organized learning experiences for Butte and the surrounding counties. In addition the SM focuses on family experiences and is open on Saturdays to the general public. It also participates in Chamber of Commerce events such as the Christmas Stroll.

Background to existing grants: The Science Mine currently has two inter-related grants, one from the BNRC funded in August 2015, and the other from SARTA funded in August 2016. The BNRC grant funds the building of six interactive exhibits related to Butte Area One issues including healthy watersheds, groundwater, storm water drainage and non-point source pollution, stream flow, acid mine drainage, and dissolved and suspended loading in water.

That BNRC project is at the halfway point with infrastructure support in place, and beta versions of four of the exhibits, with two ready to proceed to final installation. As these exhibits have been designed, it has become increasingly evident that there is not sufficient wall space to accommodate the extensive signage for each exhibit.

To remediate the wall space issue, the Science Mine applied for a SARTA grant that was recently funded in August 2016. The SARTA grant has three points of focus, one of which is internet-based immersive computer displays for BNRC exhibits that provide information at various levels of intellectual sophistication and include specially designed webpages for investigation of each exhibit topic. This allows each visitor regardless of age to explore the exhibit at a developmentally appropriate level, and allows the SM to display photo documentation and answers to "burning questions" for the exhibits without exceeding available wall space. This digital capability leads naturally into a second phase of establishing "virtual fieldtrips" to the SM, which can be utilized by area teachers or leaders of various youth clubs and organizations. The one year of SARTA funding allows for the purchase of the necessary equipment for the digital signage, however, it does not cover the second year of development of web-based content for the exhibits. Currently, prototypes of displays are being tested with purchase of complete sets to proceed this winter.

Project Focus: This application for BNRC small project funding focuses on three areas: (1) university student assistance for installation of the new digital signage and creation of related websites for each exhibit; (2) the extension of existing collaborations with the addition of a mobile unit to take activities to festivals and other Butte events, and public locations; and (3) an outreach coordinator who will recruit and train volunteers to run the mobile unit, and who will cultivate the "virtual fieldtrip" component with Butte Public Schools that capitalizes on the digital signage and exhibit websites, and includes " a day with a scientist" excursions.

Focus #1 of this project will employ students from the Montana Tech Association of Computing Machinery (ACM). These students have the ability to assist with the final installation of digital signage and create the deep, interactive websites for each exhibit. Because the SM is virtually an all-volunteer organization, the current expertise to install this equipment and create these websites single-handedly is greatly limited, which could significantly increase the time needed to build and refine these sites. By creating paid internships for ACM students, this process could be expedited while providing valuable experience to Tech students and contributing to their financial support.

Focus #2 will take the exposure of the BNRC exhibits to the next level, by creating "mini" versions of the Butte Area One exhibits, along with other exhibits, that can be transported to

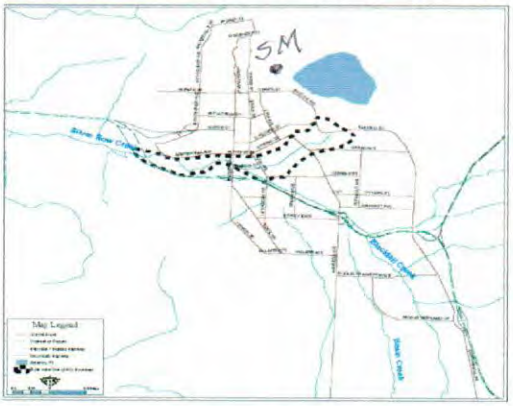
off-site locations, including festivals, public events and public locations. This requires an enclosed transport trailer, small quiet generator, rubber tubs and wheeled storage boxes for exhibits and materials, dollies, collapsible tables and chairs, canopies, portable signage, and electronic displays as well as scaled versions of exhibits.

Focus #3 creates an essential, temporary position, Outreach Coordinator, who will recruit and train appropriate volunteers to manage the mobile unit and can implement virtual fieldtrips to the Science Mine or local research facilities by classrooms. Currently the Science Mine, the Butte Public Schools, and National Center for Appropriate Technology are all on the same community network, which allows live video streaming. Dr. Phil Curtiss, SM Board Member and Assistant Professor of Computer Science at Montana Tech, has worked to make this infrastructure possible. In addition he has discussed the possibility of virtual field trips to the SM with Jim O'Neill, Butte Public Schools Assistant Superintendent for curriculum. For example, all sixth-grade classrooms could be studying a particular science topic and then culminate this study with a virtual field trip and a "day with a scientist" at the Science Mine, as well as other science facilities such as NCAT, Montana Resources, Seacast, Horseshoe Bend water treatment plant, etc., utilizing live-streaming video with two-way equipment. These virtual field trips will be archived and accessible by the public through the Science Mine website. This will greatly enhance the access to SM exhibits by people at all levels, and additionally allow interaction of students with real-life research environments. Coordination of these types of opportunities initially requires extensive oversight, and therefore the Outreach Coordinator position is key. Eventually this position will devolve into a volunteer-led endeavor with a number of people, especially retired teachers, who can coordinate the mobile unit and the virtual field trips schedule.

Total Dollar Amount: The Science Mine is requesting $84,900 for this proposal. Committed match for this project is $93,311. Uncommitted match is $53,000. This project will provide deep, immersive, interactive web-based content for digital signage of the six BNRC exhibits, previously funded; create a mobile unit for SM exhibits to go on the road to festivals, public events and schools; and implement virtual field trips to the SM along with "a day with a scientist" events.

Project location: While the Science Mine is located at 36 East Granite Street, the project will allow its exhibits, especially specific to the hydrogeology, chemistry, and biology of Butte Area One and its relationships to Silver Bow Creek, Blacktail Creek, and the Berkeley Pit, to be transported both physically and virtually to public schools, festivals and other Butte-Silver Bow events. The exhibits explain remedy and restoration issues directly related to Butte Area One.

This project will extend the reach of these exhibits throughout the community and Silver Bow County. The location of the SM is indicated on the map on the next page.



C. Project Goals and Objectives: The primary goal of this project is to extend the impact of BNRC exhibits, as well as other SM exhibits, through physical and virtual outreach efforts to public schools, festivals and other public events and locations in Butte-Silver Bow.

The project objectives pursued under this project include:

1. Design and completion of websites for BNRC exhibits and programming of interactive, internet-based digital signage for these exhibits.
2. Creation of a mobile unit for the Science Mine to take exhibits and activities to public schools, festivals and other Butte-Silver Bow events.
3. Extension of the formal volunteer program at the SM, to implement use of the new mobile unit, and create a network of virtual field trips to the SM, and "day with a scientist" visits.

D. Project Benefits: The major benefit of this project is the synergy created with the existing BNRC grant #1 that is currently underway, as well as the SARTA grant for digital signage. This proposal will allow the SM to take public education to the next level and greatly increase the exposure of the BNRC exhibits. The mobile unit will be set up at Butte festivals, county fairs, and other public gatherings, such as farmer markets. In addition, with budget cuts in the public schools, it has become increasingly difficult for classroom teachers to take their students on fieldtrips. Currently these teachers actually have to do fundraising, such as bake sales, to pay for the cost of buses and drivers for these fieldtrips. By providing "virtual" fieldtrips, which can then lead to students and their families visiting the SM on Saturdays, the SM can increase public awareness of this amazing facility and reduce the extra work of fundraising by teachers. In addition the virtual fieldtrips will include live streaming of a "day with a scientist" utilizing scientists from Montana Tech and research facilities in the Butte area related to SM exhibits. Portable live streaming equipment can be set up both at the SM as well as research and development facilities for major scientific industries in Butte and the surrounding area. These

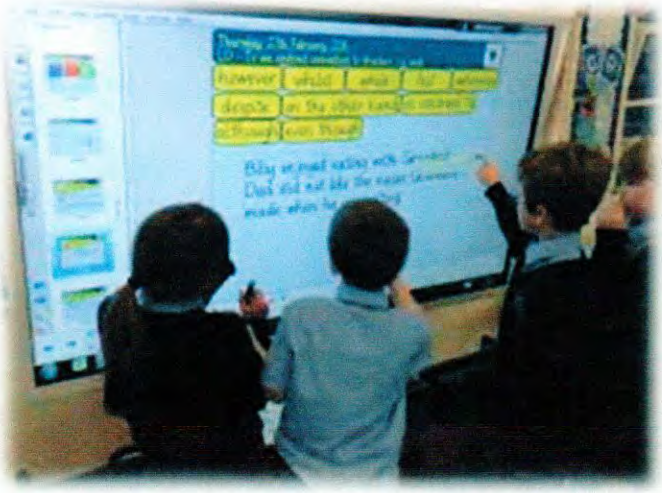
experiences will encourage STEM education and the pursuit of technical careers by students who have this type of early exposure to the real world of science. By expanding the outreach of Science Mine exhibits and new programs, through mobile and online resources, we are making an investment in the future. By linking these resources to other educational endeavors in Butte, we are expanding the network of learning opportunities, with experiences that teachers are unable to provide in the classroom setting.

E. Project Implementation:

Objective #1 - Design and completion of websites for BNRC exhibits and programming of interactive, internet-based digital signage for these exhibits.

Tasks, objective #1: Please note that tasks 1, 2, and 3, as well as part of 4, will be completed prior to the beginning of the current proposal, under the auspices of the SARTA grant.

1. Measurement and assessment of spatial requirements for each exhibit and available wall space within the SM – completed by January 2017- SARTA grant.
2. Determination of technical equipment and resources needed for installation of that equipment for each exhibit – completed by January 2017- SARTA grant
3. Bidding and ordering of equipment – completed by February 2017- SARTA grant
4. Installation of equipment and set-up- underway from fall 2016 through fall 2017. Interactive signage may look like the photographs below:



5. Creation of interactive signage material and webpages for each exhibit, including links to related sites, background information, historic photographs, diagrams, and access to portals for "burning questions"- completed by May 2018-BNRC grant #2.
6. Observation of beta versions of signage and websites and patrons' interactions with them, and implementation of revisions as necessary to improve effectiveness, based on these observations- completed by May 2019- BNRC grant #2.

Objective #2: Creation of a mobile unit for the Science Mine to take exhibits and activities to public schools, festivals and other Butte-Silver Bow events.

Tasks, Objective #2

1. Bid and purchase an enclosed 12 foot trailer similar to U-Haul , along with tubs, hand cart, generator, canopies, platform cart, digital signage and other equipment for use in mobile educational outreach. Trailer may look similar to the one depicted below:

2. Design, build or purchase scaled versions of the six BNRC exhibits, along with several other exhibits, and adapt them to portable carriers and display platforms. Mobile activities might be set up similar to those pictured below:

3. Develop portable lab area, with individual stations as well as tables and chairs for additional hands-on activities, and digital signage. Ideas for this area may look like the following mobile area below:

Objective #3: Extension of the formal volunteer program at the SM, to implement use of the new mobile unit and create a network of virtual field trips to the SM.

1. Form search committee for temporary, part-time Outreach Coordinator; committee develops the job description and terms of employment; also develops application process.
2. Advertise position and review applications; interview finalists, and work with Board of Directors to complete selection and hire Coordinator.
3. Provide orientation and training for new coordinator.
4. Advertise and interview for volunteer candidates to form a strong, reliable cadre of volunteers for a variety of duties associated with the mobile unit and virtual field trips.
5. Train volunteers to conduct mobile outreach activities, and to gradually take over the duties of the Outreach Coordinator.
6. Develop mobile outreach list for various events and festivals, as well as onsite visits to classrooms.
7. Seek mobile outreach opportunities and create calendar for these events.
8. Work with the Butte Public Schools and teachers at various grade levels, to develop topics for virtual field trips to the Science Mine and "a day with a scientist" activities.
9. Purchase portable streaming equipment for use in "a day with a scientist."
10. Recruit scientists with research related to the topics for the virtual field trips.
11. Create a calendar for virtual field trips.

Staff Experience: The following people are members of the Science Mine Board of Directors. Each of them, based on their individual expertise and skills, will provide services for the various tasks of this project, listed above. Please note that all of these people are busy professionals and are volunteers who contribute significant hours to the Science Mine each year. Some of these people have been with the SM since its inception in 2010. All of them are passionate about the role and mission of the SM and how it can create an informed citizenry who appreciates science, engineering, technology and mathematics, and understands its implications for the future of Butte.

- **Dr. Doug Coe**, dean and professor of Letters, Sciences, & Professional Studies at Montana Tech, as president of the Science Mine Board, will organize regular meetings of the Board to keep the project moving forward and will provide planning oversight and expertise. He currently serves in this capacity for the BNRC #1 grant project. His role as dean at Montana Tech makes him an important organizational resource.
- **Dr. Lois Podobnik**, physicist, and retired provost and academic vice president of Chadron State College, will provide oversight for the project planning, quarterly reports, and financial documentation. She currently serves in this capacity for the BNRC #1 grant project. Dr. Podobnik has extensive experience with grant writing and managerial oversight, having brought in and supervised over $12 million in grant funds for science education to Nebraska during her career there.

- **Dr. Fred Hartline**, science education and technology expert, will provide expertise and hands-on assistance for the planning, construction, and implementation phases of all digital signage, including the building of interactive webpages. He currently is the lead for design and implementation of the BNRC #1 exhibits, and will expand this role to include the immersive and exploratory aspects of the digital signage for this proposal. Dr. Hartline has far-reaching experience in hands-on physics and biology curriculum development with such prestigious organizations as the Lawrence Hall of Science.
- **Dr. Phillip Curtiss,** assistant professor and research professor in Computer Science at Montana Tech, will provide technical expertise in the design, planning, and installation of all technological components of the digital signage project, as well as the networking of the SM to support this project. Dr. Curtiss also has his own technology consulting firm that works on a variety of technology-based projects around the area, and donates this firm's time to the SM.

F. Project Schedule: Project Schedule Narrative – See attached detailed timeline graphic on next page

Tasks for all three objectives will be performed simultaneously. Tasks for a given objective will generally be done consecutively, although some tasks may overlap or be done at the same time. Because it is difficult to ascertain the time needed to complete various tasks, they are listed, with a reasonable expectation of completion as noted in the timeline table.

- **Year 1 - Summer 2017 to Summer 2018 – see timeline graphic on next page**

Objective #1 – Tasks 1 through 3, plus the beginning of task 4 will be completed prior to the start of the summer 2017 as part of the SARTA grant. Task 5 will be completed in year 1 of the BNRC grant #2.

Deliverables: All electronic equipment installed; basic interactive signage is operational and construction of webpages begun.

Objective #2 - Task 1 completed with task 2 and 3 underway.

Deliverables: Enclosed trailer is purchased, along with related storage and transport equipment, as well as equipment for display and usage of hands-on exhibits. Mini-versions of BNRC exhibits are under construction.

Objective #3 – Tasks #1 through 5 and 9 are completed; tasks 6 through 8 are underway.

Extending Public Outreach Science Mine Project Timeline

	2017					2018												2019						
Obj#.task# Description	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
1.5 Develop signage																								
1.6 Observe-revise signage																								
2.1 Bid, purchase trailer																								
2.2 Design, build/buy exhibits																								
2.3 Create deployable lab space																								
3.1 Develop search materials																								
3.2 Select/hire outreach coord.																								
3.3 Train new coordinator																								
3.4 Recruit outreach volunteers																								
3.5 Train outreach volunteers																								
3.6 Develop list of events																								
3.7 Seek outreach opportunities																								
3.8 Develop school event topics																								
3.9 Buy streaming video equip.																								
3.10 Recruit scientists for "visits"																								
3.11 Create calendar of "visits"																								

Deliverables: New Outreach Coordinator is hired; Coordinator creates and implements volunteer program for mobile SM; cadre of volunteers has begun training. Portable live streaming and video archiving equipment is purchased and installed. Discussions with Butte Public School teachers have identified topics for virtual field trips and a day with a scientist program.

- **Year 2 – Summer 2018 to Summer 2019 - see timeline graphic on previous page**

Objective #1 – Task 6 is completed.

Deliverables: Beta versions of interactive, immersive, internet-based signage along with web pages are completed; monitoring of beta versions with patrons; refinement of signage and webpages completed, based on monitoring results; marketing of exhibits and new discovery-based signage is ongoing; updates to web pages and links for signage is ongoing.

Objective #2 – Tasks 2 and 3 are completed.

Deliverables: Mobile unit is fully operational, and being deployed throughout Butte-Silver Bow and adjacent counties.

Objective #3 - Tasks 6 through 11 are complete.

Deliverables: Mobile outreach program is up and running with a full complement of trained volunteers; SM outreach activities occur at various festivals, public events at the Original or elsewhere in Butte and the adjacent region, and in K-12 schools in Butte; virtual field trips to the SM and a day with a scientist program is in place and operating; the network of educational opportunities continues to expand with programming; Coordinator's duties become distributed among volunteers, and position is phased out.

G. Monitoring Activities: The major outcome for this project is the increased use of the Science Mine's new and existing resources, as well as, increased links to other organizations that serve public education. This outcome includes an increase in visitation to the SM, attendance at mobile events, usage of new online webpages, and participation by new partner organizations in these activities.

Monitoring activities will consist of three types: (1) summative completion of simple activity checklists for planning and completion of tasks as well as simple attendance records; (2) formative observations of visitor interactions and participation with each program as well as participant surveys; and (3) analysis of social comments on the SM Facebook page as well as Twitter, along with the use of electronic counters on webpages to gauge usage.

The checklists will be completed as the grant project progresses, and will be included with the quarterly reports. The formative observations of visitor interactions will be used to assess the effectiveness of the immersive internet-based signage, as well as the new mobile activities. These observations will include volunteer observations along with surveys of participants. In addition to attendance, an increase in the understanding of concepts illustrated in exhibits, and development of problem solving skills and critical thinking will be evident by data gathered from the participant surveys. Comments on Facebook and Twitter will be compiled and analyzed for constructive suggestions as well as things that are working well. Counters on interactive webpages will allow the SM staff to determine the degree of usage of those pages and comments on social media will help improve the ease of use of these webpages. By refining the various elements of this grant proposal, based on formative feedback during the grant, it will be possible to utilize a model of continuous improvement for SM programs and ensure continued participation.

H. Project Budget:

Budget Narrative - The following **budget narrative** gives the details and calculations for the entries in the budget table. In-kind planning, design and implementation work is provided by SM Board members as uncommitted match. In addition to this match, there is the committed match from the BNRC grant #1 of $49,000 with an additional match from the SM of $34,000, and the SARTA grant of $44,311 with an additional match from the SM of $19,492. This brings the committed match to a total of $93,311 cash from BNRC and SARTA plus $53, 492 in volunteer and professional labor donated by the SM, or a total committed match of $146,803.

Objective #1 – interactive, immersive web-based content for BNRC exhibits

- **Tasks 5 & 6: Internships as contracted labor** for ACM, video, and marketing students at Montana Tech - $1000/student/year x 7 students x 2 years = $14,000.
  Students will perform approximately 144 hours of work over 2 semesters each year.
- **Match** will be provided by SM board members who will supervise students and provide the project management plan for this objective. 144 man-hours x professional rate $120 = $18,000.

Objective #2- mobile unit, design and construction

- **Tasks 1 & 3: Equipment & materials for the mobile infrastructure** including the trailer, dollies, ramps, tubs, display stations, tables, chairs, generator,

canopies, signage. Trailer estimated at $5000 and other items collectively at $5000 for a total of $10,000.

- **Task #2: Equipment & materials** for design and construction of BNRC mobile exhibits by SM board members is estimated at $10,000, based on some technical equipment needed for exhibits, along with construction materials.
- **Match** will be provided by SM board members listed in this proposal and include 100 man-hours at the volunteer rate of $25/hr. for tasks 1 and 3, along with 240 man-hours at the professional rate of $125/hr. for task 2 requiring specialized expertise. This totals $32,500 match for Objective #2.

Objective #3- recruitment and training of outreach volunteers and implementation of virtual field trips

- Tasks #1, 2 & 3 require Match of 25 hours by 4 board members at the volunteer rate of $25/hr. equals $2500 in match for these three tasks.
- Outreach Coordinator works approximately 16 hours/week for 4.3 weeks/month or 69 hours/month. At a rate of $20/hr., this equates to $1380 per month. Tasks 3 through 5 require 11 months to complete. These tasks also overlap with Tasks 6 through 11 and require additional time throughout the grant timeline as indicated in the timeline graphic. However, towards the end of the grant, in March 2019, the duties of the Outreach Coordinator will be gradually turned over to a team of volunteers who will maintain the mobile unit, manage the virtual field trips, and maintain the outreach calendar. During the fall 2017, the Outreach Coordinator will work 70 hours during the months of October and November, and 35 hours during December. In 2018 the coordinator will work 70 hours in January, February, March, April, and May, then 35 hours in June and July, with 20 hours in August. In the fall of 2018, the coordinator will work 70 hours each in September, October, and November; 35 hours in December, January, February and March, as duties gradually are distributed to volunteers. By April 2018, the Outreach Coordinator's duties will be completed entirely by volunteers. These total hours equate to 965 total hours at $20/hour for a total contracted service of $19,300. Year one of the grant entails 615 hours distributed over tasks 3 through 11, with tasks 1 through 5 completed and the other tasks underway. Year two of the grant entails 350 hours with tasks 6 through 11 completed.
- Live streaming equipment will allow the SM to create virtual "a day with a scientist" visits to the SM as well as research and development facilities throughout Silver Bow and southwestern Montana. This portable video

equipment will allow for interactive two-way presentations to two (can be expanded later) remote locations (i.e. schools) using the Science Mine as the control site (head-end) for the production. Because it is all portable, sites can be changed, as demand for a variety of virtual visits expand. The presenter would be able to see all remote sites and interact with the individuals at the remote sites to answer questions etc. The quality will be SD/HD utilizing the community fiber optic network as the transmission medium to provide production quality video and audio end-to-end. In addition, content can be captured and simultaneously multicast to solid-state-disk recording medium, for later playback on-demand, as well as live streaming through a reflector service so parents could watch their child live from a remote location over the web, as well as later via video on-demand. This high-end equipment allows for an initial system that can later be expanded to add additional remote sites simultaneously. Cost of this system is $31,608 for presenter site, two remote receiving sites, one control site at the SM, and archiving of all video's for on-demand playback over the Internet.

Summary Budget Table

Tasks	Budget Category	Cost	SM Match Volunteer Hours	Total BRNC#2 and Match
Objective #1				
Tasks 5 & 6	Internships/contracted services	14,000	18,000	32,000
Objective #2				
Tasks 1 & 3	Equipment & materials	10,000	2500	12,500
Task 2	Equipment & materials	10,000	30,000	40,000
Objective #3				
Tasks 1 & 2			1500	1500
Tasks 3 thru 11 (see narrative for details)	Outreach coordinator/ Contracted services	19,300	1000	20,300
Task 9	Equipment & materials	31,600		31,600
BNRC #2 Total		84,900	53,000	137,900
Committed match – BNRC #1 grant	49,000		34,000	83,000
Committed match –SARTA grant	44,311		19,492	63,803
Grand total – All sources	93,311	84,900	106,492	284,703

JIM O'NEILL
Butte School District
Curriculum Director

November 15, 2016

Dr. Doug Coe, Board Chair
Science Mine, Inc.
36 E. Granite St.
Butte, MT 59701
406-497-7777

Dr. Coe:

The Science Mine continues to innovate and explore methods of delivering hands-on experiences to young people through engaging and meaningful learning opportunities. The recent proposed efforts to leverage the high-speed Community Fiber Optic Network in linking our science classrooms to hands-on demonstrations performed by scientists at the Science Mine adds a level of engagement and a practicum to classroom instruction that our students would otherwise be missing.

The aforementioned activities will spur interest and engagement which will motivate students to visit exhibits at the Science Mine and in our community. These visits will reinforce a deeper understanding of what our students have learned in the classroom.

Butte School District #1 fully supports the efforts of the Science Mine as it seeks application to the BNRC funding opportunity and will work with the Science Mine toward implementing these types of collaborative and interactive learning opportunities. If you have any further concerns or questions, please feel free to contact me at your convenience.

Sincerely,

Jim O'Neill

Jim O'Neill
Curriculum Director
Butte School District

119 N. Montana
Butte, MT 59701

PHONE **406-533-2545**
FAX **406-533-2539**
EMAIL **oneilljh@butte.k12.mt.us**
WEB SITE **www.butte.k12.mt.us**

NATIONAL CENTER
FOR APPROPRIATE
NCAT TECHNOLOGY

www.ncat.org *Working for a Sustainable Future Since 1976*

November 14, 2016

Dr. Doug Coe, Board Chair
Science Mine, Inc.
36 East Granite Street
Butte, MT 59701

Dear Dr. Coe:

NCAT is pleased to support the Science Mine innovative efforts to deliver hands-on, interactive experience to young people in ways that engage them in learning through discovery. We applaud your recent efforts to leverage the high-speed Community Fiber Optic Network that connects School District classrooms, NCAT and the Science Mine to provide hands-on science demonstrations from working scientists in the community. These experiences will provide engagement and a practicum to the students' classwork instruction. We will welcome students interested in NCAT's work to meet with our professional specialists to explore up close in their own community the concepts that they have been studying. For example, students may learn about solar energy concepts and visit NCAT to see our new 45.5 kw system that provides for most of NCAT's energy needs.

NCAT fully supports the efforts of the Science Mine as it seeks funding opportunities from BNRC and will work with the Science Mine toward implementing these collaborative and interactive learning activities. Please don't hesitate to let me know if we can be of further assistance.

Sincerely,

Marcia Brown

Marcia Brown
Chief Operating Officer
National Center for Appropriate Technology

NCAT Headquarters: 3040 Continental Drive ~ P.O. Box 3838 ~ Butte, MT 59702 (406)494-4572 Fax (406)494-2905
Regional Offices: 207 West Center St. ~ Fayetteville, AR 72701 36355 Russell Blvd ~ Davis, CA 95617 510 George St., Ste. 212 ~ Jackson, MS 39202
900 Rutter Ave., Ste. 16 ~ Forty Fort, PA 18704 118 Broadway, Ste. 524 ~ San Antonio, TX 78205