



September 28, 2018

Governor's Office of Management and Budget
350 North State Street, Suite 150
Salt Lake City, UT 84114-2210

Re: *Legislative Appropriation for Research Center to Seven County Infrastructure Coalition.*

Respected Officials;

On June 20, 2018, and again on July 18, 2018, the Seven County Infrastructure Coalition (the "Coalition") presented to the Utah Legislative Interim Committee on Public Utilities, Energy, and Technology regarding a proposal to fund a research center to advance molten salt reactor (MSR) technology. The proposed research center would facilitate the development of nuclear medicine and clean energy. The characterization of molten salts will also be a key focus for the center; salt characterization is important for the development of MSR technology and not currently available on a significant scale. Molten salt is an advance nuclear technology that will allow for domestic production of isotopes used in nuclear medicine and a source of rare isotopes that are part of groundbreaking cancer treatments.

The research center will be an open-access facility, meaning everyone interested in using its facilities will have equal access on a first-come, first-serve basis. This is distinct from most national labs and many other institutional research facilities. Development in the molten salt field has been delayed where priority access to research equipment and facilities is enjoyed by sponsoring institutions that have other or additional research interests. Also, research facilities associated with large institutions carry significant overhead costs that increase the cost by several multiples. Another benefit of the proposed research center is that it would be set up to meet nuclear quality assurance standards (NQA-1), as well as standards required to be a nuclear science user facility. This will clothe the research results at the proposed research center with heightened credibility for future use with federal agencies. It will also qualify research projects at the center for additional federal funding. The performance standards for the propose research center will be that it (1) satisfy requirements to be an NQA-1 facility, and (2) become recognized as a nuclear science user facility.

This research facility would be a new program for the State of Utah. It is proposed that the State of Utah make a direct appropriation to the Seven County Infrastructure Coalition in the amount of \$9,998,700. This budgeted amount includes \$5,824,950 in research equipment, \$1,000,000 for an existing building and necessary retrofit, and \$3,173,050 for licensing, training,

personnel, utilities and building and equipment upkeep. After the first 5 years, the research facility would be self-sufficient from revenue from user fees. There are more than six U.S. companies and a dozen universities working on molten salt research; we are in discussions with several regarding use cases. The equipment could also be used for other tests, useful to advance other research. Senator David Hinkins plans to introduce appropriations language in the legislature so no further legislative requests would be required from the Governor's office.

The Seven County Infrastructure Coalition is an independent political subdivision of the State of Utah, created as an interlocal entity by Carbon, Daggett, Duchesne, Emery, San Juan, Sevier, and Uintah counties. The proposed research center will be located within the Coalition. Not only with this have the benefit of bringing high paying jobs to our rural communities and help achieve Governor Herbert's goal of 25,000 new jobs in the rural Utah, but it will have the added benefit of alleviating public concerns around the radioactive nature of the contemplated research; however, it should be noted that these levels of radioactive materials do not pose public risk. The Coalition is seeking to augment the above appropriation with initial applications for federal grants in the amount of \$3,000,000. This will enable the Coalition to acquire equipment and facilities, obtain licensing, develop safety plans and training, hire qualified technicians, and pay for other expenses to get the lab equipped and operational.

If the proposed research center is not funded, then the advancement of molten salt technology will be delayed or restricted to those with sufficient budgets to fund their own private laboratories. The proposed research center can make Utah the hub of molten salt technology. In the beginning, the research facility will create approximately twelve high paying jobs, but in the long run, thousands of jobs will be created to support this advanced technology. Utah can become the center piece of this development. At present, the isotopes necessary for nuclear medicines are all imported. Because of this, the United States passed legislation to hasten the development of a domestic source of these isotopes and reduce regulatory delay. Additional isotopes with significant potential to treat cancer can only be produced by molten salt technology. Small amounts of these isotopes remain from an MSR built at the National Labs in the 1960s, but annually this resource only provides enough materials to treat about a dozen patients each year. In addition to helping address air quality issues in Utah, molten salt technology has immense potential to enable Utah's talented medical field to drive forward new treatments and research. This is an unparalleled opportunity.

Most Sincerely,

SEVEN COUNTY INFRASTRUCTURE
COALITION



Michael J. McKee
Executive Director

OPTICS LAB

<u>Item</u>	<u>Part No/Circuit Name</u>	<u>Quantity</u>	<u>Price</u>	<u>Website</u>
Lock-in Amplifier	SR865A	1	\$7,950	http://www
Kolmar MCT IR detector	KLD-1-11/11/DC	1	\$3,045.00	http://www
Laser safety system	B-LOBAR	1	\$6,369.00	www.ri.co
ns laser	TEC-045	1	\$13,496.04	www.sach
UV-Vis spectrometer	Silver-Nova	1	\$4,985.00	www.Stell
CW IR Laser - Fiber optic	Ventus 3000	1	\$16,637.00	www.laser
WaveForm Generator	Keysight 33220A	1	\$2,402.40	www.teste
Optical table with shelf kit	INT4-46-8-A	1	\$7,850.00	www.newj
Thermal Stage, controller, and chiller	L-THMS600	1	\$17,130.00	www.mccr
Dual Laser Raman Microscope with ad	Renishaw inVia	1	\$356,193.00	www.renis
Polarizing Microscope	OPTIKA B-1000 POL-I	1	\$17,993.00	https://ww
Fiber Optic Interogator	FI3000	1	\$15,000.00	www.Fiber
CO2 Laser		1	\$15,000.00	
Fiber Optic Raman	Spectra Solutions	1	\$29,500.00	https://ww
Constant Current Source	Keithley 6221	1	\$6,400.00	
Oscilloscope	Tektronix MDO4024C	1	\$8,000.00	https://ww
FTIR	Thermofisher (used)	1	\$12,000.00	
Optics lab equipment		1	\$30,000.00	
Nickel coated fiber optics		1	\$5,000.00	
	TOTAL		\$ 574,950.44	

TEST EQUIPMENT

<u>Item</u>	<u>Quantity</u>	<u>Price</u>	<u>Est. Cost</u>
Hot Cells	2	\$400,000.00	\$800,000.00
DSC with mass spectome	1	\$200,000.00	\$200,000.00
High Temp Viscosmeter	1	\$150,000.00	\$150,000.00
X-Ray difraction mach.	1	\$100,000.00	\$100,000.00
Induction Coupled Plasma	1	\$150,000.00	\$150,000.00
IME Chemical Characterization	1	\$150,000.00	\$150,000.00

Flow loop - laser dopler	1	\$	300,000.00	\$	300,000.00
Computer terminals	1	\$	400,000.00	\$	400,000.00
Particle Accelerators	2	\$	200,000.00	\$	400,000.00
Integrated core simulation	1	\$	2,000,000.00	\$	2,000,000.00
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TOTAL \$ 4,650,000.00

SALT PURIFICATION EQUIPMENT

TOTAL \$ 600,000.00

BUILDING and Retrofit (5,000 ft2) 1 \$1,000,000 \$1,000,000

TOTAL \$1,000,000

TOTAL EQUIPMENT AND BUILDING \$ 6,824,950.44

Safety Protocol, Training, and Personnel \$ 2,286,050.56

Utilities/Upkeep of equipment \$ 887,000.00

\$ 3,173,050.56

\$ 9,998,001.00

Federal Grant \$3,000,000