

Idaho IGEM Fund Program

Progress Report Form

Proposal No. IGEM16-003
Name: ISU: Wide Band Gap and Harsh Environment
Semiconductor RD&D Capability
Name of Institution: Idaho State University
Project Title: Wide Band Gap Semiconductor RD&D Capability
Reporting Period: End of Year - Annual Report (June 2016)

Information to be reported in your progress report is as follows (attach additional information as needed):

1. Summary of project accomplishments for the period just completed and plans for the coming reporting period:

All pieces of equipment have been received and are being installed. There has been a substantial delay in the installation/construction process due to infrastructure build out delays. Further, the supplier of the power supply (Radio Frequency Generator) has been tardy in the delivery and support of the equipment. This item has been received and is currently being installed.

2. Summary of budget expenditures for the period just completed (**include project burn rate**):

The majority of the \$700,000 has been expended and payment is in process for the remaining encumbered funds.

3. Numbers of faculty and student participation resulting from the funding, including internships:

Currently 3 students, two faculty and two engineers are participating.

4. List patents, copyrights, plant variety protection certificates received or pending:

Filed Patents:

- U.S. Prov. Pat. App. Ser. No. 62/301,738: Licensed to Numat, filed March 1, 2016 Stable P-Type Zinc Oxide and Bandgap Engineered Zinc Oxide Systems

Pending Patents:

- Method and Technique for Fabrication of Novel Uranium Oxide Semiconductors

5. List technology licenses signed and start-up businesses created:

NuMat, titled "Technology Development and License Agreement," and effective June 1, 2015.

EJ Idaho, Licensee of Harsh Environment Semiconductor based on Uranium Oxide

6. Status of private/industry partnerships (include enough information to judge level of engagement):

EJ Proprietary has committed \$250,000 NuMat, Inc has committed \$280,000 in funding for the current fiscal year. These funds will be provided to ISU for lab set up and operation. See question 7 for explanation of delays.

7. Any other pertinent information that will indicate to the council that the project is meeting satisfactory progress.

The project started after the expected date of 07/01/2015 due to the late release of funds (9/23/15). The hot isostatic press was not purchased at the start of the project because the delay in release of funds. The piece of equipment originally planned for purchase was no longer available by the time we had the funds. In June 2016 another used HIP became available and was purchased. The project was further delayed due to delays in the infrastructure build out for the electrical and plumbing requirements of the equipment. Additionally, the delivery of the radio frequency generator (a major piece of the crystal growth furnace) has been delayed several months because of the vendor. ISU General Counsel was in contact with this vendor after delivery was promised in October 2015 but it did not occur. This equipment was delivered to ISU on 6/25/16. The hot isostatic press was received 6/28/2016.

With the delivery of these final items and the completion of the infrastructure the installation of all the equipment will be completed this summer and the lab will be operational.

The project has created 5 new full time jobs in the private sector which are now working at the RISE Complex.