ADDENDUM

This Agreement dated XX Nov, 2012 (the "Addendum") modifies the written University of Tennessee – Office of Real Estate Administration, Oil and Gas Lease Proposal Package Number 06-02-008.

WHEREAS The University of Tennessee desires to modify said Agreement to include a long-term research project emphasis with the successful "Proposer" as follows:

That the University of Tennessee Institute of Agriculture intends to launch a research initiative on its Forest Resources Research and Education Center (FRREC) in Morgan and Scott Counties to investigate the impacts of natural gas and oil extraction. The fact-based, scientific demonstration will seek to answer critical research questions in the areas of groundwater, wildlife, erosion, geological shale, and flora and fauna. The data gathered, and the conclusions drawn, from these studies would allow the development of gas extraction Best Management Practices that could be applied to other operations in the state and region and would add to the body of knowledge in these areas. The project will provide science-based facts for the scientific community, regulatory agencies, concerned environmental groups and citizens, and the oil and gas industry.

This initiative is directly related to the University's mission of teaching, research and outreach. Graduate and undergraduate students will be involved in the research studies in this outdoor, real-life classroom; the data gathered will lead to comprehensive research in an area of knowledge where little is known today; and the findings will be shared through scientific publications and Extension outreach with landowners, concerned citizens, environmental groups, governmental officials and the oil and gas industry. Additionally, the initiative is aligned with the mission of FRREC, which is to provide the land and supporting resources necessary for conducting modern and effective forestry, wildlife, and associated social, biological and ecological research programs; to demonstrate the application of optimal forest and wildlife management technologies; and to assist with transfer of new technology to forest landowners and industries.

While the UT Institute of Agriculture's AgResearch system will be the lead investigating unit, and the research will be conducted on the FRREC site, this will be a multi-disciplinary research project initiative involving disciplines across the University of Tennessee, and with the financial support and subject matter expertise from the successful proposer. This research project initiative will require the successful "Proposer" to cooperate with the University in the timing and implementation of research project components, including the modification of certain activities to accommodate investigation and measurements. Furthermore, the "Proposer" agrees that in association with developing and implementing research associated with the development of oil and gas resources on University property that it agrees to support and cooperate with the University to the extent that the integrity and scientific value of any research is not compromised or lost by any actions associated with oil and gas development.

The successful "Proposer" must further state their willingness, and/or abilities, to accommodate the University in its research activities, and describe any resources,

expertise, capabilities and financial support* that it would be willing to contribute to the enhancement of the University's research project target areas as listed in the table below. Additionally, lease and production revenues will support research.

Research Project Area	Internal Expertise/Resources	Financial Support Level
Water Quality/Ground Water Monitoring		
Drilling Site Soil Remediation/Surface Water Quality Impacts		
Sedimentation Control/Site Reclamation		
Geological Rock Formation Investigation		
Advanced Fracking Techniques/Remediation		
Oil and Gas Efficiency Recovery Systems		
Terrestrial Ecosystem Disturbance/Investigation		
Natural Gas Fleet/Equipment Conversion Engineering		
Landowner Outreach Socioeconomic Studies		
Other (Please Specify) _____		

***The minimum expected level of start-up research project funding support is $500,000/year**

The "Proposer" must also provide documentation (please attach to Addendum) of its level of expertise to plan, design, implement, and manage research and development projects.

Additionally, the "Proposer" accepts the intent of the University to conduct research on the environmental impacts of oil and gas development, including geologic investigations, addressing water and air quality issues, measuring terrestrial ecosystem affects, and evaluating the use and/or development of gas & oil production Best Management Practices (BMP's). To accomplish this goal, the University will require the "Proposer" to identify, one (1) year in advance, the well locations that it schedules to drill within the five (5) year primary term of the lease. These well sites will then be designated as Research Well Sites. A minimum of one well will be drilled in the first year. Prior to disturbing these research well sites with any gas and oil development activities the University proposes to collect pre-well site environmental data. Notwithstanding this requirement for specifically selected research well sites, for each well the "Proposer" intends to drill.

Finally, the "Proposer" agrees to establish all primary and secondary access and haul roads along established routes of existing roads on the property where it is practicable to improve these roads to service transportation needs for oil and gas development. The "Proposer" shall also secure permanent ingress-egress easement rights to the University properties for the purpose of long-term operations, which will include reciprocal rights for the FRREC in order to carry out research and operations on the properties. The "Proposer" agrees to obtain the University's written agreement to the locations of all proposed roads before any construction is initiated. The "Proposer" also recognizes that the University has vested interested in conducting research of the environmental, ecological impacts and disturbances associated with roads in a forested ecosystem, and that the University may request variation in road corridor sizes, construction techniques, road design, and road locations to create variations in amounts and kinds of disturbance.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement.

For The University of Tennessee

_____ Date: _____

Name: _____ Title: _____

For "Proposer":

_____ Date: _____

Name: _____ Title: _____