**PUBLIC SUMMARY**

**Title:** Innovative Leak Detection Methods for Gas and Liquid Pipelines

**Project Description:** there is a need to develop innovative technologies to enhance leak detection technologies (LDT) on hazardous liquid and natural gas pipelines to detect and locate leaks more accurately and quickly. This proposal is in response to address a technology development effort for the ‘field validation demonstrations to advance pipeline leak detection beyond current capabilities.’ While the solicitation specifically requests the development of technologies to address methane/CO2mitigation, selected technologies and methods outlined in this proposal can be applied to both gas and liquid product pipelines to enhance computational pipeline monitoring (CPM) leak detection methods. The balance of the technologies specifically designed to address the challenges of monitoring changing pipeline inventories applicable to gas systems due to the compressible nature of the product.

**Anticipated Results:** The project develops a suite of technologies to be developed to address the most common limitations of CPM systems including:

* •Reducing flow measurement uncertainty which in turn helps identify smaller pipeline leaks using CPM methods. This includes the development of statistical, heuristic and pattern recognition methods and overlapping zone balance calculations to help pinpoint sections of flow imbalances.
* Developing simplified, automated methods to account for changes in pipeline inventory.

This proposal will test the developed technology on simulated systems followed by validation on a gas pipeline system. Optionally, validation of the applicable methods would be performed on a pipeline system transporting liquid hydrocarbons.

**Potential Impact on Safety:** The project methods will allow for the detection of smaller leaks and/or less time to reliably detect larger leaks than can currently be performed with existing leak detection systems. In any combination of size/response time, less product is lost from the pipeline using the methods to be developed here. This will result reduced safety and environmental impacts.