State Innovation Grant Project
Rhode Island Department of Environmental Management (DEM)
Progress Report #8
October 1, 2008 to December 31, 2008

Project Title: Underground Storage Tanks—Alternative Inspection Programs and the U.S. Energy Policy Act of 2005

Part 1 – **Synopsis of Accomplishments.** The major activities that took place during the reporting period included meetings/conference calls, finalization of facility and tank post-certification data, beginning of baseline and post-certification analysis, and ongoing interstate indicator comparisons. Relative to the original work plan schedule and the key tasks associated with this reporting period, progress is summarized below.

Task	Original Completion Date	Status	Comments
Statistical analysis of RIDEM UST ERP data	June 1, 2008	Ongoing	Baseline facility- and tank-level data analysis completed. Post-certification field inspection database complete (93 facilities). QA/QC performed on all 93 post-certification checklists.
Design data collection template/criteria for partner states	Nov. 1, 2007	Completed	Completed for FL and NH.
Send out data collection template/criteria to partner states	Jan. 1, 2008	Completed.	Same template (table of formatted performance indicator data) that was sent to FL was also provided to NH.
Begin Interstate Comparative Analysis	July 1, 2008 (start)	Ongoing	Using template provided, Florida has commenced data collection and grouping with some preliminary results; most indicators are not exactly analogous because of differences in regulatory format. NH completed only a macro-level analysis because of similar issues with differences in regulatory formatting.

Part 2 – Narrative Discussion.

- *Statistical Analysis of ERP Data* - Finalization of the baseline data had resulted in the identification of 59 measurable facility and tank-level indicators, 35 performance trend indicators, and 24 non-measurable indicators (118 total). Any indicator that displayed a compliance proportion of 0.95 or less was considered a potentially measurable indicator whereas those indicators that were calculated to be over 0.95 were categorized as performance trend indicators, to be monitored for continued compliance. Additional statistical work (Wald, adjusted Wald, cluster analysis) was

conducted relative to confidence interval calculations. The analysis of data at both the facility and tank-levels goes beyond the scope of work presented in DEM's original proposal and workplan, but is being performed to further support the validity of ERP when compared against a traditional inspection program as noted below.

Of the 100 randomly selected post-certification inspections, 93 were eventually completed by DEM and will be used as the complete post-certification data set. This data is currently being organized and formatted so that a thorough analysis can be performed to look for any changes and improvements. The results should be available by the next reporting period.

- *Partner States* - Work with partner states to compare compliance rates for indicators is continuing. Roberta Dusky of FL DEP has separated 2007 UST inspection data from the combined database that includes AST inspection information. There was a total of 19,193 compliance inspections for both UST and AST facilities of which 9,960 inspections involved Underground Storage Tanks. A total of 11,198 violations for UST facilities were recorded. Preliminary results indicated that approximately 3,800 facilities accounted for the 11,198 UST violations; approximately one-third of all UST facilities had at least one violation. One major barrier to developing a one-to-one comparative survey is that there are many differences in regulations and formatting. Of the 59 measurable indicators developed from RI's database, fewer than 10 potential FL indicators appear to be exactly identical to any of RI's indicators. For example, Indicator F.11 (Spill Prevention – sumps clean of debris, water, product) also exists in FL's checklist. But for the most part, no direct comparisons can be made. Many regulations involve time frames that are different (e.g., system checked every X years); other FL regulations contain information relevant to more than RI regulation/indicator, so comparing this data may be problematic. It was preliminarily agreed that the FL data should be presented in several different categories including 1) RI/FL identical indicators, 2) indicators that are identical but with different time frame requirements, and 3) indicators that overlap more than one RI regulation. Work continues to complete the table of comparative indicators.

RI project staff traveled to New Hampshire to meet with Thomas Beaulieu and provided to him the same template for comparative analysis. As with FL, differences in regulatory formatting made it difficult to create a one-to-one indicator table; instead, a *macro* analysis was performed where NH grouped their regulatory requirements into analogous sections found in RI's checklist. Some regulations can be grouped to match specific RI sections whereas others must be regrouped to match up with certain sub-parts of RI's sections. Once RI finishes the post-certification data analysis, a macro-level comparison of RI's ERP results and NH's inspection data will be performed.

- *Economic Analysis* – A paper that describes a first order economic evaluation of the costs of ERP versus the traditional inspection approach for the RI UST program is still in the process of being written.

Part 3 – Projection of Activities, Accomplishments, and Major Expenditures for Next Quarter Report. Analysis of baseline and post-certification inspection data will be completed with statistical calculations (Fisher, Bonferonni). URI will continue other statistical analyses to complement the traditional approaches used above. A Ph.D. student, under the guidance of Dr. Hanumara of the Department of Computer Science and Statistics, will analyze the *tank-level* data as a thesis project. The table of FL compliance rate data will be completed and ready for comparative analysis with RI ERP data. Initial macro-level comparative studies using NH data will commence. The economic analysis paper will also be more complete and possibly ready for publication. There will be no unusual expenditures expected for the next reporting period.

Part 4 – Financial Report. In this reporting period, *$28,787* was spent of which $24,371 was used to cover DEM personnel costs and $4416 was paid to URI. Total grant expenditures as of December 31, 2008 are *$177,999*. The rate of spending is close to what was originally anticipated.