QUARTERLY PROGRESS REPORT

January 1, 2019 to March 31, 2019

PROJECT TITLE: Looking Beyond Florida's 75% Recycling Goal: Development of a Methodology and Tool for Assessing Sustainable Materials Management Recycling Rates in Florida

PRINCIPAL INVESTIGATOR(S): Timothy G. Townsend

AFFILIATION: Professor, University of Florida
             Department of Environmental Engineering Sciences

COMPLETION DATE: September 30, 2019   **PHONE NUMBER: 352-392-0846**

PROJECT WEB SITE: https://www.essie.ufl.edu/home/townsend/research/florida-solid-waste-issues/hc18/

Work accomplished during this reporting period:

Development of Environmental Lifecycle Assessment Impact Factors

The project team collected five LCA models collected as part of Task 1 including: Waste Reduction Model (WARM), OpenLCA, Municipal Solid Waste Decision Support Tool (MSW-DST), Solid Waste Optimization Lifecycle Framework (SWOLF) and Environmental Assessment System for Environmental Technologies (EASETECH). The models were studied to assess a methodology to calculate environmental-based lifecycle impact (LCI) factors, such as GHG emissions or water use, associated with one ton of a material and its end-of-life management. We have begun using these models to begin completion of Task 2 to calculate the following environmental LCI factors: energy use, global warming potential, water consumption, human toxicity, aquatic ecotoxicity, acidification, and eutrophication. Each LCI factor is associated with a specific material and its management. The current list of materials that we have calculated these environmental impacts include newspaper, cardboard, office paper, magazines, 3rd class mail, phonebooks/textbooks, mixed paper, HDPE bottles, PET bottles, plastic film, mixed plastic, glass, aluminum cans, ferrous cans, yard trash, food waste, mixed MSW, and textiles. For each material we have calculated LCI factors associated with the following types of end-of-life management: single stream and dual stream recycling, mixed waste processing, mass burn combustion, refuse-derived combustion, composting, anaerobic digestion, and landfilling.

Work planned for the next reporting period:

Development of Environmental Lifecycle Assessment Impact Factors for Other Materials and Source Reduction

In the next reporting period we will continue working on Task 2. We currently have completed calculating LCI factors for many curbside materials, however other materials such as other types of plastics, construction and demolition debris, and durable goods (e.g., electronics, appliances, furniture, etc.) are not included in the traditional LCA models. Additionally, the LCA models do not all include the impacts of

source reducing a material. For both of these items we will need to develop a methodology to collect information on the environmental LCI factors of the materials not included in the LCA models and the LCI factors for each material when it is managed as source reduced.

Development of Economic and Social Lifecycle Assessment Impact Factors

As part of Task 2 we will begin collecting industry data from the stakeholder working group to be used in the creation of the social and economic LCI factors, which include jobs produced, total costs, and recyclability. The data collected will be incorporated into a multiple methodologies which we will develop to estimate those social and economic LCI factors for each material and its management. During our working group meeting we will meet to discuss and decide how to best improve the methodologies so they are best illustrating the associated social and economic impacts.

Development of Tool as a Workbook

Preliminary work will begin to develop the format and content included in the tangible tool as described in Task 3 of the project proposal. The tool will incorporate all 11 LCI factors shown in Figure 1 and include means for estimating the material mass flow at end-of-life for a Florida county.

Preparation for first Stakeholder Working Group Meeting

The project team will hold a meeting during the next reporting period with solid waste industry representatives to present the data that we have collected so far, explain our proposed project approach, and to receive their input.
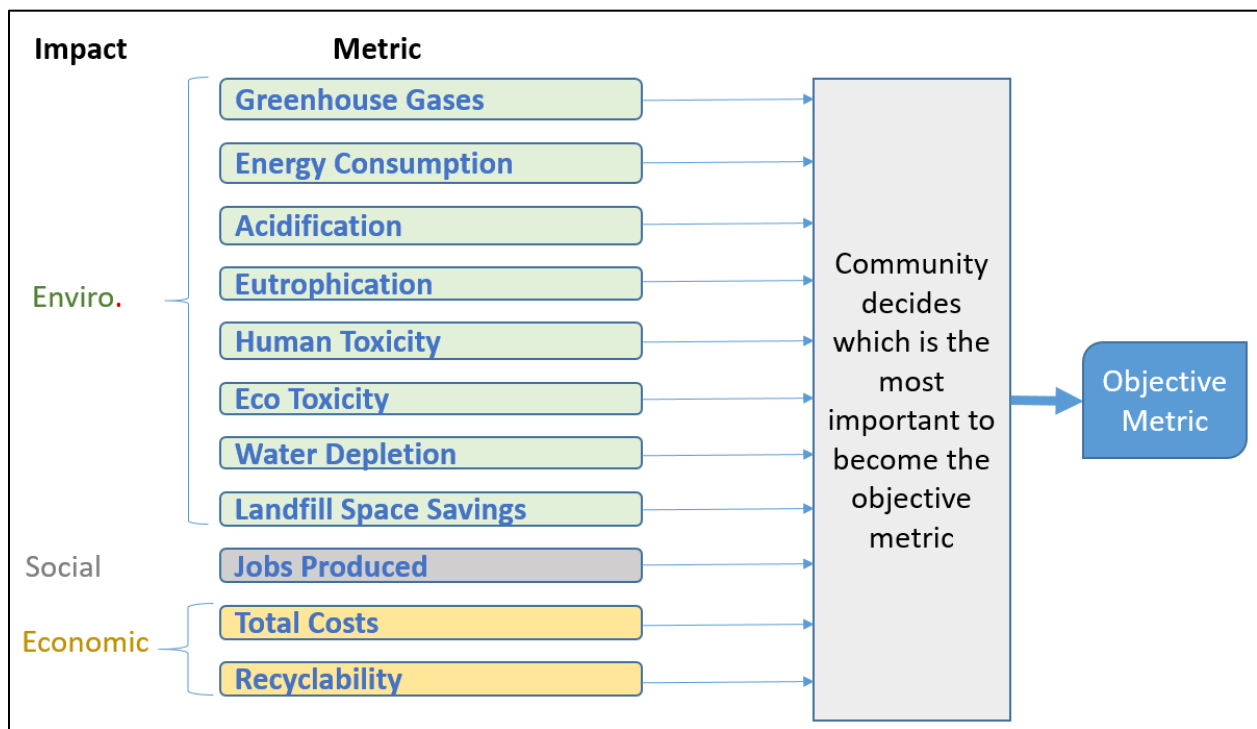

Figure 1. Schematic showing the 11 lifecycle impact (LCI) factors that are in development for the project that will be included as part of the workbook tool.

Metrics:

Name	Rank	Department	Professor	Institution
Malak Anshassi	PhD Student	Environmental Engineering	Dr. Townsend	University of Florida

Stakeholder Working Group Meeting: The research team began preparation for their stakeholder working group meeting scheduled on May 13th, 2019.

Invited Stakeholder Working Group members include:

1. Karen Moore
2. Shannan Reynolds
3. Cory Dilmore
4. Dawn Templin
5. Suzanne Boroff
6. Kim Walker
7. Travis Barnes
8. Ana Wood
9. Alan Altman
10. Sally Palmi
11. Marc Bruner
12. Keith Howard
13. Mary Jean Yon
14. Gene Jones
15. Keyna Cory
16. Ron Beladi
17. Dave Gregory
18. Carlo Lebron
19. Tobin McKnight
20. Kevin Leo
21. Richard Tedder
22. Dawn McCormick
23. Bob Hyres
24. Kim Williams
25. James Suter
26. Kim Brunson
27. Victor Storelli
28. Tim Townsend
29. Steve Laux
30. Malak Anshassi
31. John Schert
32. Jay Bassett
33. Steve Smith
34. David Dee