FINAL REPORT

HIGHLANDS COUNTY BOARD OF COUNTY COMMISSIONERS

Innovative Grant (IG9-02)

August 08, 2009 – September 02, 2011

INNOVATIVE WASTE REDUCTION AND RECYCLING GRANT

Prepared for:

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Tallahassee, FL

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SECTION 1 - INTRODUCTION:

Highlands County now operates a bioreactor landfill. In a bioreactor landfill moisture is added to the waste in the landfill cells to maximize decomposition of waste which then creates a secondary benefit by maximizing landfill gas production. Due to what is considered a small amount of gas, no developers are interested in a landfill gas-to-electricity project. Highlands County considered other types of projects and a direct use project is the best utilization for this gas. Highlands County proposed to locate a County owned and operated asphalt plant at the Solid Waste Management Facility/Landfill. Instead of burning the landfill gas off at the flare, the gas is extracted from the landfill and pumped through an underground piping system to the asphalt plant burner to dry the aggregate during the production of asphalt road mixes. Highlands County estimates that the plant will produce 30,000 tons of asphalt annually. Since all the asphalt will be used in local municipal projects, there will be no lack of market for the asphalt mix products. The economic analysis for the plant was based solely on local government use within Highlands County and because of the current economic environment; local governments are having trouble obtaining asphalt from the private sector, unless scheduled well in advance.

Locating the asphalt plant at the landfill provides the County with several benefits to recycling a higher percentage of currently disposed of landfilled waste products that in turn should extend the projected life of the Solid Waste Management Facility/Landfill.

The plant will utilize recycled concrete, recycled roofing shingles, and reclaimed asphalt percentages in the asphalt produced. Concrete is processed into fine and coarse aggregate replacing virgin sand and gravel. Asphalt shingles consist of fine aggregate, fibers, and up to 18-20% asphalt cement content. Utilizing the recycled shingles will reduce the amount of virgin

liquid asphalt cement required to meet FDOT mix design standards. The plant will also use RAP (Reclaimed Asphalt Pavement) like other commercial asphalt facilities. The most significant use of recyclable waste from the landfill will be the utilization of landfill gas for drying aggregate material.

Developing a market for waste reuse is the key factor in successfully recycling any waste. A publicly owned and operated asphalt plant located at the County's landfill puts the technology at the source of recyclable waste with the market being Highlands County's 2,400 lane miles of roadways.

SECTION 2 - SUMMARY:

The Florida Department of Environmental Protection, through an Innovative Waste Reduction and Recycling Grant provided a $1,650,000 grant, with Highlands County providing matching funds to purchase and construct Highlands County's Asphalt Plant. The plant is located at the Highlands County Solid Waste Management Facility. This grant demonstrated through the use of recycled concrete, asphalt shingles and recycled asphalt product (RAP) how materials typically disposed of in C&D landfill areas could be recycled, processed and used in an asphalt mix product. In addition, the methane gas typically burned off is utilized in the burner at the asphalt plant reducing the amount of diesel needed to dry the aggregate, thus reducing the cost of the asphalt material used to maintain Highlands County's road system, saving tax dollars.

Highlands County initiated the asphalt plant grant project because of availability issues with patch asphalt material and because of difficulties scheduling work through the private contractors during road surfacing projects. Some of the local municipalities have experienced similar problems and they support this project because asphalt will be readily available at competitive prices. They have expressed interest in purchasing asphalt products from the County asphalt plant and at a Board meeting held July 19, 2011 the Highlands County Board of County Commissioners approved the sale of Highlands County asphalt product to the municipalities.

SECTION 3 - PROJECT DEVELOPMENT:

Coordinated several meetings with County Staff to develop and conduct a request for proposal submitted to asphalt plant vendors.

A vendor was chosen and the concept and implementation phase was in full process. A location was decided upon on the Landfill property, close enough to the cell for easy extraction and transportation of the methane gas. Road and Bridge staff completed the earthwork and Solid Waste Management, at the time, coordinated the engineering effort with PBS&J Engineering to prepare the site for the asphalt plant construction. Road and Bridge and Landfill staff worked together with sub-contractors to lay out and pour all of the concrete foundations. The asphalt plant was installed by a sub-contractor hired through Gencor.

SECTION 4 - PROJECT TIMELINE:

Authorization to bid	December, 2006
Bid Opening	May, 2007
Award of Contract for Asphalt Plant	September, 2007
Equipment Lease Agreement Authorization	October, 2007
Pre-Shipment Plant Inspection	March, 2008
Construction	March – September, 2008
Project Construction Completion and Initial Plant Start-up	September 2008
Started Production	October 2008

SECTION 5 - EQUIPMENT PROCUREMENT:

Gencor Model 200 Skidded Ultra Drum Asphalt Plant with 6 Cold feed aggregate bins and 1 additional (RAP) bin for recycled material.

A 1,000KW Cummins generator was purchased to run the electronic components of the asphalt plant, while in production.

A Gardner Denver blower was purchased to extract the methane gas from the landfill and direct the gas to the asphalt plant through an underground piping system.

SECTION 6 - PROJECT IMPLEMENTATION:

The first run of asphalt material was successfully produced on October 16, 2008. Approximately 1000 tons of asphalt was laid on the Asphalt Plant Access Road which leads to and from the asphalt plant through the landfill property. The first public road to be paved with Highlands County Asphalt material was Daffodil Street in Leisure Lakes. Approximately 900 tons was produced and laid on Daffodil Street at that time.

SECTION 7 - PROJECT RESULTS:

The Highlands County Clerk of Courts Internal Auditing Department completed an internal audit on the asphalt plant after the first year of production. In May of 2010 Highlands County Administration transferred management responsibilities from Solid Waste Management to the Highlands County Road and Bridge Department.

Upon completion and implementation of the asphalt plant, Highlands County has realized several benefits because of the project. During the first three years of operation, asphalt has been readily available at any time. Road and Bridge staff can produce asphalt around the clock

if the need presents itself, based upon annual budget restrictions. Adding Landfill space by recycling previously disposed of materials is another benefit.

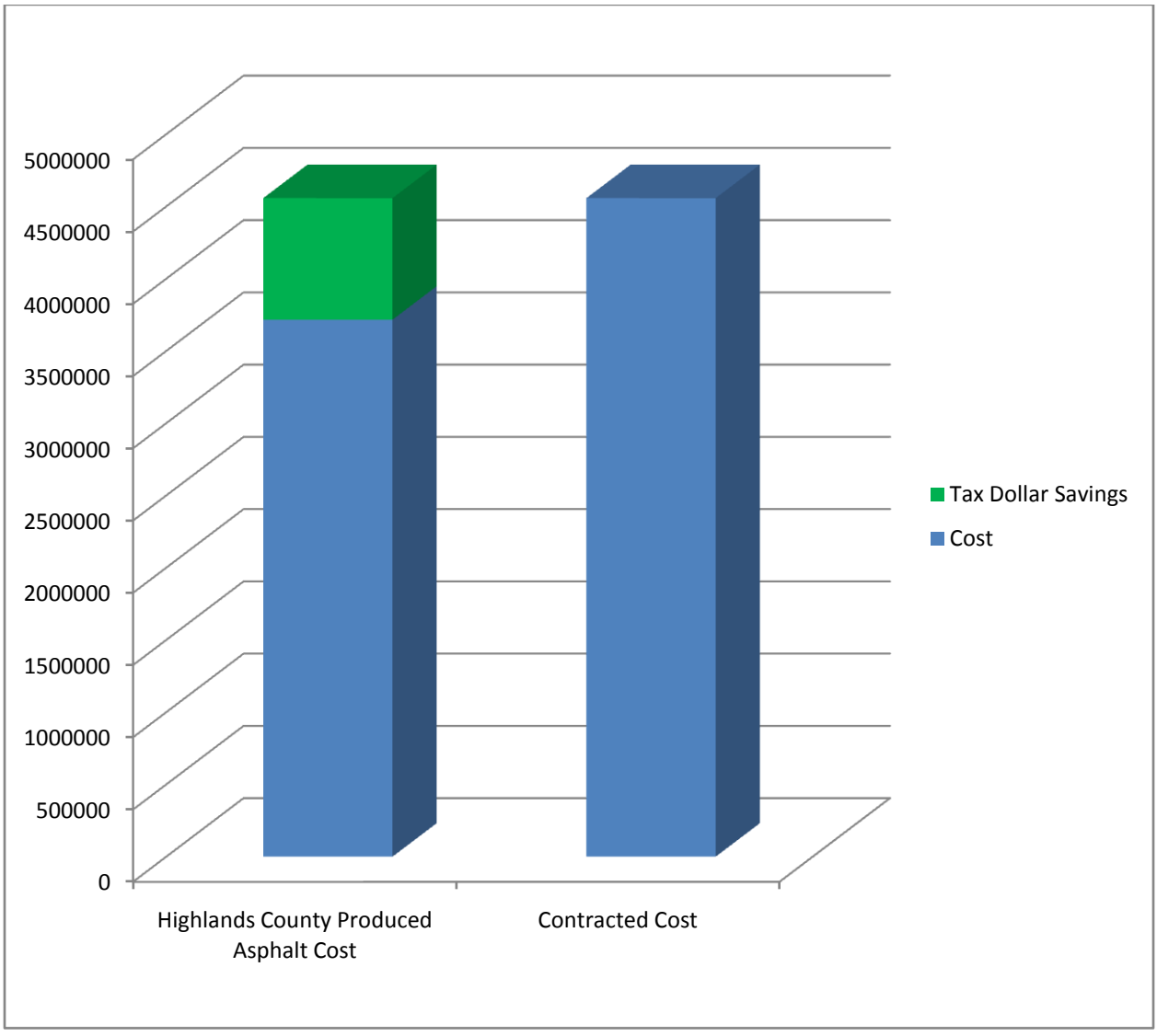
Based upon outside vendor bids during this three year period, Highlands County also realized a cost savings by producing asphalt material with in-house forces.

The utilization of the methane gas from the Landfill reduces fuel consumption through the asphalt plant burner by a minimum of 25%. The fuel percentage reduction alone saved County taxpayers over $66,000 annually, based upon fuel prices at the time.

With the combination of recycled materials available, the utilization of methane produced at the landfill and the production of asphalt being readily available, the Highlands County Asphalt Plant Grant Project is beneficial to the residents of Highlands County.

FY 9/10-10/11 HIGHLANDS COUNTY ASPHALT COST

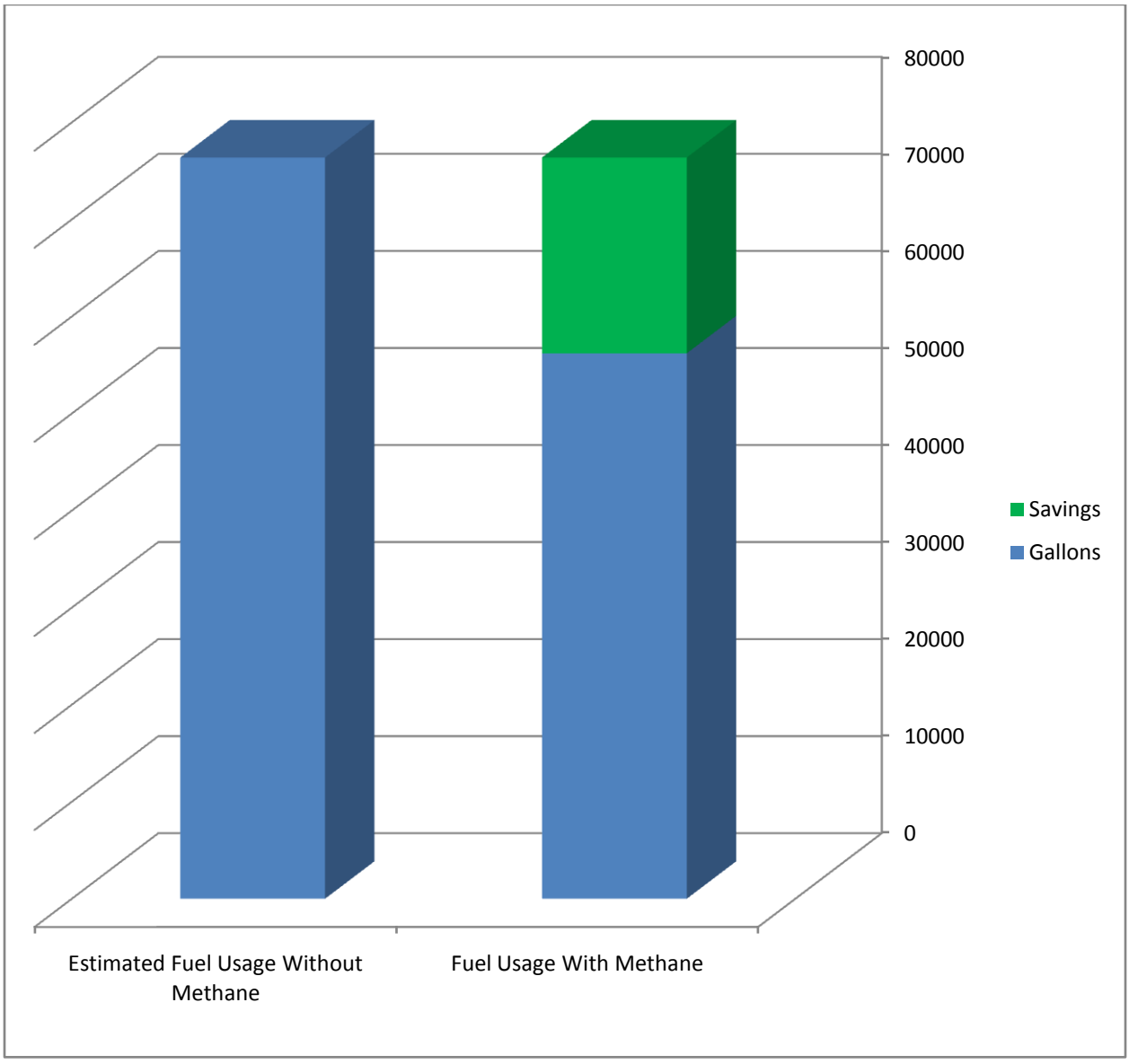
TAX DOLLARS SAVINGS



Attachment A

FY 10/11 DIESEL FUEL CONSUMPTION CHART

WITH and WITHOUT METHANE



Attachment B

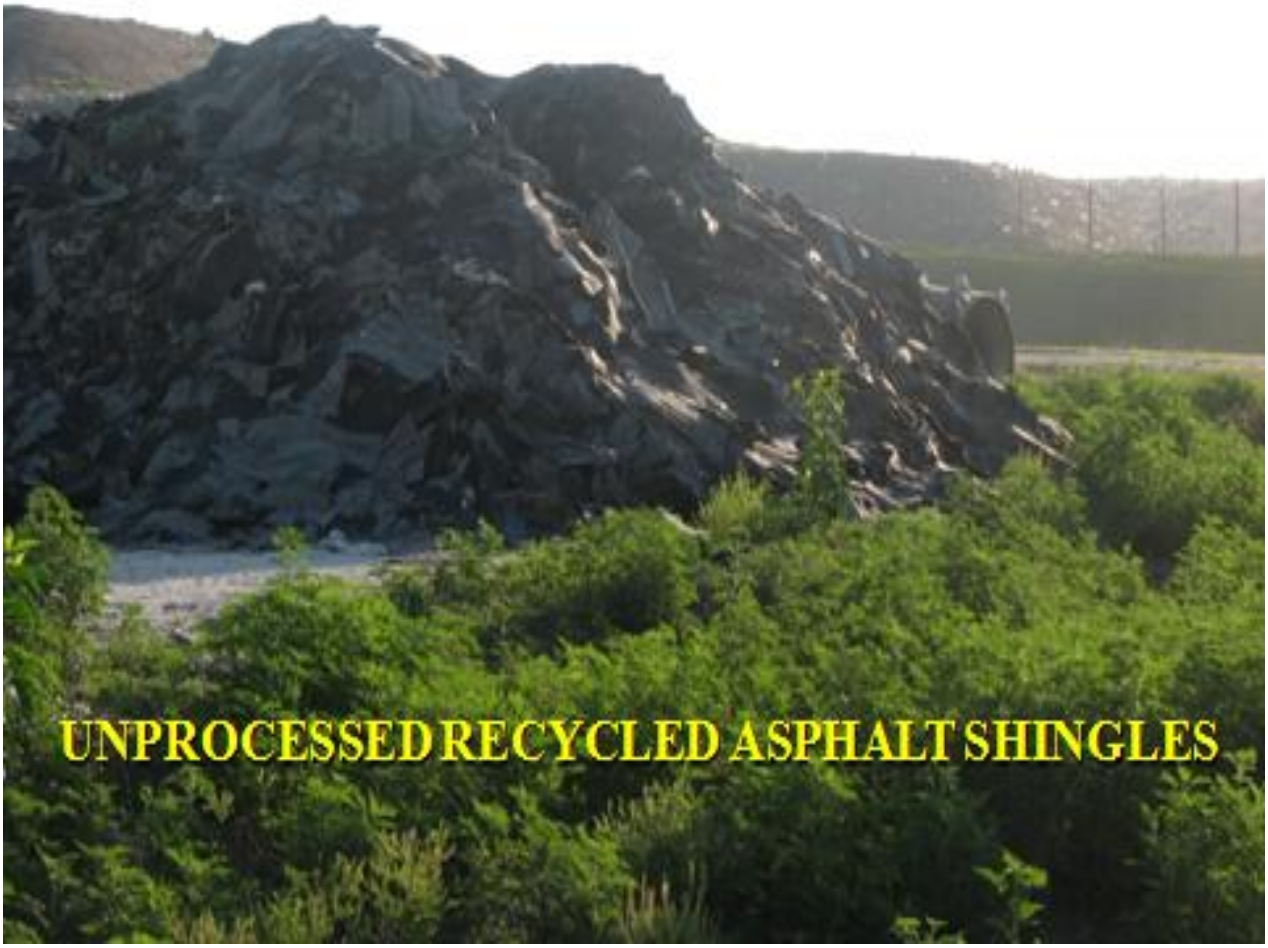
Attachment C1

Disposed of at the Landfill, processed and utilized in a FDOT certified mix design obtained from CalTech Testing, Lake City, Florida.

Attachment C2

Disposed of at the Landfill, processed and utilized in a FDOT certified mix design obtained from CalTech Testing, Lake City, Florida.

Attachment C3



Attachment C4

Disposed of at the Landfill, processed and utilized in a FDOT certified mix design obtained from CalTech Testing, Lake City, Florida.

Attachment C5

Attachment C6

LANDFILL METHANE PUMP

Attachment D

Installed to extract methane that is produced at the Landfill, to provide a supplemental fuel to dry the aggregate at the Highlands County Asphalt Plant.