



Auld Road Transfer Site Solar Compactor Retrofit

CIF Project 830.3



Township of Whitestone
21 Church Street
Dunchurch, Ontario P0A 1G0
www.whitestone.ca

Continuous Improvement Fund
92 Caplan Avenue, Suite 511
Barrie, ON L4N 0Z7
www.thecif.ca

Acknowledgement

This Project has been delivered with the assistance of the Resource Productivity and Recovery Authority's Continuous Improvement Fund, a fund financed by Ontario municipalities and stewards of Blue Box waste in Ontario. Notwithstanding this support, the views expressed are the views of the author(s), and the Resource Productivity and Recover Authority and Stewardship Ontario accept no responsibility for these views.

© 2018 Resource Productivity and Recovery Authority and Stewardship Ontario

All rights reserved. No part of this publication may be reproduced, recorded or transmitted in any form or by any means, electronic, mechanical, photographic, sound, magnetic or other, without advance written permission from the owner.

Table of Contents

1	Background	1
1.1	Community Profile	1
1.2	Waste Management System	1
1.3	Program Challenges	1
2	Approach	2
2.1	Monitoring and Measurement Methodology	2
2.2	Implementation	2
2.2.1	Site Improvements	2
2.2.2	Electrical Installation	3
2.3	Project Results	3
2.4	Analysis of Results	4
2.5	Lessons Learned	4
3	Project Budget	4
4	Conclusions	5

LIST OF TABLES

Table 1: Comparison of pre vs post operating costs at Auld Rd site	3
Table 2: Project Budget for Compaction Unit Connection to Hydro	5

LIST OF FIGURES

Figure 1: Photograph of electrical site upgrades	2
Figure 2: Photograph of hydro grid connection and metre	3
Figure 3: Spotter shack electrical improvements	4

1 Background

1.1 Community Profile

The municipality of Whitestone is located in beautiful cottage country in the District of Parry Sound approximately two hours north of Toronto. The municipality incorporates the townships of East Burpee, Burton, McKenzie, Ferrie, Hagerman, and the communities of Ardbeg, Dunchurch, Maple Island, and the village of Whitestone. The municipality covers a wide territory of nearly 1,000 square kilometres featuring beautiful lakes and rugged Canadian Shield terrain.



The municipality is home to a permanent population of approximately 1,000 and at least twice as many seasonal residents during summer months.

1.2 Waste Management System

The municipality provides two-stream recycling and garbage at each of our two waste transfer sites as there is no curbside collection of waste or recycling. The depots are staffed and open to the public during scheduled hours of operation.

In 2012, the municipality purchased solar compaction units for the recycling program to improve hauling costs of transferring this material to the material recovery facility (MRF) in Bracebridge through an agreement with the CIF under project 281. The compactors were a success in reducing the number of hauls required to move material and in effect improved the recycling program's bottom line.

The recycling program accepts:

Containers: Glass bottles & jars, plastic containers & lids, metal cans & foil, polystyrene, and plastic bags.

Fibres: Newspapers, magazines & books, boxboard & mixed paper, corrugated cardboard, tetra-pak boxes, and gable-top cartons.

1.3 Program Challenges

The waste transfer sites utilize compaction units to bulk recyclables prior to transport to the MRF. While the equipment is efficient in reducing the number of hauls required to move materials, the solar units incorporated had not performed as anticipated. During winter months, there is very little solar input to the units and staff are forced to run generators in order to run the units and maintain power levels within the solar unit batteries. This has proven costs in terms of fuel, staff time, and the capital costs of the generator themselves.

In 2015, staff recognized a decision would need to be made regarding purchasing a new, larger capacity generator or directly connecting the compaction units to the hydro electric grid. Staff determined connection to the grid would provide a more financially sustainable option for the Auld Road site.

2 Approach

To retrofit the existing compaction units to the hydro electric grid required the municipality to contract assistance from an electrician and Hydro One. Additionally, municipal staff completed site improvements at the waste transfer site in preparation for the upgrades to accommodate a new spotters shed, hydro poles, and electrical equipment. All work completed at the Auld Road site were completed during the winter of 2016.

2.1 Monitoring and Measurement Methodology

In evaluating the impact of the project, the municipality completed a pre vs post analysis of costs related to maintaining and operating the compaction units at the Auld Rd waste transfer site. Specifically, the costs of staffing, fuel (pre), capital depreciation, and hydro costs were compared. Costs in the pre condition focused on additional labour inputs in arriving at site outside of operating times to charge and cycle the compactors vs post condition costs related to hydroelectric fees.

2.2 Implementation

2.2.1 Site Improvements

Minor site improvements were completed at the Auld Road waste transfer site during the month of November, 2015 to facilitate the implementation of the connection to the hydro grid. As pictured below, modifications to the concrete pad, including setting a post to attach electrical equipment to and a second post for the metre. This work was completed by municipal staff and involved the rental of some equipment. No issues were noted in completing the work.



Figure 1: Photograph of electrical site upgrades

2.2.2 Electrical Installation

BRS Electric Ltd. was contracted in February of 2016 to install a pole mount 200A outdoor service, conductors, and the requisite cabling and installation of electrical receptacles at the compaction units. Hydro one was contracted to connect the site equipment to the grid. The 30A electrical receptacles are featured in the left picture on the preceding page, while the pole mounted service equipment is pictured below. The work was completed over two days and without issue. Service hours for the public were not impacted.



Figure 2: Photograph of hydro grid connection and metre

2.3 Project Results

The key performance indicators tracked for this project were the costs of fuel (pre), capital depreciation, and hydro. A comparison of these costs is presented below in Table 1. Capital depreciation is the cost of the generators over a period of five years of operating life.

Table 1: Comparison of pre vs post operating costs at Auld Rd site

Operating cost	Pre	Post
Fuel	\$ 773.90	-
Hydro	-	\$ 226.15
Maintenance (Generator)	\$ 250.00	-
Capital depreciation	\$ 1,885.61	\$ 479.62
Totals	\$ 2,909.51	\$ 705.77

Staff note the allocation of their time to the recycling program has improved as they are no longer operating the generator before and after collection hours.

Additional savings were likely to have resulted from the retrofit as staff had previously had to arrive early prior to shifts in order to prepare the compaction units for service prior to operating hours during colder winter months or after low solar input periods where the batteries would have lost their charge.

2.4 Analysis of Results

The retrofitted system is saving the Municipality approximately \$2,200 per year in operating costs at the Auld Road waste transfer site. The project costs (detailed in Table 2 below) amount to approximately \$7,200. The cost savings of the retrofit therefore provide a return on investment in less than 4 years.



Figure 3: Spotter shack electrical improvements

2.5 Lessons Learned

The project has been well received by the community, staff, and attendants at the waste transfer site. The real learnings for the Municipality have been related to the difficulties in relying solely on the solar power system to operate the compaction units which cannot be reliably done without the use of a medium-heavy generator.

Municipal waste site staff are pleased with the improved safety of the work site attributable to the new lighting system both inside and outside the spotter's shack.

The project had been delayed during the winter months of 2015/16 due to issues with coordinating the electrical work at the site.

3 Project Budget

The budgeted project related to CIF project 830.3 is presented on the following page in Table 2. The project was completed on budget.

Table 2: Project Budget for Compaction Unit Connection to Hydro

Vendor	Item	Subtotal
BRS Electric Ltd.	Install pole mount 200A & cables	\$ 3,483.63
BRS Electric Ltd.	Install sub-panel, outlets, light fixture	\$ 2,500
ACE Equipment sales and rentals	Site upgrades	\$ 870.00
Hydro One	Hydro service equipment	\$ 359.60
Total costs		\$ 7,213.23

4 Conclusions

In conclusion, the Municipality would like to thank the Continuous Improvement Fund, and Stewardship Ontario for supporting the retrofit of the compaction units at the Auld Rd waste transfer site. Staff are pleased with the improvement in the operational efficiency of the program as we are no longer reliant on generators to recharge the solar system and cycle the units during low solar input times.

Further, reducing the Municipality's reliance on fossil fuels and improved safety on site are additional benefits to the retrofit and connection to the hydro grid.