

Project Overview

Intern: Martin Gakuria

Major: Environmental Engineering

College: University of Nebraska-Lincoln



Company Background

The Lincoln Water System has a structured system of data acquisition to determine the efficiency of its pumping stations, distribution mains, water wells, and transmission systems. This has, over the last ten years, led to reduction in energy consumption despite the increase in the City's population. Water use over the years is been rather steady, but energy costs continue to be an issue for pumping and distribution of water.

Project Description

The purpose of this project was to help identify ways to reduce costs and greenhouse gas (GHG) emissions related to future infrastructure. The cost and GHG benefits of reducing infrastructure construction are potentially larger than that achieved from improvements to general operational efficiency alone, in the scope of long term life cycle GHG emissions.

Pollution Prevention Benefits and Results

As the City of Lincoln strives for a greener future, as set forth in the Lincoln-Lancaster County 2040 Comprehensive Plan, the recommendations from this project will help reduce energy consumption, save money, and reduce GHG emissions over time. The potential pollution prevention benefits and results from this report are summarized in Table 1 below.

Table 1: Potential Pollution Prevention Benefits and Results

P2 Category	Annual GHG Reduction (metric tons of CO ₂ e)	Annual Energy Reduction (kWh)	Annual Cost Savings
VFD Installation	530	580,000	\$100,000
Infrastructure Building*	2300	8,300,000	\$5,000,000**
TOTAL	2830	8,580,000	\$5,100,000

* Only considering Necessary Maintenance Infrastructure 2008-2014 CIP (Water Supply Wells, Treatment Plant Expansion, Transmission Main and Distribution Mains)

**Based on CIP 2008-2014 (Table 5)

Additional indirect and intangible benefits include:

- Decreased future pump maintenance cost
- Meeting Lincoln Mayor's Executive Order for 2040 Plan
- Demonstrated industry leadership