OHIO ENVIRONMENTAL PROTECTION AGENCY
DRINKING WATER STATE REVOLVING FUND (DWSRF)
AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009 (ARRA)
GREEN PROJECT INFORMATION

FFY 2009 ARRA GREEN PROJECT INFORMATION FORM

The Federal American Recovery and Reinvestment Act of 2009 (ARRA) requires a minimum amount of funding be used toward Green Infrastructure, Energy Efficiency, Water Efficiency, or other Environmentally Innovative activity. To ensure that this requirement is met, Ohio EPA is requiring ARRA recipients to provide additional information about potential green components of their project(s).

In many instances, a Business Case is required for justification to consider an item or activity "green". The US Environmental Protection Agency (EPA) has provided guidance for help in evaluating the green elements of a project. Please complete this cover sheet and appropriate page(s), as noted below for each project that will incorporate a "green" component(s). More guidance is provided on the back of each form.

PWS Name: Village of Cardington PWSID: OH5900112

Project Name: Distribution Replacement Phase IV PPL #: 137
(as assigned by OEPA– refer to project list on web)

Total Estimated Project Cost: $ 573,732.00 Total Est. Green Amount: $ 573,732.00
ARRA maximum $359,689.00

Type of "Green" Element(s) included in this project. For each box that is checked the corresponding page of this form must be completed and submitted with this cover page. Attach additional pages as necessary:

- ☐ **Green Infrastructure** (porous pavement, bioretention, trees, green roofs, and other practices that mimic natural hydrology and reduce effective imperviousness)
- ☐ **Energy Efficiency** (energy audit, water pump system improvements or replacements, variable frequency drives, SCADA, on-site clean power, solids treatment or handling, replacement or rehabilitation of distribution lines)
- ☒ **Water Efficiency** (water meter installation or replacement, leak detection equipment, water line replacement, water audit, water efficient fixtures)
- ☐ **Other Environmentally Innovative Activity**

Completed by:

Name: Bridgette Marchio (please print) Title: Environmental Specialist

Signature: Bridgette Marchio Date: 10-17-09

For OEPA use only:
Project #: FS 390534-01 DWSRF #: PPL # 141

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GREEN PROJECT INFORMATION

WATER EFFICIENCY: (W) (i.e. water main replacement, meter installation, leak detection equipment, water efficient features)

PWS Name: Village of Cardington PWSID: OH 5900112

Project Name: Distribution Replacement Phase IV PPL #: 137

Total Est. Project Cost: $573,732.00 Total Est. Green Reserve Amount: $573,732.00
ARRA maximum $359,689.00

Project Summary:

The project includes the replacement of over 1.4 miles of waterline within the Village of Cardington's distribution system.

Water Main Replacement

Water main material/length to be replaced?	8507 LF of cast iron pipe
Est. total system water lost due to breaks and leaks	39 %
Est. water loss from pipe being replaced	29%
Total annual production	88,469,000 gallons (avg for 2007 & 2008)
Number of breaks recorded in past 24 months for the area to be replaced?	13
Est. Annual water savings	25,656,010 gallons
Est. annual costs savings	$186,000.00 ($7.25 per 1,000 gallons (2008 rates))
Other efficiencies to be gained by the replacement? (i.e. reduced head and therefore less energy loss in an upstream pump station, etc.)	NA

Meter Installation/Replacement	○ Original Installation ○ Replacement
Reason for replacement?	
Est. annual water savings	
Est. annual costs savings	

Business Case Narrative (Calculate water saving improvements and costs savings):

The Village proposes to replace 8507 feet of 1930's 1", 4" and 6" cast iron pipe within their distribution system (13 %) with 1", 6", 8" and 12" PVC . Between 2007 and 2008, the Village recorded monthly water losses between 24 – 58 %. The section of pipe being replaced accounted for 75 % of the leaks within the distribution system over the past two years[1]. This replacement is anticipated to save over 25 MGY and the larger pipe diameter will improve low pressure zones within the project area.[2] It is anticipated that the water loss after replacement of the piping will be less than 10 %. Therefore, the entire project cost of $573,732.00 is green eligible.

Attached Supporting Documentation

☐ Engineering Project Planning Documents ☐ Water/Energy Efficiency Determination (OEPA)
X Public Water System Records ☐ Other:

1 Email memorandum submitted by Village Administrator Dan Railey

2 Village of Cardington Water Distribution System Analysis (General Plan)

From: Dan Ralley <ralley@cardington.org>
To: Bridgette Marchio <bridgette.marchio@epa.state.oh.us>
CC: Rick Greenwood <rgreenwood@kemccartney.com>
Date: 4/6/2009 12:23 PM
Subject: Cardington Water Loss Data

Bridgette,

Below, you should find information regarding Cardington's water loss ratio. As you can see, we regularly have between 30 and 40% loss despite efforts over the last five years to replace numerous waterlines and check for leaks. In months where there are multiple breaks, this percentage increases to more than 50%. The area designated for the Phase IV waterline project is where greater than 75% of our leaks have been found in the last two years, and is likely the area that is responsible for most of this loss ratio. It should also be noted that, in recent years, we have replaced nearly 3/4 of all water meters so that we are sure that we are accurately accounting for the number of gallons billed.

The current waterlines in the Phase III and Phase IV areas are cast iron, and were mostly installed in 1932/33. As a result lead joints are prominent in both areas. In addition, customers in both areas suffer from iron discoloration stemming from the decay of the inside of cast iron pipes (rather than the Village's raw water which is not high in iron).

Please let me know if you need additional information, or if you have difficulty viewing the water loss data.

Dan Ralley
Village Administrator
(419) 864-7607
ralley@cardington.org
www.cardington.org

Gallons Billed	Plant Production	Daily Average		% Loss
2007				
January	5,130,111	7,865,000	253,710	34.77%
February	6,194,453	8,840,000	315,714	29.93%
March	4,310,885	8,924,000	287,871	51.69%
April	4,628,575	7,040,000	234,667	34.25%
May	5,235,769	7,550,000	243,548	30.65%
June	5,117,933	6,810,000	227,000	24.85%
July	4,508,560	7,199,000	232,226	37.37%
August	4,748,534	7,210,000	232,581	34.14%
September	4,130,800	8,280,000	276,000	50.11%
October	4,848,056	7,580,000	244,516	36.04%
November	4,079,190	7,370,000	245,667	44.65%
December	4,067,732	8,540,000	275,484	52.37%
Monthly Avg	4,750,050	7,767,333	255,749	38.40%
Total	57,000,598	93,208,000		
2008				
January	4,931,162	7,900,000	254,839	37.58%
February	4,939,362	7,620,000	272,143	35.18%

Google Maps

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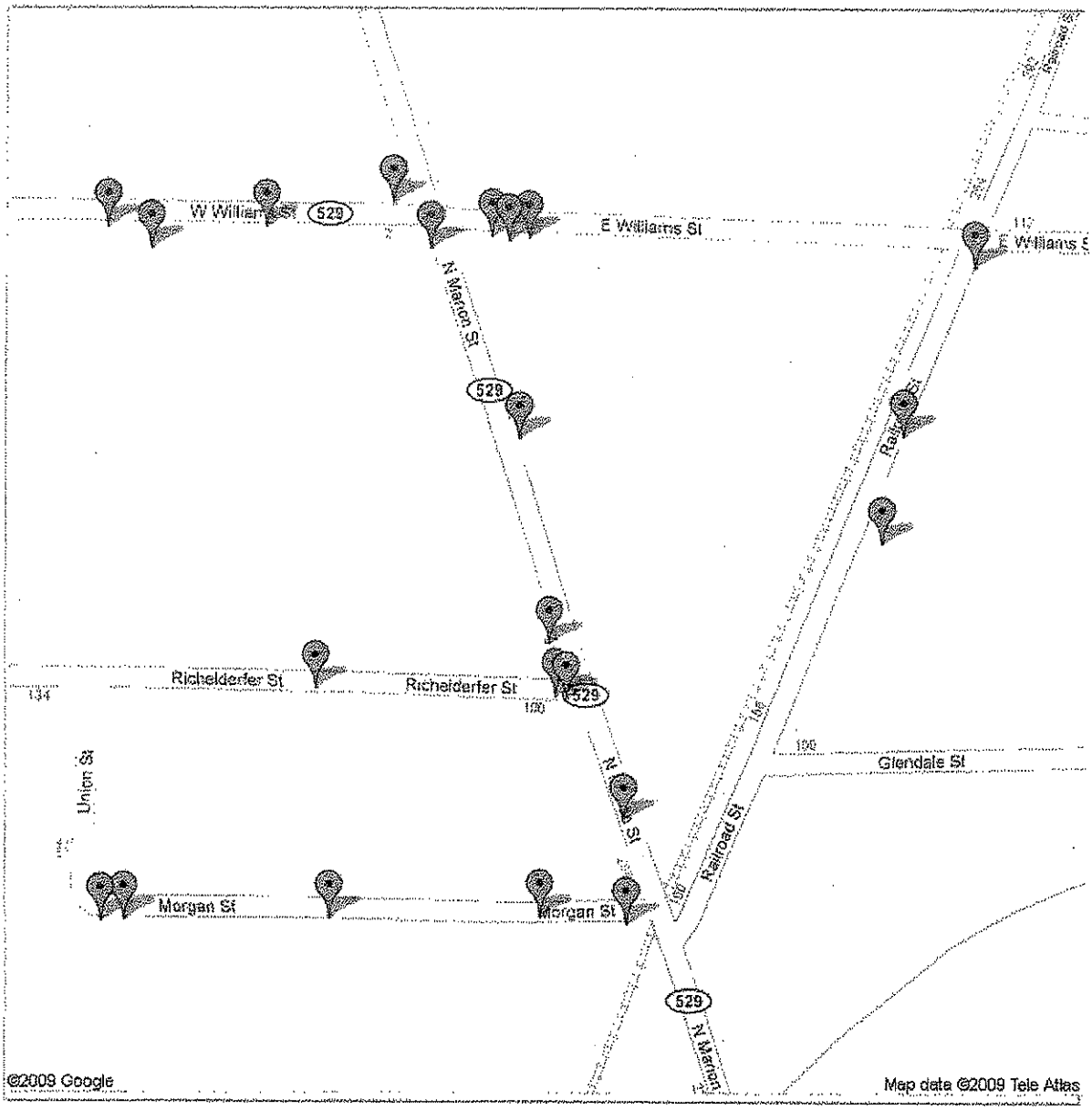
Text the word "GMAPS" to 466453



Untitled

237 Railroad St

Winter 2006/07 leak on 6" cast iron line.

Railroad & Williams St.

Broken valve in intersection. Replaced summer 2007.

158 Morgan

March 2009 leak on service line on Morgan St.

140 Morgan St

Leak on 4" cast iron line February 19, 2009.

158 Morgan St

March 2007 leak on 4" cast iron line on Morgan St.

N. Marion St.

December 2008 leak on 4" cast iron line on N Marion St.

N Marion St.

January 2005 leak in 4" cast iron line.

N. Marion St.

December 2007 leak on 4" cast iron line on N. Marion St.

N Marion St

December 2008 leak on 4" line on N. Marion St in Richelderfer intersection.

N Marion St.

Winter 2007 leak on 4" cast iron line on N. Marion St.

N. Marion St.

Winter 2006/07 leak on 4" cast iron pipe on N. Marion St. that necessitated the replacement of section of pipe.

Morgan St. FH

July 2006 replaced non-functional fire hydrant on Morgan St.

Williams St

March 2006 leak on Williams St. 6" CIP pipe

Williams St

July 2007 leak when working on valves at Railroad St.. Temporary increase in pressure caused blow out near site of previous leak.

Williams St.

March 2006 leak on 6" cast iron line.

120 W Williams St

December 2007 Leak on 8" line at 120 W. Williams

154 W Williams St.

11/15/08 leak

156 W Williams St

Leak on 11/16/08 emerged after repair 75 yards to the east of line was being repressurized.

Morgan St

Winter 2001 leak on 4" cast iron pipe

Richelderfer

Fall 2003 leak 4" cast iron pipe.

Railroad St

Spring 2003 leak.

Raw Water Line

Winter 2001 leak on raw water line.

VILLAGE OF CARDINGTON

WATER DISTRIBUTION SYSTEM ANALYSIS

(GENERAL PLAN)

ADDENDUM #2

MAY 5, 2009

There have been no updates to the Cardington Water Distribution System Analysis since Addendum #1 in November 2008.

In addition, a scenario that included placing a proposed water storage tank near the High School and Ault Road, an 8-inch line on Chesterville Road and Water Street along with 8-inch water line modifications in East Main Street, West Main Street and Gilead Street. Also included was the 8-inch inner connect water line between Crestview Drive and Riverview Drive. The Junction Report for this scenario indicates that the residual pressures throughout the entire Village exceed the 20 psi recommended minimum.

Improvements for this site include the construction of a water storage tank located at East Main Street and South Marion Street or at a site near the High School and Ault Road, and an 8-inch waterline in West Main Street, East Main Street, South Marion Street, Nichols Street, Chesterville Road, Water Street, Gilead Street, Crestview Drive and Riverview Drive.

<u>William Street West of Gilead Street (J-95)</u>

A 1000 gpm fire flow was applied to the existing distribution system at junction J-95 on Williams Street west of Gilead Street. This scenario created negative residual pressures in Williams Street at the applied fire flow hydrant and in Gilead Street from Williams Street south to Crestview Drive.

To improve residual pressures in this area, an 8 inch waterline was inserted along Gilead Street, East Main Street from Center Street to River View Drive and an interconnecting pipe was run between Crestview Drive and Riverview Drive. The Junction Report for this scenario indicates that the residual pressures at all locations throughout the Village except at junction J-95 exceeded 20 psi.

Improvements for this site include replacing the existing 6-inch waterlines in Gilead Street and East Main Street with 8-inch waterline, and the replacement of the existing 4-inch waterline on East Main Street from Gilead Street east to Riverview Drive with an 8-inch waterline; and the construction of an 8-inch interconnect water line from Gilead Street to East Main Street at River View Drive.

<u>Morgan Street and Union Street J-35</u>

A fire flow of 1000 gpm was applied at junction J-35 at the intersection of Morgan Street and Union Street. The results from this Junction Report indicates that residual pressures at junctions J-32, J-34 and J-35 dropped below 20 psi.

The fire flow at this junction was reduced to 900 gpm, the waterline on North Marion Street from Williams Street to Morgan Street was changed from 4-inch to 8-inch size. These modifications resulted in all residual pressures throughout the Village exceeding 20 psi.

Additionally, with a proposed elevated water storage tank located near the High School and the 8-inch waterline replacements on West Main Street, East Main Street, Gilead Street, Water Street, Chesterville Road, Nichols Street, and South Marion Street, a fire flow of 750 gpm was applied at junction J-35. The Junction Report for this scenario indicated that residual pressures throughout the Village exceed 20 psi.

Improvements at this site would include replacing the existing 4-inch and 6-inch waterlines on North Marion Street with a proposed 8 inch waterline.

East Main Street, Riverview Drive (J-41)

A fire flow of 1000 gpm was applied at junction J-41 with 8-inch waterline improvement in West Main Street, East Main Street, South Marion Street, Nichols Street, Water Street, Gilead Street, and the existing inner connecting 8-inch line from Crestview Drive to Riverview Drive.

The Junction Report for this scenario indicates that residual pressures in Gilead Street from Williams Street to Crestview Drive, and along East Main from Riverview Drive to Township Road 124 were below the recommended 20 psi minimum.

To improve these residual pressures, a looped 8-inch waterline was placed from East Main Street cross country to Chesterville Road. This looped waterline created residual pressures greater than 20 psi.

Improvements to this area would require that any future proposed developments in this area be looped between East Main Street and Chesterville Road.