State of Wisconsin
Department of Natural Resources
Bureau of Community Financial Assistance – CF/2
101 S. Webster St., P.O. Box 7921
Madison, WI 53707-7921
Phone No. (608) 266-7555, FAX (608) 267-0496

RECEIVED
SEP 30 2013
DNR BUREAU OF COMMUNITY FINANCIAL ASSISTANCE

Applicants must complete and submit this form for each Clean Water Fund Program (CWFP) and Safe Drinking Water Loan Program (SDWLP) project for which they submit a Financial Assistance Application.

Municipality	☑ CWFP	EIF Project No.
Village of Kendall	☐ SDWLP	4173-04

Does this project include any "green" elements as described below?

☑ YES (If yes, complete and return page 1 **and** appropriate page(s) with green category information)

☐ NO (If no, complete and return only page 1)

Name and Title of Person Completing This Form (Type or Print)	Phone No.	Email Address
Brad Stuczynski, P.E.	608-355-8964	bstuczynski@msa-ps.com
Signature of Person Completing This Form: Brad Stuczynski		Date Signed: 09/25/2013

Green projects fall into four separate categories: green infrastructure, water efficiency, energy efficiency, and environmentally innovative projects. Please read the definitions below and refer to the guidance document ***Green Project Reserve: Guidance for Determining Project Eligibility***, dated April 21, 2010, (available on the web at http://dnr.wi.gov/org/caer/cfa/EL/Section/news.html). This document explains the types of projects eligible for funding under the Green Project Reserve and details which types of projects are considered categorically eligible and which types of projects require a business case. **Applicants must submit all required business cases prior to loan closing.** DNR is required to post the business cases on the web.

When completing this form, include only those costs you intend to request from the Environmental Improvement Fund.

SUMMARY OF GREEN PROJECT RESERVE COSTS

GREEN CATEGORY	EIF-FUNDED GREEN PROJECT COSTS
Green Infrastructure	$ 0.00
Water Efficiency	$ 0.00
Energy Efficiency	$ 85,200.00
Environmentally Innovative	$ 0.00
TOTAL	**$ 85,200.00**

FOR DNR USE ONLY	
Signature of GPR Specialist: Becky Scott	Date Review Completed: 10/9/13

Energy Efficiency definition: Energy Efficiency projects include the use of improved technologies and practices to reduce the energy consumption of water quality projects, use energy in a more efficient way, and/or produce/utilize renewable energy.

This project is categorically an Energy Efficiency project ___

Indicate Categorical Project number from *GPR: Guidance for Determining Project Eligibility* and estimated cost (i.e. 3.2-3 for $175,000):

Categorical Project Number: _____ Estimated Cost: $_____

Categorical Project Number: _____ Estimated Cost: $_____

Other: _____ Estimated Cost: $_____

Or

This project requires a business case ✓

Indicate Business Case Project number from *GPR: Guidance for Determining Project Eligibility* and estimated cost (i.e. 3.5-1 for $23,000):

Business Case Project Number: 3.5-4 Estimated Cost: $ 85,200.00

Business Case Project Number: _____ Estimated Cost: $_____

Other: _____ Estimated Cost: $_____

The **TOTAL** estimated cost of this Energy Efficiency project or project components $ 85,200.00

Please provide a **detailed** description of your Energy Efficiency project or project components below. Please include any pertinent calculations of energy savings in both kilowatt hours and percentage of overall energy usage. Attach a separate sheet if necessary.

3.5-4 - I/I Correction Project: The project consists of the replacement of approximately 950 lf of aged clay sanitary sewer main with new 8-inch PVC sewer main.

See attached for Potential Energy Savings Calculations. The project is estimated to reduce approximatley 283 kWh/year at the influent lift station and wastewater treatment plant.

The estimated cost of $85,200 was determined based on actual bid prices plus 5% contingencies and engineering. (see attached)

The project was determined to be cost effective based on the alternatives analysis that was included in the July 17, 2013 Engineering Report/ Facilities Plan. (see attached)

Potential Energy Savings Calculation

Village of Kendall
CWF # 4173-03

2007-2010 Potential I/I Reduction		20,000 gpd
- From 2013 Engineering Report/Facilty Plan		
Potential Annual I/I Reduction	x 365 days =	7.30 MG
Total Length of Sewer Collection Mains Needing Rehab & Replacement =		17,239 lf
*Prior to 2012 Rehab project		
Total Length of Sewer Mains to be Lined =		970 lf
% of Total Mains to be Lined =		5.6%
Amount of Potential I/I from Pipe vs. Manholes		50%
Estimated Reduction of I/I (%) due to This Project=		2.8%
Estimated Reduction of I/I due to This Project=		0.21 MG

Reduced Pumping at Influent Lift Station (hrs) = (0.21 MG) / (325 gpm) / (60 min/hr)

= 11 hrs/year

Reduced Pumping at Influent Lift Station (kWh) = (7.5 Hp) / (0.60 efficiency) x (0.746) x (22 hrs/year)

= **98 kWh/year**

Reduced Energy Cost at WWTF = (9 kWh/1000 gallons) x (210,000 gal)

= **185 kWh/year**

TOTAL POTENTIAL ENERGY SAVINGS=

= **283 kWh/year**

GREEN COST SUMMARY
Village of Kendall
CWF #4173-03
MSA # 00145006

	Construction	5% Contg.	Const. Tot	Engineering	Total
Sanitary Sewer Reconstruction - As Bid	$69,278	$3,464	$72,741	$12,470	$85,211

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July 17, 2013

Mr. Thomas Mugan, P.E.
Wisconsin DNR Bureau of Water Quality
101 S. Webster Street – WT/3
P.O. Box 7921
Madison, WI 53707-7921

Re: Sanitary Sewer Replacement Engineering Report/Facilities Plan
Spring Street Utility and Roadway Improvements
Village of Kendall, Monroe County, Wisconsin
CWF Project No. 4173-04

Dear Mr. Mugan:

Below please find the Engineering Report for the referenced project. The report is intended to satisfy the Department facility planning requirements necessary to attain eligibility for financial assistance through the Clean Water Fund Program. On behalf of the Village of Kendall, MSA is requesting Department consideration of the following:

Project Description

The complete scope of the Spring Street Utility and Roadway Improvement project includes the replacement of approximately 1,340 lineal feet of undersized 4-inch water main, service laterals and appurtenances, the construction of a new water system loop, the replacement of sanitary sewer mains and service laterals within the Village right-or-way, replacement of existing storm sewer and the limited addition of new storm sewer, approximately 1,650 centerline feet of street grading, base course, concrete curb and gutter, asphaltic concrete pavement and associated sidewalk and turf restoration.

The proposed wastewater collection system improvement work includes the replacement of approximately 950 lineal feet of aged clay sanitary sewer with new 8-inch PVC sewer main between recently rehabilitated manholes. Collection systems improvements also includes the replacement of approximately fourteen sewer service laterals with new pre-molded lateral wyes and new 6-inch PVC service laterals extended to the street right-of-way line. Restoration work associated with the 'open cut' sewer main and lateral replacement will require the reconstruction of the street over the sewer main and laterals and the replacement of the existing curb and sidewalk over the service laterals. All wastewater collection system work will be performed within the existing Spring Street right-of-way.

Demonstration of Need

The existing sanitary sewer in the project area consists of approximately 75 year old, 8–inch vitrified clay pipe with three foot joint spacing. The sewer, originally installed as a Public Works Administration project in the mid-1930's, has serviced the community well beyond the expected design life of approximately 50 years. The Village of Kendall wastewater treatment facility (WWTF) design flow is 70,000 gallons per day. The average daily base line sewage flows received at the Village wastewater treatment facility during wet weather conditions are approximately 20,000 gallons per day higher than the theoretical calculated flow based on population and industry. Collection system aging combined

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with rising groundwater levels has resulted in sanitary sewer overflows during significant rain events. Recent efforts to rehabilitate the sewer collection system in the project area include the structural lining of existing block manholes, reconstruction of the manhole chimney tops and replacement of the manhole frames and open pick hole covers.

The 2009 Sanitary Sewer Televising report prepared by Flow-Rite Pipe & Sewer Services LLC, identifies sewer main deficiencies including root intrusion, horizontal and vertical misalignment, offset joints and pipe joint deterioration. Regular sewer maintenance activities are inefficient due to the pipe alignment deficiencies. The existing current roadway condition in the area of the sewer mains and service laterals is an indication of the deteriorating sewer condition. Several sewer service laterals are 'hammer tapped' and intruding in to the main. The majority of the 'factory wye' lateral connections are offset near the main with some showing mineral deposition. The mineral deposition in the service laterals are indication of groundwater infiltration into the municipal sewage collection system. The offset lateral condition at the main will eventually lead to additional roadway settlement and possible sewage back up in to the connecting homes or structures. The groundwater infiltration evident in the service laterals is a likely component of the wet weather flow recorded at the treatment facility. The proposed collection system improvements will partially address the larger issues related to an aging sewer collection system and groundwater infiltration.

Alternative Evaluation

During the scoping process for the project described above, the following three alternatives were considered;

1. No Action.
2. Sewer Rehabilitation.
3. Sewer Replacement (Recommended).

Alternative #1- No Action

Under the no action alternative, the Spring Street Utility and Roadway Improvements project would proceed while leaving the sanitary sewer mains and laterals their current condition. Alternative #1 project activity would include water main replacement and looping, storm water drainage improvements and street reconstruction. The design life of the water system improvements is 50 years and the service life of the roadway and storm drainage improvements is 35 years. The existing sanitary sewer has already exceeded its expected design life therefore the remaining service life is unknown. If the existing sewer were to fail prior to the service life of the roadway, the Village would incur the high costs for sewer repair and associated surface restoration. In addition to the high capital cost for repair, the Village would suffer higher costs the continued maintenance of the sewer and roadway repairs. Proceeding with the no action alternative would not address the existing aging and deteriorating sewer infrastructure or the associated groundwater infiltration. The Village would continue to incur added costs associated with conveying and treating groundwater, sewer system back-ups and overflows may increase in the future as the sewer collection system piping continues to deteriorate.

Alternative #2 – Sewer Rehabilitation

Sewer rehabilitation has been considered as an alternative to address the sewer deficiencies identified on the referenced project. The sewer rehabilitation method examined under Alternative #2 includes resin impregnated Cured-in-Place Pipe (CIPP) lining to structurally rehabilitate the existing sewer mains. The CIPP process includes service reinstatement by robotically cutting holes through the liner at the lateral connections after the CIPP liner is cured. The holes in the liner at the lateral locations are typically where groundwater infiltration can enter the sewer therefore chemical grouting of the service lateral connections would be performed, if possible, to stabilize and seal the existing sewer connections against infiltration. Where lateral connections are defective (offset joints, root intrusion, mineral scale, etc.) chemical grouting is not feasible and must be excavated and repaired.

CIPP lining of the sewer mains and lateral connection grouting can be a cost effective method for sewer main rehabilitation where the existing pipe conditions are suitable and surface disturbance is undesirable or cost prohibitive. With regard to the proposed Spring Street Utility and Roadway improvement project, sewer rehabilitation is not recommended due to the following;

1) The CIPP process will not correct the known horizontal and vertical pipe alignment deficiencies in the sewer within the project area. Approximately 25 percent of the sewer main within the project area would require excavation and replacement to correct the alignment deficiencies.
2) Defective conditions exist in the lateral connections adjacent to the sewer main on eight of the fourteen service laterals within the project area. The deficiencies in these lateral connections will not allow chemical grouting after CIPP lining. Therefore, the lateral connections must be excavated and replaced to eliminate further deterioration and prevent groundwater from entering the sewer.
3) The sewer rehabilitation alternative does not address the potential deficiencies that may exist in the portion of the service laterals within the Village right-of-way. Research on aging collection systems indicate that most lateral defects occur within 15 feet of the main. The current cost for CIPP lateral lining is generally three times greater than the cost of open trench replacement. Therefore open trench replacement of the sewer laterals from the sewer main to the right–of-way line is recommended for either the sewer rehabilitation or replacement alternatives.
4) The estimated cost for the rehabilitation alternative including CIPP lining of the sewer mains, lateral reinstatement, grouting six lateral connections, open cut repair of eight lateral connections, and CIPP lining of the service laterals from the main to the right-of-way line is $132,100. The cost for the rehabilitation alternative is approximately 93 percent of the cost for the same scope of work performed by open cut replacement including restoration.

Alternative #3 – Sewer Replacement

The scope of the sewer replacement alternative is described above in the Project Description section of this report. The sewer replacement alternative is recommended for the Spring Street Utility and Roadway Improvement project, and as it meets the need to replace aged and deteriorating sewer infrastructure and is consistent with the open cut construction methodology to be employed for the replacement of the water main adjacent to the sewer. The sewer replacement alternative is cost

effective when considering it is the goal of the project to improve or replace all of the municipal infrastructure in the project area including the public roadway.

User Charge Impact

The estimated cost for the entire project is estimated to be $873,800. The Village has received a $294,000 Community Development Block Grant (CDBG-PF) through the Wisconsin Economic Development Corporation (WEDC) to fund a portion of the water main replacement and roadway reconstruction costs. The estimate for the collection system related project costs is $197,300. The project cost to the typical residential utility customer will be an estimated $72.81 annually, an increase of approximately 119% (assuming the sewer related costs are financed at 2.63 percent interest for 20 years). Currently, the Village's sewer user charge rates do not provide adequate revenue to offset utility expenses. Sewer user rates will need to increase to cover existing operational costs and the sewer related project debt.

Environmental Effects

Environmental effects of a typical sewer replacement project include construction noise, traffic disruption, dust, fuel consumption, equipment emissions. The greatest potential environmental effect of the project will be erosion due to storm water runoff during construction. The construction contractor will be required to comply with the Wisconsin DNR requirements for the pending Construction Site Storm Water Runoff permit. Portions of the proposed water distribution and storm drainage improvements will be within the flood boundaries of the Baraboo River, Fox Valley Creek and Spring Creek. No wetlands or floodplains will be impacted as a result of proposed collection system improvements.

Parallel Cost Estimate

The existing sewers in the proposed project area are the minimum allowable diameter of 8-inches in accordance with Wisconsin Administrative Code NR 110.13(2). The sewers in the project service area will be replaced with 8-inch diameter pipe at the same lines and grades as the existing mains therefore no additional design capacity will be provided thus the parallel cost is 100%.

Implementation Schedule

The proposed schedule for the Spring Street Utility and Roadway Improvement project is as follows:

- Project Advertising, Bidding and Construction Contracts: August – September, 2013.
- Phase 1 Construction: September – October, 2013
  (Phase 1 construction includes water main looping, connections and associated restoration).
- Phase 2 Construction: April – September, 2014
  (Phase 2 construction activities include water main replacement, sanitary sewer replacement, service lateral replacement, storm sewer, roadway reconstruction and restoration).

Based on the information provided, The Village of Kendall is requesting WDNR Engineering Report approval for the CWF eligible portions of the project. Construction plans and specifications are being prepared and will be submitted separately under normal plan submittal procedures.

Thomas Mugan, P.E.
Wisconsin DNR Bureau of Water Quality
July 17, 2013

Your attention to this request is appreciated. If you have any questions, comments, or concerns, please do not hesitate to contact me at (608) 355-8968 or by email at azimmer@msa-ps.com.

Sincerely,

MSA Professional Services, Inc.

Andrew Zimmer, P.E.
Project Manager

AZ:dp

cc: Lynne Hanson, Village Clerk

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