Rice Creek Watershed District
Stormwater Management Grant Program
2024 Application Form

I. APPLICANT INFORMATION

Organization (to be named as Grantee): City of Arden Hills

Street Address: 1245 West Highway 96

City, State, Zip: Arden Hills, MN 55112

Tax Status: Local Government Tax ID#: 9047998

(e.g., local government, non-profit 501(c)(3), private business, etc.)

II. PROJECT CONTACTS

Project Officer: David Swearingen Financial Officer: Dave Perrault

Title: Public Works Director/City Engineer Title: City Administrator/Finance Director

Telephone: 651-792-7847 Telephone: 651-792-7824

Fax: Fax:

Email: dswearingen@cityofardenhills.org Email: dperrault@cityofardenhills.org

III. PROJECT INFORMATION

Project Name: 2024 PMP Street & Utility Improvements

Location(s) of Project: Royal Lane, Norma Avenue, Briarknoll Drive, Briarknoll Circle, McClung Drive, Colleen Avenue, Colleen Circle, James Avenue, Royal Hills Drive, Arden Vista Court, and Keithson Drive

City: Arden Hills State: MN County: Ramsey

Project Start Date: Spring 2024 Project Completion Date: Fall 2024

Project Type (check only those that directly apply):

- ☒ Water Quality Treatment Project
- ☐ Stormwater Reuse Irrigation Project
- ☐ Peak Runoff Rate Control Project
- ☐ Runoff Volume Control / Flood Storage Project
- ☐ Other:

Is a RCWD Rule C permit required for this project? ☐ YES ☐ NO ☐ UNKNOWN

IV. GRANT REQUEST

RCWD Grant Funding Requested: $ 94,650

Applicant Match Funding Committed: $ 94,650

State/Other Funding Committed: $ 0 Source(s): N/A

Total Estimated Project Cost: $ 189,300 N/A

Would you be willing to accept grant funding in an amount less than requested? ☒ YES ☐ NO

V. SIGNATURE OF APPLICANT

I certify that the information contained within this application is true and accurate.

Signature of Project Officer Date: 11/21/23

VI. Executive Summary / Abstract

Include a brief Executive Summary (100 words or less) that summarizes the main goals and activities of the project and the expected environmental outcomes that will be achieved. Identification of the total amount of funds being requested along with the required match, and how you heard about the program should be included in the Executive Summary. The summaries will be used in the grant review process and on the RCWD website, for projects that are funded.

As part of the City of Arden Hills greater 2024 PMP Street & Improvements project, it is propose

VII. Description (10 points)

The RCWD has established guidelines for prioritizing projects based on location. Water quality improvement projects should be located to benefit a RCWD lake classified as either "Protection" or "Restoration" (see Table 2-4 in the RCWD 2020 Watershed Management Plan), and/or a waterbody with an approved Total Maximum Daily Load (TMDL) study or other recognized diagnostic water quality study. Flood storage and runoff rate control projects should focus on reducing peak flood elevations in known regional flood hazard areas and/or documented local problem areas. Describe the specific watershed management, water quality or quantity need(s) that the project will address and its impact on the target water resource within the District.

Name the target waterbody benefitting from this project: Valentine Lake

List and describe the Best Management Practices (BMPs) to be incorporated into this project.

Nine sump storm manholes with SAFL Baffles will be installed just prior to each system's outfall.

If applicable, describe how the project impacts or protects RCWD groundwater resources, minimizes impervious surfaces, and/or maximizes infiltration.

The project will protect the RCWD by capturing sediment and chemicals to keep them from ente

Provide drawings, maps and/or schematics which graphically illustrate the location and conceptual design of the project. **(Attach separate sheets.)**

Describe how long-term operation and maintenance of the project will be accomplished.

Each structure will be inspected at least annually (or more frequently if deemed necessary over

[redacted]

VIII. Prioritization (15 points)

How does the project support existing regional planning efforts such as the RCWD Watershed Management Plan, municipal surface water management plans, TMDLs, or other recognized diagnostic studies? Is the project included on the Member Community Project List (Appendix G) within the RCWD Watershed Management Plan? Please provide citations where possible.

The project areas all flow into stormwater management ponds that ultimately flow to Valentine l

IX. Targeting (15 points)

Describe the critical pollution or flooding sources and risks addressed by this project. Explain why the proposed project is the most cost-effective and feasible means to attain the expected resource benefits. Has a formal analysis been conducted to substantiate this position?

There is an existing pollution risk from the existing system which is leading to the need for ponc

X. Measurable Outcomes (20 points)

Provide a detailed estimate and description of the anticipated pollutant reduction, stormwater rate/volume reduction, groundwater withdrawal reduction, and/or other environmental or natural resource benefits associated with the project. Describe the methods and cite the sources (i.e. P8 model, HydroCAD, XP-SWMM, MIDS, MN Stormwater Manual, etc.) used to calculate or estimate the pollutant reductions and/or hydrologic outcomes. **(Mandatory for RCWD to consider your proposal!)**

SAFL Baffles are a pretreatment BMP that capture and retain stormwater sediment total susper

Describe the strategy for monitoring and/or evaluating the results or effectiveness of the project, including how success will be defined and measured.

The effectiveness of the project will be determined over time as it is determined how much sedir

[redacted]

XI. Cost-Effectiveness (20 points)

Provide a detailed budget that lists each item for which funding is being requested. You must also list the sources of required local matching contributions. Why is this the most cost-effective approach to solving the problem? Have other alternatives been explored? **(Attach separate sheets if needed.)**

See attached cost estimate for the project elements which funding is being requested for. Matchi

XII. Project Readiness (10 points)

Please describe the anticipated timeline for implementing this project. What steps have been taken to ensure that the project can be implemented according to this timeline? Are any permits needed?

The work identified is part of the City of Arden Hills greater 2024 PMP Street & Utility Improveme

XIII. Engagement Opportunities (10 points)

Demonstrate any potential for public engagement, education and demonstration and describe what methods will be used to ensure that the purpose and success of the project are made known to the public. Applicants must incorporate a public engagement component into the project.

The purpose of the SAFL Baffles and the reason for inclusion in the project will be made known to

VI Executive summary.

As part of the City of Arden Hills greater 2024 PMP Street & Improvements project, it is proposed to replace the final storm sewer structure prior to an outfall with a sump and SAFL Baffle. The goal is to remove sediment and chemicals from the stormwater that ultimately flows into Valentine Lake. The total cost for the installation of 10 new sump structures with SAFL Baffles is estimated to be $189,300 and Arden Hills is requesting 50% of the eligible costs, $94,650, through the grant program. Arden Hills heard about the grant program through conversations with RCWD staff during a preliminary meeting for the project.

VII Description

Nine sump storm manholes with SAFL Baffles will be installed just prior to each system's outfall. SAFL Baffles are a stormwater pretreatment system that is installed with a sump storm sewer manhole structure to provide stormwater quality treatment by removing sediment, and harmful chemicals (such as phosphorus) that cling to the surface area of sediment, from stormwater which keeps it out of downstream water bodies. It works by capturing and retaining sediment, by stopping the rotating scour action that takes place during high flow conditions.

The project will protect the RCWD by capturing sediment and chemicals to keep them from entering the stormwater ponds/drainage systems that lead to Valentine Lake, and ultimately Rice Creek.

Each structure will be inspected at least annually (or more frequently if deemed necessary over the first season of operation) by city maintenance staff. As the SAFL Baffle captures sediment which settles into the sump, staff will utilize a Vac Truck to remove the accumulated sediment and ensure proper operation of the structure is maintained.

VIII Prioritization

The project areas all flow into stormwater management ponds that ultimately flow to Valentine Lake. Seven of the nine locations all flow through the stormwater management pond located southwest of Briarknoll Drive (adjacent to Highway 10) which includes RCWD's "Highway 10 & 694 Outlet Structure" facility. By capturing the sediment before outletting into the stormwater management ponds, it will reduce the amount of maintenance (such and pond dredging) required on the ponds. It will also reduce the amount of sediment that enters the RCWD outlet structure facility and the amount that finds its way downstream to the major resources of concern (such as Valentine Lake). This project is not included on the Member Community Project List.

IX Targeting

There is an existing pollution risk from the existing system which is leading to the need for pond dredging activities. This pollution risk comes from the conveyance of sediment through the stormwater system that finds its way into our stormwater ponds, lakes, and rivers. This causes both underperforming systems and pollution to these natural resources that adversely impacts water quality for humans,

animals, and vegetation. SAFL Baffles are installed in existing systems, often in structures that are already in place, to capture sediment before it reaching our stormwater ponds, lakes, and rivers which makes it a very cost-effective solution to provide the desired pollutant reduction. Additional research can be found at the following website: https://upstreamtechnologies.us/docs/SAFL/SAFL-Baffle-Research-Summary.pdf

X Measurable Outcomes

SAFL Baffles are a pretreatment BMP that capture and retain stormwater sediment total suspended solids (TSS). The MnDNR indicates they provide considerable water quality benefits (https://www.dnr.state.mn.us/water_access/bmp/sump_manhole_with_safl_baffle_bmp.html) . SHSAM (Sizing Hydrodynamic Separators And Manholes) software was used to estimate the percent removal of suspended sediments in the stormwater runoff from SAFL Baffles in sump storm structures. Using the catchment areas that drain to each storm sewer system that will have a SAFL Baffle installed throughout the project along with the results from SHSAM, the total pollutant reductions were determined using MIDS modeling. The Total Phosphorus loading is 30.67 lbs and the removal amount is 7.05 lbs for an overall removal of 23% TP. The Total Suspended Sediment loading is 5,571 lbs and the removal amount is 2,338 lbs for an overall removal of 42% TSS.

The effectiveness of the project will be determined over time as it is determined how much sediment is captured. This will be through two measurable results. The first being the amount of sediment retained in the SAFL Baffle sump structures that requires removal. And the second being the stormwater pond storage volume. This project will dredge a couple of the stormwater ponds in the area (with more planned in the future). A bathymetric survey was completed to determine the volume of existing sediment in these ponds and will be designed and re-surveyed to determine the post-construction storage volume. This same exercise can be completed in the future to determine if sediment is finding its way to the ponds at the same rate or not.

XI Cost-Effectiveness

See attached cost estimate for the project elements which funding is being requested for. Matching funds will be provided from a combination of the City of Arden Hills Surface Water Management Utility Fund and its PIR Fund. This is the most cost-effective approach because it provides a high pollutant reduction performance without significant additional project costs, when compared to other relevant BMP's.

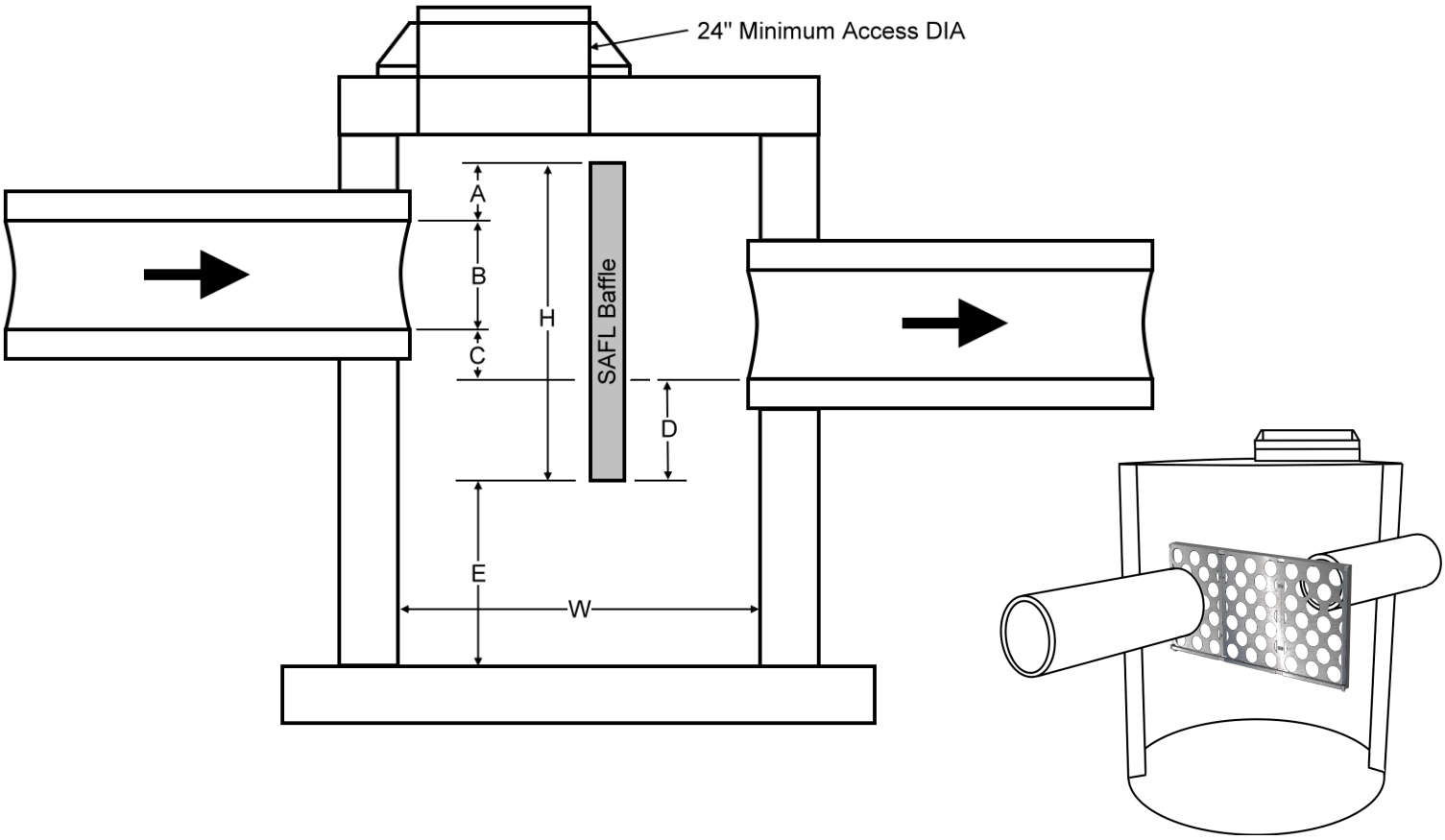
XII Project Readiness

The work identified is part of the City of Arden Hills greater 2024 PMP Street & Utility Improvements project which is scheduled to be constructed over the 2024 construction season. This overall project is already under design and will be bid in late winter/early spring of 2024. The overall project requires some permits but the SAFL Baffle work described does not require any permits to proceed.

XIII Engagement Opportunities

The purpose of the SAFL Baffles and the reason for inclusion in the project will be made known to the public through a project summary included in a Community Newsletter.

SAFL BAFFLE SIZING REQUIREMENTS



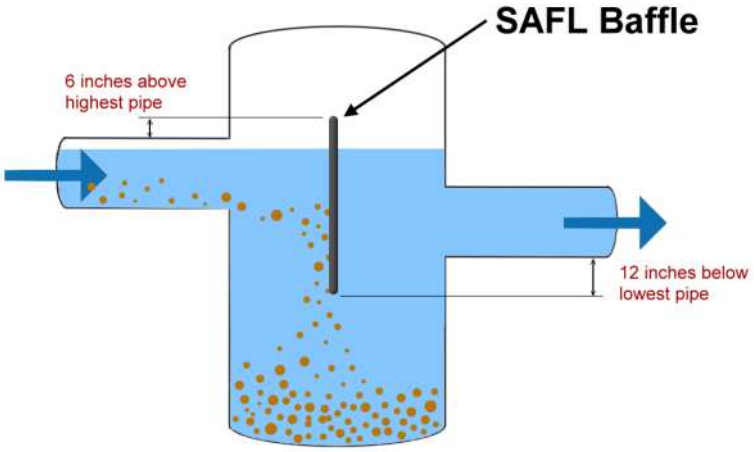
A	0 to 6" 6" is ideal
B	Inlet pipe inside diameter
C	0 to 6" 0" is ideal
D	12"
E	36" Minimum. 48" or greater is ideal and results in less frequent sump cleanout
W	W = Sump diameter if round or width if rectangular
H	Baffle height = A + B + C + D
Purchase Baffle Size	W x H View the complete list of Available Baffle Sizes
	Also see: Bracing Guide & Stacking Guide
NOTE 1	If H is greater than 57" two SAFL Baffles may be stacked.
NOTE 2	75% of flow must be horizontal. No more than 25% falling from above
NOTE 3	This detail does not cover sizing the sump for sediment removal efficiency. Contact Upstream for sump sizing or use SHSAM Software
NOTE 4	For more information, see our Design Guide

PATENT PROTECTED Patents: US #8663466B2 - US #8715507B2 - US #9506237B2 - CA #2742207

SAFL BAFFLE SIZING DETAIL

UPSTREAM TECHNOLOGIES INC.
5201 EAST RIVER ROAD, SUITE 303
FRIDLEY, MN 55421
651-237-5123

SAFL BAFFLE


SAFL Baffle
6 inches above
highest pipe
12 inches below
lowest pipe

2024 PMP STREET & UTILITY IMPROVMENTS

CITY OF ARDEN HILLS

RCWD GRANT FIGURE 1

JULY 2023

LEGEND

- PROJECT AREA
- EXISTING STORM SEWER
- EXISTING WATERMAIN
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER PIPE
- PROPOSED STORM SEWER PIPE
- TREE REMOVAL
- (1) REPLACE RINGS AND CASTING
- (2) MUD STRUCTURE/INVERT
- (3) SUMP & SAFL BAFFLE
- (4) REPLACE STRUCTURE
- (5) PROPOSED STRUCTURE
- (6) REPLACE GATE VALVE AND BOX
- (7) REPLACE SANITARY RINGS & CASTING/ADD CHIMNEY SEAL
- (8) GRADE CHANNEL
- (9) ADD RIP RAP
- (10) ADJUST APRON
- (11) REPLACE HYDRANT
- (12) SEWER PIPE GROUTING
- (13) DOCUMENTED CURB PONDING

COUNTY RD 96 W

KEITHSON DR

SNELLING AVE N

ROYAL HILLS DR

ARDEN VIEW DR

ARDEN VISTA CT

3 4

0 75 150

HORZ. SCALE FEET

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2024 PMP STREET & UTILITY IMPROVEMENTS

CITY OF ARDEN HILLS

RCWD GRANT FIGURE 1

JULY 2023

BOLTON & MENK

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	Arden Vista Ct	**Briarknoll Dr**	**Colleen Ct**	**James Ave**	**Keithson Dr**	**McClung Dr**	**Royal Hills Dr**	**Royal Lane**	Totals
PP load	1.5	5.86	2.87	0.83	1.29	1.44	0.46	2.61	16.87
PP removed	0.98	0.98	1.42	0.67	0.63	0.92	0.42	1.01	7.05
DP load	1.23	4.79	2.35	0.68	1.06	1.18	0.38	2.14	13.80
DP removed	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TP load	2.73	10.65	5.22	1.51	2.35	2.62	0.84	4.75	30.67
TP removed	0.98	0.98	1.42	0.67	0.63	0.92	0.42	1.01	7.05
TP removed (%)	35.90	9.24	27.25	44.77	27.00	34.93	50.38	21.28	**22.98**
TSS load	495.38	1934.95	948.56	273.87	426.91	476.82	153.04	862.06	5571.59
TSS removed	323.98	325.07	479.97	222.93	209.61	302.78	140.18	333.62	2338.14
TSS removed (%)	65.40	16.80	50.60	81.40	49.10	63.50	91.60	38.70	**41.97**

PRELIMINARY ENGINEER'S ESTIMATE FOR RCWD GRANT ITEMS

2024 PMP STREET & UTILITY IMPROVEMENTS

CITY OF ARDEN HILLS, MINNESOTA

BMI PROJECT NO. 0T1.130168

ITEM NO.	SPEC. REF	DESCRIPTION	NOTES	UNIT	RECLAMATION AREAS		MILL & OVERLAY AREAS		TOTAL ESTIMATED QUANTITY	ESTIMATED UNIT PRICE	ESTIMATED TOTAL PRICE
					STREET	STORM	STREET	STORM			
1	2104.502	REMOVE DRAINAGE STRUCTURE		EACH	0	4	0	3	7.00	$550.00	$ 3,850.00
2	2104.503	REMOVE SEWER PIPE (STORM)		LIN FT	0	4	0	4	8.00	$15.00	$ 120.00
3	2104.503	REMOVE CURB & GUTTER (SPOT)	(3)	LIN FT	80	0	48	0	128.00	$10.00	$ 1,280.00
4	2503.602	CONNECT TO EXISTING STORM SEWER		EACH	0	10	0	8	18.00	$1,500.00	$ 27,000.00
5	2506.502	CASTING ASSEMBLY (STORM)	(12)	EACH	0	5	0	4	9.00	$1,200.00	$ 10,800.00
6	2506.503	CONSTRUCT DRAINAGE STRUCTURE DESIGN 48-4020		LIN FT	0	9.0	0	9.1	18.10	$650.00	$ 11,765.00
7	2506.503	CONSTRUCT DRAINAGE STRUCTURE DESIGN 48-4022	(15)	LIN FT	0	37.7	0	31.0	68.70	$650.00	$ 44,655.00
8	2506.602	SAFL BAFFLE		EACH	0	5	0	4	9.00	$7,500.00	$ 67,500.00
9	2531.503	CONCRETE CURB & GUTTER DESIGN B618 (SPOT)		LIN FT	80	0	48	0	128.00	$40.00	$ 5,120.00
ESTIMATED CONSTRUCTION SUBTOTAL					**$ 4,000.00**	**$ 91,115.00**	**$ 2,400.00**	**$ 74,575.00**			**$ 172,090.00**
10% CONTINGENCY					**$ 400.00**	**$ 9,112.00**	**$ 240.00**	**$ 7,458.00**			**$ 17,210.00**
ESTIMATED CONSTRUCTION TOTAL					**$ 4,400.00**	**$ 100,227.00**	**$ 2,640.00**	**$ 82,033.00**			**$ 189,300.00**