

Project Name: 1010-005 Bloody Run Creek
Project Sponsor: City of Marquette
Length of Project: (October 1, 2010 – December 31, 2011)

Project Overview

The City of Marquette lies in a picturesque landscape nestled in the hills of NE Iowa, and through it flows the Bloody Run Creek. Though scenic, this topography poses significant challenges in managing watershed issues. Marquette repeatedly experienced devastating impacts of uncontrolled runoff emanating from the surrounding bluffs during storm events, and realized the need to improve watershed management and water quality within the Bloody Run Creek area. The storm of July 17th-18th, 2007 brought over 8” of rainfall overnight and was particularly devastating. Runoff caused flood damage to numerous homes, vehicles and properties. In addition, large quantities of silt and natural debris carried by overland flows were deposited within the City right-of-way, on private property and even into Bloody Run Creek.

Environmental Accountability

In a proactive approach to address these issues, a storm water management plan was developed, engineering plans completed, and a multi-phase management project defined. Phase I of the comprehensive project was completed in 2010, and integrated with Phase II initiatives.

Site conditions, as described by the engineering firm, present several challenges for managing storm water flows. The surrounding steep, wooded and rocky hills extend down to the back of residential lots, leaving minimal room to effectively manage runoff prior to impacting properties. Soil conditions are generally poor from a hydrologic standpoint, with shallow depths to rock and native soils having high runoff potential and slow infiltration rates. Because the majority of the runoff from the south and west becomes channelized before reaching the base of the hills, flow rates and velocities tend to be high, causing erosion issues and subsequent debris deposition. The combination of several factors, including the steep surrounding terrain, poor infiltration capacity of native soils, and the channelized nature of the flows reaching the Bench Area led to the conclusion that the best method for addressing these concerns was to safely convey the flows with upgraded collection systems.

Marquette maintained two collection ponds in the Bench area to collect storm water runoff. Upper pond collects storm water draining from the hills to the south, and when filled to capacity would overflow and drain over land to Lower pond. With no outflow structure to connect the Upper and Lower ponds, the overflow following storm events compounded the issues of erosion and debris accumulation in the watershed management process.

Prior storm sewer collection systems had numerous pipes with insufficient capacity to convey runoff from a 5-year storm event, resulting in storm water surcharge in several locations onto the streets. A 100-year storm event caused significant street and overland flow and unplanned ponding. Plans were to reduce overland flow, debris delivery and pollutant deposits into Bloody Run Creek and adjoining wetlands. A 5 year storm event (3.67 inch rainfall) produces runoff at 28.6 cfs, with a pre-existing system capacity able to manage 7.1 cfs. The improvements to the

system are designed to perform at 200 cfs, which effectively controls a 100 year storm event (6.36 inch rainfall).

Current Estimated Environmental Benefits				
WIRB Funded Practices	Units Installed	Amount Constructed	Annual Storm Event Performance	Annual Debris/Sedim. Reduction
Debris Basin	1	4,486 C.Y.	28.6 C.F.S.	orig. spec.
Conveyance Systems	1	1,499 L.F.	28.6 C.F.S.	orig. spec.
Totals		5, 985	28.6 C.F.S.	

Revised Estimated Environmental Benefits				
WIRB Funded Practices	Units Installed	Amount Constructed	Annual Storm Event Performance	Annual Debris/Sedim. Reduction
Debris Basin	1	5,934 C.Y.	200 C.F.S.	enhanced
Conveyance Systems	1	1,973 L.F.	200 C.F.S.	enhanced
Totals		7,907	200 C.F.S.	

Phase I of the project was designed to address the South East and South Central areas and included infrastructure upgrades for intakes, piping, and reconstruction of the Upper and Lower ponds to significantly increase capacity. Phase II focused on the South West area, which produces water runoff volume equivalent to the South Central and South East areas combined. The capacity of the Upper Pond was considered in Phase I, and the height of the retaining bank was increased to be 3 ft. higher to accommodate for storage capacity of silt and sediment. This pond can be pumped down in low risk periods and allow for efficient sediment removal. Both ponds were cleaned of sediment build-up, existing berms elevated, and linked with an underground overflow pipe to mitigate the impacts of overland flows like silt, sediment and natural debris displacement. This Phase I initiative, vital to accommodate Phase II upgrades and additional flow volumes, provided the ability for Marquette to manage the watershed runoff entering the Upper pond, and maintain Upper pond levels in anticipation of and during major storm events.

Keeping the preservation of local and natural resources and the effective management of the watershed in mind, the major goals achieved are:

- Completed construction of debris basin catchment of Phase II.
- Constructed conveyance systems to integrate with Upper Pond containment structure completed in Phase I.
- Provided a defined route for major storm flows, improving the system's function and assuring effective future conveyance in both a 5-year and 100-year storm events.
- Mitigated unmanaged runoff and decreased the impact of uncontrolled overland flows. Observations made during a 2 inch storm event validated the effectiveness of the improvements; as no damage was witnessed from natural debris and sediments runoff.

- Benefitted from the design of water discharge into wetland area rather than directly into Bloody Run Creek, providing a natural buffer of protection.
- Improved water quality of runoff; preserving local wetlands and Bloody Run Creek.
- Collaborated efforts with projects identified in the Iowa Great Places plan to achieve common goals of local resource preservation and wetland education.
- Conducted public outreach and interaction; led tours including local school educators and students.

Marquette has concluded all construction related aspects of this project and will continue to monitor system performance with respect to future storm events. All citizens as well as visitors to the region will benefit from the outcomes achieved in completion of this WIRB project. Future projects to expand the benefits of Phases I & II into the Pheasant Ridge development could be undertaken should additional program funding be available.

Program Accountability

Emphasis was placed on maintaining involvement with all supporting partners, including those committing resources or assistance, whether in-kind or financial:

- Clayton County Conservation Board
- Clayton County Soil and Water Conservation District
- Residents of Marquette – 17 temporary and permanent easements - \$110,000 value
- City of Marquette - \$417,000 anticipated contribution for Phase II

City representatives promoted the project on a continuing basis to those attending meetings and provided information specifically to impacted City residents and property owners as inquiries were made.

The project committed to having technical experience and measurement tools in place to assure the projects goals were met. The professional engineering services of Howard R. Green were utilized for the preparation of the storm water plan and project construction plans. Authorized and approved contractors were used for Phase I and Phase II. Adherence to federal and state regulations was assured.

Marquette maintained experienced City personnel with appropriate training throughout the planning process. Upper Explorerland Regional Planning Commission (UERPC) has been contracted to provide administrative services for this project; thus saving the need to hire additional staff locally. Larry Liefeld, regional planner, and Dean Hilgerson, City Manager, traveled to Des Moines and met with Jerry Neppel for WIRB administration training at the onset of this project.

With UERPC assistance, progress reports were prepared and submitted to WIRB as required. Project construction activity began in March of 2011, and concluded in July 2011. Ledger reports were filed on 1/15/11, 7/22/11 and 1/15/12 and the annual report on 1/15/12 as well. IJOBS reports were submitted quarterly as required, on 1/26/11, 4/16/11, 7/22/11, 10/21/11 and 1/15/12. The Plan of Work was reviewed and updated as required. Dean Hilgerson, City Administrator, remained in contact with UERPC planner Larry Liefeld via phone calls, email

and face to face visits to discuss and document progress and what was planned for the upcoming month.

Marquette began public education and awareness initiatives for spring construction activities with a public meeting on January 11, 2011. Finalized engineering and plan documents for the project were approved February 10, 2011. The City conducted the public notice process and held a public hearing February 15, 2011. Marquette conducted the project letting March 1, 2011, completed the bid letting and engineering review, and accepted contract bids. The contract was awarded and a pre-construction meeting was held March 23, 2011. Construction began on March 28, 2011, with a progress meeting held on April 14, 2011. Phase II progress was discussed at each City Council meeting through July 19th, 2011, when major construction activity for the project concluded and the last construction cost sheet was submitted to the City. Final punch list items to finish the project including the monitoring of seeding and cleanup were documented.

Financial Accountability

Total costs for Phase I eclipsed \$1.46 million, of which Marquette has invested \$775,000, and IJOBS funding contributed \$677,000. Phase II had costs estimated at \$617,000. Marquette committed to this project, and benefitted from a WIRB grant in the amount of \$200,000.

The City received a mix of local, I-Jobs, and landowner contributions to fund Phase 1 of this project, with a cost of \$1,462,210. I-Jobs funding was received in the amount of \$677,047. In a testament of local community support, 17 permanent and temporary easements for this project, which were initially included in the estimated budget at \$110,000 were obtained from land owners at no cost to the project! The up-front investment of \$274,123 by Marquette for planning and engineering, when combined with the construction estimate of \$401,040, represents a 46% commitment by the City for Phase I. Phases I & II, with a total costs eclipsing \$2 million, was funded by almost 60% of local and in-kind contributions.

Cost effective measures like these allow the City to more efficiently implement watershed management initiatives than the project could have cost-shared on its own. Further analysis of the local watershed in adjacent areas where additional attention is needed will receive priority attention.

A budget amendment request made to re-allocate funding for the lower than expected Mobilization cost for the project, which was a \$24,050 savings. Routing enhancements to the Conveyance system to accommodate landowner requests resulted in additional work and increased cost in the Conveyance and Street Rework line items. Enhancements maintained system performance to reduce sediment and debris delivery to Bloody Run Creek.

1010-005 Bloody Run Creek Watershed Amendment Request (November 2011)

WIRB Funded Items	Current Budget		Budget Modification Request	
	Units	Budget	Units	Budget
Engineering (Admin)	Design - Reporting	\$18,600	Design - Reporting	\$18,600
Mobilization (Admin)	1	\$14,700	1	\$6,575
Street Rework (Admin)	677 sq. yds.	\$11,100	1,681 sq. yds.	\$13,225
Site Preparation (Admin)	1	\$11,650	1	\$10,650
Debris Basin (Practice)	4,486 cu.yds.	\$45,050	5,934 cu.yds.	\$47,050
Conveyance (Practice)	1,499 lin.ft.	\$98,900	1,973 lin.ft.	\$103,900
Totals		\$200,000		\$200,000

The final budget for the Bloody Run Creek project came in \$123,425 over the original projected budget. The biggest factor for the overage was due primarily to more street removal and repair than originally designed. Due to unforeseen circumstances regarding the routing of conveyance from the debris basin to the Upper Pond, an alternate route had to be designed in order to accommodate the rights of a landowner. This resulted in the removal of street pavement and other residential driveways. The performance of the conveyance system was not impacted in any way, but required a larger investment in the replacement of current infrastructure than originally planned.

1010-005 Bloody Run Creek Watershed Total Project Funding

WIRB Funded Items	Original Budget		Final Costs Budget	
	Units	Budget	Units	Budget
Engineering (Admin)	Design - Reporting	\$58,400	Design - Reporting	\$69,585
Mobilization (Admin)	1	\$45,300	1	\$20,575
Street Rework (Admin)	677 sq. yds.	\$33,000	1,681 sq. yds.	\$107,962
Site Preparation (Admin)	1	\$36,400	1	\$42,030
Debris Basin (Practice)	4,486 cu.yds.	\$137,900	5,934 cu.yds.	\$143,322
Conveyance (Practice)	1,499 lin.ft.	\$306,000	1,973 lin.ft.	\$356,951
Totals	WIRB % = 32%	\$617,000	WIRB % = 27%	\$740,425

Public Outreach

This project was envisioned to be a focal point of future endeavors sharing a common goal of promoting environmentally friendly and economically sound watershed management practices. Marquette conducted information and education programs to increase awareness of Bloody Run Creek and adjoining wetlands' water quality issues to watershed residents, visitors and the local community.

On a monthly basis during city council meetings, the project's progress was reviewed with residents of Marquette. An information bulletin board was maintained for the public to review on a walk in basis at city hall as well. Data collected on the performance of the storm water management system by monitoring debris build-up, storm water surcharge events and overflow paths will be made public and used as an educational tool to inform watershed residents about the ongoing efforts made for watershed management initiatives in the area. Made contact with Tim Englehardt, Clayton County Conservation, to discuss project and review ongoing goals.

Education efforts were taken to entice residents and landowners to implement water management practices to reduce the probability of silt and natural debris runoff from negatively impacting the local environment. Photos of visit by local school students included a tour of the construction project, debris basin, Upper Pond area and discussion of wetland protection and provided to local media. The North Iowa Times, Marquette's local newspaper, included project updates along with city council meeting information monthly, and published a major news story (including photos) on completion of Phases I and II July 13, 2011. Issue 27, Volume 155.



Marquette City Administrator Dean Hilgerson leads a tour with local school children in September 2011 on the Phase II project activities and resulting benefits to Bloody Run Creek.

Along with the runoff and flash flood mitigation initiatives, improvements to this watershed management system will allow the community to develop and enhance opportunities in conjunction with the planned educational center. Designated as an Iowa Great Place, Marquette also plans to create an educational park, inclusive of a trail system and learning center that focuses on wetlands and their value as a unique natural resource. This project will create jobs for participating contractors which will provide work for existing employees, with possible permanent jobs to follow in conjunction with the completion of the Iowa Great Places project.

This project includes an innovative and unique design, implementing a wetland buffer between the storm water outlet area and Bloody Run Creek. The wetland buffer performs well in the management of storm water; improving the quality of the water prior to entering Bloody Run Creek. The watersheds have seen planned transformations as well. Several bio-swales have been developed to channelize flows to the Lower pond, and the connection of the Upper pond to the Lower pond via underground pipe has been a positive approach to minimizing erosion and debris build-up while increasing our capacity to handle excess storm water. Residents have been pleased with the results of these innovations thus far, and are excited to see the project proceed to completion.

A final project survey will document landowner and operator views of the project and will be compared to the pre-project survey results. Photographic documentation will accompany the project and be on file.

PROJECT BUDGET FOR WIRB FUNDING

BUDGET FOR YEAR # **SUMMARY**

PROJECT NAME: Phase II - Blood Run Creek Watershed Management Plan

Applicant City of Marquette

EXPENSES			REVENUES					
Expense Category	Number, Acres or Other Units	Line Item Cost	Line Item Revenue	WIRB	Funding Source 1	Funding Source 2	Funding Source 3	Funding Source 4
1 Mobilization (LS)	1	\$20,575	\$20,575	\$6,575	0	0	0	0
2 Steel Rework	1	\$107,962	\$107,962	\$13,225	\$14,000	\$94,737	\$0	\$0
3 Site Prep & Finish Grade	1	\$42,030	\$42,030	\$10,650	\$31,380	\$0	\$0	\$0
4 Engineering	1	\$69,585	\$69,585	\$18,600	\$50,985	\$0	\$0	\$0
5 Debris Basin	1	\$143,322	\$143,322	\$47,050	\$96,272	\$0	\$0	\$0
6 Conveyance System	1	\$356,951	\$356,951	\$103,900	\$253,051	\$0	\$0	\$0
7 0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8 0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
9 0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10 0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
11 0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
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24 0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
25 0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
26 0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Totals		\$740,425	\$740,425	\$200,000	\$540,425	\$0	\$0	\$0

A line item cost will equal the line item revenue on the same line.
 A line item revenue will equal the sum of the revenues on the same line.
 Include in-kind contributions as revenue, identified by source. List as in-kind.
 If cost-sharing is used, quantify the funds provided as cost-share in a column. Give the source name and label as cost-share.
 Insert name of funding source in Columns F through I. Add additional columns as needed.
 DO NOT highlight cells or use ink colors other than black.

Total Project Cost	\$740,425
Total WIRB Cost	\$200,000
% WIRB Contribution	27