

FINAL REPORT

United to keep our lakes alive!



**DICKINSON COUNTY
CLEAN WATER ALLIANCE**

Project 5028-010 Urban Watersheds of Dickinson County Lakes and 303(d) Waters

Preparer's Signature:

[Handwritten Signature]

SWCD Chairperson's Signature:

Mark Ingwersen

Watershed Improvement Review Board
(March 1 2006 to February 28, 2009)

Final Project Report

The term of the grant agreement.

- March 1, 2006 to February 29, 2009

Complete financial ledger for the term of the grant agreement.

- See attachment 1

Financial Accountability

Summary: Watershed Improvement Funds				
Grant Agreement Budget Line Item	Total Funds Approved (\$)	Total Funds Expended (\$)	Available Funds (\$)	Matching Funds(\$) *
Project Administration	24,500	26,500	0	30,750
Salary/Benefits	51,800	47775.00	4025.00	
Information/Education	15,500	13,873.80	1626.20	
Equipment	3,000	4,002	0	1,002
Low Impact Development Priority Areas	338,000	230,485.08	107,514.92	
Low Impact Development non-priority area	58,000	54,619.01	3,380.99	
Totals	486,800	376,179.89	110,620.11	31,752
Difference	0	0	116,547.11	

*Dickinson SWCD

Explain significant differences between the approved application budget and actual amounts expended of Watershed Improvement Funds and any unspent balance.

The following differences in the Grant Agreement Budget Line Items were experienced (with explanation as to why the difference was experienced):

- Project Administration (\$2,000): A delay in prioritizing areas into low and non-priority areas. The \$2,000 difference was paid to a contractor to help speed the process up. That \$2,000 came from Information and Education.
- Salary/Benefits (\$4,025): The end of the agreement with Iowa State University caused the project to lose the engineering assistance. We contracted with a local engineer to complete the planning and design requirements so we could attempt to expend the remaining funds for the project. The new engineer did complete designs on systems but not as many systems as we had anticipated prior to the weather causing a stop to project construction. We then discontinued the design portion of the project as no more projects could be built.
- Information and Education (\$1,626.20): I&E funds were not spent in a great amount prior to 2008. A good deal of success was achieved during the summer of 2008 using television, radio, and print media. Four-thousand dollars was transferred by the WIRB after a request to increase our **salary and benefits** line item.

- Equipment (\$1,002): The equipment purchase was more costly than had been anticipated. Matching funds were located locally (Dickinson SWCD) and the equipment was purchased.
- Low Impact Development, Priority Areas (\$107,514.92) and Low Impact Development, Non-priority Areas (\$3,380.99): The Low Impact Development line items were not spent for two primary reasons. First, several times the project funds were obligated only to have the landowner cancel the request for funds because of the lack of contractors and time constraints in building the practice. Time was a major consideration due to the priority areas not being identified. Secondly, an early fall caused the cancellation of many projects that were scheduled for December and possibly early January. At the first part of December, however, there was 14 to 20 inches of hard frost in the ground making it extremely difficult to complete construction of these projects much less establish vegetation to complete the practice.

Total Project Funding

Funding Source	Cash		In-Kind Contributions		Total	
	Approved Application Budget (\$)	Actual (\$)	Approved Application Budget (\$)	Actual (\$)	Approved Application Budget (\$)	Actual (\$)
WIRB	486,800	382,282.48			486,800	382,282.48
Dickinson SWCD	40,231	40,590			40,231	40,590
Dickinson SWCD WQC	113,056	174,000			113,056	113,056
Dickinson CCB, Naturalist			600	600	600	600
NRCS			48,510	48,510	48,510	48,510
Land and Business Owners	422,000	351,267.72			422,000	351,267.72
Iowa DNR, In-kind			159,000	159,000	159,000	159,000
Totals	1,062,087	948,140.20	208,110	208,110	1,270,197	1,095,306.20

Watershed Improvement Fund contribution: Approved application budget: 38 %
 Actual: 34 %

The differences in the approved application budget and actual dollars spent are in favor of the WIRB board. WIRB funds were not expended in as great a quantity as anticipated because of reasons identified above. However, contributions to the project were greater than originally anticipated so a greater match to expense ratio was realized. The approved budget was for 38% of the budget to be WIRB funds and the actual expense ratio was only 34% of the budget.

Environmental Accountability

The majority of construction of the Low Impact Development practices took place during the summer of 2008 and fall of 2008. Water sampling was not completed on any of these projects but other projects within the Iowa Great Lakes do have water sampling ongoing. Monitoring of the other projects and similar areas prior to construction would be a good idea to identify how well these LID practices work in the Iowa Great Lakes.

Reduction Results for the Infiltration Basins:**

Source: **Estimating Load Reductions for Agricultural and Urban BMP's**

"Pollutants Controlled Calculation and Documentation for Section 319 Watersheds Training Manual"
(Michigan Department of Environmental Quality, June 1999)

Filtering results (using modeling) for 101 LID Practices in the Iowa Great Lakes

Reduction of Total Suspended Solids = 66.9 T/yr

Reduction of Total Nitrogen = 154 lb/yr

Reduction of Total Phosphorus* = 77 lbs/yr

Water filtered through practices = > 1.1 million gallons/yr

* Much discussion has been held in the Iowa Great Lakes Region in regards to the primary pollutant associated with algal growth and poor water conditions in these lakes, Phosphorous. The level of Phosphorous that is carried to a lake is at issue and depending upon the modeling that is used there could be significant differences in the reduction of Phosphorous. Using the Generalized Watershed Loading Function (GWLF) model, the Phosphorous loading in this region should be about 5.9 lbs of P per ton of sediment. Using that modeling the Phosphorous reduction from these 101 LID practices would be **395 lbs** of Phosphorous per year. Since Phosphorous is our nutrient of concern, the difference in models is significant. In our lakes 395 pounds of P could grow up to 395,000 lbs of algae per year in addition to the algae already growing in the lake.

** Sufficient monitoring data on Urban BMP's is not currently available for Iowa for modeling. This resource was found through the Center for Watershed Protection website.

Pollutant removal of BMP's treating stormwater from Schueler, et.al at the Center for Watershed Protection

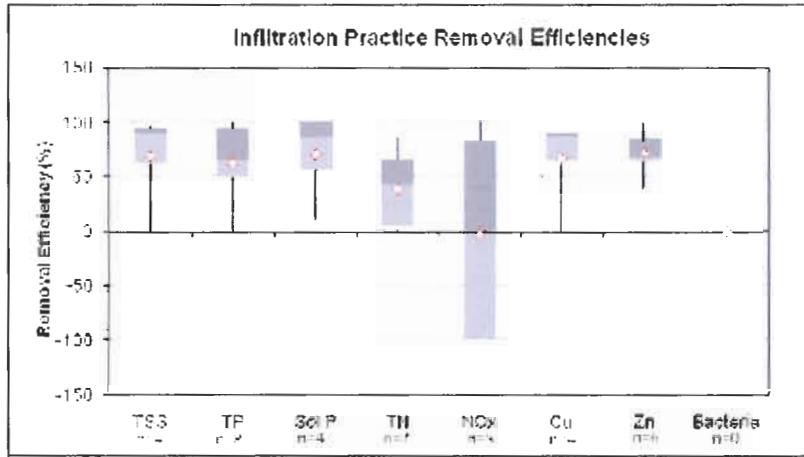


Figure 6. Infiltration Practice Removal Efficiencies

Table 6. Infiltration Practice Removal Efficiency Statistics								
	TSS	TP	Sol P	TN	NO _x	Cu	Zn	Bacteria
Median	89	65	85	42	0	86	66	N/A
Min	0	0	10	0	-100	0	39	N/A
Max	97	100	100	85	100	89	99	N/A
Q1	62	50	55	2	-100	62	63	N/A
Q3	96	96	100	65	82	89	83	N/A
Number	4	8	4	7	5	4	6	0

The plots and tables summarize the following features from the data:

- Median Efficiency = where light grey and dark grey bars meet
- Average Efficiency = small diamond
- 25th Percentile = bottom of light grey bar
- 75th Percentile = top of dark grey bar
- Highest value = top of line
- Lowest value = bottom of line
- Number of studies analyzed for each pollutant = n (located below the pollutant label)

The plots and tables show removal efficiencies for the following pollutants:

- TSS = Total Suspended Solids
- TP = Total Phosphorus
- Sol P = Soluble Phosphorus (ortho-phosphorus and dissolved phosphorus)
- TN = Total Nitrogen
- NOx = Nitrogen as Nitrate (NO₂) & Nitrite (NO₃)
- Cu = Copper
- Zn = Zinc
- Bacteria = Bacteriological indicators (fecal streptococci, enterococci, fecal coliform, *E. coli* and total coliform)

Summary: Practices and Activities

Practice or Activity	Unit	Approved Application Goal	Accomplishments	Percent Completion
LID Practices	No.	125	101	81
Television Infomercial	No.	300	300	100
Radio Advertisements	No.	360	360	100
Print Media Adds	No.	12	12	100
Kiosk Purchase	No.	1	1	100
Project Signs	No.	80	80	100

The major concern with most of the Lakes in Dickinson County and the Iowa Great Lakes, in particular is sediment and phosphorous loading. Because these practices were installed on existing construction, the problem of sediment was not one of concern. These LID Practices were planned and built to be a retrofit of existing development. The LID practices do remove a significant sediment load from runoff water, however. The sediment, of course, carries with it significant nutrient and pollution loading. In addition, a significant volume of trash is captured in these structures to be cleaned out at a later date by the landowner.

As the contractors, information and education program, and landowners documented success in building these LID practices it became a very popular thing for residents of the Iowa Great Lakes to look into. Many of the people who made contact with the district and expressed a desire to build a LID practice did so because of word of mouth and a contact with a previously constructed practice.

In addition to the sediment and nutrients that are filtered from water traversing through these practices it should be noted a significant reduction of water temperature is found to occur with these structures. The amount of water that is filtered through these practices is estimated to be 1.1 million gallons of water per year. Each gallon that is filtered through these LID practices is then released slowly to a water body or to the ground water. There are many side benefits to having constructed these LID practices in addition to the nutrients and sediment that are filtered.

The cultural awareness and educational opportunities that has occurred because of this project will affect generations to come. The awareness these rain gardens in many ways may be a bigger impact than the pollutants that are removed from runoff each year. Each person that is aware of why rain gardens are built have been very conscious of trying to reduce impervious surface or working with new plans to decrease the amount of impervious surface.

Program Accountability

The project Information and Education campaign became a very effective tool in “selling” the program. 10-minute info-mercial was shown on Lakes T.V., 30-second commercials were aired on local radio stations, and printed ads were published in newspapers. While the cost share for LID practices was only available within watersheds of Dickinson County, the info-mercials, radio ads, and newspaper ads reached an additional 50,000 residents in a 9-county area surrounding the Iowa Great Lakes and up to 100,000 visitors to the Lakes Region on many weekends.

The project was launched in 2006 with the idea the Iowa Great Lakes Water Quality Assessment would be complete and priority areas could readily be identified. However, the priority areas could not be identified immediately and so the project was stalled until the summer of 2008. During the summer of

2008 priority areas were identified and the project moved forward and was readily accepted by many as a way to improve their property with an attractive “garden” that reduced runoff to the lake.

A lesson learned while implementing this project was many times people will sign up for a popular project because they want to belong or they want to participate but they will not carry through. If one thing could be changed about this project, it would be to pre-qualify the landowners a bit more to ensure they were serious about going through with a project. Many times a landowner would not cancel the project until a design had been done, approvals had been done by the commissioners, and cost estimates had been prepared. Those items were 90% of the workload of the district. Unfortunately thirty-two applications were received went entirely through the process only to be dropped for one reason or another. That is nearly half of the applicants.

A second lesson learned that is significant, and one that caused some drop out of applicants, is the availability of contractors in the Iowa Great Lakes to complete the work. Because our construction phase had to be squeezed into a 6-month period, the number of contractors for the number of jobs was not adequate. The contractors did the best they could but simply ran out of time due to an early freeze-up. The ability to extend this project would have been one that would have allowed this project to become even more successful than it was.

This project could and should be replicated in some form elsewhere. A few program changes that would be recommended include:

- Set a maximum cost share amount on some if not all practices
- Require Engineering to follow the SUDAS manual’s suggestion of 10% pervious surface for an impervious areas
- Require a plan to cover the entire property instead of just “the problem areas”. Sometimes the evident problem areas are not the only problem areas.