

# **Coulee Baton Microwatershed Rural Sewer Improvement Project**

## **FINAL REPORT**

### **EXECUTIVE SUMMARY**

The Coulee Baton Microwatershed Rural Sewer Improvement Project was developed in response to a larger plan focusing on the Gulf of Mexico Hypoxic Zone using a microwatershed management strategy. The Coulee Baton Microwatershed receives no drainage inputs from upstream sources – its inputs are generated from within – making it an ideal watershed in which to study and improve water quality. Failing home septic systems within the microwatershed were found to be a major contributor to NPS pollution in its waterways. Assessment within the watershed revealed that about 70% of the homes therein were discharging undertreated sewerage into the drainage ways. The Coulee Baton Microwatershed Rural Sewer Improvement Project was designed to minimize that contribution.

Because the Coulee Baton Microwatershed is self-contained and predominately residential, the logical presumption can be made that replacing 70% of failing sewer systems therein will result in significant reductions in NPS, especially fecal coliform contamination. Reporting specific pre- and post-installation levels of contamination were not required of this project, but are part of the larger effort within the same watershed.

Project tasks centered on goals that are consistent with Louisiana’s Nonpoint Source Management Plan for 2000. The project sought to outreach and educate homeowners about their septic systems, and their responsibility in maintaining those systems in order to protect the water entering and exiting the microwatershed. It further sought to demonstrate three effluent reduction (ER) systems, which have been mandated in recent years for all new septic system installations. Ultimately the project sought to offer homeowners cost-share assistance in the repair or replacement of their aging, failing home sewer systems. This project could be replicated in any small watershed that is predominately residential; it could also be tailored to reduce the sewerage effluent of commercial facilities.

Practical details and logistics of achieving deliverables were discussed and agreed upon in several meetings/ consultations between DEQ representatives, DHH representatives, Natural Resources Conservation Service (NRCS) specialists, Vermilion SWCD employees and board members, and Acadiana RC&D Council members and staff. These entities worked cooperatively throughout the duration of this project. Promotion and support for the project also came from public officials and from the public at large.

The first contract with DEQ became executable in July 2008 with a project expiration date of July 2009. The project contract was amended about half-way through, to include more funding from DEQ so that a greater cost-share percentage could be provided to homeowners. That amended contract became executable in September 2009 and the deadline was extended until September 2010. In total funding from DEQ was finalized at \$445, 873 – \$310,319.50 (68%) of that was utilized. Match totaled \$79,686 and was provided in homeowner contributions, in-kind services and volunteer time – \$58,500.31 (73%) of match was committed by project end date. The goal was to replace up to 115

home sewer systems within the watershed. Eighty systems (69% of the goal) were replaced by project end date.

The main challenge to the success of this project was not in technology transfer or information transfer, but in motivating homeowners to participate. The technology is not new. The effluent-reduction systems that were demonstrated are approved by the Department of Health and Hospitals well-known to professional installers. Reaching and convincing individual homeowners was the most difficult and least predictable task of this project. Some homeowners understand their role in water protection, and readily accepted an opportunity to bring their systems into compliance with DHH regulations. Others were unconvinced that their systems were problematic and seemed suspicious and wary of the process. Obtaining voluntary consent in those instances was simply impossible.

Project was promoted on the council website, in newspaper advertisements and articles, by placing posters and printed materials at public buildings, by conducting door-to-door campaigns, by hosting public meetings, making public presentations and by word of mouth. Information can be gleaned from our website, from our newsletter and from presentations we have made or will make.

For organizational purposes, this comprehensive report is formatted similarly to the project proposal according to *Tasks* which outline all deliverables. Supporting documentation is submitted and referenced as *Exhibits* that correspond to each task.

### **Project Element I – Outreach and Education**

This project began with outreach. An information packet was mailed to each home within the watershed, and to licensed septic system installers in the area. The homeowner information packet included an introductory letter, a project timeline, a list of required documentation, an application, and a hold harmless agreement. Refer to *Exhibit I (a)*. An information packet for licensed septic system installers/contractors included an introductory letter *Exhibit I (b)*, and a copy of the homeowner letter. The purpose of the mail outs was primarily to announce the program and to encourage attendance at two town hall meetings.

Notice of the town hall meetings was advertised in two local newspapers as articles, as public service announcements (PSAs) in the newspapers' calendar of events, and in electronic newsletters. *Exhibit I (c)*. The meetings were scheduled one week apart, one in the morning and one in the evening to accommodate different schedules. At these town hall meetings, details of this project were communicated by power point. Emphasis was placed on water quality within the microwatershed, and the impact of home septic systems. The three effluent reduction systems (previously chosen) to be demonstrated and the principles of each system's expected performance were introduced. *Exhibit I (d)*. A total of about 15 – 20 homeowners attended these meetings, which were held at the Abbeville Library. *Exhibit I (e)*. Attendees were given an opportunity to ask questions and to apply to receive one of the three demo systems at no cost. As a result of these meetings, sixteen applications for demo systems were submitted. All sixteen sites were visibly inspected and ranked according to the previously established criterion. Ultimately three home sites were chosen to have a demo system installed, and a bid process started. *Exhibit I (f)*.

Another packet (with a letter, ER system schematics and an agreement) was sent out to contractors for the purpose of acquiring bids to install the demos systems. The bids were reviewed and awarded according to cost. *Exhibit II (a)*.

Once the demo systems were installed and time was allowed to observe their functionality, the Public Field Day was held to further outreach efforts. More PSAs were sent out, invitation letter was sent to parish officials, and a door-to-door delivery of fliers inviting homeowners to attend the public field day was conducted. *Exhibit I (g)*.

Roadside signs were placed at each demo site, and remained in place for about six months as advertisement to those traveling in the vicinity.

In spite of these early outreach efforts very few homeowners (4) initially responded to the 60 /40% cost-share incentive. DEQ requested investigation via survey to ascertain the reason for such low participation. Addresses were updated and a total of 234 surveys were mailed out to residents within the watershed. About 20 surveys were returned as undeliverable and about 30 responses to the survey were received. An overwhelming majority of the respondents stated that they could not afford the 40% required and that they would be more inclined to participate if a higher percentage was offered. Documentation of this effort exists in a supplemental file, but its size prohibits its reproduction on paper; it is available for viewing at the Acadiana RC&D office.

DEQ investigated the potential for increased funding. In anticipation of an amended contract, revisions were made to the original budget and deliverables, and a strategic timeline was devised to reintroduce the program at a higher cost-share percentage. Revisions were also made to all original letters and agreements for homeowners and contractors. In the months of contractual review, Acadiana RC&D promoted the program at various public settings – Earth Day events and civic club meetings. Vermilion SWCD continued to promote the program and offer assistance with the permitting process. During this time, only one more homeowner participated at the original cost share incentive.

As soon as the amended contract was received, partners attended the Vermilion Parish police jury meeting to ask for support in promoting the new 90/10% cost share opportunity. Advertisement began to announce the ninety percent cost share program and to encourage participation at another scheduled public meeting. Newspaper articles were printed and large maps and fact sheets were placed at public places in Kaplan and Abbeville. A door-to-door campaign to deliver revised homeowner packets was conducted throughout the watershed. (Approximately 150 homes were visited. An estimated 35 homes already have upgraded systems installed and are in compliance with current DHH regulations. It can thus be surmised that about 115 homes would be served by this program.) An updated list of licensed installers was obtained and a revised packet was mailed out to approximately 60 contractors. *Exhibit I (h)*. Homeowners who had participated at the 60/40% level were reimbursed an additional 30% of the installation of their ER systems.

Within one month from the receipt of the amended contract, a public meeting was held. About 48 citizens were in attendance, representing about 34 homes. Attendees were re-introduced to the project and informed of the reason they were being given this opportunity: to protect the waters of the Coulee Baton Microwatershed. The three effluent reduction demonstration systems were detailed, with emphasis placed on the fact that (in this round of funding,) reimbursement would be restricted to the installation of these three systems only. Attendees were given timelines, application packets, and

time for questions to be answered and concerns to be addressed. *Exhibit I (i)*. Consequently, 18 applications were handed in that night, and within the first two week application pool 52 applications had been received at the Vermilion Parish SWCD office. More phone inquiries and applications continued to be managed for the duration of the project.

### **Project Element 2 – Effluent Reduction (ER) Systems Demonstration and Public Field Day**

Much consultation (with Department of Health and Hospitals, DEQ, project partners, NRCS personnel, experienced septic system installers) and detailed consideration were invested in the decision to demonstrate three ER systems: a Rock Plant filter system, and Spray Irrigation system, and a (conventional) Gravel Field line. In response to initial outreach efforts – newspaper article, advertisements, mail outs and town hall meetings – 16 applications were submitted to receive one of the three ER systems agreed upon by project partners. All sites were visited, ranked and scored according to 12 previously agreed upon criterion. The homeowners of the three sites with the highest rankings were notified, and the homeowners agreed to install one of the three demo systems, considering their own lifestyle preferences. Installers were asked for bids in a second packet of information. *Exhibit II (a)*. Once the bids were awarded, the installation process began.

The first system to be installed was the Rock Plant Filter system. The rock bed was allowed to gather water for about two weeks before the wetland plants were installed. Upon installation of the plants, the homeowner was given instructions about care and maintenance of the bed. The owner has reported no problems with the function of the system thus far. An inspection of the wetland plants one year after installation revealed that the plants did not thrive. An NRCS expert in these systems visited the site, surmised that the plants were not getting enough moisture, and recommended that the liner be replaced with an impermeable liner so that the rock bed would hold water longer. The original installer agreed to replace the liner with 4 layers of 4ml plastic sheeting. Two weeks later new plants were installed.

The second system installed was the gravel field line. Due to lot size constraints, and with DHH (verbal) instruction a 30' "L" shaped extension had to be added and tied into the field line. The installation was completed without any other incident. The owner reports satisfaction with its function.

The third demonstration system installed was the Spray Irrigation system. There were several problems with this system (components) from the beginning. A larger pump chamber (secondary holding tank) had to be installed so that the system would cycle on at longer intervals; the pump in the pump chamber was not powerful enough to pressurize the water through the lines to the spray heads and had to be replaced; one spray head broke away from the irrigation line and had to be replaced; the inline filters were clogging, so the primary treatment tank had to be pumped just four months after installation; the owner must be willing to check inline filters and chlorinator tablets regularly. Since February 2009 the owner reports no further problems. *Exhibit II (b)*.

Inherent in any demonstration is a learning curve and as a result of these installations, the following upgrades are being recommended to the installers now that the amended contract is being executed:

- Spray Irrigation System: Install a larger capacity pump chamber (at least 300 gal for a 500 gallon primary treatment tank system), a ½ hp submersible turbine pump for the pump chamber, two in-line filters - one on either side of pump chamber to protect spray heads from clogging.
- Rock Plant Filter system: Install an impermeable liner up to 16 ml in thickness.
- Gravel Field line: maximum width and depth in regulatory guidelines/schematics.

Refer to *Exhibit I (h)* for schematics and suggested upgrades.

Approximately six weeks after the installation of the three ER demonstration systems, a Public Field Day was held. The event was publicized in local newspapers, to elected officials, and with a door-to-door distribution of fliers. *Exhibit I (g)*. Approximately 60 people were in attendance for the field day, including project partners, homeowners, licensed installers, banking institutions, and volunteers. Information was presented in Power Point, emphasizing homeowner responsibility to watershed health and the three ER systems being promoted. Cost-share program parameters were reiterated. Watershed health was emphasized at several booths that were set up, and children’s activities were included. Participants were given an opportunity to ask questions, peruse information booths, and fill out cost-share applications. Banking representatives were on hand to offer the potential of interim loans to qualifying applicants. Attendees were given an opportunity to complete a survey; only about seven surveys were returned, but all indicated that valuable information had been attained. Finally, attendees were invited and transported to the sites where demo systems had been installed. *Exhibit II (c)*.

### **Project Element 3 – System Replacement Cost Share Program**

This phase of the project began with the aforementioned Public Field Day. In spite of the efforts to iterate program benefits for the watershed and for septic system owners, only four ER systems were installed within the first four (4) months of the cost-share phase. One more was installed five months later, in spite of the fact that Acadiana RC&D and Vermilion SWCD continued to promote the program, offer application assistance and help with the permitting process. *Exhibit III (a)*.

A meeting and several discussions were held with project partners to determine the best course of action. It was decided that a survey would be sent out, and if necessary, a follow-up phone survey conducted. Results of the mail out were as follows: More than two hundred and thirty surveys were mailed to addresses provided by VSWCD. Twenty were returned as “undeliverable”. If possible, address corrections were made and the surveys resent. Just fewer than 30 were returned completed, a vast majority of which indicated that they did not participate because they could not afford 40% of the costs. Meanwhile additional funding was sought by DEQ project administrators.

Upon learning of the availability of additional funds, and while final signatures on the amended contract were imminent, project partners once again convened to discuss a timeline of activities to launch the revised cost-share component of this project. That timeline was followed and is reported on page 6 below. Homeowners who had participated at the 60/40% level were reimbursed an additional 30% of the installation of their ER systems. *Exhibit III (b)*.

It was agreed that the application process would be conducted in two two-week long application “pools” in order to track anticipated spending of project funds. At this point, unused funds were not anticipated.

Following the publicity and outreach efforts as documented in *Exhibit I (h)*, a second Public Meeting was held within one month of receiving the executable amended contract. Watershed health protection was emphasized, program parameters were explained, as were details of the three systems to be installed. Homeowner packets were distributed along with a timeline specifying deadlines for application and installation. *Exhibit I (i)*. Participants were given a chance to ask questions and air concerns. Installers were on hand to offer services. Participants who asked were given assistance in filling out applications. Eighteen applications were completed, and within 1 week more than 30 applications had been submitted to Vermilion SWCD. By the end of the first two week application pool, 52 applications had been received, but only 48 were within the established boundaries of the microwatershed.

In July a final attempt to garner more homeowner participation was conducted in a final door-to-door campaign. Approximately 35 homes were visited along five roads within the microwatershed, but the attempt yielded not a single positive response. *Exhibit I (j)*.

As long as funds were not depleted, the application process continued. The original June deadline for all installations was extended to August 30, 2010 allowing for weather delays and to allow for final report preparation. By the end of August, total of 80 installations were completed – roughly 69% of the estimated number of homes within the watershed without properly functioning septic systems. *Exhibit III (c)*.

Eight applications have been received from homeowners who reside just outside the boundary. The possibility of including those homes (for the sake of utilizing more project funds) was dismissed because a contract revision would have been required, and project time constraints would not allow for that process.

#### **Project Element 4 – Reporting**

A total of 13 monthly reports, 8 quarterly reports, and 1 annual report have been submitted (along with invoices requesting reimbursement) to DEQ as per contract stipulations. *Exhibit IV (a), (b), and (c) respectively*.

#### **Conclusion**

The Coulee Baton Microwatershed was an ideal location for a project of this kind because it is self-contained and predominately residential. The deliverables of the Coulee Baton Microwatershed Rural Sewer Improvement Project included homeowner education, effluent reduction (ER) demonstration systems, and a cost-share incentive to repair or replace aging or failing home septic systems with Department of Health and Hospitals (DHH)-approved ER systems.

Education and outreach efforts were largely successful, with approximately 17,000 residents in the immediate area of the watershed being exposed to information regarding watershed health as it relates to septic systems. The selection and installation of the three ER systems chosen for

demonstration resulted in homeowner satisfaction and greater public awareness of the advantages of ER systems. The cost-share incentive was initially not deemed successful. In spite of early comprehensive outreach efforts and increased citizen awareness, only five homeowners participated at the 60/40% cost-share level. At the request of DEQ project managers, a survey was conducted to determine the reason. Surveys overwhelmingly indicated the majority of homeowners were stymied by the cost of installing even the most basic new home septic system at the 60/40% cost-share level. Once an increase in funding was secured, homeowner participation increased. By project deadline, homeowners had 80 ER systems installed, nearly 70% of the estimation of homes with failing systems in the microwatershed. They subsequently received up to a 90% cost-share incentive to have an approved ER system installed. The logical presumption can be made that a replacement percentage as high as 70% will result in significantly reducing NPS contaminants, especially fecal coliform.

This project could be replicated in any small watershed that is predominately residential. The challenge of such replication lies not in technology transfer or information transfer, but in motivating homeowners to participate. Reaching and convincing individual homeowners was the most difficult and least predictable task of this project. Some understand their role in water protection and readily accepted the opportunity to bring their systems into compliance with DHH regulations. Others were unconvinced that their systems were problematic and seemed suspicious and wary of the process. Proper education is necessary in order to motivate individuals to action, but vary rarely will education and outreach garner a voluntary response of 100%.

Although this project focused on residential systems, the three demonstrated effluent-reduction systems may be scaled for use by business or commercial ventures. For example, rock plant filter systems may be used behind commercial buildings if there is adequate drainage and room for “wetland” construction. Whether used for residential or commercial purposes, the ER systems may be “upgraded” in order to optimize functionality. Such upgrades could be made at the discretion of the installer and homeowners as long as the system remains in compliance with state mandates.