Wisconsin Department of Natural Resources

Final Report to the

U.S. Environmental Protection Agency

#H-040-08 and #H-041-08 State Innovation Grant

Regarding

Environmental Management System (EMS) Training and Auditing Services for the Dairy Sector

Background

Urban and rural nonpoint source pollution is the leading cause of water quality problems in Wisconsin, degrading or threatening an estimated 40 percent of the streams, 90 percent of the inland lakes, many of the Great Lakes' harbors and coastal waters, many wetland areas and substantial groundwater resources in Wisconsin. Polluted runoff contributes to habitat destruction, fish kills, reduction in drinking water quality, harbor and stream siltation, and a decline in recreational use of lakes. In April 1993, an outbreak of cryptosporidium in Wisconsin infected more than 400,000 people and killed 54. Agricultural runoff was the suspected culprit, but the adopted solution was to spend $89 million improving urban drinking water supplies.

In Wisconsin, approximately 1% of our 15,000 dairy farms are required to have water permits and comply with existing confined animal feeding operation (CAFO) regulations. This means 99% of dairy farms do not have any environmental permits at all and are largely unregulated by the Wisconsin Department of Natural Resources (WDNR). As a practical matter, the only short-term prospect for Wisconsin to address our agricultural runoff issues on the smallest 99% of farms is by supplementing, rather than expanding, the permit program.

WDNR has been working to address superior environmental performance for several years. The Joyce Foundation funded phase one of Dairy Gateway in 2003. Dairy Gateway was a collaboration ofboth government and non-government agencies that focus on agriculture, land management, and water quality. The project partners had several underlying objectives which supported these goals, but first among them was to generate support and enthusiasm for a shared vision of communities united around ideas and specific actions that support a strong dairy industry while at the same time protecting and restoring natural resources. To that end, grant funds were used to build and strengthen a network of collaborative problem solvers that are inspired and capable of achieving the vision, and to develop local leaders within the network. Funding was also used to begin testing some of the processes that could deliver desired environmental results. Finally, grant funds were used to enable disinterested and credible third parties to witness, document, and assess the successes and failures of the initiative.

This process was to a certain extent fairly successful but a number of critical and contentious issues emerged. Specific examples of on farm practices and the continued operation of Environmental Management Systems speak to the environmental results that are produced and the ongoing attention given to environmental management when the system is in place. The first was a series of farm-related incidents concerning manure spills. The second was a rejection of the decision making process. The strategy for the second phase was modified to change project management. A steering committee was created to manage issues and decision making for the Dairy Gateway project. Members included most of the project partners and resulted from an early recognition that the project would not be perceived as credible by some parties and was not likely to succeed if DNR made all the management decisions. The Steering Committee was formed in the summer of 2006 and formed the Agricultural Watershed Improvement Network (AWIN). In 2007, WDNR collaborated with Dairy Business Association to formulate the Green Tier Advancement Project (GTAP) also known as the Charter. Both entities worked together to form partnerships and build trust with producers through networking opportunities. Key networking areas included training, participation in the Interested Persons Group, auditing and technical assistance.

The application of Environmental Management System (EMS) principles to the dairy sector is still viewed by many as hypothetical or foreign, but in fact WDNR and others in Wisconsin have been working for several years to develop capacity and relevant local examples. This State Innovation Grant (SIG) project is the fourth in the series of efforts in Wisconsin to determine how disparate systems can come together under an EMS as it related to actual on-farm practices that address superior environmental performance bringing with it a more cohesive program.

The purpose of this grant was to build upon the EMS knowledge and capacity developed in Wisconsin, and move beyond the feasibility or "proof of concept" stage to test the full potential of an EMS as a tool for environmental improvement in the dairy sector. The project also worked to link dairy producers using an EMS with dairy processors using an EMS to forge supply-chain relationships that would drive and reward environmental improvement.

WDNR released two separate Requests for Proposal (RFP) relating to EMS services. The first focused on EMS training and consulting for the dairy sector. The second focused on EMS auditing services for the dairy sector. The EMS Training and Implementation RFP awarded to Perfect Environmental Performance, LLC (PEP) in April of 2008 and ran through April 30, 2010. The Auditing Services RFP awarded to Validus in April of 2008 and was completed in September, 2011. . Both vendors complied with deliverables within their respective contract including coordination of project activities, quarterly reports, and final reporting requirements

WDNR Goals

An Interested Persons Group (IPG) was established via outreach by WDNR and Dairy Business Association Green Tier Advancement Project (DBA-GTAP). The IPG included representatives from: DBA-GTAP, WDNR, Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP), UW-Discovery Farms,Natural Resource Conservation Service (NRCS), River Alliance of Wisconsin, Wisconsin Landand Water Conservation Association, and two Wisconsin dairy producers.

DNR and DBA-GTAP identified three priorities for the IPG:

- Increase participation in the DBA-GTAP,
- Increase environmental performance of DBA-GTAP participants, and
- Improve the financial benefit to participants who achieve superior environmental performance.

The IPG, after a series of five face-to-face meetings and several conference calls, provided recommendations for incentives that could be made available to producers as a way to enhance the value proposition for designing and implementing an environmental management system:

1. Allow higher ranking for applicants to the Federal Conservation Security Program(CSP), if the applicant is participating in Green Tier, and:

a. Highest ranking in Environmental Quality Incentives Program (EQIP) for entering the DBA-GTAP Charter,
b. Priority cost share dollars for neighboring farms within ten (10) miles of DBA-GTAP member site,
c. Create incentive system that rewards progressive farm management(e.g. cost sharing at 50% (NMP), 75% (CNMP), and 90% (EMS)), and
d. Higher ranking in EQIP for achieving Green Tier Status.

2. Package an EMS training program by partnering withexisting training and certification programs, and existing service providers.

a. Development of progressive farm management training program should include, at a minimum, the following parties:
    i. Department of Natural Resources,
    ii. Department of Agriculture, Trade and Consumer Protection,
    iii. USDA-Natural Resource Conservation Service,
    iv. Land Conservation Departments,
    v. UW-Extension,
    vi. Members of the Agriculture Coalition, and
    vii. Wisconsin Land and Water Conservation Association.

b. The program will:
    i. Make available outreach materials that outline the benefits of moving from implementation of NMP's to implementation of CNMP's and finally EMS implementation,
    ii. Ensure outreach materials clarify what gaps exist between NMP, CNMP and EMS as well as the steps necessary to successfully make each transition,
    iii. Encourage additional producers to pursue CNMP status, beyond permitted operations, and
    iv. Encourage farms with CNMP to move to EMS level through a public education and information campaign.

3. Allow Comprehensive Nutrient Management Plan (CNMP) to satisfy eligibility requirements for DBA-GTAP Tier I status. In order to be eligible, the CNMP shall, at a minimum:

a. Identify natural resource concerns,
b. Be implemented,
c. Be reviewed and approved by NRCS (verify implementation), and
d. Result in an annual report to WDNR on environmental performance, utilizing as the basis for reporting "natural resource concerns" and Tier I model terms.

4. Establish committee to review alternative and technology-based agriculture practices.
a. The committee includes standing members, ad hoc expert members (as needed)as well as agricultural producers,
b. Tier I participants eligible to approach committee for trial on a pilot basis,
c. Tier II participants eligible to use technologies as an alternative to permit requirements, and
d. The committee may entertain appropriate items identified by the IPG

5. Farms participating in Green Tier and are in good standing are eligible to receive expedited permitting.

6. Clarify and list differences between state and federal regulations, per WPDES requirements, in order to establish "roadmap/menu of options."

7. Look for opportunities to provide positive press releases (i.e. at a minimum one (1) per year) about performance of Green Tier participants, both for Tier I and Tier II.

8. If and when WPDES fees increase, consider reducing fee-rate for Tier I and Tier II participants.

9. Explore options to provide EMS conformance audit services for Tier II participants.

10. Establish next steps for IPG such as measurement and monitoring of Green Tier participants.

The fore mentioned goals established a performance based platform that producers can aspire to and **a reason (incentives included in the recommendations) for producers to get there**. The work in this grant represents whether this particular tool, EMS, could provide the mechanism to reach the goals, and whether or not that EMSs provided sufficient incentives for continued participation. WDNR's ultimate goal was to address environmental issues through superior environmental performance and report on performance improvements.

Green Tier Program Application

The Green Tier Program, s. 299.83, Wis. Stats., created by 2003 Wisconsin Act 276 (made permanent in 2009), commonly referred to as the Green Tier Law, authorized WDNR to work toward further environmental improvements using Environmental Management Systems (EMSs) for the agriculture sector. An EMS is a way for individuals to voluntarily manage their environmental impacts while improving environmental and economic issues through the "Plan, Do, Check, Act" model. For this project, Wisconsin's dairy industry was specifically targeted.

Training RFP awarded to PEP

TRAINING RFP

There were four key objectives for the training RFP:

A. Provide a working knowledge of the EMS approach.
B. Guide the participant to identify environmental activities under their control.
C. Prioritize aspects and impacts in a manner that assists the environmental decision making process.
D. Prepare participants to enroll in Green Tier by developing an EMS appropriate to their operation.

The training and consulting proposal consisted of six stages:

1. Project set-up including identification of PEP team members which was needed in order to deliver each of the elements that had been outlined in the request for proposals
2. Collaboration and awareness building.
3. Recruitment of EMS participants.
4. Facilitation of EMS educational sessions.
5. Implementation and technical support of on-farm EMS.
6. Cooperative activities.

Identification of Team Members

As a part of the response to the request for proposals, each respondent had indicated who would potentially be a part of the team. Prior to the final award, an additional review was done to assess the potential team participation included in the responses. The actual invitations to team members and formation of the team was a part of the actual implementation process.

PEP sought to find Team Members who demonstrated and understood the EMS principles. Each member of the team brought unique talent, knowledge and skills to the team. Key team members included Tim Anderson, Timm Johnson, Douglas Johnson and James Kettler. Skills brought to the teams included environmental management systems experience, knowledge of best agricultural practices, communications, agricultural outreach, and ability to work across agricultural program and organizational boundaries just to name a few of the attributes included in the team. In addition, PEP received collaborative support from the Manitowoc, Kewaunee and Calumet County Land and Water Conservation Departments, UW-Extension, Professional Dairy Producers of Wisconsin, 1000 Friends of Wisconsin and River Alliance of Wisconsin. This network allowed PEP to communicate efficiently and effectively with the dairy producers. These groups recommended dairy producers as potential program participants in the Northeast or Lakeshore Basin area as identified in the RFP.

Collaboration and Awareness Building

PEP's initial goal was to engage 30 dairy producers in the EMS training program. In the fall of 2008, PEP planned three educational conferences in cooperation with the Northeast area UW-Extension and Land Conservation Departments. The purpose of the conferences was to make dairy producers aware of the project, explain the project benefits and answer any questions potential participants might have.

Additional support to communicate the program was driven from industry groups such as the Professional Dairy Producers of Wisconsin, crop consultants and lenders. Five past Agricultural

Watershed Improvement Network (AWIN) participants also agreed to participate by speaking at conferences or learning sessions and serve as a resource for producers in the project.

The first two educational EMS conferences were attended by four dairy producers and five agribusiness representatives. Due to lack of participation, the third educational conference was cancelled. Although the conferences did create awareness about the EMS project, none of the four producers decided to move forward with the project.

Recruitment of EMS Participants

PEP moved to their next strategy to recruit producers for the project. The PEP Team focused on one-on-one meetings with producers who had been identified as prospects for the project. Subsequent telephone calls and one to three additional meetings were held with **nine** farms prior to their decision to attend the training sessions. All nine farms chose to participate in the program resulting in a 100% success rate from the face-to-face recruitment.

In addition, there was a recommendation to establish a group of interested participants in the Northwest (NW) region of the state. WDNR approved moving forward with this group which consisted of **four** dairy farms and a cheese processor.

In an effort to streamline recruitment, WDNR approved allowing the **eight AWIN** participants into the project. Recruitment efforts for this category began in November of 2009 and included one-on-one phone calls and meetings. By January of 2010, one farm and associated cheese production facility agreed to participate in the project.

Due to the amount of time expended on recruitment, WDNR amended the contract and reduced the number of participants in the training session from 30 to 15. This, in turn, reduced the number of anticipated audits that would be conducted in the auditing contract. This was reinforced by the fact that even with the sector contact and many other collaborators' efforts the level of participation was not meeting expectations.

Facilitation of Training Sessions

PEP developed the first EMS Generic Guidance Manual in 2005. This manual was revised five times prior to the State Innovation Grant (SIG) project. During the SIG, the most significant change to the EMS Generic Guidance Manual was to customize it to each operation. Every EMS training participant received a copy of the EMS General Guidance Manual (Attachment 1) at the first session.

PEP designated two groups of four producers and one independent producer for the NE region. In addition, the four producers and processor were identified as a group in the NW region.

Ten training sessions were to be completed from December, 2008 through April, 2009. The 13 producers and one processor identified from the one-on-one recruitment process did complete the training program. If a participant missed a session, a make-up session was conducted at their farm prior to the next session. The training sessions reviewed the specifics of the EMS structure. In addition, the producers were provided templates for their use in developing the elements of their own EMS. The producers could complete the templates whether at the training session or as part of their "homework" prior to the next session.

PEP planned on at least one on-farm session for each producer; however, six additional sessions were required for the NE group due to producers missing the training session. Seven producers completed the training sessions in the NE region while two dropped out.

In the NW region, all participants started out in a group format for the first two training sessions. After the first two training sessions, one-on-one sessions were conducted with the producers for a total of 15 training sessions. By the end of the summer, two of the four farms completed documents related to their EMS. In addition, three of the four farms implemented changes in work practices relating to their

environmental impacts. Those impacts included manure management, leachate management and bio-security.

Implementation and Technical Support of On-Farm EMS

There was a need to find a balance between ISO 14001 language and informal business language on-farm. Thus, a review of the ISO 14001 elements with the producer was crucial for the producer to understand how to incorporate this tool on-farm. It was important to link positive environmental impacts and formalizing procedures to assist with those areas. Documentation was extremely beneficial to producers to help them identify areas that could be improved.

Due to the reduced number of participants, each dairy producer moving forward was eligible for manual customization assistance, a trial EMS readiness review, an internal compliance review exercise and individualized technical assistance.

Most of the environmental improvements at the operations related to spill prevention, oil and farm chemical use management, manure/fertilizer/crop spray management, and engagement of employees in the EMS.

Area	Great Lakes Basin Region (NE)	Northwest Region
Number of Participants	9 producers	4 producers/1 processor
Number Completed Training	7 producers	2 producers/1processor
Number Receiving Technical Assistance	7 producers	2 producers

AUDIT AND ASSISTANCE RFP AWARDED TO VALIDUS

Audit and Assistance RFP EMS Audit Program Objectives:

The initial objective of the program included providing EMS auditing services to 15 Wisconsin dairy sector businesses that had implemented an ISO 14001 or functionally equivalent (FE) EMS by June 30, 2010.Due to the lack of training participants, it was apparent that there were not enough EMS candidates to fulfill the audit contract with WDNR. On November 2, 2009, Validus submitted a letter to the WI Department of Natural Resources (WDNR) requesting an addendum to the purchase order which included a grant extension. As a cooperative venture between the dairy industry and WDNR, additional EMS training candidates from the DBA-GTAP Charter program were also provided the opportunity to participate in the audit with approval by WDNR. The addendum allowed for additional objectives for the program. First, it increased the availability of resources for on-farm EMS technical assistance and internal auditing services while preserving EMS auditing services to dairy producers who had completed EMS training. Second, it provided additional time for delivery of on-farm EMS technical assistance, internal auditing services and EMS auditing. The addendum was approved by WDNR, and the contract was extended to June 1, 2011.

Audit Objective: The objective of the audits was to determine conformance to the Wisconsin Green Tier (GT) ISO 14001:2004 Functionally Equivalent (FE) Environmental Management System (EMS) requirements (Attachment 2) as well as the EMS requirements established by the respective dairy.

Number of Audits: A total of four audits were conducted from November of 2008 – December of 2010. All sites were approved for audits through WDNR. There were two auditors that conducted the FE audits on behalf of Validus. Both auditors were approved by WDNR. Each audit contained a review of the EMS in accordance to the Green Tier ISO 14001:2004 Functional Equivalency. Each audit report included information on conformance to 18 EMS audit components. The status was indexed as such:

C = Conformance – these items were acceptable when audited and are strengths for the farm

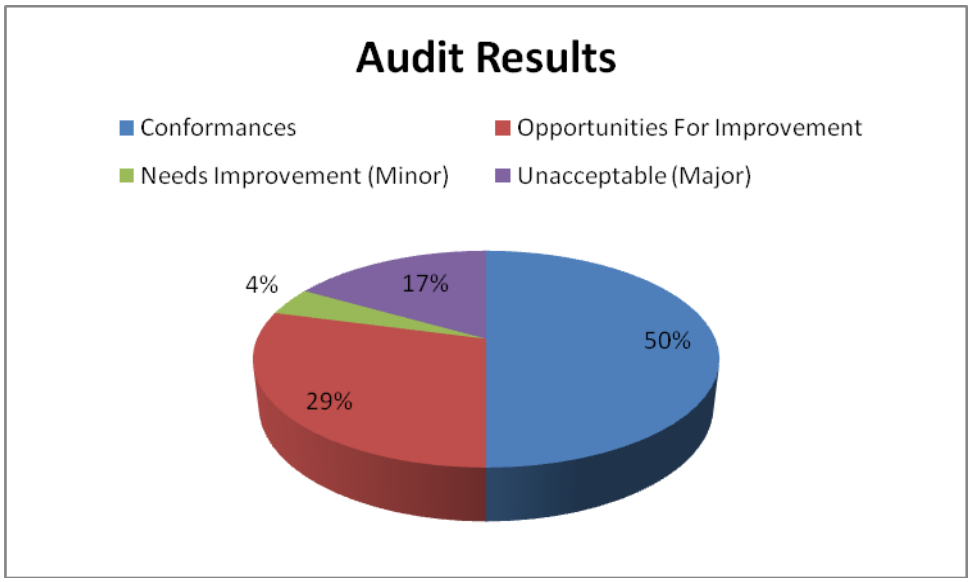
OFI = Opportunity for Improvement – not viewed as a non-conformance of the EMS, but a place where the system could be improved

NI = Needs Improvement - minor non-conformance - should be corrected or improved upon before unacceptable is issued at the time of next audit

U = Unacceptable - major non-conformance - item does not meet EMS, ISO 14001:2004 and/or DNR EMS Functionally Equivalent requirements

Audit Summary: At the time of the audits, there were no serious environmental risks posed at any dairy. The systems were comprehensively documented and many of the procedures were simple in nature, meaning they were not overburdened with detail which is appropriate to smaller organizations. It appeared that the systems were designed in enough detail to provide substantial conformance to ISO 14001:2004 Standard or deemed Functionally Equivalent to ISO 14001:2004 by DNR. There were no unresolved or diverging opinions encountered during the audits. A copy of the aggregate results is available in Attachment 3.

In total, there were 36 Conformances, 21 Opportunities for Improvement, 3 Needs Improvement (minor non-conformance) and 12 Unacceptable (major non-conformance) Component Areas. Any audit that received a Non-Conformance was issued a Corrective Action Report. Each site that received a Corrective Action submitted appropriate documentation to demonstrate correction of the issue. These areas are focus points for the next audit. All sites received FE status.



Audit A – This audit was conducted in November of 2008 to determine areas of improvement that would promote EMS conformance for program participants. The key representative was a participant in a prior DNR sponsored EMS program, and was a mentor for the SIG training session program. Of the 18 EMS Audit Components, the site received 3 Conformances, 5 Opportunities for Improvement, 2 Needs Improvement and 8 Unacceptable. The site completed all Corrective Action areas and the site received a FE certificate.

Audit B – This audit was more complex as it consisted of two separate sites under the same EMS, and there was one report issued for both . The audits were conducted in cooperation with parallel programs running within the dairy industry. The key representative of the dairies was a participant in a previous DNR EMS program, and was a speaker and mentor for the SIG EMS training sessions. The audits were conducted in August of 2010. Of the 18 EMS Audit Components, the sites received 4 Conformances, 9 Opportunities for Improvement, 1 Needs Improvement and 4 Unacceptable. The sites completed all Corrective Action areas and a FE certificate was issued for the dairies.

Audit C – This EMS site completed implementation of their EMS through the SIG training and technical assistance program. The audit was completed in December of 2010. Of the 18 EMS Audit Components, the site received 12 Conformances, 6 Opportunities for Improvement, 0 Needs Improvement and 0 Unacceptable. The site received a FE certificate.

Audit D – The audit was conducted in December of 2010. The EMS was developed and implemented through a parallel dairy industry program training with continuing technical assistance from the SIG. The site was approved for audit by DNR. Of the 18 EMS Audit Components, the site received 17 Conformances, 1 Opportunity for Improvement, 0 Needs Improvement and 0 Unacceptable. The site received a FE certificate.

Audit Summary: Each of the four audits included a thorough review of the farm's EMS. The EMS representative at each site was interviewed at length and records were reviewed in support of audit processes. The auditors reported that each EMS management representative understood the elements of the system and the elements were effectively implemented and maintained as required by the Standard and that the audits simply act as an aid to move the farm towards further continual improvement.

EMS practices generally follow the procedures outlined and evidence of this exists in most areas. It was apparent that the systems were fairly immature and that in some areas a more comprehensive approach is appropriate.

The EMSs were designed in enough detail to generally conform to the requirements of the WIDNR Green Tier (GT) EMS system, EMS requirements set by the dairy, and substantial conformance to ISO 14001. There were several items that required corrective action prior to awarding FE status, and none of the operations requested ISO 14001 certification. Upon corrective action, all dairies received their respective FE status. Areas of improvement and focus may include:

- Aspects/impacts – there were some specific areas that had not been identified on the operation's respective list of aspects and impacts including potential spill from fertilizer storage, septic removal, and acid storage.
- Objectives – provide measurable examples.
- Records – add training records and retention schedules.
- Training – competency for all employees was not evident on the dairy's matrix
- Monitoring and measuring – not currently being conducted since it was not measured in the objective
- Corrective Action – was not closed out and dated back to 2005 with no review
- Internal audits and management reviews – conduct in accordance to FE status
- Evaluation of compliance – not currently reviewed on regular basis
- Communication – provide a detailed description of external communication policy
- Control of Documents – some posters within the dairy were not legible due to the elements, designation of individual to review documents on a regular basis
- Operational Procedures – not all procedures were being followed by employees

EMS Training Participant Analysis

In addition to the audits, WDNR requested Validus conduct an analysis of 11 operations participating in the EMS training programs that showed the most initiative to implement their respective EMS. Six producers in the NE region, three producers in the NW region and two producers in the SW region from a parallel program were identified as participants in the analysis. . Of the 11 sites reviewed within the training program, the following results were identified.

EMS Element	Number in Conformance	Comments
Scope	11 Acceptable	Identified scope at all operations
Policy	7 Acceptable/2 Needs Improvement/ 2 Unacceptable	More specific information would benefit 2 and 2 operations did not have an identified policy
Aspects/Impacts	7 Acceptable/1 Needs Improvement/3 Unacceptable	Expanding the list was crucial to one operation and 3 did not identify aspects/impacts to date
Legal/Other	3 Acceptable/7 Needs Improvement/1 Unacceptable	Permitted operations were reviewing information for permits only; one operation did not review any requirements legal or otherwise
Objective/Targets	5 Acceptable/6 Unacceptable	6 of the 11 operations had no

		objectives or targets
Resources/Roles/Responsibilities	4 Acceptable/7 Needs Improvement	All operations were specific, but 7 of them had limited documentation
Competence/Training/Awareness	5 Acceptable/5 Needs Improvement/1 Unacceptable	Those that needed improvement did not have any training records and one did not have any training
Communication – External/Internal	4 Acceptable/6 Needs Improvement/1 Unacceptable	4 of the 11 documented both external and internal communications while 6 operations needed to improve on external communications
Documentation	4 Acceptable/7 Needs Improvement	All operations provided some documentation for the operation and 4 included documentation for EMS elements
Control of Documents	6 Acceptable/4 Needs Improvement/1 Unacceptable	6 operations were specific on who was responsible including review of external documents which is an area that needed to be improved in the others
Operation Control	5 Acceptable/3 Needs Improvement/3 Unacceptable	3 of the operations had some operational procedures and 3 did not have any operational procedures regarding environmental procedures
Emergency Preparedness/Response	1 Acceptable/6 Needs Improvement/4 Unacceptable	Most operations had some type of verbal plan, but had never conducted an emergency drill; 4 operations had no plan
Monitoring/Measuring	1 Acceptable/7 Needs Improvement/3 Unacceptable	Operations utilized soil testing as part of their NMP with some calibration and one monitored water usage; the others did not calibrate any of their technology or monitor soil tests
Evaluation of Compliance	1 Acceptable/3 Needs Improvement/7 Unacceptable	One operation evaluated compliance due to regulatory issue at the time while three utilized industry organizations to assist in the evaluation but needed additional support
Corrective/Preventive Action	0 Acceptable/2 Needs Improvement/9 Unacceptable	The systems were relatively immature and only 2 implemented some corrective

		action; none had utilized any preventive action to date
Control of Records	6 Acceptable/3 Needs Improvement/2 Unacceptable	6 operations were keeping accurate records while 3 needed to improve the system with a retention plan and 2 did not have any control mechanism in place
Internal Audit	11 Unacceptable	No internal audits as of the analysis
Management Review	11 Unacceptable	No management reviews completed as of the analysis
Potential to Enroll in Green Tier	7 High/2 Medium/2 Low	Producers were asked to rank the probability on Green Tier enrollment i.e. high, medium and low. 64% indicated a high desire to pursue enrollment.

In addition to the analysis, WDNR approved Validus to provide technical support to dairy operations that showed the most potential to implement an EMS.

Assistance was provided in the following format:

- On-farm meetings to review implementation efforts, set agendas and develop EMS strategies
- Update roles and responsibilities in relationship to EMS activities
- Process updates utilizing current process or new template
- Translation of significant aspects operating procedure documents into Spanish to enhance internal communication as it related to operational controls
- Review of documentation including records being kept and record retention policy
- Assistance with external and internal communication actions
- Evaluation of regulatory compliance and updating compliance information
- Use of corrective and preventive action measures
- Preparing internal audit review schedules
- Management review and use of review

In the waning stages of the audit agreement, Validus and WDNR made a conscious shift to promote implementation of EMS instead of the more formal audit regiment. It was clear that there was a need to breathe life into EMSs to advance them from the **development stage** to **implementation** in order to obtain superior environmental results. The fairly sophisticated action plan included assistance in implementation, review of performance measures, coordination of incentives to improve performance and industry outreach.

Technical Assistance Support

WDNR approved technical assistance support specifically with five producers who were deemed most likely to continue to implement and pursue Green Tier status. Support was given in several forms, but direct one-on-one meetings were the most effective.

Upon scheduling a meeting, the EMS representative focused on areas of improvement within the EMS. Those areas included the following:

- Review of scope, policy and aspects and impacts
- Updating environmental management plans
- Preparing new operational procedures to meet needs of significant aspects
- Assistance with training employees and organizing emergency drills
- Translating operational procedures into native language
- Lamination of documents to keep them legible
- Identifying technology to allow for calibration practices
- Assistance with internal audits
- Follow-up on management review minutes
- Team meetings to discuss resources, roles and responsibilities
- Assistance with Green Tier enrollment application
- EMS Mapping Program

EMS Mapping Assistance

WDNR approved on-farm technical system assistance to investigate whether or not a mapping system would provide a mechanism to improve environmental performance. This assistance was provided to a non-permitted operation to better understand the importance of linking production efficiency with the operation's EMS.

Validus piloted the use of geographical information systems or mapping in an EMS to provide a link to environmental, economic, and social management of the farming operation in order to increase productivity, profitability, communication, and reduce the probability of environmental degradation.

The use of mapping allows the owners/operators to make decisions as it relates to the farming operation. As operations depend on multiple fields, farm numbers and tract numbers, confusion can occur between what is being reported(both for personal records and governmental records) and what is being applied on the ground. The mapping allows for identification of all of the operator's fields; which were mapped out according to common land unit boundaries. With this, the common land units or fields were identified with information including Farm Number, Tract Number, Size, Field Number, "Common Name" and available soil test information. The importance of using these field characteristics is due to the variation in names that occur between the producer and the USDA. The producers typically have a common field name such as "John's North 40," whereas the Farm Service Agency (FSA) would distinguish this field as "Field 2 on Tract 1234". When applying multiple characteristics to the fields, the landowner can distinguish fields as needed for their personal records and records that need to be reported such as crop reporting to the FSA.

With the increasing size of the operations, the need for labor is vital for continuing success and growth. As new labor is hired or contracted it is important that they understand the farming operation which includes the location of the farm and fields that they will be performing field operations in. The locations of the fields are not typically adjacent, so the maps will help employees or contractors identify the route they will need to take in order to get to the field and ensure that field operations are performed as assigned to the proper location. The misidentification of a field could cause both economic and environmental harm. The use of mapping targets placement of nutrients where they are needed most instead of a broad application to all fields. The electronic format enhances the effectiveness of the program as it specifically identifies the field and quantity of nutrients to be

delivered. An example of this would be applying manure to a field that may not need it due to very high phosphorous (P) and/or potassium (K) levels. By adding the available soil test information to the field characteristics/attributes, the producer is also able to determine where fertilizer is needed. The potential for phosphorous (P) pollution can increase in fields with very high soil test phosphorous levels when nutrients are continually applied. By being able to identify the P and K levels, along with field locations, the producer will be able to better understand where manure shall be allocated and from which source (i.e. swine manure from lagoon, dairy manure from a pit), and location if multiple sources/locations are available. This will play an important part in better overall nutrient management of a farm.

Overall, mapping is of great benefit to the producers when implemented in accordance to their EMS. EMS practices strengthened their environmental stewardship by placing nutrients where they will be best used at the field level, protecting soil and water quality and conserving natural resources.

Throughout the process, information was also provided to the participants regarding farm management software that will assist them in tracking superior environmental performance through their EMS. This was not a permitted operation, and management opted to utilize the mapping program to address their nutrient management plan, train their employees for continuity in work procedures, and monitor progress for the future. The software looks at overall farm management and helps with record keeping for nutrient application, pesticide application, tillage operations performed, field yields, soil test information, grid sampling, planting information and harvesting information. For EMSs to be effective in the future, it is absolutely crucial to formalize a relationship between the operation's production and economics relative to the management system.

Outreach - EMS Website Updates

Communication and access to information is crucial in sustaining a program. WDNR requested that Validus prepare updates to the EMS website hosted on the Dairy Business Association's Green Tier Advancement Program page. There were two updates completed within the project.

Enhancements to the website included resources, communication from WDNR, checklists to improve areas within the EMS, Green Tier enrollment details, a list of EMS benefits, and links to regulations and additional resources.

The communication from WDNR supported the cooperation between the agency and the producers. It was also important to communicate the benefits of an EMS and provide details about the Green Tier program. The addition of checklists as well as updating regulations and resources is a benefit to any producer interested in enhancing environmental performance. Benefits include:

1. Improved environmental performance
2. Increased operational efficiency
3. Reduced costs
4. Enhanced operational image – the public, lenders, neighbors, community leaders, government officials all understand the importance of being environmentally conscious and pro-active
5. Established benchmarks for environmental improvement on your operation
6. EMS is the base for participation in Wisconsin incentive programs
7. Provides environmental results above compliance programs
8. A platform for regulatory flexibility for the industry
9. A way to mitigate risk

10. Improved employee awareness of environmental issues and responsibilities

A link to the website is provided in Attachment 4.

Internal Assistance/Outreach Outcomes Relating to Green Tier

The assistance supported implementation of the operation's EMS. Of specific interest are the environmental benefits resulting from superior performance on the dairies including:

- Use of manure digesters at three sites minimizing the risk of non-point pollution runoff
- Conservation of water by implementing new operational guidelines and technology (approx. 32,000 gallons/day)
- Enhanced soil fertility utilizing mapping technology and GPS
- Conserving natural resources by reclaiming sand resulting in 90 less loads of sand being trucked to the dairy
- Adopting methods to reduce depletion of natural resources i.e. reclaiming sand
- Reclamation of sand decreased the amount of fossil fuels and emissions since 90 loads of sand were not delivered to the dairy due to new technology
- Conservation of energy by switching to new lighting and implementing new wash cycle system to clean cow towels
- Recycling of silage plastic instead of placing it in the landfill
- Reducing the usage of copper sulphatein order to protect soil and water

Of the sites that requested additional assistance, two completed applications for Green Tier. Another site utilizing the mapping program plans to move forward with Green Tier upon expansion of their livestock enterprise. Producers not currently applying for Green Tier indicated they would consider enrolling if Green Tier provided the following:

- Expedited permit renewal process - currently two operations are waiting on permit renewals that are 6 months or more expired
- Regulatory flexibility - opportunity to spread manure in the winter or irrigate "tea" lagoon water
- Reduced sanctions and public criticism – accidents can happen even with an EMS – producers would like assurance that regulatory agencies would work with them to correct the situation without heavy sanctions and media attention

Lastly, the relationships built between the producers, WDNR and industry organizations such as Dairy Business Association are valuable networking tools linking the dairy industry with Green Tier.

PROJECT OVERVIEW

Strengths

Below are some of the strengths identified from the program.

- As an ISO 14001-based program, the EMS elements were familiar to the auditors and allowed for a clear verification process.
- Introduction of the ISO 14001 elements during the training session helped producers understand the development and implementation phases of their EMS.
- The willingness of previous EMS participants to engage with new recruits suggested that there is an opportunity to develop a self-supporting system of mentors to exchange information and internal audit resources.
- Producers who engaged a key representative within or outside of their operation were more likely to implement and continue to improve their EMS. All dairy producers that completed training felt they received some benefit from the management system approach toward continual improvement. The producers that implemented processes on their dairies have made continual improvements by enhancing soil conservation practices, conserving water and other natural resources and recycling.
- The EMS guidance manual developed through the SIG drawing from many previous documents as well as experience gained through the grant, serves as a foundation tool, and it is designed so that it can be customized for any size dairy.
- Identification of environmental aspects and impacts provided a wealth of information for producers as they managed hundreds of acres in a number of counties.
- Focusing on EMS training and communication enhanced each farm's development of their values as well as improved external and internal communications at the farm.
- The development of the EMS produced positive external communications about the farm to those outside the farm who live in the community or work in the supply chain.

Lessons Learned

Although dairy producers heard about the Green Tier program through communications from industry organizations, there was little EMS knowledge by the participants prior to their involvement in the program.

Each participant brought forth their own learning and management style. Although the group process was beneficial in bringing additional ideas and exchange of information to the discussion, it was important to interact one-on-one with the dairy producers who decided to implement their EMS.

Even though an EMS guidance manual was available to all participants, each operation was different. Producers appreciated the trainers being able to relate the program specifically to their farm which helped build a trustworthy relationship.

The economy will affect whether or not producers participate in a program such as this. The number of program participants in 2009 was hindered by the price of milk which dipped to $11 CWT. (Attachment 5 – National Agricultural Statistics Service Milk Prices) When the economy started to rebound in 2010,

those who participated in the training and developed an EMS started to implement their EMS. Unfortunately, the downturn in milk prices and the overall economy reduced the number of farms available to audit. Thus, the auditing RFP was extended in hopes of providing additional time for producers to participate in both training and auditing projects. There was no impact on milk price as a result of environmental performance. One of the things that was learned as a result of the grant is that it would be unlikely to see an impact on milk prices as a result of environmental performance given how milk and related products are priced.

A producer was more likely to participate if another dairy producer in the area was a respected member of the community and was already committed to the EMS process.

Producers who attended at least one training session, but decided not to continue with the project, identified additional documentation, perceived need for advanced computer skills and unrealistic time restraints as the top three reasons for discontinuing the process.

Every dairy implementing an EMS should have a minimum of two people who are integrally involved with the system. This would ensure the process would move forward if one person left or became incapacitated. It was clear in each implementation, both those that reach completion and those that did not, that an "on-farm" champion and back-up was essential to the ongoing involvement and engagement of employees of the farm as well as the needed external communications for an effective system.

When working in the rural community, it is important to identify the most appropriate and effective communication mechanism, whether it is electronic, hard copy, or direct phone calls. In fairness, regardless of the medium, one on one communication is the only mechanism that consistently works within this culture and only then over time.

Weaknesses

External factors were key issues in the development and implementation of the EMS at the farm level. Those factors included, but are not limited to management changes at the farm, the economy and personal challenges. For instance, at one farm, the environmental management representative left the farm operation and there was not a backup person. A downturn in milk prices played an important role on the amount of time a producer would spend on the EMS versus cash flow management. Personal issues such as health and family relationships also resulted in producers declining to participate or move forward with the program

The project did not compare the EMS approach to the progressive farm pyramid nor did it provide a GAP analysis of an EMS with comprehensive nutrient management plans. That was outside the scope of work for this grant but would certainly present an opportunity for future study.

Utilizing electronic correspondence as the major communication source resulted in variety of problems including line speed, version issues, and limited computer skills.

Conclusion

There are three key takeaways from this project. Environmental Management Systems are a logical, viable tool for improving on farm environmental performance and profitability. Even though this may be viewed as anecdotal, there was evidence observed in the returns realized and the performance institutionalized on those farms. Environmental Management Systems are foreign to both the culture and discipline of current dairy production practices. The long term prospect of Environmental Management Systems being a part of production agriculture will be directly driven by "up front" incentives and support.

This project did result in the development and implementation of environmental management systems, that continue to function, that established voluntary environmental improvement goals, measured progress, and took actions to protect and restore water quality and natural resources beyond regulatory levels. The system, developed and implemented through the project, reached a level of maturity and effectiveness that the facilities have successfully applied for Green Tier participation. Two are active Green Tier participants and two are in process. Other EMS's are at that same level but the producer has chosen not to apply for the program. The EMS approach with both Green Tier and non-Green Tier producers has demonstrated advantage of a whole farm, multi-media tool, influencing the environmental performance of others up and down the supply chain. Using an EMS as a supplement to permits and regulations for the dairy sector has enormous potential to contribute to solving high priority environmental issues, most obviously in the area of nonpoint source water pollution. As we found with the mapping application, EMS can also be a catalyst for innovation. To realize that potential would require reaching critical mass which this project demonstrated could be extremely difficult.

We did find that EMS is not a clear or easy choice for dairy producers. While Wisconsin has more dairy EMS's than most other states, EMS is still far from standard skill set for dairy producers. Even with a modest 15 producer and 1 processor goal, only a few producers (well below goal) were willing to invest the time to build and maintain the EMS. Even with training and auditing adjusted to reflect on-farm production experience, knowledge regarding the environmental challenges that exist on a farm, and a clear understanding of what an EMS is to accomplish to decrease the likelihood of negative consequences to the program or the producers being served, the uptake was low due to a wide variety of factors. The largest factor appears to have been the documentation and tracking. During the course of the project, funds were shifted to more "on farm" and direct assistance which seemed to bridge some of the gaps. Ultimately, however, the uptake of EMS will hinge directly upon strategies that can quickly and easily be adapted to the unique "way of doing things" at each farm which will be far less reliant on an EMS standard and much more closely tied to defined outcomes. Some would assert that environmental management systems will only be adopted if there is a mechanism to pay the producer for environmental performance, no requirement needed, just provide an economic incentive.

The project did demonstrate that EMS is quite unlikely to stand on its own in the dairy producer community. Producers with an understanding of the efficiency and effectiveness of systems, value of social licenses and ability to impact the supply chain have been able to move forward with EMS, regardless of the processor size. While the overall funding for the project was limited, there were sufficient funds to determine that an implementation strategy that was adapted to the producer, linked directly to the farm and able to address a performance need with business value yielded an engaged participant. While the impact of supply chain management was not felt by the producer community during the course of this project, there was enough activity with retailers that some producers saw the

potential for a retail "requirement" that would be a catalyst for them. In part, this reinforces the potential for a strong external catalyst for a systems approach.

Although Wisconsin didn't reach the scale that was expected with the project, this grant moved us from hypothetical and anecdotal conversations with producers into the development of practical tools and strategies that could take us to landscape scale activity. The economics were not sufficient to move this project to landscape scale implementation of environmental management systems even with the tools that were developed under the grant. We have a far better understanding not only of the investment to put systems in place but also the catalysts that are likely to produce engagement at a landscape scale. Wisconsin fully intends to continue development work for environmental management systems within the producer community and continue making investments to build a link with the processor community to find other models that will produce better incentives.

This report was compiled with support of Validus in collaboration with WDNR.

Grant Financial Status

	Approved Budget	Cumulative Expenditures (approx. through 06/30/2011)
A. Personnel	$30,000	$40,773
B. Fringe Benefits	$14,535	$18,801
C. Travel	$4,500	$741
D. Equipment	-	-
E. Supplies	$2,500	$1,181
F. Contractual	$215,000	182,352
G. Construction	-	
H. Other	$3,000	$2,086
I. Total Direct Costs	$269,535	$245,934
J. Total Indirect Costs	$5,465	$8,152
K. TOTAL COST	**$275,000**	**$254,086**

Attachments

Attachment 1	EMS Generic Guidance Manual (CD)
Attachment 2	Wisconsin Green Tier (GT) ISO 14001: 2004 Functionally Equivalent (FE) Environmental Management System (EMS) requirements- Website Link:http://dnr.wi.gov/org/caer/cea/environmental/documents/provingEMS.pdf
Attachment 3	EMS Aggregate Audit Data
Attachment 4	Producer Outreach – Website Link: http://www.widba.com/green_tier_project.php
Attachment 5	National Agricultural Statistics Service Milk Prices in Wisconsin (2008-2010)

Attachment 3 - EMS Audit Aggregate Data

C = Conformance – these items were acceptable when audited and are strengths for the farm

OFI = Opportunity for Improvement – not viewed as a non-conformance of the EMS, but a place where the system could be improved

NI = Needs Improvement - minor non-conformance - should be corrected or improved upon before unacceptable is issued at the time of next audit

U = Unacceptable - major non-conformance - item does not meet EMS and/or ISO 14001 or ISO 14001 equivalency requirements

EMS COMPONENTS	14001 ELEMENT	EMS STATUS	COMMENTS
Introduction/Scope	4.1	2 C 1 OFI 1 NI 0 U	**FINDING(S):** There was one site with no documentation of the scope although the owners were consistent on what they considered it to be and another site would benefit from a clarification of exclusions within the dairy.
Environmental Policy	4.2	3 C 1 OFI 0 NI 0 U	**FINDING(S):** In one instance there was limited evidence that the environmental policy was communicated to the public.
Environmental Activity Analysis	4.3.1	1 C 3 OFI 0 NI 0 U	**FINDING(S):** Each operation utilized a detailed spreadsheet to identify aspects and impacts although review on an annual basis with assist with areas not list such as potential spill from fertilizer storage, acid spills and septic removal.
Legal and Other Requirements	4.3.2	3 C 0 OFI 0 NI 1 U	**FINDING(S):** Three of the four operations documented their process by which regulations were handled.
Environmental Objectives, Targets and Action Plans	4.3.3	1 C 2 OFI 0 NI 1 U	**FINDING(S):** Targets are not fully established. Objectives were not easily identified within the environmental management program.
Resources, Roles, Responsibility and Authority	4.4.1	2 C 2 OFI 0 NI 0 U	**FINDING(S):**Completing edits to the organizational chart and additional communication to employees will clarify responsibilities. Definitions for management's roles and responsibilities were not clear.
Competence, Training and	4.4.2	0 C 3 OFI	**FINDING(S):** Additional evidence will ensure employees

EMS COMPONENTS	14001 ELEMENT	EMS STATUS	COMMENTS
Awareness		0 NI 1 U	are competent and trained for their respective roles. Training was evident for nutrient management areas, but not for other areas. Performance reviews did not specifically relate to the EMS activities.
Communication	4.4.3	2 C 1 OFI 0 NI 1 U	**FINDING(S):** Internal communications was well defined and appeared sufficient on the days of the audit. A more detailed description for external communication regarding incoming requests to the operation were noted.
Documentation	4.4.4	4 C 0 OFI 0 NI 0 U	**FINDING(S):**All required documents exist. Additional documents exists that form part of the EMS.
Control of Documents	4.4.5	2 C 0 OFI 1 NI 1 U	**FINDING(S):**Although two operations did have revision dates on documents, procedures do not cover external documents. Documents must remain legible, and the procedure needs to include how to control revisions.
Established Farm Processes (Operational Control)	4.4.6	2 C 2 FI 0 NI 0 U	**FINDING(S):**Procedures exists requiring controls for significant aspects. Some examples were seen of controls e.g. nutrient plan, application procedure, waste control (jobsite statistics worksheets). Not all significant aspects have a control (although not all require controls e.g. dust is considered significant and the mitigation is to contract surface treatment).
Emergency Preparedness and Response	4.4.7	3 C 1 OFI 0 NI 0 U	**FINDING(S):** Examples of emergency plans/procedures exist around significant potential impacts, but the plans need to be formally reviewed and should be tested significant impacts from aspect/impact analysis.
Monitoring and Measurement	4.5.1	2 C 1 OFI 0 NI 1 U	**FINDING(S):** Examples of monitoring and measurement were seen, in particular the nutrient management plan, which is a significant impact contains measurements of the control applied to the spreading manure and nutrient values. There is a process in place for identifying and making measurements. Not all impacts and controls are measured. There might be other measurements that could be appropriate. Examples

EMS COMPONENTS	14001 ELEMENT	EMS STATUS	COMMENTS
			were seen of analysis laboratory reports containing appropriate detail an justification of competency. Examples were seen of calibration (e.g. spreader). Calibration requirements were not identified on one site.
Evaluation of Compliance	4.5.2	1 C 1 OFI 0 NI 2 U	**FINDING(S):**On one site, there was an annual review of legal requirements. In the case of the other sites, the review could be improved or did not exist.
Non-conformity, Corrective Action and Preventive Action	4.5.3	1 C 2 OFI 0 NI 1 U	**FINDING(S):** Although a procedure exists, there were only a few entries to review and discuss. One operation was not following the EMS procedure for corrective action. Preventive action is an area to improve on in the future.
Control of Records	4.5.4	1 C 1 OFI 1 NI 1 U	**FINDING(S):** A procedure existed at all operations with one operation having a clear list of recordssubject to this control. Information on retention of records will improve the process. There was no record back at one operation.
Internal Audit	4.5.5	3 C 0 OFI 0 NI 1 U	**FINDING(S):** A completed internal audit checklist was seen demonstrating that an internal audit has been completed. The internal auditor lacked training to conduct internal audits.
Management Review	4.6	3 C 0 OFI 0 NI 1 U	**FINDING(S):** Management reviews were conducted in accordance to the EMS. Two of the three operations utilized a checklist to assist with the review. The other operation did not meet the management review requirements.

ATTACHMENT 5- USDA-NASS Quick Stats (Prices)

U.S. & All States Data -Prices
Monthly Prices Received

Commodity ?	Year	State	Util	Usage	Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Milk: Fluid Grade	2008	Wisconsin	All	All	Price per Unit	21.1 dols / cwt	19.2 dols / cwt	19.2 dols / cwt	18.4 dols / cwt	19.1 dols / cwt	20.5 dols / cwt	19.5 dols / cwt	18.5 dols / cwt	18.1 dols / cwt	18.8 dols / cwt	17.8 dols / cwt	16.9 dols / cwt
Milk: Fluid Grade	2009	Wisconsin	All	All	Price per Unit	13.2 dols / cwt	11.5 dols / cwt	12.1 dols / cwt	12.4 dols / cwt	11.6 dols / cwt	11.4 dols / cwt	11.4 dols / cwt	12.4 dols / cwt	13.5 dols / cwt	14.7 dols / cwt	15.8 dols / cwt	17 dols / cwt
Milk: Fluid	20	Wiscon	Al	All	Price	16.3 dols	16 dols	14.7 dols	14.5 dols	14.9 dols	15 dols	15.2 dols	16.4 dols	17.9 dols	18.8 dols	18 dols	16.5 dols

3 Records displayed

Your request has been processed. Click the 'Download CSV' Link below to download data retrieved.

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