FINAL PROJECT REPORT

Incorporating Environmental Management Systems Into Permitting Decisions

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PROMOTE PROTECT PROSPER
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TABLE OF CONTENTS

LIST OF APPENDICES

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This project could not have been done without the help of the four facilities who willingly agreed to work with the Project Advisory Team

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EXECUTIVE SUMMARY

The South Carolina Department of Health and Environmental Control (DHEC) was awarded a State Innovations Grant by the U.S. Environmental Protection Agency to explore the relationship between environmental management systems (EMS) and permitting. The project sought to study how an EMS could:

- Improve the overall performance of the facility;
- Explore ways permit requirements could be integrated and streamlined based on an EMS;
- Determine how an EMS could ensure consistency in the development, implementation, and enforcement of a permit; and
- Evaluate the potential benefits of incorporating EMSs as an incentive for permitting options.

The project began with the formation of a cross-media team comprised of permitting, compliance and enforcement staff representing the major media programs within Environmental Quality Control (EQC). The team asked four facilities to participate in the study. The criteria for facility selection were: membership in South Carolina Environmental Excellence program (SCEEP) and/or the EPA Performance Track program; a fully implemented EMS; a good compliance record; types of permits; and willingness to participate in DHEC staff training.

One of the key project activities - staff training - was designed to provide a basic design structure of EMSs, the role they can play in the regulatory framework, and how EMSs may improve overall regulatory oversight. The facilities participated in the training, providing case studies and "real-world" insight into the utility of having an EMS.

With the assistance of an EMS consultant, the project team conducted initial permit reviews. The permits were compared to the ISO 14001 EMS standard, and general

comparisons between the permit requirements and the standards were made. Then, site visits were conducted and similarities between the facilities permits and its EMS were developed.

In general, the results of the study demonstrated that although each organization was compliance oriented and had a regulatory management system in place, the use of an EMS further assisted in tightening the compliance system function. The project also found that:

- There is a good correlation between the facility's EMS and their permits. There does not appear to be any significant differences based on the type of EMS a facility had (ISO-certified; ISO-Responsible Care, other). In each facility permit/EMS review, it was clear that the permit drove the regulatory obligations of the facility; the EMS ensured compliance with those obligations.
- The permit set the standards required to be met while the EMS provides the detail or the "how tos" to meet the permit standards.
- While the EMS is not a substitute for the permit, it may allow for streamlining of certain permit requirements.
- While there may be an opportunity to streamline permit requirements based on the EMS, it may not translate into administrative cost savings for the permit writer as it adds a component that requires verification/confirmation of the EMS as part of the permitting process.
- However, there may be administrative cost savings if the EMS is used as a tool for the inspector to evaluate facility compliance. An inspector may not have to inspect to the same level or "depth" of a traditional facility inspection. At the pre-

inspection interview, some aspects of the inspection may be adequately covered through review of the facility's EMS.

- Along the lines of the Title V annual compliance certification, there may be an opportunity to allow facilities to provide a self-certification for certain aspects of the permit where it is demonstrated that the EMS provides more detail/safeguards towards meeting the regulatory requirement. (See examples above).
    - There was agreement on the possibility of reducing the frequency of inspections across media program based upon a facility's EMS and past compliance record *provided* the EMS was submitted for DHEC review and the facility attested to the use of an independent third-party auditor.
- To implement the above, a commitment from EPA is needed to provide flexibility through the media program's annual grant/work plan commitments in order to incorporate EMS into consideration of the frequency of facility inspection schedules.
- One fundamental question that is still an unknown is the number of facilities in SC that (1) have an EMS; (2) that is of a specific type (eg. ISO certified vs. other); and (3) that is or is not certified through an independent 3rd party auditor. The recommendation was made to conduct a pilot study through the 2008 inspection schedules cross-media (the 3 programs listed above) to ask these 3 questions as part of the inspection checklist to compile an inventory of EMS facilities in SC.
- Integration of EMS into permitting will require ongoing training of permitting, compliance and enforcement staff. The training provided through the project was

a significant first step in raising awareness about EMS and the role it can play in the regulatory framework. However, continued training is needed.

- Even with project advisory team members who received the more intensive EMS training, it was difficult for them to look beyond the need for the permit to reflect the regulatory requirements in place. Particularly in the RCRA program where the regulations are so prescriptive and detailed, there was difficulty understanding how an EMS could potentially substitute, supplement, or streamline the permit.

INTRODUCTION

Many companies across the country are implementing environmental management systems (EMS) to meet their environmental obligations and to enhance overall environmental performance. As more facilities invest the time and money in these systems they are challenging states to recognize and integrate EMS into the environmental regulatory framework. The U.S. Environmental Protection Agency (EPA) recognized this challenge when it issued its *Strategy for Determining the Role of Environmental Management Systems in Regulatory Programs* in April 2004. The EPA urged states to explore ways to incorporate EMS options into the permitting and regulatory structure. Through the State Innovations Grant program, the EPA sought to partner with states to answer the following question: can EMS be used to improve the efficiency and effectiveness of regulatory tools such as permitting?

The South Carolina Department of Health and Environmental Control (DHEC) sought and received a State Innovations Grant to explore the relationship between EMS and environmental permitting. While DHEC recognizes facilities with EMS through its voluntary environmental leadership program (South Carolina Environmental Excellence program), there are no regulatory benefits for having an EMS. Through the State Innovations grant, DHEC was provided an opportunity to study ways in which a facility EMS could be integrated into the regulatory framework. By conducting a comparative analysis of selected facilities' EMSs and permits, the project sought to answer several questions posed in the EPA's 2004 Strategy:

1. Can EMSs, in tandem with performance standards, achieve better and more efficient regulatory/permitting environmental results than prescriptive operational controls?

2. Under what conditions could regulators rely on EMSs in permits and rules to redirect regulatory oversight from lower to higher priority areas?

3. Can EMS elements improve performance and efficiency by substituting for overlapping administrative and information-gathering requirements in rules and permits?

Insight into these questions based upon the project's findings and recommendations are more fully described in this report for consideration by the EPA and other states that may have similar interests and issues.

PROJECT SUMMARY

The project involved a review of the permitted activities and the EMSs of four participating facilities. The facilities were chosen from the membership of either the South Carolina Environmental Excellence Program or the EPA National Environmental Performance Track program. Each facility held multiple permits issued by DHEC including, air, NPDES or wastewater pretreatment, stormwater, and hazardous waste treatment, storage or disposal (TSD). Particular emphasis was placed on having at least two facilities with TSD permits. Each facility had an active EMS; particular consideration was given to selecting facilities with different types of EMSs so comparisons could be made. Working with the participating facilities, the project undertook the following major tasks:

(1) Provide EMS training for EQC staff, and more intense training for the project advisory team, to increase awareness and understanding of the purpose and mechanics of an EMS;

(2) Examine each facility's existing permits and its EMS to determine how an EMS can impact permit requirements in the following ways: (a) provide possible incentives in permitting options; (b) streamline administrative and/or other permit requirements; (c) improve consistency in how permits are written, monitored and enforced; and (d) improve environmental performance and results in maintaining or going beyond compliance;

(3) Determine ways in which specific permit requirements could be addressed, altered or consolidated through an EMS; and

(4) Evaluate the potential to incorporate EMSs into facility permits.

PROJECT ACTIVITIES

1. Formation of the Project Advisory Team.

The project began with the formation of a cross-media advisory team comprised of permitting, compliance and enforcement staff from DHEC's major environmental media programs (Air, Land, Water, Laboratory Services) within Environmental Quality Control (EQC). The advisory team's role was to: (1) review and advise on the project tasks and the Quality Assurance Project Plan; (2) assist in selection of the facilities participating in the project; (3) participate in the EMS staff training; (4) assist in the permit and EMS reviews as requested, including the facility site visits; and (5) review preliminary findings and provide feedback on final recommendations. Assisting in these efforts was the project director (the director of EQC Office of Enforcement and Compliance Assistance) and the project manager (unit leader for the Center for Waste Minimization, EQC's pollution prevention office). A complete list of the project team is included as **Appendix A.**

In addition to the project advisory team, periodic updates were provided to EQC's Permitting Directors Committee. This is a standing committee that meets on a bi-monthly basis to coordinate cross-media permitting issues. The committee members were kept apprised of the project tasks, and provided valuable feedback on permitting issues that arose. EQC management was also kept current on the project's progress through

presentations at the EQC Quarterly Management meeting, and at the Assistant Bureau Chiefs and Bureau Chiefs meetings.

2. Selection of the Project Consultant.

Grant funds were used to enlist the services of a project consultant. Following a solicitation process Dr. Phil Barnes, a faculty member at the University of South Carolina and an internationally renowned expert in the field of environmental management systems, was selected. Dr. Barnes assisted the project in several ways: (1) conducting the EMS staff training and analyzing the pre- and post-test evaluations; (2) assisting with the comparative analysis of facility permits and facility EMS; (3) developing matrices that described the similarities and differences between the EMSs and permits; (4) participating in the facility site visits; and (5) developing the initial project findings for review by the project advisory team.

3. Selection of the Participating Facilities.

Facilities were selected from a list of South Carolina Environmental Excellence Program members and the EPA National Environmental Performance Track program. This decision was made because membership in these programs requires an EMS, a good compliance record, and generally indicates a senior management commitment to environmental excellence. The criteria for facility selection included: (1) the number and type of permits the facility held; (2) the type of EMS the facility had; (3) the absence of current or past compliance issues; and (4) a willingness to actively participate in EMS staff training.

Based on these criteria, four facilities were approached and agreed to participate. Letters of agreement were obtained from each of the facilities. In them, the facilities

agreed to share their EMSs and related documentation, participate in one or more site visits with the project team, and serve as case studies for the EMS training. The participating facilities are briefly described below. A more comprehensive description of the facility case studies is included in Section 6 of the Project Activities.

Table 1
Participating Facilities

Facility Name	Location	Air Permit	Water Permit	Hazardous Waste Permit
Dayco Products	Walterboro, SC	Conditional Major	NPDES Stormwater	
Charleston Air Force Base	Charleston, SC	Title V	NPDES Stormwater	RCRA Part B
Milliken Chemical – Dewey Plant	Spartanburg, SC	Title V	NPDES Stormwater NPDES WW	RCRA Part B
Holcim	Holly Hill, SC	Title V	NPDES WW	RCRA Part B

Dayco Products. Dayco Products, LLC is a subsidiary of Mark IV Industries, a multinational corporation. Dayco manufactures power transmission belts and other automotive belts that are used in vehicles manufactured by automakers in the European Union. Dayco employs between 100 and 299 full-time personnel. Regulatory permits evaluated were a conditional major air operating permit and a stormwater permit. Dayco is an ISO-14001 certified facility. For purpose of the case study for Dayco, the primary focus was on its air permit. Dayco permitted sources include its industrial boilers, grinding areas and wax booths.

Charleston Air Force Base. Charleston Air Force Base's mission is to support, train, and deliver world class airlift transport providing agile combat support for the U.S. Therefore, the Base's EMS is focused on eliminating any environmental issues that hinder its mission. The Base developed an environmental management system as a result

of Presidential Executive Order 13148 that states that all federal agencies implement an EMS by December 31, 2005. Charleston Air Force Base is not certified to ISO 14001, but follows the Air Force EMS that is based on the requirements of the 14001 standard. Regulatory permits evaluated were a Title V air operating permit, a NPDES stormwater permit, and a RCRA Part B permit. For the case study, the primary focus was on its RCRA permit for greater than ninety-day storage of hazardous waste.

Milliken Chemical – Dewey Plant. The Dewey Plant is a chemical manufacturer, and employs between 100-299 people. The plant is certified to Responsible Care (RC) 14001 which combines the requirements of the ISO 14001 with those of the Responsible Care initiative of the American Chemistry Council. The American Chemistry Council requires all its members to have in place a management system at their headquarters that either meets the requirements of the Council or conforms to the RC 14001. The RC 14001 enables Milliken to combine environment, safety and health, and security risks as part of its EMS. The plant's regulatory permits include NPDES wastewater, NPDES stormwater, a Title V air operating permit, and a RCRA Part B permit. For Milliken's case study, the primary focus was on its RCRA permit for greater than ninety-day storage of hazardous waste and for acceptance of waste from other Milliken facilities.

Holcim U.S. The Holcim Holly Hill facility is a manufacturer of cement, and employs between 100-299 people. The plant is certified to ISO the 14001 standard. Regulatory permits reviewed include Title V air operating permit, NPDES wastewater permit, and a RCRA Part B permit.

A more detailed evaluation of the facilities' permits and EMSs is included in a later section of this report.

4. Conduct EMS training for EQC staff.

An important component of the project was the EMS training provided to EQC staff. One of the consistent messages received by EQC management from the facilities that participate in the state environmental leadership program is the basic lack of knowledge exhibited by staff regarding the concept and mechanics of an EMS. Likewise, EQC staff has often mentioned the need to provide training on EMSs as they read and hear more about them at the national level. The project team felt that any advances in the integration of EMSs into the regulatory framework were heavily dependent on increasing the knowledge base of the permitting, compliance and enforcement staff.

With that goal in mind, the project team worked with the project consultant to develop two training sessions: a basic *EMS 101* training for EQC staff; and a more extensive *EMS in Permitting* training for selected staff, facility participants, and the project team. The agendas for both trainings are included in **Appendix C**. The one-half day EMS 101 training was conducted on January 6, 2006 with 205 permitting, compliance, enforcement, and regional office staff in attendance. The training was satellite broadcast to the regional office staff to minimize travel to Columbia. The training was conducted by the project consultant, and included the basic design structure of EMSs, the role they can play in the regulatory framework, and how EMSs may improve overall regulatory oversight. The training concluded with the presentation of a case study presented by the environmental manager for Dayco Products, one of the facilities participating in the project. The training was recorded onto a DVD for future reference and to share with the EPA and other interested states.

At the conclusion of the basic training, 29 selected staff and the project team participated in an additional day and a half EMS in Permitting training. Selected staff participants included staff from the central office that work with the participating facilities, facility representatives, and staff from regional offices where the four facilities are located. The training was designed to provide a more in-depth education on EMSs, and included facility case studies and a mock audit.

All participants were required to take a pre- and post-test to measure increase in awareness and understanding as a result of the training. The tests are attached as **Appendix D**. The pre- and post-tests consisted of the same questions, and each test was numbered to match individual responses. While the tests were anonymous, they did include a check box for the bureau where the participant works so that overall bureau response could be evaluated. Pre-tests were completed prior to the start of the training; post-tests were filled out and turned in at the conclusion of the training. For satellite viewing staff, tests were given to an on-site supervisor and mailed to the project manager.

205 DHEC personnel registered for the EMS 101 training; 50 (Bureau of Air Quality); 47 (Bureau of Land and Waste Management); 40 (Bureau of Water); 10 (EQC Administration); 55 (Bureau of Environmental Services); and 3 (other). 201 attended the training and turned in pre- and post-tests. Post-test results were based on 201 responses which showed an overall increase in correct responses of 14.7% with the highest increase in the Bureau of Air Quality with an 18% increase. All bureaus, with the exception of EQC Administration, increased correct responses by over 10%. The percent change in "Don't Know" (DK) answers demonstrates that the information provided during the training increased the knowledge of participants through an overall decrease in the DK

category of 14.6% with the Bureau of Air Quality showing the greatest decrease in "DK" answers by 19.1%, followed by the Bureau of Environmental Services (17.6%).

According to the pre- and post evaluation results, the questions were clear and understood by the participants. After analysis of the participants' responses, it was found that two questions could have been confusing due to the question structure. Only 0.17% of the participants changed a pre-evaluation correct answer to a post-evaluation incorrect answer.

In response to the question, "How would you rate the EMS 101 training in assisting you in better understanding environmental management systems?" 199 respondents rated that training as follows: Excellent =13.1%, Good=60.9%, Fair=25.1%, Poor=02.5%. General comments about the training varied. Ratings of fair and poor and several of the comments did not relate to the question on EMS understanding, but to the temperature of the room, seating, breaks, etc. Overall, the analysis of the pre- and post-test responses demonstrate that the participants did gain useful information that increased EMS awareness and provided knowledge that assisted in better understanding EMS and its role in permitting.

29 participants attended the EMS in Permitting Training. 27 participants turned in a pre- and post-test: 7 (Bureau of Air Quality); 4 (Bureau of Environmental Services); 5 (EQC Administration); 7 (Bureau of Land and Waste Management); and 4 (Bureau of Water). An evaluation of post-tests showed a 11.3% overall increase in the number of correct answers with the Water Bureau demonstrating the highest increase at 23%. 20 participants rated the training as follows: Excellent = 40%; Good = 55%; Fair = 1%. The EMS in Permitting training demonstrated that participants increased knowledge of EMS

and the relationship to permitting. The participating facilities provided excellent examples of how the EMS criteria assisted in managing permit obligations.

In January 2007 – one year after the training – a follow-up survey was sent to all training participants. A copy of the survey and the survey results are attached as **Appendix E**. The follow-up survey was designed to gain insight into how staff may have applied knowledge gained as a result of the EMS training. 69 out of the 201 trained (34%) responded to the survey. In general, the results indicate that over one-half (54%) of the respondents did read material and conduct Internet EMS searches since the training. However, the responses indicate only small gains in the use of EMSs by regulatory staff.

Table 3
One Year Follow-up Survey Results

Question	Never	1-5x	5-10x	10-20x	20+	Continuous Use	N/A
Read material or conducted Internet search on EMS	32	31	4	0	2	0	0
Participated in more EMS training	61	7	1	0	0	0	0
Discussed EMS benefits with colleagues	22	33	10	1	2	1	0
Discussed EMS with regulated company on telephone or on-site	42	25	1	0	1	0	0
Reviewed company EMS as part of permit writing	59	6	2	0	0	0	2
Reviewed company EMS as part of inspection	59	7	3	0	0	0	0
Reduced fine of company for non-compliance if it had an EMS	67	1	0	0	0	0	1
Received EMS information through DHEC communiqués	32	32	4	1	0	0	0
Participated in EMS meeting with staff or supervisors to discuss use of EMS in permitting	57	9	1	1	1	0	0
Used EMS format to develop checklist, evaluation forms, reports, or other documentation for job activities	63	5	1	0	0	0	0

5. Conduct study of facility permits and EMSs.

During this phase of the project, the project team and consultant conducted an initial review of the permits and of the four participating facilities. The permits were compared to the ISO 14001 EMS standards, and general comparisons between the permit requirements and the standards were made. The general comparison is included as **Appendix F**. Site visits were then scheduled with three of the four facilities to discuss the significance of using an EMS to assist environmental managers in meeting permit requirements. Each evaluation was completed on-site within a six hour period. Documentation was reviewed by the project team and the consultant. Interviews with each organization's individual responsible for maintaining environmental areas and the EMS were conducted during the document review and through a follow-up evaluation. Comparison charts documenting the similarities between the facility's permits and its EMS were developed after the site visits. The comparison charts are included in **Appendix B**.

While the project initially began with four facilities, the project team did not continue its work with the Holcim facility. There were several reasons for this decision. First, the Holcim facility was initially included because it held a RCRA permit as a treatment, storage and disposal facility. However, in examining the RCRA permit it was discovered that the permit holder was not only Holcim but also a co-located facility called Energis. Roughly 90 percent of the RCRA permit conditions applied to the Energis facility. Second, while both facilities are operated under the same parent corporation and are co-located, each has its own EMS. Holcim's EMS includes very little regarding the RCRA permit. Third, there were compliance issues affecting the

Energis facility and while they were not tied to Holcim's operations the project team felt it would be difficult to continue Holcim's involvement in the project.

6. Document findings of the EMS/permit study.

In general, the results of the study demonstrated that although each organization was compliance oriented and had a regulatory management system in place, the use of an EMS further assisted in tightening the compliance system function. This was evidenced by enhanced documentation, communication channels, work instructions and compliance reviews. The site visit results also demonstrated that the EMS increased the roles and responsibilities of employees, contractors and suppliers.

Comparisons of the permit requirements with the requirements of ISO 14001 showed similar management topics within the permits. In general, there was a good correlation between a facility's EMS and its permits. Although the permits were written in a manner that referred to a systematic management of specific permit requirements, the permits did not require verification of permit management. The details of managing requirements within the permit were based on the type of permit and the seriousness of the impact on the environment. However, the EMS provided the "road map" for the verification of permit and compliance management through the "plan-do-check-act" cycle.

Each site evaluated had an EMS structured in the framework of the ISO 14001 EMS Standard. However, the design of each facility's EMS was different, based on the site's corporate EMS requirements. Charleston Air Force Base developed its EMS based on Air Force criteria and language that demonstrated an emphasis on meeting government guidelines with the main emphasis on regulatory compliance. Dayco's EMS

certification was based strictly on ISO 14001:2004. There was also an emphasis on regulatory compliance, but the EMS was also used in improving product quality, going beyond compliance and customer relationships. For example, Dayco was required to conform to the European chemical reduction requirements that required all Dayco products to be free of the listed chemicals. Milliken's Dewey Chemical Plant received certification to the Responsible Care (RC) ISO 14001. RC 14001 is a product of the American Chemical Council and the International Organization for Standardization. RC 14001 was created especially for chemical processors.

The following case studies are based on documentation reviews of the facility's EMS and interviews with the person identified as the EMS Coordinator or EMS Environmental Management Representative. Greater emphasis will be placed on those aspects of the EMS that are pertinent to the permits and to regulatory compliance. Clear evidence of linkages (or the lack thereof) between the EMS and permit will be highlighted in each case study. The EMS and permit comparisons are also contained in table form in Appendix B.

Case Study 1: **Charleston Air Force Base, U.S. Air Force-Air Mobility Command**
Permits Reviewed: **RCRA part B; NPDES General Permit for Stormwater Discharges; Title V Air Operating Permit**

The primary focus of the Charleston Air Force Base (CAFB) case study was on its EMS and RCRA permit. CAFB employs 5,925 full-time personnel, including 3,735, military personnel, and 2,054 Air Force Reservists. EMS implementation at CAFB is a result of President Clinton's Executive Order 13148. In 2000, the Greening of Government Executive Order stated that all federal agencies would implement an EMS by December 31, 2005. An EMS GAP Analysis was conducted in 2003 comparing ISO

14001 with the CAFB environmental compliance system. At that time, CAFB had 80% of the ISO 14001 EMS addressed with existing Air Force environmental management practices. The CAFB regulatory management system is supported by a person assigned to each media area. The CAFB environmental management system is also supported by the Air Force Environmental Compliance Assessment and Management Program (ECAMP). An ECAMP took place every three years at CAFB. In between the ECAMP, CAFB was required to conduct its own internal compliance assessments. This exercise provided the CAFB with a regulatory management system based on ensuring that installation operations linked to regulatory permits were compliant. There were also goals of cost reduction within CAFB in relation to environmental issues, for example, reduction of hazardous waste. When economic incentives were incorporated into the regulatory EMS CAFB had an EMS model that closely met the ISO 14001 requirements. However, specific management requirements through the ISO 14001 EMS combined with the CAFB EMS initiated a better documented and overall structured EMS.

The Air Force provided each installation with an Implementation Guidance Series. The Series consists of modules that address the EMS in relation to the Air Force mission. Each module provided guidance to the installation EMS coordinator and team in regard to a particular section of the EMS development based on the sections of the ISO 14001 EMS standard. For example, Module I is Planning, Module II is Implementation and Operations, and Module III is Check and Review. The Air Force EMS model has included additional requirements in its EMS, mainly in areas of documentation based on existing Air Force directives and policies and compliance related management programs. Before EMS implementation, CAFB strictly followed its environmental protection

requirements by following "environmental compliance rules. The CAFB also implemented the pollution prevention program (P2) tool before implementation of the EMS. The P2 program assisted the CAFB to identify installation practices that impacted the environment. The EMS environmental management plan was incorporated into P2 opportunities.

The review of the CAFB EMS documentation and interview with Luis Class, the CAFB's EMS Coordinator, was not an EMS audit, but an evaluation of the CAFB EMS in comparison to how the EMS affected the compliance requirements of the permit.

- Environmental Policy The CAFB developed its environmental policy in 2004, which states that the CAFB make a commitment to regulatory compliance. A commitment to environmental compliance at the federal, state, and local level is a requirement of the ISO 14001:2004 Element 4.2 Environmental Policy. Therefore, the CAFB included this commitment in its Policy. The CAFB policy meets the requirements of ISO 14001 and is strengthened by a very good presentation of how the policy is appropriate to the nature and scale of the CAFB mission. The policy is signed and distributed throughout the base. It is also available to the public through the CAFB Office of Public affairs. The RCRA permit does not require or include a comparable statement of environmental policy. In this respect, there is not a link between the EMS and the permit.
- Environmental Aspects and Impacts When identifying the installation's aspects and impacts, CAFB used its compliance site inventory to identify existing and potential environmental impacts. The different nomenclature for EMS and permit activities should be noted. In an EMS, the "aspect" is the cause of the "impact." Translated

into RCRA, the "aspect" is hazardous waste and associated activities; the "impact" is the effect of those activities on the environment. An EMS requires that those activities, products, and services that create or have the potential to have an environmental impact be addressed. When establishing the EMS, CAFB linked environmental impacts with regulatory compliance activities because compliance had the most significant aspects and impacts. In essence, then, the permit is written to manage the aspect (hazardous waste) to keep the impact (effect on the environment) within regulatory limits. For example, in the RCRA permit, the link to the EMS aspects and impacts are the generation and management of its hazardous waste .

- Training In relation to the EMS, training was identified through the requirement for awareness training on the environmental policy and on training of those employees who work in an area that has been identified as a significant aspect. Training is also included as a requirement within the RCRA permit. It is contained in Module II G of the permit, and the permit requirements reflection the requirements contained in the state's hazardous waste management regulations. Personnel are required to be adequately trained, and training records must be maintained. Here, there is a direct link between the EMS Standard 4.4.2, Competence, Training and Awareness, and the permit requirements on training.
- Communications Internal communication is driven by the base's EMS, and addresses relevant levels and functions within CAFB. In this respect, the EMS is more detailed; there is no comparable requirement in the RCRA permit. External communication is part of the RCRA permit as it applies to reports and notifications to regulators on certain hazardous waste management activities, spills, releases and so forth. While

the EMS describes external communications with regard to regulators, it goes further in it communications plan for external stakeholders.

- Documentation and document control is driven by RCRA permit requirements, but the base's EMS provides greater detail on the actual mechanisms for ensuring that the permit requirements are met. For example, the RCRA permit requires that documents such as hazardous waste manifests, inspection logs, waste analyses, training records, and emergency preparedness and response procedures be maintained and available for inspection. The EMS Standard 4.4.4, includes not only the documents to be maintained but also the personnel responsible for ensuring they are maintained, updated and disseminated as appropriate. While the requirements are set by the permit the details of meeting those requirements are more thoroughly detailed in the EMS.
- Monitoring and Measurement is well defined in the RCRA permit to ensure regulatory compliance. For CAFB the key characteristics of its operations are identified in the significant aspects of the EMS. As stated before, the significant aspects are linked to CAFB regulatory requirements. This ensures that those areas within the RCRA permit that are identified as having an environmental impact are monitored and measured by the CAFB to ensure that compliance with the permit is met. This was seen in the compliance site inventory and continual management of the inventory through monitoring and measuring. Internal evaluation of compliance and other requirements is completed on an annual schedule for internal CAFB purposes. External compliance reviews are conducted through the Air Force ECAMP

program on a three year rotation. For example, weekly compliance inspection are required by the RCRA permit and are tracked through the EMS.

- Corrective and Preventive Action for noncompliance is not an EMS issue. However, non-conformance in regard to not conducting an annual evaluation of compliance can become a non-conformance. Corrective action is required within permitting, but as with other permits the language refers the auditor to the regulation for further explanation of corrective action. Basically, non-compliance is a situation which is not in compliance with a regulation or their permit. Non-conformity is a situation which is not compliant with the EMS standard. Both are linked together by the EMS structure but need to be addressed according the governing standards. There may be a noncompliance situation that was not considered non-conformity to the EMS which in this case should be, so the EMS isn't addressing every aspect. The records requirements with the EMS are not required by the Air Force, so it was not addressed with a conformance to an EMS. However, records within the compliance area are identified through the Air Force process.
- Control of Records is a separate element of the EMS, but in the RCRA permit it overlaps with documentation and document control. Records required to be maintained for compliance are identified in the RCRA permit, for example, training records and manifests. But the base's EMS goes beyond the permit in that it describes responsibilities for document control and the internal audits conducted according to the ECAMP compliance program (now ESOH program). Record control is another example where the EMS supplements the permit requirements to ensure regulatory compliance is met.

- Management Reviews are according to the installation schedule. The EMS requires that top management review the results of internal audits and evaluations of compliance with legal requirements in addition to reviewing the overall EMS. While the RCRA permit has a signatory requirement for the facility owner, it does not address management review. This is an instance where the RCRA permit and the EMS are not directly linked.

The CAFB has used the EMS to enhance its management of compliance. The base reported that the EMS improved the organization's ability to communicate, improve documentation and improve the structure of its compliance program through a systematic approach to managing compliance issues.

Case Study 2: **Dayco Products, LLC, Mark IV Industries**
Permits Reviewed: **NPDES General Permit for Stormwater Discharge**
Conditional Major Air Quality Operating Permit

The primary focus of the Dayco EMS case study was its Conditional Major Air Quality Operating permit. Dayco Products, LLC is a subsidiary of Mark IV Industries. Mark IV Industries is a multinational organization and its plants in the U.S. provide its products to European and U.S. auto makers. Most of its customers require suppliers to register/certify to the ISO 14001 EMS standard. Therefore Dayco's EMS is based on the ISO 14001:2004 EMS Standard. Dayco has implemented an environmental management system program that is benchmarked by other organizations. During the site visits Mr. Revell, the facility's EHS manager, acknowledged the EMS as having a strong impact on Dayco's environmental management through the ability to better administer and maintain the environmental management program. Although Dayco has been building its environmental management program for many years, the implementation of the EMS has

provided better environmental awareness throughout the Dayco plants and has assisted in a better structured and sustainable environmental management program. Dayco's EMS implementation began as a competitive requirement. In order to meet the demands of customers and the market, ISO 14001 was a requirement for implementation. Therefore, the EMS was not implemented to better control regulatory permits, but to meet competitive demands. However, implementation of the ISO 14001 EMS structure did provide Dayco with a better environmental management program, which enhanced the regulatory linkage with management practices.

Dayco began its environmental program in 1991 with a pollution prevention program. The Dayco EMS is compliance driven. Each facility receives EMS guidance from the corporate office. Through implementation of ISO 14001, EMS employees increased their awareness of environmental compliance issues.

- Environmental Policy The policy meets the ISO requirements. It is available to the public when requested. The policy is included in the visitors' admittance agreement forms. The policy makes a commitment to regulatory compliance on the local, state, and federal levels.
- Environmental Aspects and Impacts Multiple teams were brought together to identify aspects and impacts of operations. Compliance was linked to the aspects identification as required by the ISO 14001 EMS. Input-Output Analysis was conducted to identify aspects and ranking was conducted by category. An annual aspects review is conducted. Dayco links its significant aspects list to its regulatory requirements. For example, aspects linkage to regulatory requirements included solvents and rubber dust as significant aspects linked to the Dayco air permit. The

ISO 14001 requirement for linkage to an organization's significant aspects increased compliance awareness for Dayco.

- Monitoring and Recordkeeping was a key component of the objectives and targets development. This area assisted in better identifying and maintaining continual improvement in light of objectives and targets on reducing regulatory risk. Currently, VOC measures are so low that Dayco management has taken it off the management reports. According to Mr. Revell, without the EMS, VOC emissions would not have been reduced. The EMS objective for continuous improvement drove the facility to reduce a permitted air emission. This is an example of where the EMS supports "beyond compliance" activities while the permit only requires compliance within the regulatory limits that it sets.
- Training and Awareness If not for its EMS, Dayco "would not have roles and responsibilities identified in areas of compliance." Identification of roles and responsibilities is included in the EMS with regards to establishing contacts for regulators, training personnel whose role is hazardous waste, or air and water monitoring. Training requirements in Dayco's air permit differ from the RCRA regulations. While RCRA requires specific training of personnel and associated recordkeeping, the air regulations and the air permit contain a general requirement that personnel be appropriately trained for operation of the permitted source. The EMS, however, provides the overall link to the roles, responsibilities, training, and recordkeeping for all personnel at the facility.
- Communication has increased to interested parties in regard to the environmental policy. This is not required by the permit, but is a part of the facility EMS. External

communication is required by the permit to the regulatory body in the form of reports. General conditions in the air permit (Sections B, E, and F of the permit) require communication back to DHEC from a compliance standpoint. However, the air permit does not address external communications to stakeholders. Again, this is an area where the EMS is more descriptive for both internal and external communications procedures; the air permit communications link is to require reports and notification of non-compliance. Dayco has increased its external communication when operations go out of compliance. Mr. Revell calls DHEC to report any incident.

- Documentation requirements are extensive based on the EMS. The organization is required to document a description of each of the ISO 14001 elements and provide direction to those documents related to the EMS documentation. This requirement requires the organization to provide direction to regulatory permits which in turn increases the timeliness of response with regard to regulatory issues. Document control is handled by one person in Dayco. This ensures that documentation related to regulatory compliance issues is always current, which reduces the risk of non-compliance because of an employee performing a job incorrectly due to using the wrong work instructions.
- Corrective and Preventive Action Through the EMS, work instructions were developed to assist in compliance related operations. Before the EMS, contractors and suppliers were not made aware of the use of materials and procedures, products or supplies. The EMS contributed to the development of corrective and preventive actions. The process is more complete and regimented. The improvement of this

area decreased the risk of non-compliance. For example in the air permit, there is a condition that states "an affirmative defense to any action brought for noncompliance with an emission limitation shall be demonstrated by the facility if all the condition of the regulations are met". This condition would then be linked back into the EMS.

- Monitoring and Measurement was enhanced though identification of key characteristics in the EMS. Key characteristics are identified through operations that have potential to have a significant impact on the environment. These were related to permit areas of compliance. Evaluation of compliance is referred to as permit review in the permit requirement, although reviews of permits are required by the organization's management. ISO-certified facilities are required to self-evaluate continuously, and to conduct internal, annual compliance evaluations. These requirements of the EMS extend beyond the air permit requirements for monitoring. Because of the monitoring requirements of the EMS, the risk of non-compliance with the permit is greatly reduced.
- Auditing The development of an internal auditing process as part of the ISO certification process assisted Dayco in maintaining compliance. Dayco's management reviews assisted in documenting compliance issues, which is a requirement of ISO 14001. As noted above, the auditing requirements of the EMS are more extensive than the monitoring and reporting requirements contained in the air permit. In this respect, the EMS enhances regulatory compliance by maintaining a more extensive internal and external auditing process.

Dayco does not measure cost savings through its EMS, but focuses measures on increased product quality. Dayco has reduced the solid waste reduction cost from $28 a

ton to $18 a ton; decreased the rental amount for its rubber dust container by $225 a month; reduced staff time for EMS (Mr. Revell is now doing the job that three people were responsible for in the past). This is due to implementation of the EMS structure within operations. Dayco will begin implementation of the 18001 Occupational Health and Safety Standard in the future, which will be built into the EMS.

Case Study 3: Dewey Plant, Milliken and Company
Permits Reviewed: NPDES General Permit for Stormwater Discharge; NPDES Wastewater Permit; Title V Air Operating Permit; RCRA Part B Permit

The primary focus of the Milliken case study was with its EMS and RCRA permit. The Dewey plant of Milliken and Company is a chemical manufacturer. The plant is certified to the Responsible Care (RC) 14001, which combines the requirements of the ISO 14001 with those of the Responsible Care initiative of the American Chemistry Council. RC 14001 goes beyond the basic ISO 14001 model to incorporate health and safety and security. The American Chemistry Council (ACC) required all its members to have in place a management system at their headquarters that either meets the requirements of the ACC or conforms to the RC 14001. As in all EMS types the Plan-Do-Check-Act model is followed and this is the same in the RC 14001; however, the RC 14001 enables Milliken to also combine environment, safety and health and security risks.

Enhancing EHS management through RC 14001 puts emphasis on regulatory requirements. Milliken's top management views regulatory permits as serious, yet the Dewey plant is far beyond compliance requirements in its operations and top management of Milliken has for years required its plants to go beyond compliance. Since Milliken was a member of the ACC prior to the RC 14001 requirement, many of

the EHS management practices were in place. However, the RC 14001 implementation provided a better structure to assist in management og regulatory permits.

- Environmental Policy The environmental policy provides commitment to regulatory compliance at local, state, and federal levels. As previously noted in the CAFB case study, the environmental policy is not linked to the RCRA permit.
- Aspects and Impacts of activities are identified and tied to regulatory requirements within the chemical industry. Top four aspects are: 1) hazardous waste handling and storage, 2) managing sister plant hazardous waste, 3) management of contaminate groundwater, 4) management of air. Significant aspects can be reduced through changing operations criteria for ranking. Regulatory requirements are listed and checked through the Chemical Council, DHEC, and other compliance information reports. Dewey kept up with regulatory requirements with Responsible Care and under the strict corporate policy on environmental compliance. Milliken had a top management driven environmental system before RC 14001 EMS. However, RC 14001 implementation strengthened the compliance management system that was in place.
- Roles and Responsibilities are defined and strictly monitored. The schedule of who in the Milliken team is responsible for a task is developed. If a person is out or cannot meet the task, another Milliken team member takes up the task or checks to see what needs to be completed for the task. This responsibility matrix was developed prior to the EMS. However, the EMS assisted in better structure and follow-up regarding responsibilities. This is an example of where the RCRA permit and EMS are not directly linked. Assigned responsibilities, organizational structures, and

description of specified roles are not part of the RCRA permit, but through the EMS these details are thoroughly covered and help to enhance permit compliance.

- Training was initiated with ISO 9001 and Responsible Care. Environmental training was added and tracked through Milliken's EMS. Training was conducted prior to EMS through permit requirements for RCRA. As noted in the CAFB case study, there is a direct link between the EMS and the permit's training requirements.
- Communication Responsible Care was the initial program for communication. (C2 150) Orientation and training on aspects and legal requirements has assisted with communications for on-the-job training. Communication is effective due to the development of various communication techniques to ensure that position responsibilities are carried out.
- Documentation and document control was already in place, however, the EMS added to work instructions and procedures which assisted in reducing the risk of non-compliance to permits. Document control was initiated with ISO 9001. Operational control was developed through the EMS and was initiated with the creation of work instructions in the environmental areas.
- Monitoring and Measurement is completed through the continual evaluation of processes and reports generated for compliance. Milliken's top management is focused on meeting a goal of zero waste generation for all its plants.
- Compliance Reviews are conducted regularly by Milliken personnel from other plants. RC 14001 strengthened the compliance management system through increased reporting, training, and evaluation of compliance issues through the EMS.

- Corrective and Preventive Action were initiated with ISO 9001 and Responsible Care. Reports for incidents are sent to each site for managers to correct any area that could have a similar incidence.
- Recordkeeping for environmental issues were added. Compliance records were already in place using the ISO 9001 system. However, increasing records based on environmental issues indirectly assisted in reducing risk of non-compliance within permits.
- Auditing was added for environmental management with the implementation of ISO 14001. Third party external audits required by the EMS put more strength and control into Responsible Care.
- Management Review is scheduled within each facility. Reports of accomplishments, incidents, corrective and preventive actions are sent up the management line. Mr. Milliken heads up the final management review with reports. Staying in compliance and reducing waste is considered the most critical area for environmental reporting.

Glenn Stoner, Environmental Manager, stated that implementation of an EMS assisted in strengthening the compliance management of Milliken Dewey plant through providing an improved structure for environmental compliance issues. Through the EMS implementation, additional activities were reviewed and their impacts on the environment analyzed. This provided better evaluation of system weakness in the compliance program.

This section of the report has described the activities associated with the EMS/permit reviews, site visits, and interviews for each of the participating facilities.

The next section will include more specific findings as they relate to the *EPA Strategy* questions regarding the role of EMSs in regulatory programs.

PROJECT RECOMMENDATIONS

General Findings

(1) Management support is crucial to exploring the use of EMSs in the regulatory framework.

While it may seem like a statement of the obvious, senior management support is critical for several important reasons. First is the internal communication link. This project could not have functioned in isolation. It was important for the media programs to step up and be involved in the training, permit reviews, site visits, and development of recommendations. To obtain this buy-in, senior management communicated its support for both the EMS concept and the project itself. Support was provided by the bureau chiefs and assistant bureau chiefs, the EQC directors, and channeled to the program staff through internal meetings, presentations, and e-mail.

The second reason why senior management support is so critical is the external communication link. Having the deputy commissioner for EQC publicly support the South Carolina Environmental Excellence program (where an EMS is one of the criteria for membership) by approving the re-location of the program from the University of South Carolina to the Department was an important first step. This was followed by Department support for legislation that piloted innovative approaches to improved environmental management, linking eligible pilot facilities to membership in the Environmental Excellence or Performance Track programs. These steps led to a dialogue between EQC management and the regulated community as well as environmental

stakeholders about the appropriate role for EMSs in the regulatory scheme. With this groundwork laid, EQC was positioned to undertake the EMS in Permitting study.

(2) Program staff must be trained to understand the role that EMS can play in the regulatory framework.

The importance in training staff on the EMS concept cannot be overstated. Incorporating EMSs into the regulatory framework cannot occur without an informed and knowledgeable staff. While the training component was not the primary focus of the study initially, it quickly grew in importance as project staff became aware of the general lack of knowledge at the program staff level. While EMSs have played a prominent role in the national dialogue on environmental performance – both by industry and by the EPA – there is amazingly little "trickle down" effect to the program level, e.g. to those permit engineers, inspectors, and enforcement staff who typically have the most interaction with a facility on a day-to-day basis.

This is why the EMS training turned out to be one of the greatest unanticipated benefits of the project. First, EQC staff was generally interested – or at least curious – to learn about EMSs. This was evidenced by the turnout for the EMS 101 half-day training where the number of staff participants far exceeded expectations. However, the strong turnout was also influenced by the senior management support that was communicated down to the program staff level. Second, the pre- and post-test evaluations were a critical measurement tool to gauge increase in awareness and understanding as a result of the training. The results clearly indicated an increase in overall understanding.

The other important measurement tool for the training was the one-year follow-up survey. The survey was sent out through e-mail to all staff who participated in the initial training. While the return rate on the survey was not outstanding, small, but

important gains were noted in the survey results. For example, in response to Question 1, "Read, reviewed material or conducted Internet research on EMS since the training" while 32 of the 69 respondents (out of 201 trained) never read any more material or gained more knowledge about EMSs, more than one-half of those responding (54%) did. Equally important is the response to Question 3, "Discussed EMS and its benefits to DHEC with colleagues," where 33 of the 69 respondents indicated doing so between one to five times, while 10 did so between five to ten times. This indicates that 62% have had additional internal dialogue about EMS since the training. For purposes of increased awareness and starting an internal dialogue about EMSs, the training was very beneficial.

But did the training influence how regulators interact with members of the regulated community? Here, the gains indicated in the follow-up survey are small, but noteworthy. In answer to Question 4, "Discussed EMS with a DHEC regulated company on the telephone or on the company site," 25 of the 69 respondents indicated they had talked with a regulated entity about EMSs one to five times in the year since the training. 10 out of 69 respondents said that they had "Reviewed a company's EMS in relation to an inspection," in answer to Question 6 of the survey. Eight staff responded that they had considered an EMS in permit writing and how the EMS could be used (Question 5). What is noteworthy is that these activities took place without any further direction or guidance from management about the use of EMSs in the regulatory framework. The increased awareness and understanding gained through the initial training did positively affect staff behavior.

These findings point to the need for continuous staff training on EMS. This is particularly true as EQC continues to wrestle with staff turnover, particularly with permit

engineers and inspectors. The benefits of an EMS to a facility cannot be acknowledged or incorporated into the regulator's activities if that regulator has no frame of reference upon which to act. For any state looking to identify ways to increase or incorporate the role of EMSs into the regulatory framework, staff training on an ongoing basis is absolutely essential.

EMS/Permit Recommendations

The recommendations resulting from the EMS/permit study are discussed in the context of the *EPA Strategy* questions that were posed at the beginning of this report.

(1) Can EMSs, in tandem with performance standards, achieve better and more efficient regulatory/permitting environmental results than prescriptive operational controls?

Permits reviewed (RCRA, Air, and NPDES) are currently written to reflect the regulations that are applicable to the permitted facility. For example, the Title V air inspection checklist mirrors the general and specific conditions written into the permit even to the point of being numbered the same. The permit conditions are tied directly to the air regulations, and include the regulation citations. The RCRA TSD permit is based on a template that uses a series of modules that are directly tied to the hazardous waste management regulations. The NPDES permit for stormwater discharges (industrial activity) is a general permit and, as such, may be closer to performance-based standards (e.g. use of BMPs, P2 plan, etc.) than the other types of permits.

In the EMS/permit review there were several examples where performance standards – in conjunction with an EMS – could supplant prescriptive operational controls, such as:

RCRA training requirements: RCRA has very detailed training requirements, and inspectors are required to go through personnel training records, training manuals, and

other documentation. ISO Standard 4.4.2, "Competence, Training and Awareness," and 4.4.4 "Documentation" provide greater procedural requirements for training and the documenting of it. In addition, the EMS specifies who is responsible for these functions. A performance standard in the RCRA permit could require that "personnel are properly trained and competent to perform their assigned duties" and incorporate by reference the applicable portions of the EMS to ensure this occurs.

Emergency preparedness and response: All three permit types (RCRA, Title V, NPDES) include conditions relating to emergency response. As compared against ISO Standard 4.4.7, however, the EMS supplements or goes beyond the permit conditions. This is another area where the permit could require a performance standard, e.g., to ensure that emergency procedures are in place, and incorporate by reference the EMS.

NPDES nonconformity, corrective action and preventive action: The NPDES permits did not address corrective actions or nonconformity. However, ISO Standards 4.5.2, "Evaluation of compliance," and 4.5.3, "Nonconformity, corrective and preventive actions," require periodic compliance reviews to ensure preventive actions are taken to avoid areas of nonconformity that then trigger corrective action. Again, this is an area where the permit could benefit from a performance based standard requiring compliance with the procedural aspects of meeting this standard provided for in the EMS.

RCRA Waste Minimization Plan: RCRA facilities are required to have a waste minimization plan, however, there are no reporting requirements associated with it. ISO Standard 4.2, "Environmental Policy," requires a commitment to pollution prevention and going beyond compliance. Yet, the permit is designed to meet regulatory limits; continual improvement is not a permit requirement. This is an area where fulfilling the EMS policy for pollution prevention and waste minimization goes beyond the permit condition on maintaining a waste minimization plan. The permit could set a performance standard to continuous environmental improvement through the waste minimization requirement with the EMS as a supplement to meeting the standard.

Title V Air Permit Annual Compliance Certification: Every year, a Title V permitted facility must provide a certification, signed by the responsible corporate official under penalty of perjury, that the facility has met all of its permit conditions. Any deficiencies or deviations must be noted in the certification. This concept could be applied to EMS facilities where it can be demonstrated that the EMS provides more comprehensive coverage than the permit itself in terms of meeting the regulatory requirements. In these instances, the facility could "self-certify" that certain conditions of the permit are met through the EMS.

The general comparison of the ISO 14001:2004 EMS Standards to permit requirements compiled in **Attachment F,** indicates a strong potential for utilization of performance standards over prescriptive operational controls. However, this will not

occur until there is a substantive culture change in how permits have been traditionally written. Furthermore, there must be support from EPA since the state is federally authorized or delegated to administer and enforce the RCRA, Title V, and NPDES Storm Water programs and as such must maintain an "equivalent" and adequately enforced program.

(2) Under what conditions could regulators rely on EMSs in permits and rules to redirect regulatory oversight from lower to higher priority areas?

There was agreement among the project team about the possibility of reducing the frequency of inspections based upon a facility's EMS and past compliance record *provided* the EMS was submitted for review *and* the facility demonstrated use of an independent 3rd party EMS auditor. Examples based on current inspection schedules include:

- There are approximately 250 Title V facilities in South Carolina; of these, 90% receive annual inspections. Historically, the Air program has found that these facilities have good compliance records, and flexibility in inspection requirements needs to focus on the smaller facilities.

- There are approximately 200 major NPDES facilities that the water program is required to annually inspect; yet, research has shown that most compliance problems occur with the small municipal and community wastewater treatment systems.

- There are approximately 45 RCRA TSD facilities in South Carolina, and EPA requires that they be annually inspected even though more inspection and oversight is needed for the large universe of small quantity hazardous waste generators.

The issue of inspection frequency does not require incorporating EMSs into permits or changing the rules. To implement, a commitment from EPA is needed to provide flexibility in the media program's annual federal grant commitments (work plans) to recognize EMS facilities setting the facility inspection schedules. Concurrently,

it requires a commitment on the part of the state to recognize EMS facilities as candidates for less frequent inspections. Using RCRA as an example, each year EPA negotiates with the state to set the number of hazardous waste generator inspections. Currently, the hazardous waste program is required to annually inspect all TSD facilities even when staff knows that certain facilities have historically maintained excellent compliance records. If the work plan commitments were adjusted so that TSD facilities with EMSs and good compliance histories could go to a biennial inspection schedule, this would free up staff resources to focus on more problematic compliance areas such as small quantity generators.

(3) Can EMS elements improve performance and efficiency by substituting for overlapping administrative and information-gathering requirements in rules and permits?

There is a potential for administrative cost savings if the EMS is used as a tool for the inspector to determine facility compliance. An inspector may not have to inspect to the same level or "depth" of a traditional facility inspection if elements of the EMS can demonstrate facility compliance. At the pre-inspection interview, some aspects of the inspection could be adequately covered through a review of the facility EMS. Some examples identified through the study include:

- Use of the EMS to show permit compliance, e.g., using the EMS as a pre-inspection "checklist"
- Use of the EMS to demonstrate the Waste Minimization Plan in place, including environmental objectives and targets for beyond compliance (RCRA)
- Use of EMS to supplement emergency procedures in place (NPDES)
- Use of EMS to assist the inspector in understanding the roles and responsibilities of personnel and internal communications (Title V Air)

For example, the DHEC inspector for the Charleston Air Force Base could use the Base's EMS when conducting regular permit inspections. Many of the inspector's document reviews, department visits, daily and weekly inspection records requests and other types of permit inspection criteria relate to the EMS. When DHEC personnel are conducting permit inspections they could have a copy of the installation's Environmental Management Plan to better understand how the EMS and permit requirements relate. A check box could be provided on the inspection report. This block would verify the presence of the EMS, and how the EMS had worked with the inspection process.

PERFORMANCE MEASURES

The project's performance measures focused primarily on improved environmental performance through waste reduction or waste avoidance, environmental condition indicators, pollution prevention and waste minimization opportunities, and environmental compliance indicators. After reviewing the facilities' permits, an evaluation of facility performance was conducted. The facilities were asked to submit data to show environmental performance in terms of waste reduced or waste avoidance for solid waste in tons per year; hazardous waste in pounds per year; water use in gallons per year; energy use in kWh per year; and volatile organic compound emissions in tons per year. The actual data can be found in **Appendix G.** After reviewing the data and comparing it to when the facilities implemented their EMS, there did not appear to be a strong relationship to an increase of these performance measures due to their EMS. All of the facilities had pollution prevention (P2) programs in place in the early 1990's which required measures be put in place to reduce the volume and/or toxicity of waste prior to the discharge or disposal. Because of the P2 programs, the facilities were able to make

significant reductions. The data does not take into consideration production increase or a change in the type of operations at the facility.

Additional environmental performance measures that were evaluated were compliance indicators. DHEC compliance and enforcement staff were asked to do a five-year compliance review of the three participating facilities. Since the facilities had already gone through a very thorough review process prior to being selected to participate in the project, the assumption was that there would not be any significant compliance issues. The compliance reviews asked for and included the following from the DHEC compliance staff:

- A list of all inspections conducted with date, type, result and any violations which resulted in an enforcement action;
- Any warning letters issued;
- Anything outstanding, such as reports that are just a few days overdue at the time of the review or anything that has not been referred to enforcement yet, but may be in the near future; and
- Any additional positive/negative information about the facility.

The compliance reviews asked for and included the following from the DHEC enforcement staff:

- All referrals;
- Any notice of alleged violations issued;
- Date and outcome of any enforcement conferences;
- Consent orders (CO) issued with penalty amount and whether the penalty included any economic benefit;
- Administrative orders (AO);
- any environmental beneficial projects included in the CO or AO in addition to the penalty;

- Any additional positive/negative information about the facility.

The actual information received can be found in **Appendix H.** The compliance reviews showed that the facilities did have some minor compliance issues after the implementation of their EMSs. All of the facilities stated that the EMS assisted in strengthening the compliance management and enhanced the regulatory linkage with management practices, although it did not guarantee compliance. Facilities still had some compliance situations that had not been prevented or identified by their EMSs.

CONCLUSION

In general, there was a positive correlation between the facility's EMS and its permits. There did not appear to be any significant differences based on the type of EMS a facility had. In each facility EMS/permit review, it was clear that the permit drove the regulatory obligations of the facility while the EMS ensured compliance with those obligations.

The overall project results demonstrated that implementation of an EMS further assisted in tightening the compliance system function and enhanced documentation, communication channels, work instructions, compliance reviews, and the roles and responsibilities of top management, employees, contractors and suppliers. However, there is currently no recognition or other incentive through the permit process for successful implementation of an EMS. Incentives might include less frequent inspections, streamlined inspections that incorporate EMS elements, and streamlined permit conditions that incorporate EMS elements by reference.

An ongoing issue with any movement towards incorporating EMS into the regulatory framework is the need to continuously inform and educate staff about EMSs. Even for the project team members who received the more intensive two-day EMS training, there were concerns about substituting any aspects of the EMS into the permitting process. It was difficult to get beyond the strong belief that the permit must mirror the applicable regulations and anything less than that (e.g. a performance based standard with an EMS) was beyond the regulatory authority of the agency. This was particularly true in RCRA where the regulations are so prescriptive and detailed, there was difficulty in understanding how an EMS could potentially substitute, supplement, or streamline the actual permit.

There was consensus, however, on the benefit of an EMS in the regulatory oversight function, specifically, inspection frequency. This offers, if not an administrative cost savings, at least a re-direction of effort to focus resources on the facilities that pose greater, or chronic compliance concerns. To do this, support is needed both from the EPA where inspection commitments are negotiated through the work plans and internally where media programs have historically locked into set inspection schedules.

One fundamental question that was not answered by the project is the universe of facilities in South Carolina that actually have EMSs, and the correlation of compliance and enforcement histories for those facilities. A future step for the agency is a cross-media pilot study through the 2008 inspection schedules that would include on each inspection report three basic questions: (1) does the facility have an EMS; (2) if so, what type; and (3) if so, is it certified by an independent third party auditor? This would

provide information on the universe of facilities with EMSs and would be valuable information as the agency considered incorporating EMSs into the regulatory framework. The project team did feel strongly that regardless of the type of EMS a facility had, it was critical that it be independently audited and certified to be recognized by the agency.

DHEC will continue to encourage facilities to implement EMSs through membership and recognition in the South Carolina Environmental Excellence Program. Consideration of recommendations contained in this report will be fully vetted through the facilities that are members of this program. In the past, they have encouraged the agency to recognize EMSs in its regulatory activities, and to offer incentives that encourage companies to develop and implement EMSs. This study has provided valuable information about the relationship of EMSs to the permitting process and, more importantly, the value of an EMS to a facility to manage its compliance obligations and to enhance its environmental performance.

APPENDICES

Appendix A: List of Project Team

Appendix B: Comparison Charts

Appendix C: Training Agendas

Appendix D: Tests

Appendix E: Follow-up Survey and Results

Appendix F: General Comparison between ISO 14001 Standard and Permit Requirements

Appendix G: Facilities Performance Measures Data

Appendix H: Facilities Compliance Reviews Data

Appendix A: Complete List of Project Team

Incorporating Environmental Management Systems in Permit Decisions

Project Team

The Goals of the Project are:

- Improve the overall environmental performance of a facility;
- Explore ways permit requirements can be integrated and streamlined based on an EMS;
- Determine how an EMS can help to ensure consistency in the development, issuance, inspection, interpretations, and potential enforcement of a permit both from a single media and cross-media perspective; and
- Evaluate the potential benefits of incorporating EMSs in as incentive for permitting options.

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Role of the Project Team

The project team served as advisors to the project director and project manager, and as the panel of technical experts on permitting and related issues. Activities that will involved the project team include:

- Review and validate project goals and objectives;
- Review and validate performance measures;
- Review and select facility participants for the project;
- Revise the Quality Assurance Project Plan (QAPP) as appropriate (e.g. after facilities are selected);
- Identify major stakeholders;
- Participate in EMS Training;
- Assist in the review of facility permits and EMSs;
- Develop recommendations on ways that permitting decisions can be impacted positively (or negatively) by a facility EMS.

Appendix B: Comparison Charts

EMS Standards (ISO 14001)	Part 70 Air Quality Permit-Charleston AFB-TV-0560-0019	Part 70 Air Quality Permit-Milliken & Company (Dewey Plant) TV-2060-0001
General Information (contents, forward, introduction)	Title page, contents, Part 1.0 General Information (p1-5)	Title page, contents, Part 1.0 General Information (p1-5)
1.0 Scope	Part 2.0 Applicability (p6)	Part 2.0 Applicability (p6)
2.0 Normative references	None	None
3.0 Terms and definitions	Go to Regulation-Pollution Control Act, Sections 48-150(5) and 48-1-110a (SC Code Regulation 61-62	Go to Regulation-Pollution Control Act, Sections 48-150(5) and 48-1-110a (SC Code Regulation 61-62)
4.0 Environmental Management Systems Requirements	Part 70 Air Quality Permit-TV-0560-0019 (All Parts)	Part 70 Air Quality Permit-TV-2060-0001 (All Parts)
4.1 General requirements	Part 3.0 General Conditions	Part 3.0 General Conditions
4.2 Environmental Policy	Facility Environmental Policy	Facility Environmental Policy
4.3 Planning	Section Heading	Section Heading
4.3.1 Environmental Aspects	p15 Conditions, Emission Unit Description (p16, 17, 18) Significance (pg 19,20, Con-4-6 (p15)	p15 Conditions, Emission Unit Description (p16, 17, 18) Significance (pg 19,20, Con-4-6 (p15)
4.3.2 Legal and Other Requirements	Section R (p12, 13, 14, 15,) General Requirements Section A. B. E. P.(p7,8,11) Permit # TV-0560-0019	Section R (p12, 13, 14, 15,) General Requirements Section A. B. E. P.(p7,8,11) Permit # TV-2060-0001
4.3.3 Objectives, Targets and Programme(s)	General Conditions Section S-29(p13)	General Conditions Section S-29(p13)
4.4 Implementation and operation	Section Heading	Section Heading
4.4.1 Resources, Roles, Responsibility and Authority	Owner or operator is listed throughout the permit as responsible (designated) (DHEC listed contact)	Owner or operator is listed throughout the permit as responsible (designated) (DHEC listed contact)
4.4.2.Competence, Training and Awareness	Depends on site (Standard 3 Regulation) (Part 6 in some permits could have training)	Depends on site (Standard 3 Regulation) (Part 6 in some permits could have training)
4.4.3. Communication	General Conditions Section B. (p7) Section E & F (p8)	General Conditions Section B. (p7) Section E & F (p8)
4.4.4 Documentation	Permit is description of document related to element requirement Part 6-New Template	Permit is description of document related to element requirement Part 6-New Template
4.4.5 Control of Documents	p22,23 conditions 5, 6, 7, 8ID 08	p22,23 conditions 5, 6, 7, 8ID 08
4.4.6 Operational Control	p20 Conditions and p22 Condition 1&2 ID 04 and ID 05, p23 condition 10 ID 11	p20 Conditions and p22 Condition 1&2 ID 04 and ID 05, p23 condition 10 ID 11

4.4.7 Emergency Preparedness and Response	General Conditions Section I.	General Conditions Section I.
4.5 Checking and Corrective Action	Section Heading	Section Heading
4.5.1. Monitoring and Measurement	Section A. Monitoring and Reporting (p20, ID 1, 13) p21,22, 23) Condition 10	Section A. Monitoring and Reporting (p20, ID 1, 13) p21,22, 23) Condition 10
4.5.2 Evaluation of Compliance	General Conditions-Section R, S,T. (p12,13,14) (p22-conditions 3&4 ID-01002,09 and ID 04-08 p24-C Facility Inspection	General Conditions-Section R, S,T. (p12,13,14) (p22-conditions 3&4 ID-01002,09 and ID 04-08 p24-C Facility Inspection
4.5.3 Nonconformity, Corrective Action and Preventive Action	Condition 5 (p15)	Condition 5 (p15)
4.5.4 Control of Records	General Conditions Section E (p8)p22,23 conditions 5, 6, 7, 8ID 08, 10	General Conditions Section E (p8)p22,23 conditions 5, 6, 7, 8ID 08, 10
4.5.5 Internal Audit	(p22-condition 3&4 ID-01002,09 and ID 04-08 /Attachment C-Checklist 1-10 (Facility Inspection	(p16,17-condition 3,4,5,6 ID-01002,09 and ID 04-08 /Attachment C-Checklist 1-10 (Facility Inspection
4.6 Management Review	Management Review takes place during annual inspection.	Management Review takes place during annual inspection.

EMS Standards (ISO 14001)	NPDES General Permit for Storm Water Discharges (Industrial Activity)
General Information (contents, forward, introduction)	Part 1-1.1 Introduction,
1.0 Scope	1.2 Permit Area, 1.3 Eligibility
2.0 Normative references	None
3.0 Terms and definitions	Appendix A - Definitions and Abbreviations Appendix B (p50)
4.0 Environmental Management Systems Requirements	Section Heading
4.1 General requirements	NPDES General Permit Part 3. 3.3 (p11) - F
4.2 Environmental Policy	None (check application)
4.3 Planning	Section Heading
4.3.1 Environmental Aspects	Storm Water Discharges, Allowable Non-Storm Water Discharges, (p3) 6,7, Part 3 P2 Plan/B(p12)
4.3.2 Legal and Other Requirements	NPDES General Permit Part 1&2.
4.3.3 Objectives, Targets and Programme(s)	Check NPDES Application (notice of Intent-Location-SIC-Water Flow
4.4 Implementation and operation	Section Heading
4.4.1 Resources, Roles, Responsibility and Authority	Part 2.2 C-10 Part 3 3.2 - 3.4A(p11&12) Appendix B (p43)
4.4.2.Competence, Training and Awareness	Part 3 C.5 (p14) F (i-j) (p19) - Engineering Subset of Facility
4.4.3. Communication	Part F B-1 (p21) C (p23) Part 3. 5.4
4.4.4 Documentation	Part 3 (p10)
4.4.5 Control of Documents	Part 3 (p10)
4.4.6 Operational Control	Part 3 and 5
4.4.7 Emergency Preparedness and Response	Part 6-6.3-A-1 (p31) Part 3.4.2 (i) (p19) 3.4C-3 (p13)
4.5 Checking and Corrective Action	Section Heading
4.5.1. Monitoring and Measurement	Part 3 C. Part 5.2 A&B Appendix B (j)) (p46)
4.5.2 Evaluation of Compliance	Part 3 C.4 (p13) D-(p15)
4.5.3 Nonconformity, Corrective Action and Preventive Action	Part 3 (p10) D (p15) F-(g) (p18) 3.4-D.2
4.5.4 Control of Records	Part 3 C.6 (p14) Part 5.5 (p29)
4.5.5 Internal Audit	Part 3 C.4 (p13) (p19 recertification) (Audit of Compliance-Evaluation)
4.6 Management Review	Part 3-3.2 (p11) (p16 Management review of compliance)

EMS Standards	Hazardous Waste Permits Template/General Requirements-Holcim	Hazardous Waste Permits Template/General Requirements-Milliken-Dewey Plant	Hazardous Waste Permits Template/General Requirements-Charleston AFB
General Information	SC-Code Section 44-56 and Regulation 61-79	SC-Code Section 44-56-10 et seq and Regulation 61-79	SC-Code Section 44-56-10 et seq and Regulation 61-79
1.0 Scope	Module I Standard Conditions SCR R.61-79 Permit # SCD 003 368 891	Module I General Permit Conditions SCR R.61-79 Permit# SCD 069 314 045	Module I Standard Conditions SCR R.61-79 Permit# SC3 570 024 460
2.0 Normative references	Module I General Permit Conditions and Module II General Facility Conditions	Module I General Permit Conditions and Module II General Facility Conditions	Module I General Permit Conditions and Module II General Facility Conditions
3.0 Terms and definitions	Module I.D R.61-79 parts 124,260, 261, 264,266,268,270 (JD 10)	Module I.D R.61-79 parts 124,260, 261, 264,266,268,270 (JD 10)	Module I.D R.61-79 parts 124,260, 261, 264,266,268,270 (JD 10)
4.0 Environmental Management Systems Requirements	Module I - SC HWM R.61-79 parts 124,260, 261, 264,266,268,270 (JD 10)	Module I - SC HWM R.61-79 parts 124,260, 261, 264,266,268,270 (JD 10)	Module I - SC HWM R.61-79 parts 124,260, 261, 264,266,268,270 (JD 10)
4.1 General requirements	Module 1 - Standard Conditions	Module 1 - General Permit Conditions	Module 1 - Standard Conditions
4.2 Environmental Policy	Facility Environmental Policy	Facility Environmental Policy	Facility Environmental Policy
4.3 Planning	No Section Heading for this EMS Element	No Section Heading for this EMS Element	No Section Heading for this EMS Element
4.3.1 Environmental Aspects	Module II.B (p14)and Module VIII - I.D.11 (p6) (Modules III through VII) (Appendix B)	Module II.B (p14)and Module VIII - I.D.11 (p6) (Modules III through VII) (Appendix B)	Module II.B (p14)and Module VIII - I.D.11 (p6) (Modules III through VII) (Appendix B)
4.3.2 Legal and Other Requirements	Hazardous Waste Permit (SCD 003 368 891) (p1)	Hazardous Waste Permit (SCD 069 314 045) (p1)	Hazardous Waste Permit (SCD 003 368 891) (p1)
4.3.3 Objectives, Targets and Programme(s)	Waste Minimization Certification Objectives (p60)	Waste Minimization Objectives (p30) Appendix F (p70) IV.F.1 IM (p23)	Waste Minimization Certification Objectives (p36)
4.4 Implementation and operation	Appendix B:RCRA Facility Investigation (RFI) Appendix C: Corrective Measures -Work Plan Outline (p59)	Appendix B - RCRA Facility Investigation (RFI) Work Plan Outline (p37)	Appendix B:RCRA Facility Investigation (RFI) Appendix C: Corrective Measures -Work Plan Outline (p59)
4.4.1 Resources, Roles, Responsibility and Authority	Module II Appendix C - Add Compliance, I.E. Duties (p7)	Module II, III, Appendix C - Add Compliance, I.E. Duties (p4) (p71)	Appendix C - Add Compliance, I.E. Duties (p7) Modules III though IV
4.4.2.Competence, Training and Awareness	Module II G - R.61-79.264.16 (p15)	Module II F - R.61-79.264.16 d-e (p11)	Module II G - R.61-79.264.16 (p15)
4.4.3. Communication	Appendix E - Land Use Control Management Plan, Appendix C-7A(p80)	Module 1-I.G Appendix E - Land Use Control Management Plan	Module I-I.G.(Reports, Notifications..) Appendix C - Elements of CMS Work Plan A-7 ((p73)
4.4.4 Documentation	I.H, I.I. Documents to be Maintained (p12,13)	I.I Documents to be Maintained (p9)	I.I Documents to be Maintained (p12,13)
4.4.5 Control of Documents	I.H, I.I. Documents to be Maintained (p12,13)	I.F (p9)	I.H, I.I. Documents to be Maintained (p12,13)
4.4.6 Operational Control	Module II, III, IV, p(4) Appendix B RCRA Workplan (p70) IV,D (p24)	Module I I.E.6, p(5) Appendix B RCRA Workplan (p70)	Module II, III, and IV (Appendix B RCRA Workplan-p70) I.E.6 (p8)

4.4.7 Emergency Preparedness and Response	Module II K.2, II K 3, II K 4 , II K.6 (p16)	Module II K.2, II K 3, II K 4 , II K.6 (p16)	Module II K.2, II K 3, II K 4 , II K.6 (p15-16)
4.5 Checking and Corrective Action	Section Heading	Section Heading	Section Heading
4.5.1. Monitoring and Measurement	Module I. I.E.6, I.E.9 (p8) Module II, Appendix A	Module I I.E.6, I.E.9 (p6) Appendix A	Module I-I.E.6, I.E.9(a) (p8) Module II, Appendix A
4.5.2 Evaluation of Compliance	Module I SCR R.61-79	Module I SCR R.61-79	Module I SCR R.61-79
4.5.3 Nonconformity, Corrective Action and Preventive Action	Appendix C (p80) (p53) II-D (p14)	Appendix D (p51) (p53) Module IV (p17)	Module IV, Appendix C (p73) Appendix B (p60), (p33)
4.5.4 Control of Records	Module III H Record M-I I.E.9 (p9) M IIF (p15)	Module III H Record M-I I.E.9 (p9) M IIF (p15) II.I (p11)	Module III.H,9p19) Module II F (p15) I.E.9 (p8)
4.5.5 Internal Audit	Module I I.E.8 (p8) V.I (p36) Module II General Facility Conditions	Module I I.E. (p10) Module II General Facility Conditions	Module I I.E.8 (p8) Module II General Facility Conditions (p14)
4.6 Management Review	Module 1-I.F Signatory Requirement	Module 1-I.F Signatory Requirement	Module 1-I.F Signatory Requirement

Appendix C: Agenda's for Trainings

EMS 101 Training

January 11, 2006

Peeples Auditorium and Satellite Broadcasted to 8 EQC Regional Offices

8:00-8: 30 **Registration/Pretest**

8:20-8:30 **Housekeeping Instructions**
Claire Prince, EQC- Administration
Director, Office of Enforcement and Compliance Assistance

8:30 **Introduction of Project and Speaker**
Claire Prince, EQC- Administration
Director, Office of Enforcement and Compliance Assistance

8:40 **Introduction**
Dr. Phillip Barnes, University of South Carolina
Research Professor

9:00 **Training Purpose**
Dr. Phillip Barnes, University of South Carolina
Research Professor

9:30 **History of EMS Organization**
Dr. Phillip Barnes, University of South Carolina
Research Professor

10:00 **Overview of ISO 14001:2004 EMS Standard Elements**
Dr. Phillip Barnes, University of South Carolina
Research Professor

10:30 **Break**

10:45 **Continue with ISO 14001 Elements**
Dr. Phillip Barnes, University of South Carolina
Research Professor

11:30 **Case Study Brief on EMS Implementation/Discussion**
Dr. Phillip Barnes, University of South Carolina
Research Professor
&
Russell Revell, Dayco Products, LLC
EHS Manager

11:45 **Post-Test**
12:00 **Adjourn**

EMS in Permitting Training
January 11-12, 2006

EQC Admin. Bldg.
Conference Room No. 2104

Day One – ***EMS in Permitting Training***
Afternoon Session

1:30 PM	Registration and Pretest
1:30	Understanding the Terminology of an EMS (ISO 14001)
2:00	Detailed EMS Element Review
3:00	Break
3:15	EMS Audits Audit Requirements Documentation/Verifying Documentation
4:30	Adjourn

Day Two – ***"EMS in Permitting Training"***
All Day Session

8:30 AM	The Auditor's Role
8:45	The Audit Process Comparing the EMS/Permitting Criteria to the Organization's Documentation
10:00	Planning the Audit
10:30	Break
11:00	Developing the Checklist (Exercise-Identification of Auditable Statements)
11:30	The EMS Documentation/System Audit
12:00 PM	Lunch (on your own)

1:00	Case Study-Mock Audits using Charleston Air Force Base and Milliken Dewey Plant EMS
2:00	Mock Audit Evaluation
2:30	Writing Nonconformance
3:00	Break
3:15	Audit Report
3:45	Developing Corrective Actions
4:00	Post-Test
4:30	Adjourn

Appendix D: Pre-and Post-Test's

Pre-Training Evaluation
EMS 101
Please complete this evaluation prior to today's workshop

Please circle the program area you work in: Land and Waste Management----Air Water----Environmental Services------EQC Admin

Today's EMS training is to provide basic information on the environmental management systems (EMS) and the relation of the EMS requirements with environmental permitting and regulatory programs. The result of this pre-workshop evaluation will not be identified with the person completing the evaluation

To evaluate your present understanding of environmental management systems, please answer the following questions by putting "T" for True or "F" for False in the space provided. If you do not know or are unsure of the answer, place a "DK" for Don't Know.

_____1. An Environmental Management System (EMS) is part of an organization's management system used to develop and implement the environmental policy and manage its environmental aspects

_____2. An EMS does not have elements that manage an organization's regulatory requirements.

_____3. An EMS is designed to continually improve the management system and which leads to improvement of environmental performance

_____ 4. The organization's top management is responsible for defining the environmental policy in agreement with the employees of the organization.

___ __5. Regulatory permits are used in an EMS to reduce compliance .

_____ 6. The key characteristics of an organization's operations is specific to regulatory requirements

_____ 7. An EMS provides a structured process to manage and reduce waste

_____ 8. In an EMS the organization must identify the aspects of its activities, products and services and rank each to determine how significant each aspect is.

_____ 9. Legal requirements are not considered when developing an EMS because the EMS is not regulatory in its intentions.

_____10. ISO 14001 EMS requires that an organization conduct periodic regulatory compliance evaluations.

II. Multiple Choice: Please circle the correct answer. If you do not know or are unsure circle "Don't know."

11. Aspects are:

a. Elements of an activity that interact with the Environment
b. Any change to the environment
c. Sometimes tied to a regulatory requirement
d. All of the above
e. None of the above
f. Don't know

12. ISO 14001 is a:

a. Specification document of the ISO 14000 Environmental Management Series
b. A guidance document to assist in EMS implementation
c. SC lottery winning number
d. b and c
e. None of the above
f. Don't know

13. The EMS policy must be:

a. Appropriate to the Organization
b. Address Environmental regulations, local, state, and federal
c. Communicated to all employees
d. Made available to the public
e. All of the above
f. Don't know

14. Impacts are:

a. Elements of an organization's activity that interact with the Environment
b. Any change to the environment
c. The cause of an effect
d. b and c
e. None of the above
f. Don't know

15. ISO 14001 is an international:

a. EMS Standard
b. U.S. Environmental Management System Standard
c. An EMS Specification Standard an organization can be certified to
d. All of the above
e. None of the above
f. Don't know

16. ISO 14001 is an EMS that:

a. Has conformance requirements
b. Is the only EMS that can be audited?
c. Assists an organization in meeting compliance requirements
d. a & c
e. None of the above
f. Don't know

17. An EMS can be implemented in:

a. Any type of Organization in any country
b. Organizations that pollute
c. Universities that have the Chicken Curse in football
d. All of the above
e. None of the above
f. Don't know

18. A corrective action:

a. Reduces re-occurrence of a non-conformance
b. Is used if a non-conformance or non-compliance is found
c. Is better than preventive action
d. a and b
e. a and c
f. Don't know

19. The "shall" in the ISO 14001 Standard means:

a. The requirement must be addressed and met
b. Is used instead of shell in coastal management plans
c. Replaces the need for "get it done."
d. a and c
e. None of the above
f. Don't know

20. An EMS process helps an organization:

a. Evaluate its current practices and procedures
b. Determine if current operating processes are effective
c. Identify potential regulatory violation
d. Assist in the implementation of environmentally sound improvement plans
e. a & b
f. Don't know

Post-Training Evaluation
EMS 101
Please complete this evaluation after to today's workshop

Please circle the program area you work in: Land and Waste Management----Air Water----Environmental Services------EQC Admin

To evaluate your understanding of environmental management systems after the training, please answer the following questions by putting "T" for True or "F" for False in the space provided. If you do not know or are unsure of the answer, place a "DK" for Don't Know.

_____1. An Environmental Management System (EMS) is part of an organization's management system used to develop and implement the environmental policy and manage its environmental aspects

_____2. An EMS does not have elements that manage an organization's regulatory requirements.

_____3. An EMS is designed to continually improve the management system and which leads to improvement of environmental performance

_____ 4. The organization's top management is responsible for defining the environmental policy in agreement with the employees of the organization.

___ __5. Regulatory permits are used in an EMS to reduce compliance.

_____ 6. The key characteristics of an organization's operations is specific to regulatory requirements

_____ 7. An EMS provides a structured process to manage and reduce waste

_____ 8. In an EMS the organization must identify the aspects of its activities, products and services and rank each to determine how significant each aspect is.

_____ 9. Legal requirements are not considered when developing an EMS because the EMS is not regulatory in its intentions.

_____10. ISO 14001 EMS requires that an organization conduct periodic regulatory compliance evaluations.

II. Multiple Choice: Please circle the correct answer. If you do not know or are unsure circle "Don't know."

11. Aspects are:

a. Elements of an activity that interact with the Environment
b. Any change to the environment
c. Sometimes tied to a regulatory requirement
d. All of the above
e. None of the above
f. Don't know

12. ISO 14001 is a:

a. Specification document of the ISO 14000 Environmental Management Series
b. A guidance document to assist in EMS implementation
c. SC lottery winning number
d. b and c
e. None of the above
f. Don't know

13. The EMS policy must be:

a. Appropriate to the Organization
b. Address Environmental regulations, local, state, and federal
c. Communicated to all employees
d. Made available to the public
e. All of the above
f. Don't know

14. Impacts are:

a. Elements of an organization's activity that interact with the Environment
b. Any change to the environment
c. The cause of an effect
d. b and c
e. None of the above
f. Don't know

15. ISO 14001 is an international:

a. EMS Standard
b. U.S. Environmental Management System Standard
c. An EMS Specification Standard an organization can be certified to
d. All of the above
e. None of the above
f. Don't know

16. ISO 14001 is an EMS that:

a. Has conformance requirements
b. Is the only EMS that can be audited?
c. Assists an organization in meeting compliance requirements
d. a & c
e. None of the above
f. Don't know

17. An EMS can be implemented in:

a. Any type of Organization in any country
b. Organizations that pollute
c. Universities that have the Chicken Curse in football
d. All of the above
e. None of the above
f. Don't know

18. A corrective action:

a. Reduces re-occurrence of a non-conformance
b. Is used if a non-conformance or non-compliance is found
c. Is better than preventive action
d. a and b
e. a and c
f. Don't know

19. The "shall" in the ISO 14001 Standard means:

a. The requirement must be addressed and met
b. Is used instead of shell in coastal management plans
c. Replaces the need for "get it done."
d. a and c
e. None of the above
f. Don't know

20. An EMS process helps an organization:

a. Evaluate its current practices and procedures
b. Determine if current operating processes are effective
c. Identify potential regulatory violation
d. Assist in the implementation of environmentally sound improvement plans
e. a & b
f. Don't know

Please answer the following questions to assist us in determining the usefulness and relevance of today's training.

21. How would you rate the EMS 101 training?

____ Excellent

____ Good

____ Fair

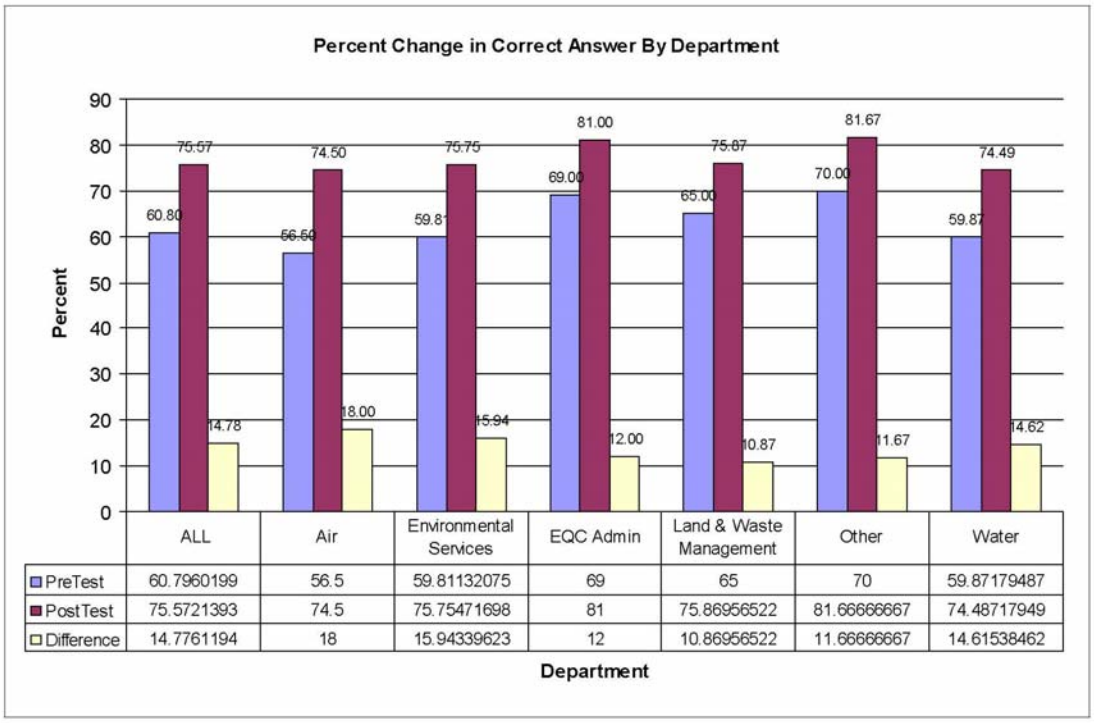
____ Poor

22. Do you have any comments about the EMS 101 training?

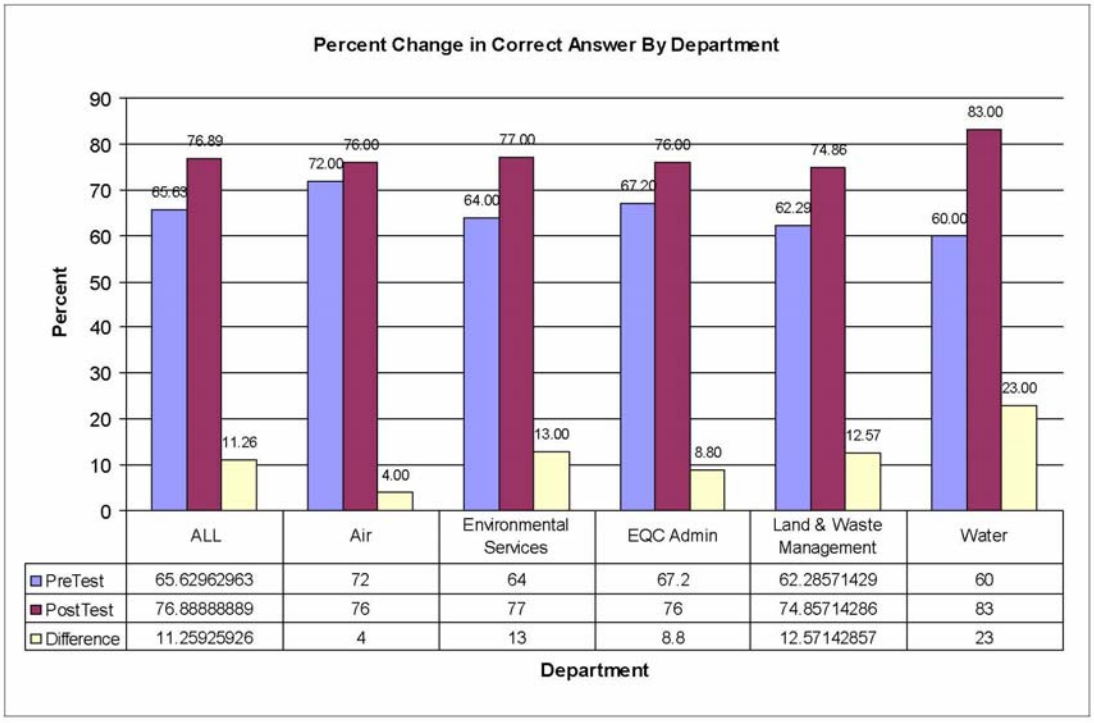
_____
_____
_____

23. Do you have any recommendations for future trainings on EMS and environmental regulations?

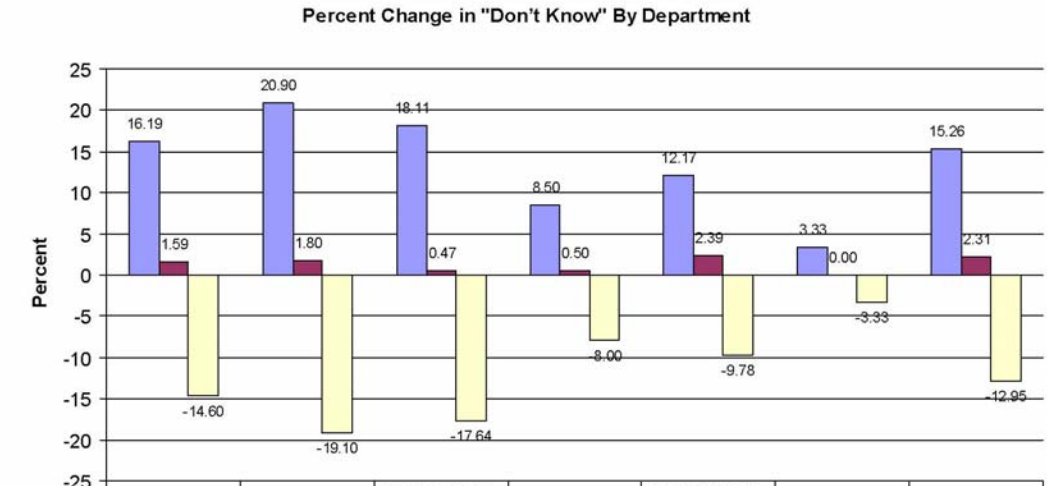
_____
_____
_____



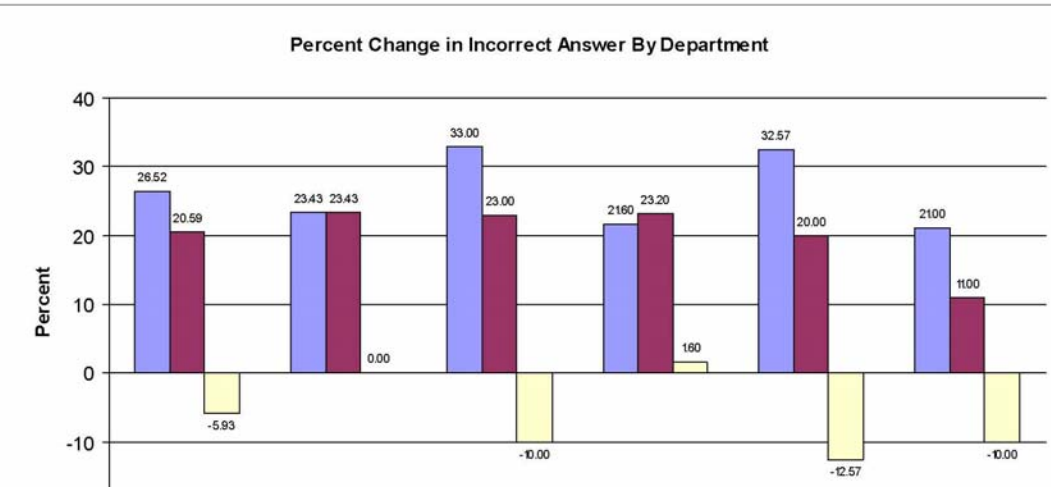
	ALL	Air	Environmental Services	EQC Admin	Land & Waste Management	Other	Water
PreTest	60.7960199	56.5	59.81132075	69	65	70	59.87179487
PostTest	75.5721393	74.5	75.75471698	81	75.86956522	81.66666667	74.48717949
Difference	14.7761194	18	15.94339623	12	10.86956522	11.66666667	14.61538462



	ALL	Air	Environmental Services	EQC Admin	Land & Waste Management	Water
PreTest	65.62962963	72	64	67.2	62.28571429	60
PostTest	76.88888889	76	77	76	74.85714286	83
Difference	11.25925926	4	13	8.8	12.57142857	23



	ALL	Air	Environmental Services	EQC Admin	Land & Waste Management	Other	Water
PreTest	16.19402985	20.9	18.11320755	8.5	12.17391304	3.333333333	15.25641026
PostTest	1.592039801	1.8	0.471698113	0.5	2.391304348	0	2.307692308
Difference	-14.60199005	-19.1	-17.64150943	-8	-9.782608696	-3.333333333	-12.94871795



	ALL	Air	Environmental Services	EQC Admin	Land & Waste Management	Water
PreTest	26.51851852	23.42857143	33	21.6	32.57142857	21
PostTest	20.59259259	23.42857143	23	23.2	20	11
Difference	-5.925925926	0	-10	1.6	-12.57142857	-10

Appendix E: Follow-Up Survey and Results

EMS Training Follow-up Questionnaire

EMS Training was provided to DHEC employees on January 11, 2006 with an introduction to Environmental Management Systems (EMS 101) and additional EMS training was given in more detail in regards to ISO 14001 EMS specific requirements (EMS in Permitting).

The follow-up survey below is designed to gain insight into: increased knowledge of an EMS and its relationship to regulatory compliance; use of EMS in permit writing; discussion of EMS in permitting during site visits; and increased use within the environmental regulatory departments.

Please circle the program area you work in:
Land and Waste Management Air Quality Water
Environmental Services EQC Administration

Answer the following questions using the scale below to indicate your use of EMS in your job activities over the past 12 months.

Scale:
***1**=Never **2**=One to Five times **3**=Five to Ten times **4**=Ten to Twenty times **5**=More than Twenty **6**=Continually use EMS in working with facilities in my DHEC job duties*

Questions: Use the scale above to answer the following questions

1. Read, reviewed material or conducted Internet research on EMS since the training____

2. Participated in additional EMS training____

3. Discussed EMS and its benefits to DHEC with colleagues____

4. Discussed EMS with a DHEC regulated company on the telephone, fax, or on the company site____

5. Reviewed EMS as a part of your area of expertise in permit writing and how an EMS could be used____

6. Reviewed a company's EMS in relation to an inspection____

7. Reduced the fine of a company for non-compliance issue if it had an EMS___

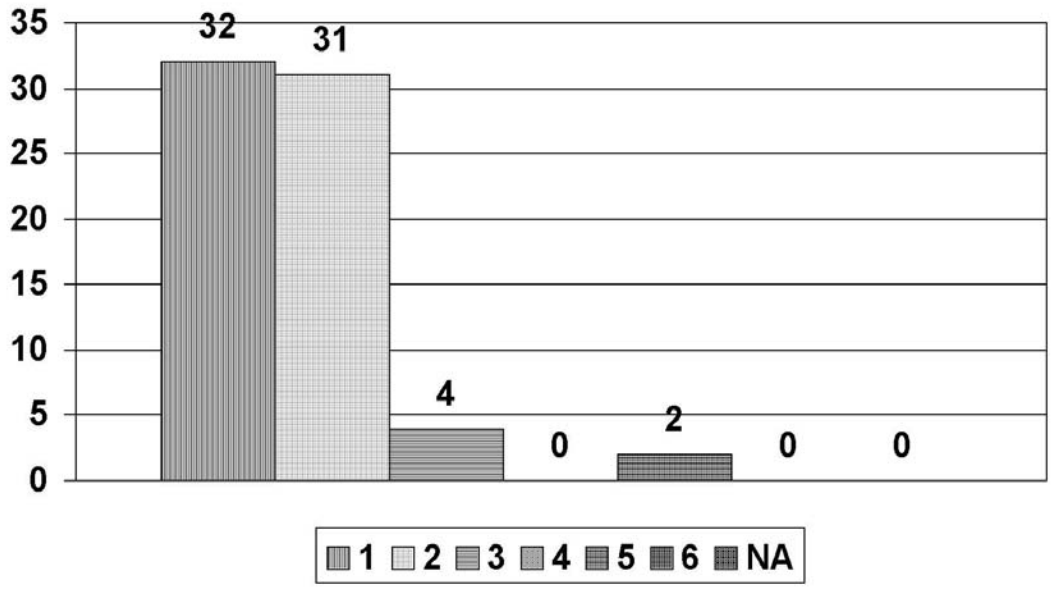
8. Received EMS information in DHEC newsletters, email or other communication ___

9. Participated in EMS meetings with colleagues or supervisors to discuss the use of EMS in permitting___

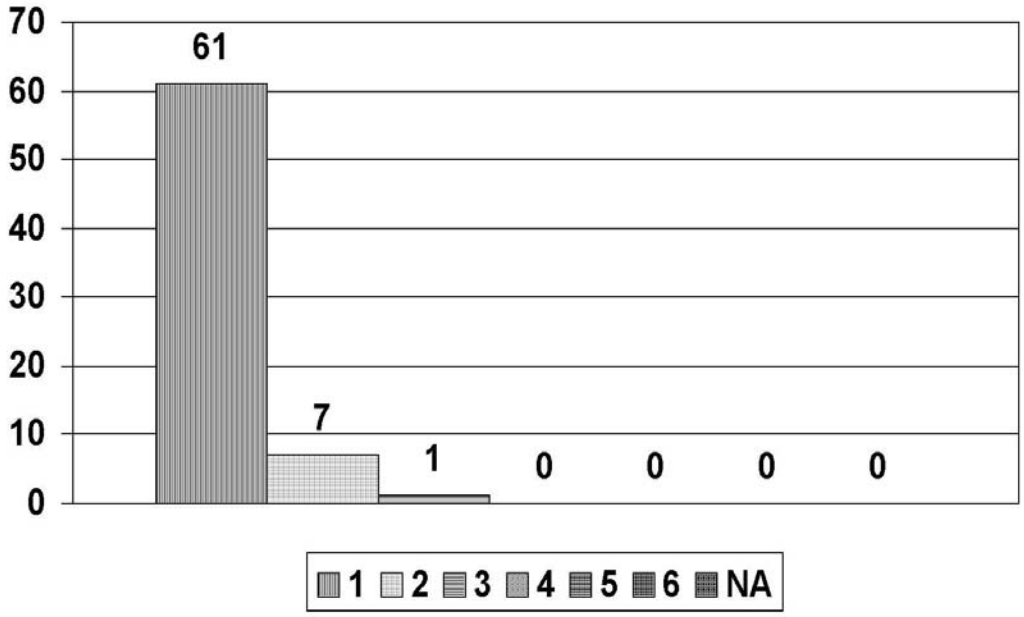
10. Used an EMS format to develop checklisst, evaluation forms, reports, or other documentation used in your job activities_____

Please return to Christine Steagall by Feb 1, 2007, to (803) 896-8991, steagacl@dhec.sc.gov or EQC Admin- Center for Waste Minimization

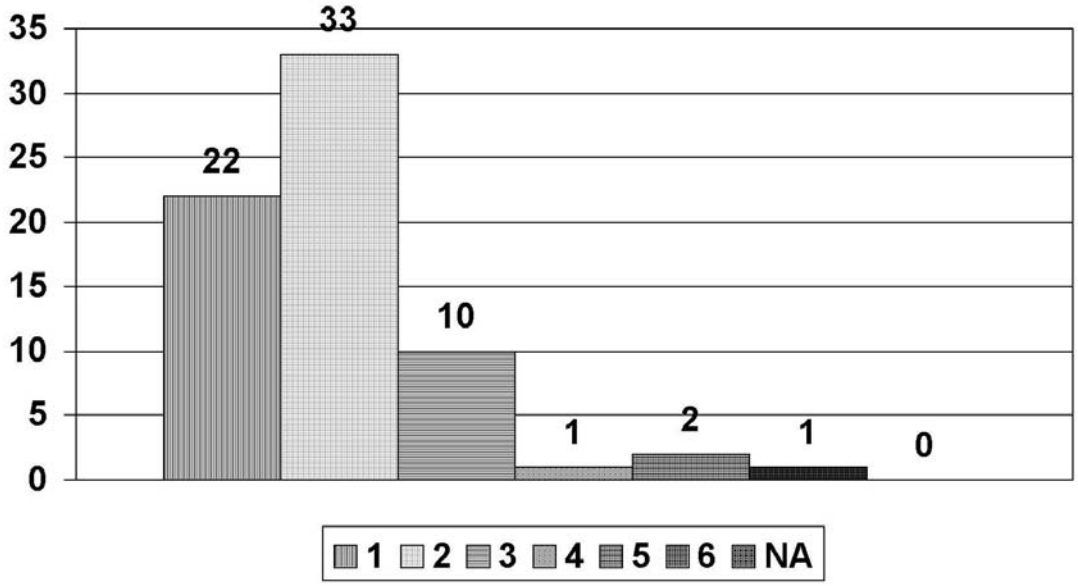
QuesNo 1 Read, reviewed material or conducted Internet research on EMS since the training



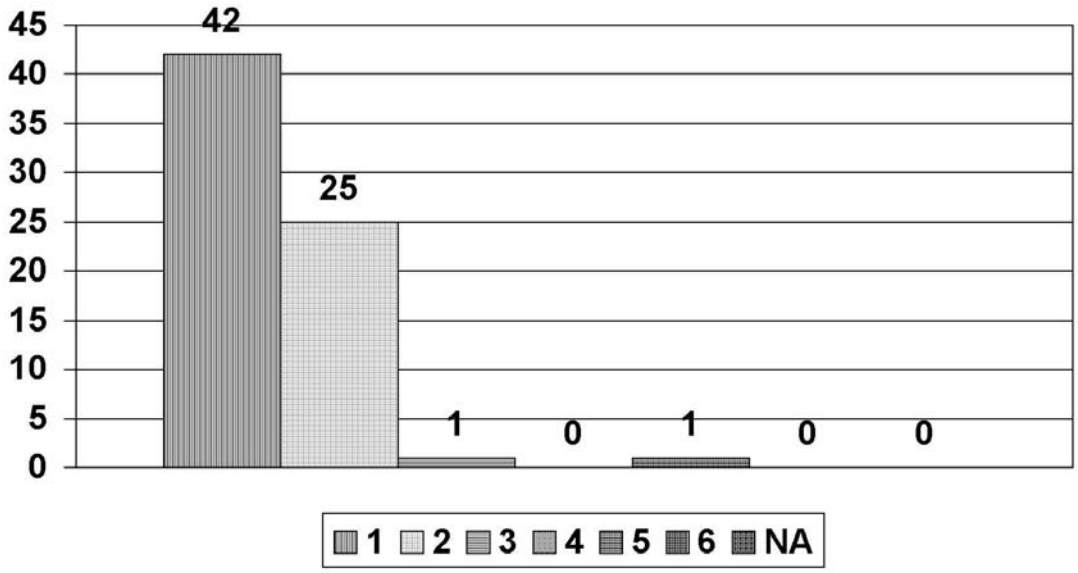
QuesNo 2 Participated in additional EMS training



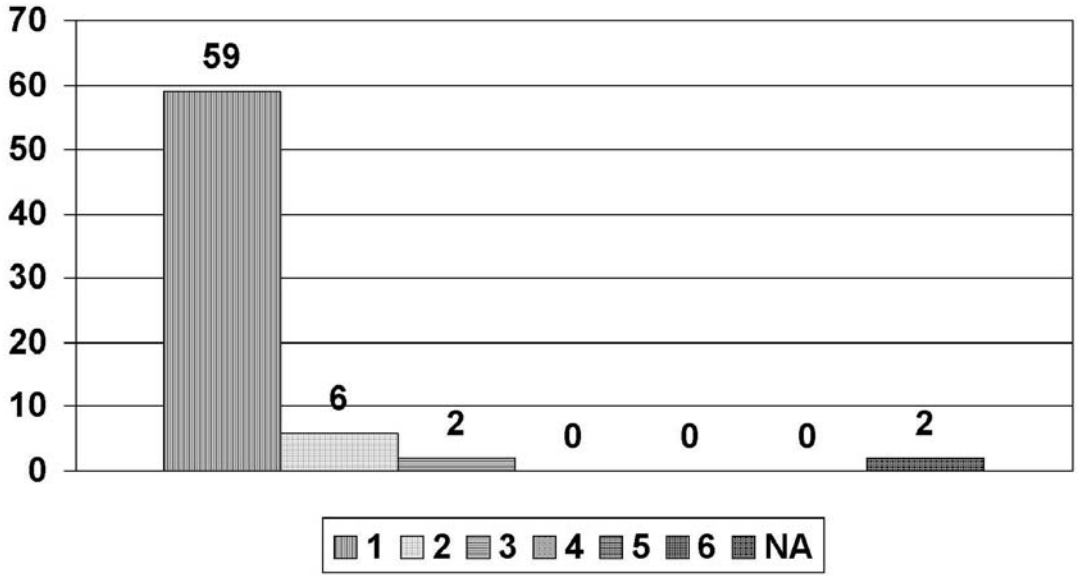
QuesNo 3 Discussed EMS and its benefits to DHEC with colleagues



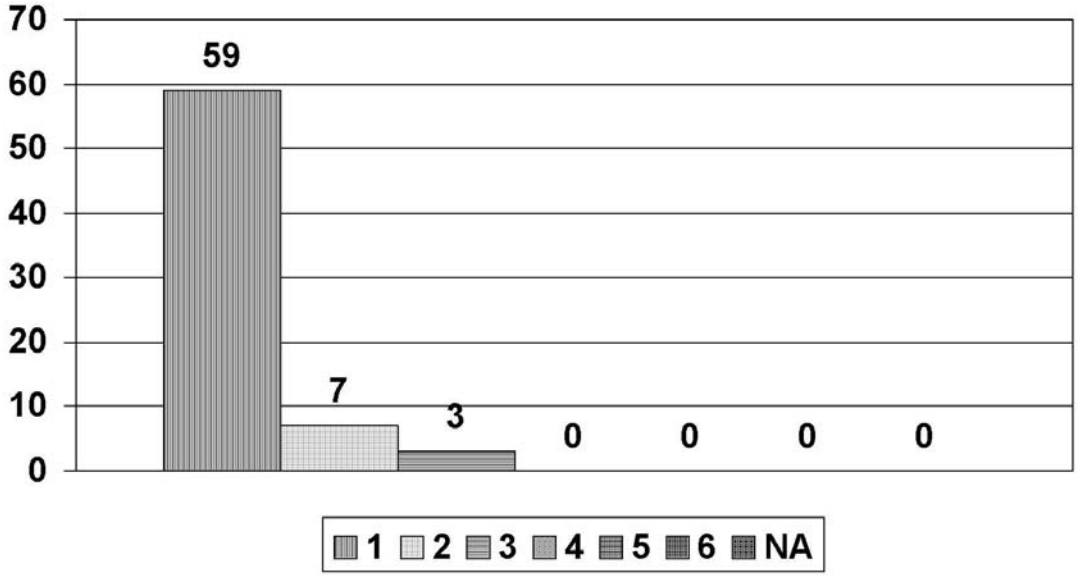
QuesNo 4 Discussed EMS with a DHEC regulated company on the telephone, fax, or on the company site



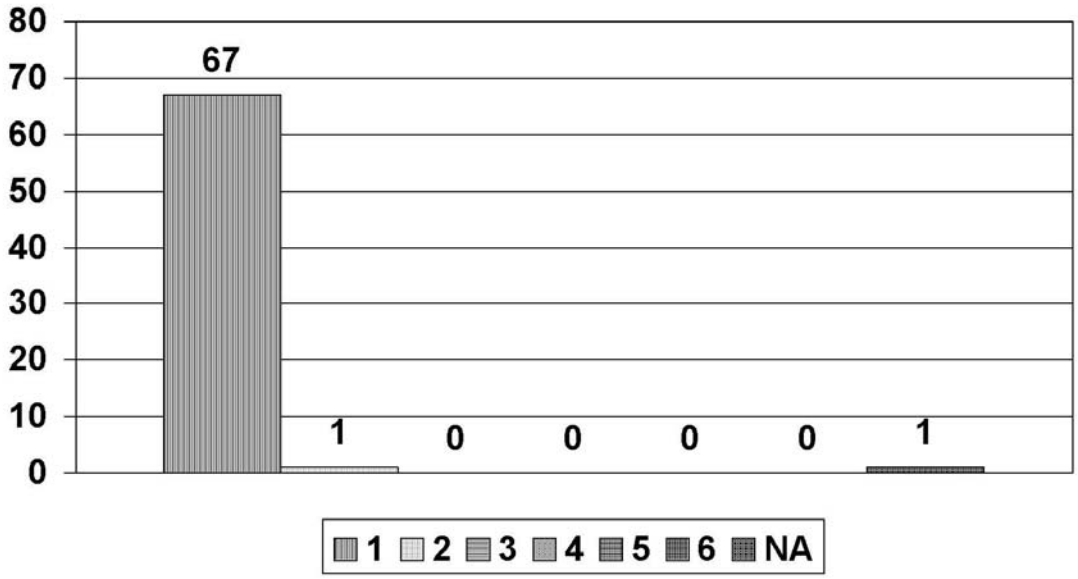
QuesNo 5 Reviewed EMS as a part of your area of expertise in permit writing and how an EMS could be used



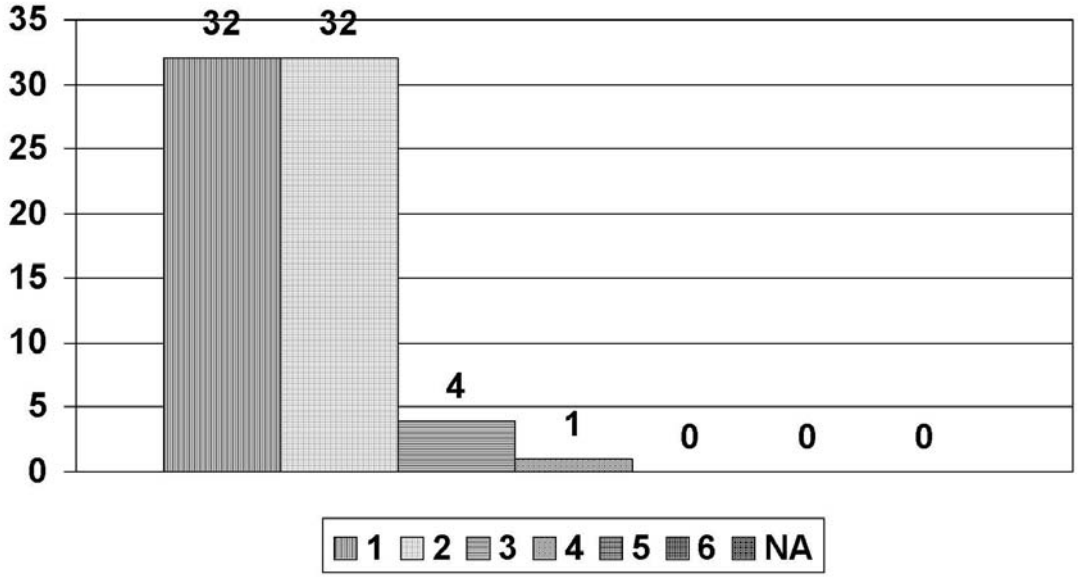
QuesNo 6 Reviewed a company's EMS in relation to an inspection



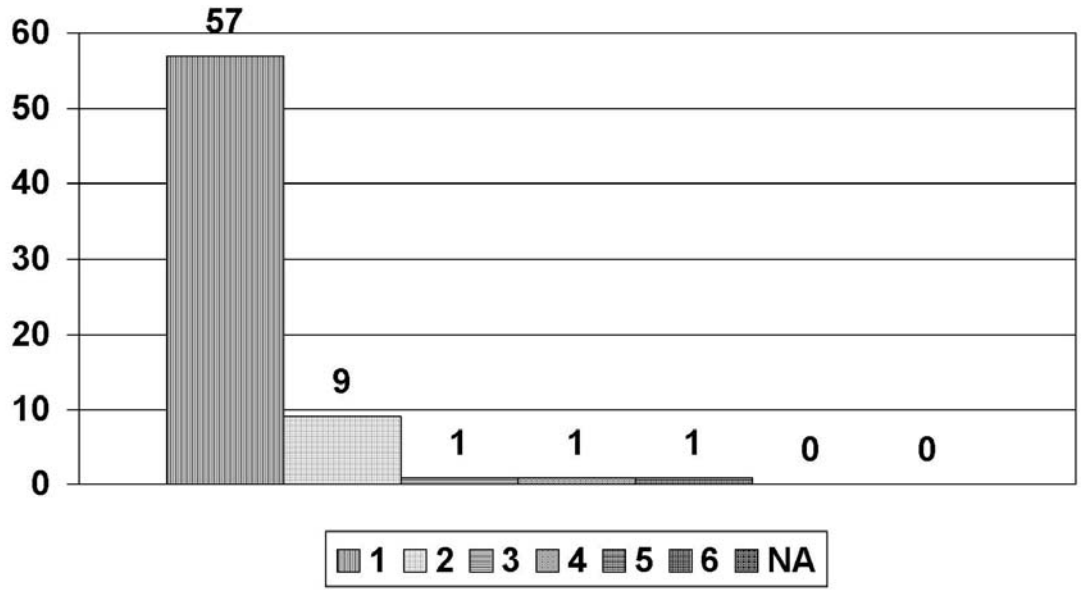
QuesNo 7 Reduced the fine of a company for non-compliance issue if it had an EMS



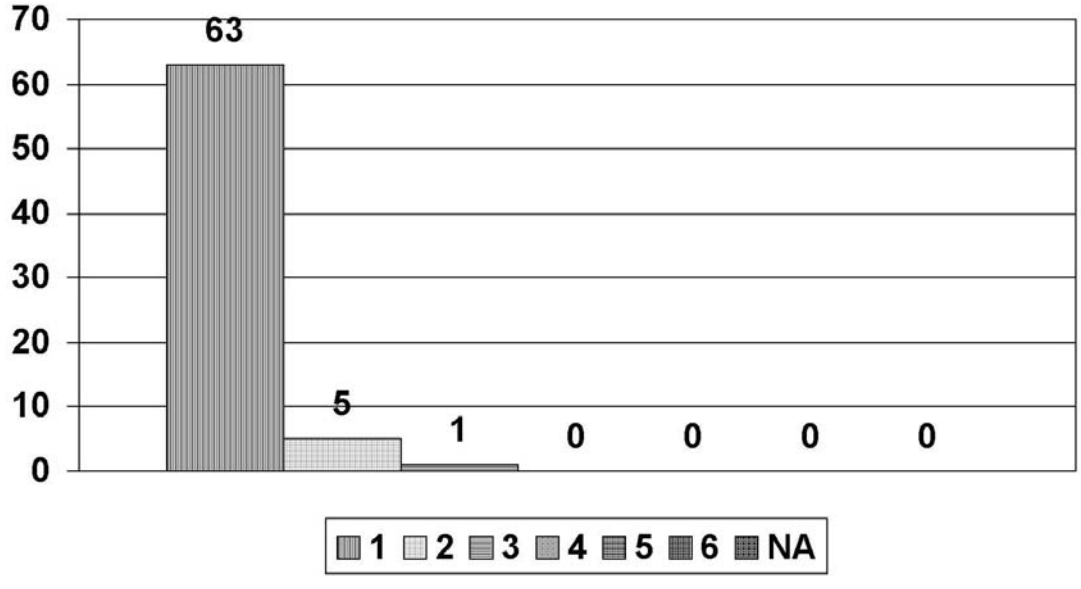
QuesNo 8 Received EMS information in DHEC newsletters, email or other communication



QuesNo 9 Participated in EMS meetings with colleagues or supervisors to discuss the use of EMS in permitting



QuesNo 10 Used an EMS format to develop checklist, evaluation forms, reports, or other documentation used in your job activities



Appendix F: General Comparison EMS and Permit Requirements

*ISO 14001:2004 EMS Element

4.1 General requirements: The EMS shall be established, documented, implemented, maintained and continually improved. This is the overall requirement of the permit: It must be established, documented, implemented, and maintained. However, continual improvement is not a requirement of the Permit, only meeting the regulatory requirements. The organization must decide to continually improve its permitting process in order to reduce noncompliance penalties, or to go beyond compliance. Continual improvement is not a permit requirement.

4.2 Environmental policy: Requires commitment to pollution prevention and regulatory compliance. The permit language demonstrates that the company is preventing pollution in regard to regulatory requirements. In each permit reviewed there were controls to assist companies in meeting federal and state limits. Therefore, fulfilling the EMS policy for P2, although continual improvement to go beyond compliance is not identified in permits, only staying in compliance with regulatory limits, based on calculations provided through the state.

4.3 Planning

4.3.1 Environmental aspects: The aspects and impacts of a facility is linked to RCRA, Air, point and non-point wastewater discharge. The facility/DHEC identifies the operations that contribute to these impacts and the permit is designed to manage the aspect, therefore keeping the impact within the regulatory limit. The aspect is the cause of the impact. The effect is the impact on the environment. In identification of the permitted pollution as an aspect, e.g. hazardous waste, the control/management of the hazardous waste is the permit.

Although, permits address several of the EMS elements, the management and/or regulatory control methods used must be researched to bring a clear understanding of the specifics of improvement each element of the EMS provides as compared to the Permit requirements. Management of the permit requirements will be investigated through this study to determine if permit requirements management can be improved through using the remaining elements of the EMS criteria.

4.3.2 Legal and other requirements: Through this EMS element the organization must have a method to identify its regulatory requirements and keep them up-to-date. How is this requirement met currently? In some organizations, they have no management practice to identify and keep up, therefore, when changing/adding or eliminating a process, changes may occur that, unless they have methods of identification of their regulations has the potential for an notice of violation (NOV).

4.3.3 Objectives, targets, and programs: The objectives and targets are not required within a permit. Objectives and targets designed to stay in compliance with regulatory

requirements are developed by the organizations. In the EMS these must be documented. It is recommended that an organization with compliance problems focus its EMS objectives and targets on developing techniques to better manage regulatory requirements.

4.4 Implementation and operation

4.4.1 Resources, roles, responsibilities, and authorities: Roles and responsibilities for regulatory compliance is the duty of the organization. As long as the permit requirements are met, the regulatory body has no authority to determine who within the organization is responsible for compliance of permits. This will be an element that can be focused on as creating improvement opportunities, due to the fact that there are facilities (especially small companies) that may fall short in this area, which if managed properly could reduce potential of non-compliance.

4.4.2 Competence, training, and awareness: Within the permitting requirements, there are many areas that will require the organization to have competent personnel to manage and contribute to manage permits. This is an area where improvement can be gained to the lack of training or the timeliness of training for personnel related to permit obligations. This is true from the beginning of the permit application through management of the permit parameters.

4.4.3 Communications: The most significant EMS requirement that is not addressed within the permit is internal communication. External communication for the permit requirements is stated in regard to permit time limits, calculations for meeting limits, etc. However, internal communication is the most important area within the organization where guidelines and appropriate lines of communication have been developed. Internal communication can be a major EMS element that can be used as an improvement tool in meeting compliance requirements.

4.4.4 Documentation: The documented permit covers the requirements, which describes the documentation required by the EMS. This includes policy, objectives and targets, and the main elements of the EMS and their interaction. However, the reference documents required by the organization needed to comply with the permit are at times missing or are not complete within organizations. For example, daily or weekly reports related to compliance issues have been found in some organizations to be late, incomplete or not updated to provide clear communication or all required data needed in permitting. This is an area where the EMS can assist in permit compliance.

4.4.5 Document Control: Documents required by the EMS shall be controlled. The permit has document control built in. However, the permit does not require a procedure on how documents relating to the permit are controlled.

4.4.6 Operational control: Within operational control, those work instructions for employees that are lacking can be identified. An analysis of specific work instructions or SOPs needed will provide assistance in better meeting permitting requirements. This element also applies to how suppliers and contractors are communicated to and trained in

regard to regulatory compliance issues within the organization. Permits do require the organization communicate and certify contractors in regard to monitoring and measures and transportation of hazardous materials and waste.

4.4.7 Emergency preparedness and response: This EMS element is usually well defined and followed within organizations. The major potential improvement in this area will be the communication and training of personnel, as well as to the placing of emergency equipment and tools in areas identified as having potential for spills. Permits have requirements for emergency preparedness and response and requirements for testing of the emergency response procedures.

4.5 Checking

4.5.1 Monitoring and measurement: This is well defined within permits and those areas identified within the permits as having an environmental impact that are monitored and measured to ensure staying within permit limits should be used as the key characteristics of the EMS in order to better control permit requirements. This EMS element also requires identification of equipment needing periodic calibration, internal or external. This requirement also is required within the permit to ensure correct monitoring and accurate measures of control limits.

4.5.2 Evaluation of compliance: This element is defined in permits as inspections and evaluation of permit requirements by the organization. The EMS requires that periodic compliance reviews are conducted by the organization to ensure the organization is aware of any noncompliance related areas or there is potential for noncompliance. This is also the purpose of the permit inspections. *Note: This element of the EMS has the potential for creating improvement in regulatory compliance due to the fact that there are companies that do not conduct periodic compliance reviews or there are companies that do not have a scheduled plan for periodic compliance reviews.* Therefore the potential for noncompliance increases with no or irregular reviews.

4.5.3 Nonconformity, corrective action and preventive actions: The permits do have corrective actions within the language which refers to corrective actions by the company if they are found to have an notice of alleged violation (NOAV), or if they discover an NOAV. The major improvement here in regulatory compliance would be preventive actions in regard to the permit requirements. Therefore, the compliance reviews and preventive maintenance of the controls that are related to the key characteristics are essential in this element for compliance improvement.

4.5.4 Control of records: Records are discussed within the permits and are defined in regard to the requirements of the permit. However, there may be records that are identified within the EMS process that may relate to assist the organization in improvement of data collection. This area, as the others, will be better assessed through an onsite assessment of the records kept by the organization that may relate to compliance issues that are not currently used.

4.5.5 Internal audit: This is a key area of improvement in regard to the organization's own internal auditing team. This EMS element has a great potential to improve the permitting process and to also contribute to the management of all the EMS elements and their contribution or relation to regulatory permitting. The permit does not require a team of internal auditors to review the compliance program or the compliance management system. Inspections and evaluations are conducted by the organization's environmental manager. Therefore, an internal auditing team can assist in auditing the compliance program and the permit manager's own management system.

4.6 Management Review: Another key element that could provide assistance in using the EMS in permitting. This element of the EMS requires that top management review the results of internal audits and evaluations of compliance with legal requirements. Permits also require top management evaluations and review. Environmental compliance reviews by top management are ongoing in federal and large private organizations. In the smaller company management reviews may not be conducted at all, even if stated within the permit. Do compliance auditors interview top management to verify that they reviewed the permit requirements, or is just a signature required? Therefore, as is well known, this element of the EMS is not used as often or sometimes not at all. This element also links to communication, internal audits, policy, etc. This element provides an overall EMS review, which through the EMS permit could provide more resources to identified compliance problems when brought to the attention of top management, who would provide resources, financial, technical and human to comply with the EMS permitting process.

*Main Element in Bold
Sub-Element underlined

Appendix G: Reduction Charts

Dayco Products

	VOC Emissions (in tons)	Hazardous Waste (in lbs)	Water Purchased (in Million Gallons)	Solid Waste (in Tons)	Energy Usage (in KWH)	Comments
1992	213		73		* not able to report	
1993	168		70			
1994	130		44			
1995	113		46	1893		
1996	102	21990	34	1887		
1997	31	14471	33	183		
1998	29	9971	35	1666		EMS Implemented
1999	22	8188	14	1381		
2000	15	4067	12	1202		
2001	7	899	11	1084		
2002	5	770	11	1059		
2003	4	0	15	1062		
2004	5	160	13	1219		
2005		275				
2006						
Totals:	97 % reduction or 208 tons	99% reduction or 21,715 tons	82% reduction or 60 million gallons	36% reduction or 674 tons		
After EMS	83% or 24 Tons Annually	97% reduction or 9,696 tons	63 % reduction or 22 million gallons	27 % reduction or 447 tons		

Charleston Air Force Base

	VOC Emissions (in tons)	Hazardous Waste (in lbs)	Water Purchased (in Million Gallons)	Solid Waste (in Tons)	Energy Usage (in KWH)	Comments
1992		308				
1993		221				
1994		324				
1995		475				
1996		141				
1997		90				
1998		112	228		82,197,425	
1999		57	258		84,116,968	
2000		60	252	3230	86,744,260	
2001		63	221	3265	85,510,099	
2002		62	235	3175	85,393,122	
2003	46	108	256	3101	93,553,608	
2004	57.6	76	275	2888	96,751,437	
2005	75.2	71	259	3092	92,568,676	EMS Implemented
2006	51.1	70	293	2750	89,194,260	
Totals:	11% increase/ 5.1 tons	77% reduction/ 238 lbs	29% increase/ 65 million gallons	15% reduction/ 480 tons	8% increase/ 6,996,835 KWH	
After EMS	32% reduction/ 24.1 tons	1% reduction/ 1 lb	13% increase/ 34 million gallons	11% reduction/ 342 tons	4% reduction/ 3,374,416 KWH	

Milliken - Dewy Plant

	VOC Emissions (in tons)	Hazardous Waste (in lbs)	Water Purchased (in Million Gallons)	Solid Waste (in Tons)	Energy Usage (in KWH)	Comments
1992			95.3		8.0	
1993			71.1	788	8.0	
1994			59.0	798	8.0	
1995			57.2	789	8.1	
1996		9,833	63.2	857	7.9	
1997	26.5	87,119	68.7	1,068	8.0	
1998	21.5	20,392	86.8	795	8.3	
1999	20.9	236,129	71.6	509	8.4	
2000	30.8	42,674	75.2	737	9.0	
2001	28.6	46,280	57.8	935	8.5	
2002	17.3	35,313	73.8	1,133	8.7	EMS Implemented
2003	20.1	40,874	64.3	738	8.8	
2004	16.2	57,895	67.5	563	9.1	
2005	20.7	2,955	77.3	661	9.5	
2006	17.9	41,570	78.2	581	9.2	
Totals:	32% reduction/8.6 tons	*	18% reduction/ 17.1 million gallons	26% reduction/ 207 tons	15% increase/1.2 KWH	
After EMS	3% increase/ .06 tons	*	6% increase/ 4.4 million gallons	49% reduction/ 552 tons	6% increase/10.5 KWH	

They are a TSD for the company, since their HW numbers include off-site generation, we didn't include those.

Holcim - Holly Hill

	VOC Emissions (in tons)	Hazardous Waste (in metric tons)	Water Purchased (in Million Gallons)	Solid Waste (in metric Tons)	Energy Usage (in KWH)	Comments
1992	* not able to report		0	0	134,222,056	
1993			0	0	129,999,954	
1994			0	0	133,878,087	
1995			0	0	133,763,590	
1996			0	0	149,887,695	
1997		40,142	0	0	156,,468,688	
1998		29,978	0	0	155,247,550	
1999		68,340	0	0	154,625,293	
2000		77,265	0	0	156,465,941	
2001		70,044	0	0	154,273,171	
2002		56,975	0	0	157,585,960	
2003		27,642	0	0	220,070,779	
2004		52,816	0	0	257,578,204	EMS Implemented
2005		70,877	0	0	263,734,893	
2006		47,629	0	9,540	278,276,931	
Totals:		19% increase/ 8253 tons			107% increase/ 144,054,865 KWH	
After EMS		10% reduction/ 5718 tons			8% increase/ 20,698,727	

ISO 14001 certification took place in April 2004 . The new plant operation began in October 2003 .
Also note that the haz waste and solid waste units are in metric tons .

Appendix H: Compliance Review Charts

Dayco Products Compliance Review Results

	Air Quality	RCRA	Water	Comments
1998				**EMS Implemented**
2000		9/25/2000 Inspection: No Violations Found		
2001	5/07/01 Inspection: No Violations Found	5/07/2001 Inspection: No Violations Found	2/12/01 Inspection: No Violations Found	
			4/05/01 Inspection: No Violations Found	
			7/09/01 Inspection: No Violations Found	
			10/02/01 Inspection: No Violations Found	
			12/31/01 Warning Letter Issued for a DMR Correction	
2002	5/30/02 Inspection: No Violations Found		1/9/02 Inspection: No Violations Found	
	1/16/02 Enforcement Referral: Failure to submit Title V Operations Ranges. Ranges were submitted and enforcement action pursued in the matter.		4/01/02 Inspection: No Violations Found	
			7/08/02 Inspection: No Violations Found	
2003	5/30/03 Inspection: No Violations Found		2/27/03 Inspection: No Violations Found; 5/28/03 Inspection: No Violations Found	
2004	1/15/04 Inspection: No Violations Found		12/08/04 Inspection: No Violations Found	

2005	4/14/05 Inspection: No Violations Found			
2006	2/01/06 Inspection: No Violations Found			

Note: Inspections are done every year for Title V: Conditional Major every other year

Note: Inspections are normally done every 5 years for Generators of Hazardous Waste

Note: Inspections are done annually. DMR - Discharge Monitoring Report

Charleston Air Force Base Compliance Review Results

	Air Quality	RCRA	Water	Comments
2000	8/28/00 Notice of Violation Issued for installation of boiler without a permit, no further action was required.	2/22/2000 Inspection: Warning Letter issued (against containers not being closed & manifest incomplete)	No Activity	
		12/12/200 Follow-Up Inspection: No violations found		
2001	12/19/01 Inspection: No Violations Found	no activity	No Activity	RA EMS, Inc. an asbestos contractor received a NOAV/NOEC for work done at the facility. However, the facility was not cited in the NOAV. The contractor no longer works for the facility.
2002	No Activity	1/11/2002 Inspection: No violations found	No Activity	
2003	7/01/03 Inspection: No Violations Found		No Activity	
2004	8/25/04 Inspection: No Violations Found	1/28/2004 Inspection: No violations found	No Activity	
2005	12/9/05 Inspection: No Violations Found	6/15/2005 Inspection: No violations found	No Activity	EMS Implemented
2006		8/24/2006 Inspection: No violations found	No Activity	
	Note: Inspections are done every year for Title V: Conditional Major every other year	Note: Inspections are done annually to TSDF by EPA FY	Note: Inspections are done annually.	

Milliken Dewy Plant Compliance Review Results

	Air Quality	RCRA	Water	Comments
2000		No activity		
2001	6/18/01 Inspection: No Violations Found	3/01/2001 Inspection: Warning Letter Issued (Generator requirements)	2/05/01 Inspection: No Violations Found	
2002	6/12/02 Inspection: No Violations Found	4/17/2002 Inspection: No Violations Found	1/07/02 Inspection: No Violations Found	EMS Implemted
	8/12/02 Inspection: No Violations Found		5/16/02 Inspection: No Violations Found	
	8/21/02 Enforcement Referral: Documenting response to a 112r inspection conducted on 6/12/02, but no violations were noted			
	4/30/02: Facility entered into Compliance Agreement 02-042-A which granted an extension to the compliance date set in US EPA 40 CFR 63.			
2003	8/11/03 Inspection: No Violations Found	No activity	1/07/03 Inspection: No Violations Found; 7/28/03 Inspection: No Violations Found; 4/04/03 & 7/15/03 Warning Letters Issued for DMR Violations	
	4/11/03 Enforcement Referral: resulted in memo to file for non-compliance with the TVACC		7/28/03 Inspection: No Violations Found	

	2/19/03 Enforcement Referral: Resulted in memo to file on 4/24/03 for violation noted in 4/11/03 referral		4/04/03 Warning Letter Issued for DMR Violations	
			7/15/03 Warning Letter Issued for DMR Violations	
2004	8/04/04 Inspection: No Violations Found	6/10/2004 Inspection: Warning Letter (against Contingency Plan & Emergency Plan requirements)	1/29/04 Inspection: No Violations Found	
			6/12/04 Inspection: No Violations Found	
2005	9/29/05 Inspection: No Violations Found	8/16/2005 Inspection: Warning Letter (against recording keeping)	1/20/05 Inspection: No Violations Found	
2006	12/7/2006 Inspection : No Violations Found	5/24/2006 Inspection: No Violation Found	6/05/06 Inspection: No Violations Found	
			9/15/06 Warning Letter Issued for DMR Violations	
	Note: Inspections are done every year for Title V: Conditional Major every other year	Note: Inspections are done annually to TSDF by EPA FY	Note: Inspections are done annually. DMR - Discharge Monitoring Report	