Environmental Management for Terminal Operations: From Compliance to Sustainability

PPM Capstone Project Toolkit

Sarah L. Garza
Director of Environmental Planning & Compliance
Port of Corpus Christi Authority
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Introduction

Environmental management is a necessary component of terminal operations, and this capstone project provides a useful toolkit for Port and Terminal staff to develop an environmental program with a modular approach. Managing your environmental affairs can encompass compliant operations, meeting regulatory requirements for monitoring and reporting, and developing environmental programs and initiatives that take you beyond compliance. This capstone project toolkit breaks environmental management into three tiers of environmental performance:

- Tier 1—Ensuring compliance with applicable rules and regulations
- Tier 2—Incorporating a management framework and principles of continual improvement
- Tier 3—Incorporating principles of sustainability and resilience

As the pressure to improve environmental performance continues to increase, this toolkit is a timely and critical resource for the Port Industry. This toolkit provides training modules to assist maritime staff in upholding the rigorous operating standards that underpin ports' and terminals' environmental and social license to operate. Compliance with rules and regulations is fundamental in the maritime industry and, really, in any industry, but having a methodology to work towards ever-increasing sustainability is invaluable for ports and terminals alike.

Often, environmental management is underfunded and understaffed, and this toolkit provides resources and training in a single, easily accessible location, offering port and terminal staff the components needed to elevate their operations to the high environmental standard prevalent among AAPA members, regardless of staffing or funding levels.

Objective

This capstone project delivers a training module that jump-starts, improves, and/or assists port and terminal staff in understanding environmental compliance, regardless of whether a terminal is new or existing, has environmental staff, or is just looking to advance more sustainable operations. The objectives of this PPM Capstone Project Toolkit are:

- Inspire participants to ensure compliant terminal operations and go beyond compliance to higher levels of sustainability

- Provide comprehensive Environmental Management Training modules that engage participants through hands-on experiences
- Provide real-world examples from Ports and terminals
- Provide useful tools for port and terminal staff to jump-start their environmental program at each tier of environmental performance
- Provide an overview of the same content appropriate for Port Commissioners' awareness and understanding

Approach/Methodology

My approach to this toolkit was to provide an all-in-one resource for staff responsible for managing the environmental affairs of a port or terminal. When I started my career at the Port, I came across the *Environmental Management Handbook* produced by AAPA in 1998, which focuses on reducing the impact of Port operations by considering regulatory requirements and the specific operations being conducted. At that point in my career, it was already outdated, but the layout helped and inspired me to learn as much as I could about the Port career I was embarking on, and the Handbook served as a framework for my research. In subsequent years, while serving in a leadership role on the Environmental Committee, I suggested updating the Handbook. While there was much support for doing so, the committee had more pressing issues to address, and ultimately, it wasn't updated.

Thinking about the utility of the *Environmental Management Handbook*, I compiled a more comprehensive toolkit that not only assists a Port or Terminal in ensuring compliance with applicable rules and regulations but also, hopefully, inspires the pursuit of higher levels of environmental achievement. A framework to systematically evaluate and prioritize environmental initiatives creates an efficient way to achieve higher levels of environmental performance. Developing that framework can be a daunting undertaking, especially if resources and/or support are limited. This toolkit lays out the framework and provides tools for each tier of environmental management, along with best practices, lessons learned, and examples from other ports. Understanding that each port is unique and different in the cargo it handles, leadership, culture, surrounding community, etc., the resources are not limited to the specific viewpoint of the Port of Corpus Christi, where I work, for instance. With examples from other ports, the toolkit provides a diverse range of approaches to sustainability.

The first tier of environmental performance, ensuring compliance with applicable rules and regulations, is foundational to an environmental program and often the hardest place to start. Digging into the rules and regulations without any guide is cumbersome. This toolkit walks you through the process for ensuring compliance, provides practical tips for reviewing your operations, and considers permitting requirements.

The second tier of environmental management opens the door for proactive environmental management, bringing in efficiency and continual improvement. The toolkit provides resources to establish a Plan-Do-Check-Act framework modeled after ISO 14001:2026.

Finally, the third tier of environmental management focuses on establishing targets and voluntary commitments that drive the organization to the highest levels of environmental performance. The

toolkit provides practical approaches to evaluating data, setting targets, and evaluating initiatives that achieve the self-prescribed benchmarks.

The approach includes training delivered via a slide deck curated with content and materials for each identified tier of environmental management. The training content of each tier builds on the prior tier's environmental performance, providing an opportunity for a Port or Terminal to systematically progress toward higher levels of environmental performance.

Within the training materials for each tier, I include a hands-on activity related to that section's content to further reinforce the material. The slide deck delivers essentially three modules packed with how-to guides, best practices, and lessons learned. The deck also includes links to examples by other ports and/or terminals. Finally, I have drafted some additional templates and starter documents to add to the overall toolkit to assist a port or terminal on its environmental compliance and stewardship journey.

Resources

This capstone project relied on human resources, including intellectual capital, and on information technology resources. It also relies on examples, best practices, and lessons learned from the broader AAPA membership.

I am an environmental practitioner with more than 20 years of maritime experience. I have helped my organization advance many of the approaches included in this toolkit. I have networked and collaborated with many of the Port and Regulatory professionals who contributed to the suggestions, best practices, and lessons learned in this toolkit. Some of these best practices and lessons learned, I have pioneered in my own organization. Recently, during a recognition dinner for employees with twenty (20) or more years of service, my Port CEO made a statement about standing on the shoulders of those who came before us. This statement resonated with me because, as I look back over my career, much of my inspiration came from, and still does, environmental leaders in other Ports and the maritime sector who have accomplished truly great things for the environment. Sustainability leaders like Dr. Geraldine Knatz, who is known for her contributions to the San Pedro Bay Ports Clean Air Action Plan while Executive Director at the Port of Los Angelos and for her contributions to the Green Port Policy and Truck Trip Reduction Program while at the Port of Long Beach (https://www.aivp.org/en/experts/geraldine-knatz/), Ms. Kristin Decas at Port of Hueneme, who was recognized at the Green Shipping Summit in 2017 as Maritime Executive of the Year (https://www.portofhueneme.org/port-of-hueneme-takes-home-the-greenest-port-of-the-year-maritime-executive-of-the-year-awards-at-the-green-shipping-summit-usa/), and Mr. David Boulduc, CEO for Green Marine who lead the team to expand Green Marine internationally (https://green-marine.org/about/team-and-structure/), just to name a few.

Having electronic access to fully functioning desktop resources can be challenging. However, through research on programs and informational videos, I identified the best programs and methods to compile this toolkit for AAPA to post on their website, which was one of my original objectives for this effort.

Content

The contents of this toolkit include, first, a training presentation outlining the three tiers of environmental management. Figure 1 below links to the full training slide deck. The training program contains three individual modules—one for each tier of environmental management.



Figure 1—Environmental Management for Terminal Operations, training slide deck. (Using the paperclip button on the right-hand side menu bar in this file, open Attachment 1)

Upon completion of each training module, participants will engage in an exercise that puts what was presented into practice. For the exercise, participants may either use actual information from their own terminal or use the examples provided. For the first module related to Tier 1: Ensuring compliance with applicable rules and regulations, participants will evaluate maritime operations using the Input/Output Diagram linked in Figure 2 below. Identifying all the inputs and outputs of an operation or activity is a critical first step in evaluating applicable regulatory requirements. If the operation is modified, the form can be revisited and updated accordingly.

The exercise for the second module, pertaining to Tier 2: Incorporating a management framework and principles of continual improvement, is to take an aspect from the previous exercise and develop a detailed Environmental Management Program. Figure 3 provides a sample layout for an Environmental Management Program for use in this group activity. The template focuses on a single environmental aspect and systematically identifies all the components of a good

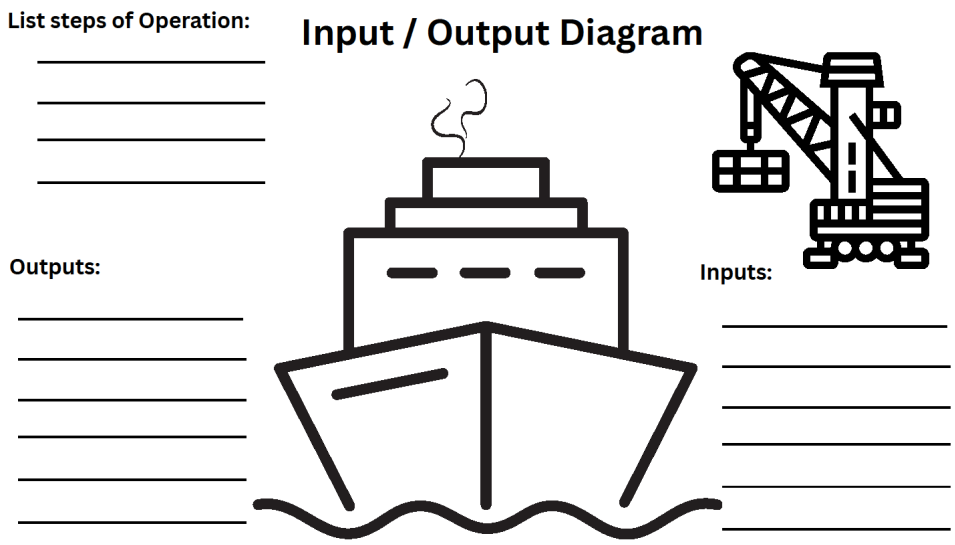


Figure 2—Input / Output Diagram for various operations and a blank form for defining your own operation. This is the document used during the group activity for the Tier 1 training module on ensuring compliance with applicable rules and regulations. (Using the paperclip button on the right-hand side menu bar in this file, open Attachment 2)

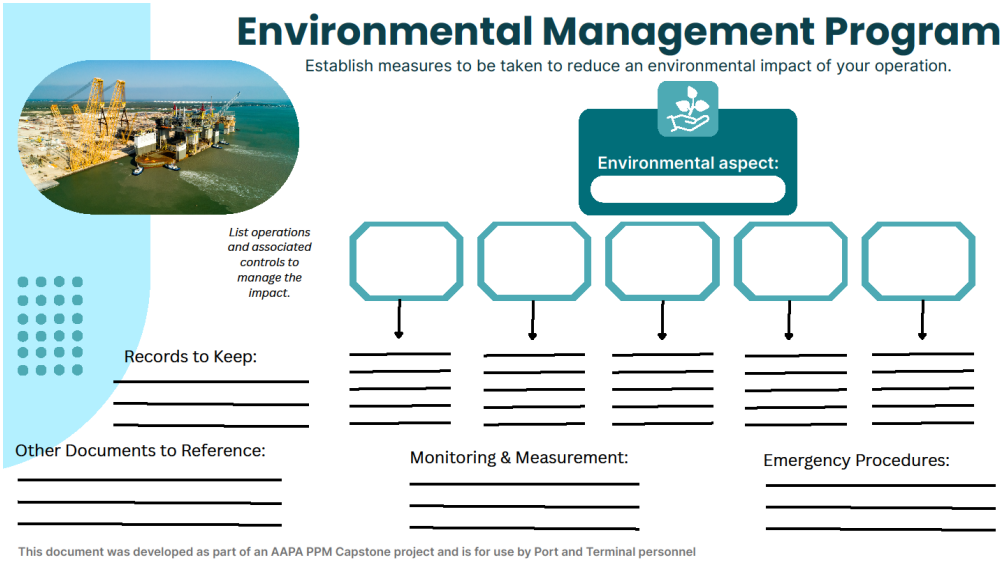
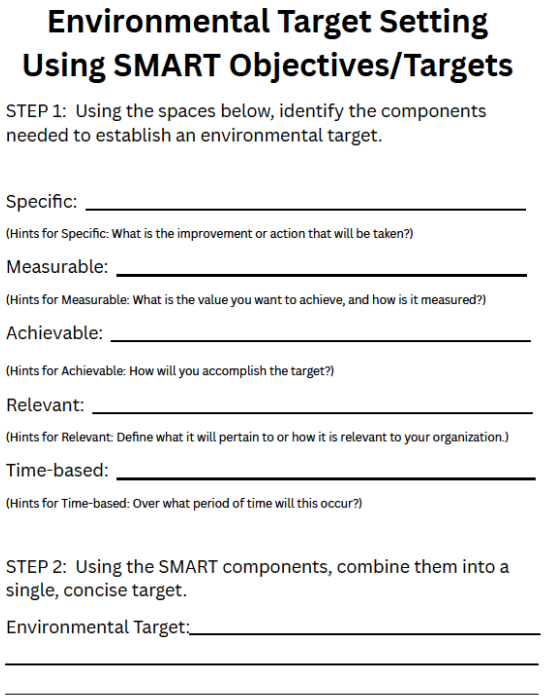


Figure 3—Environmental Management Plan, a template for planning how to manage and reduce the impacts of an operation. This is the document used during the group activity for the Tier 2 training module on incorporating a management framework and principles of continual improvement. (Using the paperclip button on the right-hand side menu bar in this file, open Attachment 3)

management plan. Planning is key to being proactive, and this tool helps the user think through all the elements and addresses the components suggested for ISO 14001 compliance.

The third exercise for participants in the training module is to practice setting environmental targets to benchmark performance. Setting an environmental target is an essential element of the third module in the training, identified as Tier 3: Incorporating principles of sustainability and resilience. This activity utilizes a template (Figure 4) I created for setting environmental targets, adapted from George T. Doran's S.M.A.R.T. framework from his 1981 article titled "There's a S.M.A.R.T. way to write management's goals and objectives."



Environmental Target Setting
Using SMART Objectives/Targets

STEP 1: Using the spaces below, identify the components needed to establish an environmental target.

Specific: _____

(Hints for Specific: What is the improvement or action that will be taken?)

Measurable: _____

(Hints for Measurable: What is the value you want to achieve, and how is it measured?)

Achievable: _____

(Hints for Achievable: How will you accomplish the target?)

Relevant: _____

(Hints for Relevant: Define what it will pertain to or how it is relevant to your organization.)

Time-based: _____

(Hints for Time-based: Over what period of time will this occur?)

STEP 2: Using the SMART components, combine them into a single, concise target.

Environmental Target:_____

_____

_____

Figure 4—Environmental Target Setting, a template for planning and setting environmental targets. This is the document used during the group activity for the Tier 3 training module on Incorporating principles of sustainability and resilience. (Using the paperclip button on the right-hand side menu bar in this file, open Attachment 4)

In addition to the comprehensive training module, this toolkit also comprises resources that supplement not only this training, but also help in achieving higher tiers of environmental performance. The tools are listed below and can be accessed using the paperclip button on the right-hand side menu bar in this file, including:

- **Permit Checklist**, Attachment 5, a tool to assist with determining what Federal permits are applicable. This tool contains links to websites with additional guidance to develop the respective permit applications. Additionally, the tool includes links to the Texas state agency when the regulatory activity has been delegated.

- **Example Terminal Regulatory Applicability Program Overview (Texas)**, Attachment 6, an example tool to guide in determining the applicable rules and regulations.
- **Environmental Management System Manual template**, Attachment 7, a tool to assist with the development of the management system framework and associated manual.
- **Data Collection Workbook**, Attachment 8, a tool to assist with monitoring environmental performance across a variety of environmental programs. The tool consists of a series of worksheets for accumulating various environmental performance indicators.
- **Environmental Sustainability Planning Tool**, Attachment 9, a tool to assist with the development of a roadmap to sustainability.

All tools are provided as downloadable documents that can be saved and adapted to suit the user's needs.

Audience Identification and Implications for Practice

The audience for this training includes port and terminal staff with little to no environmental experience; individuals responsible for ensuring compliant operations with some environmental experience; and environmental practitioners seeking another perspective on environmental management in port and maritime operations. The training serves as a resource or refresher, depending on the participant's level of experience and the organization's desired outcome for managing its environmental affairs within the three tiers of environmental management. Ideally, this training will create opportunities for ports and terminals to establish environmental programs where none exist and/or advance existing programs to higher levels of environmental performance.

Because this training is technically detailed, and because environmental management is most successful when you have support from the highest level within the organization, I have also provided a high-level overview for Port Commissioners. Figure 5 below links to this presentation. This brief overview provides Port Commissioners with a perspective on the three tiers of environmental management, best practices of interest to Commissioners, and links to examples of environmental leadership by other AAPA members.



Figure 5—High-level overview presentation for Port Commissioners. (Using the paperclip button on the right-hand side menu bar in this file, open Attachment 10)

Reflections on Learning

In the development of this toolkit, I indicated that I hoped to:

- Engage and inspire broader participants in activities that advance their respective environmental programs
- Maximize the use of information technologies to create an engaging training module and dynamic toolbox of resources
- Develop and incorporate participant activities that are useful to staff for new and existing environmental programs
- Provide a complete set of tools for AAPA and membership use

As I planned how to approach this project, I reflected on my career and the individuals who helped me get to where I am today, individuals who inspired me to advance environmental initiatives boldly and proactively. In doing so, I learned that I am still very passionate about the work that I get to do every day. When I started my career, I didn't see myself working at a port, nor did I appreciate how an individual passionate about the environment could make a difference. This project has helped me see that I still want to make a difference every day, and that the Port is the place to do so. Additionally, as I meet the next generation of Port Environmental professionals, I have realized that teaching them is one way to make a difference, not only locally but also regionally, nationally, and internationally.

Despite the challenges along my journey from compliance to sustainability, I, with the help of my team and colleagues, have accomplished great things. Focusing on the near term, it is sometimes hard to see the progress made. Through this project, I also reflected on the environmental accomplishments of my Port and drew on many of the experiences and projects to build the content for this toolkit.

Finally, and most importantly, I learned that I still have a lot to learn. As I compiled examples from other AAPA members, I found myself distracted by the many environmental programs and initiatives out there. I found information, examples, and best practices that I was able to pass on to my staff for consideration or for improving one of our projects. Additionally, I developed the content for this toolkit using Canva, a program that I am new to. I learned to link, build, and connect content to enhance the user experience and increase the toolkit's functionality.

Conclusions

This Capstone Project Toolkit is an electronic resource that, in a modular format, progressively and systematically ensures compliance and advances environmental sustainability. The *Environmental Management for Terminal Operations: From Compliance to Sustainability* slide deck is packed with links to other resources presented herein, as well as to example sustainability programs, helpful resources, and more. In conclusion, it is essentially an updated Environmental Management Handbook.