

CASE STUDY 9

Pennsylvania Department of Transportation (PENNDOT) Strategic Environmental Management Program (SEMP)

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CASE STUDY 9

Pennsylvania Department of Transportation (PENNDOT) *Strategic Environmental Management Program (SEMP)*

EMS STATUS	<p>Implemented (at least in part).</p> <p>PLEASE NOTE, PENNDOT is pursuing ISO 14001 certification for maintenance activities in each of its 11 Engineering Districts (covering 67 counties and involving more than 5,000 employees).</p>
FOCUS	<p>Maintenance units in the Engineering Districts. In particular, the program focuses on:</p> <ul style="list-style-type: none">• Stockpile and garage operations,• Erosion and sedimentation control during roadway maintenance activities,• Winter services (use of anti-icing, deicing, and antiskid materials).
DOT's BASIS FOR SELECTION OF FOCUS	<p>Engineering Districts provide the key link between the Department and its stakeholders, customers, and regulators. Maintenance comprises more than 75% of a District's work force and the vast majority of the Department's operating budget.</p> <p>Maintenance was also viewed as providing the greatest opportunity/need to achieve consistency in compliance and overall environmental performance.</p>
RELEVANCE TO THE EMS PROCESS ROADMAP	<p>The process used by PENNDOT incorporates all of the EMS Process Roadmap steps.</p>
ACCOMPLISHMENTS, BENEFITS	<ul style="list-style-type: none">• Obtained ISO 14001 certification in December 2002 for maintenance unit in Engineering District 10.• During the extreme conditions of the winter of 2003-2003 operators and assistant managers confirmed that the materials usage control practices adopted by PENNDOT helped them extend the life of their road salt inventory by as much as 3 weeks (based on their experience under similar conditions).• EMS procedures and processes in Districts 10, 11 and 12 have been recognized by Pennsylvania Department of Environmental Protection (DEP) staff as best management practices that ease oversight, monitoring, and permitting needs (e.g., using a District-wide permit, eliminating monitoring and analyses).• District 10 analysis of E&S control procedures and practices shows training and planning provides an estimated 2 weeks of work crew and equipment productivity at no increase in cost (doing it right the first time instead of going back to correct problems) – translates to cost avoidance of \$25,000/year for District labor and equipment.• An anecdote from an employee interview by the ISO registrar: <p style="text-align: center;"><i>"I've worked here for more than 20 years. We never did this before but that doesn't mean we were right. This is what I want to do for my children and grandchildren."</i></p>
IMPLEMENTATION NEEDS	<ul style="list-style-type: none">• Implementation in District 10 required about 1½ years. The next Districts are expected to require a similar time frame.

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IMPLEMENTATION NEEDS (cont'd)

- District Implementation Teams comprised of at least one management representative from the District and County Offices meet approximately every 3 weeks (for 2-3 hours at a time) during the course of implementation to develop and plan for implementation of procedures, processes, and tools.
- Consultant support, funded through HQ, requires about \$75,000 per year per District – the amount will decrease as additional Districts come on line (procedures, processes, and tools developed in other Districts can be adapted for use).
- A District Process Owner leads day-to-day implementation in each District. Process Owner duties are collateral to existing duties. In the beginning stages of implementation (first year or two) Process Owner requirement is ½ to ¾ FTE.
- Approximately \$50,000 is required for an ISO 14001 registrar contract to provide the initial registration and two years of surveillance audits for four engineering districts. This price reflects cost savings due to the District 10 SEMP pilot registration and the familiarity of the registrar with PENNDOT processes (each District is focusing on similar activities).

KEYS TO SUCCESS

- The visible commitment of senior management, particularly in the District, cannot be emphasized enough.
- Use one District as the pilot for the next group of Districts. Then use these as pilots for the remaining Districts.
- Build on existing successes and programs.
- Involve work force, including organized labor, in development and training activities.
- Make EMS fit into existing procedures and processes; avoid making processes and tools fit into EMS.
- Routine (frequent as opposed to lengthy) communication of goals, objectives, plans, and successes.
- Implementation isn't the end – the program must be maintained (this can't be viewed as a program of the month).

BACKGROUND, ADDITIONAL INFO

PENNDOT's SEMP efforts began with two key commitments of State and Department senior executives. At the state level, Executive Order 1998-1, *The Governor's Green Government Council*, called on the agencies of the Commonwealth to:

Incorporate "...environmentally sustainable practices, including Strategic Environmental Management, into Commonwealth government's planning, operations, and policymaking and regulatory functions, and to strive for continuous improvement in environmental performance with the goal of zero emissions. Strategic Environmental Management includes and environmental management system with a strong pollution prevention and energy efficiency program, effective community involvement, measurable economic and environmental performance goals, environmental accounting, and life cycle analysis."

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BACKGROUND, ADDITIONAL INFO (cont'd)

The commitment of PENNDOT senior management is shown in the Secretary of Transportation's response to the Executive Order as follows:

"One of the Department's Green Plan initiatives is to establish an environmental management system using the existing Department framework and the concept of the Department of Environmental Protection's Strategic Environmental Management (SEM). PennDOT is the lead agency in SEM application. Once implemented, it is expected the environmental management system will yield quantifiable, positive environmental and economic impacts through a continual improvement process."

CONTACT(S)

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EXAMPLE TOOLS, PROCEDURES

Excerpts of PENNDOT's SEMP procedures, processes, and tools are attached.

- The Executive Order (refer to the information provided above the Background discussion) was signed by then-Governor Tom Ridge and PENNDOT's commitment to SEMP was adopted by Secretary Brad Mallory. Demonstrating PENNDOT's ongoing commitment to SEMP spanning a change in Administrations, Secretary Biehler signed the Green Plan Policy this past June. This Policy contains the same basic principles as the previous Policy which was signed in May 2001. Exhibit 1 presents the Policy signed by Secretary Biehler.
- PENNDOT teams evaluated all of the Department's activities to characterize their impact on the environment. These evaluations and characterizations were then used to prioritize SEMP implementation efforts. These evaluations and characterizations were then used to prioritize SEMP implementation efforts. Exhibit 2 provides an excerpt of a District Development and Implementation Document which describes this process and how it led to the initial focus on maintenance activities.
- Process Flow Diagram for planning and practicing erosion and sedimentation (E&S) control to ensure that requirements are identified before a crew goes on site thus maximizing crew effectiveness and minimizing the potential for noncompliance (Exhibit 3)
- E&S Control planning requirements checklist (Exhibit 4) that presents existing requirements provided in a foreman's manual in an easy to use format.
- Posters used to communicate program goals, plans, and actions (Exhibit 5).
- Statements, incorporated in employee Job Descriptions, used to communicate environmental responsibilities to maintenance employees (Exhibit 6).
- Matrix used to identify, and in turn track completion of, environmental training for maintenance employees (Exhibit 7).

CASE STUDY 9
Exhibit 1

GREEN PLAN POLICY STATEMENT

As a direct result of our commitment to assuring adequate, safe and efficient intermodal transportation facilities and services at reasonable cost to the citizens of the Commonwealth of Pennsylvania, the Department of Transportation will play a leading role in the administration of environmental responsibility. The Department will demonstrate this leadership by committing to the following principles relative to the planning, design, construction, operation and maintenance of Pennsylvania's balanced intermodal transportation system:

Principle 1

Plan, design, build, operate and maintain a statewide transportation system that protects the environment, prevents pollution and uses resources efficiently.

Principle 2

Contribute to economic vitality and quality of life by applying sound environmental management practices which address the requirements of the public, users, carriers, industry and labor.

Principle 3

Comply with applicable environmental legislation and regulations.

Principle 4

Establish a program of review and continual improvement of environmental performance which accounts for technical and economic developments, scientific understanding, and significant environmental impacts.

Principle 5

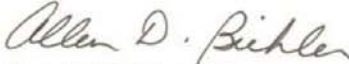
Establish relevant and measurable objectives which endeavor to improve environmental performance and provide the means to gauge progress.

Principle 6

Ensure employees understand these principles as well as their priority, and are furnished with the means to fulfill them.

These principles are essential elements for the management of the Department as we enter the 21st century. As part of a fully integrated environmental management system, these principles should be incorporated into the policies, programs and practices of all Department of Transportation organizations.

June 2003


Allen D. Biehler, PE
Secretary of Transportation

CASE STUDY 9 Exhibit 2

4.2 Environmental Aspects (ISO 14001 Element 4.3.1)

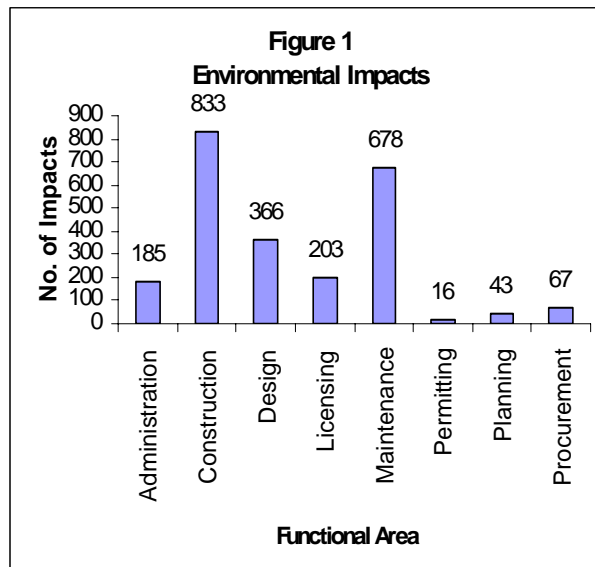
The Environmental Management Representative, with the support of SEM Program Office staff and the cooperation of the District 10 Process Owner, District Engineer, and Environmental Manager used the Department environmental aspects and impacts analysis information presented and referenced in the *Procedure for Analyzing Environmental Aspects and Impacts*, SEMP-431, and the processes described in SEMP-431 to establish SEMP implementation priorities for District 10. As District 10 was used as the SEMP implementation pilot for the other Engineering Districts, the aspects and information determinations for District 10 provide the SEMP development and implementation foundation for the other Districts.

The significant aspects addressed by District 10's initial SEMP are:

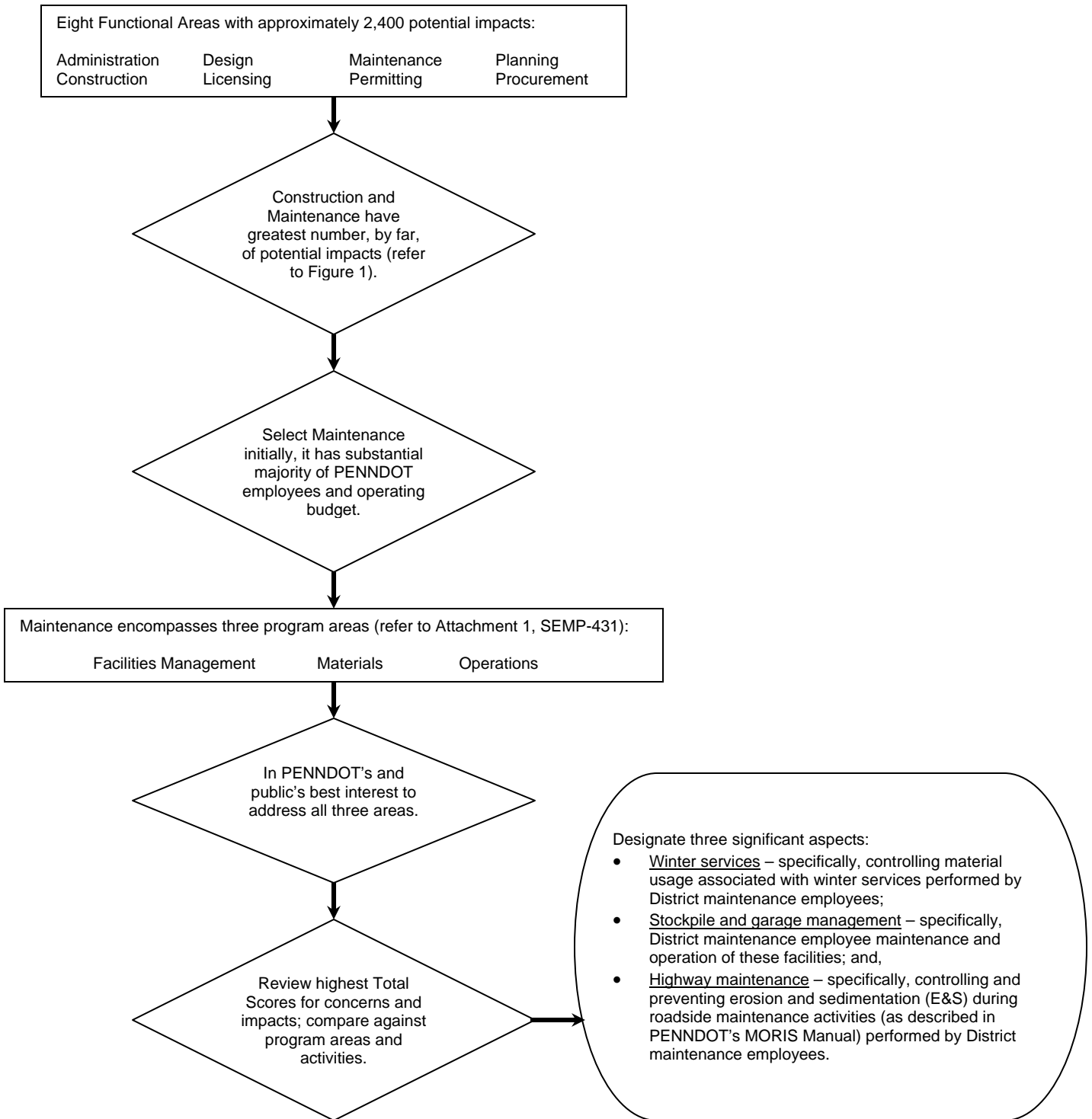
- Winter services – specifically, controlling material usage associated with winter services performed by District maintenance employees;
- Stockpile and garage management – specifically, District maintenance employee maintenance and operation of these facilities; and,
- Highway maintenance – specifically, controlling and preventing erosion and sedimentation (E&S) during roadside maintenance activities (as described in PENNDOT's MORIS Manual) performed by District maintenance employees.

Following is information that supports the selection of these significant aspects. Figure 2 presents a flow diagram that illustrates the process and decisions that led to designation of these significant aspects.

The impacts determination process noted in SEMP-431 showed the following distribution of impacts in the eight Functional Areas.



**Figure 2
Significant Aspect Designation Process**



The maintenance impacts were then reviewed, refer to Section 5.7 of SEMP-431, to determine the significant aspects associated with the three maintenance program areas noted above. With respect to the three areas noted above, the analysis of impact Frequency, Base Score, and Total Score showed that the following concerns and impacts represented 18 of the top 22 Total Scores (out of a total of 165 scores).

- Surface water (potential degradation of surface water quality),
- Earth disturbance (erosion and sedimentation),
- Ground water (potential degradation of ground water quality),
- Flood plains (potential infringement or alteration),
- Resource use other than paper,
- Waste (contaminated media, disposal of hazardous waste, spent absorbents, excess soil, etc.), and
- Air quality (emission/release of volatile and semi-volatile compounds).

The Environmental Management Representative and Central Office and District senior management then reviewed specific activities within each of the three program areas (refer to Attachment 1 of SEMP-431) to identify listed activities (comprised of both operations and facilities) that exerted one or more of the environmental impacts noted above. Following is a list of the programs and activities identified through this review process:

- Facilities – 01 and non-01 stockpiles,
- Operations – Routine highway maintenance and winter activities
- Materials – Storage and waste management.

These determinations led to the identification of specific activities and facilities (associated with the programs and activities listed above) that interacted with the environment to produce the identified significant impacts (i.e., significant aspects as described in ISO 14001). The significant aspects identified as a result of these reviews are identified at the beginning of this section (i.e., section 4.2).

For informational purposes, following is a brief table that illustrates the relevance of each of the environmental concerns and impacts noted above to the three significant aspects.

Concerns and Impacts	Winter Services	Stockpile and Garage Management	Highway Maintenance
Surface water	X	X	X
Earth disturbance		X	X
Ground water	X	X	X
Flood plains		X	X
Resource use other than paper	X		
Waste		X	
Air quality		X	

This document will be updated as appropriate (in accordance with the *Procedure for SEMP Document Control*, SEMP-445) to reflect additions to or modifications of the significant aspects identified above. Such updates may include the addition of significant aspects related to construction, design, or office activities.

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Exhibit 4

Activity	Description
711-7226-01	Paved shoulder base repair
711-7226-02	Shoulders,paved base/subbase rep.Heavy dut
711-7232-01	Shoulders, paved milling bit, surface mech
711-7311-01	Drainage inlet & endwall cleaning
711-7311-02	Drainage,clean inl & end,CLOGGED>manual & mech
711-7314-01	Drainage cleaning pipe & culverts mechanized
711-7321-01	Drainage,repair/replace inlets &endwalls,man.
711-7324-01	Drainage pipe replacement < 36", mech
711-7324-02	Drainage pipe replacement > 36" mech
711-7325-01	Repair/replacement of structure <8' length
711-7328-01	Drainage U-drain

Highlighted activities have E&S control requirements.

711-7215-01 711-7215-02

CONTOURS	Cut to original contour
CONTROLS	Straw bales, silt fence, or rock filters at point of discharge until disturbed area revegetated/stabilized
DISPOSAL	Do not dispose of excavated material in wetland or waterway
	Don't broadcast material onto slopes of ditches or channels
	Arrange for disposal beforehand - do not dispose in floodplain, wetland, or private property adjacent to wetlands so that material could be graded to wetland
DRAINAGE	Establish flow lines to drainage facilities
REMOVAL	Remove only debris or deposited material
STABILIZATION	Waste materials must be stabilized - rolling is acceptable
TEMPORARY MEASURES	Required if disturbed area is within 50 feet of stream

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Exhibit 5

What does SEMP have to do with me?

We will manage our environmental responsibilities.

<u>What</u>	<u>How</u>	<u>Who</u>
Winter Services	Control Material Application	You
Stockpile/Garage Management	Good Housekeeping and Operations (runoff control, PPC, salt under cover, etc.)	You
Erosion and Sedimentation Control	Minimize/Eliminate Runoff	You

What do our program and ISO 14001 require of me?

Ask yourself:

- How does my job affect the environment?
- How do I minimize or eliminate runoff and pollution?
- How do I stay in compliance with laws and District commitments to Sound Environmental Practices?
- How do I help with continual improvement?

Sound Environmental Practices

The Green Plan Policy
“What must I do?”

-  - Control
-  - Prevent
-  - Comply
-  - Improve

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Working Title	Responsibility Statement (refer to Section 6. of the Job Description)
District Engineer	<p>Directs activities to fulfill the maintenance environmental requirements described or referenced in the District's Strategic Environmental Management Program (SEMP) <i>Manual for Sound Environmental Practices</i>. This direction of activities includes efforts to ensure that, within the fiscal constraints imposed through the Department's budgetary processes, resources are made available to fulfill the District's SEMP commitments and objectives. As a member of the District's Strategic Management Committee (SMC) performs the activities to fulfill the requirements identified for members of the SMC in the District's <i>SEMP Development and Implementation Manual</i>.</p> <p>Directs activities to fulfill the District's SEMP-related business plan objectives.</p> <p>Attends environmental training identified for this Working Title and for members of the SMC in the District's <i>SEMP Manual for Sound Environmental Practices</i>.</p>
ADE Maintenance	<p>Plans, organizes, and directs activities to fulfill the maintenance environmental requirements described in the Maintenance, MORIS, and Bridge Maintenance Manuals, and identified for this Working Title in the District's Strategic Environmental Management Program (SEMP) <i>Manual for Sound Environmental Practices</i>. This planning, organization, and direction of activities includes efforts to ensure that, within the fiscal constraints imposed through the Department's budgetary processes, resources are made available to fulfill the District's SEMP commitments and objectives. As a member of the District's Strategic Management Committee (SMC) performs the activities to fulfill the requirements identified for members of the SMC in the District's <i>SEMP Development and Implementation Manual</i>. Also fulfills the environmental management requirements designated for this title in environmental training programs.</p> <p>Implements the SEMP-related maintenance unit business plan objectives designated for this title. Supports the efforts of other managers and employees to implement the SEMP-related maintenance unit business plan objectives.</p> <p>Attends environmental training identified for this Working Title and for members of the SMC in the District's <i>SEMP Manual for Sound Environmental Practices</i>.</p>
County Maintenance Manager	<p>Manages, plans, and organizes county roads maintenance activities to fulfill the environmental management requirements identified in the Maintenance, MORIS, and Bridge Maintenance Manuals and designated for this title in the District's Strategic Environmental Management Program (SEMP) <i>Manual for Sound Environmental Practices</i>. This management, planning, and organization of activities includes efforts to ensure that, within the fiscal constraints imposed through the Department's budgetary processes, resources are made available to fulfill the District's SEMP commitments and objectives. Receives new information for or revisions to the District's <i>SEMP Manual for Sound Environmental Practices</i> from the District SEMP Process Owner, incorporates this information in each county and stockpile copy of the District's <i>SEMP Manual for Sound Environmental Practices</i>, and implements the new or revised SEMP procedures, processes, or tools. Also fulfills the environmental management requirements designated for this title in environmental training programs.</p> <p>Implements the SEMP-related maintenance unit business plan objectives designated for this title. Supports the efforts of other managers and employees to implement the SEMP-related maintenance unit business plan objectives.</p> <p>Attends environmental training designated for this title in the District's <i>SEMP Manual for Sound Environmental Practices</i>.</p>
Transportation Equipment Operator B	Implements the environmental protection requirements of maintenance work activities performed by the employee. Also fulfills the environmental management requirements designated for this title in environmental training programs.
Transportation Equipment Operator A	<p>Recognizing that everyone is involved in the District's and County's actions to demonstrate sound environmental practices, each employee fulfills the maintenance unit business plan objectives related to the Strategic Environmental Management Program (SEMP). Also, supports the efforts of other employees to meet these objectives.</p> <p>Attends environmental training designated for this position in the District's <i>SEMP Manual for Sound Environmental Practices</i>.</p>
Temporary Equipment Operator A	
Highway Maintenance Worker	
Highway Sign Worker	
Carpenter	
Mason	

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	Working Title	Training Programs									
		Environmental Awareness	Stockpile/Facilities Academy	Stockpile/Facilities Refresher	E&S Control	E&S Control Refresher	Winter Services	Spring Maintenance Meeting	Fall Maintenance Meeting	New Employee Orientation Prog.	First Responder/Incident Response
County Maintenance Unit	County Maintenance Manager	x	x	x	x	x	x	x	x	x	x
	Assistant Maintenance Manager	x	x	x	x	x	x	x	x	x	x
	Highway Foreman I, II, and III	x	x	x	x	x	x	x	x	x	x
	Transportation Equipment Operator B	x	x	x	x	x	x	x	x	x	x
	Transportation Equipment Operator A	x	x	x	x	x	x	x	x	x	x
	Temporary Equipment Operator A	x	x	x	x	x	x	x	x	x	x
	Highway Maintenance Worker	x	x	x	x	x		x	x	x	x
	Highway Sign Worker	x	x	x	x	x		x	x	x	x
	Carpenter	x	x	x	x	x		x	x	x	x
	Mason	x	x	x	x	x		x	x	x	x
	County Equipment Manager	x	x	x	x	x	x	x	x	x	x
	Mechanic Supervisor	x	x	x	x	x		x	x	x	x
	Automotive Mechanic	x	x	x	x	x		x	x	x	x
	Equipment Body Repairer Painter	x	x	x	x	x		x	x	x	x
	Maintenance Repairman	x	x	x	x	x		x	x	x	x
	Tradesman Helper	x	x	x	x	x		x	x	x	x
	Semi-skilled Laborer	x	x	x	x	x		x	x	x	x
	Welder	x	x	x	x	x		x	x	x	x
	Diesel Mechanic	x	x	x	x	x		x	x	x	x
	Custodian	x	x	x	x	x		x	x	x	x
	County Roadway Programs Coordinator	x	x	x	x	x	x	x	x	x	x
	Chief Clerk	x						x	x	x	
	Roadway Programs Technician (RPT)	x						x	x	x	
	Radio Operator	x							x	x	
	Stock Clerk	x						x	x	x	
	Accounting Assistant	x								x	
	Purchasing Agent	x						x	x	x	
	Clerical Staff	x								x	