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Environmental Aspects

Background and Exhibits

In *Module 1*, you defined the scope of your facility's EMS, in *Module 3*, you drafted your facility's policy that included commitments for continual improvement and prevention of pollution, and in *Module 4*, you identified the legal requirements and voluntary commitments that apply to your facility. In *Module 5*, you will use all that information as you identify the environmental aspects associated with your facility and determine the subset of these aspects that have significant impacts. The outcome of *Module 5*'s activities will be your list of significant environmental aspects (SEAs), upon which all of your subsequent objectives and targets, environmental management programs (EMPs), operational controls, monitoring and measurement, training, etc., will be based within your EMS.

Definitions and Relationships

An **environmental aspect** is defined as an element of a facility's activities, products, or services that can or does interact with the environment. These interactions and their effects may be continuous in nature, periodic, or associated only with events, such as emergencies.

An **environmental impact** is defined as any change to the environment, whether adverse or beneficial, resulting from a facility's activities, products, or services.

A **significant environmental aspect** is one that may produce a significant environmental impact.

In short, the aspect is the cause and the impact is the effect. *Exhibit 5-1: Cause and Effect — Environmental Aspects and Environmental Impacts*, provides examples of this relationship.

Exhibit 5-1: Cause and Effect— Environmental Aspects and Environmental Impacts

Environmental Aspect	⇒	Environmental Impact(s)
Emissions of volatile organic compounds (VOCs)	⇒	Air pollution, smog
Discharges to stream	⇒	Degradation of aquatic habitat and drinking water supply
Spills and leaks	⇒	Soil and groundwater contamination
Electricity use	⇒	Air pollution, global warming
Use of recycled paper	⇒	Conservation of natural resources

Techniques and Data Sources for Identifying and Evaluating Environmental Aspects

As shown in *Exhibit 5-2: Selected Techniques and Data Sources for Identifying and Evaluating Environmental Aspects and Impacts*, there are numerous techniques and data sources to assist you in identifying and evaluating environmental aspects and impacts at your facility. You may already have experience using some of these techniques at your shipyard. Note that much of the data you have collected to date will be useful as you identify environmental aspects and determine their significance.

Exhibit 5-2: Selected Techniques and Data Sources for Identifying and Evaluating Environmental Aspects and Impacts

Techniques and Data Sources	When Best Used
Emission Inventories	Used to quantify emissions of pollutants to the air. Some data on emissions or chemicals of concern may already be available to you, based on EPCRA requirements and Clean Air Act (CAA) Title V permitting program data requirements.
Environmental Compliance Audits	Used to assess compliance with federal, state, and local environmental regulations. These methodologies are in common use. Their scope and level of detail vary. These are not typically directed at examining environmental impacts (particularly for products).
Environmental Cost Accounting	Used to assess the full environmental costs associated with activities, products, or services. Emerging protocols require comprehensive assessments to quantify such costs.
Environmental Impact Assessments	Used to satisfy requirements of the National Environmental Policy Act (NEPA) regarding the evaluation of environmental impacts associated with proposed projects. Methodology in common use, but not typically used to assess environmental impacts associated with existing operations.
Environmental Property Assessments	Used to assess potential environmental liabilities associated with facility or business acquisitions or divestitures. The scope and level of detail is variable. These assessments typically do not assess impacts associated with products or services.
Failure Mode and Effects Analyses	Commonly used in the quality field to identify and prioritize potential equipment and process failures as well as to identify potential corrective actions. Often used as a precursor to formal root cause analyses.
Life Cycle Assessments	Used to assess the cradle-to-grave impacts of products or processes, from raw material procurement through disposal. Life-cycle methodologies are somewhat subjective and can be resource intensive. These methodologies are described in ISO 14040-14048.
Pollution Prevention or Waste Minimization Audits	Used to identify opportunities to reduce or eliminate pollution at the source and to identify recycling options. Requires a fairly rigorous assessment of facility operations. These audits typically do not examine off-site impacts.
Process Flow Diagrams	Used to allow an organization to visualize and understand how work gets accomplished and how its work processes can be improved.
Process Hazard Analyses	Used to identify and assess potential impacts associated with unplanned releases of hazardous materials. Methodology in common use due to Occupational Safety and Health Act (OSHA) Process Safety Management regulations. Typically employs team approach to identify and rank hazards.
Project Safety/Hazard Reviews	Used to assess and mitigate potential safety hazards associated with new or modified projects. Methodologies in common use. Typically do not focus on environmental issues.
Risk Assessments	Used to assess potential health and/or environment risks typically associated with chemical exposure. Variety of qualitative and quantitative methodologies in common use.

A recommended approach, which is described in detail below, is based on creating process flow diagrams. This approach is recommended because it will give you a thorough understanding of all of your facility's processes.

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The Process Flow Diagram Technique

Process flow diagrams allow facilities to visualize and understand how processes work and how they might be improved. As illustrated in *Examples 5-1* through *5-21* later in this module, a process flow diagram visually depicts:

- Inputs of the process or activity, which include energy and other resources consumed and raw materials and chemicals used;
- Step-by-step process flows;
- Decision points (e.g., on alternate methods); and
- Process outputs, which include products or services, air emissions, noise, odor, radiation, wastewater discharges, solid waste, and hazardous wastes.

As an EMS tool, they help facilities to identify inputs (such as chemicals, raw materials, and other resources used), outputs (including products, wastes, air emissions, etc.), and decision points and interactions with other processes, and thereby help to identify environmental aspects and impacts.

Using this technique to identify environmental aspects involves the following tasks, each of which is described in greater detail below:

- Subdividing your facility into appropriate units, i.e., activities and processes, for subsequent environmental aspects data collection;
- Developing process flow diagrams, which are essentially material balance sheets (of all inputs and outputs) of the activities and processes;
- Identifying environmental aspects by transferring the input and output information from the process flow diagrams to environment aspect identification forms;
- Determining SEAs by evaluating the identified environmental aspects against pre-established significance determination criteria to arrive at the list of SEAs, upon which other elements of an EMS will be based;

- Documenting your approach to environmental aspects identification and significance determination in a written procedure; and
- Reviewing and revising environmental aspects over time.

Subdividing Your Facility into Appropriate Units

The appropriate level of subdivision will be one that balances the need to capture all relevant input/output information with a desire to avoid having too much unwieldy information, much of which might be redundant. Also keep in mind that the scheme for subdividing the facility should mirror how the facility is divided in terms of staffing and supervision. The people who manage and work in these areas will ultimately take ownership of the SEAs, work instructions, and monitoring and measurement that result from this process.

Exhibit 5-3: A List of Common Activities and Processes with Functional Areas at Shipbuilding and Ship Repair Facilities, identifies more than 25 common activities and processes across 6 general functional areas at a typical shipbuilding and ship repair facility.

Remember to look at services as well as products. While the need to examine on-site operations might be obvious, you also should consider identifying aspects of activities that might be done off-site (such as servicing equipment at a customer's site). Similarly, the environmental aspects of the products, vendors, and contractors you use may be less obvious, but many will be appropriate to consider. Aspects may also result from past activities, such as spills. You may want to refer to the defined scope of your EMS (see *Module 1*) in determining the set of processes and activities for which aspects will be identified.

Exhibit 5-3: A List of Common Activities and Processes with Functional Areas at Shipbuilding and Ship Repair Facilities

Activity and Process	Functional Area
Drydock Painting	Construction and Repair
Small Parts Coating, Outdoor	
Gas Metal Arc Welding	
Dry Abrasive Blasting	
Burning and Cutting	
High Pressure Water Jetting	
Metal Grinding	
Material Transport, Crane	
Metal Working	
Bilge Cleaning	
Fiberglass Reinforced Construction	
Other Painting, Coating, and Plating	
Pipe Fabrication, Aluminum Fabrication, Steel Fabrication	
Metal Plating and Surface Finishing	
Other Machining and Metal Working	
General Repairs	Maintenance
Storage of Materials and Waste: paint and solvents, metals, hydraulic fluids, lube oils, paint waste, blasting media, welding gases, universal waste, diesel, fuel, gasoline	Raw Materials Management and Waste Accumulation
Hazardous Waste Disposal	Waste Disposal and Treatment
Universal Waste Disposal	
Wastewater Disposal	
Wastewater Treatment	
Fuel Storage and Transfer	Maintenance and Operation
Electrical Generation	
Compressed Air Generation	
Steam Generation	
Administration	General Support

Developing Process Flow Diagrams

Use a team to diagram the inputs and outputs of the activities and processes into which you have subdivided your facility. At a minimum, the team should include the process “owner.” Probably it should also include members of the Cross Functional Team (CFT) who have become specialists in environmental aspect identification.

Identifying Environmental Aspects

If you have done a thorough job of diagramming the inputs and outputs of all of the appropriate activities and processes at your facility, the next step is easy. Transfer the information from each flow

diagram onto a separate environmental aspect identification form (such as the one provided with *Exhibit 5-5: Procedure for Environmental Aspects, Objectives and Targets, and Programs (EP-003) as Identification and Significance Determination of Environmental Aspects and Setting Objectives and Targets (Aspects Form) (EF-003.01)*) for each process or activity. This information should be arranged on the environmental aspect identification form by input subcategory (e.g., supplies, chemicals, energy use, or water use) and by output subcategory (e.g., air emissions, noise/odor/radiation, water discharges, solid/residual wastes, storm water discharges, or spills). Having these subcategories on the form should reduce the likelihood of mistakenly neglecting relevant aspect information.

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Determining Significant Environmental Aspects

Determining which aspects have significant impacts, and therefore will be included in your EMS as SEAs, is one of the most crucial steps in EMS planning. It can be one of the most challenging as well as one of the most rewarding. Decisions you make in this step will affect many other system elements, such as setting objectives and targets, establishing operational controls, and defining monitoring needs. Careful planning of this activity will pay dividends later.

Determining which aspects are significant involves some subjective decisions. For this reason, you will achieve more balanced results by having a CFT that represents different job functions. This will provide a cross-section of operational experience and different perspectives.

Your CFT should carefully define the criteria that will be used to determine which environmental aspects are significant. The criteria presented below are intended to achieve a balance between structure and flexibility. They are a starting point that you can use to customize your own criteria.

- An obvious initial criterion is whether the aspect is subject to environmental regulations—all of these aspects, as defined by broad scientific and legislative consensus, are significant. A closely related condition is whether an aspect is the subject of facility policy, goals, or voluntary commitments. For example, many facilities have established energy-use, water-use, or waste reduction goals and targets because it also makes good business sense. If these facility policies/goals apply to your facility, then the associated aspects should be considered significant.

- A second criterion to consider involves the views of interested parties. One of the commitments of your environmental policy must be communication with external stakeholders. There are a variety of community concerns that might affect your designation of a particular activity as a significant aspect. These may include issues other than pollution. Some examples are the noise level or odor produced by your facility; increased traffic caused by your business; and increased light needed for your operations. Aspects that the community considers important (for example, aspects that the community has lodged complaints about) should be labeled as significant in your EMS.
- A third criterion is whether the aspect has good technical and financial potential for pollution prevention improvements (such as the reduced use of water, energy, or hazardous materials). Pollution prevention is also included in your environmental policy. The determination that makes for a particular aspect under this criterion is highly subject to the specific circumstances and values of your facility and community. For example, a high rate of water use would be of higher concern in a desert region than in a region where water is more plentiful. The determination that your CFT makes is based on your judgment and your facility's specific circumstances.
- A final criterion is one that your CFT customizes for your facility. A commonly used approach relies on scoring environmental aspects based on magnitude, frequency, toxicity, and duration.

Where appropriate, individual aspects can be grouped. For example, if energy use is listed as an environmental aspect for several processes, it may also be a facility-wide concern. The CFT could list energy on each process-specific aspect form and then record the aspect and significance determination on a facility-wide form to indicate it as a facility-wide concern.

As shown in *Exhibit 5-4: Significant Environmental Aspects as a Basis for Operational Controls and Objectives and Targets*, SEAs serve as the basis for further planning of your EMS. In a subsequent step, each SEA will be assigned an objective. That is, it either becomes the subject of: controls, which are ongoing; improvements, which have targets that specify how much can be achieved and by when; or an investigation leading to improvements (*Module 6*), which will have targets that indicate when study results will be issued.

Each improvement (and investigation) objective will be associated with an EMP that specifies who is responsible for what outcomes and by when (*Module 7*). In addition, your facility's SEAs will have key characteristics that are monitored and measured (*Module 14*), and also will be the basis for determining where operational controls are required (*Module 12*).

Documenting Your Approach

You need to describe your approach to identifying aspects and determining their significance in the form of a written procedure. You can modify *Exhibit 5-5: Procedure for Environmental Aspects, Objectives and Targets, and Programs (EP-003)*, to develop that procedure. Variations on this procedure are provided in Appendix D—Environmental Aspect/Impact Ranking. Keep the resulting information up-to-date, so that the potential aspects of new activities, products, and services are factored into your targets and objectives (see *Module 6*) and operational controls (see *Module 12*).

Reviewing and Revising Environmental Aspects Over Time

Regularly revisiting your environmental aspects and objectives, as described in *Module 6*, is an essential step in developing an EMS that achieves the goal of continuous improvement. The regular review of aspects can be used to change the priorities you set last time, or it can be used to examine a part of your facility's activities that you set aside last time. The regular review can be part of a planned "phasing in" process, wherein different parts of your facility's operations are reviewed until all your facility's activities are included in your EMS. The regular review of aspects is the foundation for your facility's continuing improvement.

Exhibit 5-4: **Significant Environmental Aspects** as a **Basis** for **Operational Controls** and **Objectives and Targets**

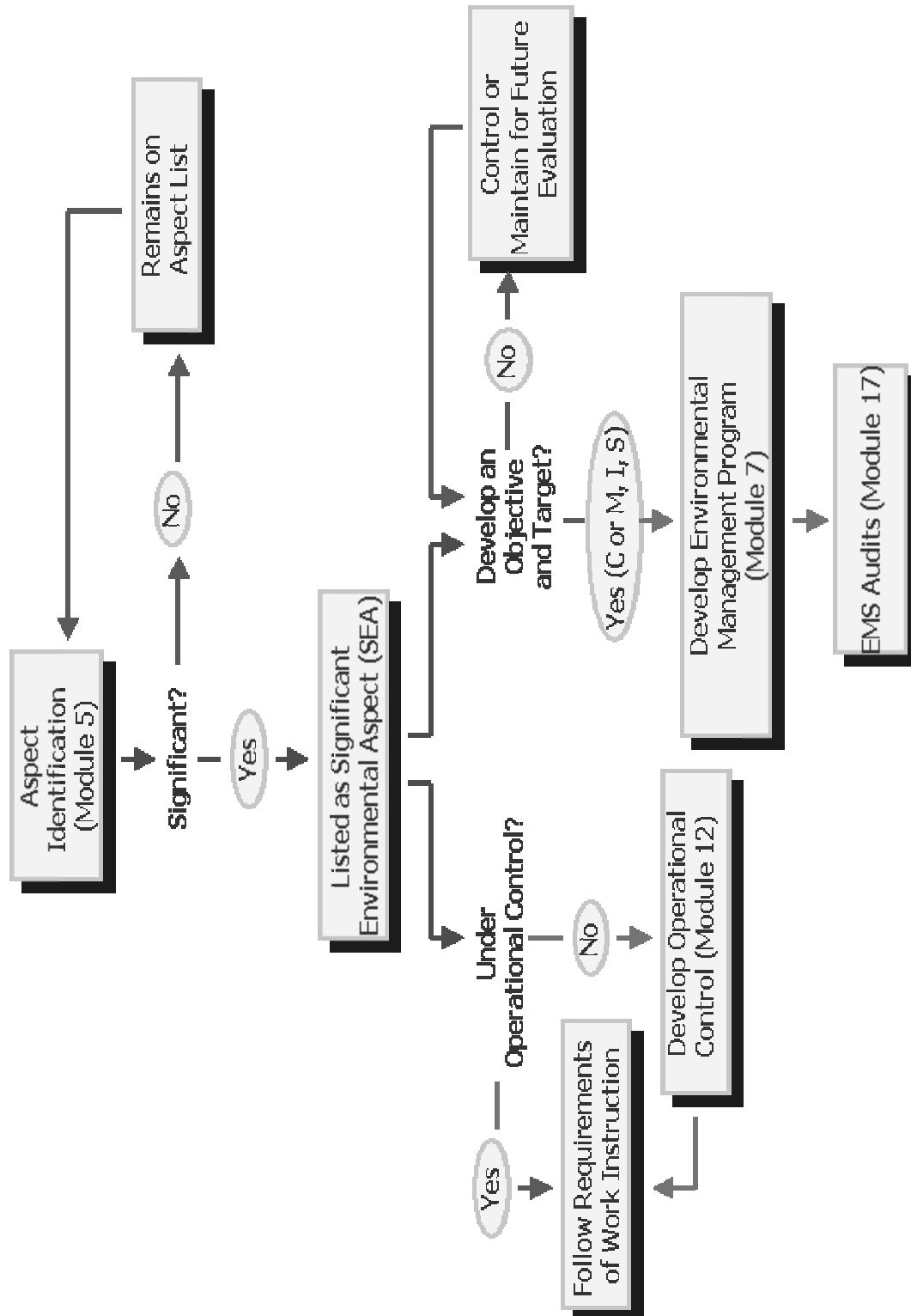


Exhibit 5-5: **Procedure** for **Environmental Aspects, Objectives and Targets,** and **Programs** (EP-003)

1.0 Purpose

This procedure defines [Facility's Name]'s method for the identification of environmental aspects of its operations and the determination of significance for aspects that have actual or potential significant impacts on the environment.

2.0 Activities Affected

All areas and departments

3.0 Forms Used

3.1 Identification and Significance Determination of Environmental Aspects and Setting Objectives and Targets (EF-003.01)

3.2 Environmental Management Programs (EF-003.02)

4.0 References

4.1 Procedure for Environmental Management System Management Review (EP-006)

4.2 Procedure for Emergency Preparedness and Response (EP-007)

4.3 Procedure for Identification of Legal and Other Requirements (EP-001)

4.4 Procedure for Communication with Stakeholders (EP-004)

4.5 Procedure for Environmental Training and Awareness (EP-008)

4.6 Procedure for Monitoring and Measurement (EP-009)

4.7 ISO 14001:1996, Elements 4.3.1, 4.3.3 and 4.3.4

5.0 Definitions

5.1 Environmental Aspect: element of an organization's activities, products or services that can interact with the environment.

5.2 Environmental Objective: overall environmental goal, arising from the environmental policy, which an organization sets itself to achieve and which is quantified where practicable.

5.3 Environmental Target: detailed performance requirement, quantified where practicable, applicable to the organization or parts thereof, which arises from the environmental objectives and which needs to be set and met to achieve those objectives.

5.4 Environmental Management Program: the means, time frames, and personnel responsible for achieving an objective and target.

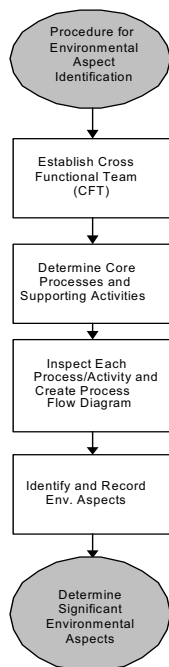
6.0 Exclusions

None.

Exhibit 5-5: Procedure for Environmental Aspects, Objectives and Targets, and Programs (EP-003) (continued)

7.0 Procedures

7.1 Procedure for Environmental Aspect Identification



7.1.1 The facility Cross Functional Team (CFT), led by the Environmental Management Representative (EMR) or designee, is responsible for completing the Identification and Significance Determination of Environmental Aspects and Setting Objectives and Targets (Aspects Form) (EF-003.01) for each core process and supporting activity. If possible, members of the CFT will conduct a physical inspection when completing the form. The completed form is a process flow diagram of a process or activity and is used to identify environmental aspects.

7.1.2 At a minimum, the CFT will review and revise the completed forms, by means of physical inspection, as necessary at issuance, annually, and before and immediately following implementation of new or modified processes/activities.

7.1.3 All environmental aspects are evaluated for significance as defined in the section below, Procedure for Determination of Significant Environmental Aspects.

7.1.4 The following procedure is used to fill out the Aspects Form (EF-003.01).

7.1.5 Creating the process flow diagram consists of identifying all raw materials, chemicals, and utilities used as inputs and all outputs produces as products and by-products. Outputs are all products, wastes produced, recycled materials, water discharges, and air emissions known for the process(es).

7.1.6 When identifying inputs and outputs, all modes of operation will be considered because startup, shutdown, or emergency operations might introduce additional aspects to the process. When doing the diagrams, the team will make notes of other potentially useful information such as the quantity or volume used per unit time, where available. These diagrams will be improved over time with specific data to allow material balances in the long term, if this is not possible initially.

To assist with these diagrams, the CFT shall consider the following potential inputs and outputs:

- Inputs
 - Supplies: Enter the major, non-chemical supplies used in the process.
 - Chemical: Enter any chemical materials used in the process.
 - Energy Use: Enter energy type and usage. (Levels are relative to the facility.)
 - Water Use: Enter water type (e.g., city, well, storm, process, chilled) and usage. (Levels are relative to the facility.)
 - Other Inputs: Enter inputs that are not covered clearly in other categories.
- Outputs
 - Air Emissions: List all air emissions whether they are drawn directly through a stack or are discharged into the room and escape as fugitive emissions.
 - Noise/Odor/Radiation: Include noise and odor as an air emission if potentially noticeable outside the facility and list any potential radiation emitted from the facility.

Exhibit 5-5: Procedure for Environmental Aspects, Objectives and Targets, and Programs (EP-003) (continued)

US EPA ARCHIVE DOCUMENT

- Water Discharges: Enter all wastewater streams that discharge directly to storm or sanitary sewer systems or surface waters. Containerized wastewater should be included in the waste section.
- Solid/Residual Wastes: Wastes are any materials intended to be discarded or disposed of, whether regulated or not, and include liquids, solids, and gases. Also include recycled materials, returnable containers, and chemical by-products under this category.
- Stormwater Discharges: List all stormwater discharges from all process areas.
- Spills: Enter all potential spills that might occur in all process areas.

7.2 Procedure for Determination of Significant Environmental Aspects (SEAs)

7.2.1 Where appropriate, individual aspects can be grouped. For example, if the consumption of energy is listed as an environmental aspect in several areas, the CFT can group these listings such that consumption of energy appears just once on a facility-wide form.

7.2.2 The following criteria will be used to determine significance and are listed in the Aspects Form (EF-003.01):

1. Legal Requirements/Voluntary Commitments/Company Policy: Subject to specifically relevant legislation, regulation, and/or permit requirements that address significant impacts to the environment. This will likely include aspects associated with processes and activities if (1) environmental regulations specify controls and conditions, (2) information must be provided to the authorities, and/or (3) there are, or may be, periodic inspections or enforcement actions taken by the authorities. Potential aspects that are subject to environmental regulations in the event of incidents will be recognized as significant when such an event occurs. A closely related condition is whether an aspect is the subject to or associated with environmentally-related facility goals, directives, policies, or subject to or associated with voluntary covenants to which the facility had committed.
2. Community Concern: Subject to or associated with community concerns, such as those previously expressed in the form of complaints or critical inquiry.
3. Pollution Prevention Potential: Based on technical and business conditions, has a high potential for pollution prevention or resource-use reduction.
4. Potential Impact to the Environment: Associated with potential impact to the environment from high environmental loading due to one or more of the following:
 - a. Toxicity (compositional characterization of materials and wastes)
 - b. Amounts (volumes and masses of emissions, waste, or releases)
 - c. Amounts (consumption of renewable and non-renewable resources)
 - d. Frequency of episodes
 - e. Severity of actual or potential impacts

(Note: Additional examples of how to determine significance are provided in Appendix D—Environmental Aspects/Impacts Ranking.)

Exhibit 5-5: Procedure for Environmental Aspects, Objectives and Targets, and Programs (EP-003) (continued)

Using the Significance Determination portion of the Aspects Form (EF-003.01), the CFT, or a subset thereof, shall evaluate, each identified aspect to determine whether it is significant. The environmental aspects will be considered to be “significant” if the aspect has an impact on the environment and meets one or more of the four criteria. For criteria 1 through 4, using your best judgment, backed up by research if possible, put Yes, No, or Not Applicable [NA] in the appropriate column on the Aspects Form [EF-003.01]. If any of the columns are assigned a Yes, indicate “S” for significant in the appropriate column for that aspect. Otherwise, indicate “N” for not significant. Provide the rationale for S or N in the appropriate column on the Aspects Form [EF-003.01].

7.3 Establishing and Maintaining Objectives and Targets

7.3.1 The CFT shall establish and maintain environmental objectives and targets for all significant aspects. Objectives and targets shall be consistent with the **[Facility’s Name]** environmental policy and shall be one of three types: control; improve; or investigate. The environmental objectives and targets for each process shall be recorded using the last two columns of the Aspects Form (EF-003.01) for each process. (They can then be summarized on a form similar to *Example 6-1: Objectives and Targets Organized by Category*, for the facility as a whole. For each SEA, the organization will establish an appropriate objective and target.) There are three types of objectives represented as follows:

C	=	Control or Maintain
I	=	Improve
S	=	Study or Investigate

Guidance regarding use of these objectives is provided below for use by the CFT:

- Control or Maintain—is an appropriate objective for SEAs that are the subject of environmental regulations because the environmental policy states that we will comply with the law. In these cases, the objective will be to maintain conformance with operational controls, such as procedures and work instructions that apply to those significant aspects. The target will be ongoing.
- Improve—is appropriate for SEAs that our facility goals commit us to improving upon. For example, energy- or water-use reductions that are not required by law but fall within our commitment to pollution prevention. Improvement objectives also can be used for SEAs that have regulatory drivers and environmental improvement goals. For example, we have regulatory requirements and fugitive emission reduction goals for our VOC emissions. Copper in storm water effluent is another example because we wish to reduce discharge levels below the limits set in our permits. Thus, the objective for these will be C and I (that is, maintain compliance and reduce emissions).
- Study or Investigate—is appropriate in cases where the CFT thinks improvement will be feasible and beneficial, but study is needed to deter-

Exhibit 5-5: Procedure for Environmental Aspects, Objectives and Targets, and Programs (EP-003) (continued)

mine how much improvement can be achieved and timeframes that are feasible. The objective will be to study the alternatives by a target date in preparation for later setting an improvement objective (or dropping the objective if the study reveals that the changes are not financially, technologically, or logistically feasible).

- 7.3.2 The CFT is also responsible for developing and recommending potential new environmental objectives to top management. In identifying potential new objectives, the CFT considers the following:
 - Environmental policy;
 - SEAs (especially those that pose chemical risk);
 - Applicable laws and regulations and potential future laws and regulations;
 - Practical business criteria, such as the potential costs and benefits of pursuing a particular environmental objective and our commitment to pollution prevention; and
 - The views of employees and other interested parties.
- 7.3.3 When developing and recommending objectives, the CFT should consider the number of columns that were marked Yes on Aspects Form (EF-003.01). These columns relate to the significance criteria established by this EMS (legal/facility requirements, community concerns, pollution prevention potential, and/or potential impact on the environment). Those SEAs with two or more Yes rankings will likely be good candidates for control, improvement, or investigation.
- 7.3.4 Performance against objectives and targets shall be reviewed at least every six months by the CFT and reported at the management review meeting (see EP-006, Environmental Management System Management Review). The management review shall endorse the facility environmental objectives and targets.
- 7.4 Establishing and Maintaining Environmental Management Programs
 - 7.4.1 The CFT shall establish and maintain environmental management programs for achieving the objectives and targets developed for the significant environmental aspects identified and updated every six months.
 - 7.4.2 Environmental management programs shall identify the means, time frames and those responsible for achieving associated objectives and targets. Responsibility will be identified at each relevant function and level of the facility.

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Exhibit 5-5: Procedure for Environmental Aspects, Objectives and Targets, and Programs (EP-003) (continued)

8.0 General Rules

- 8.1 The CFT shall include representation from all appropriate functional areas and departments.
- 8.2 The environmental aspects and significant aspects associated with the operations of semi-permanent on-site contractors are covered by this procedure.
- 8.3 Interested parties include employees and the community.
- 8.4 The environmental management programs that address the following areas should be created if applicable objectives and targets are developed:
- 8.4.1 Compliance Assurance
 - 8.4.2 Pollution Prevention/Waste Minimization
 - 8.4.3 Energy Management
 - 8.4.4 Materials Management

9.0 Frequency

This procedure will be repeated at least annually. More frequent updates will be conducted for new projects or processes that affect the list of the facility's significant aspects.

10.0 Records

The originals of completed Aspects Forms (EF-003.01) are maintained by the EMR or designee.

Record of Revisions

Revision Date	Description	Sections Affected

Identification and Significance Determination of Environmental Aspects and Setting Objectives and Targets (Aspects Form) (EF-003.01)

Person Completing Form:		Area/Process:					Date:			
ASPECT IDENTIFICATION		SIGNIFICANCE DETERMINATION					OBJECTIVES & TARGETS			
Category/Aspect	Inputs, Processes, Outputs, Products	Quantity or Volume	Legal Requirements/Voluntary Commitments/Company Policy	Community Concern	Pollution Prevention Potential	Potential Impact to the Environment	N or S	Rationale for Significance (S) or Non-significance (N)	Objective & Type C = control or maintain S = study or investigate I = improve	Target
Energy Usage:										
Water Usage:										
Supplies/Disposables:										
Chemicals:										
Air Emissions:										
Noise/Odor/Radiation:										
Wastes:										
Water Discharges:										
Stormwater Discharges:										
Spillage and Other:										

Examples

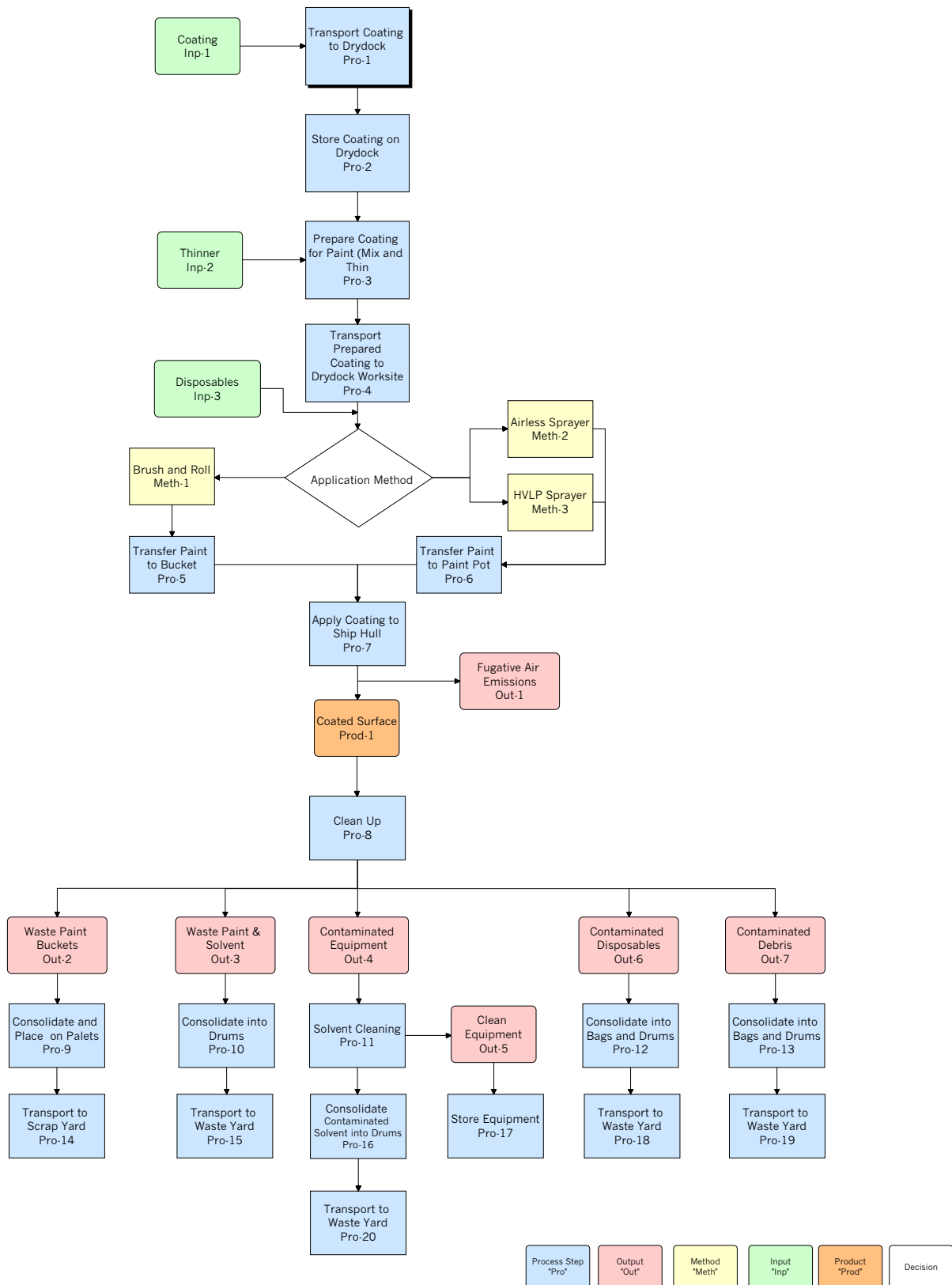
Process flow diagrams and associated Aspects Forms (EF-003.01) that illustrate how the diagrams can be used to identify and determine the significance of the aspects for 21 common production processes at shipbuilding and ship repair facilities are provided below as *Example 5-1: Flow Diagram and Aspects Form for Drydock Painting* through *Example 5-21: Flow Diagram and Aspects Form for Waste Management*.

- **Example 5-1** provides an example flow diagram and Aspects Form for drydock painting.
- **Example 5-2** provides an example flow diagram and Aspects Form for small parts coating, outdoor.
- **Example 5-3** provides an example flow diagram and Aspects Form for dry abrasive blasting.
- **Example 5-4** provides an example flow diagram and Aspects Form for burning and cutting.
- **Example 5-5** provides an example flow diagram and Aspects Form for ultra high pressure water jetting.
- **Example 5-6** provides an example flow diagram and Aspects Form for metal grinding.
- **Example 5-7** provides an example flow diagram and Aspects Form for material transport, crane.
- **Example 5-8** provides an example flow diagram and Aspects Form for aluminum fabrication.
- **Example 5-9** provides an example flow diagram and Aspects Form for steel fabrication.
- **Example 5-10** provides an example flow diagram and Aspects Form for sheet metal.
- **Example 5-11** provides an example flow diagram and Aspects Form for ship's fuel removal.
- **Example 5-12** provides an example flow diagram and Aspects Form for pipe fabrication.
- **Example 5-13** provides an example flow diagram and Aspects Form for compressed air.
- **Example 5-14** provides an example flow diagram and Aspects Form for inside machine shop.
- **Example 5-15** provides an example flow diagram and Aspects Form for interior ship painting.
- **Example 5-16** provides an example flow diagram and Aspects Form for paint booth.
- **Example 5-17** provides an example flow diagram and Aspects Form for steam plant.
- **Example 5-18** provides an example flow diagram and Aspects Form for supply management.
- **Example 5-19** provides an example flow diagram and Aspects Form for bilge management treatment and discharge.
- **Example 5-20** provides an example flow diagram and Aspects Form for wastewater treatment and discharge.
- **Example 5-21** provides an example flow diagram and Aspects Form for waste management.

The process flow diagrams show environmental aspects of the processes, with “inputs, processes, outputs, products” labels that correspond to a column heading of this name on the Aspects Form. You likely will want to review these examples and modify them to meet your facility’s specific conditions. The examples should provide a starting point for understanding how the aspect identification process works and for applying it at your facility.

Note that the drydock painting example in *Example 5-1: Flow Diagram and Aspects Form for Drydock Painting* will be further expanded in *Module 6* and *Module 7* to illustrate how to proceed from significant aspect determination to setting objectives and targets and establishing Environmental Management Programs.

Example 5-1: Flow Diagram and Aspects Form for Drydock Painting



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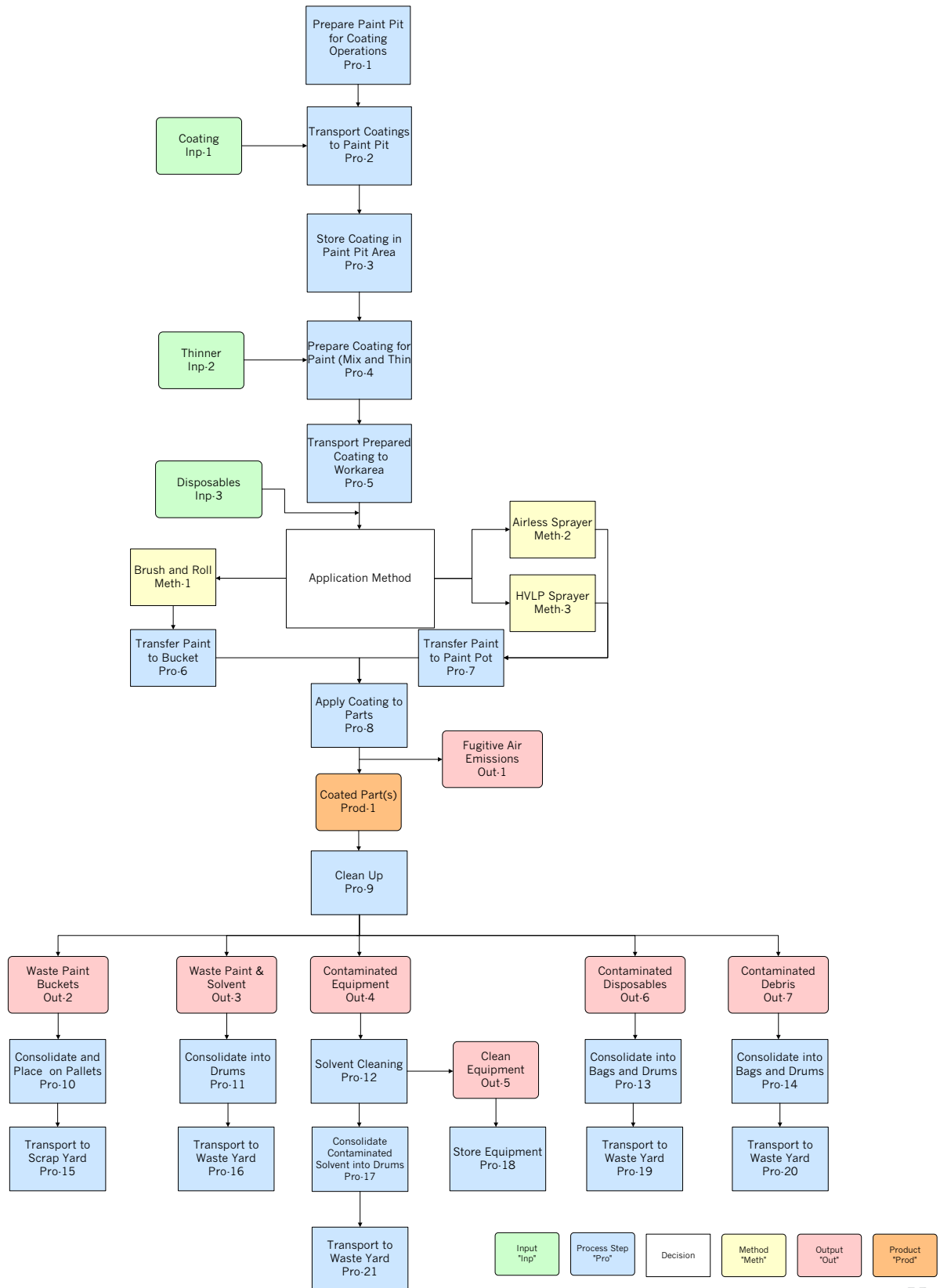
Example 5-1: Flow Diagram and Aspects Form for Drydock Painting (continued)

Person Completing Form: John Smith, Paint Department Supervisor		Area/Process: Drydock Painting				Date: 5/17/01			
ASPECT IDENTIFICATION		SIGNIFICANCE DETERMINATION				OBJECTIVES & TARGETS			
Category/Aspect	Inputs, Processes, Outputs, Products	Quantity or Volume	Legal Requirements/ Voluntary Commitments/ Company Policy	Community Concern	Potential Pollution Prevention	Potential Impact to the Environment	Rationale for Significance (S) or Non-significance (N)	Objective & Type C = control or maintain S = study or investigate I = improve	Target
Energy Usage:									
Electricity/Paint Mixers	Mix and thin coatings (Pro-3)	10 kw/year	No	No	No	No	Does not meet significance criteria, low volume usage		
Diesel Fuel/Forklift	Transport coatings and waste to dry dock (Pro-1, Pro-14, Pro-15, Pro-16, Pro-18, Pro-19, Pro-20)	1000 gallons per year	No	No	No	No	Does not meet significance criteria, low volume usage		
Water Usage:									
		N/A							
Supplies/Disposables:									
Rags	Inp-3		No	No	No	No	Does not meet significance criteria		
Gloves	Inp-3		No	No	No	No	Does not meet significance criteria		
Tyvek Coverall	Inp-3		No	No	No	No	Does not meet significance criteria		
Filters	Inp-3		No	No	No	No	Does not meet significance criteria		
Sand Paper	Inp-3		No	No	No	No	Does not meet significance criteria		
Chemicals:									
VOC Content	Virgin Coatings (Inp-1)		Yes	Yes	No	N/A	Marine Coating Rule, Air Permit		
HAP Content	Virgin Coatings (Inp-1)		Yes	Yes	No	N/A	Marine Coating Rule, Air Permit		
VOC Content	Virgin Thinners (Inp-2)		Yes	Yes	No	N/A	Marine Coating Rule, Air Permit		
HAP Content	Virgin Thinners (Inp-2)		Yes	Yes	No	N/A	Marine Coating Rule, Air Permit		
Air Emissions:									
Fugitive VOCs	Applying Coating (Pro-7)	40 tons	Yes	Yes	Yes	N/A	Marine Coating Rule, permits of operate, toxic air emissions rule		
Fugitive HAPs	Applying Coating (Pro-7)	10 tons	Yes	Yes	Yes	N/A	Marine Coating Rule, permits of operate, toxic air emissions rule		
Over Spray, Fugitive Particulate Emissions	Applying Coating (Pro-7)	8 tons	Yes	Yes	Yes	N/A	Marine coating rule, coating permits to operate, toxic air emissions rule		
Noise/Odor/Radiation:									
Odor from VOCs Fume	Applying Coating (Pro-7)		No	No	No	No	Does not meet significance criteria		
Wastes:									
Contaminated Scrap	Waste Paint Cans (Out-1)	10,000 lbs per	No	No	Yes	No	Waste Reduction Program		

Example 5-1: Flow Diagram and Aspects Form for Drydock Painting (continued)

Contaminated Waste	year	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Waste Reduction Program
Tyrex Suits, Rollers, Brushes, Filter Masks, Paint Stirrers, Drop Clothes, Masking Tape (Out-5), Debris (Out-6)		No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Waste Reduction Program
Waste Chemicals	1,500 gallons	Yes	Yes	N/A	Yes	Yes	Yes	N/A	Yes	N/A	Yes	RCRA (Title C)
Solid Waste, Landfill	10,000 and 5,000 lbs per year	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Waste Reduction Program
Water Discharges:												
N/A	N/A											
Stormwater Discharge:												
VOC-contaminated Water		Yes	Yes	N/A	Yes	Yes	Yes	N/A	Yes	N/A	Yes	Storm water permit
Heavy Metal Contaminated Water		Yes	Yes	N/A	Yes	Yes	Yes	N/A	Yes	N/A	Yes	Storm water permit
Spillage and Other:												
Spillage	Transport waste cans, cleaning solvents, contaminated solvents and debris to scrap yard (Pro-14, Pro-18, Pro-19, Pro-20)	5 gallons per year	No	No	No	No	No	No	No	No	No	Does not meet significance criteria, low volume spillage
Spillage, Contaminated Scrap	Consolidate equipment cleaning solvent into drums (Pro-16)	10 gallons per year	Yes	No	No	No	No	No	No	N/A	No	Volume exceeds "No Spill" Policy limits
Coating Thinner Spillage	Transport coatings and thinners (Pro-1 through Pro-6)		No	No	No	No	No	No	No	No	No	Does not meet significance criteria, low spillage volume
	Consolidate Waste (Pro-9)	5 gallons	No	No	No	No	No	No	No	No	No	Does not meet significance criteria, low volume of spillage, scrap is recycled
	Consolidate waste paint and solvent (Pro-10)	100 gallons per year	Yes	No	No	No	No	No	No	N/A	No	Volume exceeds "No Spill" Policy limits
	Solvent Cleaning of Equipment (Pro-11)	50 gallons per year	Yes	No	No	No	No	No	No	N/A	No	Volume exceeds "No Spill" Policy limits
	Consolidate Contaminated Solvent into Drums (Pro-16)	10 gallons per year	Yes	Yes	No	No	No	No	Yes	N/A	Yes	Does not meet significance criteria, low volume of spillage

Example 5-2: Flow Diagram and Aspects Form for Small Parts Coating, Outdoors

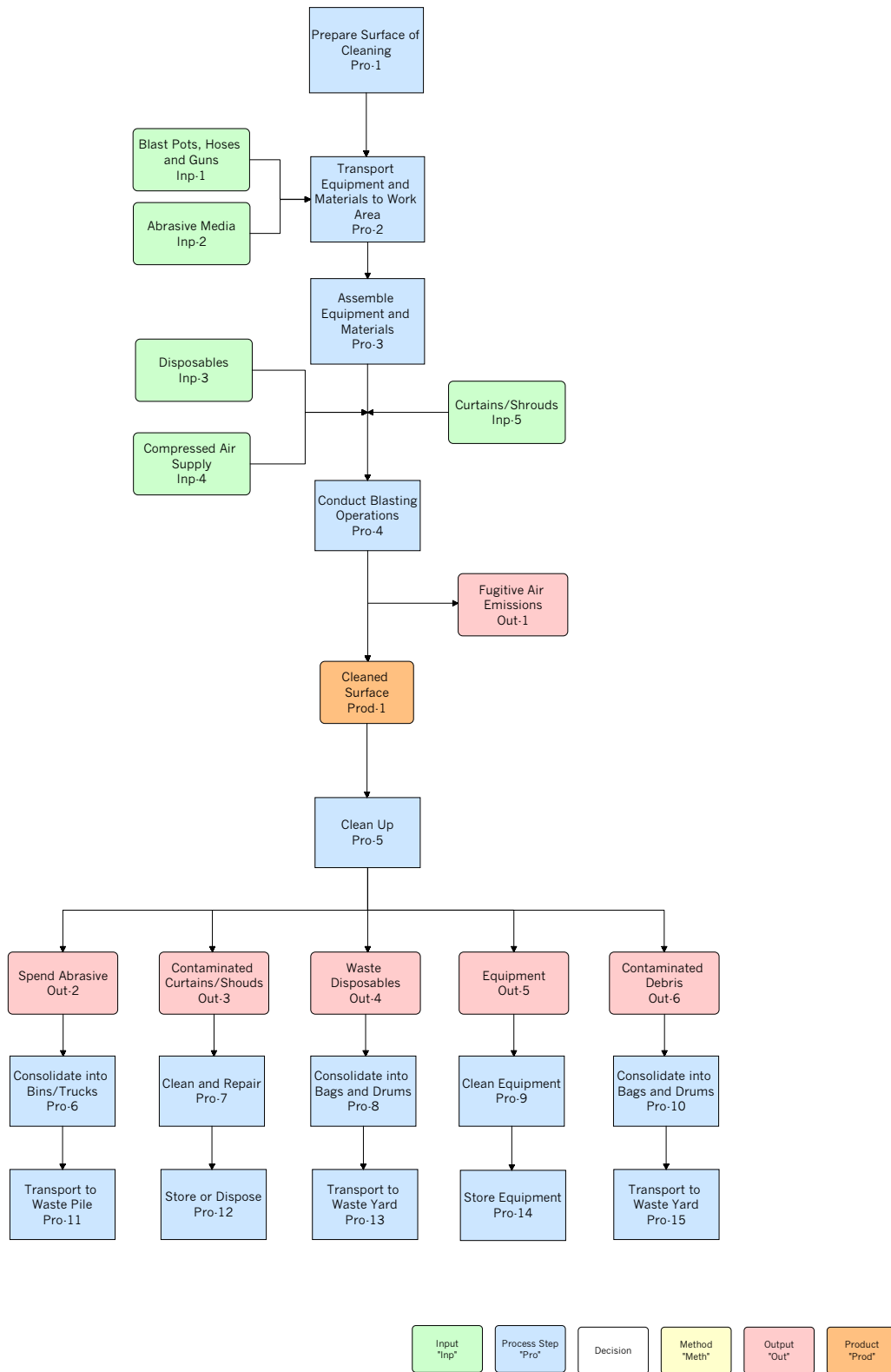


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Example 5-2: Flow Diagram and Aspects Form for Small Parts Coating, Outdoors (continued)

Person Completing Form: John Smith, Environmental Engineer		Area/Process: Small Parts Coatings, Outdoors				Date: 5/17/01			
ASPECT IDENTIFICATION		SIGNIFICANCE DETERMINATION				OBJECTIVES & TARGETS			
Category/Aspect	Inputs, Processes, Outputs, Products	Quantity or Volume	Legal Requirements/Voluntary Commitments/Company Policy	Community Concern	Pollution Prevention Potential	Potential Impact to the Environment	Rationale for Significance (S) or Non-significance (N)	Objective & Type C = control or maintain S = study or investigate I = improve	Target
Energy Usage:									
Electricity/Paint Mixers	Mix and thin coatings (Pro-4)	10 kw/year	No	No	No	No	Does not meet significance criteria, low volume usage		
Diesel Fuel/Forklift	Transport Equipment, Materials, Waste and Scrap to and from Paint Pit. (Pro-2), (Pro-5), (Pro-15), (Pro-16), (Pro-19), (Pro-20), (Pro-21)	1000 gallons per year	No	No	No	No	Does not meet significance criteria, low volume usage		
Water Usage:									
N/A		N/A							
Supplies/Disposables:									
Rags	Inp-3		No	No	No	No	Does not meet significance criteria		
Gloves	Inp-3		No	No	No	No	Does not meet significance criteria		
Tyvek Coverall	Inp-3		No	No	No	No	Does not meet significance criteria		
Filters	Inp-3		No	No	No	No	Does not meet significance criteria		
Sand Paper	Inp-3		No	No	No	No	Does not meet significance criteria		
Chemicals:									
VOC Content	Virgin Coatings (Inp-1)	N/A	Yes	Yes	No	N/A	Marine Coating Rule, Air Permit		
HAP Content	Virgin Coatings (Inp-1)	N/A	Yes	Yes	No	N/A	Marine Coating Rule, Air Permit		
VOC Content	Virgin Thinners (Inp-2)	N/A	Yes	Yes	No	N/A	Marine Coating Rule, Air Permit		
HAP Content	Virgin Thinners (Inp-2)	N/A	Yes	Yes	No	N/A	Marine Coating Rule, Air Permit		
Air Emissions:									
Fugitive VOCs	Fugitive Air Emissions (Out-1)	2 tons	Yes	Yes	Yes	N/A	Marine Coating Rule, permits of operate, toxic air emissions rule		
Fugitive HAPs	Fugitive Air Emissions (Out-1)	0.5 ton	Yes	Yes	Yes	N/A	Marine Coating Rule, permits of operate, toxic air emissions rule		
Over Spray, Fugitive Particulate Emissions	Fugitive Air Emissions (Out-1)	8 tons	Yes	Yes	Yes	N/A	Marine coating rule, coating permits to operate, toxic air emissions rule		

Example 5-3: **Flow Diagram** and **Aspects Form** for **Dry Abrasive Blasting**

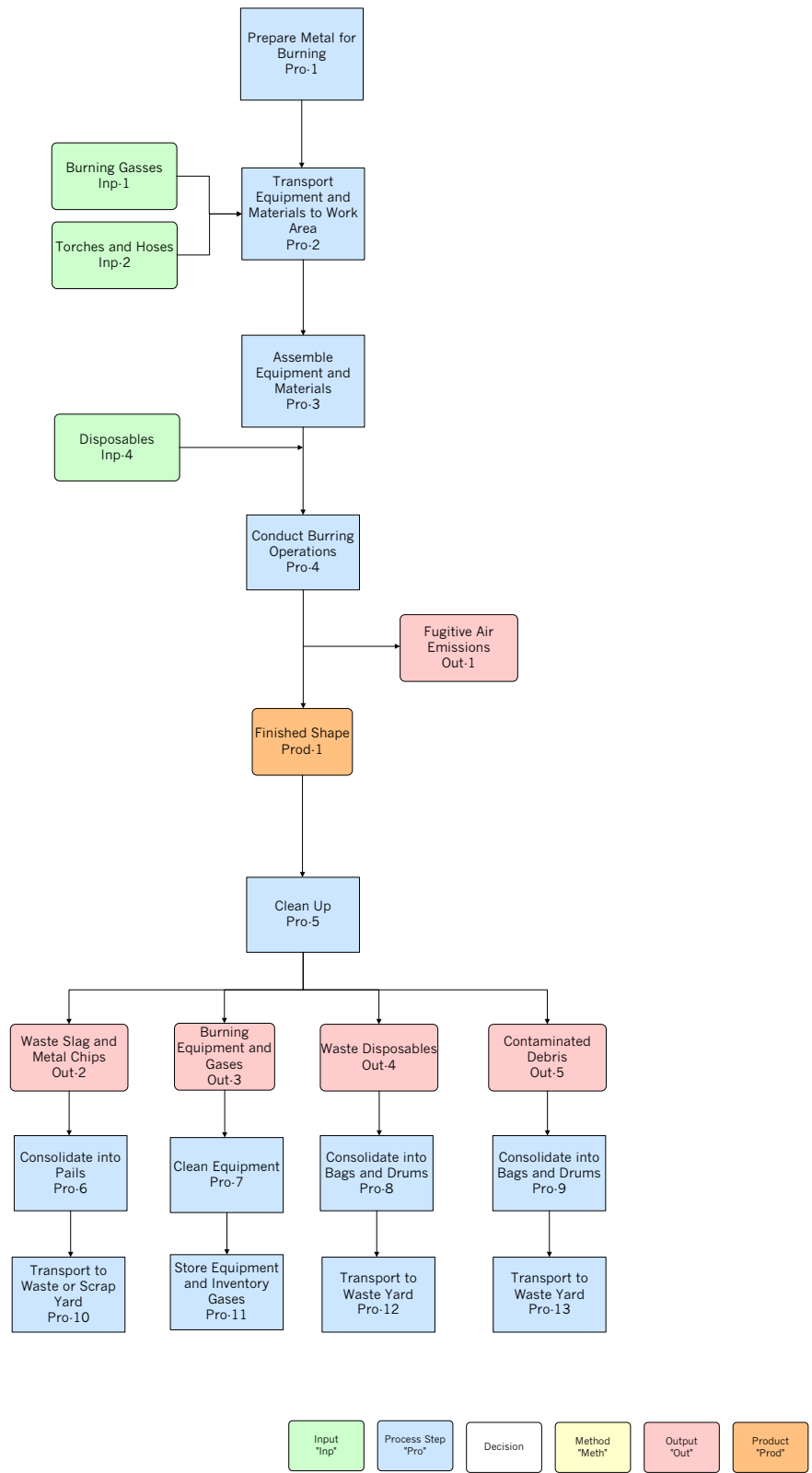


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Example 5-3: Flow Diagram and Aspects Form for Dry Abrasive Blasting (continued)

Person Completing Form: John Smith, Environmental Engineer		Area/Process: Dry Abrasive Blasting				Date: 5/17/01			
ASPECT IDENTIFICATION			SIGNIFICANCE DETERMINATION			OBJECTIVES & TARGETS			
Category/Aspect	Inputs, Processes, Outputs, Products	Quantity or Volume	Legal Requirements/Voluntary Commitments, Company Policy	Community Concern	Pollution Prevention Potential	Potential Impact to the Environment	Rationale for Significance (S) or Non-significance (N)	Objective & Type C = control or maintain S = study or investigate I = improve	Target
Energy Usage:									
Electricity	Compress Air Supply (Inp-4)	10,000 kw per year	No	No	Yes	No	S	Pollution prevention potential.	
Diesel Fuel/Forklift	Transport Equipment, Materials, Scrap and Waste to and from Work Area (Pro-2), (Pro-11), (Pro-12), (Pro-13), (Pro-14) and (Pro-15)	1000 gallons per year	No	No	No	No	N	Does not meet significance criteria, low volume usage	
Water Usage:									
N/A		N/A							
Supplies/Disposables:									
Rags	Inp-3		No	No	No	No	N	Does not meet significance criteria	
Gloves	Inp-3		No	No	No	No	N	Does not meet significance criteria	
Tyvek Coverall	Inp-3		No	No	No	No	N	Does not meet significance criteria	
Filters	Inp-3		No	No	No	No	N	Does not meet significance criteria	
Chemicals:									
N/A		N/A							
Air Emissions:									
Fugitive Particulates	Fugitive Air Emissions (Out-1)	10 tons	Yes	Yes	Yes	N/A	S	Permits to operate, Toxic air emissions rule, Nuisance rule	
Noise/Odor/Radiation:									
Blasting Operations	Conduct Blasting Operations (Pro-4)	High levels of noise	Yes	Yes	No	N/A	S	High noise levels effects nesting birds	
Wastes:									
Waste Abrasive	Spent Abrasive (Out-2)	6,000 tons per year	Yes	Yes	Yes	N/A	S	Waste Reduction Program	

Example 5-4: Flow Diagram and Aspects Form for Burning and Cutting



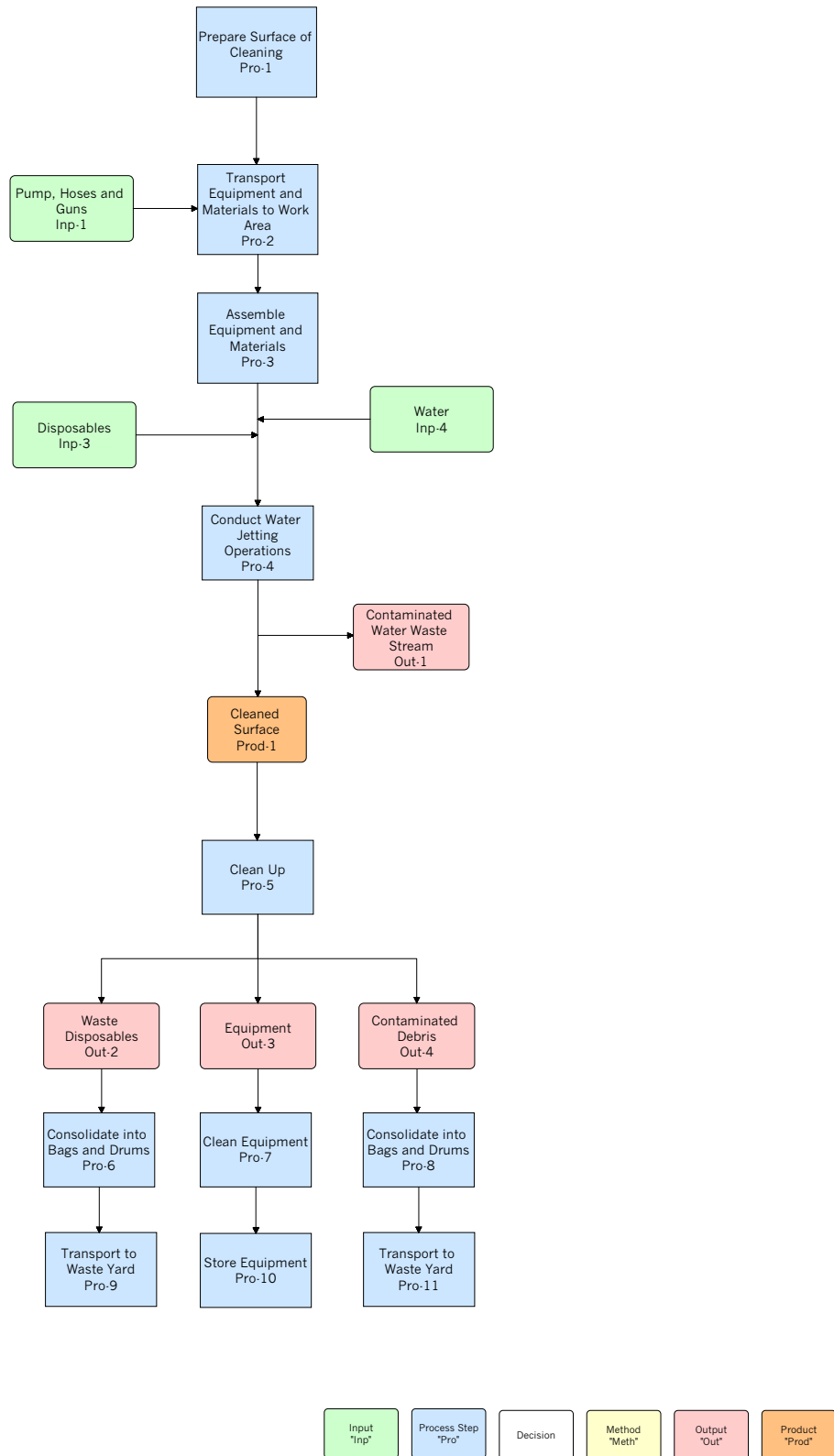
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Example 5-4: Flow Diagram and Aspects Form for Burning and Cutting (continued)

Person Completing Form: John Smith, Environmental Engineer		Area/Process: Burning and Cutting					Date: 5/17/01			
ASPECT IDENTIFICATION			SIGNIFICANCE DETERMINATION					OBJECTIVES & TARGETS		
Category/Aspect	Inputs, Processes, Outputs, Products	Quantity or Volume	Legal Requirements/Voluntary Commitments/Company Policy	Community Concern	Pollution Prevention Potential	Potential Impact to the Environment	N or S	Rationale for Significance (S) or Non-significance (N)	Objective & Type C = control or maintain S = study or investigate I = improve	Target
Energy Usage:										
Diesel Fuel/Forklift	Transport Equipment, Materials, Scrap and Waste to and from Work Area (Pro-2), (Pro-10), (Pro-12), (Pro-13), (Pro-14)	1000 gallons per year	No	No	No	No	N	Does not meet significance criteria, low volume usage		
Water Usage:										
N/A		N/A								
Supplies/Disposables:										
Rags	Inp-4		No	No	No	No	N	Does not meet significance criteria		
Gloves	Inp-4		No	No	No	No	N	Does not meet significance criteria		
Tyvek Coverall	Inp-4		No	No	No	No	N	Does not meet significance criteria		
Filters	Inp-4		No	No	No	No	N	Does not meet significance criteria		
Chemicals:										
Acetylene	Burning Gases (Imp-1)	N/A	No	No	No	No	N	Does not meet significance criteria		
Air Emissions:										
Metal Fumes	Fugitive Air Emissions (Out-1)	0.5 ton	Yes	Yes	Yes	N/A	S	Permits of operate, Toxic air emissions rule		
Noise/Odor/Radiation:										
Odor from Burning Fumes	Fugitive Air Emissions (Out-1)		No	No	No	No	N	Does not meet significance criteria		
Wastes:										
Scrap Metal	Waste Slag and Metal Chips (Out-2)	10,000 lbs per year	No	No	Yes	No	S	Waste Reduction Program		
Contaminated Waste	Waste Disposables (Out-4), Contaminated Debris (Out-5)		No	No	Yes	No	S	Waste Reduction Program		
Water Discharges:										
N/A		N/A								
Stormwater Discharges:										
Heavy Metal Contaminated Water	Fugitive Air Emissions (Out-1)		Yes	Yes	Yes	N/A	S	Storm water permit		
Spillage and Other:										
Spillage	Transport Equipment, Materials, Scrap and Waste to and from Work Area (Pro-2), (Pro-10), (Pro-12), (Pro-13)	100 lbs per year	No	No	No	No	N	Does not meet significance criteria, low volume spillage		

Example 5-5: Flow Diagram and Aspects Form for Ultra High Pressure Water Jetting

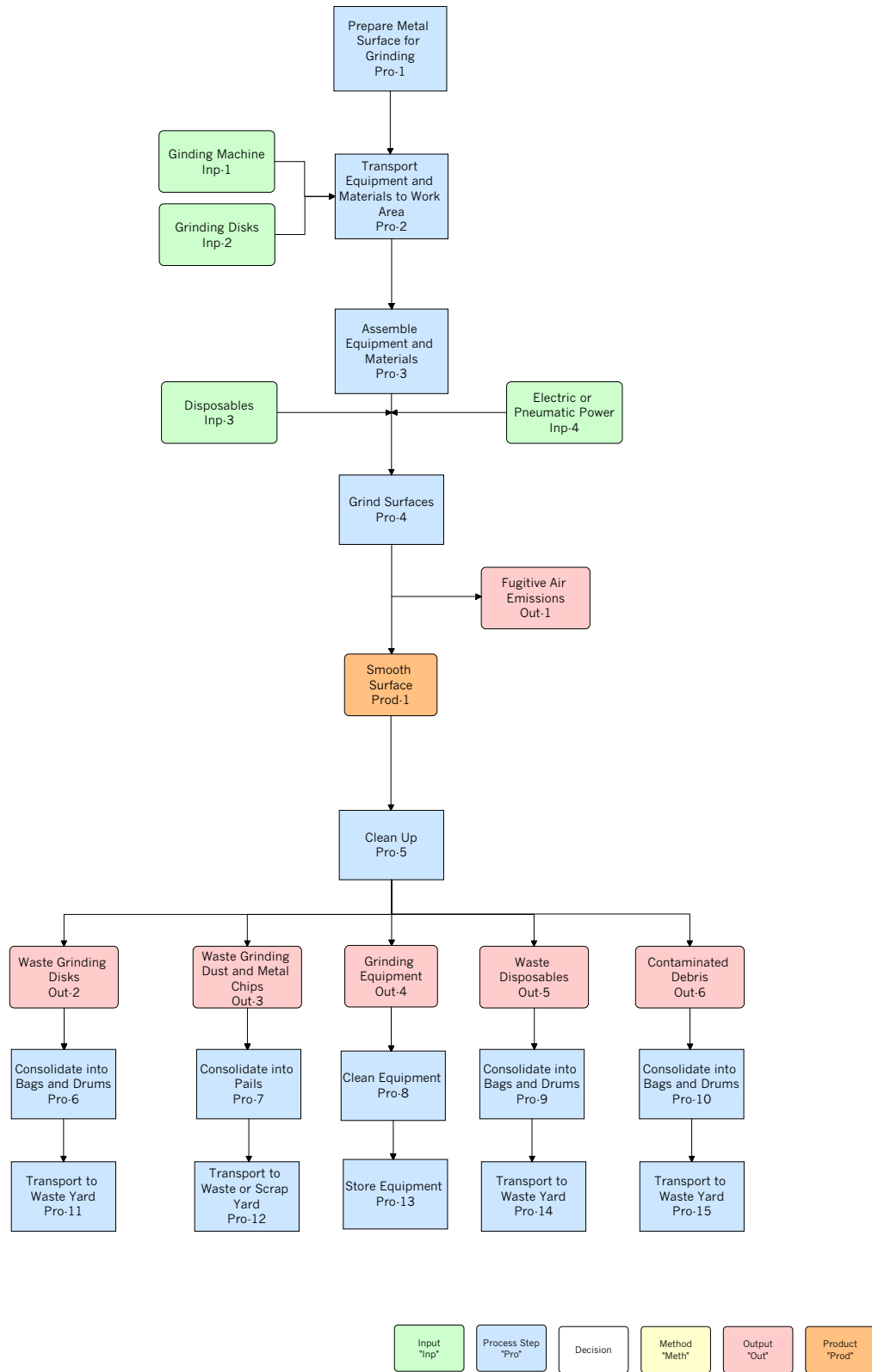
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Example 5-5: Flow Diagram and Aspects Form for Ultra High Pressure Water Jetting
(continued)

Person Completing Form: John Smith, Environmental Engineer		Area/Process: Ultra High Pressure Water Jetting				Date: 5/17/01			
ASPECT IDENTIFICATION			SIGNIFICANCE DETERMINATION			OBJECTIVES & TARGETS			
Category/Aspect	Inputs, Processes, Outputs, Products	Quantity or Volume	Legal Requirements/Voluntary Commitments, Company Policy	Community Concern	Potential Pollution Prevention	Potential Impact to the Environment	Rationale for Significance (S) or Non-significance (N)	Objective & Type C = control or maintain S = study or investigate I = improve	Target
Energy Usage:									
Diesel Fuel/Pumps	Conduct Water Jetting Operations (Pro-4)	5,000 gallons per year	No	No	No	No	Does not meet significance criteria, low volume usage		
Water Usage:									
Water	Water (Inp-4)	100,000 gallons per year	No	No	No	No	Does not meet significance criteria, low volume usage		
Supplies/Disposables:									
Rags	Inp-3		No	No	No	No	Does not meet significance criteria		
Gloves	Inp-3		No	No	No	No	Does not meet significance criteria		
Tyvek Coverall	Inp-3		No	No	No	No	Does not meet significance criteria		
Filters	Inp-3		No	No	No	No	Does not meet significance criteria		
Chemicals:									
N/A		N/A							
Air Emissions:									
N/A		N/A							
Noise/Odor/Radiation:									
Water Jetting Operations	Conduct Water Jetting Operations (Pro-4)	High levels of noise	Yes	Yes	N/A	No	High noise levels effects nesting birds		
Wastes:									
Contaminated Wastewater	Contaminated Waste Water Stream (Out-1)	80,000 gallons per year	Yes	No	Yes	N/A	NPDES discharge requirements		
Solid Waste	Waste Disposables and Debris (Out-2), (Out-4)	10,000 lbs per year	No	No	Yes	No	Waste reduction policy		
Water Discharges:									
Contaminated Wastewater	Contaminated Waste Water Stream (Out-1)	80,000 gallons per year	Yes	No	Yes	N/A	NPDES discharge requirements		
Stormwater Discharges:									
Contaminated Wastewater	Contaminated Waste Water Stream (Out-1)	80,000 gallons per year	Yes	No	Yes	N/A	Stormwater permit requirements		
Spillage and Other:									
N/A		N/A							

Example 5-6: **Flow Diagram and Aspects Form for Metal Grinding**

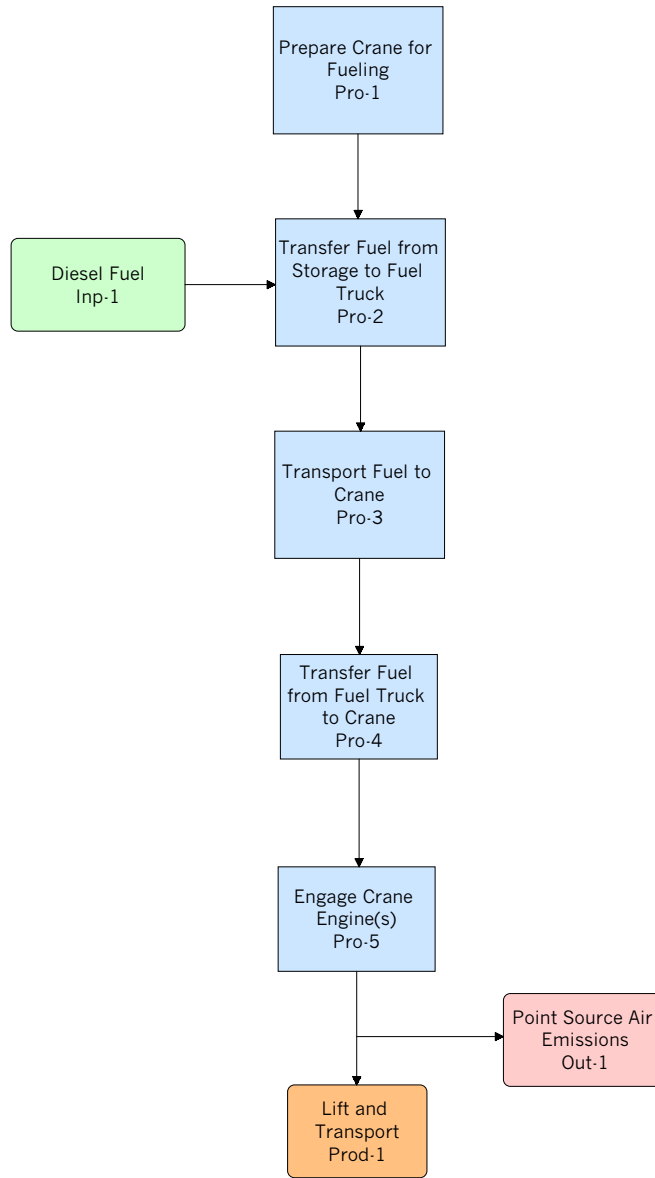


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Example 5-6: Flow Diagram and Aspects Form for Metal Grinding (continued)

Person Completing Form: John Smith, Environmental Engineer		Area/Process: Metal Grinding				Date: 5/17/01			
ASPECT IDENTIFICATION		SIGNIFICANCE DETERMINATION				OBJECTIVES & TARGETS			
Category/Aspect	Inputs, Processes, Outputs, Products	Quantity or Volume	Legal Requirements, Voluntary Commitments, Company Policy	Community Concern	Pollution Prevention Potential	Potential Impact to the Environment	Rationale for Significance (S) or Non-significance (N)	Objective & Type C = control or maintain S = study or investigate I = improve	Target
Energy Usage:									
Electricity	Electric or Pneumatic Power (Inp-4)	5,000 kw/year	No	No	No	No	Does not meet significance criteria, low volume usage		
Diesel Fuel/Forklift	Transport Equipment, Materials, Scrap and Waste to and from Work Area (Pro-2), (Pro-11), (Pro-12), (Pro-14) and (Pro-15)	1000 gallons per year	No	No	No	No	Does not meet significance criteria, low volume usage		
Water Usage:									
N/A		N/A							
Supplies/Disposables:									
Grinding Discs	Inp-2		No	No	No	No	Does not meet significance criteria		
Gloves	Inp-3		No	No	No	No	Does not meet significance criteria		
Tyvex Coverall	Inp-3		No	No	No	No	Does not meet significance criteria		
Filters	Inp-3		No	No	No	No	Does not meet significance criteria		
Chemicals:									
N/A		N/A							
Air Emissions:									
Metal Dust and Fumes	Fugitive Air Emissions (Out-1)	1.8 tons per year	No	No	Yes	No	Soil and water contamination		
Noise/Odor/Radiation:									
N/A		N/A							
Wastes:									
Solid Waste	Waste Grinding disks Metal dust and chips, disposables and debris (Out-2), (Out-3), (Out-5), (Out-6)	8,000 lbs per year	No	No	Yes	No	Waste Reduction Program		
Water Discharges:									
N/A		N/A							
Stormwater Discharges:									
Heavy Metal Contaminated Water	Fugitive Air Emissions (Out-1)		Yes	Yes	Yes	N/A	Storm water permit		
Spillage and Other:									
Spillage	Transport Equipment, Materials, Scrap and Waste to and from Work Area (Pro-2), (Pro-11), (Pro-12), (Pro-14) and (Pro-15)	100 lbs per year	No	No	No	No	Does not meet significance criteria, low volume spillage		

Example 5-7: **Flow Diagram** and **Aspects Form** for **Material Transport, Crane**

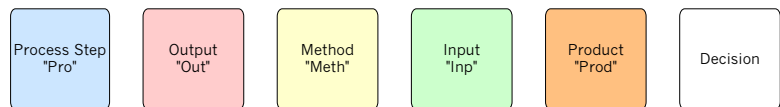
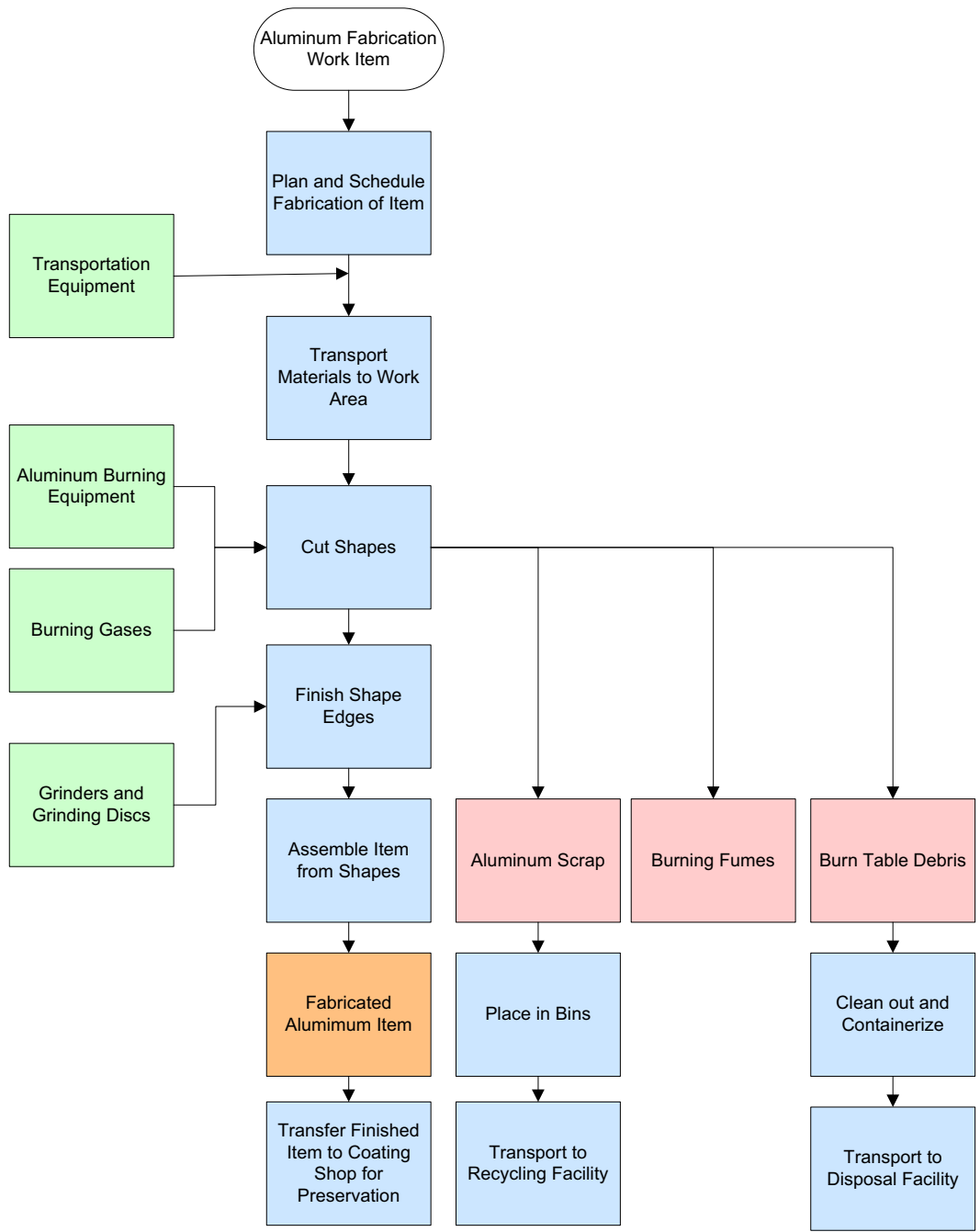


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Example 5-7: Flow Diagram and Aspects Form for Material Transport, Crane (continued)

Person Completing Form: John Smith, Environmental Engineer		Area/Process: Material Transport, Crane				Date: 5/17/01				
ASPECT IDENTIFICATION			SIGNIFICANCE DETERMINATION				OBJECTIVES & TARGETS			
Category/Aspect	Inputs, Processes, Outputs, Products	Quantity or Volume	Legal Requirements/ Voluntary Comments/ Company Policy	Community Concern	Pollution Prevention Potential	Potential Impact to the Environment	N or S	Rationale for Significance (S) or Non-significance (N)	Objective & Type C = control or maintain S = study or investigate I = improve	Target
Energy Usage:										
Diesel Fuel	Diesel Fuel (Imp-1)	10,000 gallons per year	No	No	No	N/A	N	Does not meet significance criteria, high volume usage		
Water Usage:										
N/A		N/A								
Supplies/Disposables:										
N/A		N/A								
Chemicals:										
N/A		N/A								
Air Emissions:										
NO _x , SO _x , Particulates	Point Source Air Emissions (Out-1)	2.3 tons	Yes	Yes	Yes	N/A	S	Permits to operate		
Noise/Odor/Radiation:										
Odor from Diesel Fuel Combustion	Point Source Air Emissions (Out-1)		No	No	No	No	N	Does not meet significance criteria		
Wastes:										
N/A		N/A								
Water Discharges:										
N/A		N/A								
Stormwater Discharges:										
Petroleum Contaminated Water	Spillage of Diesel Fuel (Pro-2), (Pro-3), (Pro-4)		Yes	Yes	Yes	N/A	S	Storm water permit		
Spillage and Other:										
Spillage	Spillage of Diesel Fuel (Pro-2), (Pro-3), (Pro-4)	250 gallons per year	Yes	Yes	Yes	Yes	S	Annual volume exceeds criteria of "No Spill Policy"		

Example 5-8: **Flow Diagram** and **Aspects Form** for **Aluminum Fabrication**



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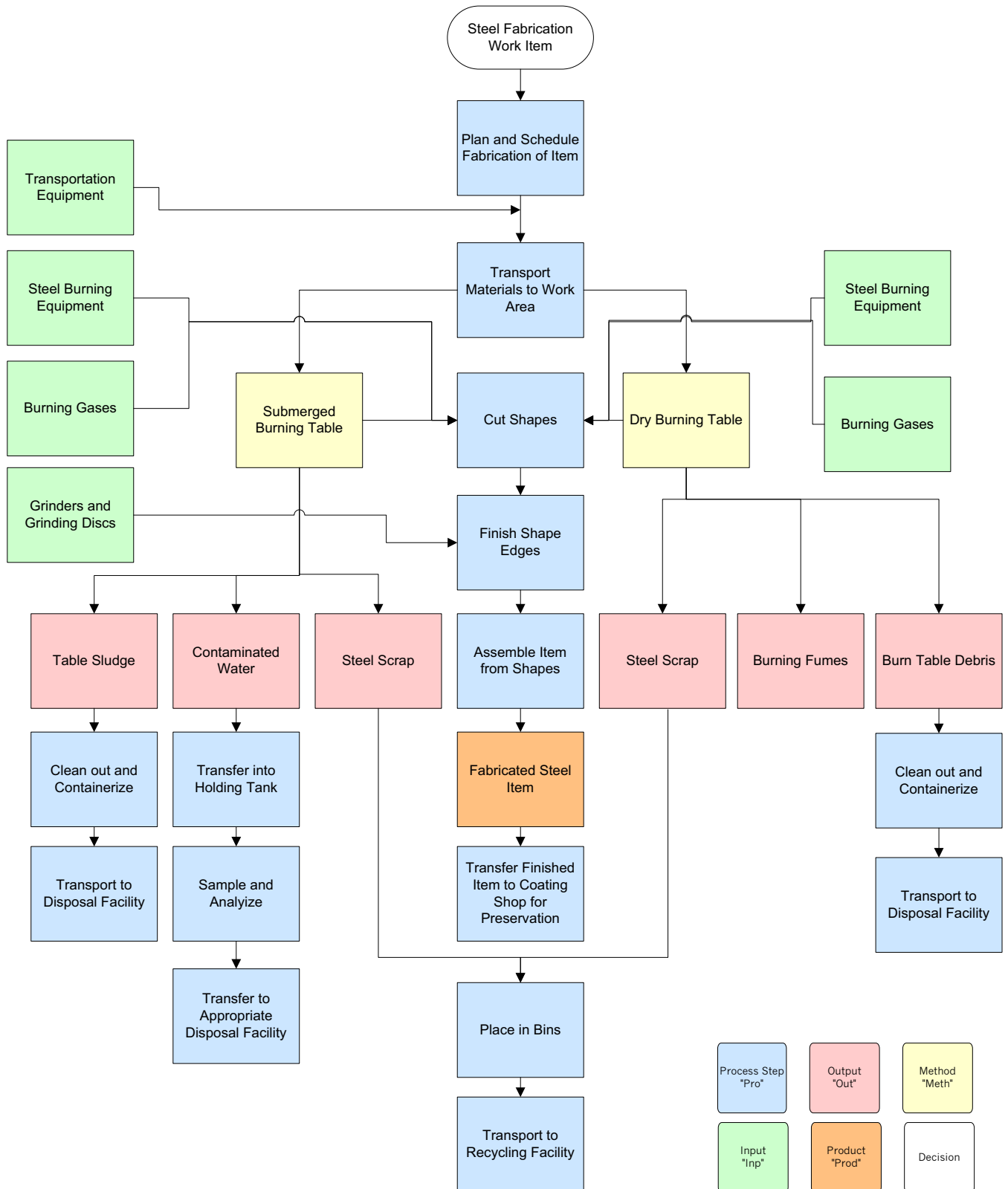
Example 5-8: Flow Diagram and Aspects Form for Aluminum Fabrication (continued)

Person Completing Form: John Smith, Environmental Engineer		Area/Process: Aluminum Fabrication				Date: 5/17/01			
ASPECT IDENTIFICATION		SIGNIFICANCE DETERMINATION				OBJECTIVES & TARGETS			
Category/Aspect	Inputs, Processes, Outputs, Products	Quantity or Volume	Legal Requirements/Voluntary Commitments, Company Policy	Community Concern	Pollution Prevention Potential	Potential Impact to the Environment	Rationale for Significance (S) or Non-significance (N)	Objective & Type C = control or maintain S = study or investigate I = improve	Target
Energy Usage:									
Diesel Fuel/Forklifts	Transport raw aluminum, fabricated items and scrap (Pro-2), (Pro-6), (Pro-8), (Pro-9)	1,000 gals per year	No	No	No	No	Low Volume Usage		
Water Usage:									
N/A		N/A							
Supplies/Disposables:									
Burning Gases	Cutting Shapes (Pro-3)	1,000 cu.ft. per year	No	No	No	No	Low Volume or Usage		
Grinding Discs	Finish Shapes (Pro-4)	100 discs per year	No	No	No	No	Low Volume or Usage		
Welding Rod & Wire	Weld shapes into items (Pro-5)	2,000 lbs per year	No	No	No	No	Low Volume or Usage		
Welding Gases	Weld shapes into items (Pro-5)	4,000 cu.ft. per year	No	No	No	No	Low Volume or Usage		
Rags	Disposables (Pro-3)	50 cu yards per year	No	No	No	No	Low Volume or Usage		
Gloves	Disposables (Pro-3)	100 pairs per year	No	No	No	No	Low Volume or Usage		
Tyvek Suits	Disposables (Pro-3)	5 cu yards per year	No	No	No	No	Low Volume or Usage		
Chemicals:									
N/A		N/A							
Air Emissions:									
Burning Fumes	Fugitive Air Emissions (Out-2)	10 lbs per year	Yes	Yes	No	No	Toxic Air Emissions Rule		

Example 5-8: Flow Diagram and Aspects Form for Aluminum Fabrication (continued)

Noise/Odor/Radiation:										
Burning Noise	Cutting Shapes (Pro-3)	120 decibels	Yes	No	No	No	No	S	Worker Safety Requirements	
Wastes:										
Scrap Aluminum	Aluminum Scrap (Out-1)	800 lbs per year	Yes	No	No	No	No	N	Scrap Aluminum is recycled	
Burn Table Debris	Burn Table Debris (Out-3)	2 drums per year	No	No	No	No	No	N	Non-Hazardous waste	
Water Discharges:										
N/A		N/A								
Stormwater Discharges:										
Stormwater Contact/Aluminum Storage	Rainfall contact with Outside Aluminum Item storage (Pro-14)	0.1 lb per year	Yes	Yes	No	No	No	S	Stormwater Permit Requirements	
Spillage and Other:										
N/A		N/A								

Example 5-9: Flow Diagram and Aspects Form for Steel Fabrication



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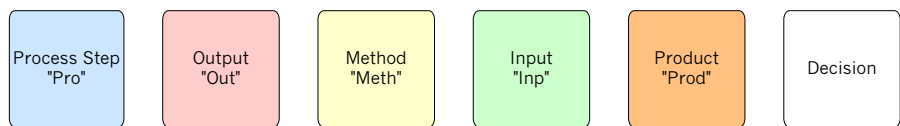
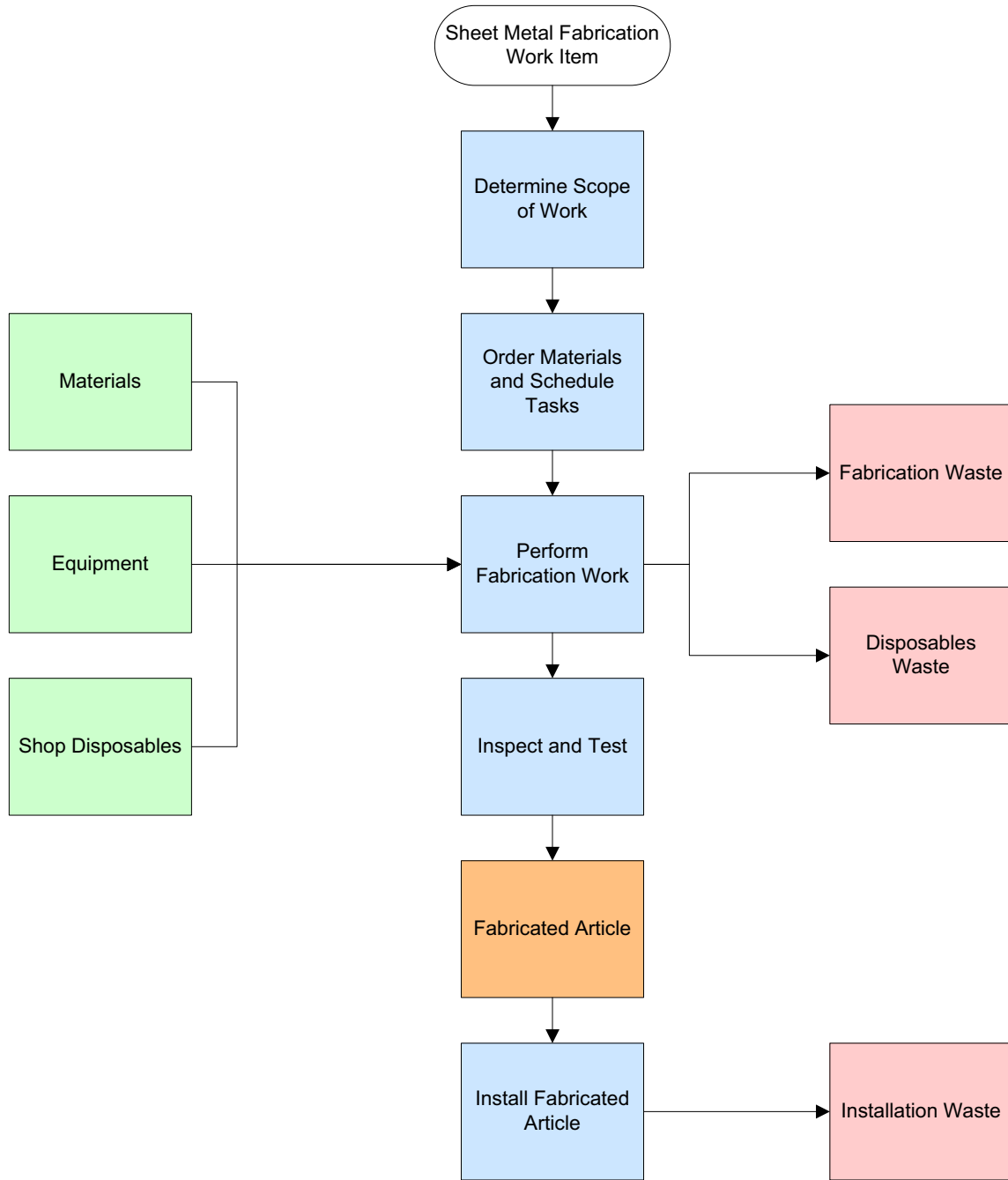
Example 5-9: Flow Diagram and Aspects Form for Steel Fabrication (continued)

Person Completing Form: John Smith, Environmental Engineer		Area/Process: Steel Fabrication				Date: 5/17/01			
ASPECT IDENTIFICATION		SIGNIFICANCE DETERMINATION				OBJECTIVES & TARGETS			
Category/Aspect	Inputs, Processes, Outputs, Products	Quantity or Volume	Legal Requirements/Voluntary Commitments/Company Policy	Community Concern	Potential Pollution Prevention	Potential Impact to the Environment	Rationale for Significance (S) or Non-significance (N)	Objective & Type C = control or maintain S = study or investigate I = improve	Target
Energy Usage:									
Diesel Fuel/Forklifts	Transport raw steel, fabricated items and scrap (Pro-2), (Pro-13), (Pro-8), (Pro-9)	1,000 gals per year	No	No	No	No	Low Volume Usage		
Water Usage:									
Water	Submerged Burning Table (Inp-4)	25,000 gals per year	No	No	No	No	Low Volume Usage		
Supplies/Disposables:									
Burning Gases	Cutting Shapes (Pro-3)	10,000 cu.ft. per year	No	No	No	No	Low Volume or Usage		
Grinding Discs	Finish Shapes (Pro-3)	1,000 discs per year	No	No	No	No	Low Volume or Usage		
Welding Rod & Wire	Weld shapes into items (Pro-5)	2,500 lbs per year	No	No	No	No	Low Volume or Usage		
Welding Gases	Weld shapes into items (Pro-5)	4,000 cu ft per year	No	No	No	No	Low Volume or Usage		
Rags	Disposables (Pro-3)	50 cu yards per year	No	No	No	No	Low Volume or Usage		
Gloves	Disposables (Pro-3)	100 pairs per year	No	No	No	No	Low Volume or Usage		
Tyvex Suits	Disposables (Pro-3)	5 cu yards per year	No	No	No	No	Low Volume or Usage		
Chemicals:									
N/A		N/A							

Example 5-9: Flow Diagram and Aspects Form for Steel Fabrication (continued)

Air Emissions:									
Burning Fumes	Fugitive Air Emissions (Out-4)	100 lbs per year	Yes	Yes	No	No	S	Toxic Air Emissions Rule	
Noise/Odor/Radiation:									
Burning Noise	Cutting Shapes (Pro-3)	120 decibels	Yes	No	No	No	S	Worker Safety Requirements	
Wastes:									
Burn Table Sludge	Table Sludge (Out-2)	1,200 gals per year	Yes	No	No	No	S	Hazardous Waste Requirements	
Scrap Steel	Steel Scrap (Out-3)	80,000 lbs per year	Yes	No	No	No	N	Scrap steel is recycled	
Burn Table Debris	Burn Table Debris (Out-5)	25 drums per year	No	No	No	No	N	Non-Hazardous waste	
Water Discharges:									
Burn Table Water	Contaminated Water (Out-2)	600 gals per year	Yes	No	No	No	S	POTW discharge requirements	
Stormwater Discharges:									
Stormwater Contact/Steel Storage	Rainfall contact with Outside Steel Item storage (Pro-14)	0.1 lb per year	Yes	Yes	No	No	S	Stormwater Permit Requirements	
Spillage and Other:									
N/A		N/A							

Example 5-10: **Flow Diagram** and **Aspects Form** for **Sheet Metal**



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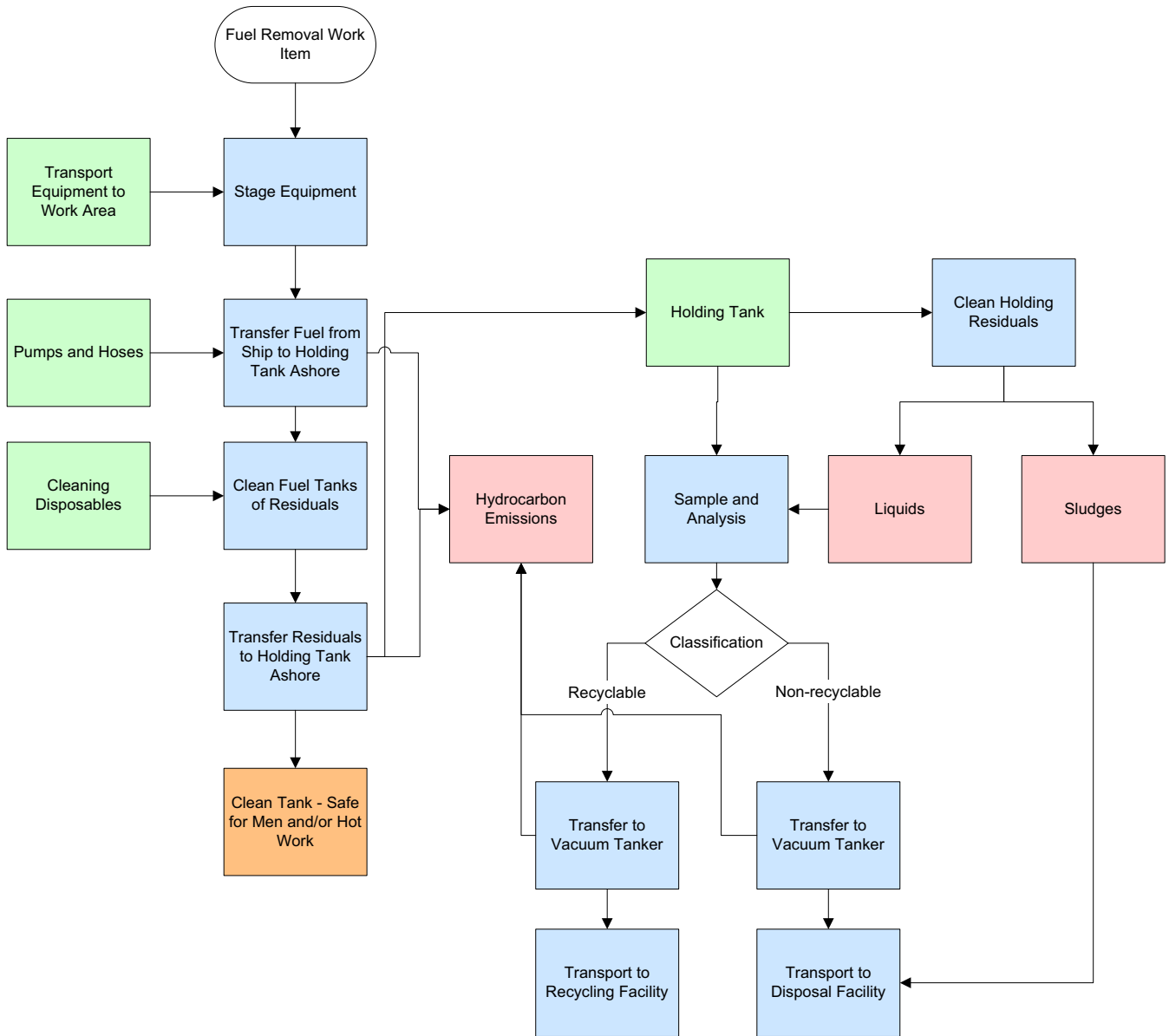
Example 5-10: Flow Diagram and Aspects Form for Sheet Metal (continued)

Person Completing Form: John Smith, Environmental Engineer		Area/Process: Sheet Metal				Date: 5/17/01		
ASPECT IDENTIFICATION			SIGNIFICANCE DETERMINATION			OBJECTIVES & TARGETS		
Category/Aspect	Inputs, Processes, Outputs, Products	Quantity or Volume	Legal Requirements/Company Policy	Community Concern	Potential Pollution Prevention	Potential Impact to the Environment	Objective & Type C = control or maintain S = study or investigate I = improve	Target
Energy Usage:								
Diesel Fuel/Forklifts	Transport raw aluminum, fabricated items and scrap (Pro-3), (Pro-6), (Pro-9)	1,000 gals per year	No	No	No	No	N	Low Volume Usage
Electricity/Equipment Power	Machine Operation (Pro-4)	50,000 kw per year	No	No	No	No	N	Low Volume Usage
Water Usage:								
N/A		N/A						
Supplies/Disposables:								
Welding Rod & Wire	Weld shapes into items (Pro-5)	2,000 lbs per year	No	No	No	No	N	Low Volume or Usage
Welding Gases	Weld shapes into items (Pro-4)	4,000 cu.ft. per year	No	No	No	No	N	Low Volume or Usage
Rags	Disposables (Pro-3)	50 cu yards per year	No	No	No	No	N	Low Volume or Usage
Gloves	Disposables (Pro-3)	100 pairs per year	No	No	No	No	N	Low Volume or Usage
Tyvek Suits	Disposables (Pro-3)	5 cu yards per year	No	No	No	No	N	Low Volume or Usage
Chemicals:								
Glues/Adhesives	Assemble pieces and install fabricated items (Pro-5), (Pro-7)	55 gals per year	No	No	No	No	N	Low Volume or Usage
Oils, Greases, Lubricants	Cut and Shape pieces (Pro-4)	25 gals per year	No	No	No	No	N	Low Volume or Usage
Air Emissions:								
Welding Fumes	Fugitive Air Emissions (Out-4)	15 lbs per year	Yes	Yes	No	No	S	Toxic Air Emissions Rule

Example 5-10: Flow Diagram and Aspects Form for Sheet Metal (continued)

Noise/Odor/Radiation:										
N/A										N/A
Wastes:										
Scrap Metal	Metal Scrap (Out-3)	100 lbs per year	Yes	No	No	No	No	No	N	Scrap metal is recycled
Fabrication Wastes	Metal Debris and other (Out-1)	10,000 lbs per year	No	No	No	No	No	No	N	Low Volume or Usage
Water Discharges:										
N/A										N/A
Stormwater Discharges:										
Stormwater Contact/Sheet Metal Storage	Rainfall contact with Outside Sheet Metal Item storage (Pro-6)	0.1 lb per year	Yes	Yes	No	No	No	No	S	Stormwater Permit Requirements
Spillage and Other:										
N/A										N/A

Example 5-11: **Flow Diagram** and **Aspects Form** for **Ship's Fuel Removal**

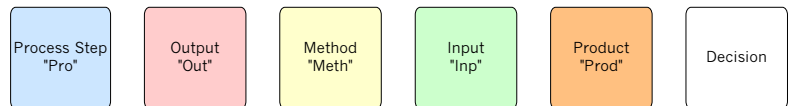
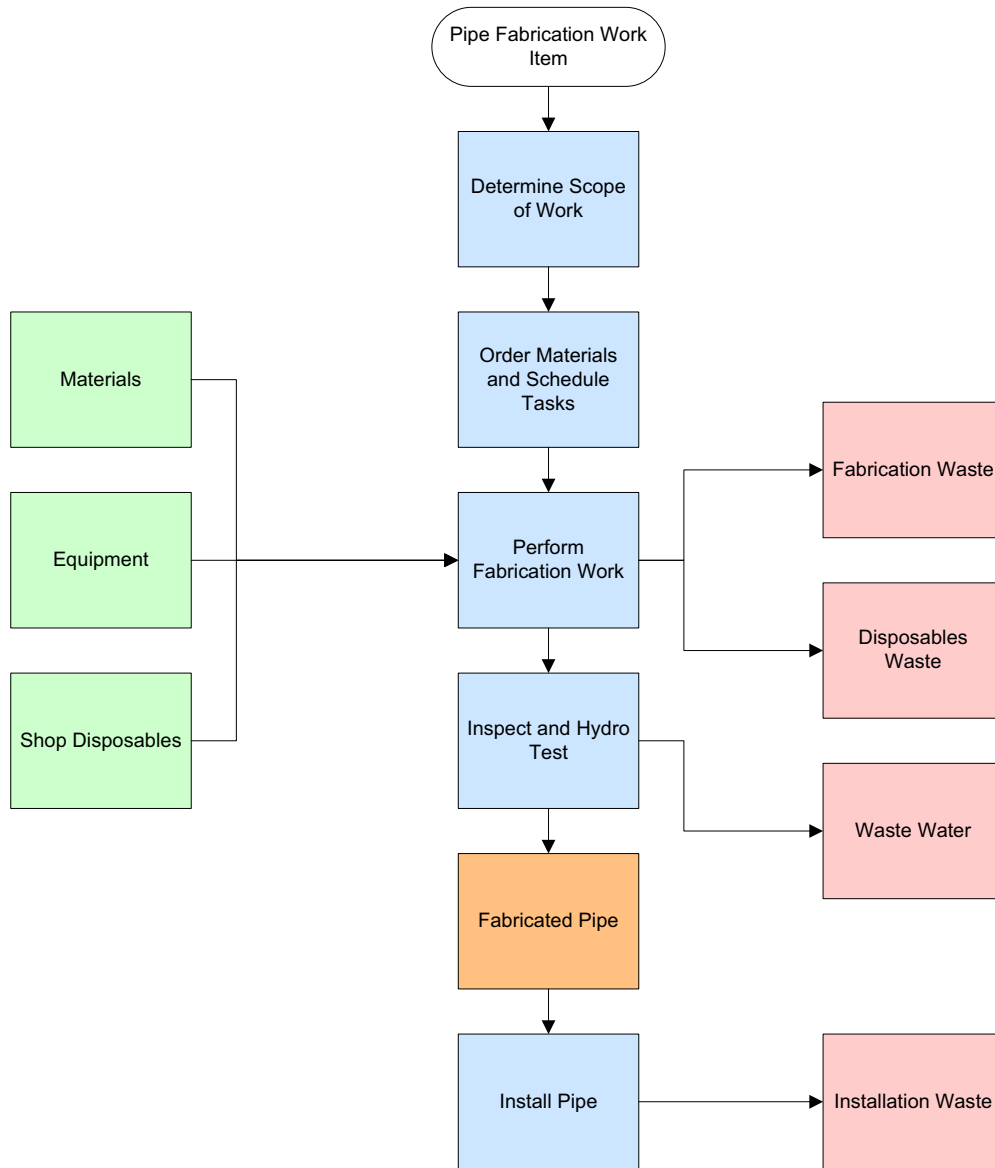


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Example 5-11: Flow Diagram and Aspects Form for Ship's Fuel Removal (continued)

Person Completing Form: John Smith, Environmental Engineer		Area/Process: Ship's Fuel Removal				Date: 5/17/01			
ASPECT IDENTIFICATION			SIGNIFICANCE DETERMINATION			OBJECTIVES & TARGETS			
Category/Aspect	Inputs, Processes, Outputs, Products	Quantity or Volume	Legal Requirements/Voluntary Commitments, Company Policy	Community Concern	Pollution Prevention Potential	Potential Impact to the Environment	Rationale for Significance (S) or Non-significance (N)	Objective & Type C = control or maintain S = study or investigate I = improve	Target
Energy Usage:									
Diesel Fuel/Forklifts	Transport Equipment and Materials to Work Area (Pro-1)	1,000 gallons per year	No	No	No	No	Low Volume Usage		
Electricity	Operation of Transfer pumps (Pro-2), (Pro-4), (Pro-7)	5,000 kw per year	No	No	No	No	Low Volume Usage		
Water Usage:									
		N/A							
Supplies/Disposables:									
Rags	Disposables (Imp-1)	500 cu yards per year	No	No	No	No	Low Volume or Usage		
Gloves	Disposables (Imp-1)	1,000 pairs per year	No	No	No	No	Low Volume or Usage		
Tyvex Suits	Disposables (Imp-1)	2,000 suits per year	No	No	No	No	Low Volume or Usage		
Filter Carts	Disposables (Imp-1)	600 per year	No	No	No	No	Low Volume or Usage		
Chemicals:									
		N/A							
Air Emissions:									
Hydrocarbons	Fuel Vapors (Pro-2), (Pro-4), (Pro-7)	1.5 tons per year	Yes	No	No	No	Air Emission Rules		
Noise/Odor/Radiation:									
		N/A							
Wastes:									
Waste Fuels	Liquid fuel removed from tanks (Out-6)	750,000 gals per year	No	No	No	No	Waste fuels are recycled		
Sludges	Sludges removed from tanks (Out-7)	850 bbls per year	No	No	No	No	Sludges are treated and disposed of off-site		
Solid Wastes	Contaminated Disposables (out-8)	600 cu yards per year	No	No	No	No	Low Volume Waste		
Water Discharges:									
		N/A							
Stormwater Discharges:									
		N/A							
Spillage and Other:									
Fuel Spillage	Spillage during transfers (Pro-2), (Pro-4), (Pro-7)	500 gals per year	Yes	No	Yes	No	High potential for spillage to be discharged to surface waters		

Example 5-12: **Flow Diagram** and **Aspects Form** for **Pipe Fabrication**



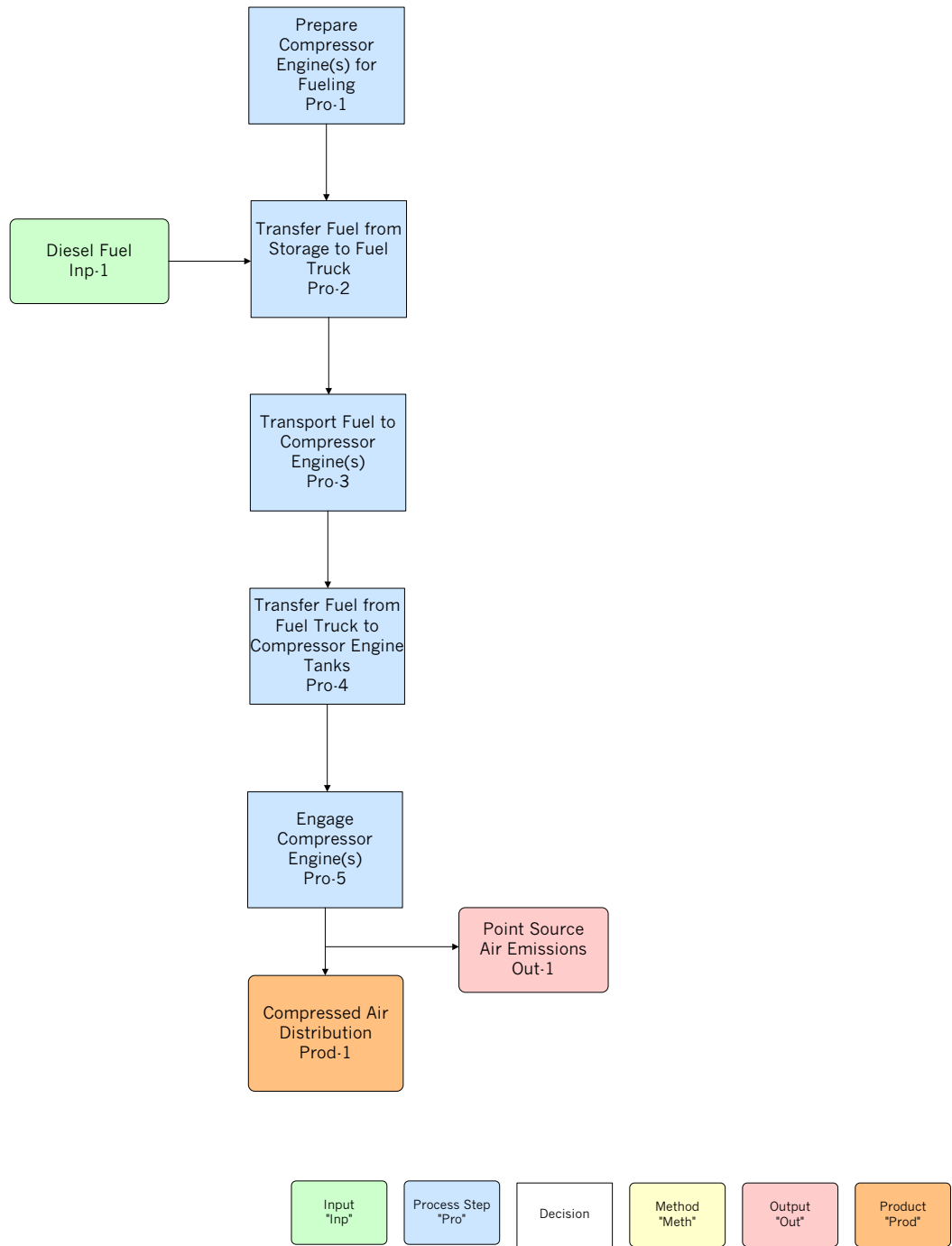
Example 5-12: Flow Diagram and Aspects Form for Pipe Fabrication (continued)

Person Completing Form: John Smith, Environmental Engineer		Area/Process: Pipe Fabrication				Date: 5/17/01			
ASPECT IDENTIFICATION		SIGNIFICANCE DETERMINATION				OBJECTIVES & TARGETS			
Category/Aspect	Inputs, Processes, Outputs, Products	Quantity or Volume	Legal Requirements/ Voluntary Commitments/ Company Policy	Community Concern	Potential Pollution Prevention	Potential Impact to the Environment	Rationale for Significance (S) or Non-significance (N)	Objective & Type C = control or maintain S = study or investigate I = improve	Target
Energy Usage:									
Electricity/Equipment Power	Machine Operation (Pro-3)	50,000 kw per year	No	No	No	No	Low Volume Usage		
Diesel Fuel/Forklifts	Transport pipes (Pro-5), (Pro-6)	800 gals per year	No	No	No	No	Low Volume Usage		
Water Usage:									
Water	Hydrostatic testing	15,000 gals per year	No	No	No	No	Low Volume Usage		
Supplies/Disposables:									
Welding Rod & Wire	Pipe Fabrication (Pro-3)	2,500 lbs per year	No	No	No	No	Low Volume or Usage		
Welding Gases	Pipe Fabrication (Pro-3)	4,000 cu ft per year	No	No	No	No	Low Volume or Usage		
Solder	Pipe Fabrication (Pro-3)	80 lbs per year	No	No	No	No	Low Volume or Usage		
Flux	Pipe Fabrication (Pro-3)	20 gals per year	No	No	No	No	Low Volume or Usage		
Rags	Disposables (Pro-3)	50 cu yards per year	No	No	No	No	Low Volume or Usage		
Gloves	Disposables (Pro-3)	100 pairs per year	No	No	No	No	Low Volume or Usage		
Tyvek Suits	Disposables (Pro-3)	5 cu yards per year	No	No	No	No	Low Volume or Usage		
Chemicals:									
Oils	Pipe Fabrication (Pro-3)	110 gals per year	No	No	No	No	Low Volume Usage		
Lubricants	Pipe Fabrication (Pro-3)	55 gals per year	No	No	No	No	Low Volume Usage		
PVC Cleaner	Pipe Fabrication (Pro-3)	10 gallons per year	No	No	No	No	Low Volume Usage		
PVC Cement	Pipe Fabrication (Pro-3)	10 gallons per year	No	No	No	No	Low Volume Usage		

Example 5-12: Flow Diagram and Aspects Form for Pipe Fabrication (continued)

Air Emissions:									
Welding, Brazing, Soldering	Fugitive Air Emissions (Out-1)	15 lbs per year	Yes	Yes	No	No	No	S	Toxic Air Emissions Rule
Noise/Odor/Radiation:									
N/A		N/A							
Wastes:									
Scrap Metal	Fabrication Waste (Out-2)	1,500 lbs per year	No	No	No	No	No	N	Scrap metal is recycled
Disposables	Fabrication Waste (Out-2)	50 cu yards per year	No	No	No	No	No	N	Low Volume Usage
Waste Water	Hydro Testing Pipe (Out-4)	8,000 gals per year	No	No	No	No	No	N	Discharged to POTW
Installation Waste	Installing Pipe System (Out-5)	100 cu yards per year	No	No	No	No	No	N	Low Volume Usage
Water Discharges:									
N/A		N/A							
Stormwater Discharges:									
Stormwater Contact/Pipe Storage	Rainfall contact with Outside pipe storage (Pro-5)	0.1 lb per year	Yes	Yes	No	No	No	S	Stormwater Permit Requirements
Spillage and Other:									
N/A		N/A							

Example 5-13: **Flow Diagram** and **Aspects Form** for **Compressed Air**

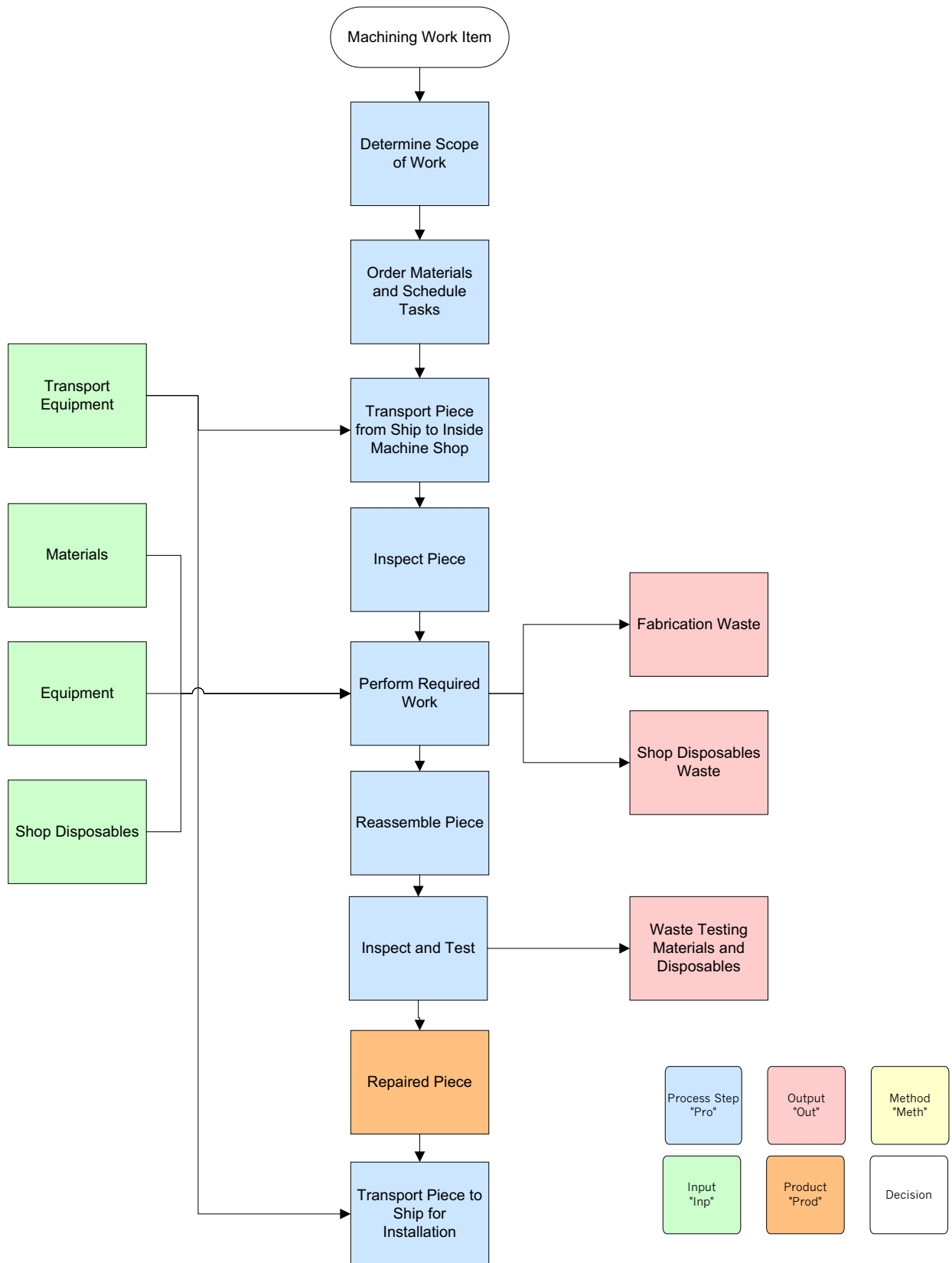


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Example 5-13: Flow Diagram and Aspects Form for Compressed Air (continued)

Person Completing Form: John Smith, Environmental Engineer		Area/Process: Compressed Air				Date: 5/17/01			
ASPECT IDENTIFICATION			SIGNIFICANCE DETERMINATION				OBJECTIVES & TARGETS		
Category/Aspect	Inputs, Processes, Outputs, Products	Quantity or Volume	Legal Requirements/ Voluntary Commitments/ Company Policy	Community Concern	Pollution Prevention Potential	Potential Impact to the Environment	Rationale for Significance (S) or Non-significance (N)	Objective & Type C = control or maintain S = study or investigate I = improve	Target
Energy Usage:									
Diesel Fuel	Diesel Fuel	100,000 gals per year	Yes	No	No	No	Air Quality Standards, Permits to Operate		
Water Usage:									
N/A		N/A							
Supplies/Disposables:									
N/A		N/A							
Chemicals:									
N/A		N/A							
Air Emissions:									
Internal Combustion	Operate Compressor Engine (Pro-5)	NOX/S OX 2 tons per year	Yes	No	No	No	Air Quality Rule, Permits to Operate		
Noise/Odor/Radiation:									
N/A		N/A							
Wastes:									
N/A		N/A							
Water Discharges:									
Air Line Condensate	Condensate Traps (Out-2)	100 gals per year	No	No	No	No	Low Volume Discharge		
Stormwater Discharges:									
N/A		N/A							
Spillage and Other:									
Oil Spills	Fuel Transfers (Pro-2), (Pro-4)	100 gals per year	Yes	Yes	No	No	Company No Spill Policy		

Example 5-14: **Flow Diagram** and **Aspects Form** for **Inside Machine Shop**



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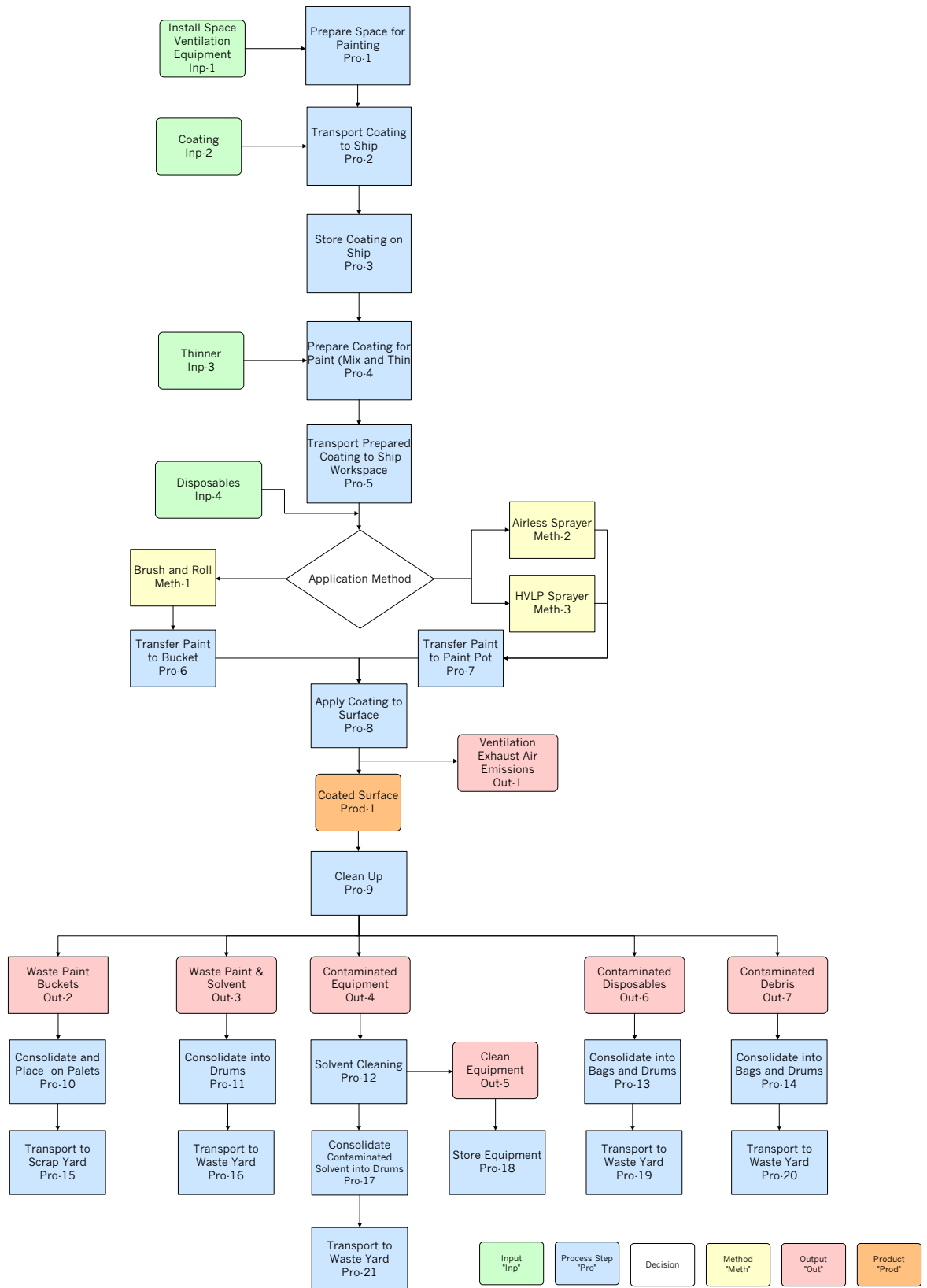
Example 5-14: Flow Diagram and Aspects Form for Inside Machine Shop (continued)

Person Completing Form: John Smith, Environmental Engineer		Area/Process: Inside Machine Shop				Date: 5/17/01			
ASPECT IDENTIFICATION			SIGNIFICANCE DETERMINATION				OBJECTIVES & TARGETS		
Category/Aspect	Inputs, Processes, Outputs, Products	Quantity or Volume	Legal Requirements/ Voluntary Commitments, Company Policy	Community Concern	Potential Pollution Prevention	Potential Impact to the Environment	Rationale for Significance (S) or Non-significance (N)	Objective & Type C = control or maintain S = study or investigate I = improve	Target
Energy Usage:									
Diesel Fuel/Forklifts	Transport machinery, fabricated items and scrap (Pro-2), (Pro-7), (Pro-9)	1,000 gals per year	No	No	No	No	Low Volume Usage		
Electricity/Equipment Power	Machine Operation (Pro-4)	50,000 kw per year	No	No	No	No	Low Volume Usage		
Water Usage:									
N/A		N/A							
Supplies/Disposables:									
Welding Rod & Wire	Weld shapes into items (Pro-4)	2,000 lbs per year	No	No	No	No	Low Volume or Usage		
Welding Gases	Weld shapes into items (Pro-4)	4,000 cu.ft. per year	No	No	No	No	Low Volume or Usage		
Rags	Disposables (Pro-4)	50 cu yards per year	No	No	No	No	Low Volume or Usage		
Gloves	Disposables (Pro-4)	100 pairs per year	No	No	No	No	Low Volume or Usage		
Tyvek Suits	Disposables (Pro-4)	5 cu yards per year	No	No	No	No	Low Volume or Usage		
Chemicals:									
Glues/Adhesives	Assemble pieces and install fabricated items (Pro-5)	55 gals per year	No	No	No	No	Low Volume or Usage		
Oils, greases, lubricants	Machinery repair and fabrication (Pro-4)	25 gals per year	No	No	No	No	Low Volume or Usage		
Air Emissions:									
Welding Fumes	Fugitive Air Emissions (Out-5)	5 lbs per year	Yes	Yes	No	No	Toxic Air Emissions Rule		

Example 5-14: Flow Diagram and Aspects Form for Inside Machine Shop (continued)

Noise/Odor/Radiation:										
N/A									N/A	
Wastes:										
Scrap Metal	Metal Scrap (Out-3)	1,000 lbs per year	Yes	No	No	No	No	No	N	Scrap metal is recycled
Fabrication Wastes	Metal Debris and other (Out-1)	10,000 lbs per year	No	No	No	No	No	No	N	Low Volume or Usage
Water Discharges:										
N/A									N/A	
Stormwater Discharges:										
N/A									N/A	
Spillage and Other:										
N/A									N/A	

Example 5-15: **Flow Diagram** and **Aspects Form** for **Interior Ship Painting**



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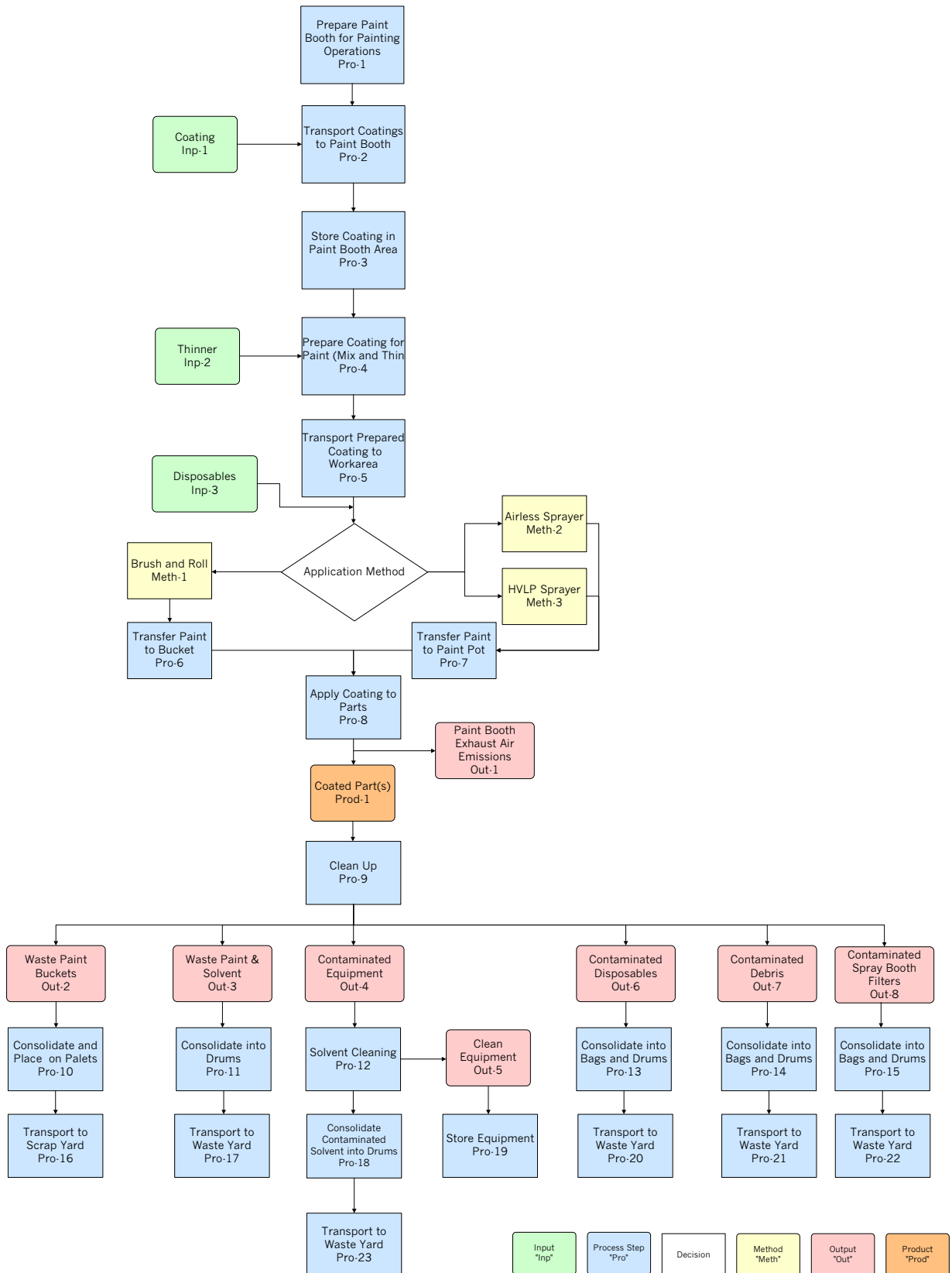
Example 5-15: Flow Diagram and Aspects Form for Interior Ship Painting (continued)

Person Completing Form: John Smith, Environmental Engineer		Area/Process: Interior Ship Painting				Date: 5/17/01			
ASPECT IDENTIFICATION		SIGNIFICANCE DETERMINATION				OBJECTIVES & TARGETS			
Category/Aspect	Inputs, Processes, Outputs, Products	Quantity or Volume	Legal Requirements/Voluntary Commitments/Company Policy	Community Concern	Pollution Prevention	Potential Impact to the Environment	Rationale for Significance (S) or Non-significance (N)	Objective & Type C = control or maintain S = study or investigate I = improve	Target
Energy Usage:									
Electricity/Paint Mixers	Mix and Thin Coating (Pro-4) Transport Equipment, Materials, Waste and Scrap to and from Work Area (Pro-2), Pro-5), (Pro-15), Pro-16), Pro-21), (Pro-21), (Pro-19), (Pro-20)	10 kw per year	No	No	No	No	Low Volume Usage		
Diesel Fuel/Forklifts		1000 gallons per year	No	No	No	No	Low Volume Usage		
Water Usage:									
N/A		N/A							
Supplies/Disposables:									
Rags	Disposables (Pro-3)	500 cu yards per year	No	No	No	No	Low Volume or Usage		
Gloves	Disposables (Pro-3)	1,000 pairs per year	No	No	No	No	Low Volume or Usage		
Tyvek Suits	Disposables(Pro-3)	50 cu yards per year	No	No	No	No	Low Volume or Usage		
Filter Carts	Disposables (Pro-3)	600 per year	No	No	No	No	Low Volume or Usage		
Sand Paper	Disposables (Pro-3)	10 gross per year	No	No	No	No	Low Volume or Usage		
Chemicals:									
VOC Content	Virgin Coatings (Inp-2)	N/A	Yes	No	No	No	Marine Coating Rule Air Permits		
HAP Content	Virgin Thinners (Inp-3)	N/A	Yes	No	No	No	Marine Coating Rule Air Permits		
Air Emissions:									
Fugitive VOC	Ventilation Exhaust Air (Out-1)	15 tons	Yes	No	No	No	Marine Coating Rule Permits to Operate Toxic Air Emissions Rule		
Fugitive HAP	Ventilation Exhaust Air (Out-1)	5 tons	Yes	Yes	No	No	Marine Coating Rule Permits to Operate Toxic Air Emissions Rule		
Overspray, Fugitive Air Emissions	Ventilation Exhaust Air (Out-1)	1 ton	Yes	Yes	No	No	Marine Coating Rule Permits to Operate Toxic Air Emissions Rule		

Example 5-15: Flow Diagram and Aspects Form for Interior Ship Painting (continued)

Noise/Odor/Radiation:												
Odor from VOC fumes	Coating Application (Pro-8)	No	No	No	No	No	No	No	No	No	No	Nuisance Rule
Wastes:												
Contaminated Scrap	Waste Paint Cans (Out-2)	3,000 lbs per year	No	No	Yes	No	No	No	No	No	S	Company Waste Reduction Program
Contaminated Waste	Tyvek Suits, Rollers, Brushes, Filter Masks, Paint Stirrers, Drop Cloths, Masking Tape, Debris. (Out-6), (Out-7)	3,500 lbs per year	No	No	No	No	No	No	No	No	S	Company Waste Reduction Program
Waste Chemicals	Waste Paint and Solvent (Out-3)	500 gallons per year	Yes	No	Yes	No	No	No	No	No	S	RCRA (Subtitle C)
Water Discharges:												
N/A												
Stormwater Discharges:												
Heavy Metal Contaminated Water	Ventilation Exhaust Air (Out-1)	100 lbs per year	Yes	Yes	Yes	Yes	Yes	No	No	No	S	Facility Stormwater Permit
Spillage and Other:												
Coating and/or Thinner Spillage	Transport waste cans, cleaning solvents, contaminated solvents and debris to waste yard (Pro-15), (Pro-16)	25 gallons per year	No	No	No	No	No	No	No	No	N	Low Volume Spillage
Coating and/or Thinner Spillage	Consolidate equipment cleaning solvents into drums (Pro-17)	10 gallons per year	No	No	No	No	No	No	No	No	N	Low Volume Spillage
Coating and/or Thinner Spillage	Transport virgin coatings and thinners to work area (Pro-2)	10 gallons per year	No	No	No	No	No	No	No	No	N	Low Volume Spillage
Spillage, Contaminated Scrap	Consolidate Waste (Pro-11)	5 gallons per year	No	No	No	No	No	No	No	No	N	Low Volume Spillage
Coating and/or Thinner Spillage	Consolidation of Waste coating and solvents, solvent cleaning of equipment, Consolidate Waste Solvents into drums (Pro-11), (Pro-12)	10 gallons per year	No	No	No	No	No	No	No	No	N	Low Volume Spillage

Example 5-16: **Flow Diagram and Aspects Form for Paint Booth**



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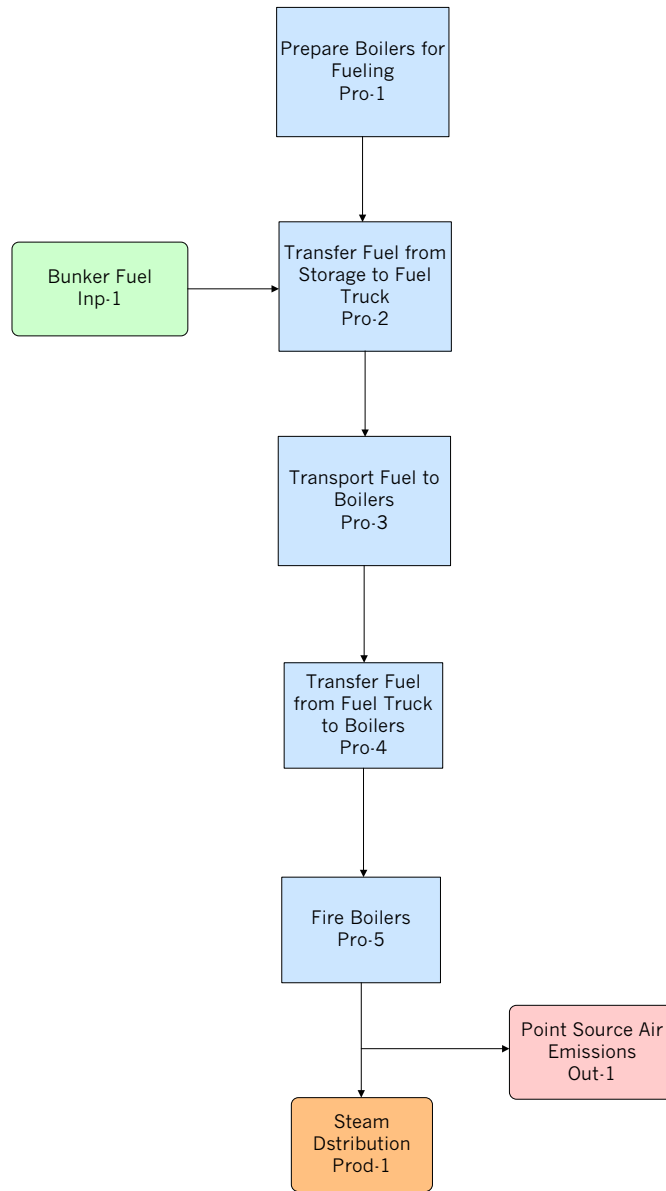
Example 5-16: Flow Diagram and Aspects Form for Paint Booth (continued)

Person Completing Form: John Smith, Environmental Engineer		Area/Process: Paint Booth				Date: 5/17/01			
ASPECT IDENTIFICATION		SIGNIFICANCE DETERMINATION				OBJECTIVES & TARGETS			
Category/Aspect	Inputs, Processes, Outputs, Products	Quantity or Volume	Legal Requirements/Voluntary Commitments, Company Policy	Community Concern	Potential Pollution Prevention	Potential Impact to the Environment	Rationale for Significance (S) or Non-significance (N)	Objective & Type C = control or maintain S = study or investigate I = improve	Target
Energy Usage:									
Electricity/Paint Mixers	Mix and Thin Coating (Pro-4)	10 kw per year	No	No	No	No	Low Volume or Usage		
Diesel Fuel/Forklifts	Transport Equipment, Materials, Waste and Scrap to and from Work Area (Pro-2), (Pro-5), (Pro-16), (Pro-17), (Pro-20), (Pro-21), (Pro-22), (Pro-23)	1000 gallons per year	No	No	No	No	Low Volume or Usage		
Water Usage:									
		N/A							
Supplies/Disposables:									
Rags	Disposables (Pro-3)	100 cu yards per year	No	No	No	No	Low Volume or Usage		
Gloves	Disposables (Pro-3)	250 pairs per year	No	No	No	No	Low Volume or Usage		
Tyvek Suits	Disposables (Pro-3)	10 cu yards per year	No	No	No	No	Low Volume or Usage		
Filter Carts	Disposables (Pro-3)	80 per year	No	No	No	No	Low Volume or Usage		
Sand Paper	Disposables (Pro-3)	2 gross per year	No	No	No	No	Low Volume or Usage		
Chemicals:									
VOC Content	Virgin Coatings (Inp-1)	N/A	Yes	No	No	No	Marine Coating Rule, Air Permits		
HAP Content	Virgin Thinners (Inp-2)	N/A	Yes	No	No	No	Marine Coating Rule, Air Permits		

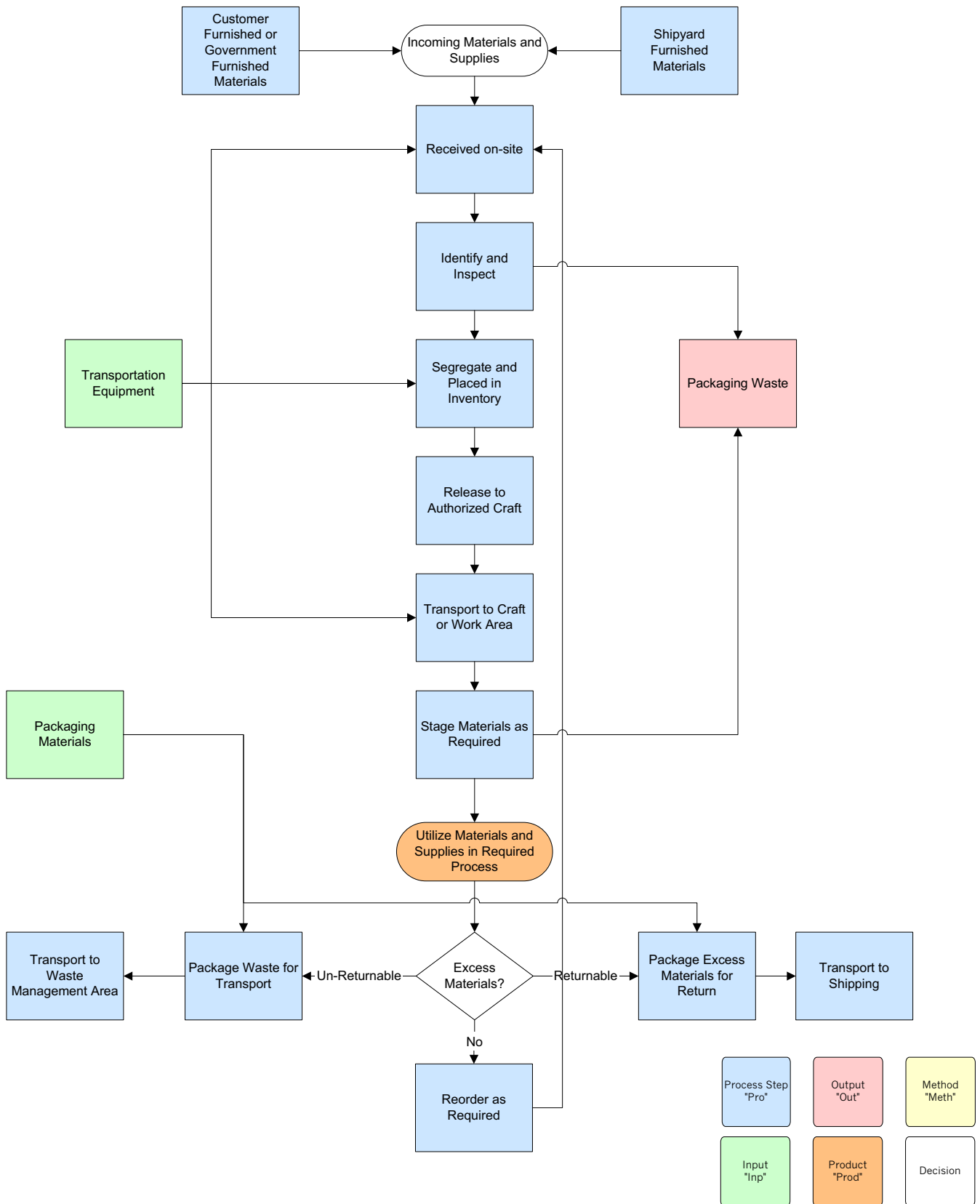
Example 5-16: Flow Diagram and Aspects Form for Paint Booth (continued)

Air Emissions:										
VOC	Paint Booth Exhaust Emissions (Out-1)	5 tons	Yes	No	No	No	No	No	S	Marine Coating Rule, Permits to Operate, Toxic Air Emissions Rule
HAP	Paint Booth Exhaust Emissions (Out-1)	1 ton	Yes	Yes	No	No	No	No	S	Marine Coating Rule, Permits to Operate, Toxic Air Emissions Rule
Noise/Odor/Radiation:										
Odor from VOC fumes	Coating Application (Pro-8)	No	No	No	No	No	No	No	S	Nuisance Rule
Wastes:										
Contaminated Scrap	Waste Paint Cans (Out-2)	500 lbs per year	No	No	Yes	No	Yes	No	S	Company Waste Reduction Program
Contaminated Waste	Tyrex Suits, Rollers, Brushes, Filter Masks, Paint Stirrers, Drop Cloths, Masking Tape, Debris, Paint Booth filters. (Out-6), (Out-7), (Out-8)	1,000 lbs per year	No	No	Yes	No	Yes	No	S	Company Waste Reduction Program
Waste Chemicals	Waste Paint and Solvent (Out-3)	50 gallons per year	Yes	No	Yes	No	Yes	No	S	RCRA (Subtitle C)
Water Discharges:										
N/A		N/A								
Stormwater Discharges:										
N/A		N/A								
Spillage and Other:										
Coating and/or Thinner Spillage	Transport waste cans, cleaning solvents, contaminated solvents and debris to waste yard (Pro-16), (Pro-17), (Pro-21)	5 gallons per year	No	No	No	No	No	No	N	Low Volume Spillage
Coating and/or Thinner Spillage	Consolidate equipment cleaning solvents into drums (Pro-18)	1 gallon per year	No	No	No	No	No	No	N	Low Volume Spillage
Coating and/or Thinner Spillage	Transport virgin coatings and thinners to work area (Pro-2)	1 gallon per year	No	No	No	No	No	No	N	Low Volume Spillage
Spillage, Contaminated Scrap	Consolidate Waste (Pro-11)	0.5 gallon per year	No	No	No	No	No	No	N	Low Volume Spillage

Example 5-17: **Flow Diagram** and **Aspects Form** for **Steam Plant**



Example 5-18: **Flow Diagram** and **Aspects Form** for **Supply Management**

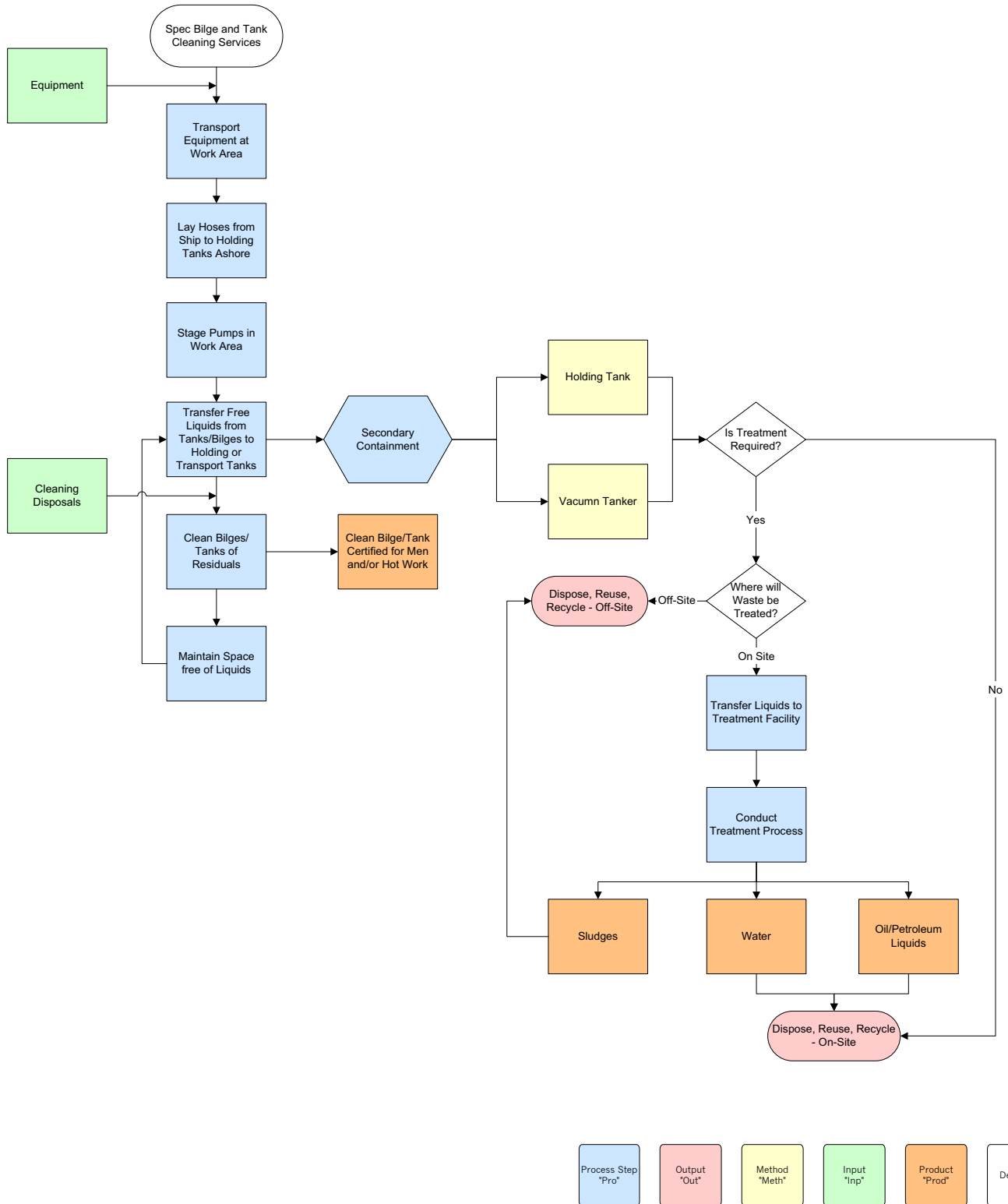


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Example 5-18: Flow Diagram and Aspects Form for Supply Management (continued)

Person Completing Form: John Smith, Environmental Engineer		Area/Process: Supply Management				Date: 5/17/01				
ASPECT IDENTIFICATION			SIGNIFICANCE DETERMINATION				OBJECTIVES & TARGETS			
Category/Aspect	Inputs, Processes, Outputs, Products	Quantity or Volume	Legal Requirements/ Voluntary Commitments/ Company Policy	Community Concern	Pollution Prevention	Potential Impact to the Environment	N or S	Rationale for Significance (S) or Non-significance (N)	Objective & Type C = control or maintain S = study or investigate I = improve	Target
Energy Usage:										
Diesel Fuel/Forklifts	Material movement (Pro-3), (Pro-7), (Pro-10)	1,000 gals per year	No	No	No	No	N	Low Volume Usage		
Water Usage:										
N/A		N/A								
Supplies/Disposables:										
Packaging Materials	Package for disposal or return (Pro-8), (Pro-9)	2,000 lbs per year	No	No	No	No	N	Low Volume Usage, Some materials are Recycled		
Chemicals:										
N/A		N/A								
Air Emissions:										
N/A		N/A								
Noise/Odor/Radiation:										
N/A		N/A								
Wastes:										
Packaging Waste	Opening packages for inspection and storage (Pro-2), (Pro-6)	1,000 lbs per year	No	No	No	No	N	Low Volume Usage		
Water Discharges:										
N/A		N/A								
Stormwater Discharges:										
N/A		N/A								
Spillage and Other:										
Spillage, Dry and Liquid	Damaged Containers (Pro-1), (Pro-5),	500 lbs & 100 gals per year	No	No	No	No	N	Low Volume Usage		

Example 5-19: Flow Diagram and Aspects Form for Bilge Management Treatment & Discharge



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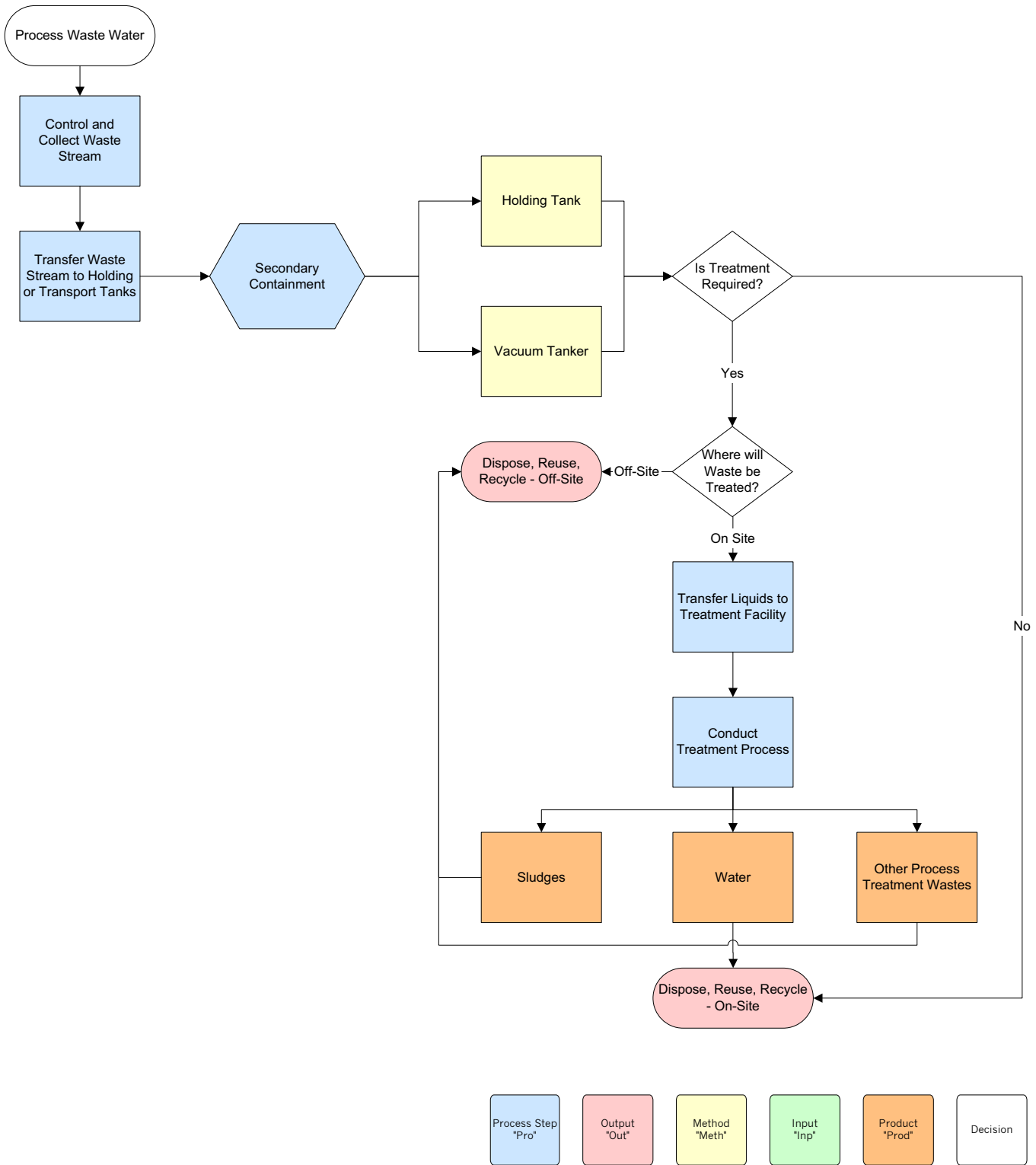
Example 5-19: Flow Diagram and Aspects Form for Bilge Management Treatment & Discharge (continued)

Person Completing Form: John Smith, Environmental Engineer		Area/Process: Bilge Management				Date: 5/17/01			
ASPECT IDENTIFICATION		SIGNIFICANCE DETERMINATION				OBJECTIVES & TARGETS			
Category/Aspect	Inputs, Processes, Outputs, Products	Quantity or Volume	Legal Requirements/Voluntary Commitments/Company Policy	Community Concern	Pollution Prevention Potential	Potential Impact to the Environment	Rationale for Significance (S) or Non-significance (N)	Objective & Type C = control or maintain S = study or investigate I = improve	Target
Energy Usage:									
Diesel Fuel/Forklifts	Transport Equipment and Materials to Work Area (Pro-1)	1,000 gallons per year	No	No	No	No	Low Volume Usage		
Electricity	Operation of Transfer pumps (Pro-4)	500 kw per year	No	No	No	No	Low Volume Usage		
Water Usage:									
Water	Tank cleaning (Imp-3)	50,000 gals per year	No	No	No	No	Low Volume Usage		
Supplies/Disposables:									
Rags	Disposables (Imp-1)	500 cu yards per year	No	No	No	No	Low Volume or Usage		
Gloves	Disposables (Imp-1)	1,000 pairs per year	No	No	No	No	Low Volume or Usage		
Tyvek Suits	Disposables (Imp-1)	2,000 suits per year	No	No	No	No	Low Volume or Usage		
Filter Carts	Disposables (Imp-1)	600 per year	No	No	No	No	Low Volume or Usage		
Chemicals:									
N/A		N/A							
Air Emissions:									
N/A		N/A							
Noise/Odor/Radiation:									
N/A		N/A							

Example 5-19: Flow Diagram and Aspects Form for Bilge Management Treatment & Discharge (continued)

Wastes:											
Tyrex Suits, Gloves, Filter Cartigates and Rags	Contaminated Disposables (Out-1)	1,000 cu yards per year	No	No	No	No	No	No	No	Low Volume or Usage	
Sludges	Treatment Sludge (Out-2)	500 bbls per year	No	No	No	No	No	No	No	Low Volume or Usage	
Water	Waste Water Residual (Out-3)	100,000 gals per year	No	No	No	No	No	No	No	Low Volume or Usage	
Oil/Petroleum Liquids	Oil/Petroleum Liquids (Out-4)	500 bbls per year	No	No	No	No	No	No	No	Low Volume or Usage	
Water Discharges:											
N/A		N/A									
Stormwater Discharges:											
N/A		N/A									
Spillage and Other:											
Waste Water/Oily Water Spillage	Spillage during transfers (Pro-4), (Pro-8)	500 gals per year	No	No	No	No	No	No	No	Spillage is maintained within secondary containment	

Example 5-20: **Flow Diagram** and **Aspects Form** for **Wastewater Treatment & Discharge**

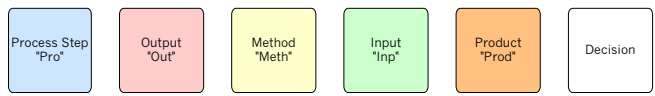
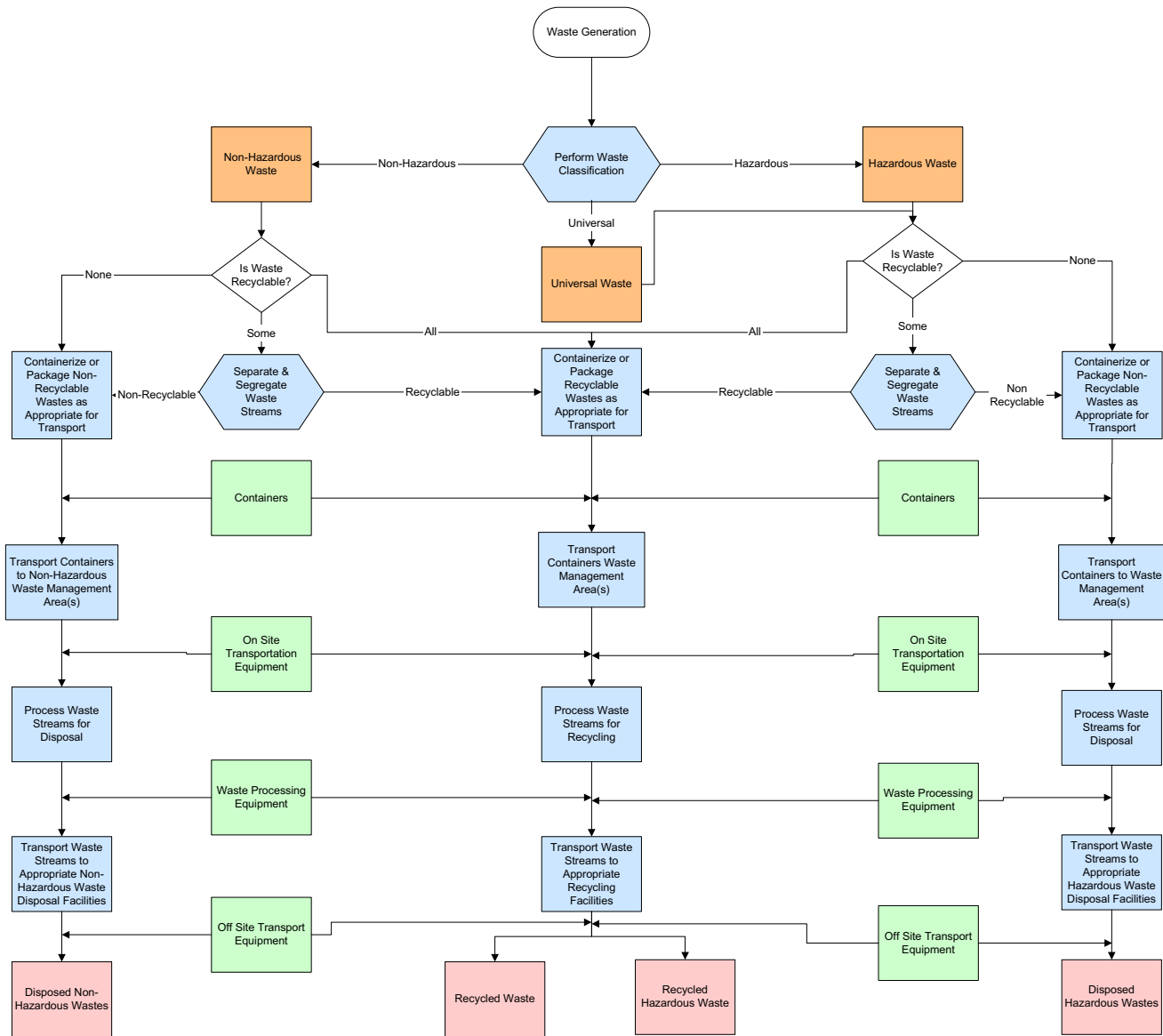


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Example 5-20: Flow Diagram and Aspects Form for Wastewater Treatment & Discharge (continued)

ASPECT IDENTIFICATION		SIGNIFICANCE DETERMINATION				OBJECTIVES & TARGETS				
Category/Aspect	Inputs, Processes, Outputs, Products	Quantity or Volume	Legal Requirements/Voluntary Comments/Company Policy	Community Concern	Pollution Prevention Potential	Potential Impact to the Environment	N or S	Rationale for Significance (S) or Non-significance (N)	Objective & Type C = control or maintain S = study or investigate I = improve	Target
Energy Usage:										
Diesel Fuel	Transfer pumps (Pro-3), (Pro-4)	1,000 gals per year	No	No	No	No	N	Low volume usage		
Electricity	Transfer pumps (Pro-3), (Pro-4)	1,000 KW per year	No	No	No	No	N	Low volume usage		
Water Usage:										
		N/A								
Supplies/Disposables:										
Rags	Disposables (Pro-3)	100 cu yards per year	No	No	No	No	N	Low Volume or Usage		
Gloves	Disposables (Pro-3)	250 pairs per year	No	No	No	No	N	Low Volume or Usage		
Tyrex Suits	Disposables (Pro-3)	10 cu yards per year	No	No	No	No	N	Low Volume or Usage		
Filter Carts	Disposables (Pro-3)	80 per year	No	No	No	No	N	Low Volume or Usage		
Chemicals:										
Treatment Chemicals	Water Treatment Chemicals (Inp-5)	2,500 gals per year	No	No	No	No	N	Low Volume or Usage, Non-Hazardous chemicals		
Air Emissions:										
		N/A								
Noise/Odor/Radiation:										
		N/A								
Wastes:										
Sludges	Treatment sludges (Prod-1)	50 bbls per year	Yes	No	No	No	S	Permit to Operate Waste Water Treatment Facility		
Waste Water	Waste Water derived from Treatment (Prod-2)	250,000 gals per year	Yes	No	No	No	S	Permit to Operate Waste Water Treatment Facility		
Other Treatment Waste	Waste Chemicals, etc.	2 bbls per year	Yes	No	No	No	S	Waste Disposal regulations		
Water Discharges:										
		N/A								
Stormwater Discharges:										
		N/A								
Spillage and Other:										
Waste water/oily water	Spillage during transfers (Pro-2), (Pro-4)	100 gals per year	Yes	No	No	No	S	Potential for Spillage into Surface Waters		

Example 5-21: Flow Diagram and Aspects Form for Waste Management



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Example 5-21: Flow Diagram and Aspects Form for Waste Management (continued)

Person Completing Form: John Smith, Environmental Engineer		Area/Process: Waste Management				Date: 5/17/01			
ASPECT IDENTIFICATION			SIGNIFICANCE DETERMINATION				OBJECTIVES & TARGETS		
Category/Aspect	Inputs, Processes, Outputs, Products	Quantity or Volume	Legal Requirements/Voluntary Commitments, Company Policy	Community Concern	Pollution Prevention Potential	Potential Impact to the Environment	Rationale for Significance (S) or Non-significance (N)	Objective & Type C = control or maintain S = study or investigate I = improve	Target
Energy Usage:									
Diesel Fuel/Forklifts	Material movement (Pro-7), (Pro-8), (Pro-9), (Pro-13), (Pro-14), (Pro-15)	21,000 gals per year	No	No	No	No	Low Volume Usage		
Water Usage:									
N/A		N/A							
Supplies/Disposables:									
Containers	Drums, Super Sacks, etc. (Inp-4)	800 drums per year	Yes	No	No	No	Waste packaging requirements		
Chemicals:									
N/A		N/A							
Air Emissions:									
N/A		N/A							
Noise/Odor/Radiation:									
N/A		N/A							
Wastes:									
Solid Waste Disposal	Non-Hazardous Waste (Out-1)	5,000 cu yards per year	Yes	Yes	No	No	Waste Disposal Requirements		
Recycled Non-hazardous Waste	Non-Hazardous Waste (Out-2)	25,000 lbs per year	Yes	Yes	No	No	Waste Disposal Requirements		
Recycled Hazardous Waste	Hazardous Waste (Out-3)	20 tons per year	Yes	Yes	No	No	Waste Disposal Requirements		
Hazardous Waste	Hazardous Waste (Out-4)	60,000 lbs per year	Yes	Yes	No	No	Waste Disposal Requirements		
Water Discharges:									
N/A		N/A							
Stormwater Discharges:									
Contaminated Runoff	Exposure of waste management areas to rainfall (Pro-4), (Pro-10), (Pro-12)	Less than 1,000 gals per year	Yes	Yes	No	No	Stormwater Regulations		
Spillage and Other:									
Waste Spillage	Spills during transport (Pro-7), (Pro-13), (Pro-9), (Pro-14), (Pro-9), (Pro-15)	200 gals per year	Yes	Yes	No	No	Hazardous Materials and Waste Spill Requirements		