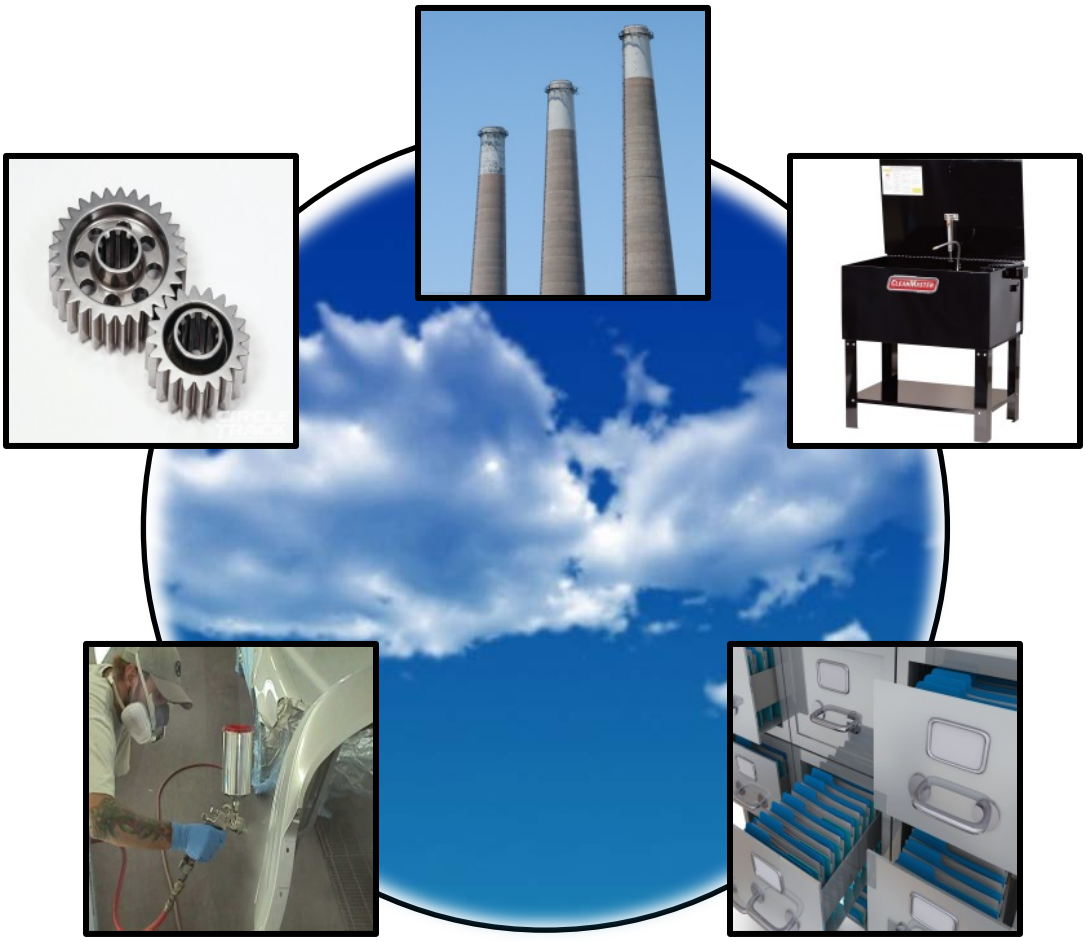
Potential to Emit Workbook

A Practical Guide to Calculating and Evaluating Your Potential to Emit Air Contaminants



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Michigan Department of Environmental Quality
Office of Environmental Assistance
Clean Air Assistance Program

www.michigan.gov/deq
800- 662-9278

Part 1: Introduction to Potential to Emit

The Potential to Emit Workbook: A practical Guide to Calculating and Evaluating Your Potential to Emit Air Contaminants was developed by the Michigan Department of Environmental Quality (DEQ), Air Quality Division (AQD) in collaboration with the Office of Environmental Assistance.

This publication was developed for guidance purposes only. Alternative methods to calculate your potential to emit (PTE) may be acceptable. Additionally, methods for calculating PTE from every industrial process are not contained in this workbook. If after reviewing this workbook you find you have additional specific questions relating to calculating PTE for your facility, feel free to contact the Office of Environmental Assistance at 800-662-9278.

How can this document help you?

The applicability of some air quality requirements is based upon a facility's PTE air pollutants. In order to determine whether or not your facility is subject to Air Quality rules and regulations, each facility must determine their PTE of air contaminants. The greater the PTE for your facility, the more likely you are subject to various Air Quality rules and regulations. This document will help you understand what PTE is, how it is calculated, and what air regulations may apply to you based on your facility's calculated PTE.

What is PTE?

The entire definition for PTE is contained in R 336.1116(n) or Rule 116(n) of the Michigan Air Pollution Control Rules (see Appendix A).

To put it simply, PTE is the maximum amount of air contaminants that your facility could emit if all of the following is evaluated:

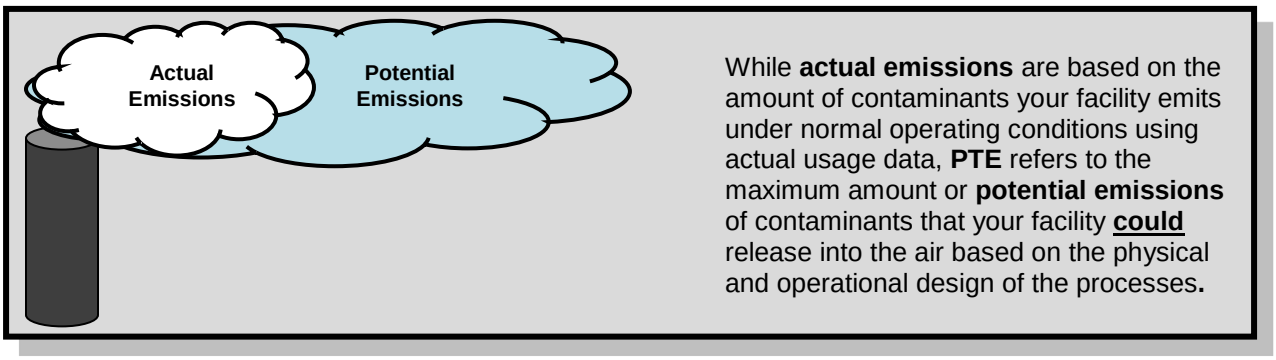
- each process is operated at 100% of its design capacity;
- each process operated 24 hours/day, 365 days/year;
- the materials emitting the highest amount of air contaminants are used or processed; and
- air pollution control equipment either is not in use or is turned off.

The PTE Equation

PTE refers to the amounts of air contaminants that the facility could release into the air while operating at the maximum design capacity, with the highest polluting materials and operating 100% of the time. The standard equation used in calculating PTE for each regulated air contaminant emitted from each process is:

PTE = (maximum hourly emission rate of pollutant) x (8760 hours)

However, as you will see in Part 2 of this workbook, process bottlenecks, permit conditions, air quality rules, and compliance/enforcement documents may legally restrict the ability your facility has to emit air contaminants.



While **actual emissions** are based on the amount of contaminants your facility emits under normal operating conditions using actual usage data, **PTE** refers to the maximum amount or **potential emissions** of contaminants that your facility **could** release into the air based on the physical and operational design of the processes**.**

Why is a facility's PTE used and not actual emissions when determining applicability?

Many state and federal rules governing regulated air pollutants are based on a source's PTE, not their actual emissions. PTE is an impartial way to categorize and regulate facilities by using consistent criteria that does not change unless new equipment is added or operational restrictions have changed. Actual emissions, on the other hand, can fluctuate from year-to-year due to changes in a facility's production rates. Using PTE to determine applicability levels the playing field for all companies.

What pollutants are regulated?

The Clean Air Act (CAA) has created rules and regulation for air pollutants based on whether the pollutants may have negative effects on human health and/or the environment. When calculating PTE, the focus is on three categories of pollutants that are regulated (Table 1-1):

- *Regulated pollutants*
- *Hazardous air pollutants*
- *Other regulated pollutants*

Table 1-1: Regulated Air Pollutants

Regulated Pollutants
• Carbon Monoxide (CO) • Lead (Pb) • Ozone (O_3), including Volatile Organic Compounds (VOC) and Nitrogen Oxides (NOx) - ozone precursors* • Nitrogen Dioxide (NO_2) • Particulate Matter (PM), PM-10 and PM 2.5 • Sulfur Dioxide (SO_2) • Green House Gases (GHGs) • Pollutants with a Nation Ambient Air Quality Standard (NAAQS) under Potential for Significant Deterioration (PSD)
Hazardous Air Pollutants
Table 1-3 on page 1-5 contains the list of hazardous air pollutants (HAPs). Some HAPs are also considered VOCs and should be included in PTE calculations for both. HAPs that are in particulate form may also be counted as PM, PM10 and PM2.5.

Table 1-1: Regulated Air Pollutants (continued)

Other Air Pollutants
National Emission Standards for Hazardous Air Pollutants (NESHAP) • Arsenic • Asbestos • Beryllium • Benzene • Mercury • Radionuclides • Vinyl chloride
New Source Performance Standard (NSPS) Pollutants • Cadmium • Dioxin/furan • Fluorides • Hydrogen chloride • Hydrogen sulfide • Mercury • Nonmethane organic compounds • Reduced sulfur compounds • Sulfuric acid mist • Total organic compounds • Total particulate matter • Total reduced sulfur
Class I and Class II Pollutants Title VI of the Clean Air Act Amendments of 1990 requires the phase-out of chlorofluorocarbons (CFCs) that deplete the ozone layer in the upper atmosphere (this is the "good" ozone that protects us from the sun's harmful rays). These ozone depleting substances are divided into two classes, Class I and Class II air pollutants. Table 1-5contains a list of these ozone depleting pollutants.

* Most facilities do not directly emit ozone. However, they may emit VOCs and NOx, which contribute to ground level ozone formation. A VOC is any compound of carbon or mixture of compounds of carbon that participates in photochemical reactions excluding the compounds listed in Table 1-5.

What does it mean to be a major source of an air contaminant?

There are several programs that apply to specific categories of major sources, such as the Renewable Operating Permit Program (ROP or Title V Program), National Emissions Standards for Hazardous Air Pollutants (NESHAP) and the Prevention of Significant Deterioration (PSD) Program. These programs have specific requirements that apply to sources that are considered major in that category. This workbook will be focusing specifically on the ROP or Title V programs in which a major source would be defined as major under Title V. Table 1-2 lists some of the thresholds for determining whether your facility is a major or minor source of air contaminants and is subject to Title V, as well as some common processes that may generate those contaminants.

A facility with a calculated PTE at or above the thresholds listed in Table 1-2 is considered a **major** source of air contaminants. If the calculated PTE for the facility yields numbers below the thresholds, the facility would be considered a **minor** source of air contaminants. As a minor source, you may not have to meet certain requirements, or you may have requirements that are less stringent.

The requirements associated with being a major source under Title V are discussed in further detail in **Parts 3, 4 and 5** of this workbook. PSD sources are typically very large sources of air contaminants that have their own set of regulations. If you complete the steps to calculate your PTE in this workbook and your results indicate you may be a major source under PSD or another program contact your District Office or the Office of Environmental Assistance at 800-662-9278.

Table 1-2: Title V Major Source Emission Thresholds

Type of Pollutant	Major Source Threshold	Common Sources of Pollutant
PM	100 tons/year	Dusty activities such as grain handling, milling, sand and gravel operations
PM10	100 tons/year	Dusty activities such as grain handling, milling, sand and gravel operations
PM2.5	100 tons/year	Fuel burning activities
VOCs	100 tons/year	Solvent cleaning, painting, fuel storage and transfer
CO)	100 tons/year	Fuel combustion
NOx	100 tons/year	Fuel combustion
SO_2	100 tons/year	Fuel combustion
Lead (Pb)*	100 tons/year	Wave soldering, lead smelting and recycling
HAPs Any single HAP Any combination of HAPs	 10 tons/year 25 tons/year	Solvent cleaning, painting, fuel storage and transfer * Lead compounds are considered HAPs
GHGs	75,000 – 100,000 tons/year on a CO_{2e} basis	Fuel Combustion
Any other regulated air contaminant	100 tons/year	

A facility that has the potential to emit 10 tons/year of any one hazardous air pollutant (HAP), 25 tons/year of any combination of HAPs, or 100 tons/year of any regulated air contaminant is considered a **major** source (see Table 1-2) and is subject to Title V of the Clean Air Act and are covered under the Renewable Operating Permit Program.

Table 1-3: Hazardous Air Pollutants (HAPs)

CAS No.	Chemical
75070	Acetaldehyde
60355	Acetamide
75058	Acetonitrile
98862	Acetophenone
53963	2-Acetylaminofluorene
107028	Acrolein
79061	Acrylamide
79107	Acrylic acid
107131	Acrylonitrile
107051	Allyl chloride
92671	4-Aminobiphenyl
62533	Aniline
90040	o-Anisidine
1332214	Asbestos
71432	Benzene
92875	Benzidine
98077	Benzotrichloride
100447	Benzyl chloride
92524	Biphenyl
117817	Bis (2-ethylhexyl) phthalate (DEHP)
542881	Bis (chloromethyl) ether
75252	Bromoform
106990	1,3-Butadiene
156627	Calcium cyanamide
133062	Captan
63252	Carbaryl
75150	Carbon disulfide
56235	Carbon tetrachloride
463581	Carbonyl sulfide
120809	Catechol
133904	Chloramben
57749	Chlordane
7782505	Chlorine
79118	Chloroacetic acid
532274	2-Chloroacetophenone
108907	Chlorobenzene
510156	Chlorobenzilate
67663	Chloroform
107302	Chloromethyl methyl ether
126998	Chloroprene
1319773	Cresols/Cresylic acid (isomers and mixtures)
95487	o-Cresol
108394	m-Cresol
106445	p-Cresol
98828	Cumene
94757	2,4-D, salts and esters
3547044	DDE
334883	Diazomethane
132649	Dibenzofurans
96128	1,2-Dibromo-3-chloropropane
84742	Dibutylphthalate
106467	1,4-Dichlorobenzene(p)
91941	3,3-Dichlorobenzidene
111444	Dichloroethyl ether (Bis(2-chloroethyl)ether)
542756	1,3-Dichloropropene
62737	Dichlorvos
111422	Diethanolamine
21697	N,N-Diethyl aniline (N,N-Dimethylaniline)
64675	Diethyl sulfate
119904	3,3-Dimethoxybenzidine
60117	Dimethyl aminoazobenzene
119937	3,3-Dimethyl benzidine
79447	Dimethyl carbarmoyl chloride
68122	Dimethyl formamide
57147	1,1 Dimethyl hydrazine
131113	Dimethyl phthalate
77781	Dimethyl sulfate
534521	4,6-Dintro-o-cresol, and salts
51285	2,4-Dinitrophenol
121142	2,4-Dinitrotoluene
123911	1,4-Dioxane (1,4-Diethyleneoxide)
122667	1,2-Diphenylhydrazine
106898	Epichlorohydin (1-Chloro-2,3-epozypropane)
106887	1,2-Epozybutane
140885	Ethyl acrylate
100414	Ethyl benzene
51796	Ethyl carbamate (Urethane)
75003	Ethyl chloride (Chloroethane)
106934	Ethylene dibromide) (Dibromoethane)
107062	Ethylene dichloride (1,2-Dichloroethane)
107211	Ethylene glycol
151564	Ethylene imine (Aziridine)
75218	Ethylene oxide
96457	Ethylene thiourea
75343	Ethylidene dichloride (1,1-Dichloroethane)
50000	Formaldehyde
76448	Heptachlor
118741	Hexachlorobenzene
87683	Hexachlorobutadiene
77474	Hexachlorocyclo pentadiene
67721	Hexachloroethane
822060	Hexamethylene-1,6-diisocyanate
680319	Hexamethyl phosphoramide
110543	Hexane
302012	Hydrazine
7647010	Hydrochloric acid
7664393	Hydrogen fluoride (hydrofluoric acid)
123319	Hydroquinone
78591	Isophorone
58899	Lindane (all isomers)
108316	Maleic anhydride
67561	Methanol
72435	Methozychlor
74839	Methyl bromide (Bromomethane)
74873	Methyl chloride (Chloromethane)
71556	Methyl chloroform (1,1,1-Trichloroethane)
60344	Methyl hydrazine
74884	Methyl iodide (Iodomethane)
108101	Methyl isobutyl ketone (Hexone)
624839	Methyl isocyanate
80626	Methyl methacrylate
1634044	Methyl tert butyl ether
101144	4,4-Methylene bis (2-chloroaniline)
75092	Methylene chloride (Dichloromethane)
101688	Methlene diphenyl diisocyanate (MDI)
101779	4,4'-methylenedianiline
91203	Naphtalene
98953	Nitrobenzene
92933	4-Nitrobiphenyl
100027	4-Nitrophenol
79469	2-Nitropropane
684935	N-Nitroso-N-methylurea
62759	N-Nitrosodimethylamine
59892	N-Nitrosomorpholine
56382	Parathion
82688	
87865	Pentachlorophenol
108952	Phenol
106503	p-Phenylenediamine
75445	Phosgene
7803512	Phosphine
7723140	Phosphorus
85449	Phthalic anhydride
1336363	Polycholrinated biphenyls (Aroclors)
1120714	1,3-Propane sultone
57578	beta-Propiolactone
123386	Propionaldehyde
114261	Propoxur (Baygon)
75569	Propylene oxide
78875	Propylene dichloride (1,2-Dichloropropane)
75558	1,2-Propylenimine (2-Methyl aziridine)
91225	Quinoline
106514	Quinone
100425	Styrene
96093	Styrene oxide
1746016	2,3,7,8-Tetrachlorodibenzo p-dioxin
79345	1,1,2,2-Tetrachloroethane
127184	Tetrachloroethylene (Perchloroethylene)
7550450	Titanium tetrachloride
108883	Toluene
95807	2,4-Toluene diamine
584849	2,4-Toluene diisocyanate
95534	o-Toluidine
8001352	Toxaphene (chlorinated camphene)
120821	1,2,4-Trichlorobenzene
79005	1,1,2-Trichloroethane
79016	Trichloroethylene
95954	2,4,5-Trichlorophenol
88062	2,4,6-Trichlorophenol
121448	Triethylamine
1582098	Trifluralin
540841	2,2,4-Trimethylpentane
108054	Vinyl acetate
593602	Vinyl bromide
75014	Vinyl chloride
75354	Vinylidene chloride (1,1 Dichloroethylene)
1330207	Xylenes (isomers and mixtures)
95476	o-Xylenes
108383	m-Xylenes
106423	p-Xylenes
COMPOUNDS	
	Antimony compounds
	Arsenic compounds (inorganic including arsine)
	Beryllium compounds
	Cadmium compounds
	Chromium compounds
	Cobalt compounds
	Coke oven emissions
	Cyanide compounds
	Fine mineral fibers
	Glycol ethers*
	Lead compounds
	Manganese compounds
	Mercury compounds
	Nickel compounds
	Polycyclic organic matter
	Radionuclides (including radon)
	Selenium compounds

*Note: Ethylene glycol mono-butyl ether (EGBE) was removed from the HAP list in December 2004. Methyl ethyl ketone (MEK, 2-Butanone) was removed from the HAP list in December 2005.

Table 1-4: Class I and Class II Ozone Depleting Substances

Class I Substances	Class II Substances	
Group I: chlorofluorocarbon-11 (CFC-11) chlorofluorocarbon-12 (CFC-12) chlorofluorocarbon-113 (CFC-113) chlorofluorocarbon-114 (CFC-114) chlorofluorocarbon-115 (CFC-115) **Group II:** halon-1211 halon-1301 halon-2402 **Group III:** chlorofluorocarbon-13 (CFC-13) chlorofluorocarbon-111 (CFC-111) chlorofluorocarbon-112 (CFC-112) chlorofluorocarbon-211 (CFC-211) chlorofluorocarbon-212 (CFC-212) chlorofluorocarbon-213 (CFC-213) chlorofluorocarbon-214 (CFC-214) chlorofluorocarbon-215 (CFC-215) chlorofluorocarbon-216 (CFC-216) chlorofluorocarbon-217 (CFC-217) **Group IV:** carbon tetrachloride **Group V:** methyl chloroform	hydrochlorofluorocarbon-21 (HCFC-21) hydrochlorofluorocarbon-22 (HCFC-22) hydrochlorofluorocarbon-31 (HCFC-31) hydrochlorofluorocarbon-121 (HCFC-121) hydrochlorofluorocarbon-122 (HCFC-122) hydrochlorofluorocarbon-123 (HCFC-123) hydrochlorofluorocarbon-124 (HCFC-124) hydrochlorofluorocarbon-131 (HCFC-131) hydrochlorofluorocarbon-132 (HCFC-132) hydrochlorofluorocarbon-133 (HCFC-133) hydrochlorofluorocarbon-141 (HCFC-141) hydrochlorofluorocarbon-142 (HCFC-142) hydrochlorofluorocarbon-221 (HCFC-221) hydrochlorofluorocarbon-222 (HCFC-222) hydrochlorofluorocarbon-223 (HCFC-223) hydrochlorofluorocarbon-224 (HCFC-224) hydrochlorofluorocarbon-225 (HCFC-225) hydrochlorofluorocarbon-226 (HCFC-226) hydrochlorofluorocarbon-231 (HCFC-231) hydrochlorofluorocarbon-232(HCFC-232) hydrochlorofluorocarbon-233 (HCFC-233) hydrochlorofluorocarbon-234 (HCFC-234) hydrochlorofluorocarbon-235 (HCFC-235)	hydrochlorofluorocarbon-241 (HCFC-241) hydrochlorofluorocarbon-242 (HCFC-242) hydrochlorofluorocarbon-243 (HCFC-243) hydrochlorofluorocarbon-244 (HCFC-244) hydrochlorofluorocarbon-251 (HCFC-251) hydrochlorofluorocarbon-252 (HCFC-252) hydrochlorofluorocarbon-253 (HCFC-253) hydrochlorofluorocarbon-261 (HCFC-261) hydrochlorofluorocarbon-262 (HCFC-262) hydrochlorofluorocarbon-271 (HCFC-271)

Table 1-5: Compounds Not Considered VOCs

• Carbon monoxide • Carbon dioxide • Carbonic acid • Metallic carbides or carbonates • Boron carbide • Silicon carbide • Ammonium carbonate • Ammonium bicarbonate • Methane • Ethane • Methyl chloroform* • Acetone • Cyclic, branched, or linear completely methylated siloxanes • Parachlorobenzotrifluoride • Perchloroethylene • Trichlorofluoromethane (CFC-11) • Dichlorodifluoromethane (CFC-12) • 1,1,2-trichloro-1,2,2-trifluoroethane (CFC-113) • 1,2-dichloro-1,1,2,2-tetrafluoroethane (CFC-114) • Chloropentafluoroethane (CFC-115) • 1,1-dichloro-1-fluoroethane (HCFC-141b)	• 1 chloro-1,1-difluoroethane (HCFC-142b) • Chlorodifluoromethane (HCFC-22) • 1,1,1-trifluoro-2,2-dichloroethane (HCFC-123) • 2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124) • Trifluoromethane (HFC-23) • Pentafluoroethane (HFC-125) • 1,1,2,2-tetrafluoroethane (HFC-134) • 1,1,1,2-tetrafluoroethane (HFC-134a) • 1,1,1-trifluoroethane (HFC-143a) • 1,1-difluoroethane (HFC-152a) • 3,3-dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca) • 1,3-dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb) • 1,1,1,2,3,4,4,5,5,5-decafluoropentane (HFC 43-10mee) • Difluoromethane (HFC-32) • Ethyl fluoride (HFC-161) • 1,1,1,3,3,3-hexafluoropropane (HFC-236fa) • 1,1,2,2,3-pentafluoropropane (HFC-245ca) • 1,1,2,3,3-pentafluoropropane (HFC-245ea)	• 1,1,1,2,3-pentafluoropropane (HFC-245eb) • 1,1,1,3,3-pentafluoropropane (HFC-245fa) • 1,1,1,2,3,3-hexafluoropropane (HFC-236ea) • 1,1,1,3,3-pentafluorobutane (HFC365mfc) • Chlorofluoromethane (HCFC-31) • 1,2-dichloro-1,1,2-trifluoroethane (HCFC-123a) • 1-chlor-1-fluoroethane (HCFC-151a) • 1,1,1,2,2,3,3,4,4-nonafluoro-4-methoxybutane • 2-(difluoromethoxymethyl)-1,1,1,2,3,3,3-heptafluoropropane • 1-ethoxy-1,1,2,2,3,3,4,4,4-nonafluorobutane • 2-(ethoxydifluoromethyl)-1,1,1,2,3,3,3-heptafluoropropane • Methyl acetate* • Methylene chloride* • Perfluorocarbon compounds* • Tertiary butyl acetate • Other compounds in materials other than surface coatings that have a vapor pressure $\leq$ 0.1 mm Hg at the temperature at which they are used.

*Refer to Rule 122(f) for more information about this compound

Part 2: How to Calculate Potential to Emit

Part 2 of this workbook discusses how to determine your facility's potential to emit (PTE). The PTE completion process is illustrated in steps using **Small Business, Inc.** To see an example of how to complete a potential to emit demonstration just follow along with the blue boxes such as the one below.

> **Small Business, Inc.** is a metal coating operation that needs to determine whether or not they are a major source of air contaminants and, therefore, subject to the ROP Program.

The PTE process has been broken down into the steps and summarized below, but will be discussed in more detail in the following pages.

STEP 1: Conduct a facility inventory to identify process equipment.

STEP 2: Gather data for each emission source.

STEP 3: Categorize emission sources (permitted, grandfathered, or exempt).

STEP 4: Identify legally enforceable limitations.

STEP 5: Identify the emission calculation methods you will use.

STEP 6: Calculate the PTE for each emission source.

STEP 7: Calculate the PTE for the facility.

You can start the PTE process by using the *Potential to Emit Summary Worksheet* to enter information about your facility for Steps 1 - 5. The *Potential to Emit Summary Worksheet* can be found in Appendix B of this book (Figure 2-1).

Emission Source	Description	Permit Status	Legally Enforceable Limitation	Calculation Method
		☐ Permitted: PTI #________ ☐ Grandfathered: ___/___/___ ☐ Exempt: R 336.________		
		☐ Permitted: PTI #________ ☐ Grandfathered: ___/___/___ ☐ Exempt: R 336.________		
		☐ Permitted: PTI #________ ☐ Grandfathered: ___/___/___ ☐ Exempt: R 336.________		
		☐ Permitted: PTI #________ ☐ Grandfathered: ___/___/___ ☐ Exempt: R 336.________		
		☐ Permitted: PTI #________ ☐ Grandfathered: ___/___/___ ☐ Exempt: R 336.________		
		☐ Permitted: PTI #________ ☐ Grandfathered: ___/___/___ ☐ Exempt: R 336.________		
		☐ Permitted: PTI #________ ☐ Grandfathered: ___/___/___ ☐ Exempt: R 336.________		
		☐ Permitted: PTI #________ ☐ Grandfathered: ___/___/___ ☐ Exempt: R 336.________		
		☐ Permitted: PTI #________ ☐ Grandfathered: ___/___/___ ☐ Exempt: R 336.________		
		☐ Permitted: PTI #________ ☐ Grandfathered: ___/___/___ ☐ Exempt: R 336.________		
		☐ Permitted: PTI #________ ☐ Grandfathered: ___/___/___ ☐ Exempt: R 336.________		

Figure 2-1: Summary Worksheet

STEP 1: Conduct a Facility Inventory

In this first step you will conduct an inventory of all the processes at your facility or **stationary source**. Examine each piece of equipment or process and determine whether or not that process emits air contaminants.

First, draw a plan view of your facility. A facility may have a fixed location (e.g., factory, plant, or commercial establishment) or may be movable (e.g., concrete crusher). Operations located close to each other or tied together by other means (such as utilities or process operations) may also be part of the same facility if they are:

- located on connected or adjacent pieces of property;
- under control by the same owner; and
- belong to the same industrial grouping.

DEQ, Air Quality Division AQD-011 provides guidance on determining what is considered to be a **stationary source** (i.e., a facility). You can download this guidance at www.michigan.gov/air (select "Permits" then "Potential to Emit")

Small Business, Inc.'s site diagram is below. A blank page is provided for you to draw a diagram of your facility in Appendix B.

Small Business, Inc.

SITE DIAGRAM – Showing Emission Sources

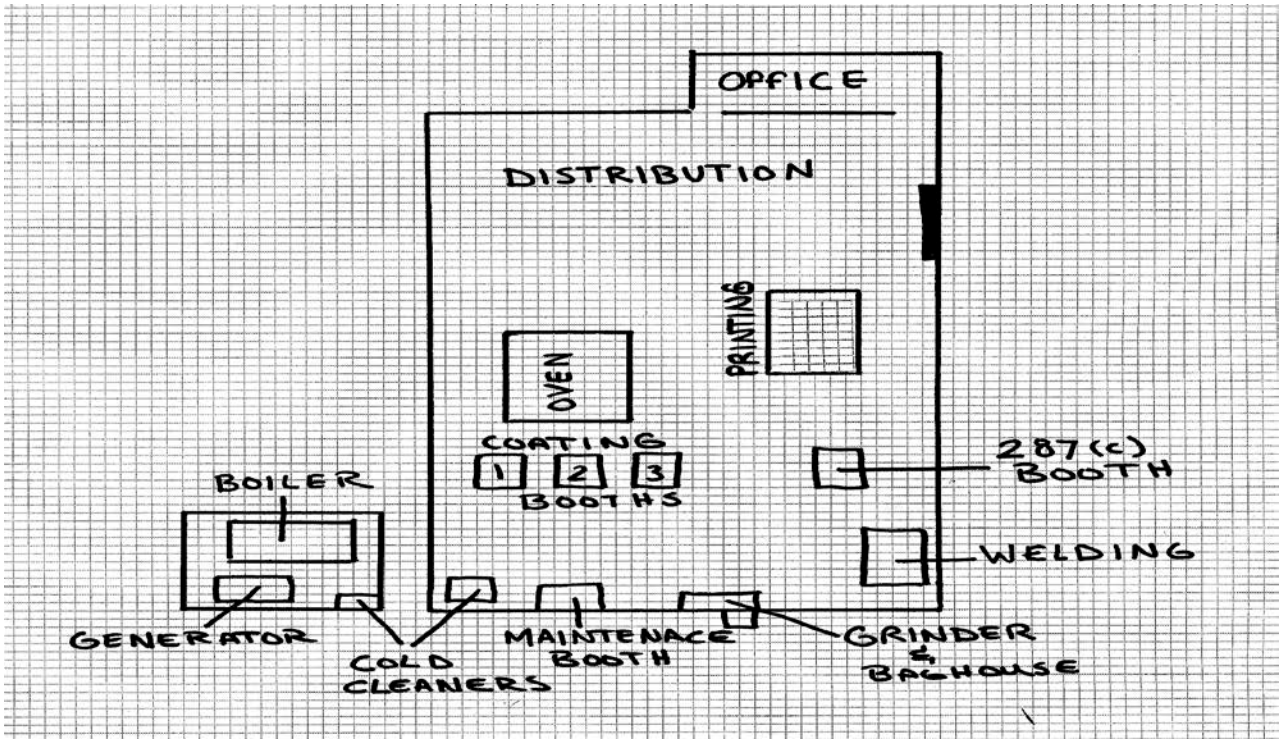


Figure 2-2: Example Site Diagram

Next, identify the emission sources. These are the processes at the facility (such as boilers, spray paint booths, degreasers, and generators) that generate air contaminants. If you have any air permits, use them to help identify your emission sources.

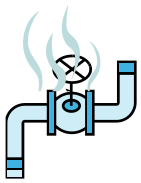
Even though some of your operations may not directly emit contaminants to the outside through a stack or vent, the emissions will eventually exhaust into the atmosphere through building ventilation or escape through doors or windows. These types of emissions must be included in your calculations.

Be sure to include any processes not located in your main building. If you have an emergency generator, storage silo, or other equipment located within your stationary source, but away from the main building, it is still part of the facility. You may also have equipment that you do not operate anymore. If a process is still operable, it must be included in your PTE calculation.

As you identify emission sources, remember to include all sources of air contaminants, such as non-production units like welding or grinding. Also, be sure to include the emission of air contaminants resulting from all aspects of the operation of a process. Ancillary activities such as cleanup are often overlooked. Most paint application equipment is purged and cleaned with solvents that evaporate into the air. These emissions must be included in the PTE calculations for the process.

Do I Need to Include Fugitive Emissions?

Air contaminants that cannot reasonably passed through a stack or a building structure are called fugitive emissions. Examples of fugitive emissions include dust blowing from rock or coal piles as well as dust kicked up by vehicles traveling on roadways. VOC emissions from outdoor leaking valves or flanges are also considered fugitive emissions.



You will include quantifiable fugitive emissions in your PTE calculation if:

1. The fugitive emissions are HAPs.

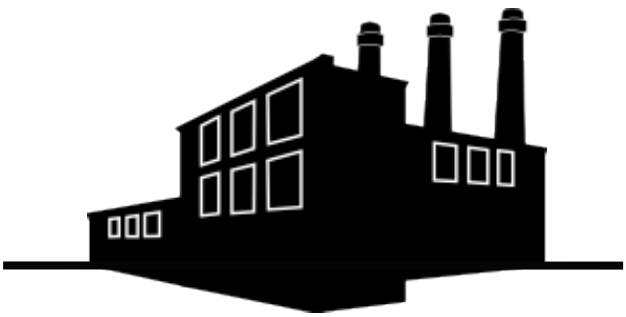
   OR

2. Your facility is one of those source categories listed in Table 2-1, in which case you will need to include the quantifiable fugitive emissions of all other regulated air pollutants (e.g., particulate matter, VOCs).

   OR

3. Your facility is subject to a NSPS or NESHAP promulgated before August 7, 1980.

Some large facilities may have a source category included in Table 2-1 as well as other source categories that are not listed. The fugitive emissions of all regulated air pollutants, other than HAPs from the non-listed source, would not have to be considered in the facility's PTE calculation.



If you need to include fugitive emissions, identify them as a separate emission source or part of an already established emission source.

Taking a walk through your facility is a great way to identify the sources of air contaminants in your facility. Another way to locate all of your emission sources is to review documents such as air permits, Michigan Air Emission Reporting System (MAERS) forms, and the Toxic Chemical Release Inventory Reporting Form (also known as Form R). The information contained in these reports will also be useful in completing your PTE calculations.

Table 2-1: Types of Facilities that Must Include Fugitive Emissions PTE

• Coal cleaning plants - with thermal dryers • Portland cement plants • Iron and steel mills • Primary copper smelters • Hydrofluoric, sulfuric, or nitric acid plants • Lime plants • Coke oven batteries • Carbon black plants • Fuel conversion plants • Secondary metal production plants • Fossil-fuel boilers (or combination thereof) totaling more than 250 mmbtu/hr • Taconite ore processing plants • Charcoal production plants • Asphalt concrete plants • Secondary lead smelters and refineries • Sewage treatment plants • Ferro-alloy production plants • Stationary gas turbines • Kraft pulp mills	• Primary zinc smelters • Primary aluminum ore reduction plants • Municipal incinerators capable of charging more than 250 tons of refuse per day • Petroleum refineries • Phosphate rock processing plants • Sulfur recovery plants • Primary lead smelters • Sintering plants* • Chemical process plants- not including ethanol production by natural fermentation • Petroleum storage and transfer units, total storage capacity over 300,000 barrels- or 40,000 gallons • Glass fiber processing plants • Fossil fuel-fired steam electric plants of more than 250 mmbtu/hr • Phosphate fertilizer plants • Grain elevators • Stationary sources subject to NESHAP for asbestos, beryllium, mercury, vinyl chloride

*Processing of fine grain materials into coarser lumps (performed primarily on ores).

Insignificant Activities

Emissions from the insignificant activities listed in Table 2-2 are excluded from PTE calculations, unless the facility-wide PTE is very close to the major source thresholds, in which case you may need to include the emissions from these sources.

Table 2-2: Insignificant Activities at a Stationary Source

- Repair and maintenance of grounds and structures and repair and maintenance of process and process equipment pursuant to Michigan Rule R336.1285(a)-(c).
- Use of office supplies.
- Use of housekeeping and janitorial supplies.
- Sanitary plumbing and associated stacks or vents.
- Temporary activities related to the construction or dismantlement of buildings, utility lines, pipelines, wells, earthworks, or other structures.
- Storage and handling of drums or other transportable containers where the containers are sealed during storage and handling.
- Fire protection equipment, firefighting, and training in preparation for fighting fires.
- Use, servicing, and maintenance of motor vehicles including cars, trucks, lift trucks, locomotives, aircraft, or water craft, except where those activities are subject to an applicable requirement (e.g., requirement to have a fugitive dust control or operating program).
- Construction, repair, and maintenance of roads or other paved or unpaved areas, except where those activities are subject to an applicable requirement (e.g., requirement to have a fugitive dust control or operating program).
- Piping and storage of sweet natural gas, including emergency venting from pressure relief valves or purging of gas lines.

Small Business, Inc. identified the emission sources and included these sources on the PTE Summary Sheet. Please follow their example and complete the first two columns on your PTE Summary Worksheet.

PTE Summary Table for Small Business, Inc.

Emission Source	Description	Permit Status	Legally Enforceable Limitation	Calculation Method
COATING BOOTHS 1-3	**3 spray booths**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336._____		
OVEN	**2,500,000 Btu/hr natural gas fired**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336._____		
MAINTENANCE BOOTH	**Booth used for touchup**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336._____		
PRINTING	**Prints information on product**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336._____		
SPECIAL PROJECT BOOTH	**Spray booth used for special projects**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336._____		
COLD CLEANERS	**2 cold cleaners for parts washing**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336._____		
CLEANUP	**Facility-wide cleanup solvents**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336._____		
GRINDER	**Metal parts grinder connected to baghouse (29,000 cfm)**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336._____		
WELDING	**Shielded metal arc welding**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336._____		
BOILER	**10 million Btu/hr natural gas fired boiler**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336._____		
GENERATOR	**Diesel fired emergency generator**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336._____		

STEP 2: Gather Data for Each Emission Source

Before you begin calculating the PTE for each of your emission sources, you will want to gather process data that will help in determining the PTE.

Below is a list of items you should gather. This information will be used to calculate your PTE as well as what method of calculation. You may want to enter relevant capacity data on the PTE Summary Worksheet in the description column.

- ☐ **Air permits**. Look for any Permits to Install or Renewable Operating Permits issued to your company.

- ☐ **Safety Data Sheets (SDS) or technical data sheets, such as manufacturer's formulation data, for raw materials used in the processes**. This information will determine what pollutants may be emitted. For example, if the emission source is a boiler, gather information about the fuel(s) used. If the emission source is a coating line, gather SDS or manufacturer formulation data for the coatings used.

> *If the emission source is a coating line that uses several different coatings per year, use an SDS that represents the worst-case coating i.e., the coating that has the highest VOC content and HAP content. (Note that this may be two different coatings).*

- ☐ **Performance test results**. Collect data from stack tests that have been conducted or any other type of test conducted on the performance of the equipment, raw materials, or emissions.

- ☐ **Capture and control efficiency of pollution control equipment**. If you have an air pollution control device (e.g., baghouse, scrubber), the manufacturer should be able to provide you with documentation that shows the percentage of a particular pollutant the device will capture and/or control.

- ☐ **Vendor literature describing the process.**
  - Air emissions data that shows what pollutants are emitted from a process and, in some cases, an emission rate.
  - Maximum application rate of spray guns - gallons/hour or gallons/minute
  - Maximum heat input capacity of boilers and ovens - Btu/hour
  - Maximum capacity of fans that exhaust pollutants - cubic feet of air/minute
  - Production rate - products/hour or product/minute
  - Fuel usage rate of generators - gallons or cubic feet of fuel/hour

> This information can usually be found in the vendor literature for the equipment or by contacting the manufacturer.

STEP 3: Categorize Emission Sources (Permitted, Grandfathered, or Exempt)

In this step you will categorize each of the emission sources you identified in Step 1 as being permitted, grandfathered, or exempt from air permitting. Although an emission source may be exempt or grandfathered from permitting requirements, you will still need to include its emissions in your PTE calculation. The paragraphs below explain each of these categories.

Need help? Contact the Office of Environmental Assistance at 800-662-9278

Permitted

If the emission source is identified in a Permit to Install or a ROP then it is "permitted." Review all permits that have been issued to your facility by the Michigan Department of Environmental Quality (DEQ) Air Quality Division. These permits contain valuable information which will assist you in calculating your PTE. For example, limits contained in a permit may be to restrict your PTE.

Grandfathered

To be considered grandfathered an emission unit must have been installed before August 15, 1967. Additionally, the emission unit must not have had any modifications or changes made to it since that date. There are very few processes that meet the grandfathered conditions; however, those that do are not required to have a Permit to Install. Emissions from grandfathered emission sources must still be included in your PTE calculation.

Exempt

The Michigan Air Pollution Control Rules exempt certain processes and equipment from the requirement to obtain a Permit to Install; however, an ROP has requirements to include some equipment that is exempt equipment. If the emission source is not included in a permit or grandfathered, it should be exempt from permitting pursuant to one of these rules. Identify the appropriate exemption for your emission source in R 336.1280 through R 336.1290 (Rules 280 – 290) (see Appendix A). Table 2-2 summarizes the exemption categories.

Be aware that R 336.1278 (Rule 278) excludes some emission sources from being exempt if emissions are considered significant. Review Rule 278 before determining whether or not the emission source is exempt.

Table 2-2: Exempt Categories

Examples of the broad categories where certain specific exemptions may be found are:

- Cooling and ventilating equipment (Rule 280)
- Cleaning, washing, and drying equipment (Rule 281)
- Furnaces, ovens, or heaters (Rule 282)
- Testing and inspection equipment (Rule 283)
- Containers, reservoirs, or tanks (Rule 284)
- Routine maintenance, parts replacement or repairs, and miscellaneous changes and operations (Rule 285)
- Plastic processing equipment (Rule 286)
- Surface coating equipment (Rule 287)
- Oil and gas processing equipment (Rule 288)
- Asphalt and concrete production equipment (Rule 289)
- Emission Units with limited emissions (Rule 290)

Note: The rules must be read carefully to determine if a source really falls under an exemption category. If you determine that a source is exempt, keep a written record of how you arrived at that decision.

Small Business, Inc. categorized all of its emission sources using the PTE Summary Worksheet. Use the PTE Summary Worksheet to categorize all of your emission sources.

PTE Summary Table for Small Business, Inc.

Emission Source	Description	Permit Status	Legally Enforceable Limitation	Calculation Method
COATING BOOTHS 1-3	**3 spray booths**	☑ Permitted: PTI # **999-89**___ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336._____		
OVEN	**2,500,000 Btu/hr natural gas fired**	☑ Permitted: PTI # **999-89**___ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336._____		
MAINTENANCE BOOTH	**Booth used for touchup**	☑ Permitted: PTI # **825-82**__ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336._____		
PRINTING	**Prints information on product**	☐ Permitted: PTI #_____ ☑ Grandfathered: **10/15/1966** ☐ Exempt: R 336._____		
SPECIAL PROJECT BOOTH	**Spray booth used for special projects**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☑ Exempt: R 336. **1287(c)**___		
COLD CLEANERS	**2 cold cleaners for parts washing**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☑ Exempt: R 336. **1281(h)**___		
CLEANUP	**Facility-wide cleanup solvents**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☑ Exempt: R 336. **1290**_____		
GRINDER	**Metal parts grinder connected to baghouse (29,000 cfm)**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☑ Exempt: R 336. **1285(l)(vi)**_		
WELDING	**Shielded metal arc welding**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☑ Exempt: R 336. **1285(i)**___		
BOILER	**10 million Btu/hr natural gas fired boiler**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☑ Exempt: R 336. **1282(b)(i)**_		
GENERATOR	**Diesel fired emergency generator**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☑ Exempt: R 336. **1285(g)**___		

STEP 4: Identify Legally Enforceable Limitations

Before calculating your PTE, you need to identify any legally enforceable limits that can be used to restrict your PTE. Legally and practically enforceable limitations may be identified in various places, such as permit conditions or state and federal rules. Some examples of these defining limitations are production or operating limits, emission limits, operational limits on control equipment combined with specific and required monitoring/recordkeeping.

In this step you will identify limits that you may be able to take into consideration when calculating the PTE for each emission unit.

Permit Conditions

Special conditions in Permit to Install may restrict an emission unit's potential emissions. Conditions that limit the emission of a pollutant to below a specific level or specify an operating capacity that is less than the maximum design capacity should be identified. The limits in these conditions should be taken into consideration when calculating PTE.

In order for a permit condition to be used as a means of restricting PTE, it must be legally and practically enforceable. If a permit was issued on or after **May 6, 1980** (the day the permit program was approved by U.S Environmental Protection Agency [EPA] and put into the Michigan State Implementation Plan), the condition would be considered legally enforceable, but may not be practically enforceable. If your Permit to Install was issued prior to May 6, 1980, it must meet the criteria found in R 336.1209 (see Appendix A) before it can be used to limit PTE.

Do you have a permit limit that does not have a monitoring/recordkeeping requirement associated with it? Modify the existing permit by submitting a Permit to Install application requesting a federally enforceable condition.

If you have a question about whether or not your permit condition would meet the requirements of being legally and practically enforceable, please contact the Office of Environmental Assistance, 1-800-662-9278.

The following restrictions, found in permit conditions, are *examples* of legally and practically enforceable limits used to restrict PTE.

- Emission limits (typically expressed as pounds of air contaminant emitted per hour, tons per month or 12-month rolling average) and operational restrictions, combined with recordkeeping requirements
- Requirements to operate an air pollution control device (filter, scrubber, etc.) including operational requirements to address efficiency, combined with recordkeeping requirements
- Limits on the amount of material to be used combined with recordkeeping requirements
- Limits on the type of fuel that can be used combined with recordkeeping requirements
- Limits on the operating hours combined with recordkeeping requirements
- Limits on production (e.g., number of production pieces/day) combined with recordkeeping requirements

Be aware that the limit must also be enforceable in a practical manner, meaning the permit must contain a monitoring/recordkeeping requirement that can be used to demonstrate compliance with the limit. For example, if there is a VOC limit, there should also be a requirement in the permit that requires you to monitor and record your mass balance VOC emissions over a specified time period, such as pounds per calendar day, tons per month and 12-month rolling time period calculations and recordkeeping.

State and Federal Rules

State and federal rules may include requirements that can be used to restrict your PTE. If the process is permitted, these requirements should have already been incorporated into the conditions of the permit. If the requirements are not in Permit to Install or if the emission unit is exempt, review the state and federal air quality regulations. The Michigan Air Pollution Control Rules can be accessed on the Internet at: **www.michigan.gov/air**.

Restrictions found in state or federal rules should be identified so they can be used in the PTE calculation. Look for requirements from applicable state and federal rules that:

- Restrict the emission of air pollutants
- Restrict emission rates
- Limit the usage of raw materials
- Restrict operation
- Require specific control devices

Below are some examples of legally enforceable limitations contained in the Michigan Air Pollution Control Rules.

Emission Limits:

- R 336.1290 (Rule 290): 1,000 pounds of noncarcinogenic VOCs per month (6 tons VOC/year). This may be used to limit potential as long as the required mass balance records are kept. See example on page 2-27.

- R 336.1331 (Rule 331, Table 31): The maximum allowable emission rate is 0.10 pounds of particulate matter (PM) per 1,000 pounds of gas from an exhaust system servicing material handling equipment. See example on page 2-28.

- R 336.1402 (Rule 402): 1.7 pounds of SO_2 per million Btu's of heat input from the combustion of oil fuel or in excess of 2.4 pounds per million Btu of heat input for coal fuel. The required testing and recordkeeping in the rule must also be kept.

- R 336.1621 (Rule 621): 3.5 pounds of VOC per gallon of coating (minus water) as applied for air dried coatings from an existing metallic surface coating line. In order to use this rule to limit PTE, current information and daily records must also be kept in accordance with the rule.

Operation/Control Requirements:

- R 336.1287(c) (Rule 287(c)) may assume that 200 gallons of the worst-case coating is used per month, provided it is in compliance with the requirements of the rule and records are kept

(see example on page 2-25). This limit applies to each emission unit that is exempt under Rule 287(c).

- R 336.1611 (Rule 611): (a) A cover shall be installed and closed when parts are not being handled, (b) … the parts shall be drained not less than 15 seconds or until dripping ceases, (c) waste organic solvent shall be stored only in closed containers…(see Example on page 2-26)

- R 336.1708 (Rule 708): It is unlawful for a person to operate a new open top degreaser unless one of the following conditions is met… (b) the degreaser is equipped with a refrigerated freeboard device…

Small Business, Inc. has Permits to Install and some of their emission sources are subject to specific state rules. Requirements have been identified that limit PTE and are included PTE Summary Worksheet. Identify any restrictions on your PTE Summary Worksheet.

PTE Summary Table for Small Business, Inc

Emission Source	Description	Permit Status	Legally Enforceable Limitation	Calculation Method
COATING BOOTHS 1-3	**3 spray booths**	☑ Permitted: PTI # **999-89**___ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336._____	**- Permit limit = 5.6 tons VOC/yr** **- Permit requires recordkeeping** **- Permit requires fabric filter**	
OVEN	**2,500,000 Btu/hr natural gas fired**	☑ Permitted: PTI # **999-89**___ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336._____	**None**	
MAINTENANCE BOOTH	**Booth used for touchup**	☑ Permitted: PTI # **825-82**__ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336._____	**Permit requires fabric filter**	
PRINTING	**Prints information on product**	☐ Permitted: PTI #_____ ☑ Grandfathered: **10/15/1966** ☐ Exempt: R 336._____	**None (grandfathered)**	
SPECIAL PROJECT BOOTH	**Spray booth used for special projects**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☑ Exempt: R 336. **1287(c)**___	**Rule: R 336.1287(c) – limits coating usage to 200 gal/month, requires recordkeeping**	
COLD CLEANERS	**2 cold cleaners for parts washing**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☑ Exempt: R 336. **1281(h)**___	**Rule: R 336.1611 - Requires that cover be closed and that parts be drained**	
CLEANUP	**Facility-wide cleanup solvents**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☑ Exempt: R 336. **1290**_____	**Rule: R 336.1290 – limits emission of non-carcinogenic VOCs to 1,000 lbs/month, recordkeeping required**	
GRINDER	**Metal parts grinder connected to baghouse (29,000 cfm)**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☑ Exempt: R 336. **1285(l)(vi)**_	**Rule: R 336.1331,Table 31J - limits emission of PM to 0.10 lbs per 1000 lbs gas**	
WELDING	**Shielded metal arc welding**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☑ Exempt: R 336. **1285(i)**___	**None**	
BOILER	**10 million Btu/hr natural gas fired boiler**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☑ Exempt: R 336. **1282(b)(i)**_	**None**	
GENERATOR	**Diesel fired emergency generator**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☑ Exempt: R 336. **1285(g)**___	**None**	

STEP 5: Identify the Emission Calculation Methods You Will Use

There are a variety of methods available to calculate the emission of air contaminants. Four common methods used to calculate PTE are:

- Legally enforceable limitations
- Performance test data
- Mass balance calculations
- Emissions factors

Following is a discussion of each of these calculation methods as well as an example of each for **Small Business, Inc**.

Legally Enforceable Limitations

Regardless of what your process is physically capable of emitting, legally and practically enforceable limitations such as rules, conditions in an air permit, and compliance/enforcement documents cannot be exceeded. You can use these values to calculate your PTE. See Step 4 for a more in-depth discussion of legally enforceable limitations.

EXAMPLE 1: RULES as Legally Enforceable Limitations

Small Business, Inc. operates a metal parts grinder that is ventilated. According to the manufacturer, the exhaust system servicing the grinder is rated at 29,000 standard cubic feet (scf) per minute. Table 31 of R 336.1331 limits PM emissions from the exhaust system to 0.10 pounds of PM per 1,000 pounds of exhaust gas.

- *1 scf air = 0.075 pounds.*
- *Maximum operating hours/yr = 8,760*

Annual Potential Emission of PM

(29,000 scf of air/min) x (60 min/hr) = 1,740,000 scf of air/hr

(1,740,000 scf of air/hr) x (0.075 lbs of air/1 scf of air) = 130,500 lbs of air/hr

(130,500 lbs of air/hr) x (0.10 lbs of PM/1,000 lbs of air) = 13.05 lbs of PM/hr

(13.05 lbs PM/hr) x (8,760 hrs/yr) = 114,318 lbs of PM/yr

(114,318 lbs PM/yr) x (1 ton/2,000 lbs) = ***57 tons of PM/yr***

EXAMPLE 2: PERMIT CONDITIONS as Legally Enforceable Limitations

Small Business, Inc. operates three coating booths. The booths were issued a Permit to Install for the coating line in 1989. One of the conditions of the permit limits VOC emissions to 5.6 tons per year and requires mass balance calculations and specific periodic recordkeeping. According to the SDS, the volatile portion of the adhesive is comprised of toluene and isopropyl alcohol.

Annual Potential Emission of VOCs

The company's legally enforceable permit condition limits its VOC emissions to 5.6 tons/year. Before using this number to limit your PTE, the company must review their recordkeeping and calculations to ensure that they are in compliance with the permitted limit.

Annual Potential Emission of HAPs

Toluene is the only HAP. However, since toluene is also a VOC and the permit limits VOC emissions to 5.6 tons per year, the potential emission of toluene cannot be greater than 5.6 tons/year. Therefore, the potential emission of toluene is 5.6 tons/year.

Performance Test Data

Performance test data which may include data from a stack test, continuous emission monitoring, or manufacturer testing can be used to estimate your potential emissions. This data must be revised to reflect the maximum hourly operating rate of your process if your equipment was not operating at that level during the performance test.

Performance test data may provide an emission rate as well as other data that is useful for calculating PTE. For example, stack test results could contain data about an air contaminant for which there are not applicable regulations in a permit or rule. Performance test data may also provide an air flow rate that could be used in conjunction with the particulate emission rate found in R 336.1331 (Rule 331) to calculate PTE.

It is **not** appropriate to use performance test results in place of an applicable requirement when calculating PTE. For example, if a stack test reveals an actual emission rate of 0.09 pounds of PM per 1,000 pounds of gas and the applicable limit in its Permit to Install is 0.10 pounds of PM per 1,000 pounds of gas, the facility should use the 0.10 limit in its PTE calculations.

EXAMPLE: PTE Calculations Using PERFORMANCE TEST DATA

Data from a stack test at **Small Business, Inc.** indicates that the actual air flow rate of the exhaust fan on the unpermitted metal parts grinder is 29,000 scf per minute. The emission source is subject to Rule 331, which limits PM emissions to 0.10 pounds of PM per 1,000 pounds of exhaust gas.

- *1 scf air = 0.075 pounds.*
- *Maximum operating hours/yr = 8,760*

Annual Potential Emissions of PM

(29,000 scf of air/min) x (60 min/hr) x (0.075 lbs of air/1 scf of air) = 130,500 lbs of air/hr

(130,500 lbs of air/hr) x (0.10 lbs of PM/1,000 lbs of air) = 13.05 lbs of PM/hr

(13.05 lbs PM/hr) x (8,760 hrs/yr) x (1 ton/2,000 lbs) = **57.16 tons PM/yr**

Mass Balance

When considering the mass balance approach, it is assumed the weight of all raw materials going into a process must equal the weight of the product and waste material leaving the process. In other words, all VOCs contained in the material are assumed to be emitted. Mass balance is usually the best way to calculate emissions from operations that involve solvent evaporation such as coating lines, printing lines, and clean-up activities. A benefit to using the mass balance approach to calculate your PTE, you do not need to separately calculate fugitive emissions. Fugitive emissions are automatically included in a mass balance calculation.

EXAMPLE: PTE Calculations Using MASS BALANCE

Small Business, Inc. has maintenance booth with a single spray gun. The gun capacity is 5 gallons per hour. The coating contains 65 percent VOC by weight and its density is 11.2 lbs/gal.

- *VOC content = (11.2 lbs coating/gal) x (0.65 lbs VOC/lb coating) = 7.28lbs VOC/gal coating*
- *Maximum operating hours/yr = 8,760*

Annual Potential Emission of VOCs

(5 gal coating/hr) x (7.28 lbs VOC/gal of coating) = 36.4 lbs of VOC/hr

(36.4 lbs VOC/hr) x (8,760 hrs/yr) = 318,864 lbs of VOC/yr

(318,864 lbs VOC/yr) x (1 ton/2,000 lbs) = ***159.4 tons of VOC/yr***

Emission Factors

If you cannot calculate your emissions using any of the methods described above, you may want to consider using an emission factor. Emission factors exist for many types of processes. An emission factor is an average emission value derived from industry data. The factor relates an activity or process to the quantity of an air contaminant released into the atmosphere. Factors are usually expressed as the weight of air contaminant released per volume or weight of the activity. Such as "100 lbs/10^6 scf natural gas," which means 100 lbs of an air contaminant is emitted per million standard cubic feet of natural gas burned.

Be aware that emission factors **only provide an** estimate of your emissions. Use of them to calculate PTE may be subject to approval by the Air Quality Division.

You may need to know your process capacity or design rating to use an emission factor. Emission factors for air contaminants can be found in publications such as the EPA's "*AP-42, Compilation of Air Pollutant Emission Factors*" (see Figure 2-2). You can access AP-42 on the Internet at: **www.epa.gov/ttn/chief/ap42/index.html**. You can also download the EPA's Factor Information Retrieval (WebFIRE) database, which allows you to search all of the EPA emission factors. WebFIRE can be accessed and downloaded at: **http://cfpub.epa.gov/webfire/ .**

If you use emission factors, make sure the factor you are using is appropriate for your process. For example, to select the right factor for a boiler, you need to know the size of your burner. Also, pay close attention to the units used with emission factor. Make sure your process data agrees with the units in the emission factor.

1.4-5 EMISSION COMBUSTION SOURCES

Table 1.4-1. EMISSION FACTORS FOR NITROGEN OXIDES (NO_x) AND CARBON MONOXIDE (CO) FROM NATURAL GAS COMBUSTION[a]

Combustor Type (MMBtu/hr Heat Input) [SCC]	NO_x[b] Emission Factor (lb/10^6 scf)	NO_x[b] Emission Factor Rating	CO Emission Factor (lb/10^6 scf)	CO Emission Factor Rating
Large Wall-Fired Boilers (>100) [1-01-006-01, 1-02-006-01, 1-03-006-01]				
Uncontrolled (Pre-NSPS)[c]	280	A	84	B
Uncontrolled (Post-NSPS)[c]	190	A	84	B
Controlled - Low NO_x burners	140	A	84	B
Controlled - Flue gas recirculation	100	D	84	B
Small Boilers (<100) [1-01-006-02, 1-02-006-02, 1-03-006-02, 1-03-006-03]				
Uncontrolled	100	B	84	B
Controlled - Low NO_x burners	50	D	84	B
Controlled - Low NO_x burners/Flue gas recirculation	32	C	84	B
Tangential-Fired Boilers (All Sizes) [1-01-006-04]				
Uncontrolled	170		24	
Controlled - Flue gas recirculation	76		98	
Residential Furnaces (<0.3) [No SCC]				
Uncontrolled	94	B	40	B

Emission factor for NOx

Emission factor for CO

Figure 2-2: AP-42

EXAMPLE: PTE Calculations Using EMISSION FACTORS

Small Business, Inc. has a natural gas-fired boiler rated at 10 million Btu per hour. The NOx Emission Factor from Table 1.4-1 in Chapter 1.4 of AP-42 (see figure 2-2 above) is 100 pounds of NOx emitted per million scf of natural gas burned. In addition to NOx emissions the company would also use emission factors to calculate CO, SO_2, PM, and VOC emissions.

- *1 scf of natural gas = 1,020 Btu*
- *Maximum operating hours/yr = 8,760*

Annual Potential Emission of NOx:

(10,000,000 Btu/hr) x (1 scf of fuel/1,020 Btu) = 9,803.9 scf of natural gas/hr

(9,803.9 scf natural gas/hr) x (8,760 hrs/yr) = 85,882,352.9 scf of natural gas/yr

(85,882,352.9 scf/yr) x (100 lbs of NOx/1,000,000 scf of fuel) = 8,588.2 lbs of NOx/yr

(8,588.2 lbs of NOx/yr) x (1 ton/2,000 lbs) = ***4.3 tons of NOx/yr***

PTE Summary Table for Small Business Inc.

Emission Source	Description	Permit Status	Legally Enforceable Limitation	Calculation Method
COATING BOOTHS 1-3	**3 spray booths**	☑ Permitted: PTI # **999-89**___ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336._____	**- Permit limit = 5.6 tons VOC/yr** **- Permit requires recordkeeping** **- Permit requires fabric filter**	**Permit condition**
OVEN	**2,500,000 Btu/hr natural gas fired**	☑ Permitted: PTI # **999-89**___ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336._____	**None**	**Emission Factor**
MAINTENANCE BOOTH	**Booth used for touchup**	☑ Permitted: PTI # **825-82**__ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336._____	**Permit requires fabric filter**	**Mass balance equation**
PRINTING	**Prints information on product**	☐ Permitted: PTI #_____ ☑ Grandfathered: **10/15/1966** ☐ Exempt: R 336._____	**None (grandfathered)**	**Mass balance equation**
SPECIAL PROJECT BOOTH	**Spray booth used for special projects**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☑ Exempt: R 336. **1287(c)**___	**Rule: R 336.1287(c) – limits coating usage to 200 gal/month, requires recordkeeping**	**Limitation in Rule**
COLD CLEANERS	**2 cold cleaners for parts washing**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☑ Exempt: R 336. **1281(h)**___	**Rule: R 336.1611 - Requires that cover be closed and that parts be drained**	**Emission factor**
CLEANUP	**Facility-wide cleanup solvents**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☑ Exempt: R 336. **1290**_____	**Rule: R 336.1290 – limits emission of non-carcinogenic VOCs to 1,000 lbs/month, requires recordkeeping**	**Limitation in Rule**
GRINDER	**Metal parts grinder connected to baghouse (29,000 cfm)**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☑ Exempt: R 336. **1285(l)(vi)**_	**Rule: R 336.1331,Table 31J - limits emission of PM to 0.10 lbs per 1000 lbs gas**	**Limitation in Rule**
WELDING	**Shielded metal arc welding**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☑ Exempt: R 336. **1285(i)**___	**None**	**Emission factor**
BOILER	**10 million Btu/hr natural gas fired boiler**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☑ Exempt: R 336. **1282(b)(i)**_	**None**	**Emission factor**
GENERATOR	**Diesel fired emergency generator**	☐ Permitted: PTI #_____ ☐ Grandfathered: ___/___/__ ☑ Exempt: R 336. **1285(g)**___	**None**	**Emission factor**

STEP 6: Calculate the PTE for Each Emission Source

In this step you will calculate the PTE for each of the emission units you identified in Step 1. You will use the information gathered in Steps 1 through 5 to help you perform the calculations. The guidance below explains the assumptions you should be making when calculating your PTE, how to deal with "bottlenecks," as well as how to identify the pollutants emitted.

PTE Calculation Worksheets for several processes can be found at: **www.michigan.gov/air** (select "Permits" then "Potential to Emit").

Calculating PTE for each regulated air pollutant emitted from each process will result in numerous calculations. Usually, more than one regulated air pollutant will be emitted from each process. Keep the calculations, data, and assumptions for each process separate. Spreadsheets are a good place to store data for each process as well as being useful to help you calculate your facility's PTE.

When calculating your facility's PTE be sure to **show your work**. When determining your applicability to certain regulations, the AQD will review how your PTE was calculated. If you use a computer spreadsheet, show a sample calculation or the formulas used. Identify all of the assumptions that were made and documents that were reviewed while completing the calculations.

Small Business, Inc. has calculated the PTE for each of the emission sources in their facility. The PTE calculations for each process are on pages 2-21 to 2-31

The PTE Equation

PTE refers to the amounts of air contaminants that the facility could release into the air while operating at the maximum design capacity, with the highest polluting materials and operating 100% of the time. The standard equation used in calculating PTE for each regulated air contaminant emitted from each process is:

PTE = (maximum hourly emission rate of pollutant) x (8760 hours)

When calculating PTE, use the following assumptions:

- The maximum hourly emission rate reflects the quantity of air pollutants generated if the emission unit was operating at its maximum design capacity.
- Unless restricted as discussed in Step 4, assume the process operates continuously, 24 hours per day x 365 days per year. This amounts to **8,760** hours per year.
- Any emission reduction attributed to an air pollution control device, such as a bag filter, scrubber, or afterburner, can be included in the calculation only if the operation of the device is required by a legally and practically enforceable permit condition, rule, or compliance/enforcement document and only to the extent that is required to meet that requirement.

If a facility is required by a permit to operate a thermal oxidizer to meet a limit of 5.0 pounds per hour VOCs and the permitted control efficiency is 95%, based on the results of stack testing, the emission reductions from the control equipment could be applied after uncontrolled emissions were calculated.

- The material containing the highest amount of air contaminants and thus air emissions are processed or used 100 percent of the time.

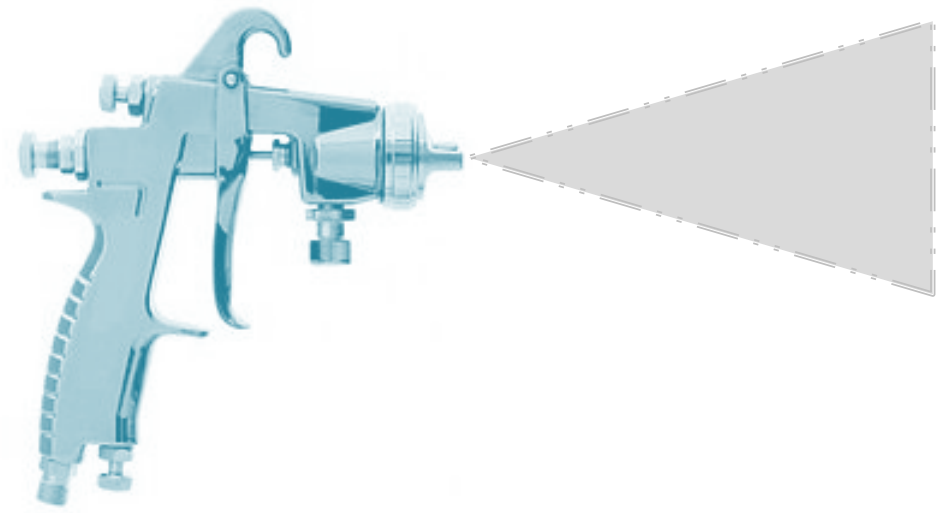
“Bottlenecks”

When calculating your PTE, be sure to take into consideration any inherent physical limitations in a process that would limit its PTE. When the output of a multi-step process is limited by the capacity of one emission unit or activity, that emission unit or activity is considered a bottleneck. If a process has a physical limitation which only allows it to operate during a certain season, such as an asphalt plant, the annual operating hours will be below the 8,760 hours/year that unrestricted processes are required to use for PTE calculations.

To make use of physical limitation or bottleneck when calculating your PTE, the limitation must be unavoidable, meaning it would be impossible to operate at a higher rate than you are using to calculate your PTE. You should be able to document that the inherent physical limitation exists and is unavoidable. If necessary, records (e.g., production records, operating hours, etc.) may be requested that demonstrate the inherent physical limitation is not exceeded. If you subsequently make a change that eliminates or changes the inherent limitation or bottleneck, you should recalculate your PTE to reflect the change in the process. An increase may be considered a modification to your facility.

If you are unsure as to whether a physical limitation may be used to limit your PTE, contact your Air Quality Division District Office (see Appendix D).

> **Small Business, Inc.** has three coating booths. All coated parts must go to a curing oven. There is only one conveyor to the oven and the conveyor can only be connected to one line at a time. Here, the conveyor is the **bottleneck**. The company would only have to include the emissions from one of the coating lines in their PTE calculation since it is impossible for more than one coating line to operate simultaneously.



Determining What Pollutants are Emitted

Determining what air contaminants are emitted from a process may take a little research. The examples on pages 2-20 to 2-30 of this document show the pollutants emitted from several common processes. Sometimes the equipment manufacturer will be able to give you information about the pollutants emitted and possibly an emission rate. Another potential place to look is in your permit to install application, if applicable.

SDS or manufacturer formulation data sheets can also be helpful in identifying pollutants that may be emitted. The information contained in these is particularly useful in determining emissions from sources of solvent evaporation (e.g., coating lines, cold cleaners, cleanup solvents). The manufacturer formulation data for coatings or solvents used will identify all the compounds that may be emitted, including VOCs and HAPs.

Publications such as EPA's "*AP-42, Compilation of Air Pollutant Emission Factors*" (**www.epa.gov/ttn/chief/ap42/index.html**) and EPA's Factor Information Retrieval (WebFIRE) database (**http://cfpub.epa.gov/webfire/**) may also be helpful.

Some pollutants fit the definition of more than one regulated air contaminant. For example, many VOCs are also considered to be HAPs (e.g., Xylene, Toluene). If a solvent you are using emits Xylene it must be reported as both HAP and VOC.

Small Business, Inc.

COATING BOOTHS 1-3

This emission source consists of three spray booths. Each gun has a capacity of 5 gallons per hour. The booths are included in a Permit to Install. The permit has a condition that limits emission of VOCs to 5.6 tons/yr based on a 12-month rolling average. The permit also has a condition that requires a fabric filter. The regulated pollutants that are emitted are VOCs, HAPs, PM, PM10 and PM2.5. In this case it is safe to assume that all PM2.5 is PM10 and that all PM10 is PM. Of all the HAPs contained in the coatings used, Xylene is present in the highest concentration.

PTE of VOC

Permit to Install # 999-89 contains an emission limit of 5.6 tons of VOC/yr. Therefore, the PTE of VOC is **5.6 tons/yr**.

PTE of HAPs

All the VOCs contained in the coatings used are also HAPs; therefore, the 5.6 tons VOC/yr limit can also be used here to restrict the PTE of HAPs. If the coatings used contain several different HAPS, assume the HAP present in the highest concentration is the only HAP emitted. In this example, Xylene is present in the highest concentration; therefore, the PTE of Xylene would be **5.6 tons/yr**.

PTE of PM

To calculate the PTE of PM from coating, assume the highest solid content coating is used continuously. The permit requires a filter, so the control efficiency for the wall filter in the booths (95 percent based on manufacturer's specifications) can be used in calculating PTE. The transfer efficiency of the spray gun is 20 percent. This means 20 percent of the coating adheres to the part and 80 percent is overspray. Of the coatings used, the one with the highest solid content* contains 2.66 pounds of solids/gallon of coating.

- (5 gal of coating/hr/spray gun) x (3 spray guns) = 15 gal of coating/hr
- (15 gal coating/hr) x (2.66 lbs of solid/gal of coating) x (0.80 overspray) = 31.92 lbs of solids/hr
- (31.92 lbs of solids/hr) x (8,760 hours/yr) x (1 ton/2,000 lbs) = 139.81 tons of solids/yr (uncontrolled)
- (139.81 tons of solids/yr) x ([100-95]/100) = **7.0 tons of solid(PM)/yr (controlled)**

COATING BOOTHS 1-3 PTE SUMMARY (ton/yr)

- VOC = 5.6
- Xylene = 5.6
- PM = 7.0

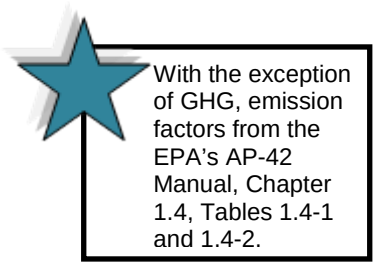
* Contact the coating manufacturer if you unable to determine the solid content of the coating.

Small Business, Inc.

OVEN

This is a 2,500,000 Btu/hr natural gas fired oven used to cure parts that are coated in coating booths 1-3 or the maintenance booth. The emission factors for a small boiler will be used to calculate emissions from this oven (see below).

Pollutant	Emission Factor
NOx	100 lbs/1,000,000 cubic feet (ft^3) natural gas
CO	84 lbs/1,000,000 ft^3 natural gas
Lead (Pb)	0.0005 lbs/1,000,000 ft^3 natural gas
PM	7.6 lbs/1,000,000 ft^3 natural gas
SO_2	0.6 lbs/1,000,000 ft^3 natural gas
VOC	5.5 lbs/1,000,000 ft^3 natural gas
GHG (CO_2e)	Various (see below)



Note: *1* ft^3 *of natural gas = 1,020 Btu*

Maximum cubic feet (cf) of natural gas used per hour:

(2,500,000 Btu/hr) x (1 ft^3 natural gas/1,020 Btu) = **2,451 ft^3 of natural gas/hr**

PTE of regulated pollutants using emission factors:

NOx: (2,451 ft^3/hr) x (100 lbs NOx/1,000,000 ft^3) = 0.25 lbs of NOx/hr
(0.25 lbs NOx/hr) x (8,760 hrs/yr) x (1 ton/2,000 lbs) = **1.10 tons of NOx/yr**

CO: (2,451 ft^3/hr) x (84 lbs CO/1,000,000 ft^3) = 0.21 lbs of CO/hr
(0.21 lbs CO/hr) x (8,760 hrs/yr) x (1 ton/2,000 lbs) = **0.92 tons of CO/yr**

Pb: (2,451 ft^3/hr) x (0.0005 lbs Pb/1,000,000 ft^3) = 0.000001 lbs of Pb/hr
(0.000001 lbs Pb/hr) x (8,760 hrs/yr) x (1 ton/2,000 lbs) = **0.000004 tons of Pb/yr**

PM: (2,451 ft^3/hr) x (7.6 lbs PM/1,000,000 ft^3) = 0.02 lbs of PM/hr
(0.02 lbs PM/hr) x (8,760 hrs/yr) x (1 ton/2,000 lbs) = **0.09 tons of PM/yr**

SO_2: (2,451 ft^3/hr) x (0.6 lbs SO_2/1,000,000 ft^3) = 0.001 lbs of SO2/hr
(0.001 lbs SO_2/hr) x (8,760 hrs/yr) x (1 ton/2,000 lbs) = **0.004 tons of SO_2/yr**

VOC: (2,451 ft^3/hr) x (5.5 lbs VOC/1,000,000 ft^3) = 0.01 lbs of VOC/hr
(0.01 lbs VOC/hr) x (8,760 hrs/yr) x (1 ton/2,000 lbs) = **0.04 tons of VOC/yr**

PTE for GHG (CO_2e) pollutants using 40 CFR 98 Subparts A and C:

Total Heat Input Capacity x Emission Factor x Conversion Factor(s) x Global Warming Potential

Total Heat Input Capacity in MMBtu/yr: Total Btu/hr x (1 x 10^{-6}) x 8760 hrs/yr
2,500,000Btu/hr x (1 x 10^{-6}) x 8760 hrs/yr = 21,900 MMBtu/yr

CO_2: 21,900 MMBtu / 1 year x 53.06 kg / 1 MMBtu x 2.2046 lbs / 1 kg x 1 ton / 2000 lbs x 1 = 1,280 tons/yr

CH_4: 21,900 MMBtu / 1 year x 0.001 kg / 1 MMBtu x 2.2046 lbs / 1 kg x 1 ton / 2000 lbs x 25 = 0.6 tons/yr

N_2O: 21,900 MMBtu / 1 year x 0.0001 kg / 1 MMBtu x 2.2046 lbs / 1 kg x 1 ton / 2000 lbs x 298 = 0.72 tons/yr

Total CO_2e tons/yr = CO_2 + CH_4 + N_2O

(1,280 tons CO_2/yr) + (0.6 tons CH_4/yr) + (0.72 tons N_2O/yr) = **1,281.32 tons CO_2e/yr**

OVEN PTE SUMMARY (ton/yr)

- NOx = 1.10
- CO = 0.92
- Lead (Pb) = negligible
- PM = 0.09
- SO_2 = 0.004
- VOC = 0.04
- CO_2e = 1,282

MAINTENANCE BOOTH

The maintenance booth consists of one spray gun, which is used for maintenance and touchup work. The gun capacity is 5 gallons per hour. This booth is included in a Permit to Install. The permit requires a fabric filter but does not contain a VOC or HAP emission limit. The regulated pollutants that are emitted are VOCs, HAPs, and PM. Several different coatings are used in this booth; therefore, the company will need to choose a worst-case coating to use in the calculations. The worst-case coating will be the coating used with the highest VOC/HAP content. Information about the worst-case coating chosen is provided below.

Worst-Case Coating Info	
Density	11.2 lbs/gal
Solids	2.31 lbs/gal
VOC	6.16 lbs/gal
Xylene	35% by weight
Toluene	17% by weight
MEK	3% by weight

PTE of VOC

- (5 gal of coating/hr) x (6.16 lbs of VOC/gal of coating) = 30.8 lbs of VOC/hr
- (30.8 lbs of VOC/hr) x (8,760 hrs/yr) x (1 ton/2,000 lbs) = **134.9 tons of VOC/yr**

PTE of HAPs (Calculate the PTE of each HAP in the coating)

PTE of Xylene

- (0.35 lb Xylene/lb coating) x (11.2 lbs coating/gal coating) = 3.92 lbs Xylene/gal coating
- (5 gal of coating/hr) x (3.92 lbs Xylene/gal of coating) = 19.6 lbs of Xylene/hr
- (19.6 lbs Xylene/hr) x (8,760 hrs/yr) x (1 ton/2,000 lbs) = **85.85 tons of Xylene/yr**

PTE of Toluene

- (0.17 lb Toluene/lb coating) x (11.2 lbs coating/gal coating) = 1.9 lbs Toluene/gal coating
- (5 gal of coating) x (1.9 lbs toluene/gal of coating) = 9.5 lbs of Toluene/hr
- (9.5 lbs toluene/hr) x (8,760 hrs/yr) x (1 ton/2,000 lbs) = **41.61 tons of toluene/yr**

PTE of MEK

- (0.03 lb MEK/lb coating) x (11.2 lbs coating/gal coating) = 0.34 lbs MEK/gal coating
- (5 gal of coating) x (0.34 lbs MEK/gal of coating) = 1.7 lbs of MEK/hr
- (1.7 lbs MEK/hr) x (8,760 hrs/yr) x (1 ton/2,000 lbs) = **7.36 tons of MEK/yr**

PTE of PM

The transfer efficiency of the spray gun is 20 percent. This means 20 percent of the coating adheres to the part and 80 percent is overspray. The permit requires a filter, so the control efficiency for the wall filter in the booths (95 percent) can be used in calculating PTE.

- (5 gal of coating/hr) x (2.31 lbs of solids/gal of coating) x (0.80 overspray) = 9.24 lbs of solids/hr
- (9.24 lbs of solids/hr) x (8,760 hours/yr) x (1 ton/2,000 lbs) = 40.47 tons of solids/yr
- (40.47 tons of solids/yr) x ([100 – 95]/100) = **2.02 tons solids (PM)/yr**

MAINTENANCE BOOTH PTE SUMMARY (ton/yr)

- VOC = 134.9
- Xylene = 85.85
- Toluene = 41.61
- MEK = 7.36
- PM = 2.02

Small Business, Inc.

PRINTING

This is a grandfathered printing machine that prints the product information on each of the items manufactured by this facility. Once the ink is applied to the part, the parts are sent to the packaging machine which boxes the parts for shipment. The actual ink usage is very small; however, since this emission unit is grandfathered, no legal enforceable limits exist to limit its PTE. Each part requires the same information be printed so the ink usage is consistent for each part (0.01 ounces of ink per part). The machine can apply the ink at a rate of 20 parts per minute; however, the packaging apparatus which boxes the parts for shipment can only package the product at a rate of 800 parts per hour. This means that the parts must be run through the machine in batches instead of continuously. Therefore, the packaging operation serves as a bottleneck that limits the amount of parts that can be run through this process per hour.

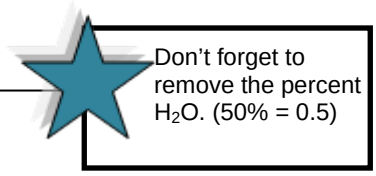
The company uses several water-based inks that contain no HAPs. The ink with the highest VOC content is 0.8 pounds per gallon (minus water). The water content is 50 percent by volume. The only regulated pollutant emitted is VOCs.

Calculation hints: *1 gallon = 128 ounces*

When calculating VOC emissions for water based coatings, it is important that the water is subtracted from the usage data before multiplying by a "minus water" VOC content figure. Failure to subtract water from the usage data will result in an over estimation of VOC emissions.

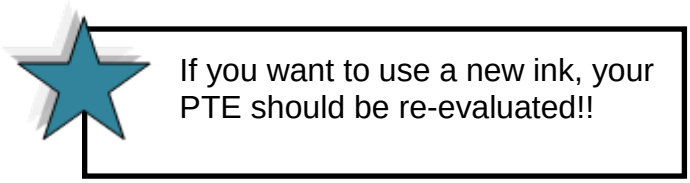
PTE of VOC

- (0.01 oz ink/part) x (1 gal/128 oz) = 0.0001 gal of ink/part
- (0.0001 gal ink/part) x (800 parts/hr) = 0.08 gal of ink/hr
- (0.08 gal ink/hr) x (1 - 0.5) = 0.04 gal of ink (minus water)/hr
- (0.04 gal ink [minus water])/hr) x (0.8 lbs VOC/gal ink [minus water]) = 0.032 lbs of VOC/hr
- (0.032 lbs VOC/hr) x (8,760 hrs/yr) x (1 ton/2,000 lbs) = **0.14 tons of VOC/yr**



PRINTING PTE SUMMARY (ton/yr)

- VOC = 0.14



Small Business, Inc.

SPECIAL PROJECT BOOTH

This coating booth consists of one spray gun, which is only used for special projects. Coating usage is very low so the booth is exempt from the requirement to obtain a Permit to Install under R 336.1287(c) (Rule 287(c)). Rule 287(c) contains a restriction that only allows the emission unit to use 200 gallons coating per month. Since several coatings are used at this booth, the company must choose a "worst-case" coating to calculate emissions. The worst-case coating should be the coating used with the highest VOC/HAP content. This is not always the same coating, but in this case we will assume it is. The information for the worst-case coating used at this booth is provided.

Worst-Case Coating Info	
Density	10.5 lbs/gal
Solids	3.68 lbs/gal
VOC	6.83 lbs/gal
Xylene	45% by weight
Toluene	18% by weight
MIBK	2% by weight

PTE of VOC

- (6.83 lbs VOC/gal coating) x (200 gal/month) = 1,366 lbs VOC/month
- (1,366 lbs VOC/month) x (12 month/yr) x (1 ton/2,000 lbs) = **8.2 tons VOC/yr**

PTE of HAPs (Calculate the PTE of each HAP in the coating)

PTE of Xylene

- (0.45 lb Xylene/lb coating) x (10.5 lbs coating/gal coating) = 4.73 lbs Xylene/gal
- (4.73 lbs Xylene/gal) x (200 gal/month) = 946 lbs Xylene/month
- (946 lbs Xylene/month) x (12 month/yr) x (1 ton/2,000 lbs) = **5.68 tons Xylene/yr**

PTE of Toluene

- (0.18 lb Toluene/lb coating) x (10.5 lbs coating/gal coating) = 1.89 lbs Toluene/gal
- (1.89 lbs Toluene/gal) x (200 gal/month) = 378 lbs Toluene/month
- (378 lbs Toluene/month) x (12 month/yr) x (1 ton/2,000 lbs) = **2.27 tons Toluene/yr**

PTE of MIBK

- (0.02 lb MIBK/lb coating) x (10.5 lbs coating/gal coating) = 0.21 lbs MIBK/gal
- (0.21 lbs MIBK/gal) x (200 gal/month) = 42 lbs MIBK/month
- (42 lbs MIBK/month) x (12 month/yr) x (1 ton/2,000 lbs) = **0.25 tons MIBK/yr**

PTE of PM

The transfer efficiency of the spray gun is 25 percent. This means 25 percent of the coating adheres to the part and 75 percent is overspray.

- (3.68 lbs solids/gal coating) x (200 gal coating/month) x (0.75 overspray) = 552 lbs solids/month
- (552 lbs solids/month) x (12 months/yr) x (1 ton/2,000 lbs) = **3.31 tons of solids (PM)/yr**

SPECIAL PROJECT PTE SUMMARY (ton/yr)

- VOC = 8.2
- Xylene = 5.68
- Toluene = 2.27
- MIBK = 0.25
- PM = 3.31

Small Business, Inc.

COLD CLEANERS

There are two cold cleaners at this facility that use SuperClean cleaning solvent. The SDS for the solvent shows that it contains 100 percent Stoddard solvent, which is a VOC. The cold cleaners are subject to R 336.1611 (Rule 611). Rule 611 requires that certain operating practices be adhered to, which serve as legally enforceable operational restrictions that may contribute to reduced emissions.

PTE of VOC

PTE (uncontrolled) is based on emission factors from Chapter 4.6 of the EPA's AP-42.

(0.33 ton VOC/yr/unit) x (2 units) = **0.66 ton VOC/yr (uncontrolled)**

Emission Factor = 0.33 tons/yr/unit

Type Of Degreasing	Activity Measure	Uncontrolled Organic Emission Factor[a]	
All[b]	Solvent consumed	1,000 kg/Mg	2,000 lb/ton
Cold cleaner			
Entire unit[c]	Units in operation	0.30 Mg/yr/unit	0.33 tons/yr/unit
Waste solvent loss		0.165 Mg/yr/unit	0.18 tons/yr/unit
Solvent carryout		0.075 Mg/yr/unit	0.08 tons/yr/unit
Bath and spray evaporation		0.06 Mg/yr/unit	0.07 tons/yr/unit
Entire unit	Surface area and duty cycle[d]	0.4 kg/hr/m^2	0.08 lb/hr/ft^2
Open top vapor			
Entire unit	Units in operation	9.5 Mg/yr/unit	10.5 ton/yr/unit
Entire unit	Surface area and duty cycle[e]	0.7 kg/hr/m^2	0.15 lb/hr/ft^2

Table 4.6-2 from Chapter 4.6 of AP-42

Since these cold cleaners are complying with the operational requirements in Rule 611, we can take into consideration emission reductions from control devices and operating procedures. Table 6-3 from Chapter 4.6 of AP-42 provides an emission reduction of 28 percent for cold cleaners.

(0.66 ton VOC/yr) x [(100 – 28)/100] total emission reduction) = **0.475 ton VOC/yr (controlled)**

Emission reduction = 28 percent (use the lowest number in range unless you can prove that a higher emission reduction is applicable.)

System	Cold Cleaner		Vapor Degreaser		Conveyorized Degreaser	
	A	B	A	B	A	B
Control devices						
Cover or enclosed design	X	X	X	X	X	X
Drainage facility	X	X	X			X
Water cover, refrigerated chiller, carbon adsorption or high freeboard[b]		X		X		X
Solid, fluid spray stream[c]		X		X		
Safety switches and thermostats				X		X
Emission reduction from control devices (%)	13-38	NA[d]	20-40	30-60		40-60
...ing procedures						
...f equipment	X	X	X	X	X	X
Waste ...mation	X	X	X	X	X	X
Reduced exhaust ...			X	X	X	X
Reduced conveyor or entry ...			X	X	X	X
Emission reduction from operating procedures (%)	15-45	NA[d]	15-35	20-40	20-30	20-30
Total emission reduction (%)	28-83[e]	55-69[f]	30-60	45-75	20-30	50-70

COLD CLEANERS PTE SUMMARY (ton/yr)

- VOC = 0.475

CLEANUP

This emission unit consists of the cleanup activities that occur throughout the facility using "MaxClean" cleanup solvent. The MSDS for the solvent shows that it contains 90 percent Toluene, which is a VOC and a HAP. This activity is exempt from permitting under R336.1290(a)(i) or Rule 290(a)(i) of the Michigan Air Pollution Control Rules, and the company has conducted all the necessary recordkeeping as required under the rule.

If the pollutant is a carcinogen then additional calculations and restrictions would apply according to Rule 290.

PTE of VOC

Rule 290(a)(i) limits the emission of non-carcinogenic VOCs to 1,000 lbs VOC per month. Since this activity is exempt under Rule 290(a)(i), we are allowed to assume that the **PTE VOCs is 1,000 lbs/month or 6 tons/yr**.

PTE Toluene

Since Toluene is also considered a HAP the **PTE of Toluene is also 6 tons/yr**.

CLEANUP PTE SUMMARY (ton/yr)

- VOC = 6.0
- Toluene = 6.0

GRINDER

The metal grinder is connected to a baghouse that operates at 29,000 cubic feet/min. The grinder is exempt from having to obtain a Permit to Install under R 336.1285(l)(vi) of the Michigan Air Pollution Control Rules. This emission unit is subject to R 336.1331, which limits the emissions of PM to 0.10 pounds of PM per 1,000 pounds of exhaust gas. Since no permit is associated with the grinder, the control efficiency of the baghouse cannot be taken into account when calculating PTE; however, you can use the exhaust gas flow rate to limit PTE since the gas must pass through the device before entering the outside air.

The only regulated pollutants emitted from this process are PM2.5, PM10 and PM. In this case we will assume that these emissions are all being captured within the calculation for PM.

Calculation Hint: 1 cubic foot (ft^3) of air at standard conditions is 0.075 pounds.

PTE of PM

- (29,000 ft^3 air/min) x (60 min/hr) = 1,740,000 ft^3 of air/hr
- (1,740,000 ft^3 air/hr) x (0.075 lbs air/1 ft^3 air) = 130,500 lbs of air/hr
- (130,500 lbs air/hr) x (0.10 lbs PM/1,000 lbs air) = 13.05 lbs of PM/hr
- (13.05 lbs PM/hr) x (8,760 hrs/yr) x (1 ton/2,000 lbs) = **57.16 tons of PM/yr**

GRINDER PTE SUMMARY (ton/yr)

- PM = 57.16

WELDING

This is a shielded metal arc welding booth. The welding operation is exempt from having to obtain a Permit to Install under R 336.1285(i) of the Michigan Air Pollution Control Rules. Emission factors will be used to calculate emissions from this operation (see below). To use the emission factor you must know the pounds of electrode consumed. There is no rated capacity available for this welding machine; however, facility data shows that the most electrode material the company has ever used over a 24 hour period is 15 pounds. The potential pounds of electrode used for the year will have to be calculated based upon 15 lbs/day. The following electrode type is used: E308.

1. Calculate the hourly electrode usage rate.

(15 lbs of E308/day) x (365 days/1 yr) = **5,475 lbs of E308/yr**

2. Identify the emission factors that will be used to calculate emission of regulated pollutants (see AP-42, Chapter 12.19, Tables 12.19-1 and 12.19-2).

Pollutant	Emission Factor
PM	10.8 lb/10^3 lb electrode used
Chromium (Cr)	3.93 lb 10^{-1} /10^3 lb electrode used
Cr (VI)	3.59 lb 10^{-1} /10^3 lb electrode used
Cobalt (Co)	0.01 lb 10^{-1} /10^3 lb electrode used
Mn	2.52 lb 10^{-1} /10^3 lb electrode used
Ni	0.43 lb 10^{-1} /10^3 lb electrode used

3. Calculate emission of regulated pollutants using emission factors.

PTE of PM

(5,475 lbs E308/yr) x (10.8 lbs PM/1,000 lbs E308) x (1 ton/2,000 lbs) = **0.03 ton of PM/yr**

PTE of HAPs

Cr: (5,475 lbs E308/yr) x (0.393 lbs Cr/1,000 lbs E308) x (1 ton/2,000 lbs) = **0.001 ton of Cr/yr**

Cr(VI): (5,475 lbs E308/yr) x (0.359 lbs Cr(IV)/1,000 lbs E308) x (1 ton/2,000 lbs) = **0.001 ton of Cr(VI)/yr**

Co: (5,475 lbs E308/yr) x (0.001 lbs Co/1,000 lbs E308) = **0.01 lbs of Co/yr**

Mn: (5,475 lbs E308/yr) x (0.252 lbs Mn/1,000 lbs E308) x (1 ton/2,000 lbs) = **0.001 ton of Mn/yr**

Ni: (5,475 lbs E308/yr) x (0.043 lbs Ni/1,000 lbs E308) = **0.24 lbs of Ni/yr**

WELDING PTE SUMMARY (ton/yr)

- PM = 0.03
- Cr = 0.001
- Cr(VI) = 0.001
- Co = negligible
- Mn = 0.001
- Ni = negligible

BOILER

The boiler is natural gas fired only with a burner capacity of 10 million Btu/hr. The emission factors that will be used to calculate PTE are provided in the table below. These emission factors come from the EPA's AP-42 Manual, Chapter 1.4, Tables 1.4-1 and 1.4-2.

Pollutant	Emission Factor
NOx	100 lbs/1,000,000 cubic feet (ft^3) natural gas
CO	84 lbs/1,000,000 ft^3 natural gas
Lead (Pb)	0.0005 lbs/1,000,000 ft^3 natural gas
PM	7.6 lbs/1,000,000 ft^3 natural gas
SO_2	0.6 lbs/1,000,000 ft^3 natural gas
VOC	5.5 lbs/1,000,000 ft^3 natural gas
GHG (CO_2e)	Various (see below)

Note: *1 ft^3 of gas = 1,020 Btu*

1. **Calculate the maximum cubic feet of natural gas used per hour:**

   (10,000,000 Btu/hr) x (1 ft^3 natural gas/1,020 Btu) = **9,803.92 ft^3 of natural gas/hr**

2. **Calculate the PTE of regulated pollutants using emission factors.**

NOx: (9,803.92 ft^3/hr) x (100 lbs NOx/1,000,000 ft^3) = 0.98 lbs of NOx/hr
(0.98 lbs NOx/hr) x (8,760 hrs/yr) x (1 ton/2,000 lbs) = **4.29 tons of NOx/yr**

CO: (9,803.92 ft^3/hr) x (84 lbs CO/1,000,000 ft^3) = 0.82 lbs of CO/hr
(0.82 lbs CO/hr) x (8,760 hrs/yr) x (1 ton/2,000 lbs) = **3.59 tons of CO/yr**

Pb: (9,803.92 ft^3/hr) x (0.0005 lbs Pb/1,000,000 ft^3) = 0.000005 lbs of Pb/hr
(0.000005 lbs Pb/hr) x (8,760 hrs/yr) x (1 ton/2,000 lbs) = **0.00002 tons of Pb/yr**

PM: (9,803.92 ft^3/hr) x (7.6 lbs PM/1,000,000 ft^3) = 0.07 lbs of PM/hr
(0.07 lbs PM/hr) x (8,760 hrs/yr) x (1 ton/2,000 lbs) = **0.31 tons of PM/yr**

SO_2: (9,803.92 ft^3/hr) x (0.6 lbs SO_2/1,000,000 ft^3) = 0.006 lbs of SO2/hr
(0.006 lbs SO_2/hr) x (8,760 hrs/yr) x (1 ton/2,000 lbs) = **0.03 tons of SO_2/yr**

VOC: (9,803.92 ft^3/hr) x (5.5 lbs VOC/1,000,000 ft^3) = 0.05 lbs of VOC/hr
(0.05 lbs VOC/hr) x (8,760 hrs/yr) x (1 ton/2,000 lbs) = **0.22 tons of VOC/yr**

GHG (CO_2e) pollutants using 40 CFR 98 Subparts A and C:

Total Heat Input Capacity x Emission Factor x Conversion Factor(s) x Global Warming Potential

Total Heat Input Capacity in MMBtu/yr: Total Btu/hr x (1×10^{-6}) x 8760 hrs/yr
10,000,000Btu/hr x (1×10^{-6}) x 8760 hrs/yr = 87,600 MMBtu/yr

CO_2: $\frac{87{,}600 \text{ MMBtu}}{1 \text{ year}} \times \frac{53.06 \text{ kg}}{1 \text{ MMBtu}} \times \frac{2.2046 \text{ lbs}}{1 \text{ kg}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} \times 1 = 5{,}124 \text{ tons/yr}$

CH_4: $\frac{87{,}600 \text{ MMBtu}}{1 \text{ year}} \times \frac{0.001 \text{ kg}}{1 \text{ MMBtu}} \times \frac{2.2046 \text{ lbs}}{1 \text{ kg}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} \times 25 = 2.41 \text{ tons/yr}$

N_2O: $\frac{87{,}600 \text{ MMBtu}}{1 \text{ year}} \times \frac{0.0001 \text{ kg}}{1 \text{ MMBtu}} \times \frac{2.2046 \text{ lbs}}{1 \text{ kg}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} \times 298 = 2.88 \text{ tons/yr}$

Total CO_2e tons/yr = CO_2 + CH_4 + N_2O
(5,124 tons CO_2/yr) + (2.41 tons CH_4/yr) + (2.88 tons N_2O/yr) = **5,129 tons CO_2e/yr**

BOILER PTE SUMMARY (ton/yr)

- NOx = 4.29
- CO = 3.59
- Lead (Pb) = negligible
- PM = 0.31
- SO_2 = 0.03
- VOC = 0.22
- CO_2e = 5,129.29

Small Business, Inc.

GENERATOR

The generator is a 5 million Btu/hr diesel fired emergency unit. It is exempt from having to obtain a Permit to Install under R 336.1285(g) of the Michigan Air Pollution Control Rules. Emission factors from the EPA's AP-42 manual will be used to calculate the PTE. The emission factors require that you know the amount of diesel fuel the generator is capable of burning per hour. The maximum fuel usage for this generator is 100 gallons of fuel/hr.

The EPA has determined that if a generator's sole function is to provide backup power when electric power from the local utility is interrupted, then the worst-case operating hours should be 500 hours per year. The EPA's emergency generator PTE guidance is available at www.michigan.gov/air (select the "Permits" tab then "Potential to Emit").

1. Identify the emission factors that will be used to calculate emission of regulated pollutants (these emission factors come from the Web FIRE emission factor database using the SCC 2-01-001-02).

Pollutant	Emission Factor
CO	130 lbs per 1000 gals diesel burned
NOx	604 lbs per 1000 gals diesel burned
SOx	39.7 lbs per 1000 gals diesel burned
PM	42.5 lbs per 1000 gals diesel burned
GHG (CO_ee)	Various (see below)

2. Calculate the potential amount of diesel fuel burned per year.

   (100 gal fuel/hr) x (500 hrs/yr) = **50,000 gallons of fuel/yr**

3. Calculate emission of regulated pollutants using emission factors.

   CO: (50,000 gal fuel/yr) x (130 lbs CO/1,000 gal fuel) x (1 ton/2,000 lbs) = **3.25 tons of CO/yr**

   NOx: (50,000 gal fuel/yr) x (604 lbs NOx/1,000 gal fuel) x (1 ton/2,000 lbs) = **15.1 tons of NOx/yr**

   SOx: (50,000 gal fuel/yr) x (39.7 lbs SOx/1,000 gal fuel) x (1 ton/2,000 lbs) = **1 ton of SOx/yr**

   PM: (50,000 gal fuel/yr) x (42.5 lbs PM/1,000 gal fuel) x (1 ton/2,000 lbs) = **1.06 tons of PM/yr**

   GHG (CO_2e) pollutants using 40 CFR 98 Subparts A and C:

   Total Heat Input Capacity x Emission Factor x Conversion Factor(s) x Global Warming Potential

   Total Heat Input Capacity in MMBtu/yr: Total Btu/hr x (1×10^{-6}) x 8760 hrs/yr
   7,200,000Btu/hr x (1×10^{-6}) x 8760 hrs/yr = 63,072 MMBtu/yr

   CO_2: $\frac{63{,}072 \text{ MMBtu}}{1 \text{ year}} \times \frac{73.96 \text{ kg}}{1 \text{ MMBtu}} \times \frac{2.2046 \text{ lbs}}{1 \text{ kg}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} \times 1 = 5{,}142 \text{ tons/yr}$

   CH_4: $\frac{63{,}072 \text{ MMBtu}}{1 \text{ year}} \times \frac{0.003 \text{ kg}}{1 \text{ MMBtu}} \times \frac{2.2046 \text{ lbs}}{1 \text{ kg}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} \times 25 = 5.21 \text{ tons/yr}$

N_2O: $\frac{63{,}072 \text{ MMBtu}}{1 \text{ year}} \times \frac{0.0006 \text{ kg}}{1 \text{ MMBtu}} \times \frac{2.2046 \text{ lbs}}{1 \text{ kg}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} \times 298 = 12.43 \text{ tons/yr}$

Total CO_2e tons/yr = CO_2 + CH_4 + N_2O

(5,142 tons CO_2/yr) + (5.21 tons CH_4/yr) + (12.43 tons N_2O/yr) = **5,160 tons CO_2e/yr**

GENERATOR PTE SUMMARY (ton/yr)

- CO = 3.25
- NOx = 15.1
- SOx = 1.0
- PM = 1.06
- CO_2e = 5,160

STEP 7: Calculate the PTE for the Facility

Once you have calculated the PTE from each individual process, calculate the total PTE for each air contaminant emitted by your facility by summing up the PTE from all of the processes. Organize your PTE totals into spreadsheets like the ones shown below for **Small Business Inc**. Blank tally sheets are provided for Criteria Pollutants and HAPs in Appendix B.

Part 3 of this workbook uses the PTE that has been calculated in the previous steps to determine whether your facility is a "major" or "minor" source and also explains what that means.

Small Business, Inc. - EMISSION TOTALS – CRITERIA POLLUTANTS

Emission Unit	CO (TON/YR)	NOx (TON/YR)	SOx (TON/YR)	PM (TON/YR)	VOC (TON/YR)	LEAD (TON/YR)	GHG
COATING BOOTHS 1-3				7.0	5.6		
OVEN	0.92	1.10	0.004	0.09	0.04	negligible	1,282
MAINTENANCE BOOTH				2.02	134.9		
PRINTING					0.14		
287(C) BOOTH				3.31	8.2		
COLD CLEANERS					0.475		
CLEANUP					6.0		
GRINDER				57.16			
WELDING				0.03			
BOILER	3.59	4.29	0.03	0.31	0.22	negligible	5,129
GENERATOR	3.25	15.1	1.0	1.06			5,160
TOTAL	7.76	20.49	1.03	70.98	155.6	0	11,571

Small Business, Inc. - EMISSION TOTALS – HAPs

Emission Unit	HAZARDOUS AIR POLLUTANT (TON/YR)						
	Xylene	Toluene	MEK	Chromium	Chromium (VI)	manganese	MIBK
COATING BOOTHS 1-3	5.6						
OVEN							
MAINTENANCE BOOTH	85.85	41.61	7.36				
PRINTING							
SPECIAL PROJECT BOOTH	5.68	2.27					0.25
COLD CLEANERS							
CLEANUP		6.0					
GRINDER							
WELDING				0.001	0.001	0.001	
BOILER							
GENERATOR							
TOTAL	97.13	49.88	7.36	0.001	0.001	0.001	0.25

ALL HAPS TOTAL:	154.62

Part 3: Major or Minor Source

Once you have calculated your facility's potential to emit (PTE) you can determine whether you are a "major" or "minor" source of air pollution. This distinction is important because major sources are subject to more regulations than minor sources. Compare your facility's PTE to the thresholds listed in Table 3-1 below:

Table 3-1: Major Source Thresholds

Type of Pollutant	Title V Major Source tons/year	NESHAP Major Source tons/year	PSD Major[1,2] tons/year	Major Non-attainment[3] tons/year	
Particulate Matter (PM)			100/250		
PM10	100			Moderate	100
				Serious	70
PM2.5	100				
Volatile Organic Compounds (VOCs)	100		100/250	Marginal	100
				Moderate	100
				Serious	50
				Severe	25
				Extreme	10
Carbon Monoxide (CO)	100		100/250	Moderate	100
				Serious	50
Nitrogen Oxides (NOx)	100		100/250	Marginal	100
				Moderate	100
				Serious	50
				Severe	25
				Extreme	10
Sulfur Dioxide (SO_2)	100		100/250	100	
Lead (Pb)*	100			100	
Hazardous Air Pollutants (HAPs) • Any single HAP • Any combination of HAPs		10 25 *Lead compounds are HAPs			
GHG[1]	100 or 75,000 – 100,000 on a CO_2e basis				
Any other regulated air contaminant	100				

[1] 100 tpy for 28 specific categories, 250 tpy for all other source categories. Requirements associated with PSD Major and GHG Major sources will not be discussed in detail in this workbook. Call the Office of Environmental Assistance for further help with these source categories.
[2] A PSD permit is required before a "major" new source constructs, or before changes or modifications that are "major" or "significant" are made at an existing "major" source of air pollution. PSD sources are large sources of air contaminants.
[3] Lower major source thresholds for non-attainment areas only apply to the pollutant for which an area is in non-attainment.

If your facility's PTE is <u>below</u> all the emission thresholds in Table 3-1, you may be considered to be a true minor source not subject to the Renewable Operating Permit Program or any of the other major source requirements. You should keep records showing your calculations and all assumptions.

Be sure to recalculate your PTE whenever new processes are added or changes are made that may increase your PTE.

If your facility's PTE <u>exceeds</u> any of the thresholds in Table 3-1, you are considered a major source. If you feel you have determined that you are a major PSD or major source non-attainment, call the Office of Environmental Assistance, 800-662-9278 for further guidance.

If you are a Title V Major source or a NESHAP Major source, you have two options:

1. Comply with the major source requirements discussed on the following page.

   or

2. Limit your PTE using one of the mechanisms described in Part 4 to avoid being a major source. Smaller companies that have <u>actual</u> emissions well below the major source thresholds should consider this option.

Small Business, Inc.'s PTE calculations in Part 2 of this workbook indicate that the major source threshold for VOC, individual HAPs (Xylene and Toluene), and total HAPs (see pages 2-32 and 2-33) have been exceeded. However, **Small Business Inc.**'s <u>actual</u> emissions are well below any of the major source thresholds. It would be a good idea for this company to limit PTE rather than apply for a Renewable Operating Permit and become subject to other major source requirements, such as National Emission Standards for Hazardous Air Pollutants (NESHAPs). Part 4 discusses how **Small Business Inc.**. will limit their PTE.

MAJOR SOURCE REQUIREMENTS

If your facility is considered a Title V Major source, you may be subject of the following requirements.

☐ **Renewable Operating Permit (ROP) Program**
All major sources of air pollution are subject to the ROP Program. You must apply for an ROP within 12 months of becoming a major source under Title V. To apply for an ROP you will need to complete an ROP application packet.

The ROP must be renewed every five years. In addition, sources subject to the ROP Program must submit annual and semi-annual certification reports indicating that the facility is complying with each permit condition of the ROP. Permit conditions that are not in compliance with the conditions in the ROP will need to be reported as deviations that have occur throughout the year.

You can find more information about the ROP Program on the Internet at **www.michigan.gov/air** (select "Permits" then "Renewable Operating Permit Program") or by contacting the Clean Air Assistance Program at (800) 662-9278.

☐ **MAERS Reporting**
All major sources under Title V and sources that opt-out of the ROP Program are subject to the Michigan Air Emissions Reporting System (MAERS). Under this system, major sources must submit a MAERS report to the AQD annually. Subject facilities will receive a MAERS notification every January that will outline their reporting requirements. Additional information about MAERS can be found on the Internet at **www.michigan.gov/air** (select "Emissions").

☐ **Annual Air Emissions Fees**
Major sources are subject to annual emissions fees. The fee amount is assessed based upon the emissions reported in MAERS. A fee invoice is mailed to the subject facility in January and the payment is due within 90 days. More information about annual air emissions fees can be found on the Internet at **www.michigan.gov/air** (select "Emissions" then "Annual Emission Fees").

☐ **National Emission Standards for Hazardous Air Pollutants NESHAPs (also known as MACT Standards)**
Certain industrial categories that exceed the major source thresholds for HAPs may be subject to a federal NESHAP. The NESHAP will usually be incorporated into a ROP. A listing of the source categories that may be subject to a NESHAP are provided in Table 3-2. You can learn more about specific NESHAPs on the internet at **www.epa.gov/ttn/atw/mactfnlalph.html**.

Table 3-2: NESHAP - Source Categories Affected

- Aerospace
- Acrylic/Modacrylic Fiber(area sources)
- Asbestos
- Asphalt Processing and
- Asphalt Roofing Manufacturing
- Auto & Light Duty Truck
- (surface coating)
- Auto Body Refinishing (area sources)
- Benzene Waste Operations
- Boat Manufacturing
- Brick and Structural Clay Products Manufacturing
- Clay Ceramics Manufacturing
- Carbon Black Production (area sources)
- Cellulose Products Manufacturing
  Miscellaneous Viscose Processes
  - Cellulose Food Casing
  - Rayon
  - Cellulosic Sponge
  - Cellophane

  Cellulose Ethers Production
  - Caroxymethyl Cellulose
  - Methyl Cellulose
  - Cellulose Ethers
- Chemical Manufacturing Industry (area sources):CMAS
- Chemical Preparations Industry (area sources)
- Chromium Electroplating
  - Chromic Acid Anodizing
  - Decorative Chromium Electroplating
  - Hard Chromium Electroplating
- Chromium Compounds (area sources)
- Clay Ceramics Manufacturing (area sources)
- Coke Ovens: Pushing, Quenching,& Battery Stacks
- Coke Ovens (Charging, Top Side, and Door Leaks)
- Combustion Sources at Kraft, Soda,and Sulfite Pulp & Paper Mills (Pulp and Paper MACT II)
- Commercial Sterilizers
  - Commercial Sterilization Facilities
- Degreasing Organic Cleaners
  - Halogenated Solvent Cleaners
- Dry Cleaning
  - Commercial drycleaning dry-to-dry
  - Commercial drycleaning transfer machines
  - Industrial drycleaning dry-to-dry
  - Industrial drycleaning transfer machines
- Electric Arc Furnace Steelmaking Facilities(Area Sources)
- Engine Test Cells/Stands (Combined with Rocket Testing Facilities)
- Fabric Printing, Coating & Dyeing
- Ferroalloys Production (Major Sources)
- Misc. Organic Chemical Production and Processes (MON) cont.
  - Chlorinated Paraffins Production
  - Ethyllidene Norbomene Production
  - Explosives Production
  - Hydrazine Production
  - Maleic Anhydride Copolymers Production
  - Manufacture of Paints, Coatings, &
  - Adhesives
  - OBPA/1, 3-diisocyanate Production
  - Photographic Chemicals Production
  - Phthalate Plasticizers Production
  - Polyester Resins Production
  - Polymerized Vinylidene Chloride Prod.
  - Polymethyl Methacrylate Resins Prod.
  - Polyvinyl Acetate Emulsions Prod.
  - Polyvinyl Alcohol Production
  - Polyvinyl Butyral Production
  - Quaternary Ammonium Comp. Prod.
  - Rubber Chemicals Production
  - Symmetrical Tetrachloropyridine Production
- Municipal Solid Waste Landfills
- Natural Gas Transmission and Storage
- Nonferrous Foundries: Aluminum, Copper, and Other (area sources)
- Off-Site Waste Recovery Operations
- Oil & Natural Gas Production includes Area Sources
- Organic Liquids Distribution (non-gasoline)
- Paint Stripping and Miscellaneous Surface Coating Operations - (Area Sources)
- Paper and Other Web (surface coating)
- Pesticide Active Ingredient Production
  - 4-Chlror-2-Methyl Acid Production
  - 2,4 Salts & Esters Production
  - 4,6-dinitro-o-cresol Production
  - Butadiene Furfural Cotrimer
  - Captafol Production
  - Captan Production
  - Chloroneb Production
  - Chlorothalonil Production
  - Dacthal (tm) production
  - Sodium Pentachlorophenate Production
  - Tordon (tm) Acid Production
- Petroleum Refineries
  - Catalytic Cracking
  - Catalytic Reforming
  - Sulfur Plant Units
  - Associated Bypass Lines
- Pharmaceuticals Production
- Phosphoric Acid
- Phosphate Fertilizers
- Plastic Parts (surface coating)

Table 3-2: MACT STANDARD - Source Categories Affected *(continued)*

- Ferroalloys Production (Area Sources)
- Flexible Polyurethane Foam Fabrication Operation
- Flexible Polyurethane Foam Production
- and Fabrication (area sources)
- Flexible Polyurethane Foam Production
- Friction Products Manufacturing
- Gasoline Dispensing Facilities (Area Sources)
- Gasoline Distribution (Stage 1)
- Gasoline Distribution Bulk Terminals, Bulk Plants, and Pipeline Facilities (Area Sources)
- Generic MACT I-Acetal Resins
- Generic MACT I-Hydrogen Floride
- Generic MACT I-Polycarbonates Production
- Generic MACT I-Acrylic/Modacrylic Fibers
- Generic MACT II-Spandex Production
- Generic MACT II-Carbon Black Production
- Generic MACT II-Ethylene Processes
- Glass Manufacturing (area sources)
- Glass Manufacturing Plants -Inorganic Arsenic Emissions
- Gold Mine Ore Processing and Production (area sources)
- Hazardous Waste Combustion
  - Hazardous Waste Incinerators (A)
  - Hazardous Waste Incinerators (M)
- Hazardous Organic NESHAP (Synthetic Organic Chemical Manufacturing Industry)
- Hospitals: Ethylene Oxide Sterilizers (area sources)
- Hydrochloric Acid Production
- Fumed Silica Production
- Industrial, Commercial and Institutional Boilers and Process Heaters - Major Sources
- Industrial, Commercial and Institutional -Boilers - Area Sources
- Industrial Cooling Towers
- Integrated Iron and Steel
- Iron and Steel Foundries (Major Sources)
- Iron and Steel Foundries (area sources)
- Large Appliances (surface coating)
- Lead Acid Battery Mfg.(area sources)
- Leather Finishing Operations
- Lime Manufacturing
- Magnetic Tape (surface coating)
- Manufacturing Nutritional Yeast (formerly Bakers Yeast)
- Marine Vessel Loading Operations
- Mercury Cell Chlor-Alkali Plants
- Metal Can (surface coating)
- Metal Coil (surface coating)
- Metal Fabrication and Finishing
- Source Nine Categories(area sources)
- Plating and Polishing Operations (area sources)
- Plywood and Composite Wood Products (formerly Plywood and Particle Board
- Manufacturing)
- Polyether Polyols Production
- Polymers & Resins I
  - Butyl Rubber
  - Epichlorohydrin Elastomers
  - Ethylene Propylene Rubber
  - Hypalon (TM) Production
  - Neoprene Production
  - Nitrile Butadiene Rubber
  - Polybutadiene Rubber
  - Polysulfide Rubber
  - Styrene-Butadiene Rubber & Latex
- Polymers & Resins II
  - Epoxy Resins Production
  - Non-Nylon Polyamides Production
- Polymers & Resins III
  - Amino Resins
  - Phenolic Resins
- Polymers & Resins IV
  - Acrylonitrile-Butadiene-Styrene
  - Methyl Methacrylate-Acrylonitrile+
  - Methyl Methacrylate-Butadiene++
- Polymers & Resins IV (cont.)
  - Polystrene
  - Styrene Acrylonitrile
  - Polyethylene Terephthalate
  - Nitrile Resins
- Polyvinyl Chloride and Copolymers Production
- Polyvinyl Chloride and Copolymers Production (area sources)
- Portland Cement Manufacturing
- Primary Aluminum
- Primary Copper
- Primary Copper Smelting (area sources)
- Primary Lead Smelting
- Primary Magnesium Refining
- Primary Nonferrous Metals-Zinc,
- Cadmium, and Beryllium (area sources)
- Printing and Publishing (surface coating)
- Publicly Owned Treatment Works (POTW)
- Pulp & Paper (non-combust)MACT
- Reciprocating Internal Combustion Engines (RICE) includes area sources
- Refractory Products Manufacturing
- Reinforced Plastic Composites Production
- Rubber Tire Manufacturing
- Secondary Aluminum
- Secondary Copper Smelting (area sources)
- Secondary Lead Smelters
- Secondary Nonferrous Metals Processing

Table 3-2: MACT STANDARD - Source Categories Affected *(continued)*

• Metal Furniture (surface coating)
• Mineral Wool Production
• Misc. Coating Manufacturing
• Misc. Metal Parts and Products (surface coating)
  • Asphalt/Coal Tar Application to Metal Pipes
• Misc. Organic Chemical Production and Processes (MON)
  • Alkyd Resins Production
  • Ammonium Sulfate Production
  • Benzyltrimethylammonium Chloride Prod.
  • Carbonyl Sulfide Production
  • Chelating Agents Production
	(Brass, Bronze, Magnesium and Zinc)(Area Sources)
	• Semiconductor Manufacturing
	• Shipbuilding & Ship Repair (surface coating)
	• Site Remediation
	• Solvent Extraction for Vegetable Oil Production
	• Stationary Combustion Turbines
	• Steel Pickling-HCL Process
	• Taconite Iron Ore Processing
	• Tetrahydrobenzaldehyde Manufacture (Formerly Butadiene Dimers Production)
	• Utility NESHAP
	• Wet Formed Fiberglass Mat Production
	• Wood Building Products (surface coating)
	• Wood Furniture(surface coating)
	• Wood Preserving (area sources)
	• Wool Fiberglass Manufacturing

Part 4: How to Avoid Being a Title V Major Source

Many smaller sources of air pollution have a high PTE but have actual emissions well below the Title V major source thresholds. If your PTE makes you a major source under Title V but your actual emissions are below the major source thresholds, you can avoid being a major source by limiting your PTE. In order to adequately limit your PTE, you will need to have a facility-wide Opt-out permit. This means that although your source has the capacity to be a major source under Title V, you have accepted limits that make you a minor source, opting you out of the Title V program.

SYNTHETIC MINOR PERMITS

A "Synthetic Minor" permit is a type of Permit to Install used to establish enforceable limits or restricts the PTE for a **specific emission unit or process equipment**. There are many reasons why a source may want to limit an emission unit's PTE. These include, but are not limited to adding on control equipment, avoiding modeling requirements and establish limits to a level below applicable major source thresholds.

An emission unit can be a "synthetic minor" by establishing emission and operational limits, enforceable by the AQD and/or the EPA, which will reduce the emission unit's potential to emit to below the Title V major source thresholds. Having a synthetic minor permit does not necessarily avoid the requirements of the ROP program. If you want to ensure that your sources PTE is limited to below the Title V major source thresholds, you will want to apply for a facility-wide Opt-out Permit.

OPT-OUT PERMITS

All Opt-out permits are synthetic minor permits, but not all synthetic minor permits are Opt-outs. Unlike Synthetic Minor permits, Opt-out Permits apply to the **entire source**. The guidance document for obtaining an Opt-out Permit is located on AQDs website. "Guidance for a Title V Opt-out Permit" can be found on the Internet at **www.michigan.gov/air** (select "Permits" then "Permits to Install/New Source Review" then "'Opting Out' of Title V").

Like synthetic minor permits, there are several instances where a source may request an Opt-out permit, such as opting out of PSD, an applicable NESHAP, or major non-attainment. For our purposes, we will consider Opt-out permits for Title V major sources. In order to opt-out of Title V, your permit will need to contain a facility wide table that limits emissions from the entire source to below the applicable thresholds. If your permit does not have this table, your source has not yet opted out of the Title V program.

Synthetic minor and Opt-out permits that are requesting enforceable limits of over 90% of Title V major source thresholds is required to go through a public comment period before the permit was issued. The public notice is a 30-day period, in which the public may request a public hearing and provide comments on the proposed permit conditions.

A facility that requests enforceable limits less than 90% of the Title V major source thresholds would not be required to go through a public comment period. For instance, if a facility requested an 89.0 ton VOC limit, public comment would not be required.

The following pages provide steps for completing and submitting an Opt-out Permit application as well as examples of some of the opt-out permit application requirements.

Small Business, Inc. has decided that the best option would be to limit PTE by obtaining an Opt-out permit. This permit will keep them from being a major source but still give enough flexibility to grow and change. Components of the opt-out permit application are on pages 4-7 to 4-11

HOW TO COMPLETE AN OPT-OUT PERMIT APPLICATION

A complete application for an opt-out permit must include all of the following components:

- ☐ **Cover letter.** Be sure to include a cover letter that clearly states that the intent of the application is to reduce the source's PTE to below applicable specific major source. The cover letter is important because it lets the permit engineer know right away why you have submitted the application. A sample cover letter is provided on page 4-7.

- ☐ **Permit to Install Application Form.** Complete the Permit to Install Application form (EQP5615E). A blank application form is provided in Appendix C. You can also access the form on the Internet at **www.michigan.gov/air** ("Permits" tab then "Permits to Install/New Source Review" then" Application Forms, Instructions and Guidance Documents"). An example of how to complete this form for an opt-out permit is provided on page 4-8.

- ☐ **PTE Calculations.** Include the current PTE calculations for all pollutants for all the emission units located at your source. Part 2 of this workbook explains how to calculate PTE. You should include a table that summarizes your source's PTE (see pages 2-32 to 2-33) as well as PTE calculations for each of the emission units at the facility, including permitted, exempt, and grandfathered equipment (example calculations are provided on pages 2-20 to 2-30).

"Once in, always in" - If you are applying for a HAPs Opt-out, it is very important that your actual HAP emissions have never exceeded the HAPs major source thresholds. You should look at your historical emissions data. If your actual HAP emissions have exceeded the thresholds, you will be subject to EPAs "once in, always in" policy and you will be unable to use an Opt-out permit to get out of Title V.

- ☐ **Proposed Plan.** Include a narrative plan that outlines the actions to be taken and the dates such actions will be taken to limit your source's PTE. In the plan, explain why your source is exceeding an emission threshold. Provide some background on your source and how you came to your conclusions. You will also want to explain how and when you plan to restrict your emissions to below the threshold. An example of a proposed plan is provided on page 4-8.

- ☐ **Restricted PTE Calculations.** Recalculate your PTE using the limits that you are proposing. Your new calculations should show the intended effect of the proposed plan on the source's PTE. In this section you should be able to show that the emissions will be below the threshold. Include a table that summarizes the new PTE for each emission unit (see pages 4-10 and 4-11 for a sample tables).

- ☐ **Propose Enforceable Limits**. In your application you need to propose the actual limit/restriction language that you would like in your issued opt-out permit. With the exception of a HAPs Opt-out, the limits you propose should contain an emission limit, a production limit, and/or operational restriction. HAPs Opt-outs are only required to contain emission limits. For non-HAPs Opt-outs, the limit/restriction must be enforceable, so you will also need to propose any monitoring or

recordkeeping that will be necessary to demonstrate compliance with the limit or restriction. More information about how to propose limits and restrictions is provided on the following pages. Keep in mind that your inspector or AQD permit engineer may discuss with you the need to alter your proposal to comply with applicable regulations.

Proposing Enforceable Limits and Restrictions

Emission Limits

An emission limit restricts the amount of an air contaminant that may be emitted over some time period (e.g., lbs/hr, lbs/day, tons/yr). The time period should be as short as possible and should take into consideration whether the type and quantity of monitoring and recordkeeping that is necessary to demonstrate compliance with the emission limit is reasonable and appropriate.

Rule 205 states: *The time period shall be set in accordance with the applicable requirements and, unless a different time period is provided by the applicable requirement, should generally not be more than 1 month, unless a longer time period is approved by the department. A longer time period may be used if it is a rolling time period, but shall not be more than an annual time period rolled on a monthly basis.*

If you are proposing an emission limit, you will also need to include any monitoring, recordkeeping, and reporting requirements that are necessary to assure that the emission limits are enforceable in a practical matter. Table 4-2 provides examples of emission limits and corresponding monitoring/recordkeeping that may be proposed. It is a good idea to submit an example of the recordkeeping format you plan to use.

If the proposed emission limit does not reflect the maximum emissions of the process or process equipment operating at full design capacity without air pollution control equipment, you must also propose either a production limit or operational restriction. Coating sources and their associated VOC emissions, daily recordkeeping can be used in place of operational or production limits.

Table 4-2: Examples of Emission Limits

Emission Limit	Monitoring/Recordkeeping
The PM emission rate from EUMETALS shall not exceed 6 tons per year based upon a 12-month rolling time period as determined at the end of each calendar month.	The permittee shall keep, in a satisfactory manner, daily calculations of the average tons per hour of materials processed in EUMETALS.
The NOx and CO emission rate for EUENGINES shall not exceed 15.0 tons per year based on 12-month rolling time period as determined at the end of each calendar month.	The permittee shall keep, in a satisfactory manner, NOx and CO emission calculations EUENGINES, in tons per 12-month rolling time period as determined at the end of each calendar month.
The individual HAP emission rate for FGFACILITY shall not exceed 9.0 tons per year. The annual limit shall be based upon a 12-month rolling time period as determined at the end of each calendar month.	The permittee shall calculate the total and individual HAP emission rate from the FGFACILITY monthly, for the preceding 12-month rolling time period.
The total HAP emission rate for the FGFACILITY shall not exceed 22.5 tons per year. The annual limit shall be based upon a 12-month rolling time period as determined at the end of each calendar month.	

If the emission limit you are proposing is less than 90 percent of the applicable major source threshold (e.g. 90.0 tons VOC/yr), the DRAFT permit will not have to go through a public comment period. If the emission limit you propose is 90 percent or more of the major source threshold, the DRAFT permit will be subject to R 336.1205(1)(b), which requires a public comment period.

Production Limits

A production limit restricts the amount of final product that may be produced over the same time period used in the emission limit (e.g., parts/hr, widgets/day). The production limit you propose should correlate with the calculated emission limit and with the intended operation of the process or process equipment. To demonstrate compliance with a production limit, monitoring and/or recordkeeping must also be proposed. Examples of production limits are provided in Table 4-3.

Table 4-3: Examples of Production Limits

Production Limit	Monitoring/Recordkeeping
The permittee shall not process more than 100,000 tons of Hot Mix Asphalt paving materials in EUHMAPLANT per 12-month rolling time period as determined at the end of each calendar month.	The permittee shall keep in a satisfactory manner, monthly, and 12-month rolling time period records of the amount of hot mix asphalt paving material produced from EU HMAPLANT.
The permittee shall not produce more than 1,000 widgets per day on EUWIDGETLINE.	The permittee shall keep in a satisfactory manner, records of the amount of widgets produced from EUWIDGETLINE on a calendar day basis.

Operational Limits

An operational limit restricts the way a process or process equipment is operated. The limit should correlate with the calculated emission limit and with the intended operation of the process or process equipment. Examples of operational limits are provided in Table 4-4.

Table 4-4: Examples of Operational Limits

Operational Limit	Monitoring/Recordkeeping
A person shall not operate the concrete batch plant unless the mixer fabric filter collector is installed and operating properly.	Implement and maintain a routine check to ensure proper operation of the control equipment.
A person shall not operate a painting process unless a thermal oxidizer is installed and operating properly.	The permittee shall monitor and record, in a satisfactory manner, the temperature in the thermal oxidizer on a continuous basis in a manner and with instrumentation acceptable to the AQD. Temperature data recording shall consist of measurements made at equally spaced intervals, not to exceed 15 minutes per interval.
EUPROCESS#1 shall not operate more than 40 hours per calendar week.	The permittee shall keep, in a satisfactory manner, a written log of the weekly hours of operation for EUPROCESS#1.
EUGRAINDRYER shall not operate for more than an average of 200 hours per month, based on a 12-month rolling time period.	The permittee shall keep, in a satisfactory manner, a monthly written log of the hours of operation of EUGRAINDRYER, averaged over the previous 12-month rolling time period.
The volatile organic compound emissions from EUPAINTLINE shall not exceed 3.5 pounds of VOC per gallon of coating as applied, minus water.	The permittee shall keep a record of the VOC content as applied, minus water, in pounds per gallon of each coating used in EUPAINTLINE.
The fuel input to EUBOILER shall not exceed X gallons per month, based on a 12-month rolling time period.	The permittee shall keep a record of the fuel input to EUBOILER on a monthly basis, for the preceding 12-month rolling time period.
The EUBOILER shall not be fired with any fuel other than sweet natural gas.	The permittee shall keep, in a satisfactory manner, a record of the fuels burned in EUBOILER.

Submittal Procedure

The submittal must include at least one original signature, and the signature should be in blue or black ink. Submit three (3) copies of the application along with two (2) copies of any plans, specifications, or drawings to the AQD Permit Section:

AIR QUALITY DIVISION - PERMIT SECTION
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
P. O. BOX 30260
LANSING, MI 48909 -7760

FOR PRIORITY/EXPRESS MAIL:

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION - PERMIT SECTION
CONSTITUTION HALL, 2ND FLOOR SOUTH
525 W ALLEGAN STREET
LANSING, MI 48933-1502

Applications for installation of new processes or for modifications other than limiting the source's PTE may be submitted together. It is your responsibility to notify both the AQD Permit Section and district staff of any situation where applications for new or modified processes and applications limiting PTE have been submitted separately and are being reviewed simultaneously.

Opt-Out Permit Cover Letter Example

Small Business, Inc.

Permit Section Supervisor
Air Quality Division - Permit Section
Michigan Department of Environmental Quality
P. O. Box 30260
Lansing, MI 48909 -7760

Re: Opt-out Permit

To Whom It May Concern:

Please find the enclosed "Opt-out" Permit to Install application for Small Business, Inc. The intent of this permit is to reduce our potential to emit to below applicable major source thresholds and avoid applicability of the Renewable Operating Permit (ROP) Program. Small Business Inc. primarily coats metal components for the automotive industry. While some of our processes are permitted, several are either exempt or grandfathered from the requirement to obtain a Permit to Install. As described in the attached documents, Small Business Inc.'s potential to emit VOCs and HAPs exceeds major source thresholds. The limits we are applying for would restrict our potential to emit to below the major source thresholds and put us more in line with our actual production rates and emission levels.

If you need additional information or if you have any questions related to this application, please contact me at (517) 555-1234. Thank you for your consideration.

Sincerely,

John Small Jr

John Small, Jr.
Environmental Manager
Small Business, Inc.

Permit to Install Application Example

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - AIR QUALITY DIVISION

PERMIT TO INSTALL APPLICATION

For authority to install, construct, reconstruct, relocate, or modify process, fuel-burning or refuse burning equipment and/or control equipment. Permits to install are required by administrative rules pursuant to Section 5505 of 1994 PA 451, as amended.

FOR DEQ USE ONLY
APPLICATION NUMBER

Please type or print clearly. The "Application Instructions" and "Information Required for an Administratively Complete Permit to Install Application" are available on the Air Quality Division (AQD) Permit Web Page at http://www.deq.state.mi.us/aps. Please call the AQD at 517-373-7023 if you have not been contacted within 15 days of your application submittal.

1. FACILITY CODES: State Registration Number (SRN) and North American Industry Classification System (NAICS)
   SRN: Z9999 NAICS: 332812

2. APPLICANT NAME: (Business License Name of Corporation, Partnership, Individual Owner, Government Agency)
   Small Business Inc.

3. APPLICANT ADDRESS: (Number and Street)
   123 Nuts and Bolts Drive
   MAIL CODE:

CITY: (City, Village or Township)	STATE:	ZIP CODE:	COUNTY:
Cool City	**MI**	**48888**	

4. EQUIPMENT OR PROCESS LOCATION: (Number and Street – if different than Item 3)

CITY: (City, Village or Township)	ZIP CODE:	COUNTY:
		Kent

5. GENERAL NATURE OF BUSINESS:
   Metal parts coating for the automotive industry

6. EQUIPMENT OR PROCESS DESCRIPTION: (A Description MUST Be Provided Here. Include Emission Unit IDs. Attach additional sheets if necessary; number and date each page of the submittal.)
   The purpose of this application is to limit out facility's potential to emit VOCs and HAPs to below Title V major source thresholds. See attached for complete list of equipment.

7. REASON FOR APPLICATION: (Check all that apply.)
   - ☐ INSTALLATION / CONSTRUCTION OF NEW EQUIPMENT OR PROCESS
   - ☐ RECONSTRUCTION / MODIFICATION / RELOCATION OF EXISTING EQUIPMENT OR PROCESS – **DATE INSTALLED:**
   - ☒ OTHER – DESCRIBE **OPT-OUT PERMIT APPLICATION**

8. IF THE EQUIPMENT OR PROCESS THAT WILL BE COVERED BY THIS PERMIT TO INSTALL (PTI) IS CURRENTLY COVERED BY ANY ACTIVE PERMITS, LIST THE PTI NUMBER(S): **999-89, 825-82**

9. DOES THIS FACILITY HAVE AN EXISTING RENEWABLE OPERATING PERMIT (ROP)? ☒ NOT APPLICABLE ☐ PENDING APPLICATION ☐ YES
   PENDING APPLICATION OR ROP NUMBER:

10. AUTHORIZED EMPLOYEE:	TITLE:	PHONE NUMBER: (Include Area Code)
John Small, Jr	**Vice President**	**(517)-555-1234**
SIGNATURE: *John Small, Jr*	DATE: **9/1/2015**	E-MAIL ADDRESS:
11. CONTACT: (If different than Authorized Employee. The person to contact with questions regarding this application)		PHONE NUMBER: (Include Area Code)
CONTACT AFFILIATION:	E-MAIL ADDRESS:	

12. IS THE CONTACT PERSON AUTHORIZED TO NEGOTIATE THE TERMS AND CONDITIONS OF THE PERMIT TO INSTALL? ☐ YES ☐ NO

FOR DEQ USE ONLY - DO NOT WRITE BELOW

DATE OF RECEIPT OF ALL INFORMATION REQUIRED BY RULE 203:	
DATE PERMIT TO INSTALL APPROVED:	SIGNATURE:
DATE APPLICATION / PTI VOIDED:	SIGNATURE:
DATE APPLICATION DENIED:	SIGNATURE:

A PERMIT CERTIFICATE WILL BE ISSUED UPON APPROVAL OF A PERMIT TO INSTALL

EQP 5615E (Rev. 09/2006)

Proposed Plan Example

Small Business, Inc.

Proposed Plan

Small Business Inc. coats metal parts for the automotive industry. After calculating the PTE for all processes, we found that we exceeded the major source thresholds for VOCs and HAPs (see attached PTE calculations). This is primarily due to the fact that our special project booth does not have any legal enforceable restrictions to limit its VOC and HAP emissions. PTE calculations indicate that the emissions of VOCs and HAPs from the maintenance paint booth are well above the major source thresholds.

Our actual emission rates are well below those estimated in the PTE calculations. Therefore, we are requesting an "Opt-out" Permit to Install that would include a SOURCE-WIDE emission limit of 90 tons per year for VOCs, 9.0 tons per year for a single HAP, and 22.5 tons per year for total HAPs. To demonstrate compliance with these emission limits, VOC emissions from the entire facility will be calculated monthly for the preceding 12-month rolling time period. In addition, total and individual HAP emissions from the entire facility will be calculated monthly, for the preceding 12-month rolling time period. All emission calculation records will be kept on file for at least five years. I have attached an example of the recordkeeping spreadsheets that will be used to calculate the monthly emission of VOCs and HAPs.

The limits that we are proposing are practically enforceable and would limit our emission of VOCs and HAPs to below the major source thresholds (see attached restricted PTE spreadsheet).

Proposed Enforceable Limits

We are requesting an Opt-out Permit to Install containing the following conditions:

1. The daily VOC emissions for all coating operations are limited to 120 lbs/day. Daily coating usage and VOC emission records will be kept as determined at the end of each month.

2. The individual HAP emission rate for FGFACILITY shall not exceed 9.0 tons per year. The annual limit shall be based upon a 12-month rolling time period as determined at the end of each calendar month.

3. The total HAP emission rate for FGFACILITY shall not exceed 22.5 tons per year. The annual limit shall be based upon a 12-month rolling time period as determined at the end of each calendar month.

4. The VOC emission rate for FGFACILITY shall not exceed 90 tons per year. The annual limit shall be based upon a 12-month rolling time period as determined at the end of each calendar month.

5. The permittee shall calculate the total and individual HAP emission rate from FGFACILITY monthly, for the preceding 12-month rolling time period.

6. The permittee shall calculate the total VOC emission rate from FGFACILITY monthly, for the preceding 12-month rolling time period.

7. All records shall be kept on file for a period of at least five years and made availat the Department upon request.

PTE for CRITERIA POLLUTANTS and proposed PTI Limits Spreadsheet Example

Small Business, Inc.

PTE for CRITERIA POLLUTANTS and proposed Permit Limits

Emission Unit	CO (TON/YR)	NOx (TON/YR)	SOx (TON/YR)	PM (TON/YR)	VOC (TON/YR)	LEAD (TON/YR)	GHG
COATING BOOTHS 1-3				7.0	5.6		
OVEN	0.92	1.10	0.004	0.09	0.04	negligible	1,282
SPECIAL PROJECT BOOTH				2.02	134.9		
PRINTING					0.14		
287(C) BOOTH				3.31	8.2		
COLD CLEANERS					0.475		
CLEANUP					6.0		
GRINDER				57.16			
WELDING				0.03			
BOILER	3.59	4.29	0.03	0.31	0.22	negligible	5,129
GENERATOR	3.25	15.1	1.0	1.06			5,160
TOTAL PTE	**7.76**	**20.49**	**1.03**	**70.98**	**155.6**	**0.0**	**11,571**
PROPOSED EMISSION LIMITS FOR PTI	**NA**	**NA**	**NA**	**NA**	**90.0**	**0.0**	**0.0**

PTE for HAPs and proposed PTI Limits Spreadsheet Example

Small Business, Inc.

PTE for HAPs and proposed PTI Limits

Emission Unit	HAZARDOUS AIR POLLUTANT (TON/YR)								
	Xylene	Toluene	MEK	Chromium	Chromium (VI)	manganese	MIBK	Individual HAPs	Aggregate HAPs
COATING BOOTHS 1-3	5.6								
OVEN									
MAINTENANCE BOOTH	85.85	41.61	7.36						
PRINTING									
SPECIAL PROJECT BOOTH	5.68	2.27					0.25		
COLD CLEANERS									
CLEANUP		6.0							
GRINDER									
WELDING				0.001	0.001	0.001			
BOILER									
GENERATOR									
TOTAL PTE	**97.1**	**49.9**	**7.4**	**0.0**	**0.0**	**0.0**	**0.3**	**-**	**154.7**
PROPOSED EMISSION LIMITS FOR PTI								**9.0**	**22.5**

APPENDIX A
Rules Cited

R 336.1116(n) Definitions; P.

(n) "**Potential to emit**" means the maximum capacity of a stationary source to emit an air contaminant under its physical and operational design. Any physical or operational limit on the capacity of the stationary source to emit an air contaminant, including air pollution control equipment and restrictions on the hours of operation or the type or amount of material combusted, stored, or processed, shall be treated as part of its design only if the limit, or the effect it would have on emissions, is legally enforceable.

Secondary emissions shall not count in determining the "potential to emit" of a stationary source. For hazardous air pollutants that have been listed pursuant to section 112(b) of the clean air act, quantifiable fugitive emissions shall be included in determining the potential to emit of any stationary source. For all other air contaminants, quantifiable fugitive emissions shall be included in determining the "potential to emit" of a stationary source only if the stationary source belongs to 1 of the following categories:

(i) Coal cleaning plants that have thermal dryers.
(ii) Kraft pulp mills.
(iii) Portland cement plants.
(iv) Primary zinc smelters.
(v) Iron and steel mills.
(vi) Primary aluminum ore reduction plants.
(vii) Primary copper smelters.
(viii) Municipal incinerators capable of charging more than 50 tons of refuse per day.
(ix) Hydrofluoric, sulfuric, or nitric acid plants.
(x) Petroleum refineries.
(xi) Lime plants.
(xii) Phosphate rock processing plants.
(xiii) Coke oven batteries.
(xiv) Sulfur recovery plants.
(xv) Carbon black plants that have a furnace process.
(xvi) Primary lead smelters.
(xvii) Fuel conversion plants.
(xviii) Sintering plants.
(xix) Secondary metal production plants.
(xx) Chemical process plants. The term chemical process plant shall not include ethanol production facilities that produce ethanol by natural fermentation included in North American industrial classification system codes 325193 or 312140.
(xxi) Fossil fuel boilers (or combination thereof) totaling more than 250,000,000 Btu per hour heat input.
(xxii) Petroleum storage and transfer units that have a total storage capacity of more than 300,000 barrels or petroleum storage vessels that have a capacity of more than 40,000 gallons.
(xxiii) Taconite ore processing plants.
(xxiv) Glass-fiber processing plants.
(xxv) Charcoal production plants.
(xxvi) Fossil fuel-fired steam electric plants of more than 250,000,000 Btu per hour heat input.
(xxvii) Asphalt concrete plants.
(xxviii) Secondary lead smelters and refineries.
(xxix) Sewage treatment plants.
(xxx) Phosphate fertilizer plants.
(xxxi) Ferroalloy production plants.
(xxxii) Grain elevators.
(xxxiii) Stationary gas turbines.
(xxxiv) Stationary sources that are subject to the federal national emission standards for hazardous air pollutants for the following materials:

(A) Asbestos.
(B) Beryllium.
(C) Mercury.
(D) Vinyl chloride.

R 336.1205 Permit to install; approval.

To view this rule go to **www.michigan.gov/air** (select the "News and Info" tab then "State Air Laws and Rules" then "Air Pollution Control Rules"). This rule is found in Part 2 of the Michigan Air Pollution Control Rules.

R 336.1209 Use of old permits to limit potential to emit.

Rule 209. (1) A person may use a permit to install or a permit to operate issued before May 6, 1980, or a Wayne county permit issued before a delegation of authority to Wayne county pursuant to section 14f of the act, to limit the potential to emit of a stationary source to a quantity less than the amount which would cause the stationary source to be subject to the requirements of R 336.1210 by complying with the requirements of subrule (2) of this rule, if the permit meets both of the following requirements:

(a) The permit contains emission limits that are less than the maximum emissions of the process or process equipment operating at full design capacity without air pollution control equipment, and the permit contains a production or operational limit consistent with the requirements of R 336.1205(1)(a).

(b) The potential to emit of the stationary source, including the emissions authorized by the permit, is less than the quantity of emissions that would cause the stationary source to be considered a major source pursuant to R 336.1211(1)(a).

(2) Except as provided by subrule (3) of this rule, a person shall meet both of the following requirements to use a permit to install or permit to operate issued before May 6, 1980, or a Wayne county permit issued before a delegation of authority to Wayne county pursuant to section 14f of the act, to limit the potential to emit of a stationary source:

(a) Submit a written notice to the department, on a form provided by the department, of the intent that the terms and conditions of the permit to install, permit to operate, or the Wayne county permit be used to limit the potential to emit of the stationary source under the provisions of this rule. The written notice shall include a certification signed by the person that the stationary source, process, or process equipment is in full compliance with the permit to install, permit to operate, or the Wayne county permit.

(b) Maintain records, conduct monitoring, and submit reports as required by the permit and as required pursuant to any applicable requirement to show that the stationary source, process, or process equipment is operating in compliance with the terms and conditions of the permit and any applicable requirements.

(3) A person need not notify the department pursuant to subrule (2)(a) of this rule if the potential to emit of the stationary source, including the emissions authorized by the permit to install or permit to operate issued before May 6, 1980, or the Wayne county permit issued before a delegation of authority to Wayne county pursuant to section 14f of the act, is less than 50% of the quantity that would cause the stationary source to be considered a major source pursuant to R 336.1211(1)(a).

R 336.1278 Exclusion from exemption.

Rule 278. (1) The exemptions specified in R 336.1280 to R 336.1290 do not apply to either of the following:

(a) Any activity that is subject to prevention of significant deterioration of air quality regulations or new source review for major sources in nonattainment areas regulations.

(b) Any activity that results in an increase in actual emissions greater than the significance levels defined in R 336.1119.For the purpose of this rule, "activity" means the concurrent and related installation, construction, reconstruction, relocation, or modification of any process or process equipment.

(2) The exemptions specified in R 336.1280 to R 336.1290 do not apply to the construction of a new major source of hazardous air pollutants or reconstruction of a major source of hazardous air pollutants, as defined in and subject to 40 C.F.R. §63.2 and §63.5(b)(3), national emission standards for hazardous air pollutants, adopted by reference in R 336.1299.

(3) The exemptions specified in R 336.1280 to R 336.1290 do not apply to a construction or modification as defined in and subject to 40 C.F.R. part 61, national emission standards for hazardous air pollutants, adopted by reference in R 336.1299.

(4) The exemptions in R 336.1280 to R 336.1290 apply to the requirement to obtain a permit to install only and do not exempt any source from complying with any other applicable requirement or existing permit limitation.

R 336.1278a Scope of permit exemptions.

Rule 278a. (1) To be eligible for a specific exemption listed in R 336.1280 through R 336.1290, any person owning or operating an exempt process or exempt process equipment shall be able to provide information demonstrating the applicability of the exemption. The demonstration shall be provided within 30 days of a written request from the department. The demonstration may include the following information:

(a) A description of the exempt process or process equipment, including the date of installation.

(b) The specific exemption being used by the process or process equipment.

(c) An analysis demonstrating that R 336.1278 does not apply to the process or process equipment.

(2) The records required by this rule shall be provided in addition to any other records required within a specific exemption.

R 336.1280 - R 336.1290 Permit to install exemptions

To view these rules go to **www.michigan.gov/air** (select the "News and Info" tab then "State Air Laws and Rules" then "Part 2 Exemptions"). These rules are found in Part 2 of the Michigan Air Pollution Control Rules.

R 336.1287 Permit to install exemptions; surface coating equipment.

Rule 287. The requirement of R 336.1201(1) to obtain a permit to install does not apply to any of the following:

(a) An adhesive coating line which has an application rate of less than 2 gallons per day and which has emissions that are released only into the general in-plant environment.

(b) A surface coating process that uses only hand-held aerosol spray cans, including the puncturing and disposing of the spray cans.

(c) A surface coating line if all of the following conditions are met:

(i) The coating use rate is not more than 200 gallons, as applied, minus water, per month.

(ii) Any exhaust system that serves only coating spray equipment is supplied with a properly installed and operating particulate control system.

(iii) Monthly coating use records are maintained on file for the most recent 2-year period and are made available to the air quality division upon request.

(d) A powder coating booth that has an appropriately designed and operated particulate control system and associated ovens.

(e) A silkscreen process.

(f) Replacement of waterwash control in a paint spray booth with dry filter control.

(g) Adding dry filters to paint spray booths.

(h) Replacement of a coating applicator system with a coating applicator system that has an equivalent or higher design transfer efficiency, unless the change is specifically prohibited by a permit condition.

(i) Equipment that is used for the application of a hot melt adhesive.

(j) Portable equipment that is used for on-site nonproduction painting.

(k) Mixing, blending, or metering operations associated with a surface coating line.

R 336.1331 Emission of Particulate Matter

To view this rule go to **www.michigan.gov/air** (select the "News and Info" tab then "State Air Laws and Rules" then "Air Pollution Control Rules"). This rule is found in Part 3 of the Michigan Air Pollution Control Rules.

R 336.1611 Existing cold cleaners.

Rule 611. (1) A person shall not operate an existing cold cleaner unless all of the provisions of subrules (2) to (4) are met or unless an equivalent control method is approved by the department.

(2) A person shall not operate an existing cold cleaner unless all of the following conditions are met:

(a) A cover shall be installed and shall be closed when parts are not being handled in the cleaner.

(b) A device shall be available for draining cleaned parts, and the parts shall be drained not less than 15 seconds or until dripping ceases.

(c) Waste organic solvent shall be stored only in closed containers, unless the stored solvent is demonstrated to be a safety hazard and is disposed of so that not more than 20%, by weight, is allowed to evaporate into the atmosphere.

(3) A person who is responsible for the operation of a cold cleaner shall develop written procedures for compliance with the provisions of this rule. The procedures shall be posted in an accessible, conspicuous location near the cold cleaner.

(4) The provisions of this rule do not apply to cold cleaners that are subject to the provisions of the halogenated solvent cleaner national emission standards for hazardous air pollutants (1995), which are adopted by reference in R 336.1651.

R 336.1612 Existing open top vapor degreasers.

Rule 612. (1) After June 30, 1980, it is unlawful for a person to operate an existing open top vapor degreaser unless all of the provisions of the following subrules are met or unless an equivalent control method is approved by the department.

(2) It is unlawful for a person to operate an existing open top vapor degreaser unless all of the following conditions are met:

(a) A cover shall be installed that is designed to be opened and closed easily without disturbing the vapor zone. The cover shall be closed at all times, except when processing workloads through the degreaser.

(b) A procedure shall be developed to minimize organic solvent carryout by doing all of the following:

(i) Racking parts to allow complete drainage.

(ii) Moving parts in and out of the degreaser at a vertical speed of less than 11 feet per minute when a powered hoist is used to raise or lower the parts.

(iii) Holding parts in the vapor zone not less than 30 seconds or until condensation ceases.

(iv) Tipping or tumbling parts in a manner such that no pools of organic solvent remain on the cleaned parts before removal.

(v) Allowing parts to dry within the degreaser for not less than 15 seconds or until visually dry.

(c) Total workload shall not occupy more than 1/2 of the degreaser's open top area.

(d) Organic solvent shall not be sprayed above the vapor level.

(e) Organic solvent leaks shall be repaired immediately.

(f) The degreaser shall be operated in a manner such that no water is visibly detectable in solvent exiting the water separator.

(g) Exhaust ventilation shall not exceed 65 cubic feet per minute per square foot of degreaser open area, unless necessary to meet OSHA requirements.

(h) Waste organic solvent shall be stored only in closed containers, unless demonstrated to be a safety hazard and disposed of in a manner such that not more than 20% by weight is allowed to evaporate into the atmosphere.

(3) A person responsible for the provisions of this rule shall develop written procedures for the operation of all such provisions, and such procedures shall be posted in an accessible, conspicuous location near the vapor degreaser.

(4) The provisions of this rule do not apply to any existing open top vapor degreaser having an air/vapor interface of less than 4 square feet.

(5) The provisions of this rule do not apply to an existing open top vapor degreaser that is subject to the provisions of the halogenated solvent cleaner national emission standards for hazardous air pollutants (1995), which are adopted by reference in R 336.1651.

R 336.1621 Emission of volatile organic compounds from existing metallic surface coating lines

To view this rule go to **www.michigan.gov/air** (select the "News and Info" tab then "State Air Laws and Rules" then "Air Pollution Control Rules"). This rule is found in Part 6 of the Michigan Air Pollution Control Rules.

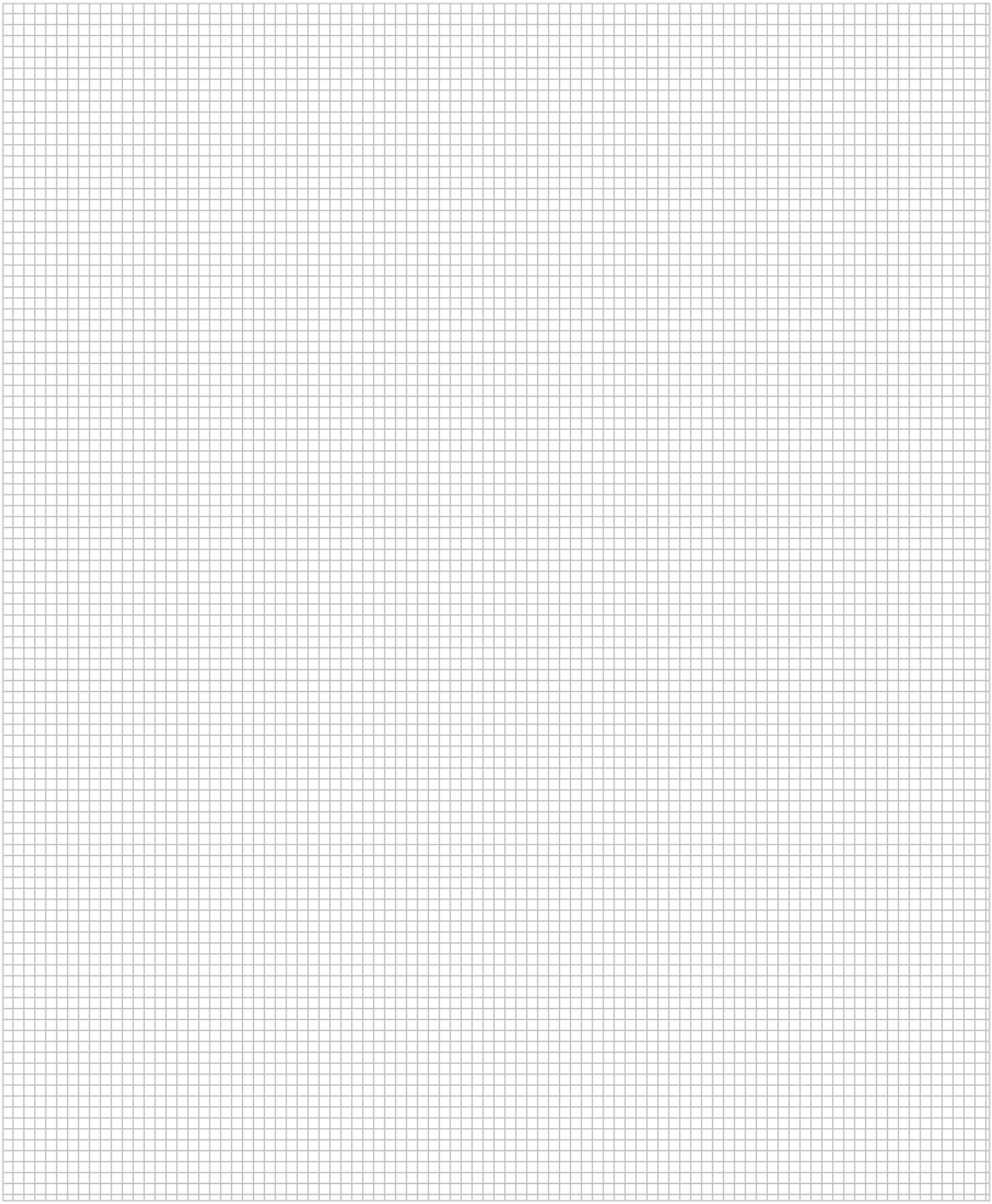
R 336.1708 New open top vapor degreasers

To view this rule go to **www.michigan.gov/air** (select the "News and Info" tab then "State Air Laws and Rules" then "Air Pollution Control Rules"). This rule is found in Part 7 of the Michigan Air Pollution Control Rules.

APPENDIX B

Potential to Emit Worksheets

SITE DIAGRAM



PTE SUMMARY TABLE

Emission Source	Description	Permit Status	Legally Enforceable Limitation	Calculation Method
		☐ Permitted: PTI #__________ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336.___________		
		☐ Permitted: PTI #__________ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336.___________		
		☐ Permitted: PTI #__________ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336.___________		
		☐ Permitted: PTI #__________ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336.___________		
		☐ Permitted: PTI #__________ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336.___________		
		☐ Permitted: PTI #__________ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336.___________		
		☐ Permitted: PTI #__________ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336.___________		
		☐ Permitted: PTI #__________ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336.___________		
		☐ Permitted: PTI #__________ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336.___________		
		☐ Permitted: PTI #__________ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336.___________		
		☐ Permitted: PTI #__________ ☐ Grandfathered: ___/___/__ ☐ Exempt: R 336.___________		

EMISSION TOTALS – POTENTIAL TO EMIT CRITERIA POLLUTANTS

Emission Unit	CO (TON/YR)	NOx (TON/YR)	SOx (TON/YR)	PM (TON/YR)	VOC (TON/YR)	LEAD (TON/YR)
TOTAL						

EMISSION TOTALS – POTENTIAL TO EMIT HAPs

Emission Unit	HAZARDOUS AIR POLLUTANT (TON/YR)						
TOTAL							

ALL HAPS TOTAL:

APPENDIX C

Permit to Install Application

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - AIR QUALITY DIVISION

PERMIT TO INSTALL APPLICATION

For authority to install, construct, reconstruct, relocate, or modify process, fuel-burning or refuse burning equipment and/or control equipment. Permits to install are required by administrative rules pursuant to Section 5505 of 1994 PA 451, as amended.

FOR DEQ USE ONLY
APPLICATION NUMBER

Please type or print clearly. The "Application Instructions" and "Information Required for an Administratively Complete Permit to Install Application" are available on the Air Quality Division (AQD) Permit Web Page at http://www.deq.state.mi.us/aps. Please call the AQD at 517-373-7023 if you have not been contacted within 15 days of your application submittal.

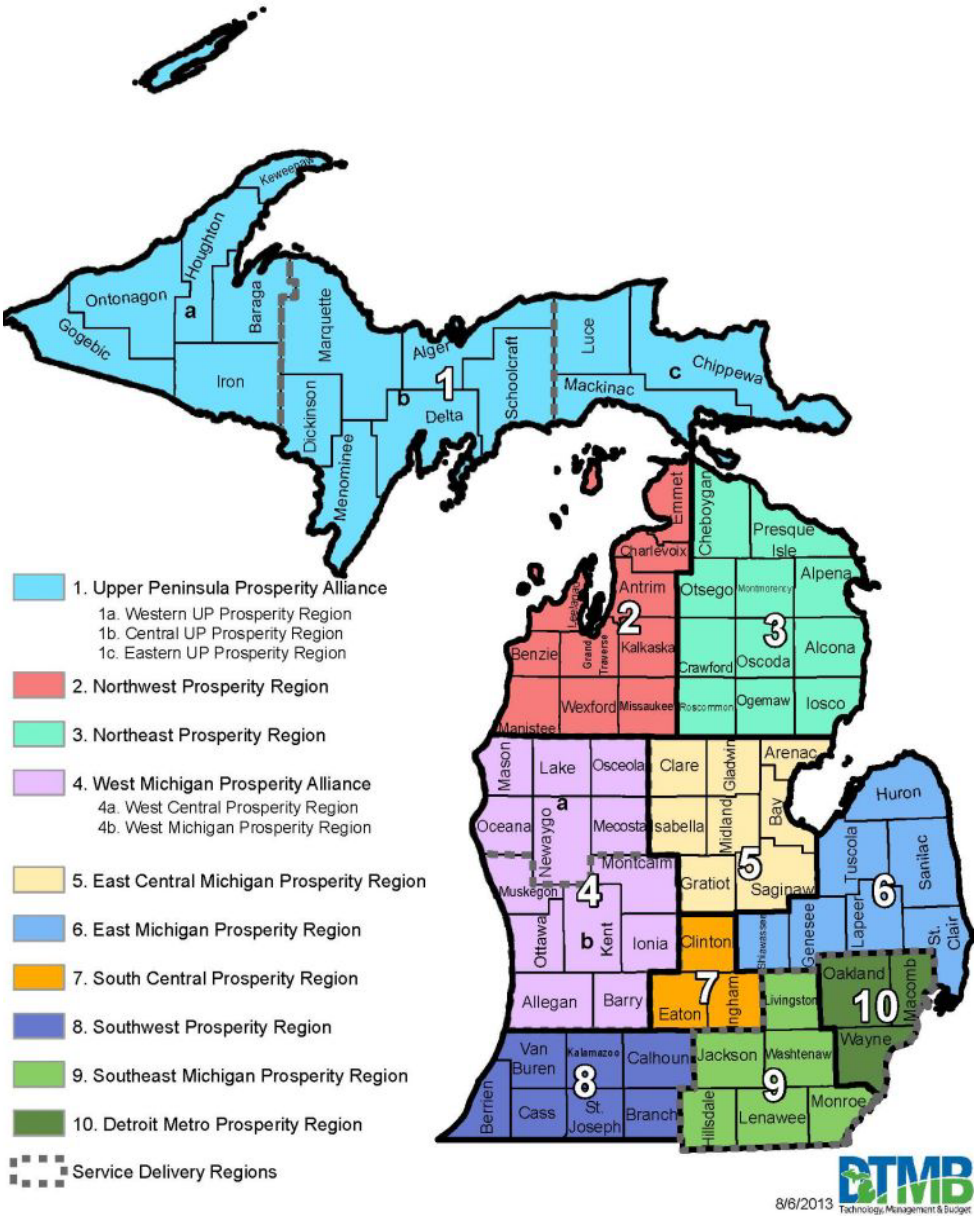
1. FACILITY CODES: State Registration Number (SRN) and North American Industry Classification System (NAICS) SRN [ ][ ][ ][ ][ ][ ] NAICS [ ][ ][ ][ ][ ][ ]			
2. APPLICANT NAME: (Business License Name of Corporation, Partnership, Individual Owner, Government Agency)			
3. APPLICANT ADDRESS: (Number and Street)		MAIL CODE:	
CITY: (City, Village or Township)	STATE:	ZIP CODE:	COUNTY:
4. EQUIPMENT OR PROCESS LOCATION: (Number and Street – if different than Item 3)			
CITY: (City, Village or Township)		ZIP CODE:	COUNTY:
5. GENERAL NATURE OF BUSINESS:			
6. EQUIPMENT OR PROCESS DESCRIPTION: (A Description MUST Be Provided Here**.** Include Emission Unit IDs. Attach additional sheets if necessary; number and date each page of the submittal.)			
7. REASON FOR APPLICATION: (Check all that apply.) ☐ INSTALLATION / CONSTRUCTION OF NEW EQUIPMENT OR PROCESS ☐ RECONSTRUCTION / MODIFICATION / RELOCATION OF EXISTING EQUIPMENT OR PROCESS – **DATE INSTALLED:** ☐ OTHER – DESCRIBE			
8. IF THE EQUIPMENT OR PROCESS THAT WILL BE COVERED BY THIS PERMIT TO INSTALL (PTI) IS CURRENTLY COVERED BY ANY ACTIVE PERMITS, LIST THE PTI NUMBER(S):			
9. DOES THIS FACILITY HAVE AN EXISTING RENEWABLE OPERATING PERMIT (ROP)? ☐ NOT APPLICABLE ☐ PENDING APPLICATION ☐ YES PENDING APPLICATION OR ROP NUMBER:			
10. AUTHORIZED EMPLOYEE:	TITLE:	PHONE NUMBER: (Include Area Code)	
SIGNATURE:	DATE:	E-MAIL ADDRESS:	
11. CONTACT: (If different than Authorized Employee. The person to contact with questions regarding this application)		PHONE NUMBER: (Include Area Code)	
CONTACT AFFILIATION:	E-MAIL ADDRESS:		
12. IS THE CONTACT PERSON AUTHORIZED TO NEGOTIATE THE TERMS AND CONDITIONS OF THE PERMIT TO INSTALL? ☐ YES ☐ NO			

FOR DEQ USE ONLY - DO NOT WRITE BELOW	
DATE OF RECEIPT OF ALL INFORMATION REQUIRED BY RULE 203:	
DATE PERMIT TO INSTALL APPROVED:	SIGNATURE:
DATE APPLICATION / PTI VOIDED:	SIGNATURE:
DATE APPLICATION DENIED:	SIGNATURE:
A PERMIT CERTIFICATE WILL BE ISSUED UPON APPROVAL OF A PERMIT TO INSTALL	

EQP 5615E (Rev. 09/2006)

APPENDIX D:
MDEQ District Offices

State of Michigan Prosperity Regions



DEQ DISTRICT OFFICES

Region 1 - Upper Peninsula District Office
1504 West Washington Street
Marquette, MI 49855
Phone: 906-346-8300

Region 2 - Cadillac District Office
120 West Chapin St.
Cadillac, MI 49601
Phone: 231-775-3960

Region 3 - Gaylord Field Office
2100 West M-32
Gaylord, MI 49735
Phone: 989-731-4920

Region 4 - Grand Rapids District Office
350 Ottawa Avenue, NW, Unit 10
Grand Rapids, MI 49503-2341
Phone: 616-356-0500

Regions 5 & 6 - Saginaw Bay District Office
401 Ketchum Street, Suite B
Bay City, MI 48708
Phone: 989-894-6200

Region 7 - Lansing District Office
Constitution Hall, 1st Floor South
525 West Allegan Street
Lansing, MI 48933
Phone: 517-284-6651

Region 8 - Kalamazoo District Office
7953 Adobe Road
Kalamazoo, MI 49009-5025
Phone: 269-567-3500

Region 9 - Jackson District Office
301 East Louis Glick Highway
Jackson, MI 49201-1556
Phone: 517-780-7690

Region 10 - SE Michigan District Office
27700 Donald Court
Warren, MI 48092-2793
Phone: 586-753-3700

Detroit Field Office
Cadillac Place
3058 W. Grand Blvd., Ste. 2-300
Detroit, MI 48202
Phone: 313-456-4700

DEQ LANSING HEADQUARTERS

Michigan Department of Environmental Quality
Constitutional Hall
525 W. Allegan Street
P.O. Box 30473
Lansing, MI 48909-7973
800-662-8278

DEQ DISTRICT OFFICES

Upper Peninsula District
1504 W. Washington St.
Marquette, MI 49855
906-228-4853
Counties: Entire Upper Peninsula

Cadillac District
120 W Chapin Street
Cadillac, MI 49601-2158
231-775-3960
Counties: Benzie, Grand Traverse, Kalkaska, Lake, Leelanau, Manistee, Mason, Missaukee, Osceola, Wexford

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Gaylord Office
2100 West M-32
Gaylord, MI 49735-9282
989-731-4920
Counties: Alcona, Alpena, Antrim, Charlevoix, Cheboygan, Crawford, Emmet, Montmorency, Oscoda, Otsego, Presque Isle, Roscommon

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Saginaw Bay District
Saginaw Bay District Headquarters
401 Ketchum St., Ste. B
Bay City, MI 48708
989-894-6200
Counties: Arenac, Bay, Clare, Gladwin, Huron, Iosco, Isabella, Midland, Ogemaw, Saginaw, Sanilac, Tuscola

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Grand Rapids District
350 Ottawa NW
Grand Rapids, MI 49503
616-356-0500
*Counties: Barry, Ionia, Kent, Mecosta, Montcalm, Muskegon, Newaygo, Oceana, Ott*awa

DISTRICT OFFICE LOCATIONS *(continued)*

Kalamazoo District
7953 Adobe Road
Kalamazoo, MI 49009-5026
269-567-3500
Counties: Allegan, Berrien, Branch, Calhoun, Cass, Kalamazoo St. Joseph, Van Buren

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Lansing District
Constitution Hall
525 W. Allegan St., 1S
P.O. Box 30242
Lansing, MI 48909-7742
517-284-6651
Counties: Clinton, Eaton, Genesee, Gratiot, Ingham, Lapeer, Livingston, Shiawassee

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Jackson District
State Office Building, 4th Floor
301 E Louis B Glick Highway
Jackson, MI 49201-1556
517-780-7690
Counties: Hillsdale, Jackson, Lenawee, Monroe, Washtenaw

Southeast Michigan District
27700 Donald Court
Warren, MI 48092-2793
586-753-3700
Counties: Macomb, Oakland, St. Clair

Detroit Office
Cadillac Place, Suite 2-300
3058 West Grand Blvd.
Detroit, MI 48202-6058
313-456-4700
Counties: Wayne

APPENDIX E:
Resources

*The following guidance materials can be found on the MDEQ's Potential to Emit website. To access this website go to **www.michigan.gov/air** (select the "Permits" tab, then "Potential to Emit").*

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY PTE GUIDANCE

- **Potential To Emit Workbook – A Practical Guide to Calculating and Evaluating Your Potential to Emit**

- **PTE Calculation Worksheets**
  - Boiler (Natural Gas Fired)
  - Space Heater (Natural Gas Fired)
  - Generator (Diesel)
  - Spray Paint Line
  - Oven (Natural Gas Fired)
  - Degreaser
  - Particulate Matter Sources
  - How to Calculate the HAP and VOC content of a Multi-Part Coating

- **AQD-004:** Mechanisms for Limiting the Applicability of Michigan's Renewable Operating Permit Program

- **Permit to Install Application Form**

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA) PTE GUIDANCE

- **EPA Potential to Emit: A Guide for Small Business** (October 1998)

- **Calculating Potential to Emit (PTE) for Emergency Generators.** September 26, 1995 policy memorandum from J.S. Seitz, Office of Air Quality Planning and Standards.

- **Calculating PTE and Other Guidance for Grain Handling Facilities.** November 14, 1995 policy memorandum from J.S. Seitz, Office of Air Quality Planning and Standards.

- **PTE Guidance for Specific Source Categories**. April 14, 1998 policy memorandum from J.S. Seitz, Office of Air Quality Planning and Standards, and E. Schaeffer, Office of Regulatory Enforcement.

- **Clarification of Methodology for Calculating PTE for Batch Chemical Production Operations.** August 29, 1996 policy memorandum from J.S. Seitz, Office of Air Quality Planning and Standards.

- **Definition of Regulated Air Pollutant for the Purposes of Title V.** April 1993 policy memorandum from Lydia N. Wegman, Office of Air Quality Planning and Standards.

- **PTE for MACT Standards – Guidance on Timing Issues.** May 16, 1995 policy memorandum from J.S. Seitz, Office of Air Quality Planning and Standards.

- **Guidance on the Major Source Determination for Certain Hazardous Air Pollutants.** August 14, 2000 policy memorandum from J.S. Seitz, Office of Air Quality Planning and Standards.

- **Preferred and Alternative Methods for Estimating Air Emissions from Equipment Leaks** (November 1996).

- **AP-42 Compilation of Air Pollution Emission Factors**

- **EPA's Web FIRE - Search and Retrieval of EPA Emissions Factors.** Database containing EPA's emission estimation factors for criteria and hazardous air pollutants.

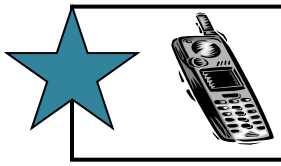
- **TANKS Emission Estimation Software.** Software program that estimates volatile organic compound (VOC) and hazardous air pollutant (HAP) emissions from fixed- and floating-roof storage tanks.

- **List of Hazardous Air Pollutants**

OTHER GUIDANCE MATERIALS

- **Permit to Install – Determining Applicability Guidebook**
  www.michigan.gov/air (select the "Permits" tab, then "Air Permits (Permits to Install)")

- **Michigan Air Pollution Control Rules**
  www.michigan.gov/air (select the "News and Info" tab, then "State Air Laws and Rules" then "Air Pollution Control Rules")



For additional assistance contact the DEQ Office of Environmental Assistance at 800-662-9278.