

Air Permitting, Permitting Strategy, and Importance of Management Involvement

FOR:

2018 INDIANA ENVIRONMENTAL
CONFERENCE

PREPARED BY:



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Clean Air Act

1970 USEPA air quality standards

- set ambient air quality standards
- states to achieve compliance ("attainment")
- construction permit for major sources
- set BACT

1990 USEPA operating permit for major sources

- mandates for nonattainment areas
- hazardous air pollutants - USEPA MACT Standards
- acid rain
- Established Title V air permitting requirements

Regulated Air Emissions

1) Criteria Pollutants

- Particulate matter
- Sulfur dioxide
- Ground level ozone (VOC and NOx)
- Oxides of nitrogen
- Carbon monoxide
- Lead

2) Hazardous air pollutants

Hazardous Air Pollutants

1990 CAA amendments - 189 HAPs (Now 187)

Examples of sources: metals and dusts, chemical process emissions, coating operations

Established Maximum Achievable Control (MACT) under NESHAPS for HAPs

Established technology based standards for major and area sources

Permit Levels

Registration	PTE < 25 TPY
MSOP	Uncontrolled PTE <100 and >25 TPY
FESOP	Uncontrolled PTE >100 and PTE <100 TPY and Minor HAP source
Part 70	PTE > 100 TPY or Major HAP source
PSD Minor	PTE < 250 TPY
PSD Major	PTE > 250 TPY
Emission Offset Minor	PTE < 100 TPY for non attainment criteria pollutant
Emission Offset Major	PTE > 100 TPY for non attainment criteria pollutant

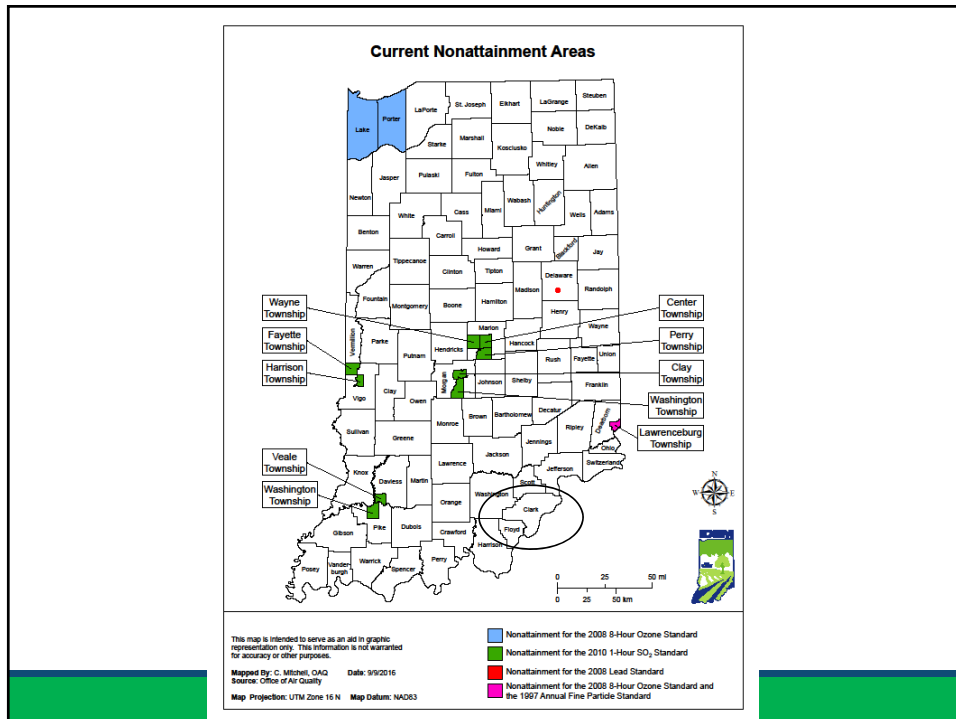
Non Attainment

Non attainment Areas in Indiana

Subject to Emission Offset Requirements

Restricts new sources to 100 TPY to maintain minor source status if emitting non attainment criteria pollutant

Requires major sources and major modifications to obtain offsets from existing permitted sources if emitting non attainment criteria pollutant



28 Listed Sources

Source Categories

See 326 IAC 2-7-1(22)(B) – Some examples include:

- Coal cleaning plants (thermal dryers)
- Chemical process plants, excluding ethanol plants
- Fuel conversion plants
- Portland Cement Plants
- Iron and Steel Mills
- Petroleum Storage and Transfer (exceeding 300,000 barrels)

Fugitive Emissions

If one (1) of the source categories that directly emits or has the potential to emit 100 TPY or any regulated air pollutant....Must consider significant sources of fugitive emissions in determining major source status.

Modification Process Summary

Mod Levels – Part 70

1) Administrative Amendment – 326 IAC 2-7-11

A) Exemption – 326 IAC 2-1.1-3

- < 5 TPY PM, PM10, or PM2.5
- < 10 TPY SO₂
- < 10 TPY NO_x
- < 10 TPY VOC
- < 25 TPY CO
- < 0.2 TPY Pb
- < 1 TPY Single HAP; < 2.5 TPY Total HAP

B) Insignificant Activity – 326 IAC 2-7-1(21)

- < 0.6 TPY or 3.29 lb per day Pb
- < 25 lb per day CO
- < 25 lb per day or 5 lb per hour SO₂
- < 15 lb per day or 3 lb per hour VOC
- < 15 lb per day or 5 lb per hour No_x
- < 25 lb per day or 5 lb per hour PM10 or PM2.5

C) Trivial Activities – 326 2-7-1(42)

Mod Levels – Part 70

2) Minor Source Modification

- < 25 TPY and \geq 5 TPY PM, PM10, PM2.5
- < 25 TPY and \geq 10 TPY SO₂, No_x and VOC
- < 25 TPY and \geq 5 TPY VOC (using control device to comply with 326 IAC 8)
- < 100 TPY and \geq 25 TPY CO
- < 1 TPY and \geq 0.2 TPY Pb

Mod Levels – Part 70

3) Minor Permit Modification – 326 IAC 2-7-12(b)

- Do not violate any applicable requirement
- No significant change to monitoring, reporting or record keeping
- Do not require a change to emission limitation
- Will not establish or change:
 - An emission cap
 - An alternative emission limit
- Are not modifications under Title I of CAA
- Are not otherwise required to be processed as Significant Modification

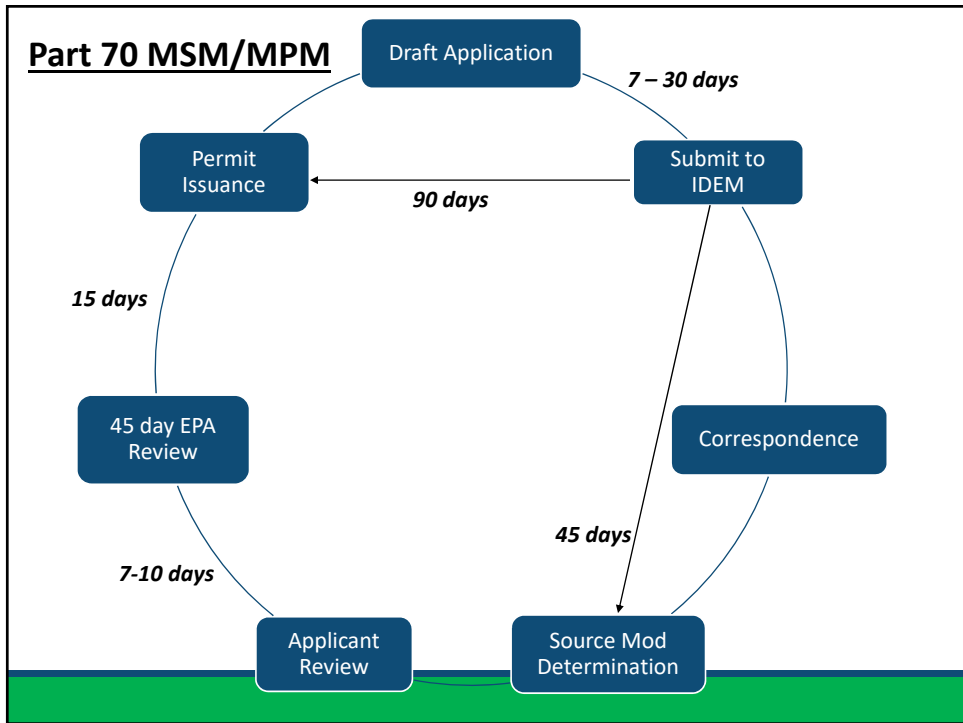
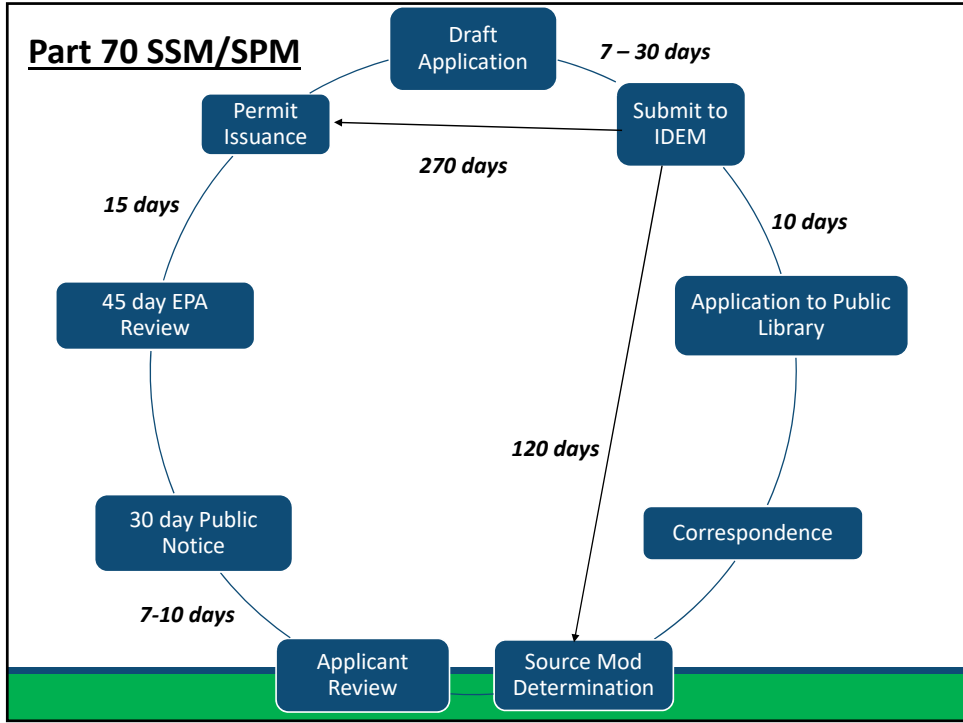
Mod Levels – Part 70

4) Significant Source Modification

- > 25 TPY PM, PM10, PM2.5
- > 25 TPY SO₂, Nox and VOC
- > 25 TPY VOC (using control device to comply with 326 IAC 8)
- > 100 TPY CO
- > 1 TPY Pb

5) Significant Permit Modification – 326 IAC 2-7-12(d)

- Anything that does not qualify as an AA or a MPM



Estimating Emissions

Emission Calculations

Calculations are used to determine:

- Level of modification – construction and operating
- Evaluating and establishing limits
- Evaluating controls
- Federal Standard Applicability (i.e. NESHAP and NSPS)
- State Regulations Applicability (i.e. 8-1-6 and 6-3-2)

Emission Calculations

Emissions should be evaluated in several forms

- Uncontrolled and Unlimited
- Uncontrolled Potential to Emit
- Controlled Potential to Emit
- Potential to Emit after Issuance/Limited
- Estimated Actual Emissions (Used internally)

Potential to Emit (PTE)

PTE = Emissions of a facility if running 8,760 hours per year

Note: physical or production constraints (bottlenecks) may be factored in.

Emission Calculations Steps

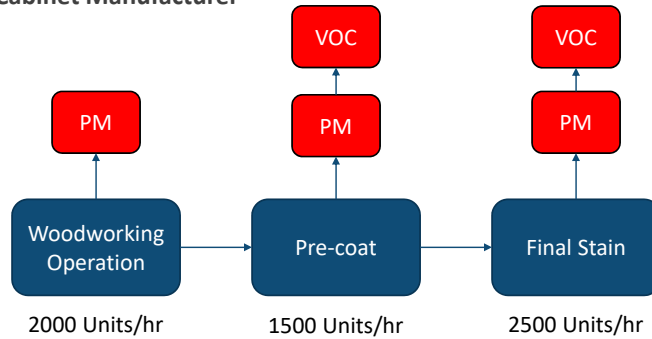
- 1) Uncontrolled Emissions
 - **Production Rate x Emission Factor x 8,760 hours**
- 2) Uncontrolled Potential to Emit
 - **Uncontrolled Emissions with Bottleneck Restrictions**
- 3) Controlled PTE
 - **Potential to Emit x Capture and Control Efficiency**
- 4) Limited/Controlled Emissions after Issuance

Emission Factors

- 1) Input's chemical composition
- 2) Site Specific or Representative Study (i.e. engineering study, stack test, etc.).
- 3) AP-42
- 4) Factor Information Retrieval Estimation (FIRE)
- 5) Tanks Program
- 6) AP-40

Emission Calculations Example

Wood Cabinet Manufacturer



Final Stain Uncontrolled/Unlimited

- 1) Uncontrolled Emissions *Emission Factor*
- VOC = 2,500 units per hour * gal/unit * VOC/gallon * 8,760 hours
- PM = 2,500 units per hour * gal/unit * lb/gal * (1 - Weight % Volatiles) * (1 - Transfer Efficiency) * 8,760 hours
- HAP = 2,500 units per hour * gal/unit * HAP/gallon * 8,760 hours

Final Stain PTE

2) Uncontrolled PTE

Emission Factor

$$\text{VOC} = 1,500 \text{ units per hour} * \text{gal/unit} * \text{VOC/gallon} * 8,760 \text{ hours}$$
$$\text{PM} = 1,500 \text{ units per hour} * \text{gal/unit} * \text{lb/gal} * (1 - \text{Weight \% Volatiles}) * (1 - \text{Transfer Efficiency}) * 8,760 \text{ hours}$$
$$\text{HAP} = 1,500 \text{ units per hour} * \text{gal/unit} * \text{HAP/gallon} * 8,760 \text{ hours}$$

Final Stain Controlled

3) Controlled Emissions

Emission Factor

$$\text{VOC} = 1,500 \text{ units per hour} * \text{gal/unit} * \text{VOC/gallon} * 8,760 \text{ hours} * [\text{RTO Efficiency?}]$$
$$\text{PM} = 1,500 \text{ units per hour} * \text{gal/unit} * \text{lb/gal} * (1 - \text{Weight \% Volatiles}) * (1 - \text{Transfer Efficiency}) * 8,760 \text{ hours} * \text{Control Efficiency (Fabric Filters)}$$
$$\text{HAP} = 1,500 \text{ units per hour} * \text{gal/unit} * \text{HAP/gallon} * 8,760 \text{ hours} * [\text{RTO Efficiency?}]$$

Calculations

Calculation spreadsheets for inventory and permitting should include:

1. Emission Units with IDs and Construction Year
2. Process rates (before and after bottleneck)
3. Control Equipment IDs, Construction Year and Efficiency Rating
4. Emission Factors – include calculations or reference

Calculation outputs should include:

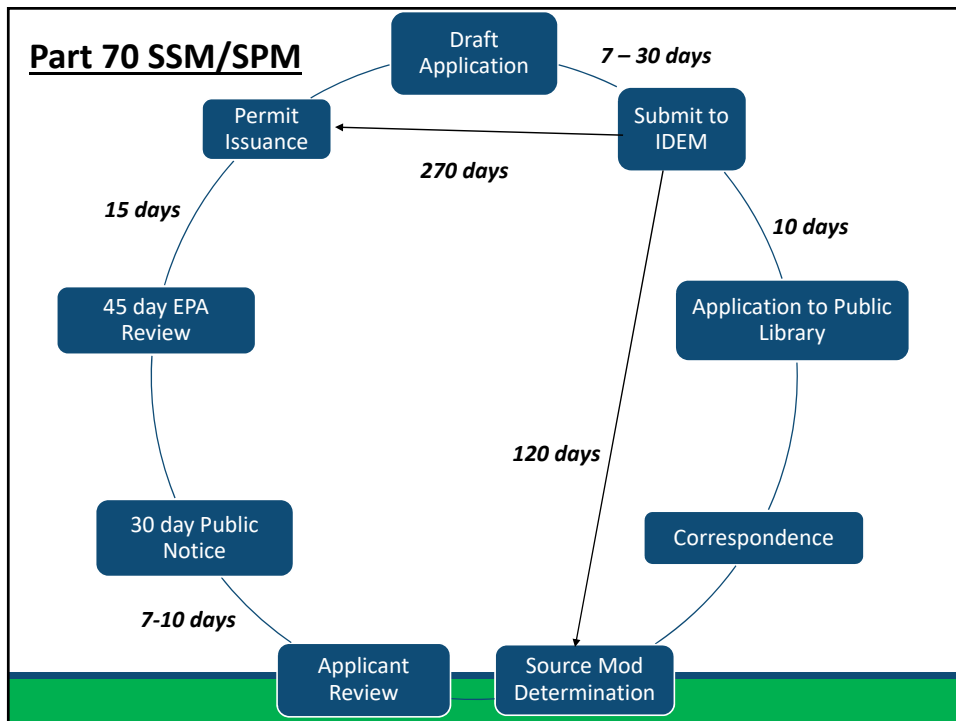
1. Yearly potential emissions for each regulated pollutants
2. (If valuable) Estimated actual emissions for each regulated pollutant
3. Hourly emission rates for applicable pollutants and scenarios
4. Daily emission rates for applicable pollutants and scenarios

Uncontrolled/Unlimited Emissions

Emission Unit	PM	VOC	Single HAP	Total HAPs
Woodworking	271.43	-	-	-
Pre-coat	116.04	2,742	50.76	53.56
Final Stain	147.95	2,693	51.27	54.23

Uncontrolled PTE Emissions

Emission Unit	PM	VOC	Single HAP	Total HAPs
Woodworking	271.43	-	-	-
Pre-coat	116.04	2,742	50.76	53.56
Final Stain	88.77	1,615	30.76	32.538



Controlled PTE Emissions

Emission Unit	PM	VOC	Single HAP	Total HAPs
Woodworking	13.57	-	-	-
Pre-coat	2.32	2,742	50.76	53.56
Final Stain	1.77	1,615	30.76	32.538

Controlled/After Issuance

Emission Unit	PM	VOC	Single HAP	Total HAPs
Woodworking	13.57	-	-	-
Pre-coat	2.32	240*	5*	12.5*
Final Stain	1.77			

* Combined with other emission units at the source

Evaluate Limit

Emission Unit	PM	VOC	Single HAP	Total HAPs
Woodworking	13.57	-	-	-
Pre-coat	2.32	240*	5*	12.5*
Final Stain	1.77			

Scenario:

Most recent quarterly report says 4.3 tons of Single HAP and 10.75 Total HAPs for the 12-month total.

Quarterly data is for 3 automated booths and 6 manual booths. What will adding 2 more automated booths do?

Outcome:

Consider becoming a major source for HAPs and comply with an average HAP lb/lb solids limit as described in 40 CFR Part 63 Subpart JJ

Timing

Source Modification Determination: 120 days

Permit Modification Issuance: 270 days

Desired Construction: 60 days

Interim Approvals

Use of Interim Approvals

Applicability: For proposed modifications/revisions to an *existing source* and located in an *attainment area*.

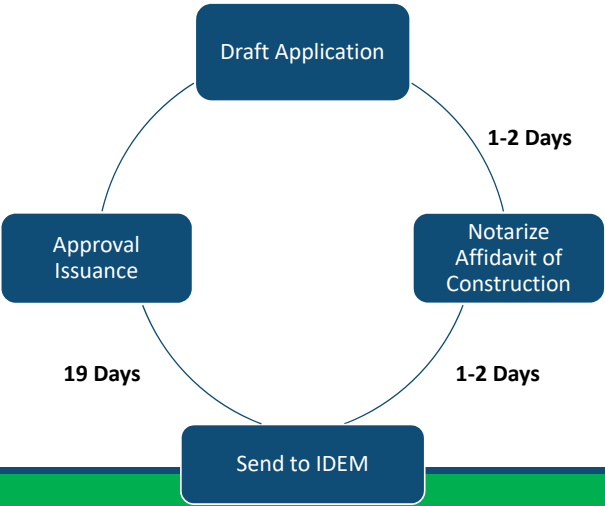
Purpose: Allow a facility to commence construction (*But not operate*) while the permit application is being reviewed.

Note: Constructing at own risk without permit approval

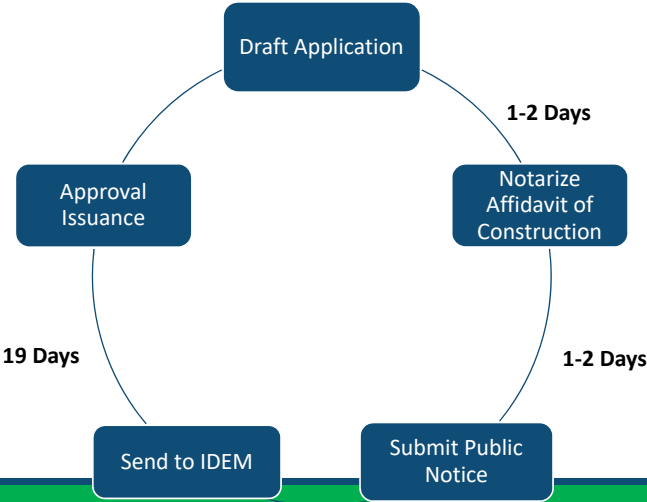
Application Includes:

1. Petition for Interim Approval – including PTE calculations and any Federal rule applicability
2. Public Notice (SSM or SPR only)
3. Affidavit of Construction
4. Interim Petition Checklist
5. Check to Cashier's office

Timing Interim Approvals – MSM/MPR



Timing Interim Approvals – SSM/SPR



Mini Case Studies

Example 1: SOCFI Plant

Key Takeaway:

Do not rely on emission factors in current permit

Scenario:

SOCFI Emission factor for VOC prior to establishing a Leak Detection and Repair program = 1.48 lb/hr.

SOCFI Emission factor for VOC with an established Leak Detection and Repair Program = 1.48 lb/hr with 87% Subpart Vva Control Effectiveness.

Outcome:

Allowed to apply “after control” to PTE in this case, which could change this from a Significant Modification to a Minor Modification

Example 2: 8-1-6

Key Takeaway:

Evaluate projected growth against existing limits – Run the numbers.

Scenario:

Company A produces a “luxury good”. Incomes are rising (or less threat of decline), economy is growing, and employment rates are down, so production is expected to continue to rise.

Latest quarterly report shows 24.7 tons over the last 12-months at a facility with an 8-1-6 limit of 25 tons per 12 months.

Limited cash and financial philosophy is to keep debt to a minimum

Outcome:

Render 8-1-6 applicable and take a daily weighted average of lb/gal VOC content of materials used, rather than a control device.

Example 3: Once in Always In

Key Takeaway:

Always verify inputs to emission calculations

Scenario:

Company B coats plastic parts for general industry.

A new unit was permitted 5 years since one of similar kind, so the coating content from the last modification was used.

Since then the supplier changed HAP content without explicit notification to their customer.

Outcome:

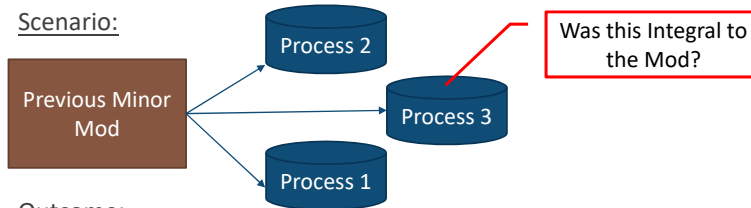
Increased HAP content should have triggered Subpart PPPP applicability 5 years ago and no limit was applied to the source.

Example 4: Circumvention

Key Takeaway:

Evaluate each construction for permitting requirements

Scenario:



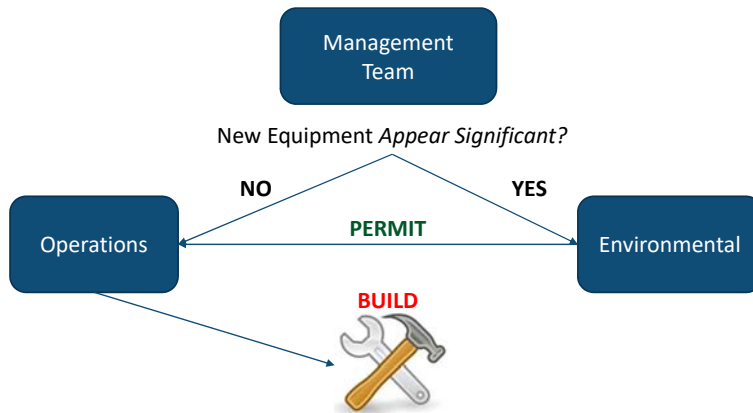
Outcome:

Avoid circumvention because Process 3 was not integral with the emission units permitted in the Minor Modification. Process 3 permitted as a Trivial Activity

Management Involvement

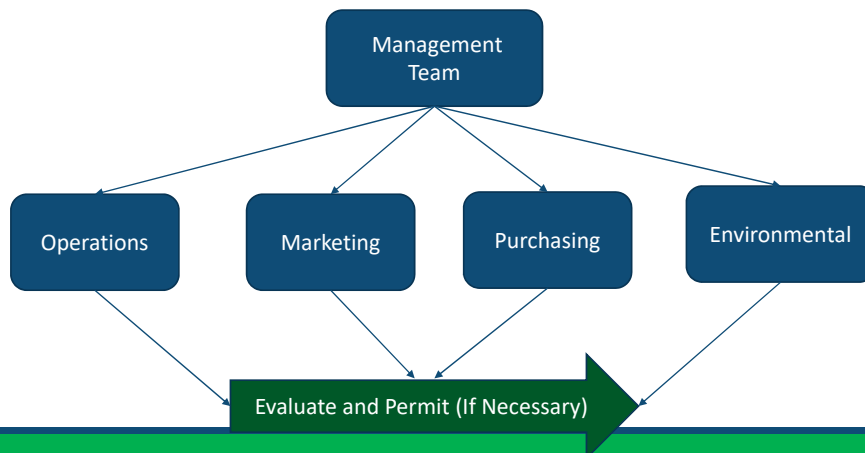
New or Modified Process

Common New Equipment Process



New or Modified Process

New Equipment Purchase Evaluation Team



Evaluate Limits

Periodically review limits and/or include limits in marketing and production meetings and projections.

Ask:

- Do they still make sense?
- Are we risking violation?

Evaluate:

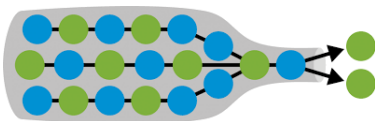
- Will the limits constrain us?
- What are our options?
- How much do those options cost?
- Should we make pre-emptive moves now before we hit a time crunch?

Collaboration

Why Should Environmental, Operations, Purchasing and Marketing Collaborate?



1) Don't restrict growth by permit and evaluate violation risks



2) Align projections and operational capabilities with permit and evaluate controls

Collaboration

Why Should Environmental, Operations, Purchasing and Marketing Collaborate?



3) Communicate to interested Parties (i.e. Suppliers)

Including Environmental in Decisions

Why Involve Environmental Early on in collaboration with other internal parties?



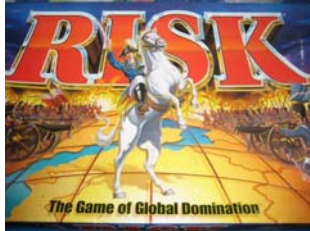
1) PRELIMINARY CALCULATIONS
Estimate Timing to Construct



2) PREVENT UNPERMITTED UNITS

Management Involvement

Why Involve Environmental Early on in collaboration with other internal parties?



3) LIMIT RISK

Thank You
