

APPLICATION TO INSTALL A WET SCRUBBER
ON EXISTING ASH HANDLING EQUIPMENT AT THE
WHEELABRATOR NORTH BROWARD, INC.
RESOURCE RECOVERY FACILITY IN POMPANO BEACH, FL

PREPARED FOR:
WHEELABRATOR NORTH BROWARD, INC.
2600 N.W. 48th Street
Pompano Beach, FL 33073

PREPARED BY:
RTP ENVIRONMENTAL ASSOCIATES, INC.®
239 US Highway 22 East
Green Brook, NJ 08812

June 2002

0112120-006-AV

RECEIVED

JUN 26 2002

BUREAU OF AIR REGULATION

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1 INTRODUCTION

Wheelabrator North Broward, Inc. (Wheelabrator) operates the North Broward Resource Recovery Facility (NBRRF) in Pompano Beach, Florida. The facility operates under the Florida Power Plant Siting Act Conditions of Certification (Case Number PA 86-22, last modified on August 6, 2001) and their approved Title V Air Operation Permit (Permit Number 0112120-001-AV, effective October 22, 2000).

The NBRRF consists of three municipal waste combustors (MWCs), each with a maximum design capacity to process 807 tons per day (tpd) of municipal solid waste (MSW). The facility also contains bottom and fly ash handling and processing equipment. Fugitive ash emissions are minimized to comply with the U.S. Environmental Protection Agency (USEPA) Emission Guidelines (EG) and New Source Performance Standards (NSPS) for MWCs (40 CFR 60 Subparts Cb and Eb) by enclosing ash handling equipment in buildings or covered conveyors and wetting the ash material. The ash handling system is Emission Unit -005 of the Title V permit and is being modified to include the installation of a wet scrubber in the ash handling building to provide additional employee comfort and safety.

2 PARTICULATE MATTER EMISSIONS

In this application, Wheelabrator proposes to install a wet scrubber to the existing ash handling building, which contains various ash handling equipment such as pelletizers and conveyors. The wet scrubber will control particulate matter (PM) emissions from the ash handling building equipment, thereby reducing indoor PM levels in the ash handling building and improving overall indoor air quality for employee comfort and safety. The wet scrubber proposed at this time is a Tri-Mer Size 60, Model H Whirl-Wet wet scrubber or equivalent. The removal efficiency for the fly ash will be about 99%. Outlet emissions are expected to be significantly less than the Florida Department of Environmental Protection (FDEP) Reasonably Achievable Control Technology (RACT) emission rate of 0.03 grains per dry standard cubic foot (gr/dscf), which is discussed in Section 3 below. With the design fan size and a 20 hp motor, a flowrate of 5,800 cubic feet per minute (cfm) is expected. Conservatively assuming the dry standard flowrate (dscfm) equals the design flow in actual cubic feet per minute (acfm), wet scrubber PM emissions will be:

$$\frac{0.03 \text{ grains}}{\text{dscf}} \times \frac{\text{lb}}{7,000 \text{ grains}} \times \frac{5,800 \text{ dscf}}{\text{minute}} \times \frac{60 \text{ minutes}}{\text{hour}} = \frac{1.49 \text{ lb}}{\text{hour}}$$

$$\frac{1.49 \text{ lb}}{\text{hour}} \times \frac{8,760 \text{ hours}}{\text{year}} \times \frac{\text{ton}}{2,000 \text{ lbs}} = \frac{6.53 \text{ tons}}{\text{year}}$$

The wet scrubber has potential PM emissions of 1.49 lb/hour and 6.53 tons per year (tpy), which is less than the Prevention of Significant Deterioration (PSD) significant emission rates of 25 tpy for total suspended particulates (TSP) and 15 tpy for particulate matter

less than 10 microns in diameter (PM₁₀). In reality, the wet scrubber may actually decrease facility PM emissions by reducing fugitive ash emissions.

3 REGULATORY REQUIREMENTS

Review Requirements: This permit application is being submitted to obtain the necessary FDEP approvals as required by Chapter 62-210 (Stationary Sources - General Requirements) of the Florida Administrative Code (FAC). The revision being proposed to the NBCRRF facility involves changes to the ash handling equipment to incorporate a particulate control device on some of the existing equipment. Rule 62-210.300, FAC requires the applicant to obtain an appropriate permit from the FDEP prior to beginning construction. The proposed revision is subject to the preconstruction review requirements of Rule 62-212, FAC (Stationary Sources - Preconstruction Review).

As shown above, the wet scrubber has potential emissions less than the PSD significant emission rates. Therefore, the General Preconstruction Review Requirements of Rule 62-212.300, FAC apply rather than PSD requirements of Rule 62-212.400, FAC. The enclosed information and permit application forms should provide FDEP with the necessary information to meet the requirements of Rule 62-212.300(3), FAC. There are no PM (TSP or PM₁₀) non-attainment areas in Florida according to the Code of Federal Regulations (40 CFR 81.310) and Rule 62-204.340, FAC. Thus, Preconstruction Review for Nonattainment Areas under Rule 62-212.500, FAC also does not apply. This permit application is also being submitted for Title V review as a permit modification pursuant to Rule 62-213.400, FAC, for concurrent processing with the preconstruction permit as described by Rule 62-213.405, FAC.

Emission Requirements: There are no federal regulations and very few state rules regulating PM emissions from the wet scrubber. The USEPA EG and NSPS for MWCs (40 CFR 60 Subparts Cb and Eb, adopted by reference at Rule 62-204.800, FAC) regulate fugitive ash emissions but do not limit emissions from minor point sources of PM emissions. Only one of the General Pollutant Emission Limiting Standards in Rule 62-296.320, FAC might apply. Due to the nature of the ash and the fact that it is handled wet, no objectionable odor would be expected from wet scrubber operation as required by Rule 62-296.320(2), FAC. The NBCRRF is a modern, state-of-the-art MWC and the prohibition on open burning at Rule 62-296.320(3) would not apply. Since the ash does not undergo any chemical or physical changes and no raw materials are processed to produce a finished product (other than the burning of refuse, which is specifically exempted), Rule 62-296.320(4)(a), FAC does not apply. Since the wet scrubber is a point source, the requirements for unconfined PM emissions at Rule 62-296.320(4)(c) apply to the facility (as currently defined in the Title V permit) rather than the proposed wet scrubber. Finally, RACT requirements in Rules 62-296.700 to 712, FAC for PM emissions do not apply to new sources for historic TSP maintenance areas previously designated in Rule 62-204.340, FAC.

Therefore, the only emission limitation applicable to the proposed wet scrubber would be the 20% opacity general visible emission standard in Rule 62-296.320(4)(b), FAC.

Therefore, this is the only emission limitation included for the wet scrubber in the enclosed permit application forms. However, FDEP guidance (DARM-PER-33 dated March 1, 2000, which is attached herein) states that this is primarily a facility-wide limitation and "...should not be included as a specific condition for an emission unit..." Therefore, no specific emission limitations are proposed for the wet scrubber. While RACT does not apply as discussed above, the proposed wet scrubber is expected to perform significantly better than the RACT limit of 0.03 gr/dscf contained in Rule 62-296.711(2)(b), FAC for vent or stack emissions from enclosed operations. The NBRRF is already a major PSD and Title V source for PM (TSP and PM₁₀) with allowable emissions of around 100 tpy, the addition of the wet scrubber will not change the source classification for this pollutant.

Testing Requirements: Even at the RACT limit of 0.03 gr/dscf, emissions will be much less than PSD significant emission levels as shown in Section 2 above. Since there are no specific emission limitations applicable to the wet scrubber, no Method 5 tests for PM emissions are required for the proposed minor PM source. For the general visibility emissions standard at Rule 62-296.320(4)(b), FAC, FDEP guidance states that "...the permittee is not required to perform a visible emissions compliance test to demonstrate compliance with the facility-wide limitation annually or before renewal..." Therefore, no Method 9 tests for measuring opacity are required for the proposed minor PM source. As noted in the guidance document, this does not prevent the Department from performing a visible emissions test per Chapter 62-297.310(7)(b), FAC, "...when the Department believes that the general visible emissions standard is being violated..." (emphasis ours). Therefore, there are no specific emission limitations or periodic testing requirements for the proposed wet scrubber.



Jeb Bush
Governor

Department of Environmental Protection

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

DARM-PER-33

SUBJECT: Guidance on the Use of the General Visible Emissions Standard,
Rule 62-296.320(4)(b), F.A.C., in Permits

DATE: March 1, 2000

According to Rule 62-210.900(1), the instructions to the long form permit application, the general visible emission standard is defined as a facility-wide limitation. As such, it should not be included as a specific condition for an emission unit, unless the process weight table is used. If a facility emits particulate matter, this standard should be included as a facility-wide limit in the permit. In a Title V permit, this standard is listed in Section II, Facility-wide Conditions, and should not be repeated anywhere else in the permit; unless it is carried forward from a previously-issued, federally enforceable construction permit or FESOP, or it is paired with the process weight table.

Though the permittee is not required to perform a visible emissions compliance test to demonstrate compliance with the facility-wide limitation annually or before renewal, when the Department believes that the general visible emissions standard is being violated, the Department may require that the owner or operator perform a visible emissions compliance test per Chapter 62-297.310(7)(b), Special Compliance Tests, F.A.C.; or Department personnel who are certified to perform visible emissions tests may determine compliance with the general visible emission standard.

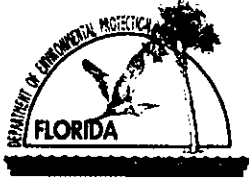
Howard L. Rhodes, Director
Division of Air Resources Management

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APPENDIX A

Air Permit Application Forms



Department of Environmental Protection

Division of Air Resources Management

APPLICATION FOR AIR PERMIT - TITLE V SOURCE

See Instructions for Form No. 62-210.900(1)

I. APPLICATION INFORMATION

Identification of Facility

1. Facility Owner/Company Name: Wheelabrator North Broward, Inc.	
2. Site Name: North Broward Waste-To-Energy Facility	
3. Facility Identification Number: 0112120 [] Unknown	
4. Facility Location: Street Address or Other Locator: 2600 N.W. 48 th Street City: Pompano Beach County: Broward Zip Code: 33073	
5. Relocatable Facility? [] Yes [X] No	6. Existing Permitted Facility? [X] Yes [] No

Application Contact

1. Name and Title of Application Contact: Chuck Faller, Senior Compliance Director	
2. Application Contact Mailing Address: Organization/Firm: Wheelabrator North Broward, Inc. Street Address: 2600 N.W. 48 th Street City: Pompano Beach State: FL Zip Code: 33073	
3. Application Contact Telephone Numbers: Telephone: (954) 971 - 8701 Fax: (954) 971 - 8703	

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	
2. Permit Number:	
3. PSD Number (if applicable):	
4. Siting Number (if applicable):	

Purpose of Application

Air Operation Permit Application

This Application for Air Permit is submitted to obtain: (Check one)

Initial Title V air operation permit for an existing facility which is classified as a Title V source.

Initial Title V air operation permit for a facility which, upon start up of one or more newly constructed or modified emissions units addressed in this application, would become classified as a Title V source.

Current construction permit number: _____

Title V air operation permit revision to address one or more newly constructed or modified emissions units addressed in this application.

Current construction permit number: _____

Operation permit number to be revised: _____

Title V air operation permit revision or administrative correction to address one or more proposed new or modified emissions units and to be processed concurrently with the air construction permit application. (Also check Air Construction Permit Application below.)

Operation permit number to be revised/corrected: 0112120-001-AV

Title V air operation permit revision for reasons other than construction or modification of an emissions unit. Give reason for the revision; e.g., to comply with a new applicable requirement or to request approval of an "Early Reductions" proposal.

Operation permit number to be revised: _____

Reason for revision: _____

Air Construction Permit Application

This Application for Air Permit is submitted to obtain: (Check one)

Air construction permit to construct or modify one or more emissions units.

Air construction permit to make federally enforceable an assumed restriction on the potential emissions of one or more existing, permitted emissions units.

Air construction permit for one or more existing, but unpermitted, emissions units.

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official: Paul Grego, Plant Manager
2. Owner/Authorized Representative or Responsible Official Mailing Address: Organization/Firm: Wheelabrator North Broward, Inc. Street Address: 2600 N.W. 48 th Street City: Pompano Beach State: FL Zip Code: 33073
3. Owner/Authorized Representative or Responsible Official Telephone Numbers: Telephone: (954) 971 - 8701 Fax: (954) 971 - 8703
4. Owner/Authorized Representative or Responsible Official Statement: <i>I, the undersigned, am the owner or authorized representative*(check here [], if so) or the responsible official (check here [X], if so) of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions unit.</i> Signature: <u>Paul Grego</u> Date: <u>6/18/02</u>

* Attach letter of authorization if not currently on file.

Professional Engineer Certification

1. Professional Engineer Name: Thomas M. White Registration Number: 51850
2. Professional Engineer Mailing Address: Organization/Firm: Wheelabrator McKay Bay, Inc. Street Address: 107 N 34 th Street City: Tampa State: FL Zip Code: 33605
3. Professional Engineer Telephone Numbers: Telephone: (813) 248 - 1457 Fax: (813) 247 - 2052

4. Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*


(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

If the purpose of this application is to obtain a Title V source air operation permit (check here [], if so), I further certify that each emissions unit described in this Application for Air Permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance schedule is submitted with this application.

If the purpose of this application is to obtain an air construction permit for one or more proposed new or modified emissions units (check here [], if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

If the purpose of this application is to obtain an initial air operation permit or operation permit revision for one or more newly constructed or modified emissions units (check here [], if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.


Signature

6/21/02
Date

(seal)

* Attach any exception to certification statement.

Scope of Application

Emissions Unit ID	Description of Emissions Unit	Permit Type	Processing Fee
-006	Wet Scrubber for Ash Handling Systems	AC1E	

Application Processing Fee

Check one: [] Attached - Amount: \$ _____ [] Not Applicable

Construction/Modification Information

1. Description of Proposed Project or Alterations:

Wheelabrator North Broward, Inc. proposes to install a wet scrubber unit to control dust and particulates in the ash handling building for increased employee comfort and safety.

2. Projected or Actual Date of Commencement of Construction: Third Quarter 2002

3. Projected Date of Completion of Construction: To Be Provided Later.

Application Comment

Application fees for this minor construction and operation permit application are covered by the facility's Title V fees.

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates: Zone: 17 East (km): 583.541 North (km): 2907.498			
2. Facility Latitude/Longitude: Latitude (DD/MM/SS): 26/17/12 North Longitude (DD/MM/SS): 80/09/48 West			
3. Governmental Facility Code: 0	4. Facility Status Code: A	5. Facility Major Group SIC Code: 49	6. Facility SIC(s): 4953
7. Facility Comment (limit to 500 characters): 			

Facility Contact

1. Name and Title of Facility Contact: Chuck Faller, Senior Compliance Director
2. Facility Contact Mailing Address: Organization/Firm: Wheelabrator North Broward, Inc. Street Address: 2600 N.W. 48 th Street City: Pompano Beach State: FL Zip Code: 33073
3. Facility Contact Telephone Numbers: Telephone: (954) 971 - 8701 Fax: (954) 971 - 8703

Facility Regulatory Classifications

Check all that apply:

1. <input type="checkbox"/> Small Business Stationary Source?	<input type="checkbox"/> Unknown
2. <input checked="" type="checkbox"/> Major Source of Pollutants Other than Hazardous Air Pollutants (HAPs)?	
3. <input type="checkbox"/> Synthetic Minor Source of Pollutants Other than HAPs?	
4. <input checked="" type="checkbox"/> Major Source of Hazardous Air Pollutants (HAPs)?	
5. <input type="checkbox"/> Synthetic Minor Source of HAPs?	
6. <input checked="" type="checkbox"/> One or More Emissions Units Subject to NSPS?	
7. <input type="checkbox"/> One or More Emission Units Subject to NESHAP?	
8. <input checked="" type="checkbox"/> Title V Source by EPA Designation?	
9. Facility Regulatory Classifications Comment (limit to 200 characters):	
<p>The source addressed in this permit application is a new wet scrubber associated with existing ash processing and handling equipment at the North Broward Waste-To-Energy Facility. The permit action requested for the proposed wet scrubber is a minor (non-PSD) modification.</p>	

List of Applicable Regulations

40 CFR Part 50	
Rule 62-4.030, F.A.C.	General Prohibition
Rule 62-4.050, F.A.C.	Applications
Rule 62-4.210, F.A.C.	Construction Permits
Rule 62-204.240, F.A.C.	Ambient Air Quality Standards
Rule 62-210.300, F.A.C.	Permits Required
Rule 62-212.300, F.A.C.	General Preconstruction Review Requirements
Rule 62-213.400, F.A.C.	Permits and Permit Revisions Required
Rule 62-213.405, F.A.C.	Concurrent Processing of Permit Applications
Rule 62-296.320(4)(b), F.A.C.	20% Opacity Limit

B. FACILITY POLLUTANTS

List of Pollutants Emitted

1. Pollutant Emitted	2. Pollutant Classif.	3. <u>Requested Emissions Cap</u>		4. Basis for Emissions Cap	5. Pollutant Comment
		lb/hour	tons/year		

Additional Supplemental Requirements for Title V Air Operation Permit Applications

8. List of Proposed Insignificant Activities: <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
9. List of Equipment/Activities Regulated under Title VI: <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Equipment/Activities On site but Not Required to be Individually Listed <input checked="" type="checkbox"/> Not Applicable
10. Alternative Methods of Operation: <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
11. Alternative Modes of Operation (Emissions Trading): <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
12. Identification of Additional Applicable Requirements: <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
13. Risk Management Plan Verification: <input type="checkbox"/> Plan previously submitted to Chemical Emergency Preparedness and Prevention Office (CEPPO). Verification of submittal attached (Document ID: _____) or previously submitted to DEP (Date and DEP Office: _____) <input type="checkbox"/> Plan to be submitted to CEPPO (Date required: _____) <input checked="" type="checkbox"/> Not Applicable
14. Compliance Report and Plan: <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
15. Compliance Certification (Hard-copy Required): <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

**A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)**

Emissions Unit Description and Status

<p>1. Type of Emissions Unit Addressed in This Section: (Check one)</p> <p><input checked="" type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).</p> <p><input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.</p> <p><input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.</p>			
<p>2. Regulated or Unregulated Emissions Unit? (Check one)</p> <p><input checked="" type="checkbox"/> The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.</p> <p><input type="checkbox"/> The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.</p>			
<p>3. Description of Emissions Unit Addressed in This Section (limit to 60 characters): New wet scrubber for existing ash handling system at facility to enhance employee comfort and safety.</p>			
<p>4. Emissions Unit Identification Number: <input type="checkbox"/> No ID</p> <p>ID: -006 <input type="checkbox"/> ID Unknown</p>			
<p>5. Emissions Unit Status Code: C</p>	<p>6. Initial Startup Date: See Field 9 Below</p>	<p>7. Emissions Unit Major Group SIC Code: 49</p>	<p>8. Acid Rain Unit? <input type="checkbox"/></p>
<p>9. Emissions Unit Comment: (Limit to 500 Characters)</p> <p>Start-up date will occur at conclusion of construction. Date to be provided later.</p>			

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method):

Particulate emissions from existing ash handling equipment in the ash handling building will be controlled by use of a Tri-Mer, Size 60, Model H Whirl-Wet wet scrubber or equivalent.

2. Control Device or Method Code(s): 001

Emissions Unit Details

1. Package Unit: Manufacturer: Tri-Mer Corporation	Model Number: Model H Whirl Wet
2. Generator Nameplate Rating: N/A	MW
3. Incinerator Information: N/A	
Dwell Temperature:	°F
Dwell Time:	seconds
Incinerator Afterburner Temperature:	°F

**B. EMISSIONS UNIT CAPACITY INFORMATION
(Regulated Emissions Units Only)**

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:	N/A	mmBtu/hr
2. Maximum Incineration Rate:	N/A lb/hr	N/A tons/day
3. Maximum Process or Throughput Rate:	700 tons/day (ash)	
4. Maximum Production Rate:		
5. Requested Maximum Operating Schedule:		
	24 hours/day	7 days/week
	52 weeks/year	8,760 hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters):		

**C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)**

List of Applicable Regulations

40 CFR Part 50	
Rule 62-4.030, F.A.C.	General Prohibition
Rule 62-4.050, F.A.C.	Applications
Rule 62-4.210, F.A.C.	Construction Permits
Rule 62-204.240, F.A.C.	Ambient Air Quality Standards
Rule 62-210.300, F.A.C.	Permits Required
Rule 62-212.300, F.A.C.	General Preconstruction Review Requirements
Rule 62-213.400, F.A.C.	Permits and Permit Revisions Required
Rule 62-213.405, F.A.C.	Concurrent Processing of Permit Applications
Rule 62-296.320(4)(b), F.A.C.	20% Opacity Limit

**D. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)**

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? See Field 14 Below		2. Emission Point Type Code: 1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point):			
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A			
5. Discharge Type Code: V	6. Stack Height: 59 feet	7. Exit Diameter: To be determined feet	
8. Exit Temperature: 77 °F	9. Actual Volumetric Flow Rate: 5800 acfm	10. Water Vapor: N/A %	
11. Maximum Dry Standard Flow Rate: 5,800 dscfm		12. Nonstack Emission Point Height: feet	
13. Emission Point UTM Coordinates: Zone: 17 East (km): 583.541 North (km): 2907.498			
14. Emission Point Comment (limit to 200 characters): The emission point is denoted on the figure in Appendix C as location 1.			

**E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)**

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type) (limit to 500 characters): Operation of a wet scrubber.		
2. Source Classification Code (SCC): 3-05-101-99	3. SCC Units: Tons	
4. Maximum Hourly Rate: 29	5. Maximum Annual Rate: 240,000	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment (limit to 200 characters):		

Segment Description and Rate: Segment of

1. Segment Description (Process/Fuel Type) (limit to 500 characters):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM	001		EL
PM10	001		EL

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units -
Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: PM	2. Total Percent Efficiency of Control: Approximately 99
3. Potential Emissions: 1.49 lb/hour	4. Synthetically Limited? [] 6.53 tons/year
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 _____ to _____ tons/year	
6. Emission Factor: 0.03 grains/dscf Reference: Eng. Estimate (Rule 62-296.711(2)(b), FAC)	7. Emissions Method Code: 5
8. Calculation of Emissions (limit to 600 characters): $\frac{0.03 \text{ grains}}{\text{dscf}} \times \frac{5,800 \text{ dscf}}{\text{minute}} \times \frac{1 \text{ lb}}{7,000 \text{ grains}} \times \frac{60 \text{ minutes}}{\text{hour}} = \frac{1.49 \text{ lb}}{\text{hour}}$	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units -
Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: PM10	2. Total Percent Efficiency of Control: Approximately 99
3. Potential Emissions: 1.49 lb/hour 6.53 tons/year	4. Synthetically Limited? []
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 _____ to _____ tons/year	
6. Emission Factor: 0.03 grains/ dscf Reference: Eng. Estimate (Rule 62-296.711(2)(b), FAC)	7. Emissions Method Code: 5
8. Calculation of Emissions (limit to 600 characters): $\frac{0.03 \text{ grains}}{\text{dscf}} \times \frac{5,800 \text{ dscf}}{\text{minute}} \times \frac{1 \text{ lb}}{7,000 \text{ grains}} \times \frac{60 \text{ minutes}}{\text{hour}} = \frac{1.49 \text{ lb}}{\text{hour}}$	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: VE20	2. Basis for Allowable Opacity: <input checked="" type="checkbox"/> Rule <input type="checkbox"/> Other
3. Requested Allowable Opacity: Normal Conditions: 20 % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment (limit to 200 characters): Rule 62-296.320(4)(b), FAC establishes an opacity limit of 20%.	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor _____ of _____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement: <input type="checkbox"/> Rule <input type="checkbox"/> Other	
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters):	

**J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)**

Supplemental Requirements

1. Process Flow Diagram <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
2. Fuel Analysis or Specification <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
3. Detailed Description of Control Equipment <input checked="" type="checkbox"/> Attached, Document ID: App. D <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
4. Description of Stack Sampling Facilities <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
5. Compliance Test Report <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously submitted, Date: _____ <input checked="" type="checkbox"/> Not Applicable
6. Procedures for Startup and Shutdown <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
7. Operation and Maintenance Plan <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
8. Supplemental Information for Construction Permit Application <input checked="" type="checkbox"/> Attached, Document ID: App. D <input type="checkbox"/> Not Applicable
9. Other Information Required by Rule or Statute <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
10. Supplemental Requirements Comment:

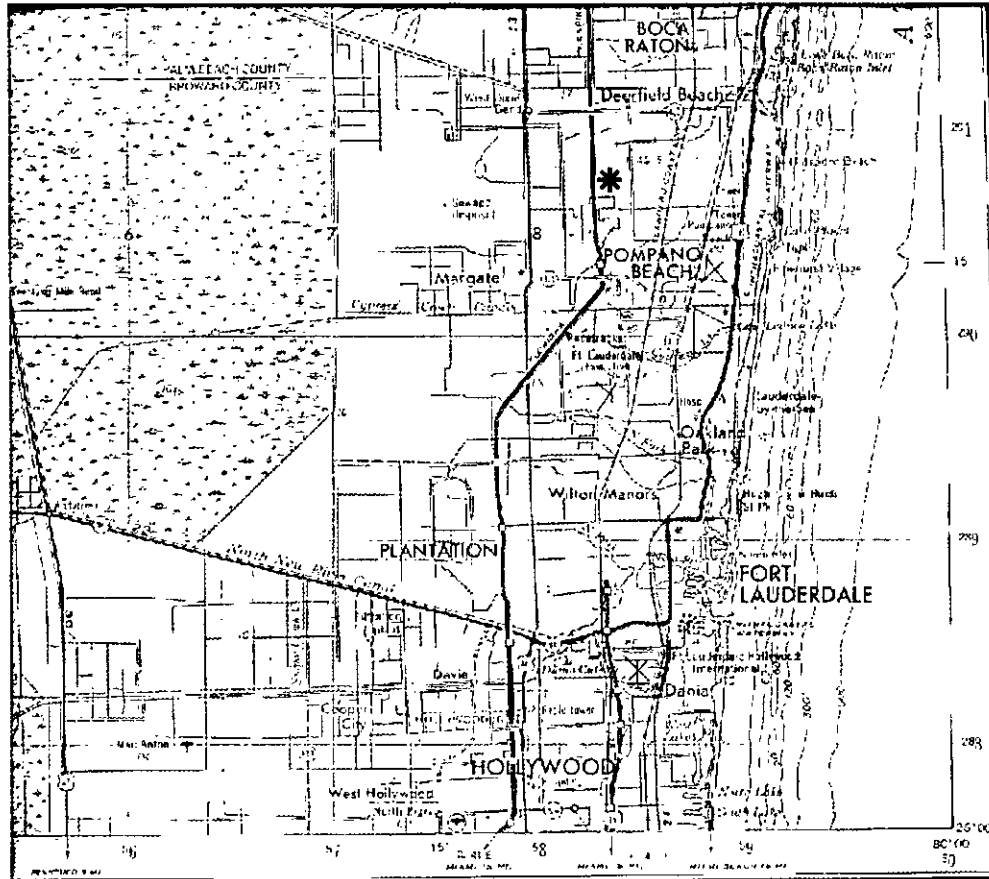
Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation [] Attached, Document ID: _____ [X] Not Applicable
12. Alternative Modes of Operation (Emissions Trading) [] Attached, Document ID: _____ [X] Not Applicable
13. Identification of Additional Applicable Requirements [] Attached, Document ID: _____ [X] Not Applicable
14. Compliance Assurance Monitoring Plan [] Attached, Document ID: _____ [X] Not Applicable
15. Acid Rain Part Application (Hard-copy Required) [] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID: _____ [] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID: _____ [] New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID: _____ [] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID: _____ [] Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) Attached, Document ID: _____ [] Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) Attached, Document ID: _____ [X] Not Applicable

APPENDIX B

Area Map Showing Facility Location

Wheelabrator North Broward Facility Location



STOCK NO. V501XNC175**#03

SECTIONED TOWNSHIP

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	36

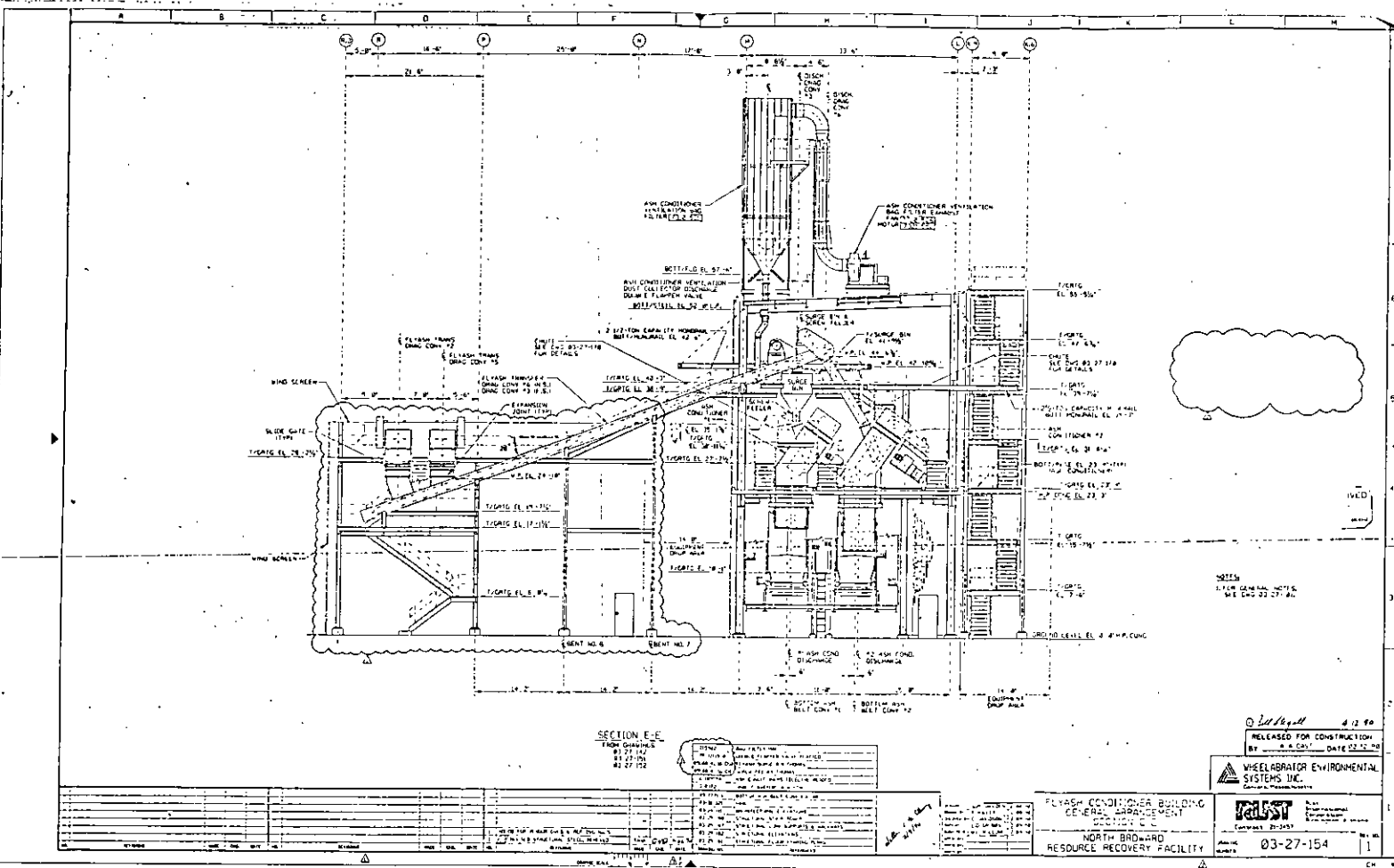
TOWN 10N R. 17E NE
 1/4 SECTION 17

TO GIVE A STANDARD REFERENCE ON THIS SHEET TO NEAREST 100 FEET 1. 100' = 1" SCALE 2. 100' = 1" SCALE 3. 100' = 1" SCALE 4. 100' = 1" SCALE 5. 100' = 1" SCALE 6. 100' = 1" SCALE 7. 100' = 1" SCALE 8. 100' = 1" SCALE 9. 100' = 1" SCALE 10. 100' = 1" SCALE 11. 100' = 1" SCALE 12. 100' = 1" SCALE 13. 100' = 1" SCALE 14. 100' = 1" SCALE 15. 100' = 1" SCALE 16. 100' = 1" SCALE 17. 100' = 1" SCALE 18. 100' = 1" SCALE 19. 100' = 1" SCALE 20. 100' = 1" SCALE 21. 100' = 1" SCALE 22. 100' = 1" SCALE 23. 100' = 1" SCALE 24. 100' = 1" SCALE 25. 100' = 1" SCALE 26. 100' = 1" SCALE 27. 100' = 1" SCALE 28. 100' = 1" SCALE 29. 100' = 1" SCALE 30. 100' = 1" SCALE 31. 100' = 1" SCALE 32. 100' = 1" SCALE 33. 100' = 1" SCALE 34. 100' = 1" SCALE 35. 100' = 1" SCALE 36. 100' = 1" SCALE 37. 100' = 1" SCALE 38. 100' = 1" SCALE 39. 100' = 1" SCALE 40. 100' = 1" SCALE 41. 100' = 1" SCALE 42. 100' = 1" SCALE 43. 100' = 1" SCALE 44. 100' = 1" SCALE 45. 100' = 1" SCALE 46. 100' = 1" SCALE 47. 100' = 1" SCALE 48. 100' = 1" SCALE 49. 100' = 1" SCALE 50. 100' = 1" SCALE 51. 100' = 1" SCALE 52. 100' = 1" SCALE 53. 100' = 1" SCALE 54. 100' = 1" SCALE 55. 100' = 1" SCALE 56. 100' = 1" SCALE 57. 100' = 1" SCALE 58. 100' = 1" SCALE 59. 100' = 1" SCALE 60. 100' = 1" SCALE 61. 100' = 1" SCALE 62. 100' = 1" SCALE 63. 100' = 1" SCALE 64. 100' = 1" SCALE 65. 100' = 1" SCALE 66. 100' = 1" SCALE 67. 100' = 1" SCALE 68. 100' = 1" SCALE 69. 100' = 1" SCALE 70. 100' = 1" SCALE 71. 100' = 1" SCALE 72. 100' = 1" SCALE 73. 100' = 1" SCALE 74. 100' = 1" SCALE 75. 100' = 1" SCALE 76. 100' = 1" SCALE 77. 100' = 1" SCALE 78. 100' = 1" SCALE 79. 100' = 1" SCALE 80. 100' = 1" SCALE 81. 100' = 1" SCALE 82. 100' = 1" SCALE 83. 100' = 1" SCALE 84. 100' = 1" SCALE 85. 100' = 1" SCALE 86. 100' = 1" SCALE 87. 100' = 1" SCALE 88. 100' = 1" SCALE 89. 100' = 1" SCALE 90. 100' = 1" SCALE 91. 100' = 1" SCALE 92. 100' = 1" SCALE 93. 100' = 1" SCALE 94. 100' = 1" SCALE 95. 100' = 1" SCALE 96. 100' = 1" SCALE 97. 100' = 1" SCALE 98. 100' = 1" SCALE 99. 100' = 1" SCALE 100. 100' = 1" SCALE		TO GIVE A STANDARD REFERENCE ON THIS SHEET TO NEAREST 100 FEET 1. 100' = 1" SCALE 2. 100' = 1" SCALE 3. 100' = 1" SCALE 4. 100' = 1" SCALE 5. 100' = 1" SCALE 6. 100' = 1" SCALE 7. 100' = 1" SCALE 8. 100' = 1" SCALE 9. 100' = 1" SCALE 10. 100' = 1" SCALE 11. 100' = 1" SCALE 12. 100' = 1" SCALE 13. 100' = 1" SCALE 14. 100' = 1" SCALE 15. 100' = 1" SCALE 16. 100' = 1" SCALE 17. 100' = 1" SCALE 18. 100' = 1" SCALE 19. 100' = 1" SCALE 20. 100' = 1" SCALE 21. 100' = 1" SCALE 22. 100' = 1" SCALE 23. 100' = 1" SCALE 24. 100' = 1" SCALE 25. 100' = 1" SCALE 26. 100' = 1" SCALE 27. 100' = 1" SCALE 28. 100' = 1" SCALE 29. 100' = 1" SCALE 30. 100' = 1" SCALE 31. 100' = 1" SCALE 32. 100' = 1" SCALE 33. 100' = 1" SCALE 34. 100' = 1" SCALE 35. 100' = 1" SCALE 36. 100' = 1" SCALE 37. 100' = 1" SCALE 38. 100' = 1" SCALE 39. 100' = 1" SCALE 40. 100' = 1" SCALE 41. 100' = 1" SCALE 42. 100' = 1" SCALE 43. 100' = 1" SCALE 44. 100' = 1" SCALE 45. 100' = 1" SCALE 46. 100' = 1" SCALE 47. 100' = 1" SCALE 48. 100' = 1" SCALE 49. 100' = 1" SCALE 50. 100' = 1" SCALE 51. 100' = 1" SCALE 52. 100' = 1" SCALE 53. 100' = 1" SCALE 54. 100' = 1" SCALE 55. 100' = 1" SCALE 56. 100' = 1" SCALE 57. 100' = 1" SCALE 58. 100' = 1" SCALE 59. 100' = 1" SCALE 60. 100' = 1" SCALE 61. 100' = 1" SCALE 62. 100' = 1" SCALE 63. 100' = 1" SCALE 64. 100' = 1" SCALE 65. 100' = 1" SCALE 66. 100' = 1" SCALE 67. 100' = 1" SCALE 68. 100' = 1" SCALE 69. 100' = 1" SCALE 70. 100' = 1" SCALE 71. 100' = 1" SCALE 72. 100' = 1" SCALE 73. 100' = 1" SCALE 74. 100' = 1" SCALE 75. 100' = 1" SCALE 76. 100' = 1" SCALE 77. 100' = 1" SCALE 78. 100' = 1" SCALE 79. 100' = 1" SCALE 80. 100' = 1" SCALE 81. 100' = 1" SCALE 82. 100' = 1" SCALE 83. 100' = 1" SCALE 84. 100' = 1" SCALE 85. 100' = 1" SCALE 86. 100' = 1" SCALE 87. 100' = 1" SCALE 88. 100' = 1" SCALE 89. 100' = 1" SCALE 90. 100' = 1" SCALE 91. 100' = 1" SCALE 92. 100' = 1" SCALE 93. 100' = 1" SCALE 94. 100' = 1" SCALE 95. 100' = 1" SCALE 96. 100' = 1" SCALE 97. 100' = 1" SCALE 98. 100' = 1" SCALE 99. 100' = 1" SCALE 100. 100' = 1" SCALE
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WEST PALM BEACH, FLORIDA
 1956
 REVISED 1972



APPENDIX C
Facility Plot Plan



SECTION E-E
FROM CHAIRS
83 27 147
83 27 150
83 27 152

NO.	DESCRIPTION	DATE	BY
1	ISSUED FOR PERMITS	12/15/80	J.M.
2	FOR CONSTRUCTION	12/15/80	J.M.
3	FOR RECORD	12/15/80	J.M.

© 1980
RELEASED FOR CONSTRUCTION
BY: A.A.C. DATE 02-15-80

WHEELABRATOR ENVIRONMENTAL SYSTEMS INC.
GENERAL ENGINEERS



FLASH CONDITIONER BUILDING
GENERAL ARRANGEMENT
SECTION E-E
NORTH BROADWARD
RESOURCE RECOVERY FACILITY

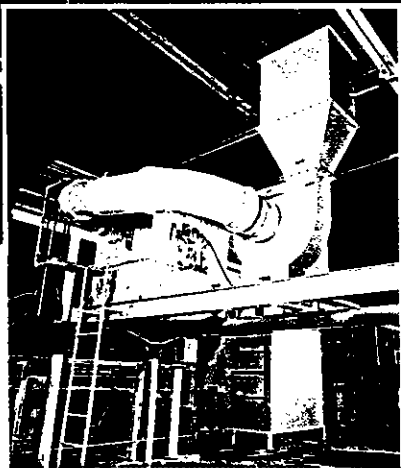
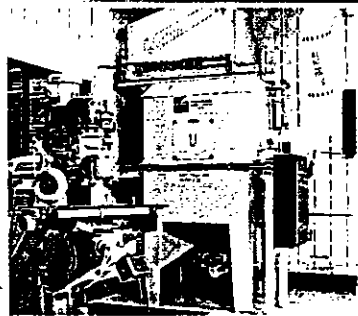
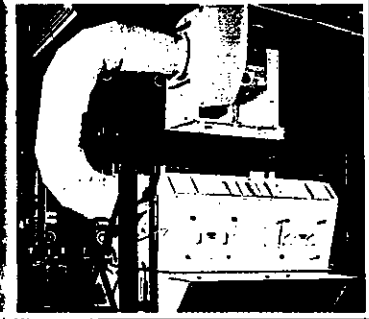
03-27-154

NO.	DESCRIPTION	DATE	BY
1	ISSUED FOR PERMITS	12/15/80	J.M.
2	FOR CONSTRUCTION	12/15/80	J.M.
3	FOR RECORD	12/15/80	J.M.

APPENDIX D

Detailed Description of Control Equipment

Wet



**High Efficiency Wet Dust Collection
with Low Maintenance and
Operating Costs**

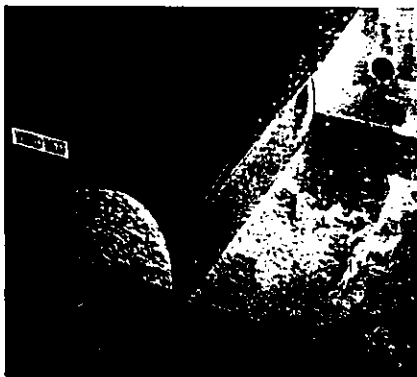
▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲

Concept and Operation

Tri-Mer's Whirl Wet is a time-proven "workhorse" designed for continuous, predictable dust collection. It has **no moving parts** and none of the traditional "high maintenance"

components such as spray nozzles, pumps or bags that can disrupt production. Instead, the Whirl Wet employs a unique process to create intensive mixing of the dust particles and water.

In order to infuse dust particles with water droplets, the mixture is passed under high velocity through a fixed-position dual opposed blade system. The mixing of the dust-laden airstream and liquid takes place and, to increase turbulence, a tangential airstream is injected through a linear slot in the lower blade assembly. Rotation is accelerated, droplets in the airstream are eliminated through a mist eliminator located downstream, and particulate material is deposited on the bottom of the unit for recovery or disposal. Water level is maintained automatically and make-up water is only necessary to compensate for evaporation or sludge removal.



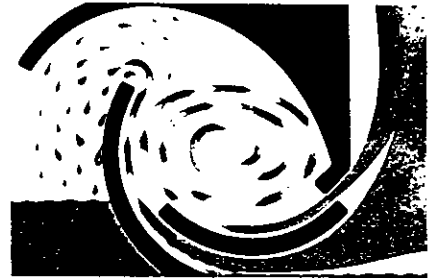
The whirl chamber under operating conditions. Note the energy-activated water coming off the top blade section.

Whirl Wet operates in the 99% efficiency range for a wide variety of applications and over a wide range of micron sizes. These efficiencies are significantly higher than those that can be achieved with cyclones or wet plate scrubbers. It is equally effective for both soluble and insoluble particles. Applications, including dye manufacturing and food processing, are ideally suited to the Whirl Wet. Energy generated inside the unit will not allow the system to clog under any operating

conditions; therefore, the agglomeration and sticky residues that often plug dry collectors are not a problem with the Whirl Wet.

Whirl Wet is a frequently specified dust collection system for the collection of coal, aluminum, fertilizer and sugar dust, and is widely used for the dust elimination requirements of the **foundry shakeout industry, lead particulate in the battery industry** and virtually every sector of the **process industries**. Dust collection from **grinding processes** and **food spices** are excellent applications for the Whirl Wet. Hydrogen venting is provided for applications generating hazardous quantities of hydrogen gas. It is becoming the leading dust collection alternative for plants where metal or plastic finishing generates dust as small as one micron.

Whirl Wet is particularly advantageous wherever materials recovery is desirable. Processes that were not formerly candidates for materials recovery have become good candidates as a result of the Whirl Wet, yielding significant economic benefits for the processor.



The whirl chamber performs the most critical function in a Whirl Wet's operation. This chamber causes water and particulate to combine, resulting in high-efficiency dust collection.

CASE STUDY

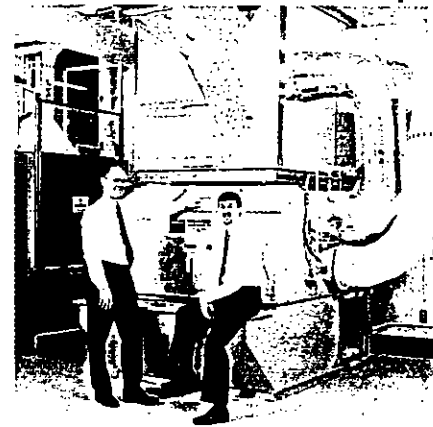
Chrysler Corporation

To maintain a clean and pleasing environment on the 1,600,000 sq. ft. shop level, where the development and manufacturing of prototypes takes place, Chrysler specified dust collection that would not only satisfy strict requirements for collection efficiency, but meet stringent specifications for noise as well. Specifically, by operating at a noise level of less than 80 db at one meter, comfort and communication would both be enhanced and there would be no requirement for a monitoring program to guard against long-term hearing loss.

Equipment proposed by the architectural firm managing the project was unable to meet Chrysler's low noise specification, even when demonstrated under controlled production conditions, with special shielding. Modifications to meet the noise maximum would have involved costly total system enclosures, thus Chrysler requested proposals from other manufacturers.

After reviewing various dust collection technologies and vendors, Chrysler awarded a contract for eight wet dust collectors to Tri-Mer.

Systems are activated on an "as needed" basis; when needed, they are instantly "on" and fully operational.



Ray Gryniewicz, Technical Equipment Manager, Facilities, of Chrysler Corporation and Todd Ainsworth, Sales Engineer of Tri-Mer Corporation with one of the eight systems installed at Chrysler Tech Center.

3 Disposal Options

Whirl Wets are self-cleaning; particulates are deposited at the bottom of the unit for easy recovery.

The Model M Whirl Wet has **manual clean-out**. This is preferred wherever dust collection volume is low. Removal of particulates is done manually.

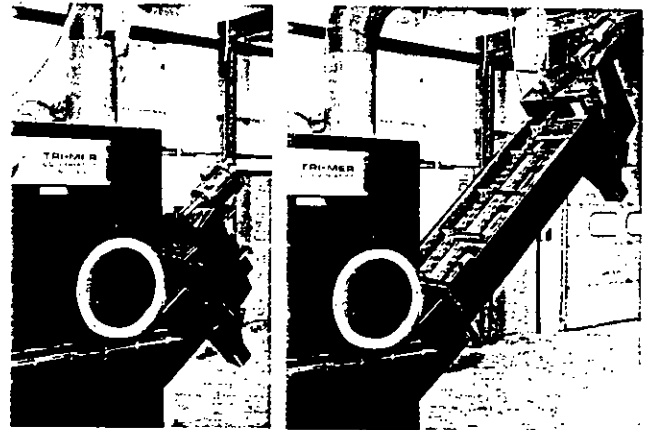
The Model H is available with an **automatically timed drain-down system with sluicing hopper**. The drain-down alternative is interfaced with an electrical control relay package that opens the drain of the Whirl Wet, closes the drain, and activates plant water feed to assure proper liquid level. This method is particularly advantageous for soluble or non-soluble dust applications. Customers preferring not to install the automatic drain can order a manual butterfly valve installed at the bottom of the Whirl Wet hopper.

The Whirl Wet "MCD" (**modular conveyor dragout**) is ideal for the heaviest dust load input applications, including grinding and foundry operations. This unique system offers a streamlined, modular design and extraordinarily low maintenance requirements.

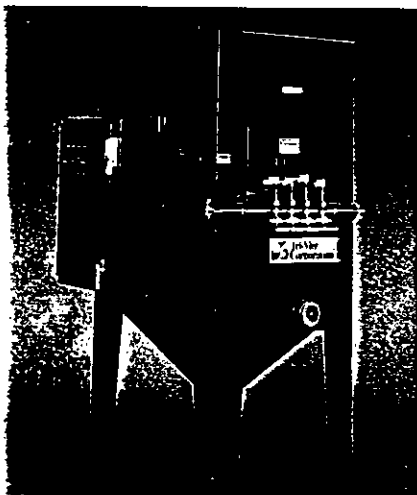
Replacement of the drag-out unit is possible in 30 minutes or less, without disassembly. But what makes the unit truly unique is that there's **never a need to empty the scrubber or shut down the unit for conveyor maintenance**. Its modular design allows simple replacement of the conveyor while operation continues. To add to the system's flexibility, the largest Whirl Wet units

include modular interchangeable conveyors — one conveyor for each hopper bay. Spare conveyors can be stocked as a simple replacement part.

Only the Whirl Wet MCD allows continuous operation, with **never** a need to enter the unit for service. Other benefits include operation flexibility and simplified handling; this Whirl Wet consumes significantly less water than any competitive system; residue is densely packed, lesser in quantity and far easier to handle.



Modular Conveyor Drag-out unit (MCD) showing simple unitized removal of conveyor for maintenance



Model H

CASE STUDY

Erickson Cosmetics

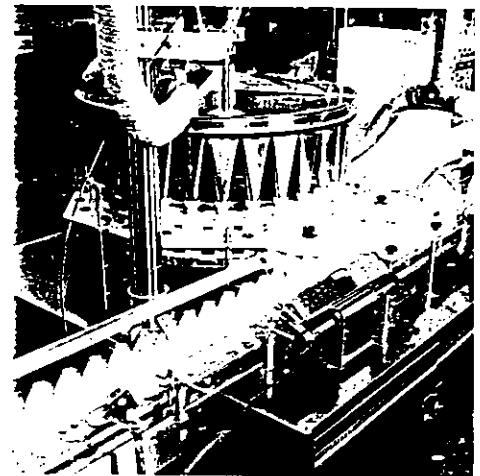
Erickson Cosmetics manufactures talc- and cornstarch-based products for the Mennen Division of Colgate-Palmolive and other companies.

Implementation of SFC SCC heightened awareness of housekeeping, and the company was a candidate for Colgate-Palmolive's prestigious Quality Award. The award honors vendors who demonstrate excellence in both the quality of the product and the quality of the facility.

After evaluating wet dust collectors, Erickson chose a Whirl Wet. The decision weighed applicability over a range of micron sizes, water consumption, maintenance, and ease of handling collected materials. Also important: Tri-Mer's willingness to let Erickson try the system prior to purchase.

Their 2200 cfm system is 95% to 99% effective for the collection of soluble and insoluble particles above one micron.

Erickson received Colgate-Palmolive's prestigious Vendor of the Year Award, a testimonial reflecting Erickson's dedication to excellence.

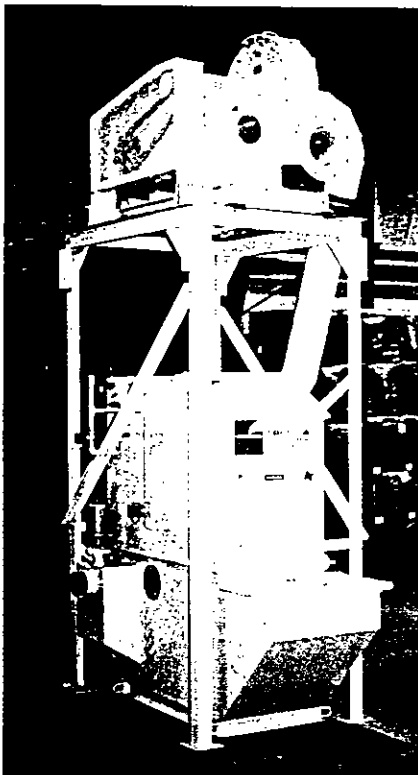


Excess dust from 30-bottle material filler ducted to mild steel Whirl Wet.

Vertical Design Alternative

Tri-Mer's top-mounted blower was designed for applications where floor space is limited or vertical integration is important to process flow. This option is available for units exhausting up to 50,000 cfm; smaller units include a separate fan support frame while larger units support the fan directly on the Whirl Wet. The Tri-Mer top-mounted blower package includes rail-mounted rubber isolators to decrease vibration, and complete ducting from scrubber outlet to blower inlet.

Other options include remotely located blowers which can be located more than 80' from the dust collector. All blower packages are tested at the factory to insure perfect balance and operation to specifications. They are engineered for simple installation and balanced for system static pressure. Blower materials of construction include mild steel, 304 and 316L stainless steel and fiberglass.



Model M

CASE STUDY

Kraft General Foods

Quaker Oats Co. and Kraft General Foods, Inc., manufacturer of Post cereal brands, have joined a fast-growing list of food and beverage makers specifying Whirl Wets to control particulate from mixing, processing and filling operations.



Model H with top-mounted blower.

Florida Tile

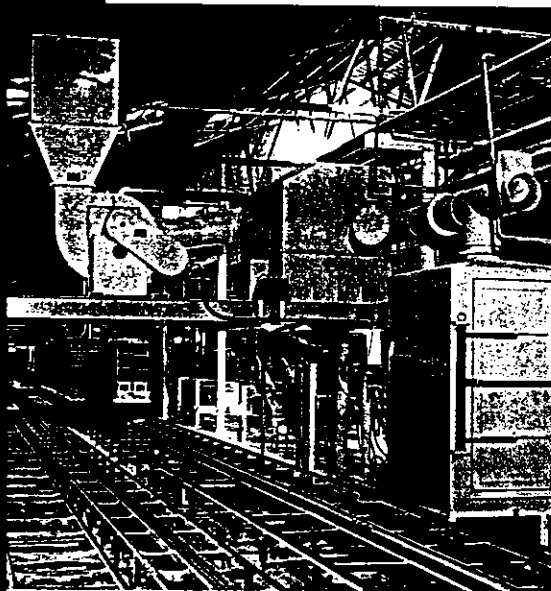
At Florida Tile, the high-weight, high-pH glaze applied to tiles after firing created an overspray that was difficult to handle.

A baghouse was installed, but the capture rate was low; it proved difficult and costly to clean and the high viscosity of the polymer-based spray caused system clogging, resulting in frequent shut-downs.

A decision was made to change to wet technology. Systems were judged on water and energy use, maintenance requirements, feasibility of materials reclamation, and ease of worker accessibility.

Two 4500 cfm Whirl Wets were installed. The units are white polypropylene and are self-cleaning by way of an automatic timer; there is no interruption of production.

Water use is estimated at 50% that of other units the company considered; energy usage is low. According to plant operations engineers, reclamation of the glaze material is virtually 100%.



Design and Engineering

Materials

Whirl Wets are manufactured from mild steel, 304 and 316L stainless steels, Hastelloy® and other alloys as required. For applications where

corrosives are present in the gas stream in addition to dust, **Tri-Mer offers systems in solid polypropylene** – and is the **only** major manufacturer of dust collectors to do so! Other equipment makers suggest that their coated steel units provide an acceptable answer to corrosive applications, but no matter what it's coated **with**, steel will corrode. And potential buyers of steel equipment must factor-in periodic shut-downs for reapplication of the coating if corrosives are present.

Tri-Mer also offers PVC and other specialized options for corrosives. Caustics can be easily and automatically added to the liquid flow to scrub (or pre-scrub) high acid loading gas simultaneously with particulate.

Special conditions

Sometimes, the gas stream will have high particulate loading, high gas loading, or both. Common cases include SO₂, NO_x, HCl, Cl₂, HF; other compounds or combinations are also found. For these applications, Tri-Mer combines the Whirl Wet with its packed bed technology.

Duct design

For highest efficiency particulate collection, proper duct velocities are a **must**. Too slow or an improper design creates clogging and loss of air to the dust collector.

To assure optimum air movement, Tri-Mer uses an integrated, computer-engineered process that's the most advanced in the industry.

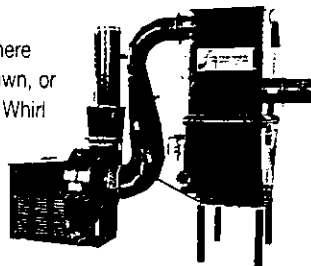
High-temperature applications achieve the highest scrubbing efficiencies with the addition of quenching equipment on the wet duct sections, ahead of the Whirl Wet.

Water use

Whirl Wet consumes less water than any wet dust collector on the market. In fact, the only make-up water required is that which is lost to evaporation or particulate removal. Water lost to particulate removal and evaporation is compensated by automatic water level controls. **Whirl Wets have no external pumps or recirculation systems to wear or cause problems in severe weather.**

Pilot plants

For applications where micron sizes are unknown, or where the suitability of Whirl Wet is not certain, Tri-Mer provides pilot Whirl Wet systems on a short-term rental basis.



These on-site trials allow the user to determine the Whirl Wet's efficiency on a given particulate, calculate water use under real-world conditions and evaluate the feasibility of a wet scrubber system in comparison to a dry system.

For many users, this trial can also determine the practicality of materials recovery.

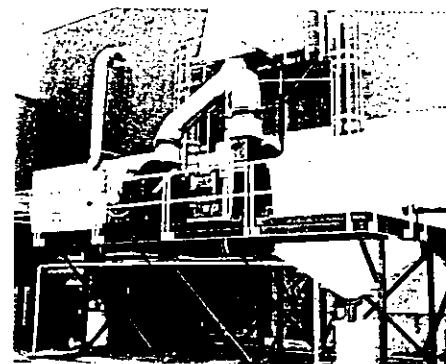


Two 9000 cfm roof-mounted Whirl Wets at BASF Wyandotte, Holland, MI.

CASE STUDY

McCormick Spice

McCormick & Co., the world's largest spice company, recently upgraded dust collection at one of its processing plants. The company wanted to maximize collection efficiency and reduce the time, cost and labor required for system maintenance.

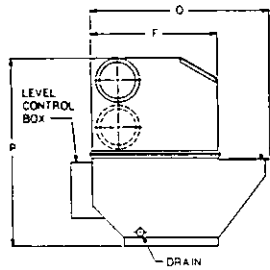


They also wanted a system that had a track record – and one that would accommodate some planned expansion. A pair of Whirl Wets, with an outboard structure, rounded corners, and an internal wash-down nozzle system that optimizes cleaning, was selected.

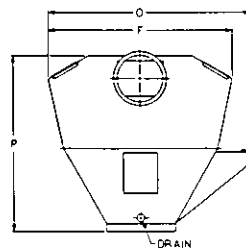
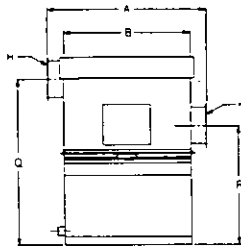
The white 12,000 cfm polypropylene Whirl Wet units at McCormick are engineered for continuous operation, and are suitable for installation outdoors. Computer controls monitor outdoor temperatures and, during the winter months, heat the unit's water to prevent a freezing condition. The heated water also helps maintain system cleanliness.

One of these systems' most important features is the design of the special hoods. Tri-Mer specified a high capture velocity on the hoods' faces, a design feature which allows dust, even twelve feet away, to be captured efficiently.

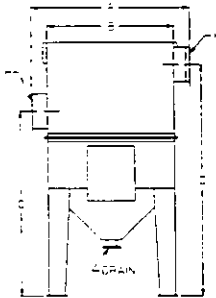
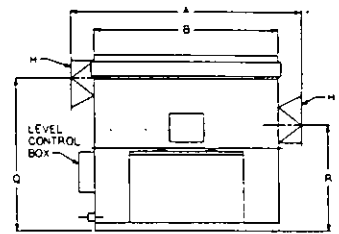
Models Available



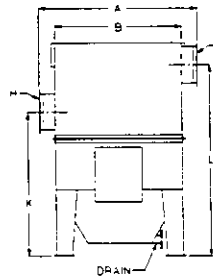
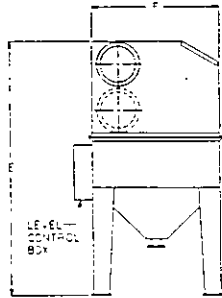
Model "M"
1000 cfm - 6000 cfm



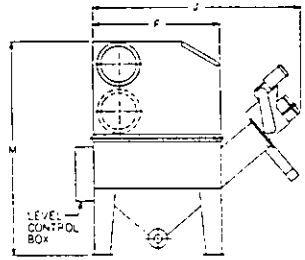
Model "M"
7000 cfm - 14,000 cfm



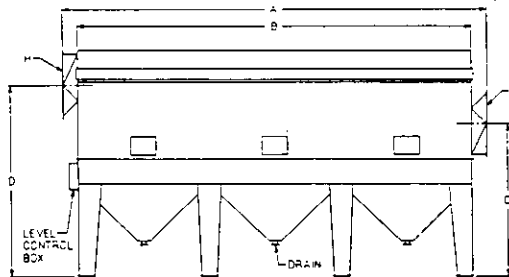
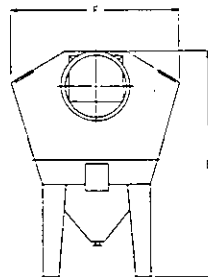
Model "H"
500 cfm - 6000 cfm



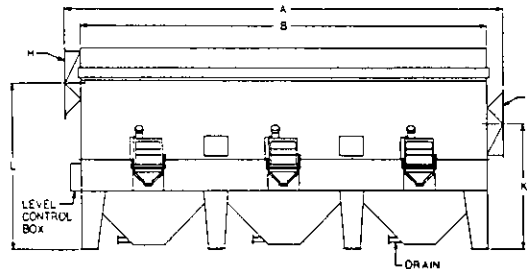
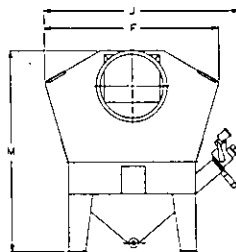
Model "MCD"
2800 cfm - 6000 cfm



Model "H"
7000 cfm - 50,000 cfm



Model "MCD"
7000 cfm - 50,000 cfm



Technical Data

Whirl Wet Model #	Min. CFM	Std. CFM	Max. CFM	A	B	C	D	E	F	H	J	K	L	M	O	P	Q	R
W/W-5	425	500	525	18.5"	6.5"	69"	86.5"	95"	48"	5"	-	-	-	-	-	-	-	-
W/W-6	510	600	630	20"	8"	69"	86.5"	95"	48"	5"	-	-	-	-	-	-	-	-
W/W-8	630	800	840	22.5"	10.5"	69"	86.5"	95"	48"	6"	-	-	-	-	-	-	-	-
W/W-10	840	1000	1050	25"	13"	69"	86.5"	95"	48"	7"	-	-	-	-	67.5"	67"	58.5"	41"
W/W-12	1020	1200	1260	28"	16"	69"	86.5"	95"	48"	7"	-	-	-	-	67.5"	67"	58.5"	41"
W/W-15	1260	1500	1575	32"	20"	69"	86.5"	95"	48"	8"	-	-	-	-	67.5"	67"	58.5"	41"
W/W-18	1530	1800	1890	36"	24"	69"	86.5"	95"	48"	9"	-	-	-	-	67.5"	67"	58.5"	41"
W/W-22	1870	2200	2310	41"	29"	69"	86.5"	95"	48"	10"	-	-	-	-	67.5"	67"	58.5"	41"
W/W-28	2310	2800	2940	49"	37"	69"	86.5"	95"	48"	11"	90"	52"	69.5"	78"	67.5"	67"	58.5"	41"
W/W-34	2890	3400	3570	57"	45"	69"	86.5"	95"	48"	12"	90"	52"	69.5"	78"	67.5"	67"	58.5"	41"
W/W-40	3400	4000	4200	65"	53"	69"	86.5"	95"	48"	13"	90"	52"	69.5"	78"	67.5"	67"	58.5"	41"
W/W-50	4200	5000	5250	78"	66"	69"	86.5"	95"	48"	14"	90"	52"	69.5"	78"	67.5"	67"	58.5"	41"
W/W-60	5100	6000	6300	91.5"	79.5"	69"	86.5"	95"	48"	16"	90"	52"	69.5"	78"	67.5"	67"	58.5"	41"
W/W-70	5950	7000	7350	70.5"	46.5"	85"	109"	117"	88"	18"	134"	64"	88"	99"	104"	90"	81.5"	58"
W/W-80	6800	8000	8400	77"	53"	85"	109"	117"	88"	18"	134"	64"	88"	99"	104"	90"	81.5"	58"
W/W-100	8400	10000	10500	90"	66"	85"	109"	117"	88"	20"	134"	64"	88"	99"	104"	90"	81.5"	58"
W/W-120	10200	12000	12600	103.5"	79.5"	89"	117"	126"	96"	22"	142"	68"	96"	105"	112"	96"	86.5"	59"
W/W-140	11900	14000	14700	116.5"	92.5"	89"	117"	126"	96"	24"	142"	68"	96"	105"	112"	96"	86.5"	59"
W/W-170	14450	17000	17850	136.5"	112.5"	94"	124"	135"	102"	26"	148"	73"	103"	114"	-	-	-	-
W/W-200	17000	20000	20800	156.5"	132.5"	94"	124"	135"	102"	30"	148"	73"	103"	114"	-	-	-	-
W/W-240	20400	24000	25200	183"	159"	100"	132"	145"	112"	32"	158"	79"	111"	124"	-	-	-	-
W/W-280	23800	28000	29400	209.5"	185.5"	100"	132"	145"	112"	34"	158"	79"	111"	124"	-	-	-	-
W/W-320	27200	32000	33600	236"	212"	107"	150"	168"	132"	38"	178"	86"	129"	147"	-	-	-	-
W/W-360	30600	36000	37800	262.5"	238.5"	108"	152"	171"	132"	40"	178"	87"	131"	147"	-	-	-	-
W/W-400	34000	40000	42000	289"	265"	119"	163"	183"	144"	42"	190"	98"	142"	169"	-	-	-	-
W/W-450	38250	45000	47250	322"	298"	123"	169"	190"	152"	44"	198"	102"	148"	177"	-	-	-	-
W/W-500	42500	50000	52500	355"	331"	127"	174"	196"	160"	48"	206"	106"	153"	185"	-	-	-	-

Dimensions are approximate; consult Tri-Mer for exact size.

Other Case Studies

American Aggregates

American Aggregates Corp. produces pelleted material for manufacturers of glass and shingle using slag from nearby AK Steel.

Originally, a 14,000 cfm venturi collected fugitive particulate. Collection efficiency was low, however, and maintenance personnel regularly shoveled inches of uncollected dust which settled over a wide area. Alternative dust collection was evaluated and a 20,000 cfm Whirl Wet was selected.

The Whirl Wet collects a half-ton of slag dust each hour. Facility maintenance has been simplified and the quality of the workplace has been improved.



In this outdoor location, a temperature-activated heater insures 24-hour operation.

Eversharp Tool Co.

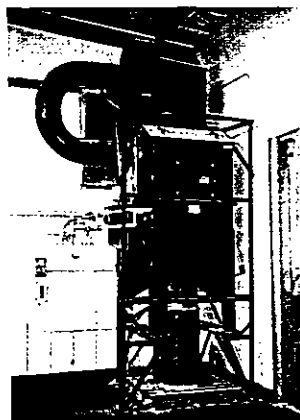
A dry bag collector caused safety and housekeeping problems for Eversharp Tool Company. Aluminum and platinum fines created by machining would short out electrical motors, contacts and breakers.

Efforts to halt the spread of the talcum-like dust fines were unsuccessful, creating housekeeping problems plant-wide. An enclosure was built around the collector and a cyclone was installed. Wall filters were also added.

Operationally, there were additional concerns. Humidity would cause the dust to stick to the bags, which would typically clog every three days. Aggressive washing of the bags would be needed to break off the accumulated crud, despite the fact that washing was contrary to manufacturer's instructions.

Eversharp, seeking a better alternative, installed a 2,800 cfm, all-polypropylene Whirl Wet. A steel frame positions the Whirl Wet above a 55-gallon drum. This allows manual release of collected material. The release is typically ten seconds in duration and is the only regular maintenance required.

The Whirl Wet system uses very little water and what water is required is recycled. The dust can now be returned to the customer for reclamation of the platinum.

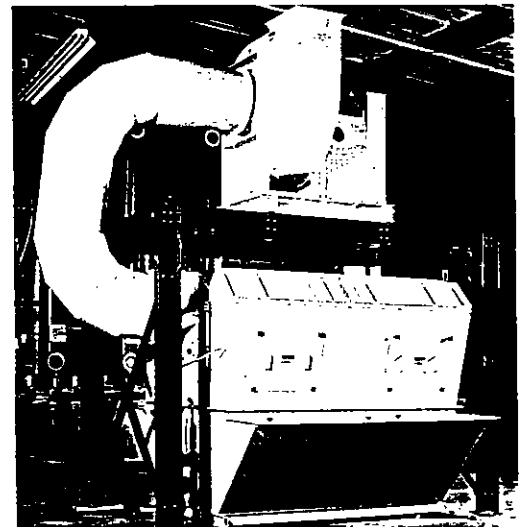


Horween Leather

For leather fines and other lightweight, porous materials, dry collection has been thought to be preferable to wet because of the material's buoyancy.

Horween Leather Company challenged that assumption. Originally, two baghouse systems collected particulate, but problems arose. First, cold winter dryness caused high levels of static electricity. Resultant sparks in the ducts headed to the baghouse, creating fire risk. Worse was a problem peculiar to tanning: steel shot embedded in the hides remained through the tanning process and the use of sandpaper on the hides created another fire hazard. The danger was heightened by tanning chemicals.

Horween installed a 14,000 cfm Whirl Wet, ducting three machines to the unit. The Whirl Wet eliminated the risk of fire and explosion at the finishing stations. With dust collection efficiency of 98.6%, dust throughout the plant was eliminated and product quality improved.



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