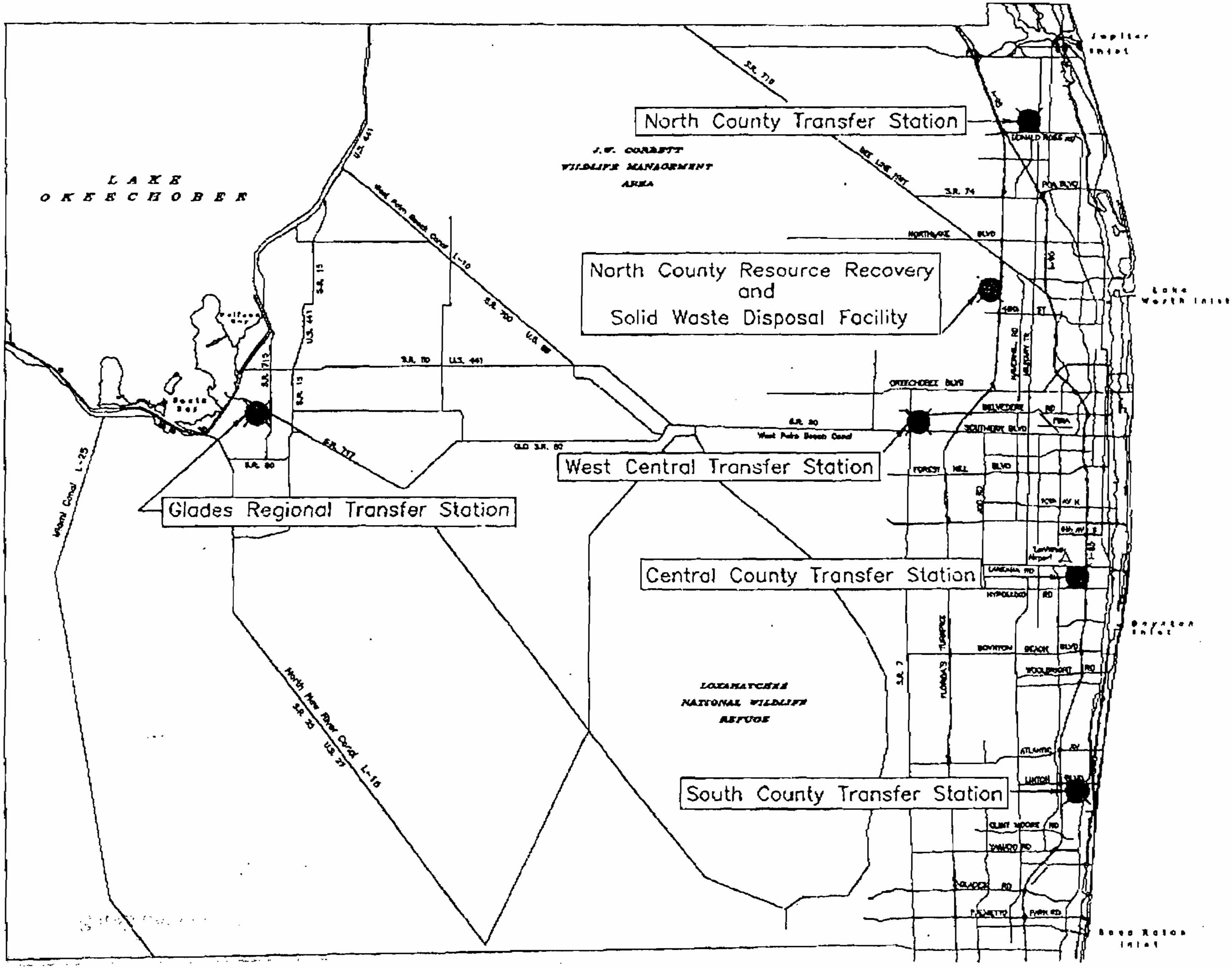
Solid Waste Authority of Palm Beach County

Title V Permit Application
Appendix

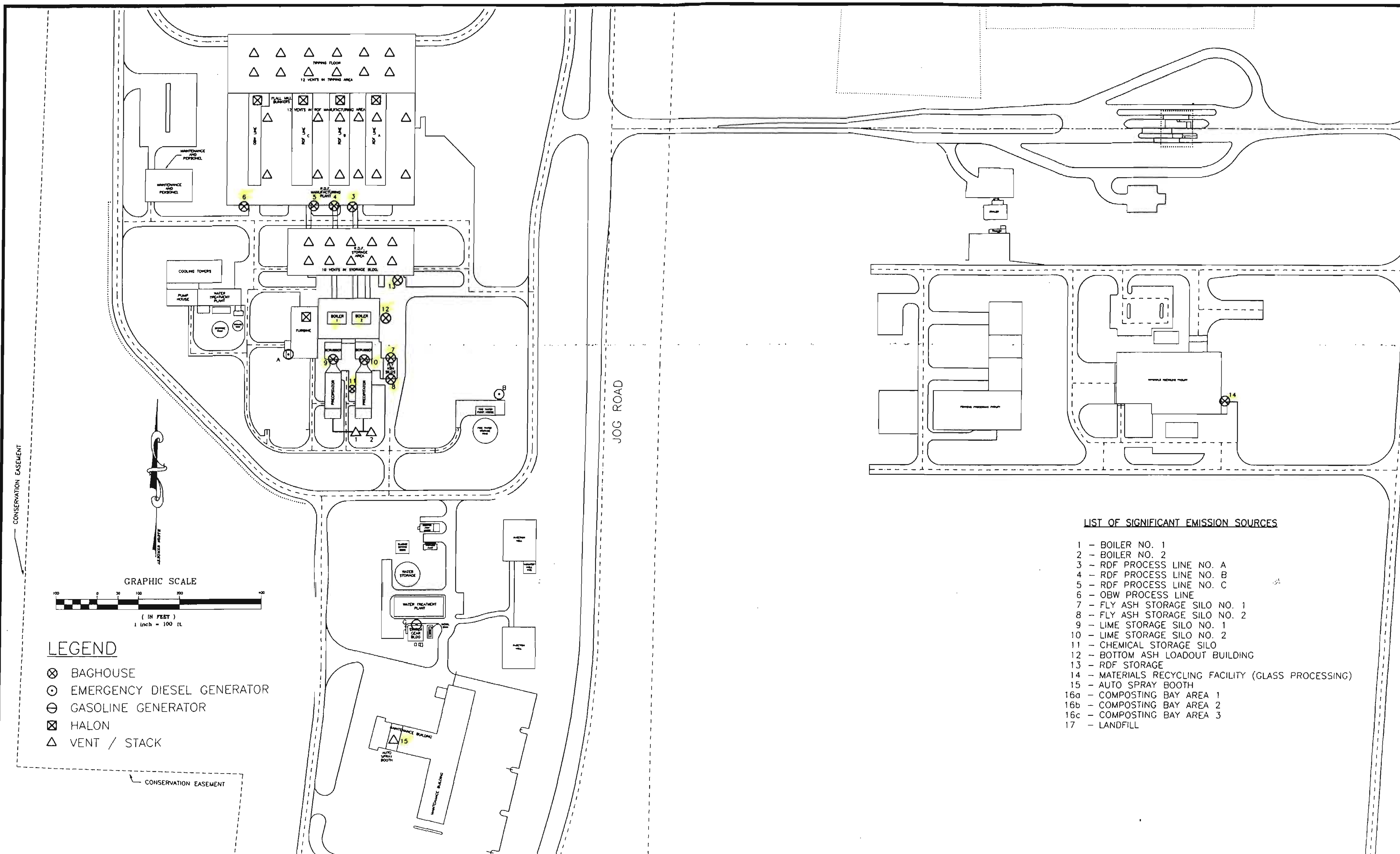
HDR

Appendix A-1
Area Map Showing Facility Location


North County Transfer Station
North County Resource Recovery and Solid Waste Disposal Facility
West Central Transfer Station
Glades Regional Transfer Station
Central County Transfer Station
South County Transfer Station
LAKE OKEECHOBEE
J.W. CORBETT WILDLIFE MANAGEMENT AREA
LOXAHATCHEE NATIONAL WILDLIFE REFUGE
Jupiter Inlet
Lake Worth Inlet
Boynton Inlet
Boca Raton Inlet

Appendix A-2

Facility Plot Plan - Drawings 07187-016-096, G-1 & G-2



LEGEND

- ⊗ BAGHOUSE
- ⊙ EMERGENCY DIESEL GENERATOR
- ⊖ GASOLINE GENERATOR
- ⊠ HALON
- △ VENT / STACK

LIST OF SIGNIFICANT EMISSION SOURCES

1 – BOILER NO. 1
2 – BOILER NO. 2
3 – RDF PROCESS LINE NO. A
4 – RDF PROCESS LINE NO. B
5 – RDF PROCESS LINE NO. C
6 – OBW PROCESS LINE
7 – FLY ASH STORAGE SILO NO. 1
8 – FLY ASH STORAGE SILO NO. 2
9 – LIME STORAGE SILO NO. 1
10 – LIME STORAGE SILO NO. 2
11 – CHEMICAL STORAGE SILO
12 – BOTTOM ASH LOADOUT BUILDING
13 – RDF STORAGE
14 – MATERIALS RECYCLING FACILITY (GLASS PROCESSING)
15 – AUTO SPRAY BOOTH
16a – COMPOSTING BAY AREA 1
16b – COMPOSTING BAY AREA 2
16c – COMPOSTING BAY AREA 3
17 – LANDFILL

HDR Engineering, Inc.
Tampa, Florida

Issue No.	Description	Date	Drwn.	Chkd.
B	REVISIONS	6/96	TJT	JB
A	ISSUED FOR PERMIT APPLICATION	7/95	TJT	RI

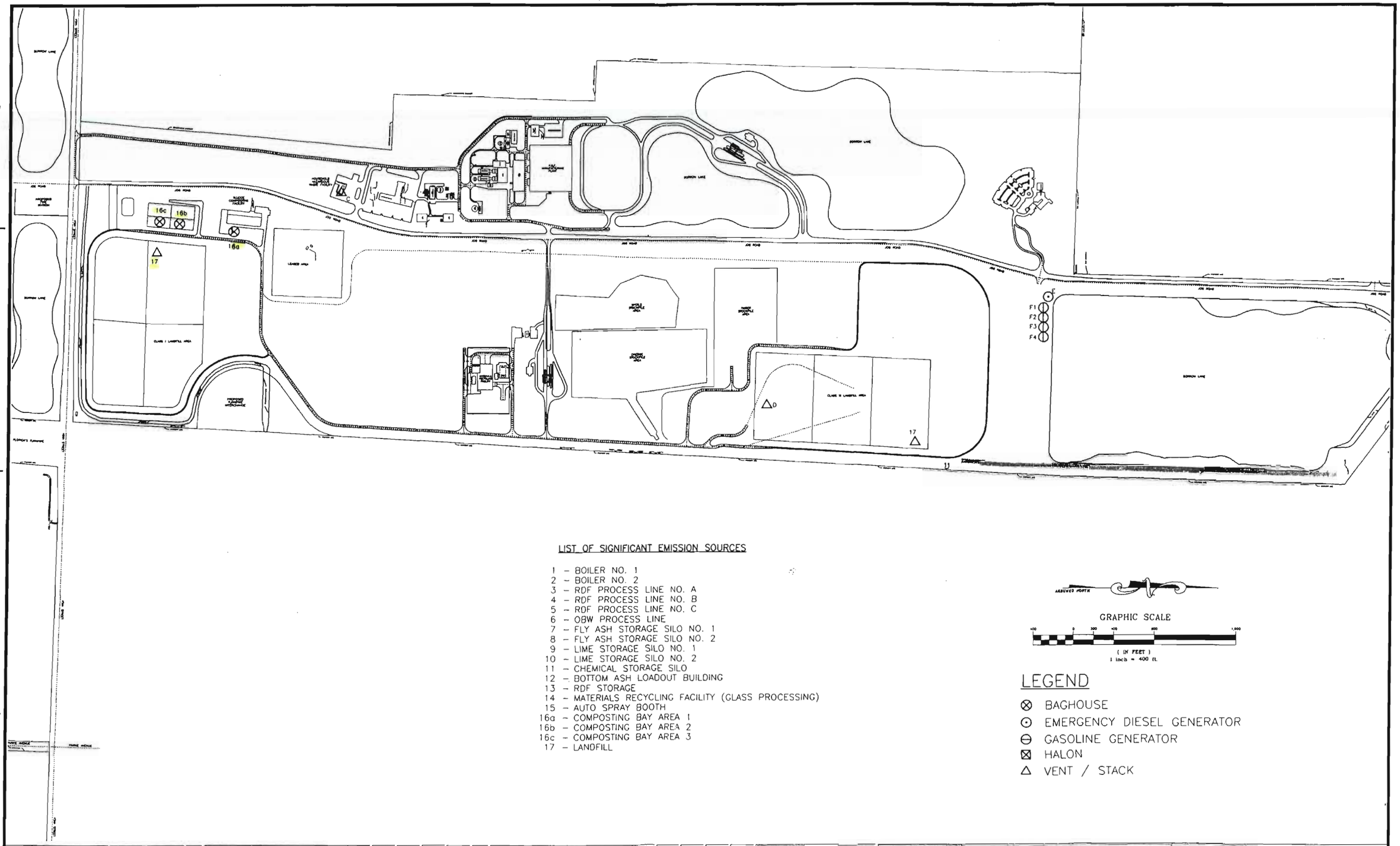
Project Manager: R. LARSON
Environmental: J. BRITTAIN
Drawn By: T. TIEDEMANN

SWA SOLID WASTE AUTHORITY

NORTH COUNTY REGIONAL RESOURCE RECOVERY FACILITY
PALM BEACH COUNTY, FLORIDA

Facility Layout with Emission Sources

Date: 6/3/96 | Scale: As Noted | Project No. 07187-016-096 | Drawing No. G-1 | Issue B



LIST OF SIGNIFICANT EMISSION SOURCES

1 – BOILER NO. 1
2 – BOILER NO. 2
3 – RDF PROCESS LINE NO. A
4 – RDF PROCESS LINE NO. B
5 – RDF PROCESS LINE NO. C
6 – OBW PROCESS LINE
7 – FLY ASH STORAGE SILO NO. 1
8 – FLY ASH STORAGE SILO NO. 2
9 – LIME STORAGE SILO NO. 1
10 – LIME STORAGE SILO NO. 2
11 – CHEMICAL STORAGE SILO
12 – BOTTOM ASH LOADOUT BUILDING
13 – RDF STORAGE
14 – MATERIALS RECYCLING FACILITY (GLASS PROCESSING)
15 – AUTO SPRAY BOOTH
16a – COMPOSTING BAY AREA 1
16b – COMPOSTING BAY AREA 2
16c – COMPOSTING BAY AREA 3
17 – LANDFILL

ASSUMED NORTH

GRAPHIC SCALE

400 0 200 400 800 1,600

(IN FEET)
1 inch = 400 ft.

LEGEND

- ⊗ BAGHOUSE
- ⊙ EMERGENCY DIESEL GENERATOR
- ⊖ GASOLINE GENERATOR
- ⊠ HALON
- △ VENT / STACK

HDR Engineering, Inc.
Tampa, Florida

Issue No.	Description	Date	Drawn	Chkd.	Supv. Engr.	Proj. Mgr.
B	REVISIONS	6/96	TJT	JB		
A	ISSUED FOR PERMIT APPLICATION	9/94	TJT	RI		

Project Manager: R. LARSON
Architect: -
HAC/Process: -
Civil: -
Mechanical: -
Electrical: -
Structural: -
Environmental: J. BRITTAIN
Drawn By: T. TIEDEMANN

SWA SOLID WASTE AUTHORITY

NORTH COUNTY REGIONAL
RESOURCE RECOVERY FACILITY
PALM BEACH COUNTY, FLORIDA

Facility Layout with Emission Sources

Date: 6/3/96
Scale: As Noted
Project No.: 07187-016-096
Drawing No.: G-2
Issue: B

Appendix B-1

Precautions to Prevent Emissions of Unconfined Particulate Matter

Precautions to prevent unconfined emissions:

- Roads are sprayed with a water truck
- Ash is quenched with water prior to landfilling

Appendix B-2
Fugitive Emissions Identifications

Potential Fugitive emissions identification:

- Precautions to prevent fugitive dust emissions - ash is quenched with water

Appendix B-3
List of Insignificant Activities

Potential Insignificant Activities/Sources

Location	Type of Activity
Resource Recovery Facility (RRF)	Emergency diesel generator Diesel fire water pump
Utilities Facility	Emergency diesel generator
Household hazardous waste	Laboratory hood
Trash processing, of woodwaste	Grinder, fugitive dust from
Mulch processing, of yard waste	Grinder, fugitive dust from
Dredge operations	1 diesel engine for dredging 4 gasoline generators for welding
Tire cutting operation	Diesel generator for segmentizer

Appendix B-4

List of Equipment/Activities Regulated Under Title VI

Appliance Inventory

Solid Waste Authority

Administration Bldg. 7501 North Jog Road West Palm Beach, FL 33412 Phone:407/640-4000 Acquired: / /

Appliance	Location	Manufacturer	Model	Serial Num	V/Ph/Hz	Charge lbs	Ref. Type	Lubricant	Capacity	Upgrades
Chiller - 01	North East Chiller		CGACD104RANKK60F	J89F71624	460/ /	83.0	HCFC-22	Unknown	200 Tons	NO
Chiller - 02	South West Chiller		CGACD104RANKK60F	J89F71623		83.0	HCFC-22	Unknown	200 Tons	NO

Appendix B-5

Compliance Report, Plan and Statement

PALM BEACH COUNTY - SOLID WASTE AUTHORITY
North County Regional Resource Recovery Facility
Facility ID No. 50-WPB-50-234

Title V Permitting - Compliance Plan
General Description

Emission Unit		Pollutant/Parameter			Applicable Requirements		Plan	
ID No.	Description	Item No.	ID Code	Item	Section	Paragraph	Method of Compliance	Frequency
001	Unit 1 Boiler	1	PM	Particulate Matter	40 CFR 60	Appendix A	Stack Test - USEPA Method 5	Annual
					62-297 FAC			
					PSD-FL-108A			
		2	NOx	Nitrogen Oxide	40 CFR 60	Appendix A	Stack Test - USEPA Method 7,7A,7B,7C,7D or 7E	Annual
					62-297 FAC			
					PSD-FL-108A		CEM	Continuously
		3	CO	Carbon Monoxide	40 CFR 60	Appendix A	Stack Test - USEPA Method 10	Annual
					62-297 FAC		CEM	Continuously
					PSD-FL-108A			
		4	H110	Lead	40 CFR 60	Appendix A	Stack Test - USEPA Method 12	Annual
					62-297 FAC			
					PSD-FL-108A			
		5	H114	Mercury	40 CFR 60	Appendix A	Stack Test - USEPA Method 101A	Annual
					62-297 FAC			
					PSD-FL-108A			
		6	H021	Beryllium	40 CFR 60	Appendix A	Stack Test - USEPA Method 104	Annual
					62-297 FAC			
					PSD-FL-108A			
		7	FL	Fluoride	40 CFR 60	Appendix A	Stack Test - USEPA Method 13A or 13B	Annual
					62-297 FAC			
					PSD-FL-108A			
		8	VOC	Volatile Organic Compound	40 CFR 60	Appendix A	Stack Test - USEPA Method 25 or 25A	Annual
					62-297 FAC			
					PSD-FL-108A			
		9	SO_2	Sulfur Dioxide	40 CFR 60	Appendix A	Stack Test - USEPA Method 6, 6C or 6B	Annual
					62-297 FAC			
					PSD-FL-108A		CEM	Continuously
		10	HCl	Hydrogen Cloride	40 CFR 60	Appendix A	Stack Test - USEPA Method 26	Annual
					62-297 FAC			
					PSD-FL-108A			
		11	Diox	Dioxin and Furans	PSD-FL-108A		Stack Test - USEPA Method 23	Annual
			O_2	Oxygen	PSD-FL-108A		CEM	Continuously
				Temp. at Scrubber Exit	PSD-FL-108A		CEM	Continuously
				Steam Production	PSD-FL-108A		CEM	Continuously
				Opacity	PSD-FL-108A	Appendix A	Stack Test - USEPA Method 9	Annual
							CEM	Continuously
				"F" Factors	PSD-FL-108A	Appendix A	Stack Test - USEPA Method 19	Annual

Title V Permitting - Compliance Plan
General Description

Emission Unit		Pollutant/Parameter			Applicable Requirements		Plan	
ID No.	Description	Item No.	ID Code	Item	Section	Paragraph	Method of Compliance	Frequency
002	Unit 2 Boiler	1	PM	Particulate Matter	40 CFR 60	Appendix A	Stack Test - USEPA Method 5	Annual
					62-297 FAC			
					PSD-FL-108A			
		2	NOx	Nitrogen Oxide	40 CFR 60	Appendix A	Stack Test - USEPA Method 7,7A,7B,7C,7D or 7E	Annual
					62-297 FAC			
					PSD-FL-108A		CEM	Continuously
		3	CO	Carbon Monoxide	40 CFR 60	Appendix A	Stack Test - USEPA Method 10	Annual
					62-297 FAC		CEM	Continuously
					PSD-FL-108A			
		4	H110	Lead	40 CFR 60	Appendix A	Stack Test - USEPA Method 12	Annual
					62-297 FAC			
					PSD-FL-108A			
		5	H114	Mercury	40 CFR 60	Appendix A	Stack Test - USEPA Method 101A	Annual
					62-297 FAC			
					PSD-FL-108A			
		6	H021	Beryllium	40 CFR 60	Appendix A	Stack Test - USEPA Method 104	Annual
					62-297 FAC			
					PSD-FL-108A			
		7	FL	Fluoride	40 CFR 60	Appendix A	Stack Test - USEPA Method 13A or 13B	Annual
					62-297 FAC			
					PSD-FL-108A			
		8	VOC	Volatile Organic Compound	40 CFR 60	Appendix A	Stack Test - USEPA Method 25 or 25A	Annual
					62-297 FAC			
					PSD-FL-108A			
		9	SO_2	Sulfur Dioxide	40 CFR 60	Appendix A	Stack Test - USEPA Method 6, 6C or 6B	Annual
					62-297 FAC			
					PSD-FL-108A		CEM	Continuously
		10	HCl	Hydrogen Cloride	40 CFR 60	Appendix A	Stack Test - USEPA Method 26	Annual
					62-297 FAC			
					PSD-FL-108A			
		11	Diox	Dioxin and Furans	PSD-FL-108A		Stack Test - USEPA Method 23	Annual
			O_2	Oxygen	PSD-FL-108A		CEM	Continuously
				Temp. at Scrubber Exit	PSD-FL-108A		CEM	Continuously
				Steam Production	PSD-FL-108A		CEM	Continuously
				Opacity	PSD-FL-108A	Appendix A	Stack Test - USEPA Method 9	Annual
							CEM	Continuously
				"F" Factors	PSD-FL-108A	Appendix A	Stack Test - USEPA Method 19	Annual

PALM BEACH COUNTY - SOLID WASTE AUTHORITY
North County Regional Resource Recovery Facility
Facility ID No. 50-WPB-50-234

Title V Permitting - Compliance Plan

Standards and Status

Emission Unit		Pollutant			Compliance Standards[1]				Compliance	Monitoring/Recording	
ID No.	Description	Item No.	ID Code	Item	Units	Type	Value	Conditions	Frequency	(Y/N)	Comments
001	Unit 1 Boiler	1	PM	Particulate Matter	grains/dscf	max	0.015	@7% O_2	Annually		
		2	NOx	Nitrogen Oxide	lbs/MMbtu	24 hr block avg	0.48		Annually		
		3	CO	Carbon Monoxide	ppmdv	24 hr avg.	200	@7% O_2	Annually		
					ppmdv	1 hr avg.	400	@7% O_2	Annually		
		4	H110	Lead	lbs/MMbtu	max	4.0 x 10(E4)		Annually		
		5	H114	Mercury	lbs/MMbtu	max	2.4 x 10(E4)		Annually		
		6	H021	Beryllium	lbs/MMbtu	max	7.3 x 10(E7)		Annually		
		7	FL	Fluoride	lbs/MMbtu	max	0.0032		Annually		
		8	VOC	Volatile Organic Compound	lbs/MMbtu	max	0.016		Annually		
		9	SO_2	Sulfur Dioxide	ppmdv	24 hr Geometric Mean	30	@7% O_2	Annually		
		10	HCl	Hydrogen Cloride	ppmdv	3 run test avg	25	@7% O_2	Annually		
		11	Diox	Dioxin and Furans	ng/dscm	max	60	@7% O_2	Annually		
002	Unit 2 Boiler	1	PM	Particulate Matter	grains/dscf	max	0.015	@7% O_2	Annually		
		2	NOx	Nitrogen Oxide	lbs/MMbtu	24 hr block avg	0.48		Annually		
		3	CO	Carbon Monoxide	ppmdv	24 hr avg.	200	@7% O_2	Annually		
					ppmdv	1 hr avg.	400	@7% O_2	Annually		
		4	H110	Lead	lbs/MMbtu	max	4.0 x 10(E4)		Annually		
		5	H114	Mercury	lbs/MMbtu	max	2.4 x 10(E4)		Annually		
		6	H021	Beryllium	lbs/MMbtu	max	7.3 x 10(E7)		Annually		
		7	FL	Fluoride	lbs/MMbtu	max	0.0032		Annually		
		8	VOC	Volatile Organic Compound	lbs/MMbtu	max	0.016		Annually		
		9	SO2	Sulfur Dioxide	ppmdv	24 hr Geometric Mean	30	@7% O_2	Annually		
		10	HCl	Hydrogen Cloride	ppmdv	3 run test avg	25	@7% O_2	Annually		
		11	Diox	Dioxin and Furans	ng/dscm	max	60	@7% O_2	Annually		

[1] Except during Start-Up, Shutdown and Malfunction periods of 3 hours maximum per occurrence

Compliance Statement : I, the undersigned, am the responsible official as defined in Chapter 62-213, F.A.C., of the Title V source for which this report is being submitted. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made and data contained in this report are true, accurate, and complete.

Title _____ Date _____

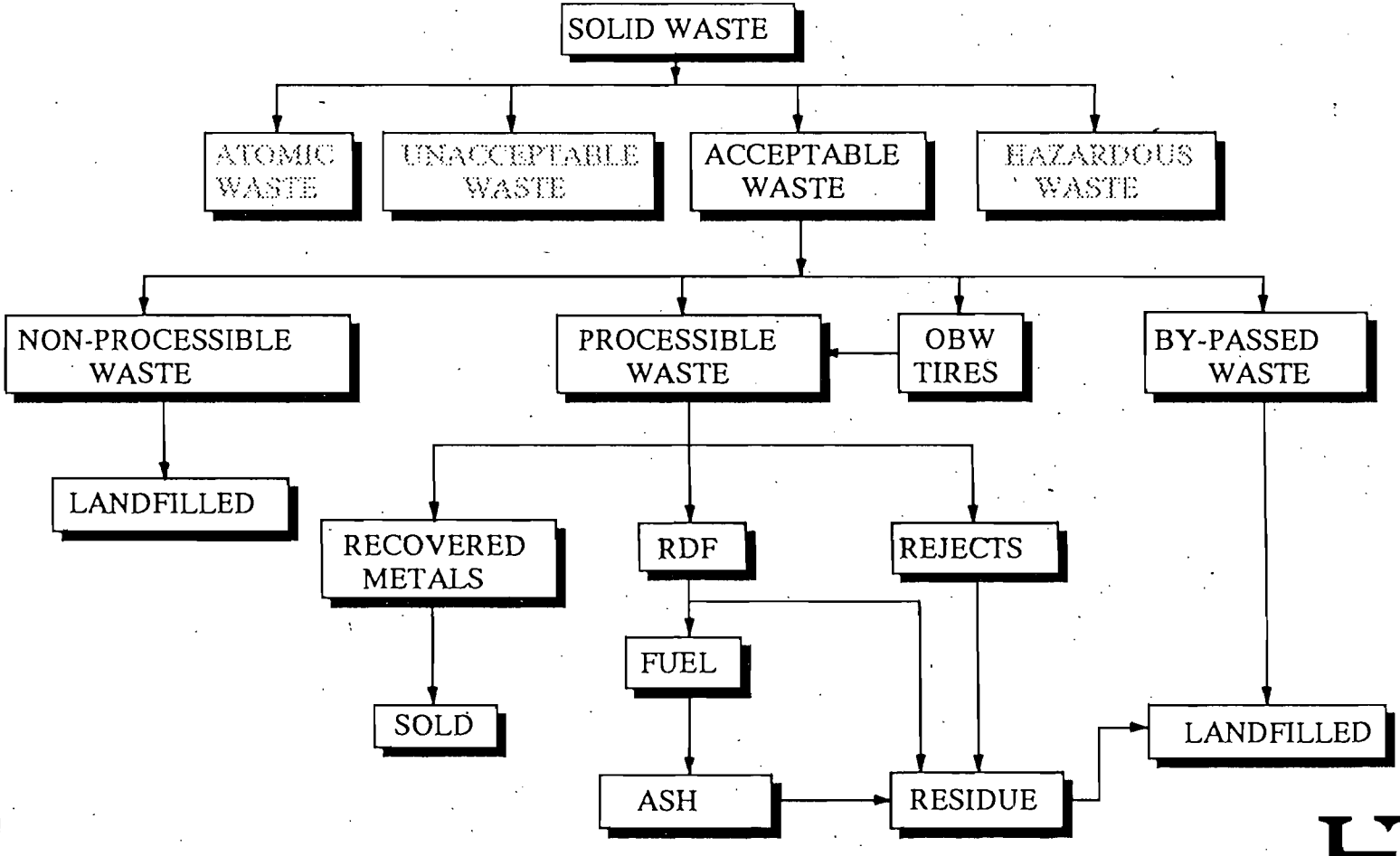
Appendix C-1
Solid Waste Flow Diagram

Figure 3-1

SOLID WASTE FLOW DIAGRAM

BASED ON CONTRACT DEFINITIONS

NCRRRF



NOTE: Atomic Waste, Unacceptable Waste and Hazardous Waste are not accepted at the NCRRRF.

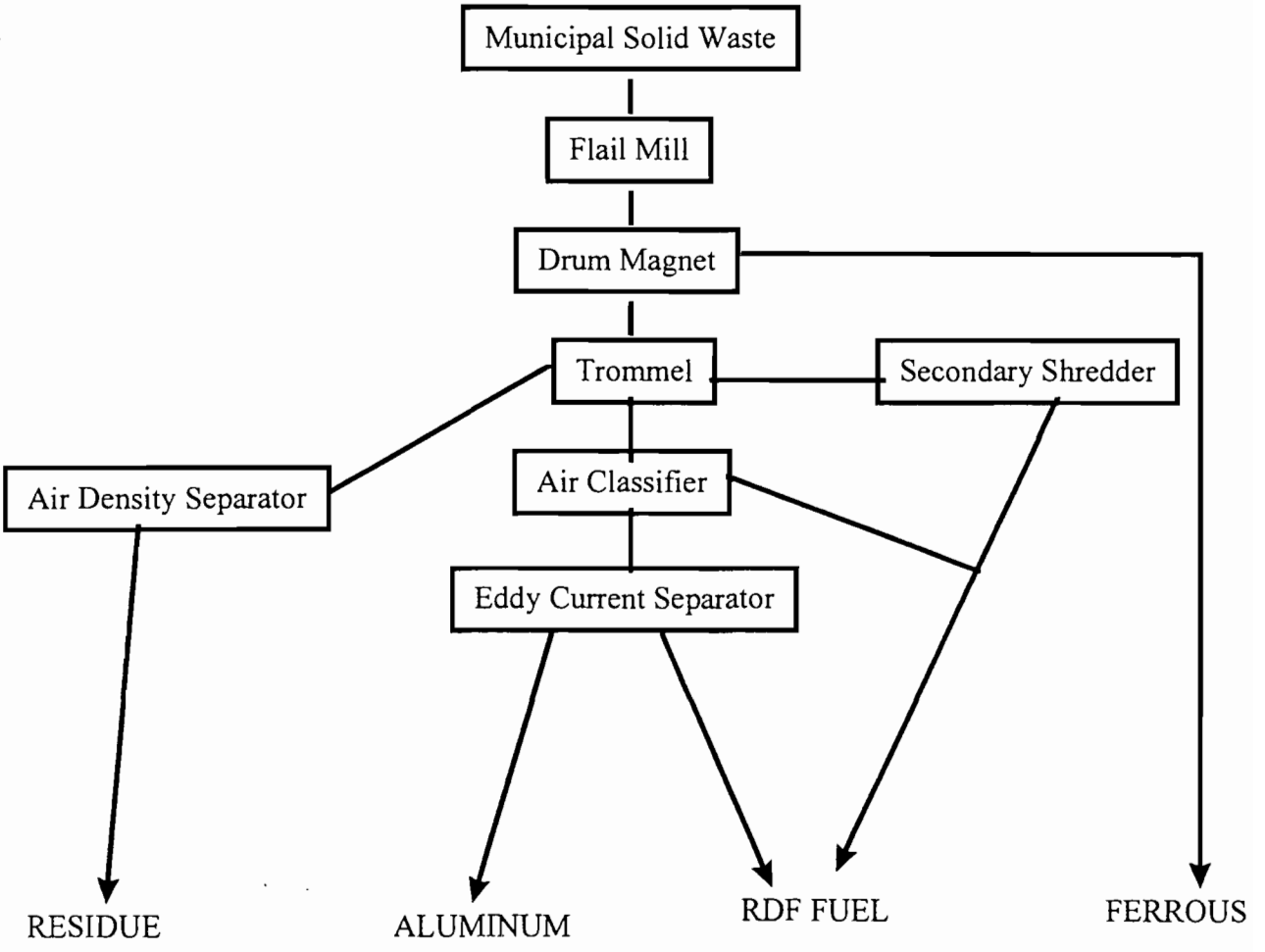
s407A014

Figure 3-1

Appendix C-2

RDF Process Flow Diagram

RDF Process Flow Diagram

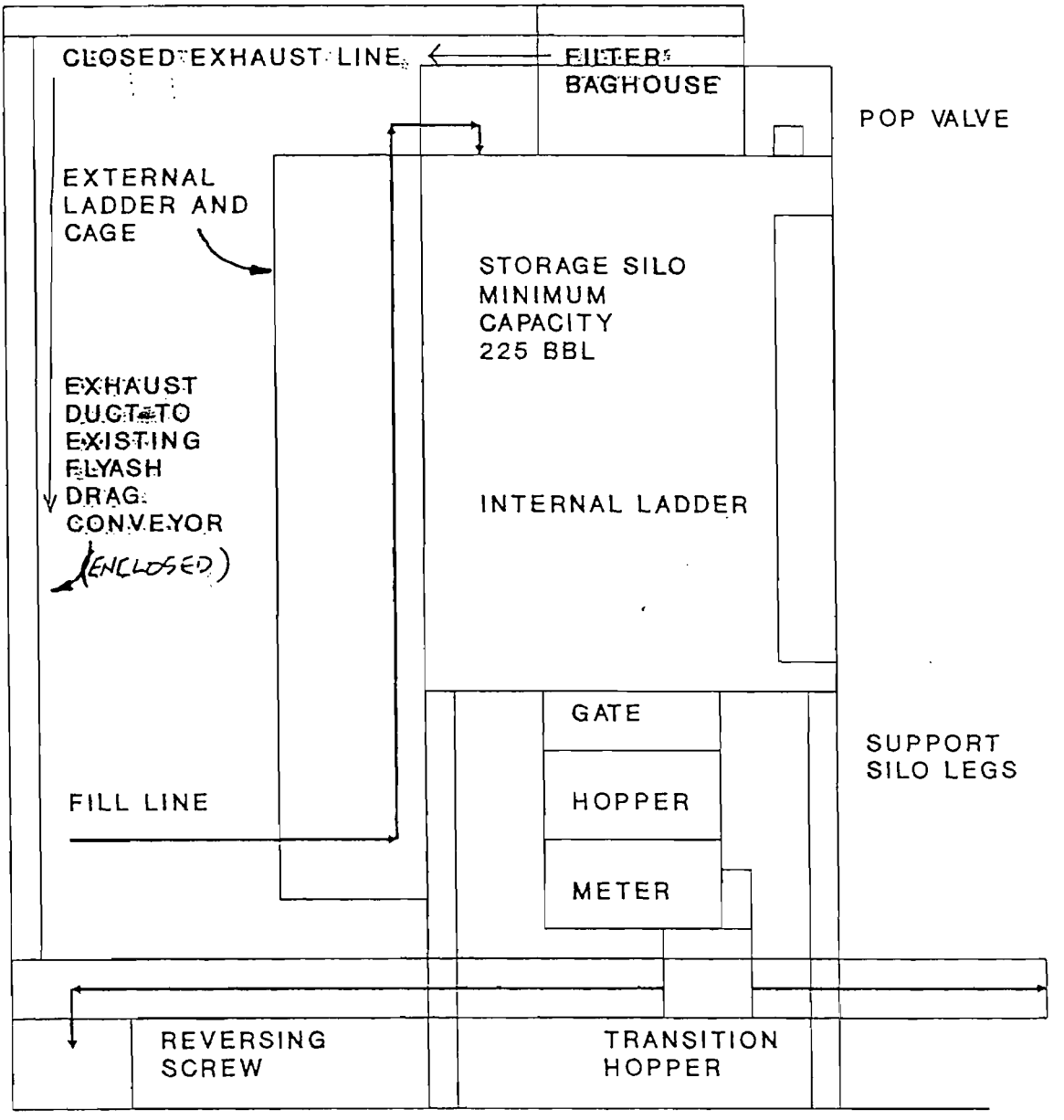


Appendix C-8

Forrester Environmental Drawing

ASH TREATMENT SYSTEM - PROCESS FLOW DIAGRAM
NCRRS

FESI/DRY STORAGE AND METERING DETAILS
WEST PALM BEACH COUNTY AUTHORITY

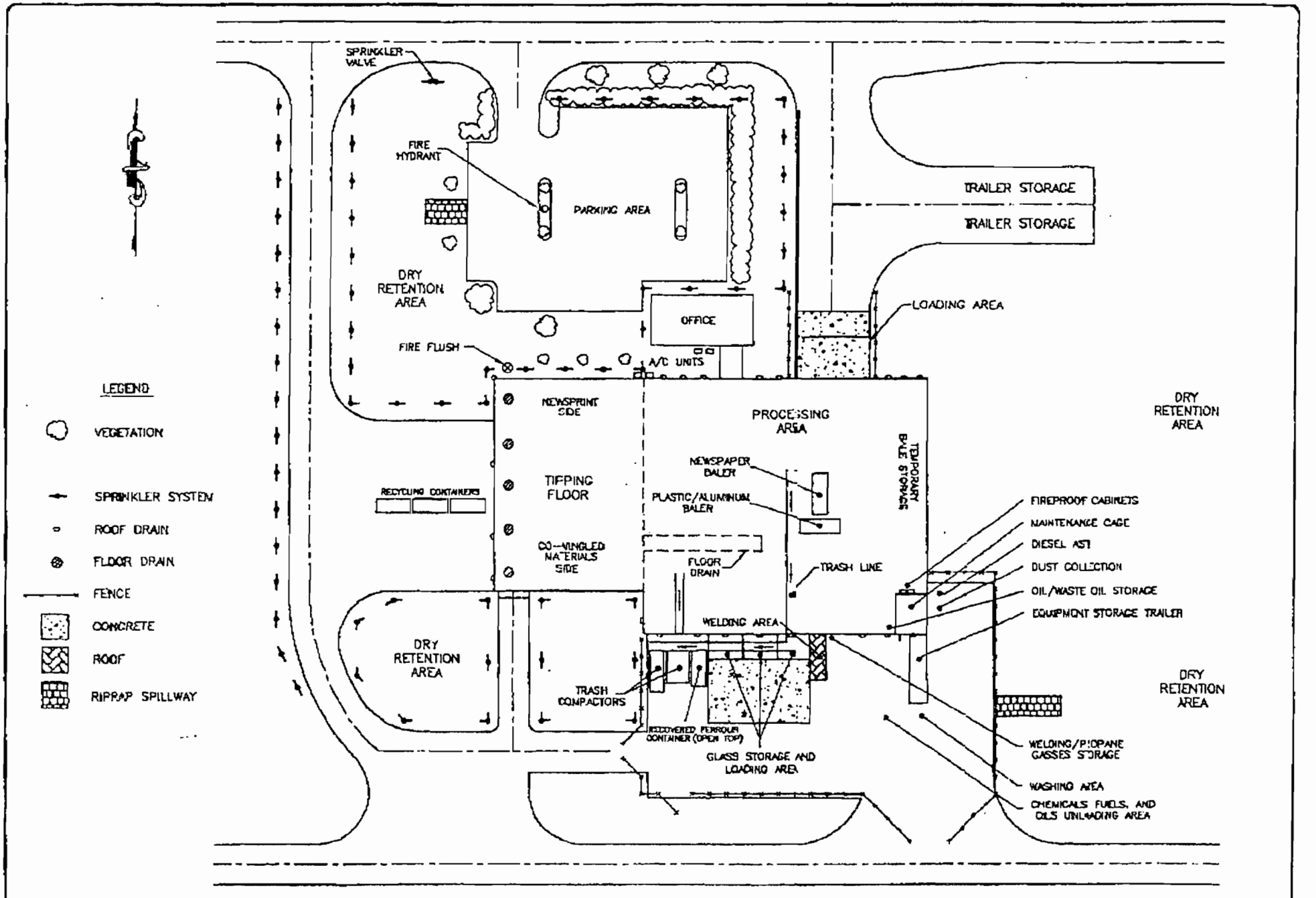


EXISTING FLYASH DRAGS

REINFORCED CONCRETE FOUNDATION

DESIGN NOTES:
- o REVERSING SCREW LOADS TO SOUTH AND NORTH FASR CONVEYORS
- o ACRISON 101-K FEEDER WITH VARIABLE DC DRIVE
- o 8" KNIFE GATE WITH TIGHT FACE TOLERANCE
- o BULK CHEMICAL DENSITY AT 90 TO 100 PCF

Appendix C-10
SWA Drawing S07-MRF



SOLID WASTE AUTHORITY
OF PALM BEACH COUNTY
7501 North Jog Road
West Palm Beach, Florida 33412
Phone: (407)640-4000 FAX: (407)683-4067

SWA

Date	Revision Description

SITE PLAN
MATERIALS RECYCLING FACILITY

NCRRF
PALM BEACH COUNTY, FLORIDA

DWG: AV	DSN:
CHK:	SCALE: 1" = 75'
APV:	DATE: 05/30/98

SHEET
507-MRF

FILE NO:

Appendix C-11

Description of Paint Spray Booths

DESCRIPTION

Paint Spray Booths are used to confine and remove overspray and fumes from the area in which spray painting is done. They are available in many different sizes (width, depth and working height) and in many different types (depending upon the amount and kind of material to be sprayed and the method of application).

Dry Type Spray Booths With Arrestor Exhaust are designed for use during intermittent or limited production spraying in locations where exhausted air must be clean. They operate by drawing contaminated air through replaceable filters (arrestor pads) which prevent overspray residue escaping to the atmosphere. All booths with arrestor exhausts are supplied with an extra set of filter pads and a draft gauge.

Water Wash Spray Booths Of Semi-Elevated Design are used where a large quantity of any normal type of finishing material (such as enamel) is being sprayed and high production is maintained. They operate by drawing contaminated air through a series of water curtains and baffles to remove the 95% to 98% of the solid particles from overspray. This prevents overspray residue from reaching the exhaust unit and stack or escaping to the atmosphere. Paint residue is actually scrubbed from the air and washed down into a water chamber which acts as a collecting tank for the entrapped particles. All water wash spray booths are supplied with manifold unit, pump unit, motor and exhaust fan.

Water Wash Spray Booths Of Conventional Design are used where the finishing operation is to be maintained at only average production speed or where space limitations require that the most compact installation be made. Conventional design booths only utilize a front water box and curtain.

All dry type and water wash spray booths are supplied with a fire deflector curtain. They may be supplied with or without conveyor openings, made according to the size, outline and location specified by the customer and with or without light openings. Dry type booths are also available in the bench (leg) style for use in spraying small and medium size articles.

All paint spray booths are of self-supporting 18 gauge sheet steel sectional panel and heavy gauge steel beam construction. They are furnished painted and ready for bolting together along with all necessary assembly hardware and instructions. All booths are of fireproof construction and are built to meet the requirements of the National Board of Fire Underwriters as well as most of those of local and state fire and health regulations. It is the responsibility of user to install this equipment in accordance with current local regulations.

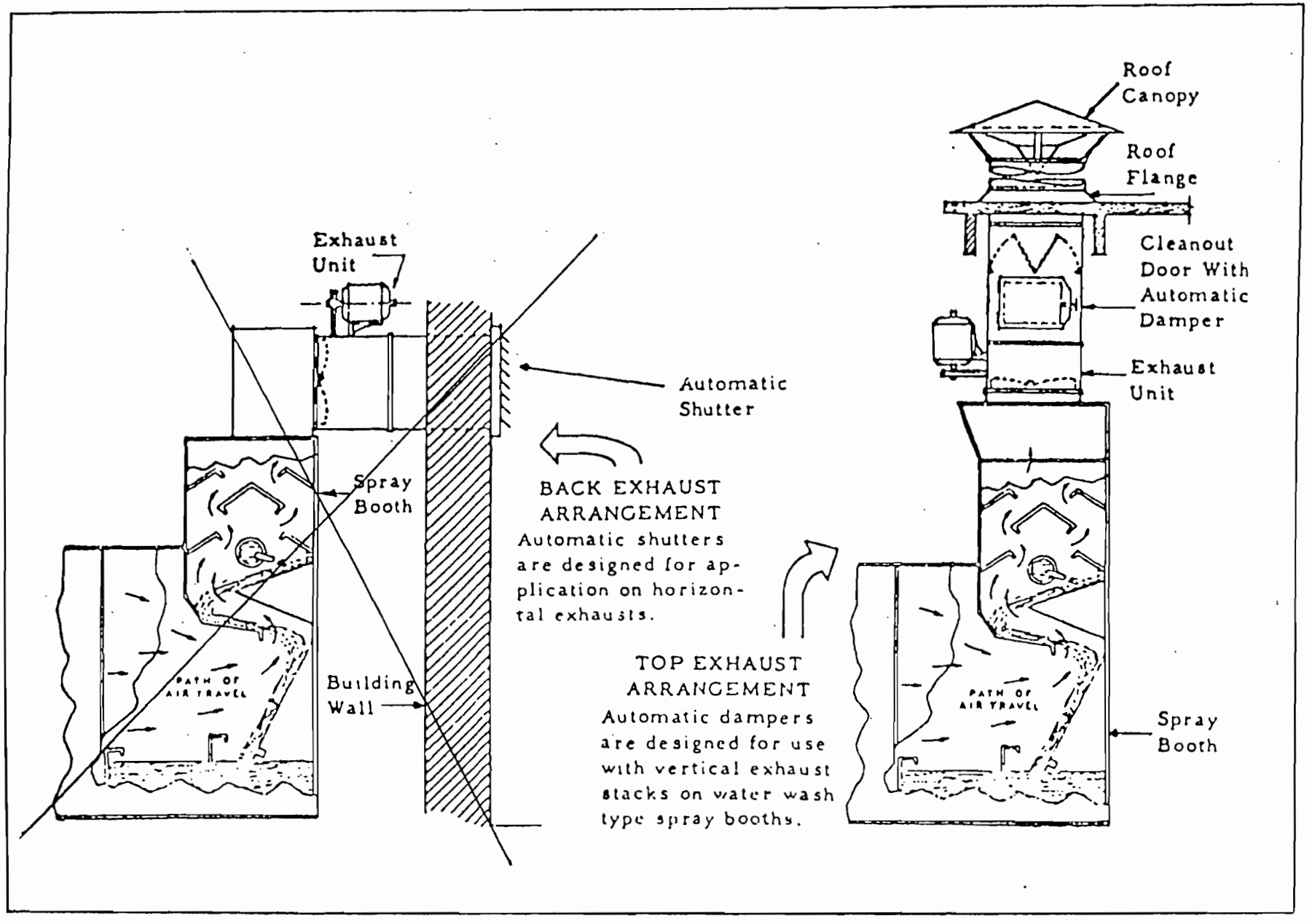
ACCESSORIES

All Paint Spray Booths are available with various accessories to meet any code requirements.

A. Lighting fixtures are necessary when the spray operator must work free of shadows brought on by inadequate lighting in order to maintain a quality finish. Bulbs are not included.

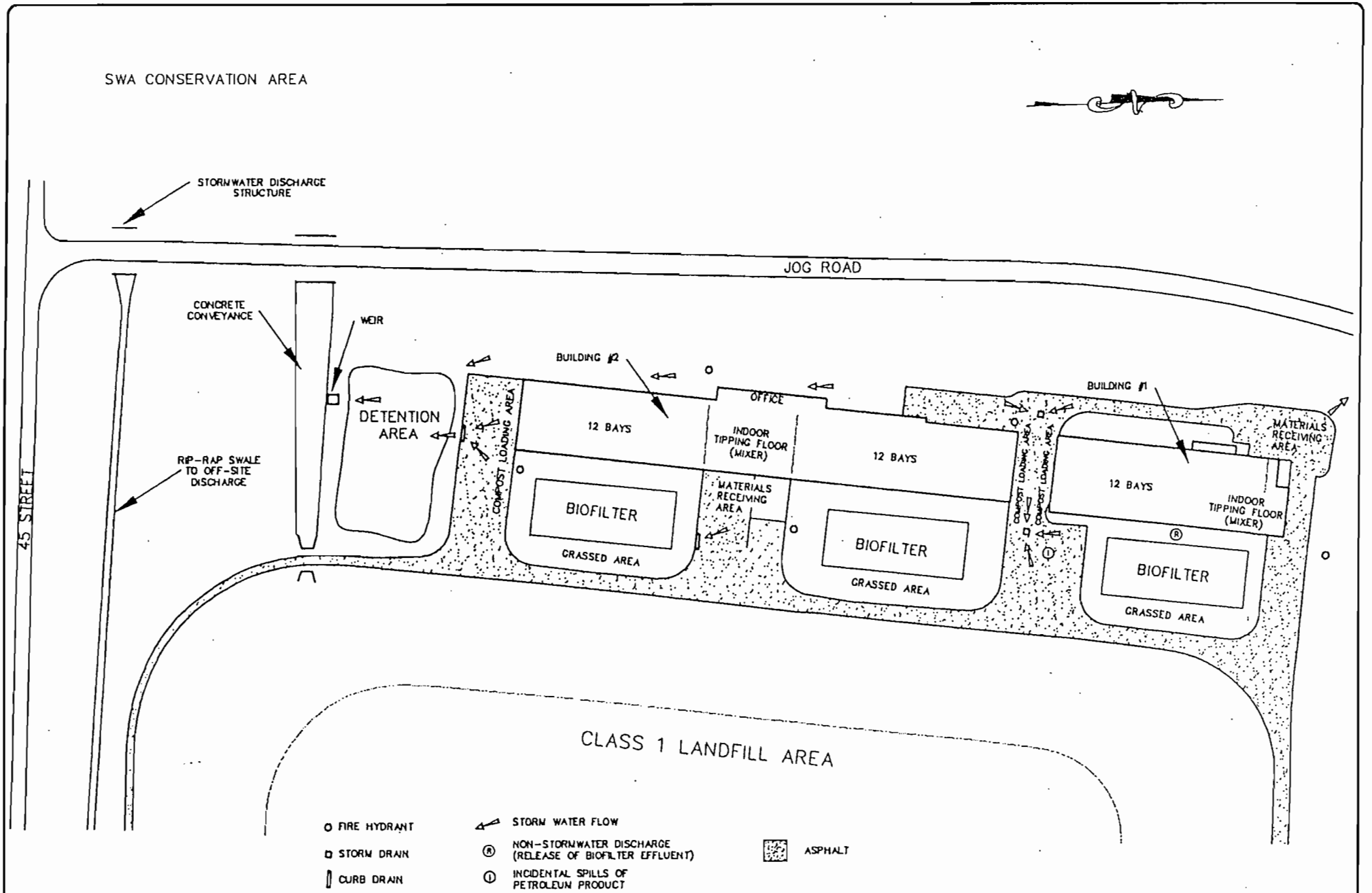
1. Incandescent Lighting Fixtures are available in the enclosed and gasketed type (Model 390338 Series) for non-hazardous locations and in the explosion-proof type (Model 390340 Series) for use in Class 1, Division 1 hazardous locations as defined by the National Electrical Code. They are available in both the dome style and the angle style and can accommodate either 150 watt or 300 watt bulbs, depending upon the model.

2. Fluorescent Lighting Fixtures are available in the open type for non-hazardous locations (Model 390227) and in the enclosed and gasketed type (Model 390240) for use in hazardous locations as defined by the National Electrical Code.


Exhaust Unit
Automatic Shutter
Spray Booth
BACK EXHAUST ARRANGEMENT
Automatic shutters are designed for application on horizontal exhausts.
PATH OF AIR TRAVEL
Building Wall
TOP EXHAUST ARRANGEMENT
Automatic dampers are designed for use with vertical exhaust stacks on water wash type spray booths.
Roof Canopy
Roof Flange
Cleanout Door With Automatic Damper
Exhaust Unit
PATH OF AIR TRAVEL
Spray Booth

Appendix C-12
SWA Drawing COMP-EXP

BEST AVAILABLE COPY



SOLID WASTE AUTHORITY
OF PALM BEACH COUNTY
7501 North Jog Road
West Palm Beach, Florida 33412
Phone: (407)640-4000 FAX: (407)683-4087

FIGURE 3

COMPOST FACILITY SITE PLAN

NCRRF
PALM BEACH COUNTY, FLORIDA

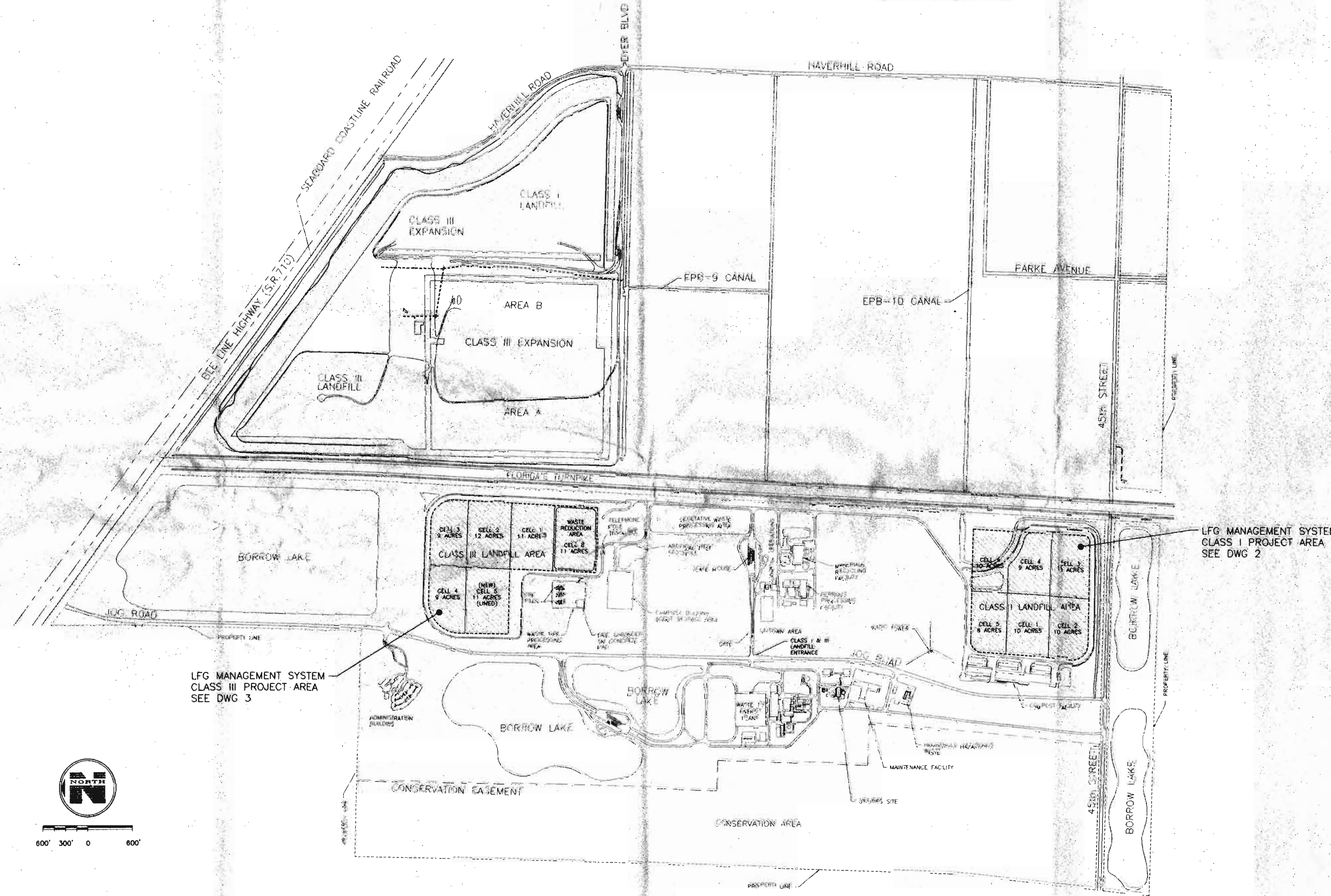
DWN: AV	DSN:
CHK:	SCALE: 1"=200'
APV	DATE: 03/20/96

SHEET

COMPOST

Appendix C-13

Waste Energy Technology Drawings



2961B01A.dwg 07/19/95 15:25

REV. NO.	DATE	DRWN	CHKD	REMARKS

PRINTED JAN 2 2 1996

DESIGNED BY: WET
DRAWN BY: EPC
SHEET CHK'D BY: JAG
CROSS CHK'D BY: JPC
APPROVED BY:
DATE: JULY 1995

WET

CAMP DRESSER & McKEE INC.
CDM

SOLID WASTE AUTHORITY OF PALM BEACH COUNTY
PALM BEACH COUNTY, FLORIDA

LANDFILL GAS MANAGEMENT SYSTEM
NORTH COUNTY RESOURCE RECOVERY FACILITY

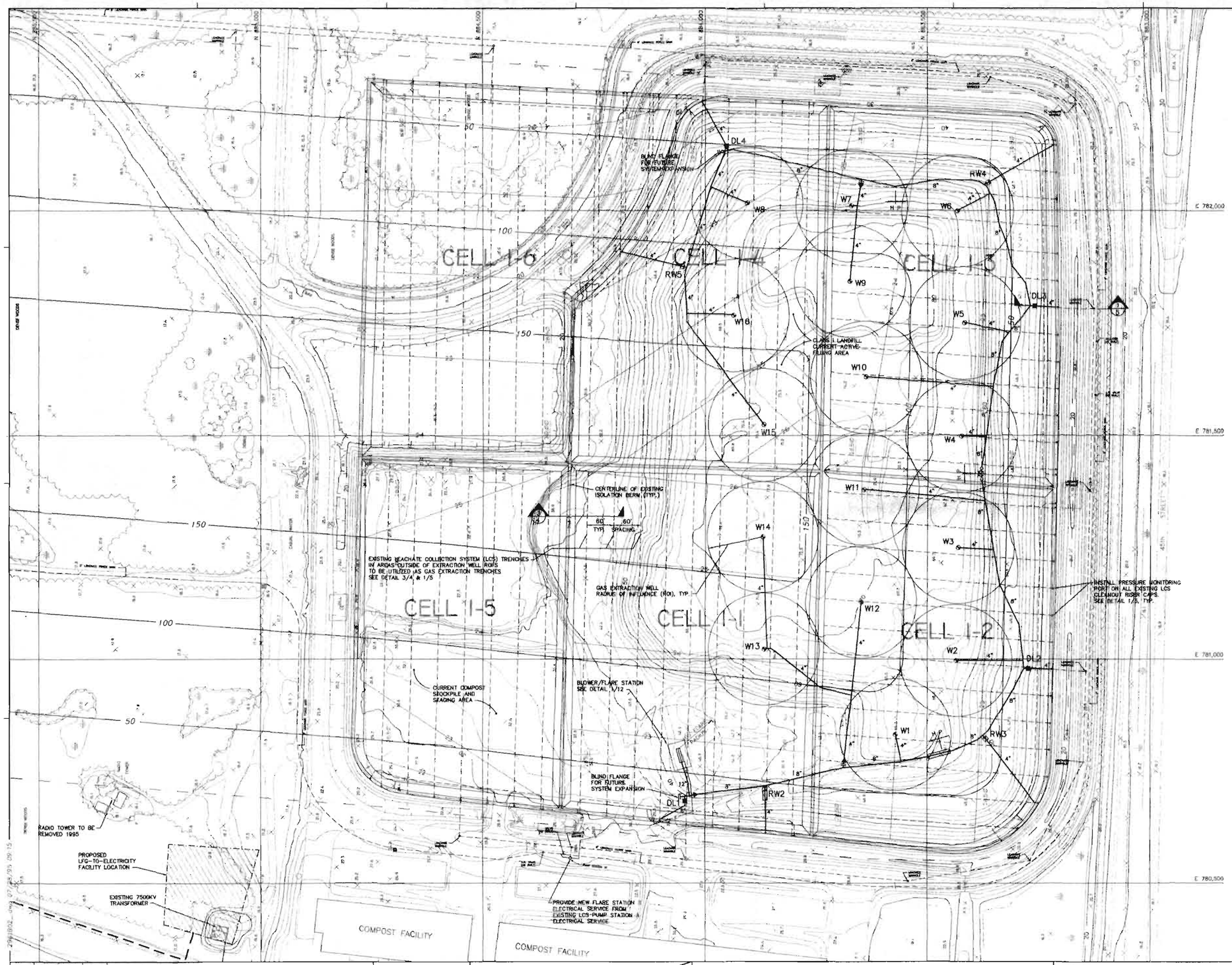
SHEET TITLE:

LANDFILL AREA SITE PLAN

WET PROJECT NO: 95296

DRAWING NO. 1

SHEET 2 OF 15



TOPOGRAPHIC REFERENCE

PREPARED BY: ENVIRONMENTAL MEASUREMENT CONSULTANTS, INC.
WEST PALM BEACH, FL (407)-842-1888

DATE OF PHOTOGRAPHY: 10/18/94 JOB NO.: 31.06

THIS MAP WAS COMPILED TO MEET NATIONAL MAP ACCURACY STANDARDS FOR TWO FOOT CONTOUR INTERVAL MAPPING. FIELD CHECKING OF THIS MAP IS RECOMMENDED BEFORE USE. TWO FOOT CONTOUR INTERVAL BASED ON CLIENT CONTROL. HORIZONTAL DATUM BASED ON LOCAL GRID.

LEGEND

- W16 — GAS EXTRACTION WELL, SEE DETAIL 1/4
- T80 — LCS TRENCH GAS EXTRACTION RISER, SEE DETAIL 1/8
- L43 — LCS CLEANOUT GAS EXTRACTION RISER, SEE DETAIL 1/5
- DL2 — LCS CLEANOUT GAS EXTRACTION RISER, SEE DETAIL 1/5
- RW4 — LCS CLEANOUT GAS EXTRACTION RISER, SEE DETAIL 1/5
- EXISTING LCS CLEANOUT RISER
- 12" — GAS COLLECTION HEADER, SEE DETAIL 1/7
- E — ELECTRICAL CONDUIT, SEE DETAIL 1/7
- HEADER VALVE, SEE DETAIL 7/7
- REDUCER
- HEADER SAMPLING RISER, SEE DETAIL 4/7
- FLANGES, SEE DETAIL 8/7
- BLIND FLANGE, SEE DETAIL 5/7
- TEE, SEE DETAIL 3/7
- ROAD CROSSING CASING, SEE DETAIL 8/7
- CELL BASE GRADE CONTOUR, SEE DETAIL 3/4
- PROPOSED FINAL GRADE CONTOUR
- CELL BERM ELEVATION
- H P — HIGH POINT

NOTES

1. AS LANDFILLING PROGRESSES, THE LFG SYSTEM WILL BE EXPANDED TO NEW CELLS UTILIZING THE CONCEPTS AND PRINCIPLES DETAILED IN THIS DRAWING SET.
2. SEE CONSTRUCTION NOTES, DWG 1.5.

REV. NO.	DATE	DRWN	CHKD	REMARKS

PRINTED JAN 22 1996

DESIGNED BY: WCT
DRAWN BY: EPC
SHEET CHK'D BY: JAG
CROSS CHK'D BY: JPC
APPROVED BY:
DATE: JULY 1995

CAMP DRESSER & McKEE INC. CDM

SOLID WASTE AUTHORITY OF PALM BEACH COUNTY
PALM BEACH COUNTY, FLORIDA

LANDFILL GAS MANAGEMENT SYSTEM
NORTH COUNTY RESOURCE RECOVERY FACILITY

SHEET TITLE:

CLASS I LANDFILL
GAS WELL, TRENCH AND HEADER LAYOUT

WET PROJECT NO: 95296

DRAWING NO. **2**

SHEET 3 OF 15

NEW ELECTRICAL SERVICE FROM EXISTING SWA POWER POLE. OVERHEAD ELECTRICAL LINES WITHIN 100' FLARE RADIUS TO BE RELOCATED OR ROUTED UNDERGROUND

BLOWER/FLARE STATION SEE DETAIL 1/9.2

CMP PIPE CASING W/ CONC. BALLAST AS REQ'D

HEADER CROSSES LINER ANCHOR TRENCH SEE DETAIL 1/8

CONDENSATE FORCEMAIN TIE-IN TO EXISTING LCS RISER, SEE DETAIL 1/9

CENTERLINE OF PERIMETER DITCH (TYP) ELEV. 19.7±

CONDENSATE FORCEMAIN ELBOW, SEE DETAIL 2/9

NOTE: TYPICAL THIS SHEET
HEADER PIPING FOR CLASS III LANDFILL AREA TO BE CONSTRUCTED AT 1% MINIMUM SLOPE IN A HERRINGBONE CONFIGURATION. CONDENSATE DRAINAGE TO BE TOWARDS EACH WELLHEAD/DRIPLEG COMBINATION WITH HEADER HIGHPOINTS LOCATED MIDWAY BETWEEN EACH WELLHEAD.

CELL III-3

CELL III-2

CELL III-1

CELL III-8

CENTERLINE OF ISOLATION BERM

BLIND FLANGE FOR FUTURE PHASE C CONSTRUCTION

EXISTING LEACHATE COLLECTION SYSTEM (LCS) TRENCHES TO BE UTILIZED AS GAS EXTRACTION TRENCHES SEE DETAIL 3/4, 1/5 & 1/6

60' 60' 120' SPACING

BLIND FLANGE FOR FUTURE PHASE B CONSTRUCTION

BLIND FLANGE FOR FUTURE PHASE B CONSTRUCTION

BLIND FLANGE FOR FUTURE PHASE C CONSTRUCTION

CELL III-4

CELL III-5

INSTALL PRESSURE MONITORING PORT ON ALL EXISTING LCS CLEANOUT RISER CAPS. SEE DETAIL 1/3, TYP.

JOG ROAD

E 782,500
E 782,000
E 781,500
E 787,000
N 890,500
N 890,000
N 889,500

100' 50' 0 100'

LEGEND

P4	GAS MONITORING PROBE SEE DETAIL 1/10
T80	LCS TRENCH GAS EXTRACTION RISER SEE DETAIL 1/6
L43	LCS CLEANOUT GAS EXTRACTION RISER SEE DETAIL 1/5
	EXISTING LCS CLEANOUT RISER
12"	GAS COLLECTION HEADER SEE DETAIL 1/7
—CW—	CONDENSATE FORCE MAIN SEE DETAIL 1/7
—E—	ELECTRICAL CONDUIT SEE DETAIL 1/7
	HEADER VALVE SEE DETAIL 7/7
	REDUCER
	HEADER SAMPLING RISER SEE DETAIL 4/7
	FLANGES SEE DETAIL 8/7
	BLIND FLANGE SEE DETAIL 5/7
	TEE SEE DETAIL 3/7
	ROAD CROSSING CASING SEE DETAIL 8/7
	CELL BASE GRADE CONTOUR SEE DETAIL 3/4
50	PROPOSED FINAL GRADE CONTOUR
	CELL BERM ELEVATION
H P	HIGH POINT

TOPOGRAPHIC REFERENCE

PREPARED BY: ENVIRONMENTAL MEASUREMENT CONSULTANTS, INC. WEST PALM BEACH, FL. (407)-842-1888

DATE OF PHOTOGRAPHY: 10/18/94 JOB NO.: 31.06

THIS MAP WAS COMPILED TO MEET NATIONAL MAP ACCURACY STANDARDS FOR TWO FOOT CONTOUR INTERVAL MAPPING. FIELD CHECKING OF THIS MAP IS RECOMMENDED BEFORE USE. TWO FOOT CONTOUR INTERVAL BASED ON CLIENT CONTROL. HORIZONTAL DATUM BASED ON LOCAL GRID.

NOTES

1. LFG SYSTEM WILL BE CONSTRUCTED IN THE FOLLOWING PHASES AS DICTATED BY THE LFG ODOR REQUIREMENTS.
   PHASE A: L40 THRU L60, T19,T80 & T98 AND ASSOCIATED PIPING TO BLOWER/FLARE STATION, AND GAS PROBES P1,2,3,4 & 8.
   PHASE B: T1 THRU T18, T20 & T21 AND ASSOCIATED PIPING.
   PHASE C: T81 THRU 197, T99 & T100 AND ASSOCIATED PIPING.
2. AS LANDFILLING PROGRESSES, THE LFG SYSTEM WILL BE EXPANDED TO NEW CELLS UTILIZING THE CONCEPTS AND PRINCIPLES DETAILED IN THIS DRAWING SET.
3. SEE CONSTRUCTION NOTES, DWG 13.

REV. NO.	DATE	DRWN	CHKD	REMARKS

PRINTED: JAN 22 1996

DESIGNED BY: WET
DRAWN BY: EPC
SHEET CHK'D BY: JAG
CROSS CHK'D BY: RPC
APPROVED BY:
DATE: JULY 1995

CAMP DRESSER & McKEE INC.

SOLID WASTE AUTHORITY OF PALM BEACH COUNTY
PALM BEACH COUNTY, FLORIDA

LANDFILL GAS MANAGEMENT SYSTEM
NORTH COUNTY RESOURCE RECOVERY FACILITY

SHEET TITLE:

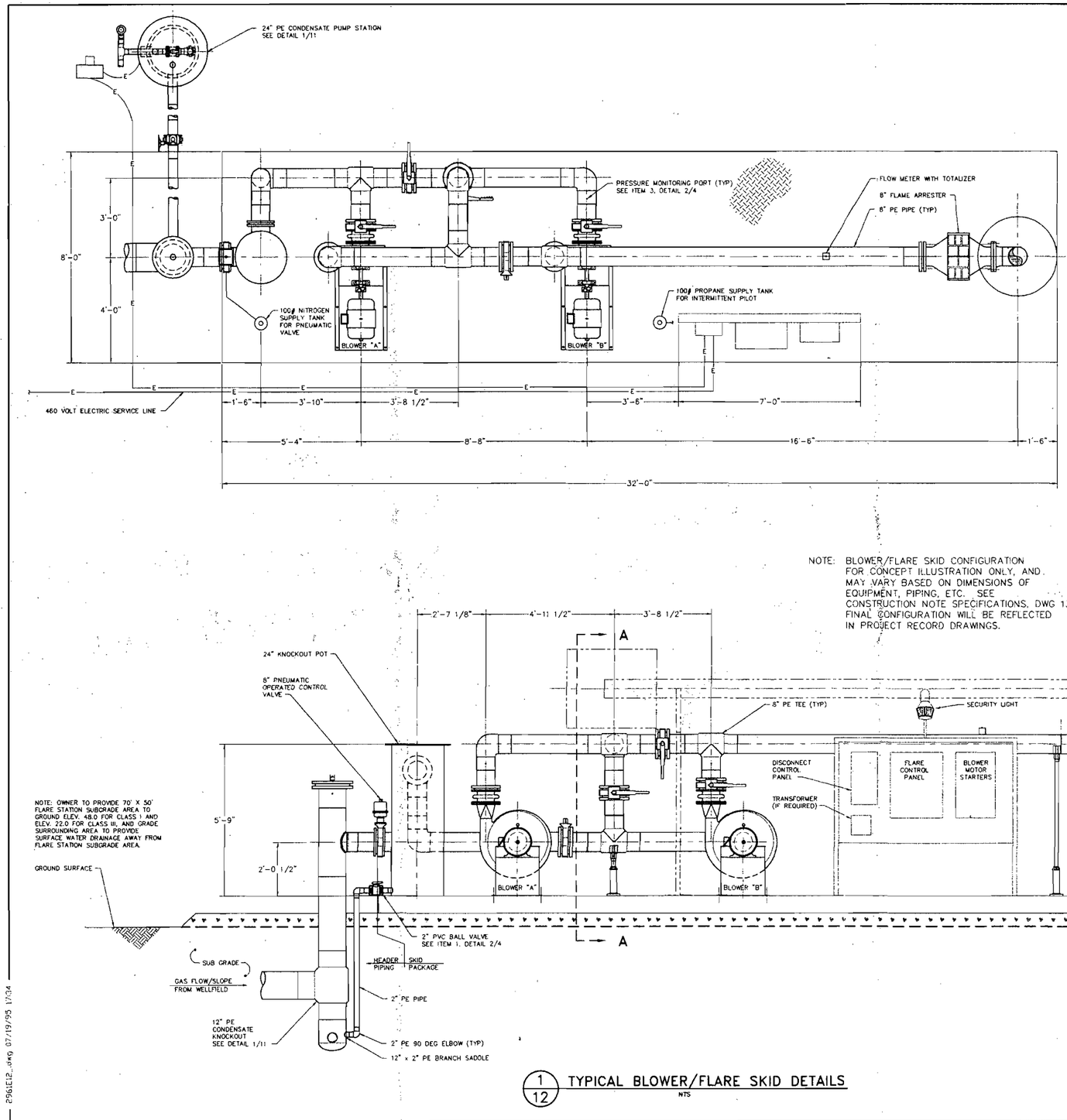
CLASS III LANDFILL
GAS WELL, TRENCH AND HEADER LAYOUT

WET PROJECT NO: 95296

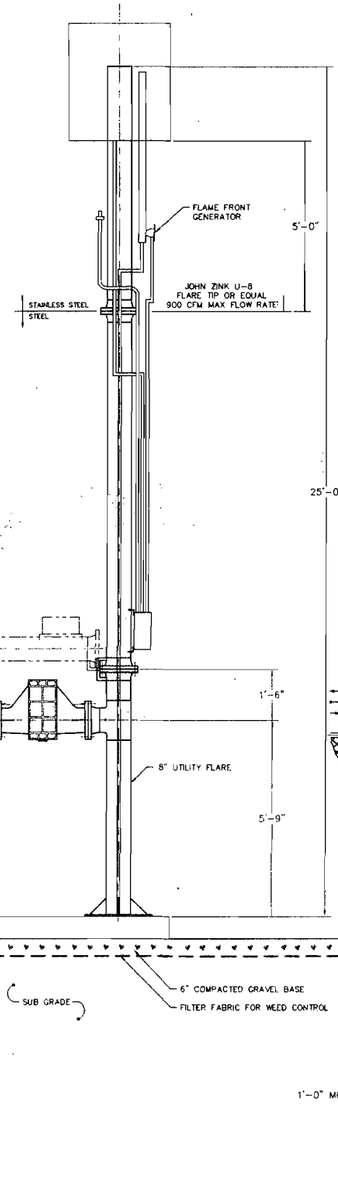
DRAWING NO. 3

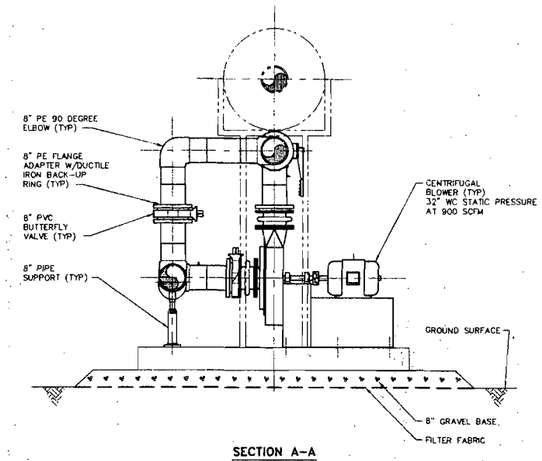
SHEET 4 OF 15

J:\95296\03_dwg 07/20/95 11:36

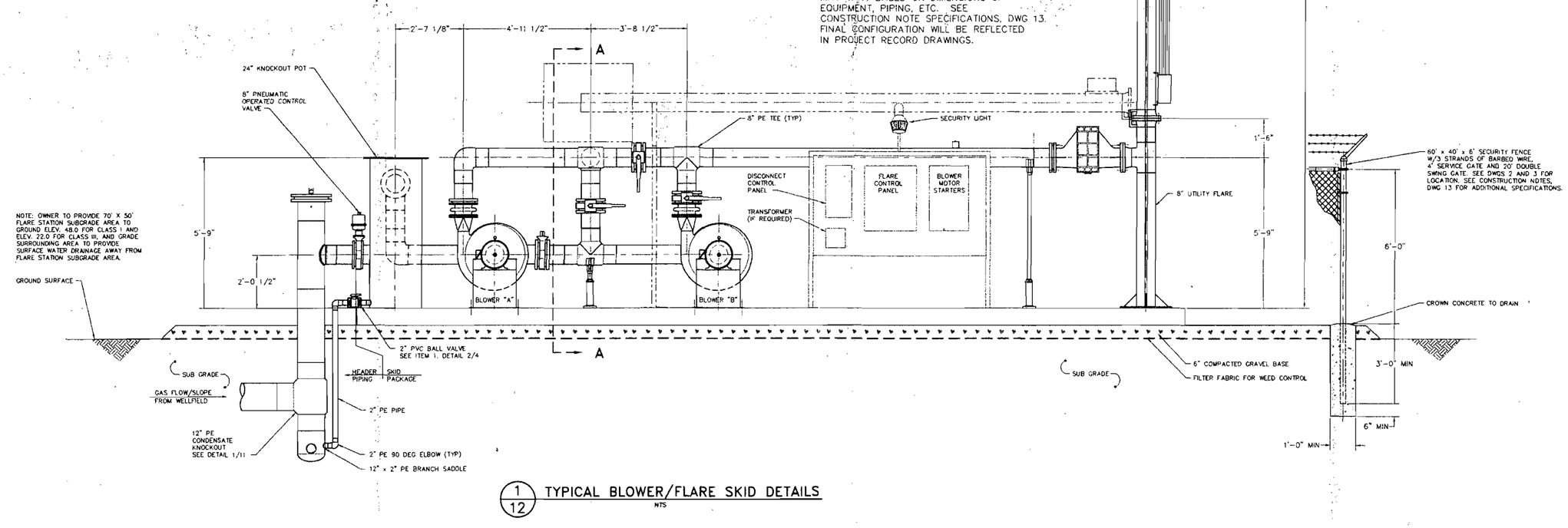


NOTE: BLOWER/FLARE SKID CONFIGURATION FOR CONCEPT ILLUSTRATION ONLY, AND MAY VARY BASED ON DIMENSIONS OF EQUIPMENT, PIPING, ETC. SEE CONSTRUCTION NOTE SPECIFICATIONS, DWG 13. FINAL CONFIGURATION WILL BE REFLECTED IN PROJECT RECORD DRAWINGS.





SECTION A-A



1/12 TYPICAL BLOWER/FLARE SKID DETAILS
NTS

D:\961E12..dwg 07/19/95 17:34

REV. NO.	DATE	DRWN	CHKD	REMARKS	PRINTED: JAN 22 1996

DESIGNED BY: WET
DRAWN BY: TLA
SHEET CHK'D BY: JAG
CROSS CHK'D BY: JPC
APPROVED BY:
DATE: JULY 1995

CAMP DRESSER & McKEE INC.
CDM

SOLID WASTE AUTHORITY OF PALM BEACH COUNTY
PALM BEACH COUNTY, FLORIDA

LANDFILL GAS MANAGEMENT SYSTEM
NORTH COUNTY RESOURCE RECOVERY FACILITY

SHEET TITLE:

CLASS I AND CLASS III LANDFILLS
BLOWER/FLARE SKID DETAIL

WET PROJECT NO: 95296

DRAWING NO. 12

SHEET 13 OF 15

Appendix D-1

Construction Agreement, Appendix A, Section 3.3.7

inert plastic construction. The sample points and analyzers used on the sample streams will provide the necessary information to maintain proper water chemistry, control boiler corrosion, and ensure that adequate quality steam is being produced.

3.3.7 DRY SCRUBBER SYSTEM AND ELECTROSTATIC PRECIPITATOR

3.3.7.1 System Description

Each train of the flue gas cleaning system includes a feed bin/storage silo for lime storage, reagent/absorbent preparation and feed systems, one (1) spray dryer absorber for gas cooling and acid gas removal, one (1) precipitator for particulate and dry absorbent collection, ash handling system and other auxiliary equipment.

3.3.7.2 Method of Operation

Pebble lime is delivered from bulk tank trucks to the lime storage silo via pneumatic blowers.

Lime is fed to the slakers from the silo at a controlled rate by volumetric feeders. Water is automatically metered to the slaker. The slaked lime flows by gravity to vibrating screens. Grit larger than 20 mesh is separated from the lime milk and is conveyed to a disposal bin via screw conveyors. The remainder of the lime milk passes through the screen directly to the reagent storage tanks.

Feed pumps deliver slurry with a manually set reagent concentration. A flow control valve with remote, manual adjustment capability determines the quantity of slurry delivered to the feed tank. The remainder of the slurry is returned to the reagent storage tank.

Diluted water is delivered to the feed tank by means of a level control on/off valve. Feed flows by gravity from the feed tank through a self-cleaning in-line screen to the feed control valve and then to the atomizer.

Total liquid feed rate to the atomizer is continuously controlled to maintain a constant spray dryer outlet gas temperature.

Untreated flue gas is introduced into the spray dryer absorber via the roof gas disperser. The flue gas contacts a fine spray of lime slurry, and acids in the gas are absorbed into the alkaline droplets as water is simultaneously evaporated. Acid gas removal efficiencies can be varied by changing the atomizer feed composition. Careful control of gas distribution, slurry flow rate and droplet size assures that the droplets are evaporated to dryness prior to touching the internal walls of the spray dryer absorber. A portion of the dry product falls to the bottom of the absorption chamber and is removed by mechanical conveyors which transport the dry product to the ash storage silo.

The treated flue gas, at a controlled outlet temperature, flows to the electrostatic precipitator where the remaining suspended solids are removed. The precipitator is designed to meet the outlet loading requirements with 3 of 4 fields in service.

The electrostatic precipitator consists of a weatherproof casing which houses longitudinally-mounted parallel rows of grounded collecting surfaces which form gas passages in which a number of spiral type high voltage electrodes are mounted in rigid frames. Tumbling hammer rapping systems are provided for both the collecting and high voltage systems as well as for the gas distribution devices.

Flue gases enter the precipitator through gas distribution devices, and are directed into the gas passages formed by the collecting surfaces. Collecting action is accomplished by the high voltage electrodes charging the dust particles in the gas stream so that they are attracted to the

collecting plates. To dislodge the particles from the collecting plates, sequential rapping is employed. The emitting wires are also rapped to maintain uniform corona formation.

Outlet gases from the precipitator pass through the induced draft fan and stack to the atmosphere.

3.3.7.3 Control Philosophy

To fulfill the required removal efficiencies with minimum reagent consumption, it is important to operate the absorber with the lowest practical gas outlet temperature. Extensive pilot testing has demonstrated that absorption efficiency improves as the absorber outlet temperature decreases. This fact must be weighed against the aggressive nature of the chloride ions. The outlet temperature from the spray dryer absorber was selected for reliable removal of the acid gases, to have a free-flowing powder, and to protect all downstream equipment from potential acid attack due to leaks.

Additionally, since the collected ash will contain many chloride salts, the hygroscopic nature of the ash requires a higher outlet temperature to assure a free-flowing product.

Slurry flow rate to each atomizer will vary primarily as a function of the evaporative heat load; i.e., gas flow and gas temperature drop across each absorber. The alkalinity (lime content) in this slurry can be adjusted to fulfill the absorption requirement by changing lime slurry concentration in the feed tank.

The control system is designed to produce the proper quantity of feed slurry to cool the flue gas to the preset outlet temperature and is thereby designed to control the acid gas outlet emission.

Each outlet temperature controller will keep a constant gas outlet temperature from the absorption chamber by an error signal to the feed flow-control valve in the feed pipe to each atomizer. The actual amount of feed slurry delivered to the atomizer will be a function of flue gas temperature.

When a change in slurry flow requirement occurs, the time interval between feed tank high and low level switches will change, thus the slaker will run for a longer or shorter time period to reach the feed tank high level switch.

Appendix D-2

Construction Agreement, Appendix A, Section 2.1.15

hopper is full and starts again when the hopper is ready for additional ferrous metal. The baler pushes material up a slide and into a demolition trailer. The third compression stroke of the baler has sufficient power to push a line of bales (end to end) out of the baler and up the slide, thus eliminating the need for a grapple crane at the baler.

2.1.15 DUST CONTROL SYSTEM

Each processing line, along with the OBW line, will have an independent dust control system that will collect dust and air classified light fraction. Once collected, these materials will be added to the RDF. All conveyor transfer points and dusty equipment will be enclosed, sealed with rubber flaps, and aspirated to collect fugitive dust. The following points in the RDF processing system will be aspirated for the purposes of dust control:

- Drag conveyor - charging end
- Flail mill vent
- Magnetic separation system enclosure
- Trommel (inlets, outlets, and enclosure)
- Secondary shredder inlet and outlet
- Disc screens
- Belt conveyor transfer points

Each processing line will have a separate dust control system that will include fans, cyclones for recovery of combustibles, and baghouses.

In addition, a dust control system will be provided to collect fugitive dust and debris from the metal air scrubber. This system will also include exhaust fans, a cyclone collector with a rotary airlock, and a baghouse. The exhaust fans will be materials-handling-type fans. Baghouse materials will be conveyed to a bin and thereafter dumped onto the RDF storage building floor. Material

collected in the cyclone will be returned to the tipping floor for processing. The following points in the OBW line will be enclosed, sealed, and aspirated:

- o OBW shredder inlet, outlet, and vent
- o Magnets
- o Air scrubber
- o Belt conveyor transfer points

2.1.16 RDF STORAGE FACILITY

The RDF storage building will be designed with aspiration points at the two-way and four-way splitters (inlets and outlets) and at all transfer points. During operation of the RDF Processing Facility, dust will be minimized by feeding RDF directly onto the RDF boiler feed system. The RDF storage pile will be developed simultaneously with dust controlled by the building ventilation system. Personnel and front loading equipment will not normally be in the building while the pile is being formed.

2.1.17 FIRE PROTECTION SYSTEM

Each processing line will have a fire protection system independent of the main building fire protection system. A water deluge system will be installed at the flail shredder, exit belt conveyors, trommel infeed conveyor, the trommel, the secondary shredder, and its output conveyors. The system will have deluge valves controlled from the RDF plant control room. It will be sectionalized to attack only those areas experiencing fire. Hose stations will be provided in the process area and on the tipping floor. The RDF storage building will be equipped with a sprinkler system and hose stations for fire control.

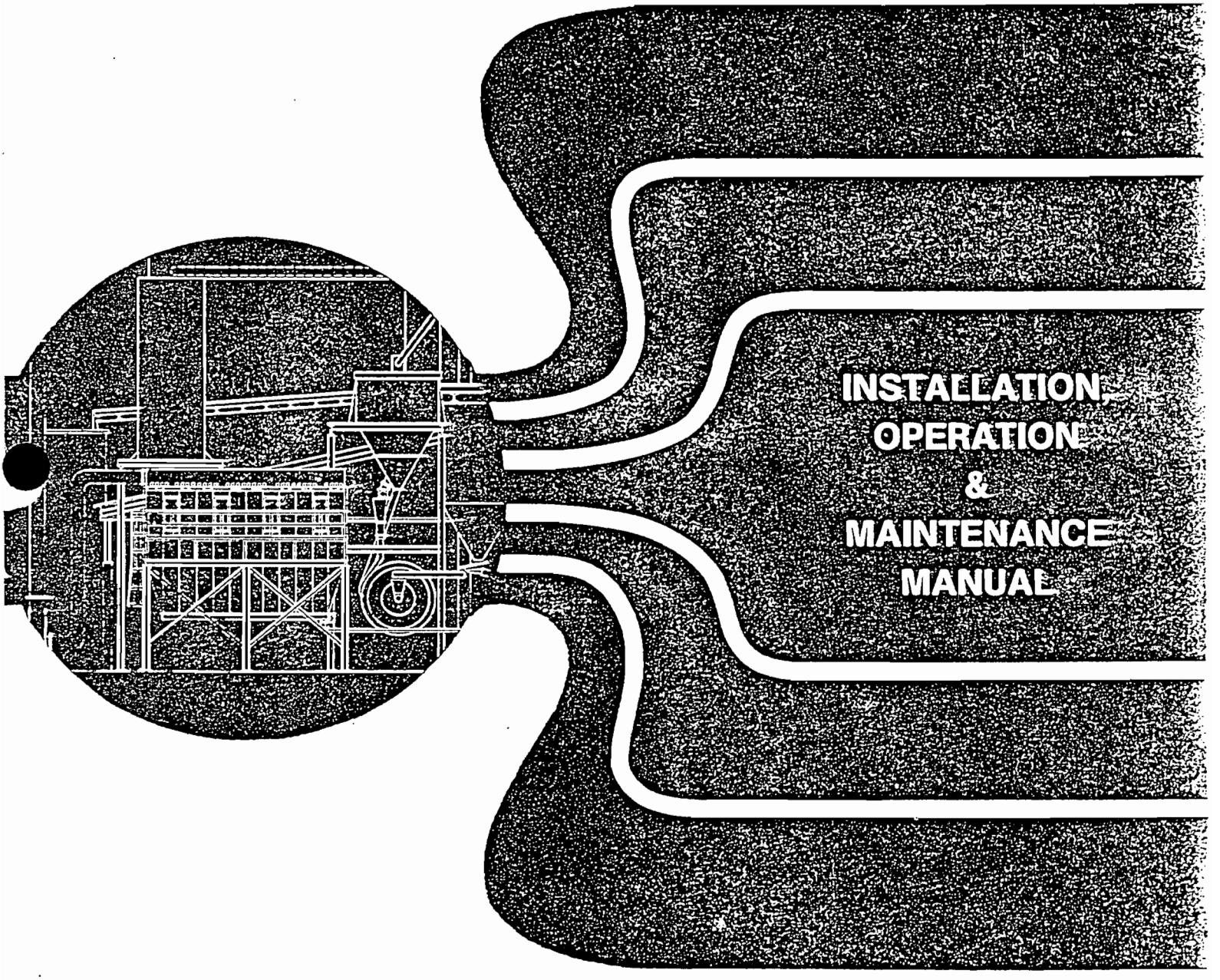
2.1.18 SUMMARY

The RDF processing operation has been designed for high availability. The design incorporates three process lines, two of which will be operational while the third is on standby reserve. The processing system will operate on a 16-hour-per-day schedule and will handle 2000 tpd of MSW using the two-line

Appendix D-3
Ultra Industries

BULLETIN #UF-2

FABRI-JET™
&
ULTRA
FABRIC FILTERS



ULTRA INDUSTRIES INC.
FABRIC FILTER DIVISION

OPERATING PRINCIPLES

FABRI-JET™ and ULTRA dust collectors remove 99.9% of dust particles quickly, efficiently. Units operate by this simple method:

Dust-laden air enters the hopper where heavier particles drop out of the air stream. Lighter particles are trapped in the air stream and rise.

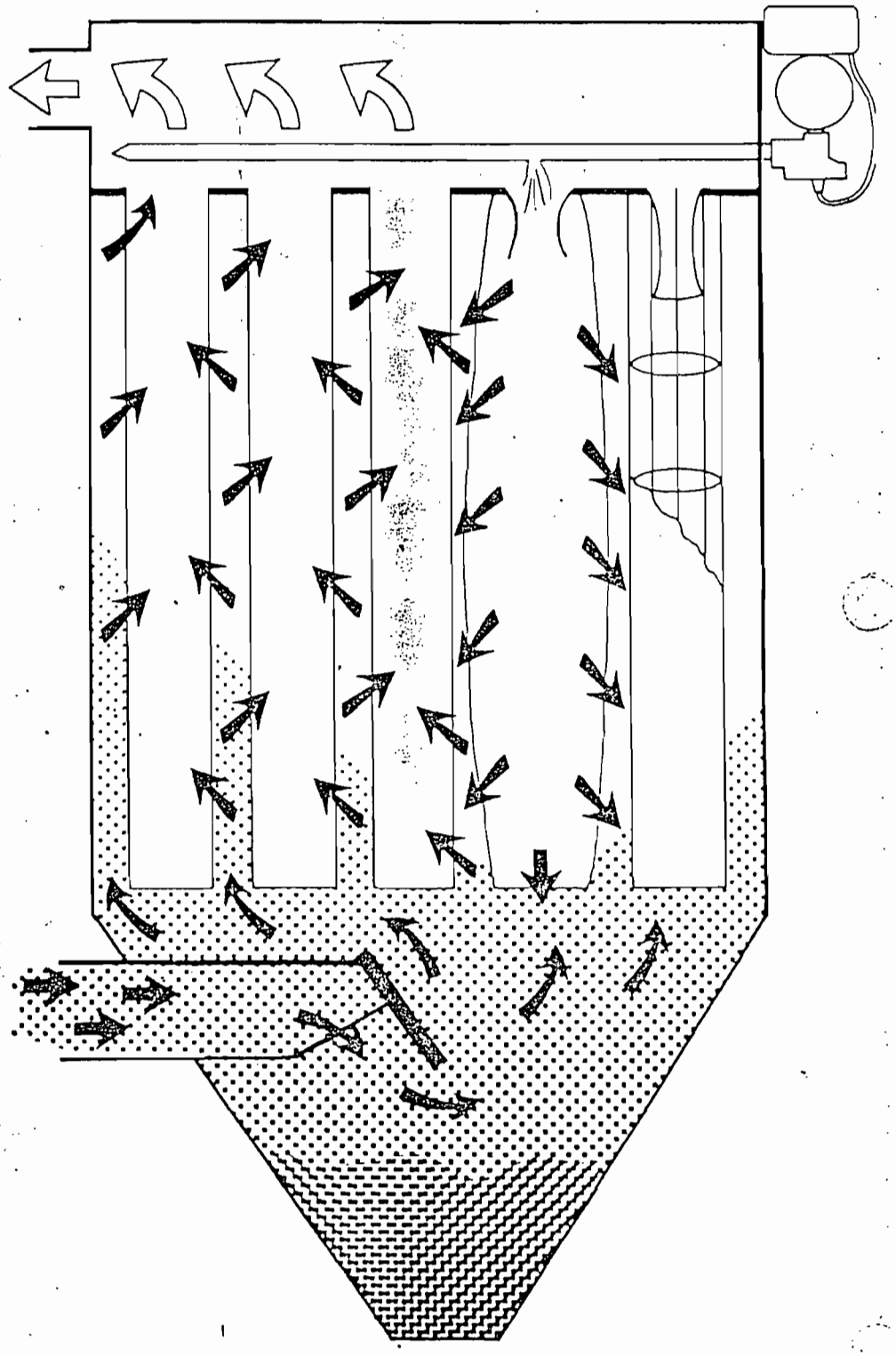
As the air passes through the filter bags, dust particles are collected on the outside surface of the filter bags and the cleaned air is exhausted from the collector.

At precise intervals, jets of high pressure air pass through the venturis, inducing a strong flow of secondary air, briefly reversing the air flow through the bags.

Shock waves pass down the inside of the bags, flexing the bags outward. The reversed air flow dislodges accumulated dust from the bag and the dust drops into the hopper.

With this method of cleaning, airflow through a row of bags is reversed for only a fraction of a second, resulting in steady airflow through the collector. The system is therefore maintained at steady-state conditions.

Collection operation is controlled by an easily-adjusted solid state timer. A Magnahelic gauge permits optimum regulation of the timer. Pulse durations and pulse intervals can be simply and accurately set at the timer to minimize air consumption.



RECEIVING YOUR COLLECTOR

Congratulations on selecting a **FABRI-JET™** or **ULTRA** collector for state of the art, efficient, thorough air pollution control and product recovery. We urge that you read and follow the instructions and advice which follow. We want you to be thoroughly satisfied with your collector.

SHIPMENT

FABRI-JET™ and **ULTRA** collectors have been designed to minimize customer assembly. Air headers, solenoids, air piping and air pressure gauges are all shipped mounted on the collectors, completely piped for operation.

Housings for the **FABRI-JET™** and **ULTRA** Models BB, CB, CF and SQ collectors are shipped as completey welded assemblies. Larger rectangular collectors are shipped in two subassemblies. The hopper is often inverted and nested inside the main housing. Walk-in plenums for top bag removal collectors are shipped as a separate subassembly.

Timers, bags, bag clamps, cages and differential pressure gauges are shipped separate from the collector. These shipments are carefully marked for identification.

INSPECTION

FABRI-JET™ and **ULTRA** collectors are carefully inspected before shipment to ensure high quality workmanship. Heavy skids and secure truck cribbing are used but at times damages do occur during shipment. We recommend that you inspect your collector when it is received for any possible damage — if there is any damage or a shortage, it should be noted on your bill of lading. Purchaser should file claims against the carrier within a few days of receipt of the shipment. Damage incurred in transit is the responsibility of the common carrier. Since it is the manufacturers policy to ship F.O.B. the factory, any claims must be initiated against the carrier by the purchaser.

STORAGE

The standard finish for the outside of the collector is one coat of factory primer, unless additional finish coats or special coatings were specified.

If additional protection is required because of lengthy outside storage, corrosive atmosphere or other conditions, the collector should be given an additional protective coat while the prime coat is in good condition.

Bags and cages, which will arrive in a separate shipment to avoid shipping damage, should be stored in a dry, indoor location.

MOUNTING THE DIFFERENTIAL PRESSURE GAUGE

INSTALLATION All accessories and a detailed instruction sheet are packed in the box with your gauge.

LOCATION Mount the gauge in a location that is free from excessive vibration and where the temperature does not exceed 140°F. Avoid direct sunlight.

CONNECTING GAUGE For a permanent installation it is recommended that ¼" O.D. copper tubing be used with regular compression fittings. An in-line paper filter will prevent dust from getting into the gauge line. If this is not used, it is recommended that a loop be placed in the high pressure line that leads from the dirty air housing so that dust does not enter the gauge.

Adjust the differential pressure gauge to indicate zero.

INSTALLING THE COMPRESSED AIR CLEANING SYSTEM

AIR CONSUMPTION The average amount of air that is consumed is listed on the drawing for each collector. This is based on a six second pulse interval, "OFF-TIME", and a pulse duration of .05 seconds, "ON TIME", which are average settings for most applications and can be varied up or down depending on the type of dust and dust loading. For example with a very light dust loading the "OFF TIME" could be set at 12 to 18 seconds thus reducing the air requirements to ½ or ⅓ of the stated volume. A corresponding reduction in the size of the air supply piping may be made.

AIR SUPPLY PIPING A 1" to 2½" O.D. compressed air supply pipe furnishing 85 to 100 psig air (whether all or no other equipment on the same line is used) should be connected to the air header. Refer to RECOMMENDED PIPE SIZES table below. Higher pressures shorten bag life, lower pressures do not adequately clean the filter bags. It is good practice to blow down the air supply piping before connecting it to the air header. This removes any debris in the supply pipe before it is connected to your collector.

AIR QUALITY Dirt, scale, or foreign matter in the piping can cause problems of the air pulsing system. Oil in the air supply can eventually cause plugging of the bags. Water in the system can cause valve problems plus the chance of freeze-up in a cold atmosphere. It is, therefore, necessary that the air be clean, dry and oil-free. The air receiver should have an automatic moisture drain. In-line air filters with automatic drains may suffice if moisture content is not too great and if kept from freezing. However, if a large amount of moisture or oil is present, a desiccant-type filter is recommended.

RECOMMENDED PIPE SIZES

Total free air consumption	Up to 100 ft.	Up to 500 ft.	Up to 1,000 ft.
up to 50 SCFM	1" O.D.	1¼" O.D.	1¼" O.D.
51 to 100 SCFM	1¼" O.D.	1½" O.D.	2" O.D.
101 to 200 SCFM	1½" O.D.	2" O.D.	2½" O.D.

INSTALLING THE FILTER BAGS

SIDE BAG REMOVAL COLLECTORS

1. Slip filter bag over the cage, making sure that the bag seam is not over the split in the top collar of cage. (See Fig. 1.)
2. Bottom of bag must be tight against the cage bottom, the seam should be straight and all wrinkles smoothed out.
3. Fold the top of the bag (about two inches) over the top of cage, smooth out the inside folds, and make sure that bag does not overlap the annular groove on inside of cage (trim off excess bag length if necessary). (See Fig. 2.)
4. Slip on the bag clamp (loosely). The tightening mechanism should not be over the bag seam. (See Fig. 3.)
5. Slide the bag and cage upward over the bag cup until the cage snaps into place on the groove in the bag cup. Bag and cage assembly should fit tight against tubesheet for proper alignment. (See Fig. 4.)
6. Tighten bag clamp. It is important that a ⅜" socket be used: a screwdriver may slip and puncture the bag. (See Fig. 5.)
7. Check to make sure that bags are hanging straight, and do not touch other bags or the collector housing. (See Fig. 6.)
8. Install the remaining bags in the same manner.
9. Close and tighten all access doors.

FIG. 1

FIG. 2

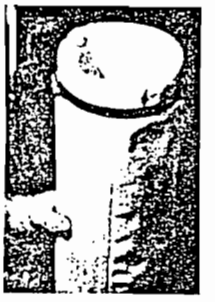


FIG. 3

FIG. 4

FIG. 5

FIG. 6

TOP BAG REMOVAL COLLECTORS

1. From the top side of the tubesheet, lower the bag into the housing up to the bag cuff.
2. The bag cuff has two sewn-in steel bands. Collapse the cuff into a U-shape and lower the bag until one of the bands is below the tubesheet and one above. Then let the cuff spring back to its original shape. Smooth the cuff around the hole. The cuff should form a perfect seal at the tubesheet.
3. Lower the cage assembly into the bag and press firmly into place.
4. Install the remaining bags in the same manner.
5. Locate a blowpipe over each row of bags and connect each blowpipe to the air header by slipping the blowpipe into the coupling at the collector wall and tightening the collar.
6. Close and tighten all access doors.

INSTALLING THE SOLID STATE TIMER

1. The **FABRI-JET™** and **ULTRA** timer is a completely solid state switching unit manufactured to rigid specifications. The timer is capable of switching up to 10 outputs at 1 amp each with 115 volts line input. Each output is capable of handling one solenoid on each air header and can handle up to six headers for a total of sixty solenoids, i.e. sixty rows of filter bags per timer.

2. The timing range is fully adjustable for optimum collector performance. The "ON TIME" (pulse duration) is adjustable from .05 seconds to .5 seconds. The "OFF TIME" (interval between pulses) can be varied from 1.5 to 30 seconds. An indicator light for "power on" is prominently located on the board as well as lights which indicate which row of bags is being cleaned. If desired, the timer can be activated by an external differential pressure switch. In this arrangement the cleaning cycle would be used only when it is necessary, as determined by a preset pressure drop across the tubesheet.

3. The standard timer is shipped in a NEMA 4, weatherproof enclosure for mounting by the customer. Other enclosures are available for hazardous applications.

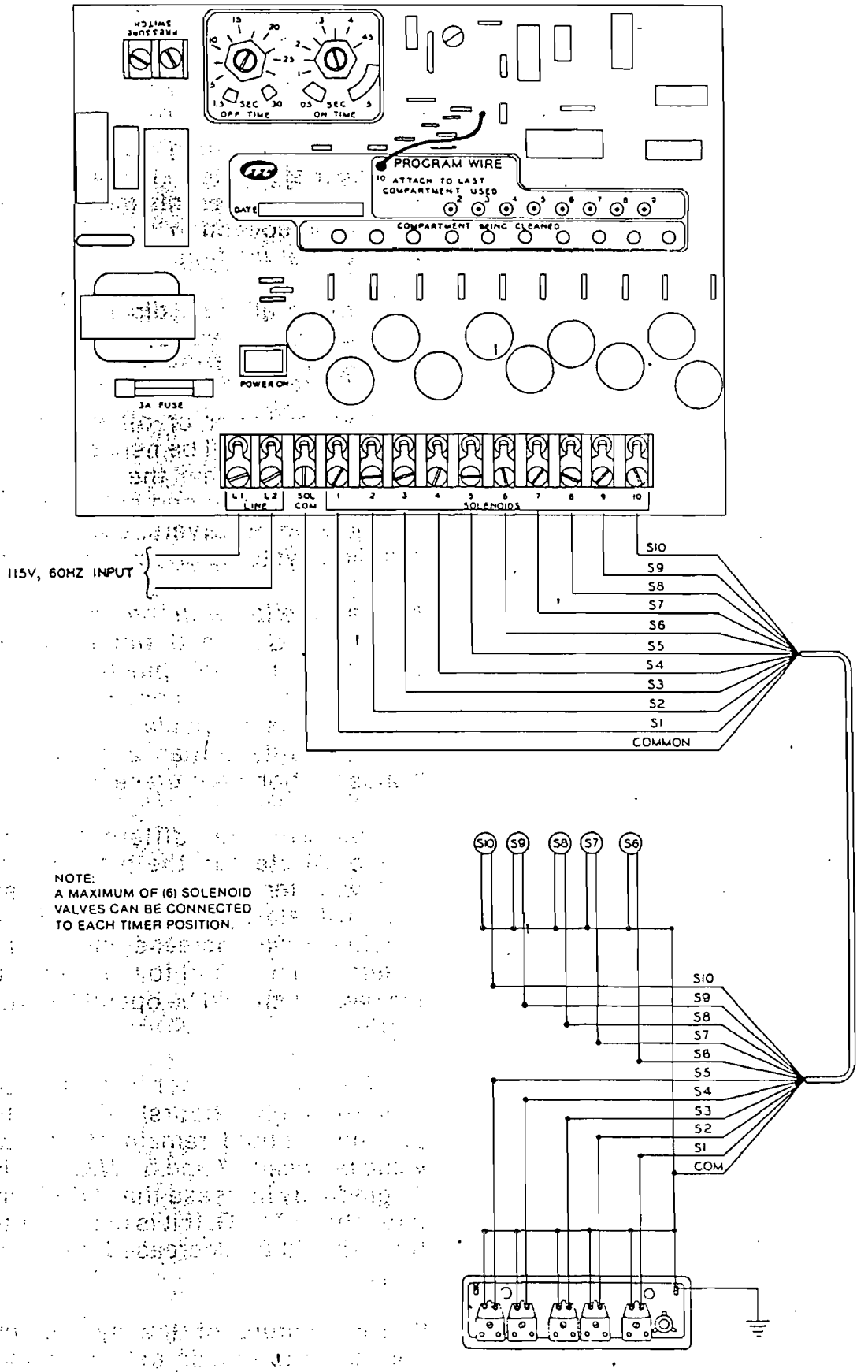
4. If the timer is to be mounted on the collector, vibration mounts should be provided. It is more desirable to mount the timer away from the collector in an accessible location that is free from vibration. The timer should not be exposed to temperatures over 120°F.

5. Install an "ON-OFF" switch in the power supply to the timer. Connect 115 volt, single phase, 60 Hz, 10 amperes input through this switch to timer terminals marked "Line L1" and "L2". In grounded systems connect neutral of line to "L2".

6. Connect wiring between the timer and solenoid valves; one side of each solenoid to the timer common terminal marked "SOL COM.", and the other side of the first solenoid to the timer output terminal marked "Solenoids 1", the second solenoid to "Solenoids 2", etc.

7. The black program wire in the timer should be connected to the "COMPARTMENT USED" socket number which is the same number as the highest numbered "Solenoids" terminal which is used. For example: if eight solenoids are connected to the timer, the program wire should be connected to the number 8 "COMPARTMENT USED" socket.

8. On collectors with more than one air header, one wire from each solenoid is connected to the timer terminal marked "SOL COM." The other wire from the first valve on each header should be connected to the timer terminal marked "Solenoids 1", the second valve on each header to "Solenoids 2", etc. On certain collectors the number of solenoid valves on each header differ. For example: a collector may have a total of 26 valves with three air headers. Two would have 9 valves, the third 8. The solenoids would be connected in sequence to the timer, with three wires on positions one through eight. On the ninth post there would be only two solenoid wires. The program wire would be connected to the ninth "COMPARTMENT USED" socket.



NOTE:
A MAXIMUM OF (6) SOLENOID VALVES CAN BE CONNECTED TO EACH TIMER POSITION.

INITIAL SYSTEM START UP

AUXILIARY EQUIPMENT

Inspect all equipment before start-up to see that there are no foreign objects in rotating equipment and that safety equipment is in place.

Start the fan, screw conveyor and/or airlock and inspect for proper rotation and that all equipment runs smoothly. After making the necessary corrections turn all this equipment off.

DUCTWORK

See that all connections are tight and that all cleanout ports are closed. The ductwork must be free of debris.

STARTING SYSTEM

1. All doors and ports should be closed, with timer and auxiliary equipment off. Turn on compressed air to collector and inspect the system for leaks. If air is leaking from any blowpipe with the timer off there may be a leak between its solenoid and diaphragm valve. Inspect the ¼" O D tubing between the solenoids and diaphragm valves to be certain that all connections are tight and there are no leaks. The tubing must not be crimped. Shut off compressed air supply.

2. Turn on timer. The red "power on" indicator should light. Turn "OFF TIME" and "ON TIME" knobs fully counterclockwise. The individual timing lights should blink at 1.5 second intervals and the corresponding solenoid valves will be activated (audible).

3. Turn on the air supply to the air header. All solenoid valves should be operating and the exhaust air from each valve can be felt.

Let the collector pulse for ten minutes to clear all lines then set "OFF" time to between six to ten seconds with 85 psig air supplied. Later this may be adjusted to suit your collection requirements based on the dust loading.

4. Turn on all dust discharge equipment such as rotary valves, screw conveyors, etc.

5. If water vapor or other condensables are present, it will be necessary to preheat the system so that the surface temperature of the piping and collector are above the dew point. Dryers, coolers and some grinding systems are common examples.

6. Start the fan with the fan damper set at about half-flow and run for 30 minutes because it is good practice to introduce the dust stream to a new bag at a reduced rate. This is particularly true when very fine solids (less than 2 microns) or high concentrations are present.

7. Observe the differential pressure gauge. At start-up the pressure drop will be low. After 30 minutes of operation the bags will start to be coated, the filtering efficiency will increase and the pressure differential will start to rise. Then the main fan damper should be opened to the design setting.

8. When the collector has stabilized (may require eight hours) the differential pressure should remain steady at some value between 1" and 6" W.G. If it is below 4" gradually increase the "OFF" time until it reaches 4" W.G. If it is over 4" the "OFF" time should be decreased until it reaches 4" W.G.

9. Temperature of the system must be controlled to remain below the maximum temperature capability of the filter bags.

10. The collector is now ready for use.

USING YOUR COLLECTOR

STANDARD START UPS Subsequent start ups (exception: after new bags are installed follow the INITIAL SYSTEM START UP procedure) should begin with all systems off. Turn on in the following sequence:

1. Filter bags installed, all ports, access doors and rotating equipment closed with safety equipment, (belt guards, etc.) in place.

2. Turn on compressed air.

3. After pressure reaches 85 psig minimum, turn on timer.

4. Turn on all dust discharge equipment.

5. Turn on main fan. Preheat system if necessary.

6. You have purchased equipment to filter 99.9% of dust particles. If the collector discharge is visible refer to the TROUBLE SHOOTING CHECK LIST that follows.

SHUTTING DOWN YOUR COLLECTOR

DUST CONTROL AND PNEUMATIC CONVEYING SYSTEMS Reverse start-up procedure. First turn off the fan, wait five to ten minutes and turn off the timer and discharge (auxiliary) equipment.

PROCESS SYSTEM Dryers and the system to the collector discharge should be run until empty and heat maintained at a reduced rate until the collector metal surfaces and filter bags are dry. Then proceed as above.

ROUTINE MAINTENANCE

INSPECTION Frequency will vary as widely as there are operating conditions. Your experience will be the best guide. In general proceed as follows:

1. Daily adjust timer "OFF" time to achieve differential pressure of 4" W.G.

2. Weekly check timer and solenoid valves for proper operation. Usually listening to determine that there is an uniform time interval between solenoid air discharge blasts will suffice.

3. Monthly lubricate fan, rotary valve and screw conveyor. Inspect seals on latter two for dust loss.

4. Quarterly inspect filter bags for condition and that every bag clamp is *tight.*

5. Inspect, clean and replace air supply and differential filters as operating conditions require.

SAFETY Before entering dust collector:

1. Run cleaning mechanism 20 minutes with fan off to clean the filter bags.

2. Run solids out of the hopper.

3. Lock out electrical power on all rotating equipment.

4. If toxic gases and/or solids are present purge collector housing and block off inlet duct.

5. Install catwalks and safety cables.

6. Secure access doors in open position or remove doors by lifting from the hinge pins.

7. Use buddy system.

8. Wear respirator.

9. Use common sense.

TROUBLE SHOOTING CHECK LIST

First be sure that you have used the complete **STANDARD START UP** procedure.

PROBLEMS & PROBABLE CAUSES (SOLUTIONS)

VISIBLE EXHAUST DUST LOSS

1. Missing bag, dust loss will be constant not in synchronization with valve blasts. (Locate and replace missing bags.)

2. Improperly installed bags. Loose clamps or bag tops not clamped between cages and venturi collars. Constant dust loss. (Reinstall bags and cages properly.)

3. Holes in bags from mechanical damage during installation, abrasion, thermal or corrosive attack or wear. Generally in synchronization with valve blasts. (Replace worn or damaged bags with bags made from filter medium suitable for application. Plugging venturis with 3" diameter rubber plugs from the clean air (plenum) side of the collector is a quick temporary measure until the bags can be replaced.)

4. Dust in plenum after bags fail. (Always clean plenum before installing new bags.)

INSUFFICIENT AIR PRESSURE

5. Piping leaks. (Tighten fittings.)

6. Additional usage from plant system. (Revise system to furnish adequate air supply.)

ENTIRE ROW OF BAGS INADEQUATELY CLEANED

7. Debris in diaphragm valve.

8. Dirt in solenoid plunger. (Remove solenoid cover and clean.)

9. Solenoid valve inoperative. Electric, solenoid, or timer fault. (Establish power to solenoid and proper wiring to timer. Check solenoid and if O.K. change wiring at timer to next unused terminal and move program wire to highest numbered terminal used or replace timer. If solenoid defective, replace.)

RANDOM BAG INADEQUATELY CLEANED

10. Debris in air distribution pipe hole. (Remove debris.)

HIGH DIFFERENTIAL PRESSURE

11. Excessive air flow. (Adjust fan damper until pressure gauge indicates proper pressure.)

12. Compressed air pressure below 75 psig. (See paragraphs 5 & 6.)

13. Solenoids skipping. (See paragraph 9.)

14. Reverse leakage through rotary valve. (Check rotary valve for wear or damage and correct.)

15. Dust on inside of bags after previous bag failure. (Clean plenum and inside of bags.) (See paragraph 4.)

16. Blinding (plugging) of bags due to condensables. (Change operations upstream so that liquids remain vaporized through unit. May be necessary to insulate the collector. Usually operating the collector with no solids flowing through will permit recovery.)

17. Re-entrainment of dust due to hopper overloading, bridging, or plugging. (Run out dust from discharge system with main fan off, consider increasing capacity of discharge system or reducing load and consider installing hopper vibrators.

18. Improper timer sequence. (Inspect timer for proper solenoid wiring and program wire position.)

19. Defective timer. (Return timer to us for repair or replace.)

20. Bags too tight. (If bags were cleaned they may have shrunk and are too tight to permit proper flexing. Replace bags.)

IMPROPER PULSING

21. Solenoid valves not working. (See paragraph 9.)

Continuous air flow through diaphragm valve. (See paragraphs 7 & 8. Leak in tubing between solenoid and diaphragm valves.)

INSUFFICIENT DUST COLLECTION (SYSTEM VOLUME TOO LOW)

23. Fan running backwards. (Correct fan rotation.)

24. High differential pressure. (See paragraphs 5 through 9, 16, 17, 18 & 19.)

25. Fan belt slippage. (Tighten or replace belts.)

26. Air short-circuiting between collection point(s) and fan. (Stop leaks.)

27. Additions to system. (Increase system capacity.)

28. System blockage. (Use proper shutdown procedure. Inspect piping for foreign material and remove. See paragraphs 9 and 15 through 19. Bags should feel soft to the hand or be replaced.)

SHORT BAG LIFE

29. High temperature. (Bleed in ambient air and/or replace with bags of high temperature rated fabric.)

30. Chemical attack. (Contact us for recommendation.)

31. Localized wear from rubbing. (Straighten cages so that bags do not rub against each other or the collector housing. Replace bags and corroded or broken cages. Wear at air inlet may require an inlet baffle.)

TIMER MALFUNCTION

32. "Power on" indicator light not on. (Ascertain that timer "ON-OFF" switch is on, that timer wiring is connected, and that indicator bulb is good. Inspect for blown fuse. Replace with 3 amp., 3 AG fuse. Do not use slow blow type.)

33. Solenoids skipping. (See paragraph 9.)

UNUSUAL DIFFERENTIAL PRESSURE GAUGE READINGS

34. Unusual readings. (Inspect gauge filter, replace if plugged.) Blocked gauge tubing. (Disconnect and remove blockage. If blockage occurs frequently, install filter and replace it routinely.)

REPLACEMENT PARTS

Your **ULTRA** and **FABRI-JET™** collectors use the finest components available. To ensure continued trouble free operation of your collector we recommend that only factory engineered components be used. The following components are suggested to be kept on hand to maintain trouble free service.

1. A spare set of filter bags and bag clamps.
2. Extra solenoid valves and diaphragm valves.
3. A spare timer board for multi-collector installations.

Our collector components can be used to maintain peak performance of collectors manufactured by Mikro Pul, Flex-Kleen and other leading manufacturers.

OPERATING INSTRUCTIONS AND PARTS LIST

For

"PB" Pressure Blowers
"HP" Pressure Blowers
"LM" Volume Blowers
"ORB" Industrial Exhausters
Series FC and BI Utility Sets

WARNING

Rotating Equipment must be properly guarded to prevent personal injury.

By acceptance of this merchandise, the purchaser and user assume complete responsibility for the safe operation of this equipment. The manufacturer disclaims any and all responsibility unless this unit is operated in compliance with all federal and local laws and regulations.

CONTENTS

cincinnati fan and ventilator company, inc.
5345 Creek Road, Cincinnati, Ohio, 45242-3999, Area Code 513-984-0600

Cat. No. PMA-177

RECEIVING & START-UP

Receiving Inspection

When unit is received, inspect immediately for damaged or missing parts. Even though all units are carefully inspected and prepared for shipment at the factory, rough handling enroute may cause concealed damage or cause nuts,bolts or locking collars to work loose. Check wheel to see that it rotates freely and that there are no obstructions. Be certain all bolts and locking collars are tightened securley.

If concealed damage is found, call the carrier and ask for their Inspection Department. Then fill out a concealed damage inspection report.

Operation

Before Start Up

1. Inspect all fasteners to make sure they are secure.
   a. Foundation bolts
   b. Set screws in fan wheel and V-belt drive
   c. Housing, bearing and motor mounting bolts
2. Access Doors should be tight and sealed.
3. Bearings should be checked for alignment and lubrication.
4. Turn rotating assembly by hand to insure that it does not strike housing. If the wheel strikes the housing, the wheel may have moved on the shaft or the bearings may have shifted in transit. Correction must be made prior to start up.
5. Check motor to insure proper speed and electrical characteristics.
6. Check V-belt drive for alignment.

GENERAL MAINTENANCE

CAUTION – *Before any maintenance or service is performed, be sure that unit is disconnected from power source to prevent accidental starting.*

Cast Aluminum & Metal Parts

The cast aluminum bearing housings and impellers, as well as all metal parts, are maintenance free and should not require any maintenance during the life of the unit.* In a severe dirty operation, the wheel should be cleaned with a wire brush to prevent an accumulation of foreign matter that could result in fan unbalance. After cleaning impeller, inspect for possible cracks or excessive wear, which can cause unbalance. Belts on V-belt drive units require periodic inspection and replacement when worn.

*Painted metal surfaces may require periodic repainting.

Motor Maintenance

1. Removing dust and dirt: Blow out open type motor windings with low pressure air to remove dust or dirt. Air pressure above 50 P.S.I. should not be used as high pressure may damage insulation and blow dirt under loosened tape. Dust can cause excessive insulation temperatures.
2. Lubrication: Under normal conditions, ball bearing motors will operate for five years without re-lubrication. Under continuous operation at higher temperatures (exceeding 104 degrees F. ambient) or dusty atmosphere re-lubricate after one year. To re-lubricate motor bearings, disassemble motor and housings thoroughly. Bearings are located in the end shields of the motor. Repack each bearing and fill cavity in back of bearings 1/3 full with Alvania Grease No. 2 (Shell Oil Company) or equivalent.

V-BELT DRIVES

CAUTION – *Care should be taken not to over tighten V-belt drives. Excessive belt tension overloads fan and motor bearings. It is much less expensive to replace belts worn from slippage than to replace bearings damaged from excessive loading.*

Fans shipped completely assembled have had V-belt drive aligned at Cincinnati Fan. Alignment should be re-checked before operation as a precaution due to handling during shipment.

1. Be sure sheaves are locked in position.
2. Key should be seated firmly in keyway.
3. Place straight edge or taut cord across faces of driving and driven sheaves to check alignment. The motor and fan shafts must be parallel: with V-belts at right angles to the shafts.
4. Start the fan. Check for proper rotation. Run fan at full speed. A slight bow should appear on slack side. Adjust belt tension by adjusting motor on its sliding base. All belts must have slack on one side.
5. If belts squeal at start-up, they are too loose and should be tightened.
6. When belts have had time to seat in the sheave grooves, then readjust belt tension.

V-belt drive assembly can be mounted as follows:

1. Clean motor and fan shafts. Be sure they are free from corrosive material. Clean bore of sheaves and coat with white lead or heavy oil for ease of shaft entry. Remove oil, grease, rust or burrs from sheaves.
2. Place fan sheave on fan shaft and motor sheave on its shaft. DO NOT POUND SHEAVES ON as this may damage bearings. Tighten sheaves in place.

3. Move motor on slide base so belts can be placed in grooves of both sheaves without forcing. Do not roll belts or use a tool to force belts over the grooves.
4. Align fan and motor shafts so they are parallel. The belts should be at right angles to the shafts. A straight edge or taut cord placed across the face of sheaves will aid in alignment.
5. Tighten belts by adjusting motor base. Correct tension gives the best drive efficiency. Excessive tension causes undue bearing pressure.
6. Start the fan and run it at full speed. Adjust belt tension until only a slight bow appears on the slack side of the belts. If slippage occurs, a squeal will be heard at start-up. Eliminate this squeal by tightening up the belts.
7. Give belts a few days running time to become seated in sheave grooves – then readjust belt tension.

If the shafts become scratched or marked, carefully remove sharp edges and high spots such as burrs with fine emery cloth or honing stone. Avoid getting emery dust in the bearings.

Do not apply any belt dressing unless it is recommended by the drive manufacturer. V-belts are designed for frictional contact between the grooves and sides of the belts. Dressing will reduce this friction.

Belt tension on an adjustable pitch drive is obtained by moving the motor – not by changing the pitch diameter of the adjustable sheave.

BEARING MAINTENANCE

Sealed Bearings

Sealed for life bearings are pre-lubricated with the correct amount of manufacturer-approved ball bearing grease, and are designed for application where re-lubrication is not required.

Units feature two single row deep groove bearings in a rugged cast aluminum or cast iron bearing bracket. Dirt and grease guard seals are an integral part of the assembly. For high temperature applications the bearings are pre-lubricated with a high temperature grease.

Relubricatable Bearing

For grease lubricated ball or roller bearings, or pillow blocks, a good grade of soda soap grease free from chemically or mechanically active material should be used.

This grease is a mixture of lubricating oil and a soap base to keep the oil in suspension. They have an upper temperature limit where the oil and soap base oxidize and thermally decompose into a gummy sludge.

Grease listed (or equivalents) are satisfactory for normal operating conditions. Regreasing will vary from 3 months to a year depending upon hours of operation, temperature and surrounding conditions. Special grease may be required for dirty or wet atmospheres (consult your lubricant supplier).

The pillow block should be filled with a low pressure gun until 1/3 full as excess grease may cause over heating.

Recommended grease for temperatures ranging from -40 degrees F to 250 degrees F are: Sinclair Refining Co.–AF No. 2, Sconv Mobile Oil Co.–Mobilplex EP No. 1, Sun Oil Co.–Sun 72XMP grease, Esso Standard Oil Co.–ANDOK "C", Texas Co.–Texaco Regal Starfak No. 2.

WARRANTY

Cincinnati Fan & Ventilator Company warrants products of its own manufacture, against defects of material and workmanship under normal use and service for a period of eighteen (18) months from date of shipment or twelve (12) months from date of installation whichever occurs first. This warranty does not cover ordinary wear and tear, abuse, misuse, overloading, altered products, systems or materials not of Seller's manufacture. Expenses incurred by Buyer(s) in repairing or replacing any defective product will not be allowed except where authorized in writing and signed by an officer of the Seller.

The obligation of Seller under this warranty shall be limited to repairing or replacing F.O.B. Seller's plant, or allowing credit at Seller's option.

On equipment furnished by Seller, but manufactured by others, such as motors, Seller extends the same warranty as Seller receives from the manufacturer thereof.

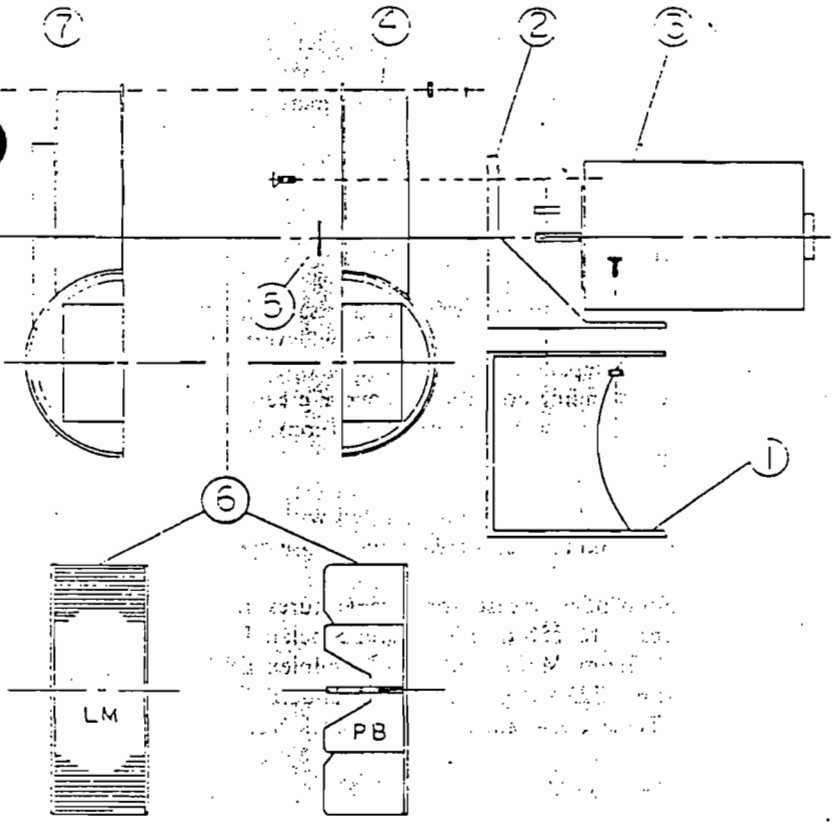
Cincinnati Fan & Ventilator Company assumes no responsibility for material returned to our plant without our written permission.

ORDERING REPLACEMENT PARTS

Replacement or spare parts may be ordered through your local Cincinnati representative.

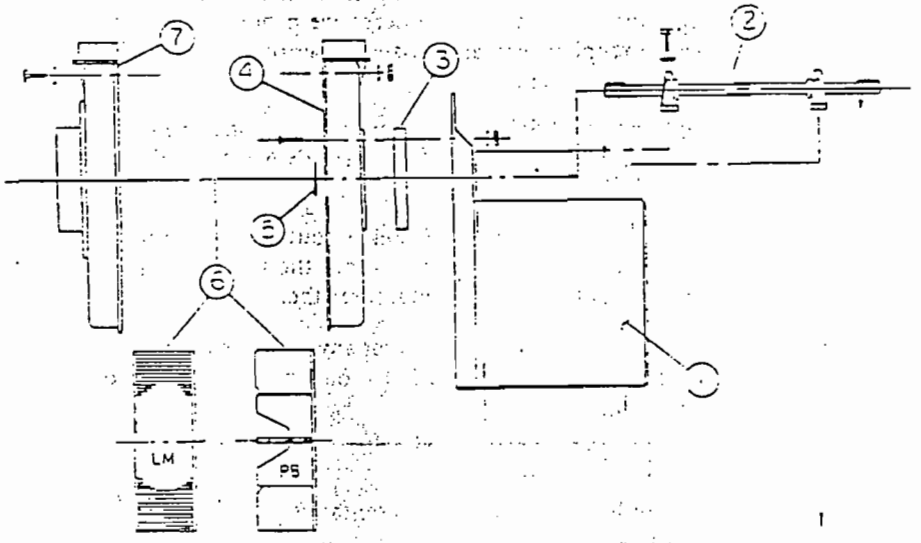
The following information should accompany parts orders.

1. Motor horsepower, frame size and motor speed.
2. Fan Speed (if V-belt driven).
3. Fan arrangement and model number.
4. Serial number, model number and a complete description of the part.



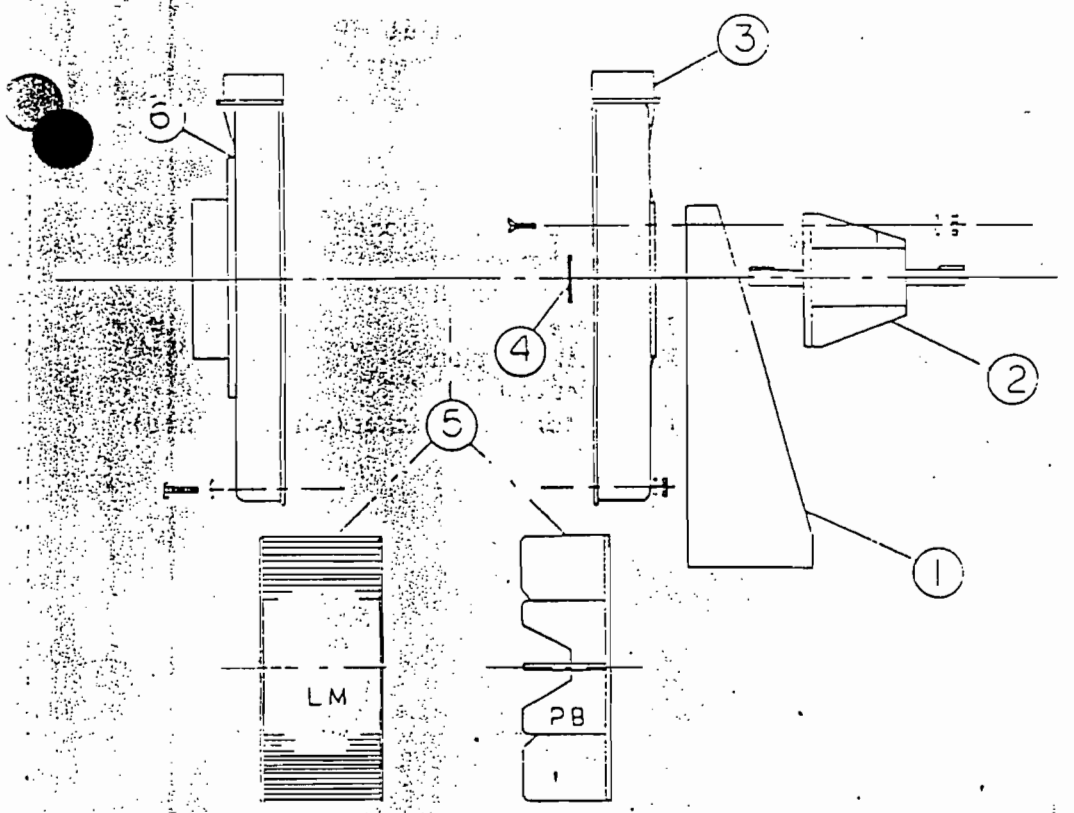
MODEL PB and LM
Arrangement No. 4

1. Base
2. Angle bracket (when required)
3. Motor
4. Housing, motor side
5. Felt seal (optional)
6. Wheel
7. Housing, inlet side



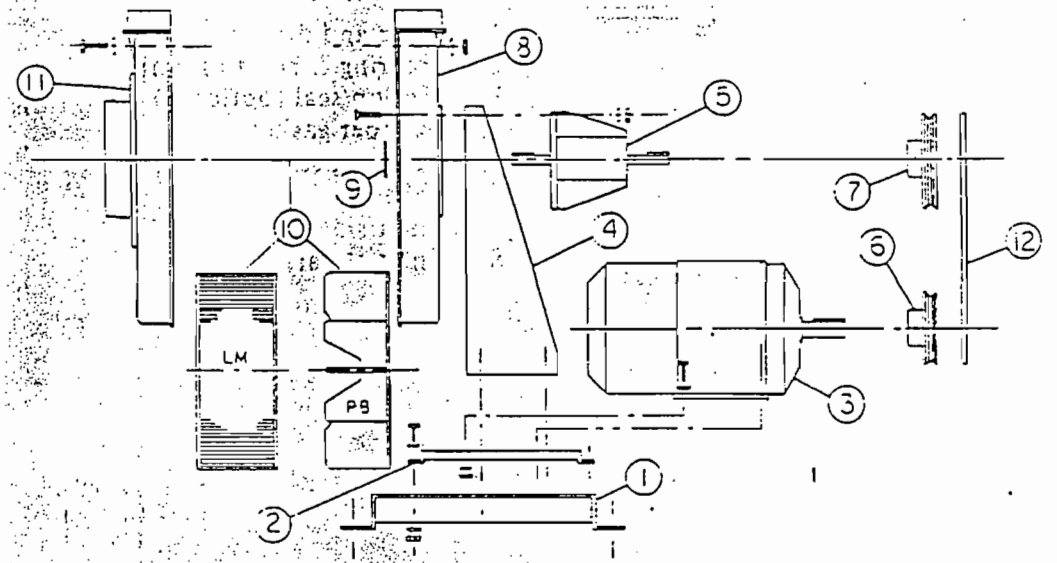
MODEL PB and LM
Arrangement No. 1

1. Base
2. Bearing assembly
3. Spacer (when required)
4. Housing, Drive side
5. Felt seal (optional)
6. Wheel
7. Housing, Inlet side



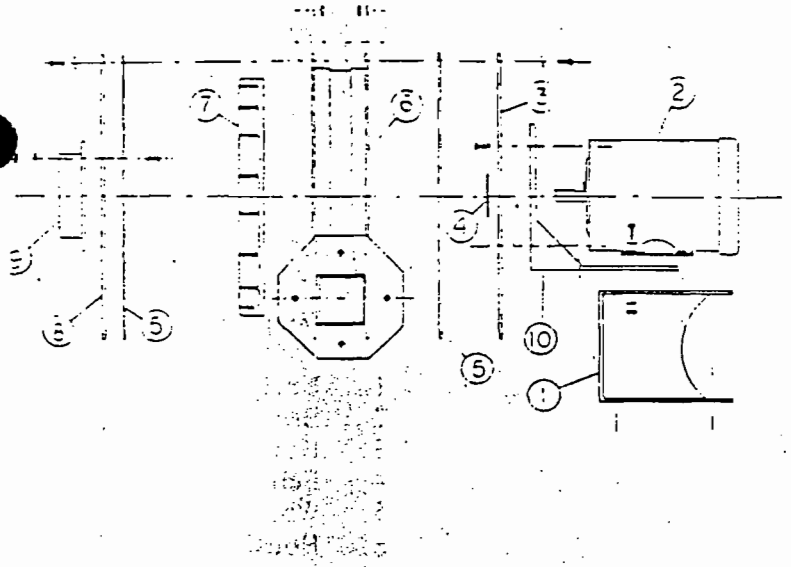
MODEL PB and LM
Arrangement No. 2

1. Upright base
2. Bearing assembly
3. Housing. drive side
4. Felt seal (optional)
5. Wheel
6. Housing, inlet side



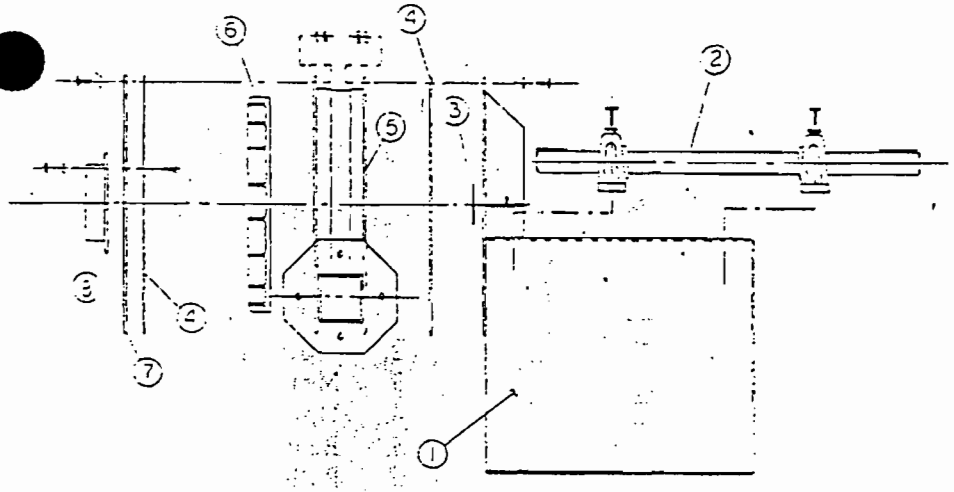
MODEL PB and LM
Arrangement No. 9-2

1. Sub base
2. Motor slide base
3. Motor
4. Upright base
5. Bearing assembly
6. Pulley, drive
7. Pulley. driven
8. Housing, drive side
9. Felt seal (optional)
10. Wheel
11. Housing, inlet side
12. Belt(s)



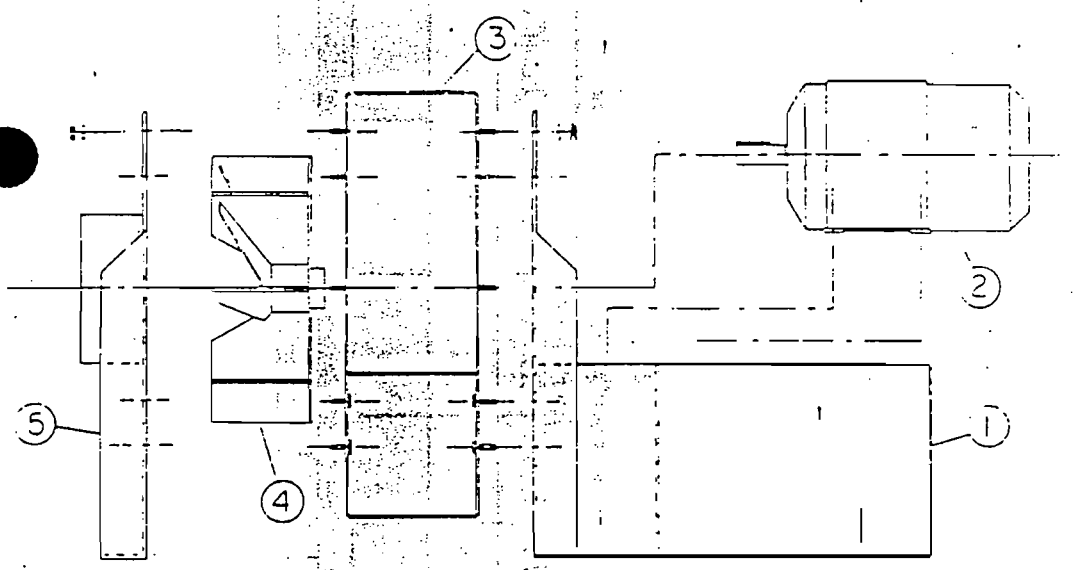
MODEL HP
Arrangement No. 4

1. Motor base
2. Motor
3. Drive side plate
4. Teflon seal (optional)
5. Rubber gasket
6. Housing scroll
7. Wheel
8. Inlet side plate
9. Inlet collar
10. Motor angle bracket (when required)



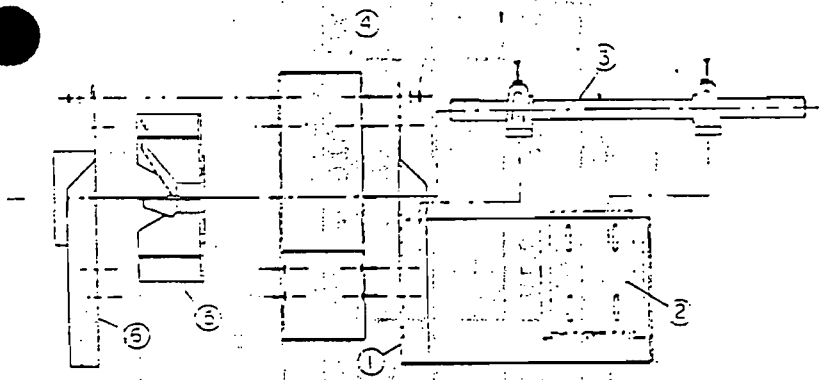
MODEL HP
Arrangement No. 1

1. Base and drive side plate
2. Bearing & shaft assembly
3. Teflon seal (optional)
4. Rubber gasket
5. Housing scroll
6. Wheel
7. Inlet side plate
8. Inlet collar



MODEL ORB
Arrangement No. 4

1. Base
2. Motor
3. Housing
4. Wheel
5. Inlet side plate



MODEL ORB
Arrangement No. 1 & 9

1. Base
2. Motor slide base (Arr. No. 9 only)
3. Bearing assembly
4. Housing
5. Wheel
6. Inlet side plate
7. Motor & drives (not shown)

SUBMITTAL DRAWING SPECIFICATION CHART

fan and ventilator company, inc.

CUSTOMER: ULTRA INDUSTRIES
BELLWOOD, IL

P.O. NO.: 11578

JOB NO.:

JOB NAME: PALM BEACH CO./SOLID WASTE AUTH

LOCATION: WEST PALM BEACH, FL

MARKS: P.O.# 1210/87 ; TOM FARRELL ; 305-471-0062 ; P.O.# 300-87-062 ; REV. 2

CF & V NO. 881085

DRAWING NO. A881085

DATE: FEB. 9, 1988

NOTES & ACCESSORIES

- INLET FLANGE DRILLING: (8) 7/16" DIA. HOLES ON 9" B.C., 11" O.D. FLANG
- OUTLET KIT: COVER, DAMPER, SCREEN
- TAG: JNM 901A BB-2005
  JNM 901B BB-2006

ROT.	DISCH.	IDENTIFICATION	NO. REQD.	WHEEL SIZE	INLET SIZE	WHEEL TYPE	PERFORMANCE						
							CFM	O.V.	S.P.	R.P.M.	B.H.P.	TEMP.	ALT
CW	HM	PB-14	2	14"	7"	ALUM.	1100		8"	3450		70°F	S.L.

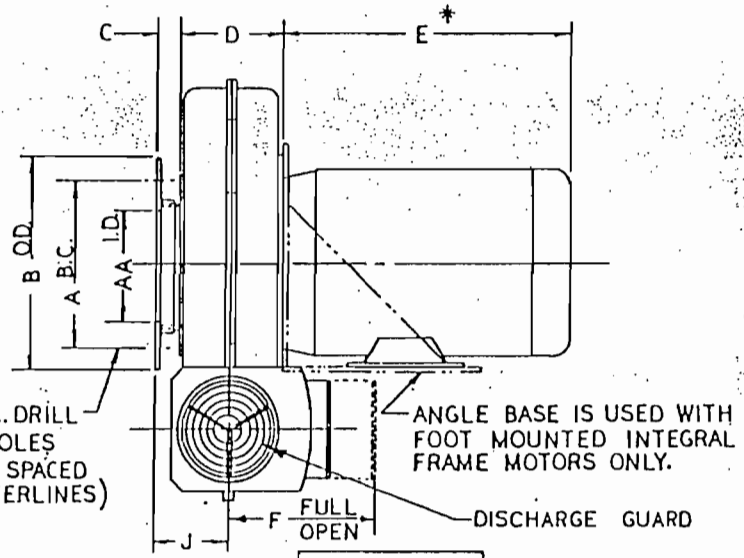
MOTOR DATA

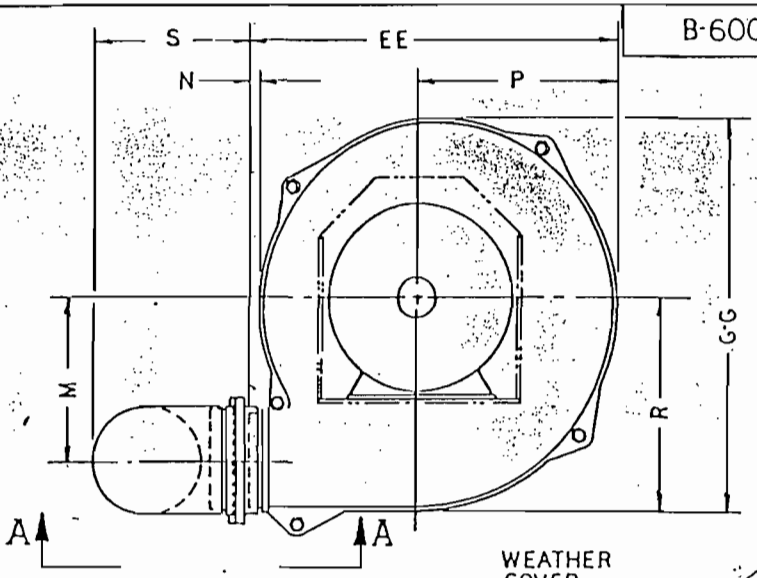
H.P.	R.P.M.	VOLTAGE	FRAME	ENCL.	CYCLE	PHASE	MANUFACTURER	SPECIAL FEATURES
5	3450	230/460		TEFC	60	3		

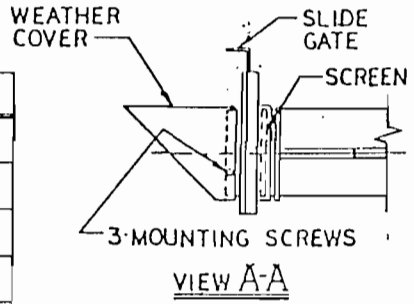
DRIVE DATA

NO. GROOVES	BELT SIZE	MOT. SHAFT	FAN SHAFT	MOTOR SHEAVE	FAN SHEAVE

B-60032







VIEW A-A

CW ROTATION SHOWN
CCW ROTATION OPPOSITE

⊕ FLANGE WILL BE SUPPLIED DRILLED

* DIMENSION "E" WILL VARY WITH MOTOR FRAME SIZE & MFG'ER

MODEL PB	SLIDE GATE	A	B	C	D	E*	F	J	M	N	P	R	S	A-A	E-E	G-G	NOMINAL INLET SIZE	
9	FG-4	9	11	1 7/16	4 1/8	12 1/2	9	3 1/4	5 5/8	1 5/16	7 1/4	7 3/4	6 3/8	4 9/16	14 9/16	14 1/4	5	
10A	FG-5	9	11	1 11/16	4 1/4	12 1/2	10 1/2	3 13/16	6 9/16	3/4	8 7/16	9	6 5/8	5 1/2	16 1/8	16 1/2	6	
12A	FG-6	9	11	1 5/8	5	15 1/2	11 1/2	4 1/8	7 5/8	3/4	9 1/2	10 1/2	8 1/2	6 7/16	18 3/16	19	7	
X 14	FG-6	9	11	1 5/8	5 7/16	15 1/2	11 1/2	4 3/8	8 1/16	1 1/4	10 1/8	11 3/16	8 1/2	6 7/16	19 15/16	20 7/16	7	
15	FG-8	11 3/4	13 1/2	1 5/8	6 7/8	16	15	5 1/16	7 7/8	1 3/16	11	12	10 1/2	7 1/2	21 9/16	22	8	
18	FG-6	11 3/4	13 1/2	1 5/8	6 1/4	16	11 1/2	4 3/4	10 1/2	15/16	12 11/16	13 3/4	8 1/2	7 1/2	24 1/8	25 1/8	8	
18	FG-6	14 1/4	16	1 5/8	6 1/4	16	11 1/2	4 3/4	10 1/2	15/16	12 11/16	13 3/4	8 1/2	9 11/16	21 1/8	25 1/8	10	
14A	FG-6	9 / 11 3/4	11 / 13 1/2	1 5/8	6	15 1/2	11 1/2	4 5/8	8 1/16	1 1/4	10 1/8	11 3/16	9 1/4	6 7/16 / 7 1/2	19 15/16	20 7/16	7 / 8	

NO	DESCRIPTION	DATE
5	REVISED "AA" DIMENSIONS; ADDED NOMINAL INLET SIZES, PB-14A & 8" INLET DIMENSIONS.	10-15-87 SEL
4	ADDED MODEL 14A; REVISED "J" "C," & "E" DIMENSIONS	8-6-87 SEL
3	ADDED NEW "F" DIMENSION; ADDED DISCHARGE GUARD	12-18-86 SEL
2	"AA" FOR PB-15 WAS 7 1/2"; ADDED PB-18 DIMENSIONS	11-19-86 SEL
1	REDRAWN	8/13/86

REVISIONS

CERTIFIED BY: 2-10-88

TOLERANCE	
FRACTIONS : 1/16	
DECIMALS : .005	
ANGLES : 1°	
ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED	
SCALE	NONE
DATE	8/13/86
DR BY	JHC
CHK BY	

MATERIAL

cincinnati fan and ventilator company, inc.
5345 CREEK RD. CINCINNATI, OHIO 45242

TITLE HORIZ. MOUNT PB BLOWERS WITH SLIDE GATE & WEATHER COVER

FLANGE MOUNTED

ASSEMBLY

DRAWING NO B-60032

SHEET 1 of 1

REV 5

RISE LOUISE CORP.
SPECIALIST IN BULK MATERIAL HANDLING EQUIPMENT

16 PASSAIC AVENUE, FAIRFIELD, NEW JERSEY 07006
(201) 227-6727 • TELEFAX NO. (201) 227-1069

FEBRUARY 1, 1988

BIN VENT FILTERS

RECOMMENDED SPARE PARTS LIST

RISE-LOUISE CORPORATION
MODEL BB-25-84 ARR.II

Suggested Quantity	Description	Part #
5	Bag Clamps	157-A1020
1	Timer Six Position	145-A1000
1	Magnehelic Guage	235-A1000
1	Pressure Guage	224-A1000
25	Filter Bags, 5-3/4" Ø x 86"Lg. 14oz NOMEX w/SST Ground Wire, Bottom removal	2004-A1H01
25	Filter Bag cages, 5-3/4" Ø x 84"Lg. Mild Steel Bottom removal	207-A1010
1	1/8" Solenoid Valve Complete	153-A1040
2	1/8" Solenoid Valve Repair Kit	154-A1000
1	3/4" Diaphragm Valve Complete	147-A1040
2	3/4" Diaphragm Valve Repair Kit	150-A1000

ABOVE PRICES ARE FIRM FOR 90 DAYS

Appendix D-4

Portec Standard Model DF-48 Dust Filter

Kolberg Mfg.
W. 21st Street
P.O. Box 20
Yankton, South Dakota 57078

Telephone 605 665-9311
TWX 910-668-3600

PORTEC

INDEX

NOTES

ITEM - A

PARTS LIST DESCRIPTION: Bill of Materials for a Standard Model DF-48 Dust Filter with Exhaust Fan

P/N: 18055 DRW. REF.: 045-0114 D DATE: 02-26-85 BY: WDR SHEET 1 of 2

ITEM NO.	PART NO.	QTY.	DESCRIPTION
1	18007	1	Manufactured dust filter weldment
2	18041	1	Manufactured door weldment
3	7479	15'	Rubber gasket material, 3/8" thick X 1" wide (Dortite # 6850)
4	18006	1	Manufactured shaker grid
5	18591	1	Electric motor, 1/4 HP 1040 RPM, 115/230 volt, 1 phase, 60 cycle, frame # FB56C, TENV, standard efficency, service factor 1.35 (Reliance Electric Model # C56H1597)
6	9600	1	Manufactured eccentric arm
7	18114	1	Manufactured rubber gasket for the exhaust fan mount
8	18115	1	Exhaust fan with 13" diameter wheel, Arrangement 4, standard mount with clockwise downblast. The unit is powered by a 3 HP 3450 RPM, 230/460 volt, 3 phase, 60 cycle, TEFC motor. The fan discharge is provided with an adjustable damper and birdscreen. The unit includes an inlet flange with (8) 7/16" diameter holes on a 9" diameter bolt cicle. The exhaust fan is rated at 1195 CFM at 5" SP. (Cincinnati Fan, Series PB, Model # PB-14)
9	18113	1	Manufactured exhaust fan mount
10	17632	48	Dust filter bag, 5" od X 58" lg, Drawing Ref. 136-0015 C
11	17677	48	Bag strap buckle, nickle plated sheet steel, slide lock type, 1" wide (McMaster Carr No. 9585K5)
12	18008	1	Manufactured dust filter mounting flange
13	7479	17'	Rubber gasket material, 3/8" thick X 1" wide (Dortite # 6850)
14	12999	16	Capscrew 3/8 - 16 NC X 1-1/2" lg
	10704	16	Lockwasher 3/8
	8029	16	Nut 3/8 - 16 NC

Kolberg Mfg.
W. 21st Street
P.O. Box 20
Yankton, South Dakota 57078

Telephone 605 665-9311
TWX 910-668-3600

PORTEC

COMPONENT SPECIFICATION

PORTEC/KOLBERG PART NUMBER: 22640 QUANTITY: 1 each dust filter

DESCRIPTION:

Differential pressure switch/gauge combination. The unit is provided with the following features and options:

A.) gauge:
    1.) scale: 0-10 inches of water
    2.) connections: 1/8" NPT
B.) switch:
    1.) type: standard model, two photocell-actuated circuits and two DPDT relays
    2.) power required: 110 volt, 50/60 Hz

MANUFACTURER: Dwyer Instruments, Inc.

MODEL: Series 3000 "Photohelic" # 3010

Kolberg Mfg.
W. 21st Street
P.O. Box 20
Yankton, South Dakota 57078

Telephone 605 665-9311
TWX 910-668-3600

PORTEC

System Operation for the PORTEC/Kolberg Dust Collector

Model: DF-48 with Exhaust Fan

The PORTEC/Kolberg dust collector is mounted on top of a pneumatically filled storage bin. When the storage bin is being filled, the volume above above the material being blown in, becomes slighty pressurized and very dusty. This slight pressure is vented to the atmospere through the dust collector via a 3 HP exhaust fan. Bags, inside the collector, filter the air before venting it.

After the bin has been filled, the bags inside the collector will be coated with dust particles. To remove these dust particles, the collector is provided with a 1/4 HP, bag shaker mechanism. The shaker mechanism is controlled by an adjustable timer. The length of time that the mechanism operates is adjustable from 0 to 3 minutes. Power is supplied to the shaker motor via a 30 amp, Nema 3R disconnect, mounted to the collector's side.

To fill the silo a pneumatic truck is used. The material is blown from the truck directly to silo storage via a 4" diameter fill pipe. A limit switch is mounted on the end of the fill pipe, where the truck connects. When the truck operator connects to the fill pipe, the limit switch becomes activated. The limit switch controls both the dust filter bag shaker mechanism and the exhaust fan. While the truck is connected, the exhaust fan runs but the bags do not shake. When the truck disconnects, the exhaust fan stops and the shaker mechanism timer becomes activated and the bags shake for an adjustable period of time (0 to 3 minutes). Pushbuttons are provided to activate both the shaker mechanism and the exhaust fan manually.

Kolberg Mfg.
W. 21st Street
P.O. Box 20
Yankton, South Dakota 57078

Telephone 605 665-9311
TWX 910-668-3600

PORTEC

Bag Replacement Instructions

Model: DF-48 with Exhaust Fan

Note: Please refer to the drawing and parts list in Section A of this manual.

1.) Remove the dust filter access door (Item No. 3).

2.) Located on the top of each dust filter bag (Item No. 7) there is a strap and abuckle (Item No. 8). The strap is sewn to the dust filter bag. To release the top of the filter bag from the shaker grid (Item No. 4), loosen and remove the buckle and strap.

3.) Sewn into the bottom of each dust filter bag is a felted snap band. The groove in the snap band holds the bottom of the filter bag in the dust filter floor. With both hands, squeeze the snap band until it collapses and pull the bag from the hole in the filter floor.

4.) Repeat Steps 2 and 3 until all 48 bags have been removed from the dust filter.

5.) Install the new filter bags. Install the bottom of each bag before the top, and insure that no twists will be in the bag when the top is connected.

To install the bottom of a filter bag; collapse the snap band, insert it into a hole on the filter floor, and release it. Make sure that the snap band groove seats properly in the hole.

To install the top of a filter bag; loop the bag strap over the shaker grid, insert the strap through the buckle, and adjust the buckle until the bag tension is taut.

6.) Repeat Step 5 until all 48 bags are installed.

7.) Reinstall the dust filter access door.

Kolberg Mfg.
W. 21st Street
P.O. Box 20
Yankton, South Dakota 57078

Telephone 605 665-9311
TWX 910-668-3600

PORTEC

COMPONENT SPECIFICATION

PORTEC/KOLBERG PART NUMBER: 28487 QUANTITY: 1 each dust filter

DESCRIPTION:

Exhaust fan. The unit is provided with the following features and options:

A.) capacity: rated at 1260 CFM at 5" SP (2.62 BHP)
B.) inlet: 8" OD
C.) discharge: 6" OD, Arrangement # 4, direct drive, clockwise downblast
D.) construction (per AMCA Type B):
    1.) blower housing: commercial grade 319 cast aluminum
    2.) radial blower wheel:
        a.) size: 12-1/4" dia., X 2-7/8" tip width
        b.) material: grade 319 cast aluminum
E.) drive motor (Reliance Electric "XE XT"):
    1.) HP: 3
    2.) RPM: 3600
    3.) electrical rating: 230/460 volt, 3 phase, 60 Hz
    4.) insulation: Class F
    5.) service factor: 1.15
    6.) enclosure: TEFC
    7.) application: energy efficient, severe / chemical duty
    8.) frame: L182T
F.) option(s):
    1.) inlet flange, drilled with eight (8) 7/16" dia. holes on a 11-3/4" dia. bolt circle, grade 319 cast aluminum
    2.) outlet slide gate damper (Model # FG-6):
        a.) operation: manually adjustable
        b.) frame halves: grade 319 cast aluminum
        c.) gate: 12 gauge galvanized steel
    3.) outlet guard, nickel/chrome/lacquer finish

MANUFACTURER: Cincinnati Fan

MODEL: PB Series, # PB-14A

RECEIVING & START-UP

Receiving Inspection

When unit is received, inspect immediately for damaged or missing parts. Even though all units are carefully inspected and prepared for shipment at the factory, rough handling enroute may cause concealed damage or cause nuts,bolts or locking collars to work loose. Check wheel to see that it rotates freely and that there are no obstructions. Be certain all bolts and locking collars are tightened securley.

If concealed damage is found, call the carrier and ask for their Inspection Department. Then fill out a concealed damage inspection report.

Operation

Before Start Up

1. Inspect all fasteners to make sure they are secure.
   a. Foundation bolts
   b. Set screws in fan wheel and V-belt drive
   c. Housing, bearing and motor mounting bolts
2. Access Doors should be tight and sealed.
3. Bearings should be checked for alignment and lubrication.
4. Turn rotating assembly by hand to insure that it does not strike housing. If the wheel strikes the housing, the wheel may have moved on the shaft or the bearings may have shifted in transit. Correction must be made prior to start up.
5. Check motor to insure proper speed and electrical characteristics.
6. Check V-belt drive for alignment.

GENERAL MAINTENANCE

CAUTION –*Before any maintenance or service is performed, be sure that unit is disconnected from power source to prevent accidental starting.*

Cast Aluminum & Metal Parts

The cast aluminum bearing housings and impellers, as well as all metal parts, are maintenance free and should not require any maintenance during the life of the unit.* In a severe dirty operation, the wheel should be cleaned with a wire brush to prevent an accumulation of foreign matter that could result in fan unbalance. After cleaning impeller, inspect for possible cracks or excessive wear, which can cause unbalance. Belts on V-belt drive units require periodic inspection and replacement when worn.

*Painted metal surfaces may require periodic repainting.

Motor Maintenance

1. Removing dust and dirt: Blow out open type motor windings with low pressure air to remove dust or dirt. Air pressure above 50 P.S.I. should not be used as high pressure may damage insulation and blow dirt under loosened tape. Dust can cause excessive insulation temperatures.
2. Lubrication: Under normal conditions, ball bearing motors will operate for five years without re-lubrication. Under continuous operation at higher temperatures (exceeding 104 degrees F. ambient) or dusty atmosphere re-lubricate after one year. To re-lubricate motor bearings, disassemble motor and housings thoroughly. Bearings are located in the end shields of the motor. Repack each bearing and fill cavity in back of bearings 1/3 full with Alvania Grease No. 2 (Shell Oil Company) or equivalent.

V-BELT DRIVES

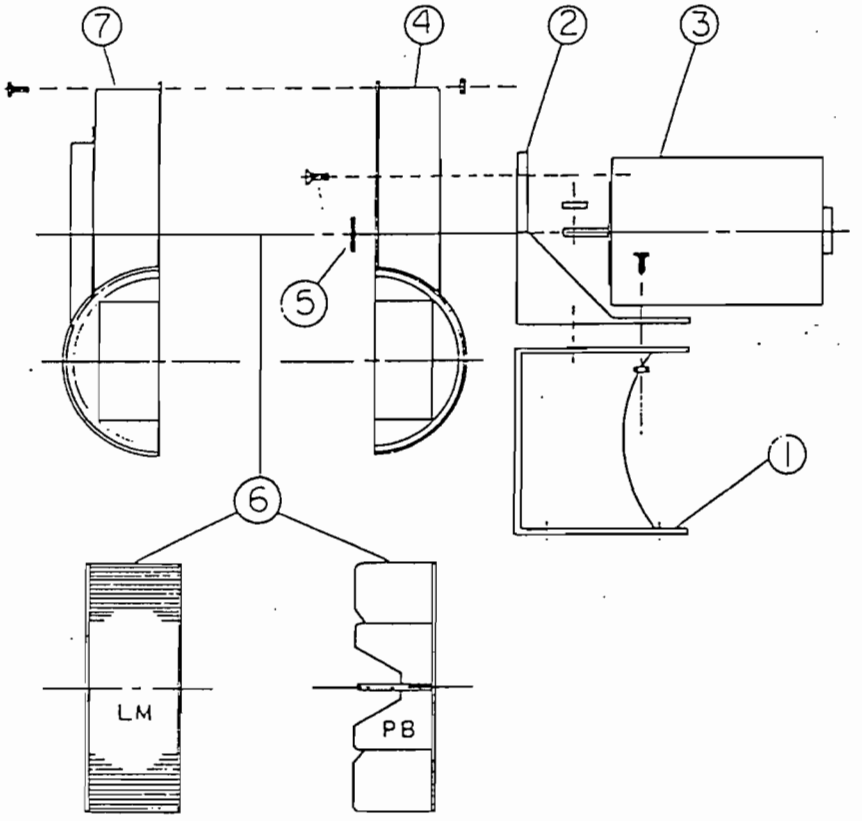
CAUTION–*Care should be taken not to over tighten V-belt drives. Excessive belt tension overloads fan and motor bearings. It is much less expensive to replace belts worn from slippage than to replace bearings damaged from excessive loading.*

Fans shipped completely assembled have had V-belt drive aligned at Cincinnati Fan. Alignment should be re-checked before operation as a precaution due to handling during shipment.

1. Be sure sheaves are locked in position.
2. Key should be seated firmly in keyway.
3. Place straight edge or taut cord across faces of driving and driven sheaves to check alignment. The motor and fan shafts must be parallel; with V-belts at right angles to the shafts.
4. Start the fan. Check for proper rotation. Run fan at full speed. A slight bow should appear on slack side. Adjust belt tension by adjusting motor on its sliding base. All belts must have slack on one side.
5. If belts squeal at start-up, they are too loose and should be tightened.
6. When belts have had time to seat in the sheave grooves, then readjust belt tension.

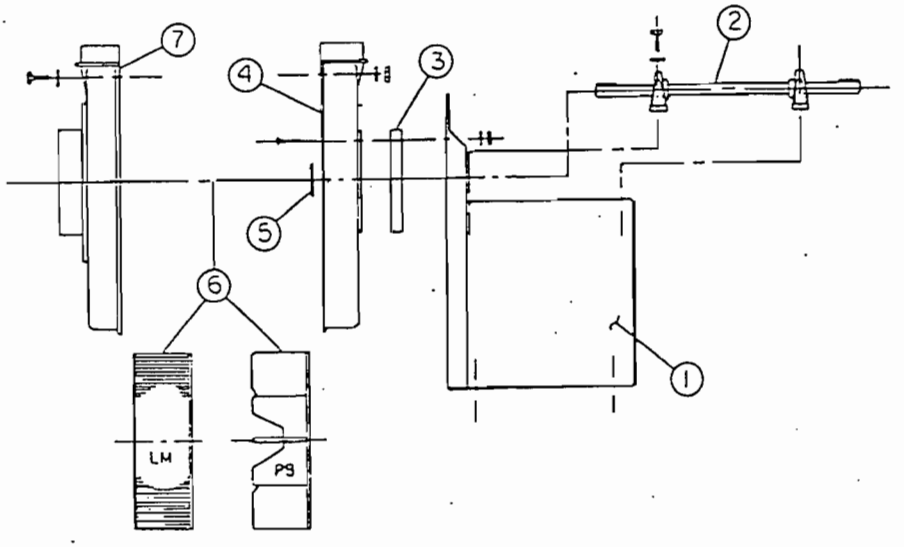
V-belt drive assembly can be mounted as follows:

1. Clean motor and fan shafts. Be sure they are free from corrosive material. Clean bore of sheaves and coat with white lead or heavy oil for ease of shaft entry. Remove oil, grease, rust or burrs from sheaves.
2. Place fan sheave on fan shaft and motor sheave on its shaft. DO NOT POUND SHEAVES ON as this may damage bearings. Tighten sheaves in place.



MODEL PB and LM
Arrangement No. 4

1. Base
2. Angle bracket (when required)
3. Motor
4. Housing, motor side
5. Felt seal (optional)
6. Wheel
7. Housing, inlet side



MODEL PB and LM
Arrangement No. 1

1. Base
2. Bearing assembly
3. Spacer (when required)
4. Housing, Drive side
5. Felt seal (optional)
6. Wheel
7. Housing, Inlet side

Kolberg Mfg.
W. 21st Street
P.O. Box 20
Yankton, South Dakota 57078

Telephone 605 665-9311
TWX 910-668-3600

PORTEC

MOTOR DATA SHEET

PART NUMBER: 18591 USE/LOCATION: Purchased separately for use with associated driven equipment; shaker motor on a standard Model DF-48 dust filter

MANUFACTURER: Reliance Electric MODEL NO.: C56H1597

A.) HORSEPOWER : 1/4

B.) SERVICE FACTOR: 1.35

C.) FULL LOAD RPM: 1040

D.) APPLICATION: standard duty

E.) ENCLOSURE: TENV

F.) FRAME: 56C

G.) HORIZONTAL: _____ VERTICAL: X

H.) BEARING TYPE: ball

I.) VOLTAGE: 115/230

J.) PHASE: 1

K.) FREQUENCY: 60 hertz

L.) TYPE OF ROTOR: squirrel cage

M.) FULL LOAD AMPS: 5.4 at 115 v
2.7 at 230 v

N.) LOCKED ROTOR AMPS: 21.0 at 115 v
10.5 at 230 v

O.) NEMA DESIGN: B

P.) NEMA KVA CODE: M

Q.)TIME RATING: continuous duty

R.) INSULATION CLASS: B

S.) TEMPERATURE RISE: 80 deg. C ABOVE 40 DEG. C AMBIENT

T.) THERMO PROTECTION: none

U.) POWER FACTOR.....FULL LOAD: 52.3
..75% FULL LOAD: n/a
..50% FULL LOAD: n/a

V.) EFFICIENCY.....FULL LOAD: 56.3
....75% FULL LOAD: n/a
....50% FULL LOAD: n/a

W.) APPROXIMATE WEIGHT: 29 lbs.

X.) ADDITIONAL INFORMATION, AS REQUIRED:

040985

Kolberg Mfg.
W. 21st Street
P.O. Box 20
Yankton, South Dakota 57078

Telephone 605 665-9311
TWX 910-668-3600

PORTEC

MANUFACTURER AUTHORIZED SERVICE FACILITY:

PORTEC / Kolberg

P.O. Box 20, West 21st Street
Yankton, South Dakota 57078

Telephone (605) 665-9311
TWX 910 688-3600

For service contact: Service Manager

For parts contact: Parts Manager

012585

Appendix D-5
Forrester Environmental

P.O. #31342G
Exhibit A

ASH TREATMENT SYSTEM - NCRRF

FESI CONFIDENTIALITY AGREEMENT

This Agreement dated the 22nd day of July 1994, by and between Forrester Environmental Services, Inc. ("FESI") and The Solid Waste Authority of Palm Beach County ("Client") sets forth the following:

INTENT: Forrester Environmental Services, Inc. ("FESI") retains various patented, patent-pending and proprietary processes and chemical recipes which are effective for the stabilization of heavy metal bearing materials and wastes. FESI intends to make appropriate technology know-how available to Client as part of a contract for services and/or transfer of technology agreement ("Agreement") which supports certain project activities ("Project").

AGREEMENT: During the marketing, sales, design, engineering, construction and/or implementation of the Project in accordance with the Agreement, Client and/or FESI may require or come into possession of information, know-how, and/or patent-pending methods which the generating party considers proprietary, sensitive business information or confidential. Specific information considered confidential by FESI includes the FESI system application processes, process drawings, process schematics, process and system operating manuals, process data, FESI generated reports and proposals, FESI chemical make-up, FESI chemical blend components, FESI chemical character, process feed rates and FESI chemical cost to client.

Specific information considered confidential by Client includes untreated and treated TCLP data, specific waste operations management and feed stock supplier information.

FESI and Client agree that any such confidential and/or proprietary information disclosed to it by the other party will be held in strict confidence and not used or released in any form without the written permission of the generator of the information except for any matters required to be disclosed or made public under the requirements of law. The generator of the confidential information shall conspicuously mark any such information as "Confidential" and confirm any confidential oral information disclosed as such to the receiving party in writing.

ACCEPTED AND AGREED TO:

Keith E. Forrester, President, FESI — Date: 7/22/94

Mr. Donald L. Lockhart, Executive Director, Solid Waste Authority of Palm Beach County — Date: 7/22/94

FESI SPECIFICATIONS AND CONDITIONS
WTE Facility - Palm Beach County - Rev. #4 - 7/25/94

The specific consulting, generic design, support services and chemical purchase terms and conditions proposed for your ash stabilization project are defined below. The attached FESI Terms and Conditions Document is incorporated herein and defines the conditions of FESI consulting and generic design services:

(a) Initial Site Project Meeting and/or Reviews

FESI will conduct an initial site meeting with all project parties. The initial meeting is intended to confirm project objectives, team members, members tasks, critical paths, deadlines, permit requirements and site conditions. FESI will also audit the waste incinerator ash generation and handling processes, ash sampling procedures, TCLP analyses methods and historical TCLP information, and provide a formal recommendations and observations report on such.

(b) FESI Waste Treatability Study

FESI will conduct a waste treatability study using three (3) FESI/WET TCLP stabilization blends, three (3) FESI/DRY TCLP stabilization blends and two (2) ash baseline samples for a total of sixteen (16) sample duplicates to be analyzed for TCLP Pb and Cd analyses. The sixteen TCLP blends will be extracted by FESI Laboratories under EPA Method 1311 and analyzed by ICP at PACE Laboratories under EPA Method 6010. The Pb and Cd stabilization blends will include proprietary FESI/WET and FESI/DRY blends proven on a variety of other FESI clients waste for Pb and Cd stabilization.

(c) Generic Operations Engineering Support

FESI will provide generic engineering in support of the incinerator ash TCLP stabilization project including the following components:

- o Definition of stabilization process requirements
- o Stabilization chemical application rate
- o Generic process control logic
- o Generic process schematic
- o FESI stabilization system component specifications
- o Process Chemical MSDS information

(d) Project Permitting

FESI will provide project permitting as requested by client

(e) Stabilization Process Chemical Supply and Terms

The FESI patent-pending chemicals are supplied through FESI under chemical use contract and confidentiality. The FESI chemicals are supplied as a "WET" or "DRY" product, depending on results of the FESI stabilization evaluation and engineering conclusions. FESI offers the following generic FESI chemical use contract terms and conditions:

FESI/WET or DRY Deliveries: FESI/WET or DRY are preferably delivered in bulk loads.

FESI Confidentiality Agreement: The confidentiality agreement is to be completed thus confirming that the FESI/WET or DRY chemical make-up and process application is proprietary and confidential to FESI and is not to be used or disclosed without written permission from FESI;

FESI Chemical Use Term Contract: The Solid Waste Authority of Palm Beach County agrees to use FESI chemicals a period of two (2) years. After that initial term, use of FESI chemicals can be continued under contract with FESI on an FESI-delivered cost plus fifteen (15) percent mark-up basis or discontinued at the users discretion with the understanding that if the FESI chemical purchases are discontinued that the FESI recipe or active ingredients therein shall not be used for waste stabilization, without prior written approval from FESI.

(f) Site Process Start-up Assistance

FESI will provide the following field supervision services:
o Process start-up supervision and sampling

o Process installation site reviews
o Operator training and manual preparations

(g) FESI Laboratory Services

FESI will supply semi-surrogate and full TCLP analyses at the request of the client in support of the project.

(h) Waste Reuse Engineering and Development

FESI will submit an ash processing and reuse engineering and product demand-side development proposal at the request of the client. Stabilized ash processing, reuse engineering, permitting and market development is commonly provided on a per-ton brokerage basis significantly lower that current disposal costs.

FESI PROCESS, CAPITAL AND OPERATING COST SUMMARY
WTE Facility - Palm Beach County - Rev. #4 - 7/25/94

Process Capital, Operating and Maintenance Summary

Based upon the description of the FASR production line and collection equipment, similar FESI ash stabilization treatability results and given the objective of maintaining flexibility in the FASR stabilization design at this time, we propose use of either the FESI/DRY pre or post-ESP silo collection injection process or the FESI/WET post-ESP silo injection process.

FESI Represents that both the FESI/DRY and FESI/WET processes are simple to operate, require little maintenance and provide for minimal weight increase of ash prior to haul and disposal.

FESI/DRY Ash Stabilization Process Estimated Costs

Expected FESI Chemical Selection: FESI/DRY-C
Estimated Treated Ash Weight Increase: 2%
Key Components: Storage silo, metering screw, pneumatic transfer and receiver for pre-ESP application

The FESI/DRY storage silo, metering and distribution system accounts for the majority of the process capital cost. The estimated cost of $5.00 per ton of FASR assumes Bottom Ash (BA) separation. The FESI/DRY pneumatic transfer and receiver unit for application of FESI/DRY into the duct work prior to the ESP collectors would be used in the event that the USEPA or the FLDEP determine that the "point of ash generation" is within the ESP hopper collectors. Otherwise, FESI/DRY would be dry fed to the facility existing pug mill unit.

FESI/WET Ash Stabilization Process Estimated Costs

Expected FESI Chemical Selection: FESI/WET-H
Estimated Treated Ash Weight Increase: 1.5%
Key Components: Storage tank, metering pump, header

The FESI/WET storage tank, metering pump and distribution system accounts for the majority of the process capital cost.

FESI FORRESTER ENVIRONMENTAL SERVICES, INC.

FAX: 407/684-5777

~~ASH~~ TREATMENT SYSTEM (NCRRF)
DESCRIPTION

December 21, 1994

RECEIVED
'94 DEC 27 AM 9 14
PALM BEACH COUNTY
SOLID WASTE AUTHORITY

Mr. Clyde R. Dunn
President
C.R. Dunn, Inc.
1200 Osceola Drive
West Palm Beach. FL 33409

Re: West Palm Beach County Solid Waste Authority Project
Authorization to Proceed

Dear Clyde:

~~TASK A - SILO~~ INSTALLATION: Set and anchor 225 bbl silo in location directly East of the walkway stairs which span the existing flyash drag conveyors in front of the facility motor control room and precipitator building. Specific tasks are a follows:

(1) Set silo in place with crane;

(2) Install 4-8" anchors;

(3) Install external silo rail cage and top safety rails;

(4) Attach silo baghouse;

(5) Procure/construct/install baghouse transition from existing baghouse base for connection to schedule 80 PVC 6" downcomer to ash conveyor hood inlet. The in-line PVC line should have an in-line spring loaded butterfly valve to restrict any positive pressure blow back to the silo from the ash conveyor, yet allow positive pressure release from the silo to the ash conveyor during pneumatic loading of the silo;

(6) Procure/install 4" carbon steel extension and minimum 6" radius 90 degree elbow for remote silo loading. Install 4" camlock fitting supplied with silo box on fill line;

(7) Connect dry plant air line to air pad manifold provided on silo cone base and procure/install air regulator (3-5 psi), isolation valve and actuator. Pulsing should occur on a minimum of 180 second cycles.

TASK B - ACRISON FEEDER INSTALLATION: Install Acrison 105-Z feeder and procure/construct/install electrical controls and transformer as needed. Task activities will be:

(1) Set feeder foundation beneath silo and anchor as needed;

(2) Bolt feeder to foundation and connect feeder inlet to silo jamgate outlet with spool flexible coupling;

(3) Procure/install transformer and control panel for local on/off switch and remote on/off and monitor. Existing speed control on screw feeder is to remain a local-only control unit.

TASK C - ACRISON DIVERTER INSTALLATION: Install Acrison diverter and procure/construct/install electrical controls as needed. Task activities will include:

(1) Connect diverter inlet to Acrison feeder tube outlet;

(2) Check diverter outlet to transfer screw inlet devices;

(3) Procure/construct/install necessary controls to activate positioner swivel. Local controls should have on/off and North/South conveyor positioning switch. Remote should have on/off/position controls and system condition indicators.

(4) Procure/construct/install weather proof housing around positioner inlets.

TASK D - TRANSFER SCREW INSTALLATION: Install transfer screw for feed from diverter to existing ash drag conveyors. Task activities will include:

(1) Install transfer screw conveyor and housing and procure/construct/install transition section from outlet of screw to inlets of North and South conveyor hoods;

(2) Procure/construct/install conveyor brace off of silo base support legs;

(3) Procure/install motor control with local on/off and remote on/off/indicator.

TASK E - GENERAL PROJECT SUPPORT TASKS:

(1) Recover temporary cut opening in side of existing lime silo building;

(2) Touch-up paint as needed.

(3) Procure/install all necessary elctrical control system conduits, wiring, control panels, junction boxes, circuit breakers, motor starters and relays for above system.

If you have any questions regarding this request, please call us as soon as possible.

Sincerely,

Keith E. Forrester, P.E., M.S.Env.Eng.
President

c: Ms. J. L. Forrester, MBA, CFO/Vice President, FESI
Mr. George Fallon, Fallon Engineering
Mr. Robert Worobel, WPBCSWA

Atts: NA
File: n/dunn-4

Appendix D-7
Dustex Corporation

DUSTEX

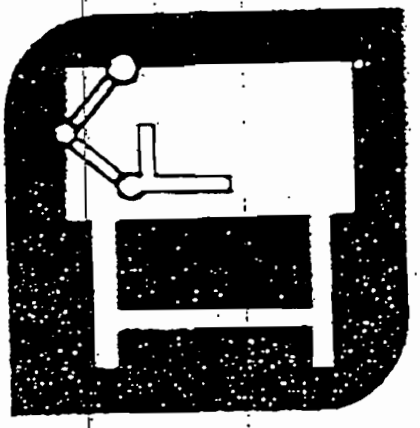
RDF STORAGE BLDG. - DUST COLLECTOR

INSTALLATION AND OPERATING INSTRUCTIONS – MODEL 3631-9-14

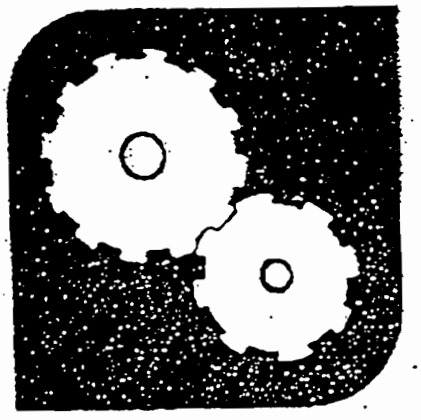
CUSTOMER National Ecology, Inc. CONTRACT # 8701040

CUSTOMER P.O.: 2043 EQUIP NO.: K31

PROJECT: Palm Beach County SPEC. NO.: 571M619

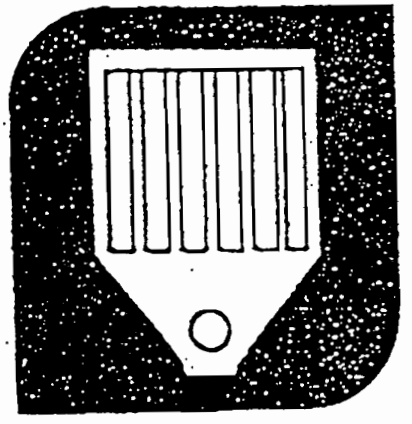


Design & Engineering



Manufacturing

Marketing



Products

OPERATING MANUAL

FOR

MODEL 3631 DUST COLLECTOR

DUSTEX CORPORATION, P. O. BOX 7368, CHARLOTTE, NORTH CAROLINA 28241
Phone: (704) 588-2030
Fax: (704) 588-2032

SPECIFICATIONS FOR

MODEL 3631 DUST COLLECTOR

1.0 General Description

The Model 3630 Series Collectors are fabric filter, jet pulse type units having pyramid type hoppers. They are designed to be delivered in two sections, with support structure members, the top or baghouse section, and the lower hopper section. The use of two sections promotes ease of shipping and erection. Removable covers are provided on the top of the baghouse section for the installation and inspection of the filter bags. The air pulsing system and clean air outlet are mounted on one side of the housing. The product stream enters at the roof of housing after clearing baffles and rises upward around the bags where the solid particles are deposited on the outside of the bags. The air stream then passes through the fabric into the bag and is exhausted from the collector through a flanged connection centered on the exhaust side. Compressed air jets are used periodically to shock and back-flush the filter bags causing the collected particles to fall down into the hopper. The collected dust is removed by rotary airlock from the pyramid type hopper. Filter fabrics of various types can be supplied to accommodate specific conditions.

2.0 Design Conditions

2.01 Design pressure; inches water gauge -24"

2.02 Design operating temperature: degrees F, 100

2.03 Maximum operating temperature governed by type of fabric filter material.

2.04 Compressed air pressure: 85 psig to 100 psig operating pressure with 125 psi, max. design pressure

2.05 Design wind load: 29 lb/sq. ft.

2.06 Voltage requirements: Sequence controller - 120V/60H/1PH
Screw Conveyor - 230/460V/60H/3PH
System Fan - 460V/60H/3PH

2.07 Sizes and compressed air requirements:

Model	No. of Filter Bags	Total Sq. Ft. Filter Area	Comp. Air Req'd On 4 Min. Bag Cycle SCFM
3631-14	108	1866	13

Dustex

3.0 Support Structure

Support columns are wide flange steel beams with a cap and base plate welded at the ends. Steel angle cross bracing between columns is provided and is to be bolted to the columns. This structure is shipped disassembled and erected by the user on his foundation. This structure supports the collector at a height that located the hopper discharge flange 12'-0" above the base line unless otherwise specified. After assembly of this structure on the base pads, the hopper is set in place on the columns and bolted down.

4.0 Hopper (Lower Section)

4.01 Arrangement - Pyramid type hoppers are standard for this model collector. The walls are 12 GA carbon steel reinforced with steel ribs on the outside. The bottom dust outlet flange is 19" sq. inside and 24-1/4" sq. outside. This outlet is located at a standard height of 12'-0" above base line. Two 18" x 45" access doors are located at the side of the hopper.

4.02 Transfer Conveyor Screw

An 18" helicoid screw conforming to CEMA NO. 300-001 runs beneath the hopper. The 19" flanged square dust discharge connection is at a standard height of 10 ft. above the base line. The screw shaft is 3-1/2" schedule 40 pipe. Couplings are 3" hardened steel shafting and bolted to the screw flights with 3/4" high strength bolts and prevailing torque locknuts. Screw flight hangers with bearings are spaced at a maximum of 12 ft. apart. Bearings inside the conveyor are made of plastic and of split type. The screw is aligned and tested for proper operation before shipment. End bearings are Dodge S2000 Pillow Blocks, 2-15/16" diameter.

4.03 Conveyor Screw Drive

This consists of 3 HP TEFC electrical motor as shown in 2.06 with belt drive to a shaft mounted speed reducer which turns the screw at 45 RPM. The entire assembly is pre-fitted and test operated before shipment. An OSHA type guard will be furnished for this drive. The user must supply the motor starter and wiring to the motor box.

5.0 Baghouse (Upper Section)

5.01 Arrangement - This section is a welded assembly ready for installing on the hopper section. Lifting lugs are provided along the top sides of this house. The clean air exhaust is a rectangular flanged connection centered at the lower edge of the exhaust duct side of the house. The house is mad of 12GA carbon steel with walls reinforced

externally and braced internally. The top of the house is made of the bag manifolds having a cover on each compartment. There are two rows of 9 bags each in a compartment. Top covers are clamped in place to seal against leakage. Railing to enclose the top working surface of the collector is optional. The pulse jets are built into the exhaust side of the house. The compressed air header and jet valves are mounted on the bottom of the exhaust plenum. The joint between the hopper and baghouse consists of a channel around the top of the hopper section into which the angle flange of the baghouse is installed and then bolted to the hopper. A sealant is provided to assure a dust tight joint.

5.02 **Bags** - The filter bags are approximately 6" diameter and 11' long of the single bag type with a snap ring seal for installation to the tubesheet. Fabric material and weight will be selected for the specific application. Bags and cages are installed after the collector is assembled on site. This is readily accomplished by opening the top manifold covers and inserting bags into the tubesheet holes and snapping the bag collar into place. With the bag hanging from the tubesheet, the cages are inserted with closed end down. Next, the ground wire is installed around the cage top. The cage hold-down bars are then installed. Covers are then closed and clamped. A clearance of 10 feet must be allowed above the top of the baghouse and any obstruction to provide for bag and cage installation.

5.03 Bag Cages - The cages are made of 11 GA galvanized carbon steel wire with a flat steel plate fixed to the bottom. They are made to a size that is readily inserted into a 6" filter bag.

6.0 Jet Pulse Air System

The compressed air manifold is to be supplied with compressed air at 85 psig min to 100 psig. If the user's air supply is at a greater pressure, then a filter regulator should be installed to maintain 85 psig pressure. The air supply must be free of moisture. A pipe tap drain is provided on the compressed air manifold for drain or blow-down to which the user should install a valve. The air consumption rates for 85 psig air and for pulsing a given bag row every 4 minutes are given in 2.07. This manifold, with its pulse valves and solenoid operators, is mounted along the top side of the housing. The solenoid operators are mounted directly to the valves.

7.0 Sequence Control

The cleaning process is programmed automatically by solid state electrical controls and powered by 120V/60HZ single phase power. This is furnished as a separate unit in a NEMA 4 box for mounting

by the user in a convenient location. It is designed for a fixed pulse time and an adjustable interval between pulses of 10 to 220 seconds. The user installs a multi-wire, 120 volt, line form the sequence control to the solenoid box mounted on the compressed air manifold.

8.0 Manometer

8.01 Delta P Gauge - A 0 to 8" W. G. Dwyer magnehelic gauge is supplied with each collector to check pressure drop. Pressure taps are provided at proper locations on the collector.

9.0 Testing And Inspection

During fabrication, regular inspections will be made for alignment and dimensions. Upon completion of fabrication and adjustment, the pulse system shall be cycled and checked for proper operation. Welding will be inspected visually for quality of joints.

10.0 Painting

All metal surfaces are wiped down before painting to remove dirt and oil that would affect the paint. One coat of enamel primer is applied inside and outside. One finish coat is applied on outside surfaces only.

11.0 Shipping

The collectors are shipped in two sections, hopper and baghouse. Structurals are unassembled. Controls and other accessories are packaged separately and shipped with the collector. Bags, cages, and conveyors will be shipped separately from their respective vendors.

Dustex

Appendix D-8
Donaldson Torit Products

Donaldson
TORIT PRODUCTS

Environmental Control, Inc.
916 N.W. 6th Avenue
Ft. Lauderdale, FL 33311
954/764-0232 (Ft. Lauderdale)
305/895-6696 (Miami)
Fax 954/764-0966
Lic. #CM CA 14588
Lic. #CG CA 06094

02-06-96

RRT Empire Returns Corp.
650 North Jog Road
West Palm Beach, FL 3142

Fax 407-640-3261

Gentlemen:

Pursuant to your request, enclosed in the information on the dust collector blower that you requested.

You are currently using a Torit model TBI-30 fan. The outlet dimensions of the blower discharge are 22.38" x 14.75". The outlet velocity of the fan was initially set at 3490 fpm with an outlet damper to provide an approximate 8000 cfm system discharge.

The fan performance is also enclosed on the TBI-30 fan curve.

Please feel free to contact me if you need any additional information.

Yours truly,

Norman Gabe

RECOVERED MATERIALS PROCESSING FACILITY

Post-it™ brand fax transmittal memo 7671 | # of pages ▸ 2

To Al Vasquez	From Graceanna
Co.	Co.
Dept. Is this enough?	Phone #
Fax #	Fax #

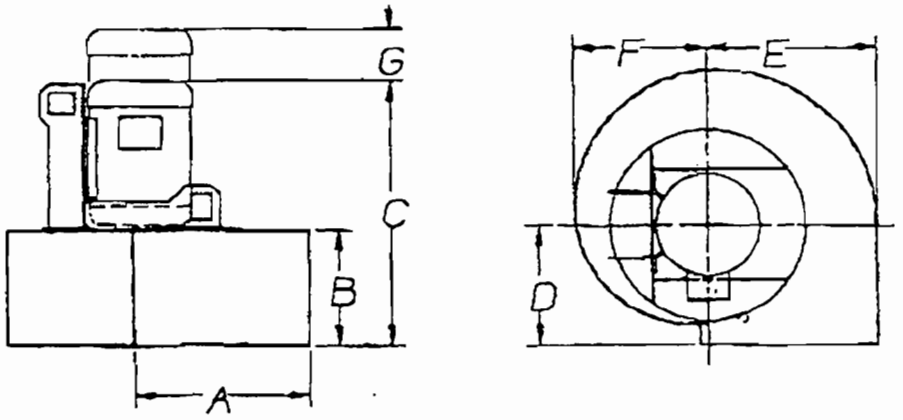
encl: 1

Filtration Solutions for a Cleaner World

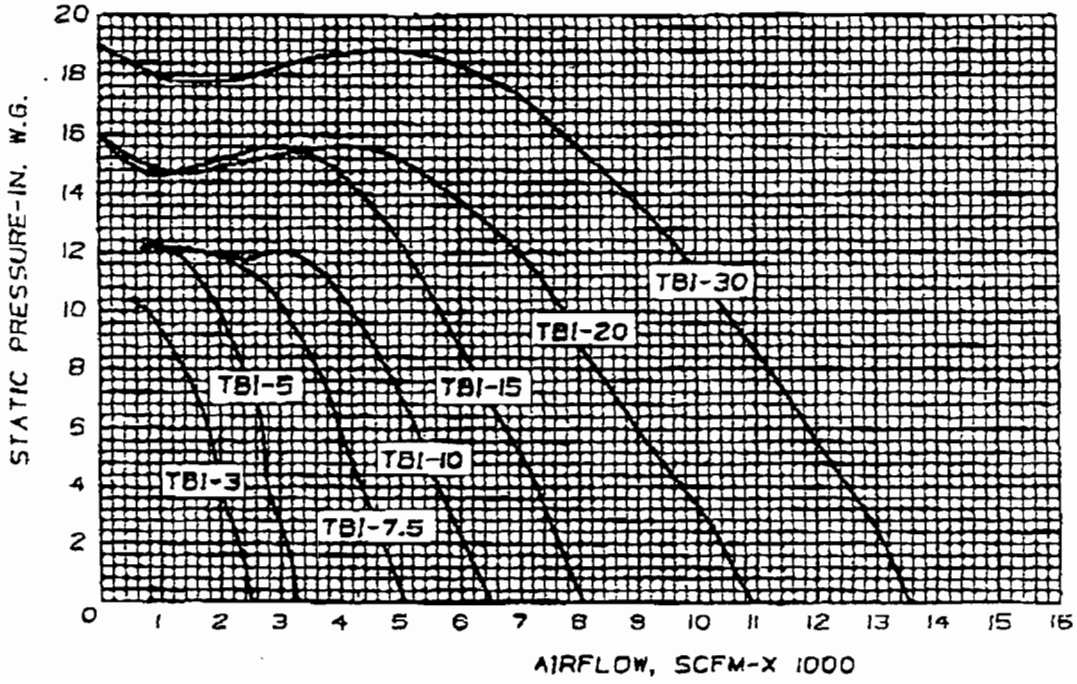
60 Cycle Fans (Inches / Millimeters)

Model								
TBI-3	16.81/ 42.69	8.69/ 22.07	20.69/ 52.55	11.71/ 29.74	15.94/ 40.49	12.75/ 32.38	12.00/ 30.48	159/ 72
TBI-5	16.81/ 42.69	8.69/ 22.07	22.50/ 57.15	11.71/ 29.74	15.94/ 40.49	12.75/ 32.38	12.00/ 30.48	178/ 81
TBI-7.5	16.81/ 42.69	10.06/ 25.55	24.63/ 62.56	11.71/ 29.74	15.94/ 40.49	12.75/ 32.38	12.00/ 30.48	218/ 99
TBI-10	16.81/ 42.69	11.38/ 28.81	25.94/ 75.03	11.71/ 29.74	15.94/ 40.49	12.75/ 32.38	12.00/ 30.48	320/ 145
TBI-15	20.38/ 51.77	11.88/ 30.18	31.24/ 79.35	13.80/ 35.05	19.40/ 49.28	15.44/ 39.22	12.00/ 30.48	520/ 236
TBI-20	20.38/ 51.77	13.56/ 34.44	32.93/ 83.64	13.80/ 35.05	19.40/ 49.28	15.50/ 39.37	12.00/ 30.48	650/ 295
TBI-30	22.38/ 56.85	14.75/ 37.47	37.94/ 96.37	14.92/ 37.90	21.26/ 54.00	17.00/ 43.18	12.00/ 30.48	725/ 329

* Minimum clearance for maintenance



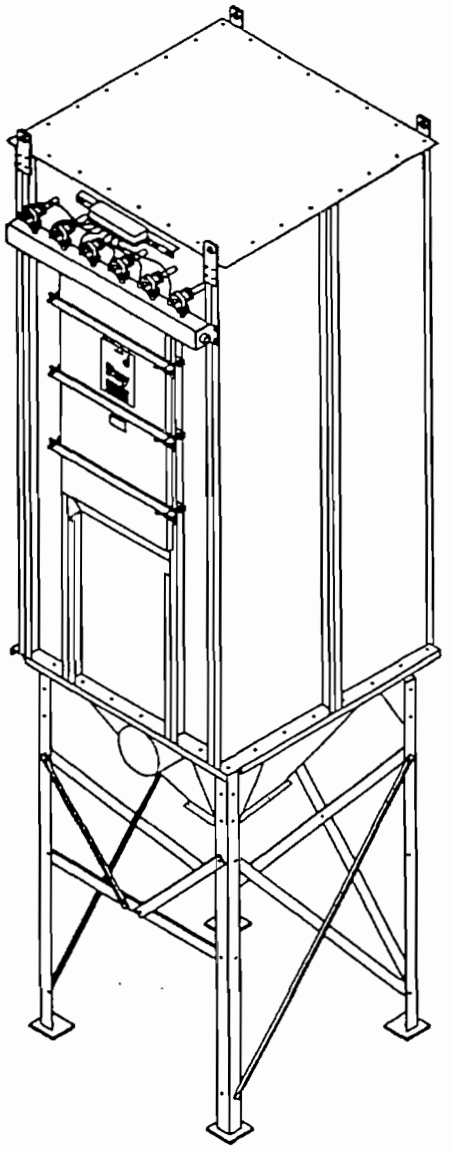
60 cycle TBI fans are available with TEFC and explosion-proof motors.
These NEMA frame motors are available in 208, 230, 460, or 575 volt, 3 phase service.



RECOVERED MATERIALS PROCESSING FACILITY

day donaldson

DAY INSTALLATION AND OPERATION MANUAL



DAY MODEL PJD DUST COLLECTOR

Includes Installation, Operation, Service Instructions, and Parts List

IMPORTANT

THIS MANUAL CONTAINS SPECIFIC PRECAUTIONARY STATEMENTS RELATIVE TO WORKER SAFETY IN APPROPRIATE SECTIONS. READ THIS MANUAL THOROUGHLY AND COMPLY AS DIRECTED. IT IS IMPOSSIBLE TO LIST ALL OF THE POTENTIAL HAZARDS OF DUST CONTROL EQUIPMENT OR SYSTEMS. IT IS RECOMMENDED THAT USE OF THIS EQUIPMENT BE DISCUSSED WITH A DAY REPRESENTATIVE. PERSONNEL INVOLVED WITH THE EQUIPMENT OR SYSTEMS SHOULD BE INSTRUCTED TO CONDUCT THEMSELVES IN A SAFE MANNER.

OPERATIONAL EXPLANATION

During normal operation dust laden air enters the PJD hopper inlet section (below the filter tubes) where a bafile plate directs the heavier particles directly into the pyramid hopper. The lighter (dust) particles pass upward into the tube section. The dust is collected on the outside surfaces of each filter tube where it forms a cake that aids in filtering efficiency. Filtered (clean) air passes through each filter tube into the clean air plenum where it is discharged through the clean air outlet.

During filter tube cleaning, compressed air is discharged from an air manifold into the cleaning blowpipes. The open and close time of each air valve is controlled by a solid state timer that energizes each pilot solenoid valve and opens the air valve. When an air diaphragm valve is open, high pressure air is directed through the blowpipe and discharged into each filter tube, forcing the collected dust to fall from the exterior of the tubes into the hopper below.

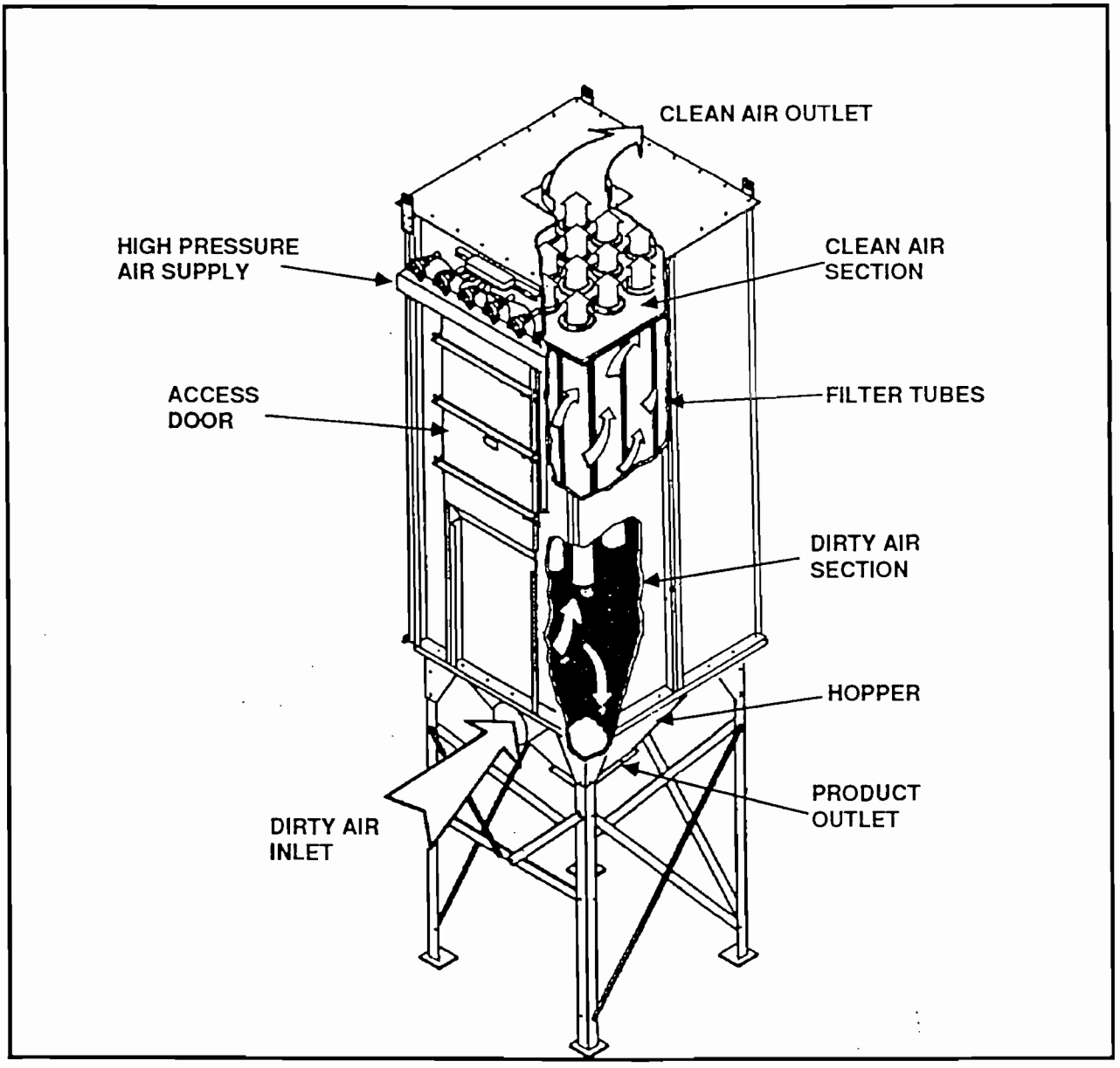


Figure 1
PJD Dust Collector Operational Schematic

Appendix D-9
Titan Air Incorporated

TITAN AIR INCORPORATED

UNIT SPECIFICATIONS

Customer JBI Inc. Sales Rep. Paul K. Date 1-5-89

Quote No. 3061 Model No. TA 220-HDR Blower Only Serial No. _____

CFM 27,200 ESP ½ Temperature Rise _____

BTU, Min. _____ Max. _____

Fuel Available - ☐ Nat Gas, ☐ LP, ☐ Steam _____ #Inlet, ☐ Elec. _____ kw

Gas Pressure, Available _____ Max. _____ Min. _____

Agency _____ ☐ Indoor Mounted ☒ Outdoor Mounted

Voltage 480 PH 3 HZ 60 Wire _____ Motor HP 20 FLA _____

Temperature Controls None Required

Optional Equipment:

- ☒ F.A. Intake Hood w/ Birdscreen
  - ☒ 45 Degree
  - ☐ Full Turn Down
  - ☐ Vertical
  - ☐ Other: _____
- ☒ Filter Section
  - ☒ FARR 30/30 300 FPM Max.
  - ☐ 1 in. Cleanable Filters
  - ☐ 2 in. Disposable Filters
  - ☐ Other: _____
- ☒ Motorized Intake Damper
  - ☐ Insulated
- ☐ Motorized Discharge Damper
  - ☐ Insulated
- ☐ Vibration Isolators
  - ☐ Base Mounted
  - ☐ Hanger Mounted
- ☐ Curb Kit
  - ☐ Flat
  - ☐ Pitched _____ on _____
  - ☐ Roof Type: _____
- ☐ Discharge Air Diffuser
  - ☐ 2 Way
  - ☐ 3 Way
  - ☐ 4 Way

Optional Controls:

- ☐ Low Temp. Limit w/ Bypass Timer
- ☐ Burner "On - Off" Ductstat (Economizer)
- ☐ Two Speed Blower Motor 1800/900
- ☐ Two Speed Blower Motor 1800/1200
- ☐ First Stage Regulator
- ☐ Circuit Analyzer
- ☐ Operating Lights
- ☐ Clogged Filter Light
- ☐ Audible Alarm
- ☐ Low Gas Pressure Switch
- ☐ High Gas Pressure Switch
- ☐ Proof of Closure
- ☐ Copper Pilot lines

- ☒ Extended Grease Lines
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

Price $ _____

F.O.B. Osseo

91

MATERIAL SAFETY DATA SHEET

WESTERN Automotive Finishes

WESTERN AUTOMOTIVE FINISHES
101 PROSPECT AVE. N.W.
CLEVELAND, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917
INFORMATION TELEPHONE NO.
(216) 566-2902

DATE OF PREPARATION
2 - DEC - 91

VOC Integrating Reducers / HS Hardener

INTG/W

CAS No.	HAZARDOUS INGREDIENT (percent by weight)	ACGIH TLV <STEL>	OSHA PEL <STEL>	Units	Vapor Pressure (mm Hg)	WV4575 VOC Integrating Reducer, Fast	WV6590 VOC Integrating Reducer, Medium	WV85100 VOC Integrating Reducer, Slow	W1025 VOC Integrating HS Hardener
	—SECTION II—								
64742-89-8	Lt. Aliphatic HC Solvent.	100	100	PPM	53.0	15	15		
64742-48-9	V. M. & P. Naphtha	300	300 <400>	PPM	12.0			17	
108-88-3 §	Toluene.	100 <150>	100 <150>	PPM	22.0	9	9	5	
1330-20-7 §	Xylene.	100 <150>	100 <150>	PPM	5.9	1	1		
64742-95-6	Light Aromatic Naphtha.	100		PPM	3.8			2	9
64742-94-5	Medium Aromatic Naphtha.	Not Established		PPM	0.1	1	1		
67-64-1 §	Acetone.	750 <1000>	750 <1000>	PPM	180.0	15	15	12	
107-87-9 §	Methyl n-Propyl Ketone.	200 <250>	200 <250>	PPM	27.8	5	5	5	
123-86-4	n-Butyl Acetate.	150 <200>	150 <200>	PPM	10.0	25	22	23	5
112-07-2 §	2-Butoxyethyl Acetate.	50		PPM	1.0		3	8	
Proprietary	Hexamethylene Diisocyanate Polymer	0.5 <1.0>		Mg/M3 Supplier Limit					50
822-06-0	Hexamethylene Diisocyanate Monomer	0.005		PPM	0.025				0.80
Proprietary	Isophorone Diisocyanate Polymer	Not Established							35
4098-71-9	Isophorone Diisocyanate Monomer	0.005	0.005 <0.02>	PPM					0.35
	Weight per Gallon (lbs.)					7.33	7.33	7.43	9.22
	VOC - Total Volatile Organic Compounds (lbs./gal.)					5.42	5.42	5.44	1.38
	VOC - Less Water and exempt Solvents (lbs./gal.)					5.42	5.42	5.44	1.38
	Photochemically Reactive					No	No	No	No
	Flash Point (°F)					12	12	12	98
	HMIS®(NFPA) Rating (health - fire - reactivity) / DOL Storage Category					2 3 0 / 1B	2 3 0 / 1B	2 3 0 / 1B	3* 3 1 / 1C
	PAINT-SAFE® Personal Protection					K	K	K	K

§ Ingredient subject to the reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313, 40 CFR 372.65 C

Section III — PHYSICAL DATA

PRODUCT WEIGHT –	See TABLE	*EVAPORATION RATE* –	Slower than Ether
SPECIFIC GRAVITY –	0.92-1.2	*VAPOR DENSITY* –	Heavier than Air
BOILING RANGE –	132-415 °F	*MELTING POINT* –	N.A.
VOLATILE VOLUME –	20-80 %	*SOLUBILITY IN WATER* –	N.A.

Section IV — FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY CLASSIFICATION *FLASH POINT* See TABLE *LEL* 0.5 *UEL* 12.8
RED LABEL – Flammable, Flash below 100 F
EXTINGUISHING MEDIA
Carbon Dioxide, Dry Chemical, Foam
UNUSUAL FIRE AND EXPLOSION HAZARDS
Keep containers tightly closed. Isolate from heat, electrical equipment, sparks, and open flame. Closed containers may explode when exposed to extreme heat. Application to hot surfaces requires special precautions. During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.
SPECIAL FIRE FIGHTING PROCEDURES
Full protective equipment including self-contained breathing apparatus should be used. Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Section V — HEALTH HAZARD DATA

ROUTES OF EXPOSURE
Exposure may be by INHALATION and/or SKIN or EYE contact, depending on conditions of use. Alcohols and acetates can be absorbed through the skin. To minimize exposure, follow recommendations for proper use, ventilation, and personal protective equipment.
ACUTE Health Hazards
EFFECTS OF OVEREXPOSURE
Irritation of eyes, skin and respiratory system. May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.
SIGNS AND SYMPTOMS OF OVEREXPOSURE
Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.
Redness and itching or burning sensation may indicate eye or excessive skin exposure.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
Hardener CONTAINS ISOCYANATES. May cause allergic respiratory and/or skin reaction in susceptible persons or sensitization. This effect may be delayed several hours after exposure.
EMERGENCY AND FIRST AID PROCEDURES
If INHALED: If any breathing problems occur during use, LEAVE THE AREA and get fresh air. If problems remain or occur later, IMMEDIATELY get medical attention.
If on SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.
If in EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.
If SWALLOWED: Get medical attention.
CHRONIC Health Hazards
No ingredient in these products is an IARC, NTP or OSHA listed carcinogen.
Prolonged overexposure to solvent ingredients in Section II may cause adverse effects to the liver, urinary, blood forming, cardiovascular, and reproductive systems.
Hardener CONTAINS ISOCYANATES. Persons sensitive to isocyanates will experience increased allergic reaction on repeated exposure.
Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

Section VI — REACTIVITY DATA

STABILITY – Stable
INCOMPATIBILITY
Contamination of hardener with Water, Alcohols, Amines, and other compounds which react with isocyanates, may result in dangerous pressure in, and possible bursting of, closed containers.
HAZARDOUS DECOMPOSITION PRODUCTS
By fire: Carbon Dioxide, Carbon Monoxide, Oxides of Nitrogen, possibility of Hydrogen Cyanide
HAZARDOUS POLYMERIZATION – Will Not Occur

Section VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Remove all sources of ignition. Ventilate and remove with inert absorbent.
If hardener is spilled, all personnel in the area should be protected as in Section VIII. Cover spill with absorbent material. Deactivate spilled material with a 10% ammonium hydroxide solution (household ammonia). After 10 minutes, collect in open containers and add more ammonia. Cover loosely. Wash spill area with soap and water.
WASTE DISPOSAL METHOD
Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.
Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State, and Local regulations regarding pollution.

Section VIII — PROTECTION INFORMATION

PRECAUTIONS TO BE TAKEN IN USE
NO PERSON SHOULD USE THESE PRODUCTS, OR BE IN THE AREA WHERE THESE PRODUCTS ARE BEING USED, IF THEY HAVE CHRONIC (LONG-TERM) LUNG OR BREATHING PROBLEMS OR IF THEY EVER HAD A REACTION TO ISOCYANATES.
Use only with adequate ventilation. Avoid breathing vapor and spray mist. Avoid contact with skin and eyes. Wash hands after using.
This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section II) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section II, the applicable limits for nuisance dusts are ACGIH TLV 10 mg./m3 (total dust), OSHA PEL 15 mg./m3 (total dust), 5 mg./m3 (respirable fraction).
VENTILATION
Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section II is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.
RESPIRATORY PROTECTION
Where overspray is present, a positive pressure air supplied respirator (TC19C NIOSH/MSHA approved) should be worn. If unavailable, a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section II may be effective. Follow respirator manufacturer's directions for use. Wear the respirator for the whole time of spraying and until all vapors and mists are gone. NO PERSONS SHOULD BE ALLOWED IN THE AREA WHERE THIS PRODUCT IS BEING USED UNLESS EQUIPPED WITH THE SAME RESPIRATOR PROTECTION RECOMMENDED FOR THE PAINTERS.
When sanding or abrading the dried film, wear a particulate respirator approved by NIOSH/MSHA for protection against non-volatile materials in Section II.
PROTECTIVE GLOVES
Wear gloves which are recommended by glove supplier for protection against materials in Section II.
EYE PROTECTION
Wear safety spectacles with unperforated sideshields.
OTHER PROTECTIVE EQUIPMENT
Use barrier cream on exposed skin.

Section IX — PRECAUTIONS

DOL STORAGE CATEGORY – See TABLE.
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Contents are FLAMMABLE. Keep away from heat, sparks, and open flame.
During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition.
Consult NFPA Code. Use approved Bonding and Grounding procedures.
Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.
OTHER PRECAUTIONS
This product must be mixed with other components before use. Before opening the packages, READ AND FOLLOW WARNING LABELS ON ALL COMPONENTS.
Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

91

MATERIAL SAFETY DATA SHEET

WESTERN Automotive Finishes

WESTERN AUTOMOTIVE FINISHES
101 PROSPECT AVE. N.W.
CLEVELAND, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917
INFORMATION TELEPHONE NO.
(216) 566-2902

DATE OF PREPARATION
2 - Dec - 91

VOC Integrating Reducers / HS Hardener

INTG/w

CAS No.	SECTION II — HAZARDOUS INGREDIENT (percent by weight)	ACGIH TLV <STEL>	OSHA PEL <STEL>	Units	Vapor Pressure (mm Hg)	WV4575 VOC Integrating Reducer, Fast	WV6580 VOC Integrating Reducer, Medium	WV65100 VOC Integrating Reducer, Slow	W1025 VOC Integrating HS Hardener
64742-89-8	Lt. Aliphatic HC Solvent.	100	100	PPM	53.0	15	15		
64742-48-9	V. M. & P. Naphtha.	300	300 <400>	PPM	12.0			17	
108-88-3 !	Toluene.	100 <150>	100 <150>	PPM	22.0	9	9	5	
1330-20-7 !	Xylene.	100 <150>	100 <150>	PPM	5.8	1	1		
64742-95-6	Light Aromatic Naphtha.	100		PPM	3.8			2	9
64742-94-5	Medium Aromatic Naphtha.	Not Established		PPM	0.1	1	1		
67-64-1 !	Acetone.	750 <1000>	750 <1000>	PPM	180.0	15	15	12	
107-87-9 !	Methyl n-Propyl Ketone.	200 <250>	200 <250>	PPM	27.8	5	5	5	
123-86-4	n-Butyl Acetate.	150 <200>	150 <200>	PPM	10.0	25	22	23	5
112-07-2 !	2-Butoxyethyl Acetate.	50		PPM	1.0		3	8	
Proprietary	Hexamethylene Diisocyanate Polymer	0.5 <1.0>		Mg/M3 Supplier Limit					50
822-06-0	Hexamethylene Diisocyanate Monomer	0.005		PPM	0.025				0.80
Proprietary	Isophorone Diisocyanate Polymer	Not Established							35
4098-71-9	Isophorone Diisocyanate Monomer	0.005	0.005 <0.02>	PPM					0.35
	Weight per Gallon (lbs.)					7.33	7.33	7.43	9.22
	VOC - Total Volatile Organic Compounds (lbs./gal.)					5.42	5.42	5.44	1.36
	VOC - Less Water and exempt Solvents (lbs./gal.)					5.42	5.42	5.44	1.36
	Photochemically Reactive					No	No	No	No
	Flash Point (°F)					12	12	12	98
	HMIS*(NFPA) Rating (health - fire - reactivity) / DOL Storage Category					2 3 0 / 1B	2 3 0 / 1B	2 3 0 / 1B	3* 3 1 / 1C
	PAINT-SAFE* Personal Protection					K	K	K	K

! Ingredient subject to the reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313, 40 CFR 372.65 C

Section III — PHYSICAL DATA

PRODUCT WEIGHT –	See TABLE	EVAPORATION RATE –	Slower than Ether
SPECIFIC GRAVITY –	0.93-1.03	VAPOR DENSITY –	Heavier than Air
BOILING RANGE –	163-401 °F	MELTING POINT –	N.A.
VOLATILE VOLUME –	48-64 %	SOLUBILITY IN WATER –	N.A.

Section IV — FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY CLASSIFICATION *FLASH POINT* See TABLE *LEL* 0.5 *UEL* 99.8

RED LABEL – Flammable, Flash below 100 F

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS

Keep containers tightly closed. Isolate from heat, electrical equipment, sparks, and open flame. Closed containers may explode when exposed to extreme heat. Application to hot surfaces requires special precautions. During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used. Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Section V — HEALTH HAZARD DATA

ROUTES OF EXPOSURE

Exposure may be by INHALATION and/or SKIN or EYE contact, depending on conditions of use. Alcohols and acetates can be absorbed through the skin. To minimize exposure, follow recommendations for proper use, ventilation, and personal protective equipment.

ACUTE Health Hazards

EFFECTS OF OVEREXPOSURE

Irritation of eyes, skin and respiratory system. May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Hardeners CONTAIN ISOCYANATES. May cause allergic respiratory and/or skin reaction in susceptible persons or sensitization. This effect may be delayed several hours after exposure.

EMERGENCY AND FIRST AID PROCEDURES

IF INHALED: If any breathing problems occur during use, LEAVE THE AREA and get fresh air. If problems remain or occur later, IMMEDIATELY get medical attention.

If on SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.

If in EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.

IF SWALLOWED: Get medical attention.

CHRONIC Health Hazards

No ingredient in these products is an IARC, NTP or OSHA listed carcinogen.

Prolonged overexposure to solvent ingredients in Section II may cause adverse effects to the liver, urinary, blood forming, cardiovascular, and reproductive systems.

Hardeners CONTAIN ISOCYANATES. Persons sensitive to isocyanates will experience increased allergic reaction on repeated exposure.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

Section VI — REACTIVITY DATA

STABILITY – Stable

INCOMPATIBILITY

Contamination of hardeners with Water, Alcohols, Amines, and other compounds which react with isocyanates, may result in dangerous pressure in, and possible bursting of, closed containers.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide, Oxides of Nitrogen, possibility of Hydrogen Cyanide

HAZARDOUS POLYMERIZATION – Will Not Occur

Section VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate and remove with inert absorbent.

If hardener is spilled, all personnel in the area should be protected as in Section VIII. Cover spill with absorbent material. Deactivate spilled material with a 10% ammonium hydroxide solution (household ammonia). After 10 minutes, collect in open containers and add more ammonia. Cover loosely. Wash spill area with soap and water.

WASTE DISPOSAL METHOD

Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.

Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State, and Local regulations regarding pollution.

Section VIII — PROTECTION INFORMATION

PRECAUTIONS TO BE TAKEN IN USE

NO PERSON SHOULD USE THESE PRODUCTS, OR BE IN THE AREA WHERE THESE PRODUCTS ARE BEING USED, IF THEY HAVE CHRONIC (LONG-TERM) LUNG OR BREATHING PROBLEMS OR IF THEY EVER HAD A REACTION TO ISOCYANATES.

Use only with adequate ventilation. Avoid breathing vapor and spray mist. Avoid contact with skin and eyes. Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section II) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section II, the applicable limits for nuisance dusts are ACGIH TLV 10 mg./m3 (total dust), OSHA PEL 15 mg./m3 (total dust), 5 mg./m3 (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section II is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

Where overspray is present, a positive pressure air supplied respirator (TC19C NIOSH/MSHA approved) should be worn. If unavailable, a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section II may be effective. Follow respirator manufacturer's directions for use. Wear the respirator for the whole time of spraying and until all vapors and mists are gone. NO PERSONS SHOULD BE ALLOWED IN THIS AREA WHERE THIS PRODUCT IS BEING USED UNLESS EQUIPPED WITH THE SAME RESPIRATOR PROTECTION RECOMMENDED FOR THE PAINTERS.

When sanding or abrading the dried film, wear a particulate respirator approved by NIOSH/MSHA for protection against non-volatile materials in Section II.

PROTECTIVE GLOVES

Wear gloves which are recommended by glove supplier for protection against materials in Section II.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

OTHER PROTECTIVE EQUIPMENT

Use barrier cream on exposed skin.

Section IX — PRECAUTIONS

DOL STORAGE CATEGORY – See TABLE.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Contents are FLAMMABLE. Keep away from heat, sparks, and open flame.

During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition.

Consult NFPA Code. Use approved Bonding and Grounding procedures.

Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

OTHER PRECAUTIONS

This product must be mixed with other components before use. Before opening the packages, READ AND FOLLOW WARNING LABELS ON ALL COMPONENTS.

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

VOC Integrating Reducers / HS Hardener

Section II — PHYSICAL DATA

PRODUCT WEIGHT –	See TABLE	*EVAPORATION RATE* –	Slower than Ether
SPECIFIC GRAVITY –	0.92-1.2	*VAPOR DENSITY* –	Heavier than Air
BOILING RANGE –	132-415 °F	*MELTING POINT* –	N.A.
VOLATILE VOLUME –	20-80 %	*SOLUBILITY IN WATER* –	N.A.

Section IV — FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY CLASSIFICATION *FLASH POINT* See TABLE *LEL* 0.5 *UEL* 12.8

RED LABEL - Flammable. Flash below 100 F

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS

Keep containers tightly closed. Isolate from heat, electrical equipment, sparks, and open flame. Closed containers may explode when exposed to extreme heat. Application to hot surfaces requires special precautions. During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used. Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Section V — HEALTH HAZARD DATA

ROUTES OF EXPOSURE

Exposure may be by INHALATION and/or SKIN or EYE contact, depending on conditions of use. Alcohols and acetates can be absorbed through the skin. To minimize exposure, follow recommendations for proper use, ventilation, and personal protective equipment.

ACUTE Health Hazards

EFFECTS OF OVEREXPOSURE

Irritation of eyes, skin and respiratory system. May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Hardener CONTAINS ISOCYANATES. May cause allergic respiratory and/or skin reaction in susceptible persons or sensitization. This effect may be delayed several hours after exposure.

EMERGENCY AND FIRST AID PROCEDURES

If INHALED: If any breathing problems occur during use, LEAVE THE AREA and get fresh air. If problems remain or occur later, IMMEDIATELY get medical attention.

If on SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.

If in EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.

If SWALLOWED: Get medical attention.

CHRONIC Health Hazards

No ingredient in these products is an IARC, NTP or OSHA listed carcinogen.

Prolonged overexposure to solvent ingredients in Section II may cause adverse effects to the liver, urinary, blood forming, cardiovascular, and reproductive systems.

Hardener CONTAINS ISOCYANATES. Persons sensitive to isocyanates will experience increased allergic reaction on repeated exposure.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

Section VI — REACTIVITY DATA

STABILITY – Stable

INCOMPATIBILITY

Contamination of hardener with Water, Alcohols, Amines, and other compounds which react with isocyanates, may result in dangerous pressure in, and possible bursting of, closed containers.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide, Oxides of Nitrogen, possibility of Hydrogen Cyanide

HAZARDOUS POLYMERIZATION – Will Not Occur

Section VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate and remove with inert absorbent.

If hardener is spilled, all personnel in the area should be protected as in Section VIII. Cover spill with absorbent material. Deactivate spilled material with a 10% ammonium hydroxide solution (household ammonia). After 10 minutes, collect in open containers and add more ammonia. Cover loosely. Wash spill area with soap and water.

WASTE DISPOSAL METHOD

Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.

Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with federal, State, and Local regulations regarding pollution.

Section VIII — PROTECTION INFORMATION

PRECAUTIONS TO BE TAKEN IN USE

NO PERSON SHOULD USE THESE PRODUCTS, OR BE IN THE AREA WHERE THESE PRODUCTS ARE BEING USED, IF THEY HAVE CHRONIC (LONG-TERM) LUNG OR BREATHING PROBLEMS OR IF THEY EVER HAD A REACTION TO ISOCYANATES.

Use only with adequate ventilation. Avoid breathing vapor and spray mist. Avoid contact with skin and eyes. Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section II) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section II, the applicable limits for nuisance dusts are ACGIH TLV 10 mg./m3 (total dust), OSHA PEL 15 mg./m3 (total dust), 5 mg./m3 (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section II is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

Where overspray is present, a positive pressure air supplied respirator (TC19C NIOSH/MSHA approved) should be worn. If unavailable, a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section II may be effective. Follow respirator manufacturer's directions for use. Wear the respirator for the whole time of spraying and until all vapors and mists are gone. NO PERSONS SHOULD BE ALLOWED IN THE AREA WHERE THIS PRODUCT IS BEING USED UNLESS EQUIPPED WITH THE SAME RESPIRATOR PROTECTION RECOMMENDED FOR THE PAINTERS.

When sanding or abrading the dried film, wear a particulate respirator approved by NIOSH/MSHA for protection against non-volatile materials in Section II.

PROTECTIVE GLOVES

Wear gloves which are recommended by glove supplier for protection against materials in Section II.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

OTHER PROTECTIVE EQUIPMENT

Use barrier cream on exposed skin.

Section IX — PRECAUTIONS

DOL STORAGE CATEGORY – See TABLE.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Contents are FLAMMABLE. Keep away from heat, sparks, and open flame.

During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition.

Consult NFPA Code. Use approved Bonding and Grounding procedures.

Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

OTHER PRECAUTIONS

This product must be mixed with other components before use. Before opening the packages, READ AND FOLLOW WARNING LABELS ON ALL COMPONENTS.

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

MATERIAL SAFETY DATA SHEET

WESTERN AUTOMOTIVE FINISHES
101 PROSPECT AVE. N.W.
CLEVELAND, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917
INFORMATION TELEPHONE NO.
(216) 566-2902

DATE OF PREPARATION
2 - Dec - 91

HI-GLO® Synthetic Enamel

ENL/W3

						Clearcoats		*Hardeners*						
CAS No.	—SECTION II— HAZARDOUS INGREDIENT (percent by weight)	ACGIH TLV <STEL>	OSHA PEL <STEL>	Units	Vapor Pressure (mm Hg)	W150 Clearcoat	W160 High Performance	W1001 GLOSS ONE® Gloss	W1010 MAXI-GLOSS® High Gloss	W1016 High Solids	W1020 INTERLOCK™ Gloss	W1029 HI-GLO™ GLASPAK™	W1030 HI-GLO™ GLASPAK™	W1032 HS Hardener
64742-48-9	V. M. & P. Naphtha	300	300 <400>	PPM	12.0	7								
64742-47-8	Mineral Spirits	100	100	PPM	2.0	23								
108-88-3 §	Toluene.	100 <150>	100 <150>	PPM	22.0	5	3							
100-41-4 §	Ethylbenzene.	100 <125>	100 <125>	PPM	7.1				2					2
1330-20-7 §	Xylene.	100 <150>	100 <150>	PPM	5.9	6	5		32	10		5		13
64742-95-6	Light Aromatic Naphtha.	100		PPM	3.8			10	11	13	10	4	14	16
111-76-2 §	2-Butoxyethanol	25	25	PPM (Skin)	0.6							2	2	
107-87-8 §	Methyl n-Propyl Ketone.	200 <250>	200 <250>	PPM	27.8			2						
95-48-7	2-Methylphenol	5	5	PPM (Skin)	0.3			2						
90-05-1	2-Methoxyphenol	Not Established			99.8					2				
141-78-6	Ethyl Acetate	400	400	PPM	86.0							56	26	
123-86-4	n-Butyl Acetate.	150 <200>	150 <200>	PPM	10.0	14	43	27	5	17	27	13	27	9
112-07-2 §	2-Butoxyethyl Acetate.	50		PPM	1.0								11	
108-65-6	1-Methoxy-2-Propanol Acetate	Not Established			1.8		10	19			19			
Proprietary	Hexamethylene Diisocyanate Polymer.	0.5 <1.0>		Mg/M3 Supplier Limit				13		20	13	6	6	
822-06-0	Hexamethylene Diisocyanate Monomer	0.005		PPM	0.025			0.04		0.04	0.03	0.01	0.01	
Proprietary	Isophorone Diisocyanate Polymer	Not Established						31	38	40	31	13	14	60
4098-71-9	Isophorone Diisocyanate Monomer	0.005	0.005 <0.02>	PPM				0.31	0.38	0.40	0.31	0.13	0.14	0.60
	Weight per Gallon (lbs.)					7.66	8.12	8.37	8.04	8.55	8.36	7.77	7.79	8.54
	VOC - Total Volatile Organic Compounds (lbs./gal.)					4.36	5.00	4.61	4.94	3.42	4.61	6.17	6.10	3.41
	VOC - Less Water and exempt Solvents (lbs./gal.)					4.36	5.00	4.61	4.94	3.42	4.61	6.17	6.10	3.41
	Photochemically Reactive					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Flash Point (°F) / DOL Storage Category					78 / 1C	58 / 1B	78 / 1C	78 / 1C	30 / 1B	80 / 1C	30 / 1B	30 / 1B	80 / 1C
	HMIS® (NFPA) Rating (health) - (re - reactivity) / PAINT-SAFE®					2*3 0 / K	2*3 0 / K	3*3 0 / K	3*3 1 / K	3*3 1 / K	3*3 1 / K	3*3 1 / K	3*3 1 / K	3*3 0 / K

§ Ingredient subject to the reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313, 40 CFR 372.65 C

MATERIAL SAFETY DATA SHEET

This form complies with 29 CFR 1910.1200 (The Hazardous Communication Standard)

Fibre Glass-Evercoat Co., Inc.
6600 Cornell Rd., Cincinnati, Ohio 45242 513-489-7600
Emergency Telephone: 1-800-543-4530

Section I Product Information

Product Name: Fiberglass Product Class: Polyester Body Filler

Part Number: 622, 632 Date of prepare 8-9-88

Section II Hazardous Ingredients

Ingredient	Cas No.	Exposure Limit	%
*Styrene	100-42-5	50ppm	<20
Talc (Contains No Asbestos)	14807-96-6	2mg/m3	<50
Unsaturated polyester	None Assigned	Non-Hazardous	<50
Glass Fiber	65997-17-3	10mg/m3 asdust	<10

* All ingredients marked with an asterisk (*) are toxic chemicals subject to reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and 40CFR Part 372

Section III Physical Data

Boiling Point: Styrene 295°F | Evaporation Rate (Butyl Acetate = 1): Slower VOC=0

Vapor Pressure (mm Hg.) 4.3 @ 20°C | Vapor Density (Air = 1): Heavier

Specific Gravity: 1.8 | Melting Point: N/A

Appearance and Odor: Paste, Sharp Aromatic Odor | Solubility in Water: Nil

Section IV Fire and Explosion Hazard Data

Flash Point: 98°F C.C. | Flammable Limits: LEL 1.1 UEL 6.1

Extinguishing Media: Water spray, foam, dry chemical or CO_2

Special Fire Fighting Procedures: Fire Fighters exposed to vapors or products of combustion should wear self-contained breathing apparatus.

Unusual Fire and Explosion Hazards: At elevated temperatures such as in a fire, polymerization may take place. If contained, violent rupture may result.

Hazardous Decomposition Products: Heating to decomposition may cause the emission of irritating

Section V Health Hazard Data

Permissable Exposure Level: Styrene- OSHA limits for styrene (29 CFR 1910.1000 Z-2) 100ppm 8 Hr. TWA, 200 ppm-500ppm Ceiling in 5 minutes. ACGIH Limit for Styrene is 50ppm 8Hr TWA

Primary Routes of Entry: Inhalation and Skin Absorption

Effects of Overexposure: SKIN- Prolonged or frequent contact may cause defatting, dryness with irritation and possible dermatitis. Styrene may be absorbed through the skin in toxic amounts. EYES-May cause tearing and irritation. INHALATION-Vapors may cause nose. throat and respiratory tract irritation. High concentration may cause headache and nausea. Repeated high concentration exposure may cause liver and kidney damage. INGESTION-May cause gastrointestinal disturbances, pain and discomfort.

First Aid: SKIN-Wash with soap and water. EYES-Flush with water for 15 minutes. Get medical attention. INHALATION-Remove victim from exposure. If victim is unconscious give artificial respiration or oxygen as needed. Get medical attention. INGESTION-Do not induce vomiting (Aspiration hazard). Get medical attention

Health Hazard Data - *Cont.*

Effects of Chronic Overexposure:

INHALATION- Repeated exposure to high concentrations may cause liver and kidney damage.

Carcinogency: The International Agency for Research on Cancer (IARC) has classified styrene as a possible human carcinogen (Class 2-B). The IARC 2B classification is not based on significant new evidence that styrene might be a carcinogen but on a revised IARC classification scheme and new data on styrene oxide.

Section VI Reactivity Data

Stability: Stable | Hazardous Polymorization: May occur

Incompatability: Strong acids and oxidizing agents

Conditions to Avoid: Heat and direct sunlight

Section VII Spill or Leak Procedures

Steps to be taken in case of Spill or Leak:

Remove sources of ignition. Absorb spill with absorbent material such as vermiculite or sand.

Waste Disposal Method:

Small quantities can be reacted with the appropriate hardener to solidify.
Dispose in accordance with all federal, state and local regulations.

Section VIII Special Protection Information

Respiratory Protection: A canister type repirator must be worn to prevent the inhalation of vapors or spray mists when the TLV or PEL is exceeded.

Wear a dust mask when sanding cured product.

Ventilation: General ventilation is required during normal use

Protective Gloves: Plastic or chemical resistant gloves to prevent skin contact

Eye Protection: Face shield or chemical goggles

Other:

Section IX Special Precautions

Storing and Handling:

Avoid storage above 100°F. Store only in original containers.

NFPA Classification: Health- 2 Fire- 3 Reactivity- 1 Special Hazard- N/A

Other:

DOT Shipping Name-Consumer Commodity ORM-D
DOT ID NO-Putty N.O.I. Item No. 150110

IATA Shipping Name-Resin Solution
IATA Hazard Class-Flammable Liquid

IMO NO-UNI866

MATERIAL SAFETY DATA SHEET

Information in accordance with 29 CFR 1910.1200 (g)(1)

DATE OF ISSUE:	04/10/90		SUPERSEDES:	01/10/89	MSDS NBR:	9001	X1

SECTION I - GENERAL INFORMATION

MANUFACTURER'S NAME: STANDARD COATING CORP.

ADDRESS: 461 BROAD AVENUE
RIDGEFIELD, NJ 07657

EMERGENCY TELEPHONE: 201-945-5058

INFORMATION TELEPHONE: 201-945-5058

PRODUCT CLASS: NITROCELLULOSE LACQUER PUTTY

TRADE NAME: NITRO-STAN SPOT & GLAZING PUTTY

MANUFACTURER'S CODE: 9000, 9001, 9002

HMIS INFO

HEALTH	2
FLAMMABILITY	3
REACTIVITY	0

SECTION II - HAZARDOUS INGREDIENTS

This product contains the following toxic chemicals (if any are present they are marked "YES" under the SARA 313 column below) subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372. This information must be included in all MSDS's that are copied and distributed for this material.

HAZARDOUS INGREDIENTS	CAS NUMBER	%	SARA 313 LISTED	MFR'S SUGG. TLV	OSHA PEL		ACGIH TLV's		LEL	VAPOR PRESS.
							TWA	STEL		
					ppm	mg/m³	ppm	ppm		mm Hg
n-BUTYL ACETATE	123-86-4		NO	150	150	-		-	1.7	8
n-BUTYL ALCOHOL	71-36-3	<5	YES		100	300		-	1.4	4.3
XYLENE (MIXED ISOMERS)	1330-20-7	<5	YES	100	100	-		-	1.0	6
STODDARD SOLVENT	8052-41-3		NO	100	100		100			1
TOLUENE	108-88-3	<5	YES	200	200	375		150	1.2	22
ETHYL ALCOHOL	64-17-5		NO		1000	1900		-	2.0	73
ISOPROPYL ALCOHOL	67-63-0	<5	YES	400	400	980		500	2.0	43.5
BARIUM SULFATE	7727-43-7	<30	YES	10 m		10 m		-	N.A.	N.A.
ALUMINUM OXIDE	1344-28-1	<5	YES		-	-		-	N.A.	N.A.

The remaining [proprietary] ingredients are not found in the most recent Massachusetts, New Jersey, Maryland, Pennsylvania or California Substance Lists, or the Federal Hazardous Substance or EPA Lists. THE FORMULA, IN ITS ENTIRETY, IS DEEMED "TRADE SECRET" BY THE COMPANY.

SECTION III - PHYSICAL DATA

BOILING RANGE: 172-340°F

VAPOR DENSITY: HEAVIER THAN AIR

EVAP. RATE: SLOWER THAN ETHER

PER CENT VOLATILE BY WEIGHT: 30

WEIGHT PER GALLON (LBS.) 13

THEORETICAL VOC (LBS/GAL):

SECTION IV - FIRE AND EXPLOSION DATA

OSHA CLASSIFICATION:

FLAMMABLE LIQUID CLASS IB

FLASH POINT: 40°F. SETA FLASH

L.E.L.: 1.0

DOT CLASSIFICATION:

FLAMMABLE LIQUID UN 1263

EXTINGUISHING MEDIA:

DRY CHEMICAL, CO_2, UNIVERSAL FOAM OR WATER SPRAY (FOG)

UNUSUAL FIRE AND EXPLOSIONS HAZARDS: WHEN HEATED ABOVE FLASHPOINT, EMITS FLAMMABLE VAPORS WHICH, WHEN MIXED WITH AIR CAN BURN OR BE EXPLOSIVE.

SPECIAL FIREFIGHTING PROCEDURES:

USE MSHA/NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE GEAR WHEN FIGHTING FIRE IN CONFINED SPACES..

U/K - Uknown N/E - Not Established N/A - Not Applicable

SECTION V - HEALTH HAZARD DATA

PRIMARY ROUTE OF ENTRY: Inhalation.

MEDICAL CONDITIONS WHICH MIGHT BE AGGRAVATED: Emphysema, asthma, dermatitis.

OVEREXPOSURE TO VAPOR MAY CAUSE:(ACUTE)

Dizziness, vomiting, nose bleeds, headache, drowsiness, narcosis, nausea, stupor, mild depression or loss of consciousness; Also, burns and irritation to the eyes, respiratory system and dermatological effects. Ingestion will cause severe irritation to respiratory and gastric tracts.

REPEATED OVEREXPOSURE TO VAPOR MAY CAUSE:(CHRONIC)

Liver, kidney, lung, and central nervous system effects.

EMERGENCY AND FIRST AID PROCEDURES:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Flush eyes with plenty of water for at least 15 minutes and SEE A PHYSICIAN. Wash affected skin areas with water. Remove contaminated clothing. If ingested, do not induce vomiting. CALL A PHYSICIAN.

SECTION VI - REACTIVITY DATA

STABILITY: Stable CONDITIONS TO AVOID: High heat,sparks,open flame

INCOMPATABILITY (Materials to avoid): Strong acids, alkalis, oxidizing agents

HAZARDOUS DECOMPOSITION PRODUCTS: Oxides of nitrogen - carbon dioxide/monoxide

HAZARDOUS POLYMERIZATION: Will Not Occeur

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

Dike and contain spill with inert material (e.g., sand,earth). Transfer liquid to containers for recovery or disposal ; solid diking material to separate containers for disposal. Flush cleaned area with water to a contaminated (chemical) sewer. Thoroughly launder clothing before reuse. Do not take clothing home to be laundered. Keep spills and cleaning runoffs out of municipal sewers and open bodies of water.

WASTE DISPOSAL METHOD:

Incinerate liquid in approved equipment. Landfill or incinerate contaminated diking material according to local, state, and federal regulations.

SECTION VIII - SPECIAL PROTECTION INFORMATION

VENTILATION:

Use local or central mechanical engineering controls to keep concentration levels below application OSHA PEL or ACGIH's TLV limit. Remove decomposition products formed during welding or flame cutting of surfaces coated with this product. Pockets of heavy, and/or flammable vapor must not be permitted to form

RESPIRATORY PROTECTION:

IN OPEN AREAS:

Use approved mechanical filter respirator to remove solid airborne particles.

IN RESTRICTED VENTILATION AREAS:

Use NIOSH/MSHA approved chemical/mechanical filter respirators designed to remove particles and vapor or positive pressure air hoods if local mechanical exhaust is not sufficient to keep TLV below levels stated in Section II.

PROTECTIVE GLOVES:

Impervious type required for prolonged or repeated contact.

EYE PROTECTION:

Use safety goggles or face shields (ANSI Z87.1 or equiv).

OTHER PROTECTIVE EQUIPMENT:

Eye bath, safety shower, aprons.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:

DANGER! FLAMMABLE
HARMFUL IF INHALED
LIQUID MAY CAUSE EYE AND SKIN IRRITATION
KEEP AWAY FROM HEAT, SPARKS, OPEN FLAME
USE ONLY WITH ADEQUATE VENTILATION
FOR INDUSTRIAL USE ONLY

AVOID PROLONGED BREATHING OF VAPOR OR CONTACT WITH SKIN
KEEP CONTAINER CLOSED
WASH HANDS THOROUGHLY AFTER USING
OBSERVE ALL LABEL INSTRUCTIONS
KEEP OUT OF THE REACH OF CHILDREN

DO NOT USE UNTIL MANUFACTURER'S SAFETY PRECAUTIONS HAVE BEEN READ

DUCT NAME: LITE WEIGHT III BODYFILLER HMIS CODES: H F R P
DUCT CODE: 156, 157, 165, 166, 167, 597 2* 3 1

SECTION I - MANUFACTURER IDENTIFICATION

CTURER'S NAME: FIBRE GLASS-EVERCOAT CO., INC.
DRESS: 6600 CORNELL ROAD. CINCINNATI,OHIO 45242
ERGENCY PHONE: CHEMTREC 800-4249300INFORMATION PHONE: 800-729-7600
TE REVISED : 10-09-90 NAME OF PREPARER : JEFF ZYCH

SECTION II - HAZARDOUS INGREDIENTS/SARA III INFORMATION

RDOUS COMPONENTS	CAS NUMBER	OCCUPATIONAL EXPOSURE LIMITS OSHA PEL	ACGIH TLV	OTHER	VAPOR PRESSURE mm Hg @ TEMP	WEIGHT PERCENT
RENE	100-42-5	50 ppm	50 ppm	NIOSH 50	5.0 68F	19.18
ESTER RESIN					N/A	30
(NON ASBETOS)	14807-96-6		2 mg/m3		N/A	40
OW GLASS SPHERES					N/A	< 5.0%

dicates toxic chemical(s) subject to the reporting requirements of section 313 of Title III and of 40 CFR 372.
ALSO MSDS FOR CREAM HARDNER
IS MSDS APPLIES TO PRODUCT CODES156.157.165.166.597

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

OILING POINT: STYRENE 295 F SPEC. GRAV. (H2O=1): 10 lbs/gal
APOR DENSITY: HEAVIER THAN AIR EVAPORATION RATE: SLOWER THAN ETHER
.O.C.: 0
OLUBILITY IN WATER: NIL
PPEARANCE AND ODOR: PASTE. SHARP AROMATIC ODOR

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

LASH POINT: 98 F METHOD USED: CC
LAMMABLE LIMITS IN AIR BY VOLUME- LOWER: 1.1% UPPER: 6.1%

XTINGUISHING MEDIA: FOAM. ALCOHOL FOAM. CO2. DRY CHEMICAL. WATER FOG

PECIAL FIREFIGHTING PROCEDURES
RE FIGHTERS EXPOSED TO VAPORS OR PRODUCTS OF COMBUSTION SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS.

NUSUAL FIRE AND EXPLOSION HAZARDS
L ATION MAY TAKE PLACE AT ELEVATED TEMPERATURE SUCH AS IN A FIRE. IF CONTAINED,VIOLENT RUPTURE MAY RESULT.

SECTION V - REACTIVITY DATA

STABILITY: STABLE

CONDITIONS TO AVOID

HEAT AND DIRECT SUNLIGHT

INCOMPATIBILITY (MATERIALS TO AVOID)

STRONG ACIDS AND OXIDIZING AGENTS

HAZARDOUS DECOMPOSITION OR BYPRODUCTS

HEATING TO DECOMPOSITION MAY CAUSE IRRITATING ACRID FUMES

HAZARDOUS POLYMERIZATION: MAY OCCUR

IF HAZARDOUS POLYMERIZATION OCCURS WHILE CONTAINED IN A CLOSED CONTAINER, VIOLENT RUPTURE MAY RESULT

SECTION VI - HEALTH HAZARD DATA

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE

VAPORS MAY CAUSE NOSE, THROAT AND RESPIRATORY TRACT IRRITATION. HIGH CONCONCENTRATION MAY CAUSE HEADACHE AND NAUSEA. REPEATED HIGH CONCENTRATION EXPOSURE MAY CAUSE LIVER AND KIDNEY DAMAGE.

SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE

PROLONGUED OR FREQUENT SKIN CONTACT MAY CAUSE DEFATTING, DRYNESS WITH IRRITATIONAND POSSIBLE DERMATITIS. EYE CONTACT MAY CAUSE TEARING AND IRRITATION.

SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE

DERMATITIS AND IRRITATION

INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE

MAY CAUSE GASTROINTESTINAL DISTURBANCES, PAIN AND DISCOMFORT.

HEALTH HAZARDS (ACUTE AND CHRONIC)

INHALATION OF REPEATED HIGH CONCENTRATIONS MAY CAUSE LIVER AND KIDNEY DAMAGE. THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) HAS CLASSED STYRENE AS A POSSIBLE HUMAN CARCINOGEN (CLASS 2-B). THE 2-B CLASSIFICATION IS NOT BASED ON NEW EVIDENCE THAT STYRENE MIGHT BE A CARCINOGEN BUT ON A REVISED IARC CLASSIFICATION SYSTEM AND NEW EVIDENCE FOR STYRENE OXIDE.

CARCINOGENICITY: NTP? NO IARC MONOGRAPHS? YES OSHA REGULATED? NO

IARC HAS CLASSED STYRENE AS A POSSIBLE HUMAN CARCINOGEN (CLASS 2-B).

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

LIVER AND KIDNEY DISORDERS

EMERGENCY AND FIRST AID PROCEDURES

FOR SKIN CONTACT, WASH WITH SOAP AND WATER. IN CASE OF CONTACT WITH EYES, FLUSHWITH WATER FOR 15 MINUTES AND GET MEDICAL ATTENTION. FOR INHALATION, REMOVE VICTEM FROM EXPOSURE. IF UNCONSCIOUS GIVE ARTIFICIAL RESPIRATION OR OXYGEN AS NEEDED. GET MEDICAL ATTENTION. IN THE EVENT OF INGESTION, DO NOT INDUCE VOMITING (ASPIRATION HAZARD), GET MEDICAL ATTENTION.

========== SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE ==========

EPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

OVE SOURCES OF IGNITION. ABSORB SPILL WITH ABSORBENT MATERIAL SUCH AS VERMICULITE OR SAND.

S DISPOSAL METHOD

LL QUANTITIES CAN BE REACTED WITH THE APPROPRIATE HARDNER TO SOLIDIFY. DISPOSE OF IN ACCORDANCE WITH ALL FED-AL, STATE AND LOCAL REGULATIONS.

ECAUTIONS TO BE TAKEN IN HANDLING AND STORING

ID STORAGE ABOVE 100 F. STORE ONLY IN ORIGINAL CONTAINERS.

HER PRECAUTIONS

SHIPPING NAME-CONSUMER COMODITY
T ID NO-PUTTY N.O.I. ITEM NO.150110
TA SHIPPING NAME-RESIN SOLUTION
TA HAZARD CLASS-FLAMMABLE LIQUID
D NO-UN1866

========== SECTION VIII - CONTROL MEASURES ==========

SPIRATORY PROTECTION

ANISTER TYPE RESPIRATOR MUST BE WORN TO PREVENT THE INHALATION OF VAPORS OR SPRAY MISTS WHEN THE TLV OR PEL IS CEEDED. WEAR A DUST MASK WHEN SANDINGTHE CURED PRODUCT.

N LATION

VIDE SUFFICIENT MECHANICAL (GENERAL AND/OR LOCAL EXHAUST) VENTILATION TO MAINTAIN EXPOSURE BELOW TLV.

OTECTIVE GLOVES

STIC OR CHEMICAL RESISTANT GLOVES TO PREVENT SKIN CONTACT.

E PROTECTION

E SHIELD OR CHEMICAL GOGGLES.

HER PROTECTIVE CLOTHING OR EQUIPMENT

OVE AND WASH CONTAMINATED CLOTHING. USE A BARRIER CREAM SUCH AS GLOVE COAT WHEN USING THE PRODUCT.

RK/HYGIENIC PRACTICES

H HANDS BEFORE EATING AND DO NOT SMOKE WHILE USING.

========== SECTION IX - DISCLAIMER ==========

SCLAIMER

PRECEEDING INFORMATION HAS BEEN COMPILED FROM CURRENT SOURCES WHICH ARE BELIEVED TO BE ACCURATE AND RELIABLE. SINCE IS NOT POSSIBLE TO ANTICIPATE ALL THE POSSIBLE CONDITIONS OF USE FOR THE INFORMATION OR THE PRODUCT. THE USER SHOULD SURE THAT THE INFORMATION IS RELEVANT TO EACH PARTICULAR CIRCUMSTANCE AND APPLY ADDITIONAL SAFETY MEASURES AS NEEDED.

ST-10 LACQUER THINNER

Material Safety Data Sheet

SECTION I - PRODUCT IDENTIFIER

PRODUCT: ST-10 Lacquer Thinner

SUPPLIER: South Eastern Chemical Ind., Inc.
660 Oak Place
Port Orange, FL 32127
(904) 760-9332

NFPA Ratings:
Health: 2
Fire: 3
React: 0
Special: --
0=LEAST to 4=EXTREME

HMIS PERSONAL PROT: G

SECTION II - HAZARDOUS INGREDIENTS

HAZARDOUS COMPONENTS-(CAS Number) EXPOSURE LIMITS

Acetone (67-64-1)----------OSHA TWA 750 ppm, STEL 1000 ppm ACGIH TWA 750 ppm, STEL 1000 ppm

Hexane (110-54-3)----------OSHA TWA 500 ppm, ACGIH TLV TWA 50 ppm

Methyl alcohol (67-56-1)--------OSHA TWA (SKIN) 200 ppm, STEL 250 ppm ACGIH 200 ppm, TLV SKIN STEL 250 ppm

Toluene (108-88-3)----------OSHA TWA 100 ppm, STEL 150 ppm ACGIH TWA 100 ppm, STEL 150 ppm Table Z2 CEILING 300 ppm acceptable maximum peak above the acceptance ceiling concentration for an 8 hour shift = 500 ppm for 10 minutes.

PM Acetate (84540-57-8)----------ND

SECTION III- PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT: Est. 56° - 58° F
MELTING POINT: ND
SPECIFIC GRAVITY (H2O=1): 0.78-0.83
VAPOR PRESSURE: Calc 98-110mm @ 20° C
VAPOR DENSITY (Air=1): >1
EVAPORATION RATE (BuAc=1): >1
SOLUBILITY IN WATER: Insoluble
pH: NA
APPEARANCE AND ODOR: Clear solution, Solvent odor.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method): Approx. +5° F (Closed Cup)
FLAMMABLE LIMITS: Lower [Est. 1] Upper [Est.18]
EXTINGUISHING MEDIA: Dry powder, carbon dioxide (CO2), water fog or spray.
SPECIAL FIRE FIGHTING PROCEDURES: Approach fire from upwind side. Avoid breathing smoke, fumes, mist, or vapors on the downwind side. Firefighters wear protective clothing, and self contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Firefighters wear protective clothing, and self contained breathing apparatus.

SECTION V - REACTIVITY INFORMATION

STABILITY: PRODUCT IS, Stable
INCOMPATIBILITY: --
MATERIALS TO AVOID: Oxidizers or oxidizing materials.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: From combustion: smoke, carbon monoxide, carbon dioxide.
HAZARDOUS POLYMERIZATION: Will not occur.

SECTION VI - HEALTH HAZARD DATA

ROUTES OF ENTRY

INHALATION? possible - irritant, narcotic
SKIN/EYES? yes - irritant
SKIN ABSORPTION? yes - irritant
INGESTION? possible - irritant, toxic

HEALTH HAZARDS

ACUTE: Inhalation of vapors may be narcotic and can be fatal. Ingesiton of liquid will cause gastrointestinal distress, irritation, possibly nausea and can be fatal. Liquid or vapors may be irritating to skin and eyes.

CHRONIC: Kidney and liver damage, and blood effects.

CARCINOGENICITY: LISTED IN NTP? No IARC MONOGRAPHS? No OSHA REGULATED? No

SIGNS AND SYMPTOMS OF EXPOSURE: Symptoms of overexposure, in odrer: Headache, fatigue nausea, visual impairment, acidosis, convulsions, circulatory collapse, respiratory failure, death. Ingestion may cause blindness or be fatal. Skin irritation develops slowly after contact, eye irritation develops immediately upon contact.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Pre-existing skin disorders.

FIRST AID PROCEDURES

EYE CONTACT: Flush eyes with water 15 minutes. Get medical attention if symptoms develop and persist.

CONTACT: Flush with water or soap and water for 15 minutes or until all traces have been removed. Seek medical attention if symptoms develop and persist.

:TION: Do NOT induce vomiting, get immediate medical attention. Aspiration into lungs may cause chemical pneumonia.

ATION: Remove victim to fresh air and, if needed, immediately begin artificial respiration. Give oxygen if breathing is labored. Get emergency medical help. Contact a physician immediately.

:CTION VII- PRECAUTIONS FOR SAFE HANDLING AND USE

OR LEAK PROCEDURES: Emergency response coordinator must have mandated training. Small spills, pick up bsorbent media. Store as HAZARDOUS waste. Large spills, contain with dikes, pick up with vacuum truck. as HAZARDOUS waste. Notify proper local, state, and federal agencies. For vapor releases, get people the area, shut off ignition sources, ventilate the area. Notify proper authorities if required by SARA III.

TIONS TO BE TAKEN IN HANDLING AND STORAGE: Store in a cool place away from ignition sources.

PRECAUTIONS: Clean up leaks/spills immediately to prevent soil or water contamination.

ECTION VIII - CONTROL MEASURES

IRATORY PROTECTION: (If concentration reaches or exceeds TLV), NIOSH approved nic vapor mask required.

'ILATION: LOCAL EXHAUST - Recommended, SPECIAL - Not necessary,
MECHANICAL-Recommended, OTHER - Not necessary
'ECTIVE GLOVES: Chemical resistant gloves suitable for toluene and acetone.
PROTECTION: Chemical goggles or full face shield.

:R PROTECTIVE EQUIPMENT: Boots, aprons, drench showers, eye wash as needed for :ection against spills and/or splashes.

HYGIENIC PRACTICES: Avoid contact with skin, eyes, and clothing. After handling product, wash hands before eating, drinking, or smoking. If contact occurs, ove contaminated clothing. If needed, take first aid action shown in section VI. ıder contaminated clothing before reuse.

ECTION IX - TRANSPORTATION INFORMATION

nt related material, n.o.s., flammable material, UN1263, (contains Toluene and tone). RQ 4,000 lbs based on Toluene.

ION X - REGULATORY/ENVIRONMENTAL

HAZARDS: ACUTE-Yes CHRONIC-Yes FLAMMABILITY-Yes
SUDDEN RELEASE OF PRESSURE-No REACTIVE-No

A Title III - Section 313, Toxic Materials:

Chemical Name	CAS #	Percentage
Toluene	108-88-3	<30%
Acetone	67-64-1	<30%
Methyl alcohol	67-56-1	<20%

:AN AIR ACT: Section 111 CLEAN WATER ACT: Section 311

ATES LISTS: Massachusetts, Pennsylvania, New Jersey, Canada

IC SUBSTANCES CONTROL ACT (TSCA), 40 CFR 710 Sources of the raw materials used in is mixture assure that all chemical ingredients present are in compliance with :t. 8(b) Chemical Substance Inventory, or are otherwise in compliance with TSCA.

tnotes:
Not applicable NE-Data not established CS-Cancer Suspect Agent OX-Oxidizer ND-No data
-Corrosive CALC-Calculated EST-Estimated STEL-Short Time Exposure Limit
-Threshold Limit Value PEL-Permissable Exposure Limit TWA-Time Weighted Average, 8 hours
S, PPI-Hazardous Material Identification System, Personal Protection Index
data presented is true and correct to the best of our knowledge and belief, however, neither seller nor preparer es any warranties, express or implied, concerning the information presented. The user is cautioned to perform own hazard evaluation and to rely upon his own determinations.

SCIENTIFIC INFORMATION SERVICES
Telephone (817) 560-4631
Form essentially the same as OSHA Form 174 dated September 1985
Preparation date: 12-91

MATERIAL SAFETY DATA SHEET

SHERWIN WILLIAMS®
AUTOMOTIVE FINISHES

THE SHERWIN - WILLIAMS CO.
101 PROSPECT AVE. N.W.
CLEVELAND, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917
INFORMATION TELEPHONE NO.
(216) 566-2902

DATE OF PREPARATION
1 - APR - 91

SUNFIRE® Acrylic Urethane

URE/1

						36, 366-, J6-, JU-, 38- series					
—SECTION II— CAS No.	HAZARDOUS INGREDIENT (percent by weight)	ACGIH TLV <STEL>	OSHA PEL <STEL>	UNITS	V.P.	URE-LF Non-Lead Colors	URE-LL Lead Colors	F12B1738 Black	F12W2030 White	V6V766 Accelerator	V6V769 Hardener
64742-47-8	Mineral Spirits	100	100	PPM	2.0						5
108-88-3 §	Toluene	100 <150>	100 <150>	PPM	22.0						
100-41-4 §	Ethylbenzene	100 <125>	100 <125>	PPM	7.1	1	1				
1330-20-7 §	Xylene.	100 <150>	100 <150>	PPM	5.9	15-20	15-20				
64742-95-6	Light Aromatic Naphtha.	100		PPM	3.8	3	3	3	2		
67-63-0	2-Propanol	400 <500>	400 <500>	PPM	33.0						
123-86-4	n-Butyl Acetate.	150 <200>	150 <200>	PPM	10.0	40-50	40-50	58	38	88	25
112-07-2 §	2-Butoxyethyl Acetate.	50		PPM	1.0	1	1				
108-65-6	1-Methoxy-2-Propanol Acetate	Not Established			1.8	0-5	0-5				
Proprlet.	Hexamethylene Diisocyanate Polymer.	0.5 <1.0>		Mg/M3 Supplier Limit			75				75
822-06-0	Hexamethylene Diisocyanate Monomer	0.005		PPM	0.025						1.4
13463-67-7	Titanium Dioxide.	10	15[5]	Mg/M3 as Dust [Resp. Fraction]		0-30	0-30		28		
1344-37-2 12656-85-8	Lead Chromate. Molybdate Orange.	0.05	0.05	Mg/M3			<20				
§	Lead compound (maximum) [% Lead]						20[12.2]				
§	Chromium compound (maximum) [% Chromium]						20[2.2]				
	Weight per Gallon (lbs.)					8-10	8-10	8.08	10.32	7.37	8.84
	VOC - Total Volatile Organic Compounds (lbs./gal.)					4.65-5.60	4.65-5.60	4.97	4.31	8.80	2.21
	VOC - Less Water and exempt Solvents (lbs./gal.)					4.65-5.60	4.65-5.60	4.97	4.31	8.80	2.21
	Photochemically Reactive					Yes	Yes	No	No	No	No
	Flash Point (°F)					72	72	79	72	72	81
	DOL Storage Category					1B	1B	1C	1B	1B	1C
	HMIS (NFPA) Rating (health - fire - reactivity)					2 3 0	2* 3 0	2* 3 1	2 3 0	2 3 0	2* 3 1
	PAINT-SAFE® Personal Protection					K	K	K	K	K	K

§ Ingredient subject to the reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313, 40 CFR 372.65 C

Section III — PHYSICAL DATA

PR[illegible]WEIGHT –	See TABLE	*EVAPORATION RATE* –	Slower than Ether
SPECIFIC GRAVITY –	0.9-1.6	*VAPOR DENSITY* –	Heavier than Air
BOILING RANGE –	174-395 °F	*MELTING POINT* –	N.A.
VOLATILE VOLUME –	55-70 %	*SOLUBILITY IN WATER* –	N.A.

Section IV — FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY CLASSIFICATION *FLASH POINT* See TABLE *LEL* 0.5 *UEL* 5.7
RED LABEL – Flammable, Flash below 100 F
EXTINGUISHING MEDIA
Carbon Dioxide, Dry Chemical, Foam
UNUSUAL FIRE AND EXPLOSION HAZARDS
Keep containers tightly closed. Isolate from heat, electrical equipment, sparks, and open flame. Closed containers may explode when exposed to extreme heat. Application to hot surfaces requires special precautions. During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.
SPECIAL FIRE FIGHTING PROCEDURES
Full protective equipment including self-contained breathing apparatus should be used. Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Section V — HEALTH HAZARD DATA

ROUTES OF EXPOSURE
Exposure may be by INHALATION and/or SKIN or EYE contact, depending on conditions of use. Alcohols and Acetates can be absorbed through the skin. To minimize exposure, follow recommendations for proper use, ventilation, and personal protective equipment.
ACUTE Health Hazards
EFFECTS OF OVEREXPOSURE
Irritation of eyes, skin and respiratory system. May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.
Certain colors contain Lead (See TABLE and PRODUCT LABEL). Acute occupational exposure to Lead is uncommon, but results in symptoms similar to chronic overexposure described below.
SIGNS AND SYMPTOMS OF OVEREXPOSURE
Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.
Redness and itching or burning sensation may indicate eye or excessive skin exposure.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
May cause allergic respiratory and/or skin reaction in susceptible persons or sensitization. This effect may be delayed several hours after exposure.
EMERGENCY AND FIRST AID PROCEDURES
If INHALED: If any breathing problems occur during use, LEAVE THE AREA and get fresh air. If problems remain or occur later, IMMEDIATELY get medical attention.
If on SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.
If in EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.
If SWALLOWED: Get medical attention.
CHRONIC Health Hazards
Certain Colors contain Lead and/or Chromate (See TABLE and PRODUCT LABEL).
Chronic overexposure to Lead may result in damage to the blood-forming, nervous, urinary, and reproductive systems (including embryotoxic effects). Symptoms include abdominal discomfort or pain, constipation, loss of appetite, metallic taste, nausea, insomnia, nervous irritability, weakness, muscle and joint pains, headache and dizziness.
Chromatee are listed by IARC and NTP. Although studies have associated exposure to Chromium VI compounds with an increased risk of respiratory cancer, available evidence indicates that Lead Chromate (Chrome Yellow, Molybdate Orange) DOES NOT present this hazard.
Prolonged overexposure to solvent ingredients in Section II may cause adverse effects to the liver, urinary, blood forming, and reproductive systems.
Persons sensitive to isocyanates will experience increased allergic reaction on repeated exposure.
Rats exposed to titanium dioxide dust at 250 mg./m3 developed lung cancer, however, such exposure levels are not attainable in the workplace.
Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

Section VI — REACTIVITY DATA

STABILITY – Stable
INCOMPATIBILITY
Metallics contain Aluminum. Contamination with Water, Acids, or Alkalis can cause evolution of hydrogen, which may result in dangerously increased pressures in closed containers.
Contamination of hardeners with Water, Alcohols, Amines, and other compounds which react with isocyanates, may result in dangerous pressure in, and possible bursting of, closed containers.
HAZARDOUS DECOMPOSITION PRODUCTS
By fire: Carbon Dioxide, Carbon Monoxide, Oxides of Metals in Section II
HAZARDOUS POLYMERIZATION – Will Not Occur

Section VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Remove all sources of ignition. Ventilate and remove with inert absorbent.
If hardener is spilled, all personnel in the area should be protected as in Section VIII. Cover spill with absorbent material. Deactivate spilled material with a 10% ammonium hydroxide solution (household ammonia). After 10 minutes, collect in open containers and add more ammonia. Cover loosely. Wash spill area with soap and water.
WASTE DISPOSAL METHOD
Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers. Waste from products containing Lead or Chromium must also be tested for extractability. Waste from products containing Methyl Ethyl Ketone may require testing for extractability.
Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State, and Local regulations regarding pollution.

Section VIII — PROTECTION INFORMATION

PRECAUTIONS TO BE TAKEN IN USE
NO PERSON SHOULD USE THIS PRODUCT, OR BE IN THE AREA WHERE IT IS BEING USED, IF THEY HAVE CHRONIC (LONG-TERM) LUNG OR BREATHING PROBLEMS OR IF THEY EVER HAD A REACTION TO ISOCYANATES.
Certain colors contain Lead (See TABLE and PRODUCT LABEL). Before initial use of Lead-containing colors, consult OSHA's Standard for Occupational Exposure to Lead (29 CFR 1910.1025).
Use only with adequate ventilation. Avoid breathing vapor and spray mist. Avoid contact with skin and eyes. Wash hands after using.
This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section II) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section II, the applicable limits for nuisance dusts are ACGIH TLV 10 mg./m3 (total dust), OSHA PEL 15 mg./m3 (total dust), 5 mg./m3 (respirable fraction).
VENTILATION
Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section II is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.
RESPIRATORY PROTECTION
Where overspray is present, a positive pressure air supplied respirator (TC19C NIOSH/MSHA approved) should be worn. If unavailable, a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section II may be effective. Follow respirator manufacturer's directions for use. Wear the respirator for the whole time of spraying and until all vapors and mists are gone. NO PERSONS SHOULD BE ALLOWED IN THE AREA WHERE THIS PRODUCT IS BEING USED UNLESS EQUIPPED WITH THE SAME RESPIRATOR PROTECTION RECOMMENDED FOR THE PAINTERS.
When sanding, wirebrushing, abrading, burning, or welding the dried film, wear a particulate respirator approved by NIOSH/MSHA for protection against non-volatile materials in Section II.
PROTECTIVE GLOVES
Wear gloves which are recommended by glove supplier for protection against materials in Section II.
EYE PROTECTION
Wear safety spectacles with unperforated sideshields.
OTHER PROTECTIVE EQUIPMENT
Use barrier cream on exposed skin.

Section IX — PRECAUTIONS

DOL STORAGE CATEGORY – See TABLE
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Contents are FLAMMABLE. Keep away from heat, sparks, and open flame.
During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances; and any other sources of ignition.
Consult NFPA Code. Use approved Bonding and Grounding procedures.
Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.
OTHER PRECAUTIONS
Certain colors contain Lead (See TABLE and PRODUCT LABEL). Do not apply Lead-containing colors on toys or other children's articles, furniture, or any interior surface of a dwelling or facility which may be occupied or used by children. Do not apply on any exterior surface of dwelling units, such as window sills, porches, stairs, or railings to which children may be commonly exposed.
This product must be mixed with other components before use. Before opening the packages, READ AND FOLLOW WARNING LABELS ON ALL COMPONENTS.
Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

MATERIAL SAFETY DATA SHEET

WESTERN Automotive Finishes
WESTERN AUTOMOTIVE FINISHES
101 PROSPECT AVE. N.W.
CLEVELAND, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917
INFORMATION TELEPHONE NO.
(216) 566-2902

DATE OF PREPARATION
2 - DEC - 91

HI-GLO® Synthetic Enamel

ENL/W3

						Clearcoats		*Hardeners*						
—SECTION II— CAS No.	HAZARDOUS INGREDIENT (percent by weight)	ACGIH TLV <STEL>	OSHA PEL <STEL>	Units	Vapor Pressure (mm Hg)	W159 Clearcoat	W160 High Performance	W1001 GLOSS ONE® Gloss	W1010 MAXI-GLOSS® High Gloss	W1016 High Solids	W1020 INTERLOCK™ Gloss	W1029 HI-GLO™ GLASPAK™	W1030 HI-GLO™ GLASPAK™	W1032 HS Hardener
64742-48-9	V. M. & P. Naphtha	300	300 <400>	PPM	12.0	7								
64742-47-8	Mineral Spirits	100	100	PPM	2.0	23								
108-88-3 §	Toluene.	100 <150>	100 <150>	PPM	22.0	5	3							
100-41-4 §	Ethylbenzene.	100 <125>	100 <125>	PPM	7.1				2					2
1330-20-7 §	Xylene.	100 <150>	100 <150>	PPM	5.9	6	5		39	10		5		13
64742-95-6	Light Aromatic Naphtha.	100		PPM	3.8			10	11	13	10	4	14	16
111-76-2 §	2-Butoxyethanol	25	25	PPM (Skin)	0.6							2	2	
107-87-9 §	Methyl n-Propyl Ketone.	200 <250>	200 <250>	PPM	27.8			2						
95-48-7	2-Methylphenol	5	5	PPM (Skin)	0.3			2						
90-05-1	2-Methoxyphenol	Not Established			99.8					2				
141-78-6	Ethyl Acetate	400	400	PPM	86.0							56	26	
123-86-4	n-Butyl Acetate.	150 <200>	150 <200>	PPM	10.0	14	43	27	5	17	27	13	27	9
112-07-2 §	2-Butoxyethyl Acetate.	50		PPM	1.0								11	
108-65-6	1-Methoxy-2-Propanol Acetate	Not Established			1.8		10	19			19			
Proprietary	Hexamethylene Diisocyanate Polymer.	0.5 <1.0>		Mg/M3 Supplier Limit				13		20	13	6	6	
822-06-0	Hexamethylene Diisocyanate Monomer	0.005		PPM	0.025			0.04		0.04	0.03	0.01	0.01	
Proprietary	Isophorone Diisocyanate Polymer	Not Established						31	38	40	31	13	14	60
4098-71-9	Isophorone Diisocyanate Monomer	0.005	0.005 <0.02>	PPM				0.31	0.38	0.40	0.31	0.13	0.14	0.60
	Weight per Gallon (lbs.)					7.66	8.12	8.37	8.04	8.55	8.36	7.77	7.79	8.54
	VOC - Total Volatile Organic Compounds (lbs./gal.)					4.36	5.00	4.61	4.94	3.42	4.61	6.17	6.10	3.41
	VOC - Less Water and exempt Solvents (lbs./gal.)					4.36	5.00	4.61	4.94	3.42	4.61	6.17	6.10	3.41
	Photochemically Reactive					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Flash Point (°F) / DOL Storage Category					78 / 1C	58 / 1B	78 / 1C	78 / 1C	30 / 1B	80 / 1C	30 / 1B	30 / 1B	80 / 1C
	HMIS® (NFPA) Rating (health - fire - reactivity) / PAINT-SAFE®					2* 3 0 / K	2* 3 0 / K	3* 3 0 / K	3* 3 1 / K	3* 3 1 / K	3* 3 1 / K	3* 3 1 / K	3* 3 1 / K	3* 3 0 / K

§ Ingredient subject to the reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313, 40 CFR 372.65 C

Section III — PHYSICAL DATA

PRODUCT WEIGHT –	See TABLE	*EVAPORATION RATE* –	Slower than Ether
SPECIFIC GRAVITY –	0.92-1.03	*VAPOR DENSITY* –	Heavier than Air
BOILING RANGE –	163-401 °F	*MELTING POINT* –	N.A.
VOLATILE VOLUME –	48-84 %	*SOLUBILITY IN WATER* –	N.A.

Section IV — FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY CLASSIFICATION *FLASH POINT* See TABLE *LEL* 0.5 *UEL* 99.8
RED LABEL – Flammable. Flash below 100 F
EXTINGUISHING MEDIA
Carbon Dioxide, Dry Chemical, Foam
UNUSUAL FIRE AND EXPLOSION HAZARDS
Keep containers tightly closed. Isolate from heat, electrical equipment, sparks, and open flame. Closed containers may explode when exposed to extreme heat. Application to hot surfaces requires special precautions. During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.
SPECIAL FIRE FIGHTING PROCEDURES
Full protective equipment including self-contained breathing apparatus should be used. Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Section V — HEALTH HAZARD DATA

ROUTES OF EXPOSURE
Exposure may be by INHALATION and/or SKIN or EYE contact, depending on conditions of use. Alcohols and acetates can be absorbed through the skin. To minimize exposure, follow recommendations for proper use, ventilation, and personal protective equipment.
ACUTE Health Hazards
EFFECTS OF OVEREXPOSURE
Irritation of eyes, skin and respiratory system. May cause narvous system depression. Extreme overexposure may result in unconsciousness and possibly death.
SIGNS AND SYMPTOMS OF OVEREXPOSURE
Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.
Redness and itching or burning sensation may indicate eye or excessive skin exposure.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
Hardeners CONTAIN ISOCYANATES. May cause allergic respiratory and/or skin reaction in susceptible persons or sensitization. This effect may be delayed several hours after exposure.
EMERGENCY AND FIRST AID PROCEDURES
If INHALED: If any breathing problems occur during use, LEAVE THE AREA and get fresh air. If problems remain or occur later, IMMEDIATELY get medical attention.
If on SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.
If in EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.
If SWALLOWED: Get medical attention.
CHRONIC Health Hazards
No ingredient in these products is an IARC, NTP or OSHA listed carcinogen.
Prolonged overexposure to solvent ingredients in Section II may cause adverse effects to the liver, urinary, blood forming, cardiovascular, and reproductive systems.
Hardeners CONTAIN ISOCYANATES. Persons sensitive to isocyanates will experience increased allergic reaction on repeated exposure.
Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

Section VI — REACTIVITY DATA

STABILITY – Stable
INCOMPATIBILITY
Contamination of hardeners with Water, Alcohols, Amines, and other compounds which react with isocyanates, may result in dangerous pressure in, and possible bursting of, closed containers.
HAZARDOUS DECOMPOSITION PRODUCTS
By fire: Carbon Dioxide, Carbon Monoxide, Oxides of Nitrogen, possibility of Hydrogen Cyanide
HAZARDOUS POLYMERIZATION – Will Not Occur

Section VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Remove all sources of ignition. Ventilate and remove with inert absorbent.
If hardener is spilled, all personnel in the area should be protected as in Section VIII. Cover spill with absorbent material. Deactivate spilled material with a 10% ammonium hydroxide solution (household ammonia). After 10 minutes, collect in open containers and add more ammonia. Cover loosely. Wash spill area with soap and water.
WASTE DISPOSAL METHOD
Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.
Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State, and Local regulations regarding pollution.

Section VIII — PROTECTION INFORMATION

PRECAUTIONS TO BE TAKEN IN USE
NO PERSON SHOULD USE THESE PRODUCTS, OR BE IN THE AREA WHERE THESE PRODUCTS ARE BEING USED, IF THEY HAVE CHRONIC (LONG-TERM) LUNG OR BREATHING PROBLEMS OR IF THEY EVER HAD A REACTION TO ISOCYANATES.
Use only with adequate ventilation. Avoid breathing vapor and spray mist. Avoid contact with skin and eyes. Wash hands after using.
This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section II) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section II, the applicable limits for nuisance dusts are ACGIH TLV 10 mg./m3 (total dust), OSHA PEL 15 mg./m3 (total dust), 5 mg./m3 (respirable fraction).
VENTILATION
Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section II is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.
RESPIRATORY PROTECTION
Where overspray is present, a positive pressure air supplied respirator (TC19C NIOSH/MSHA approved) should be worn. If unavailable, a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section II may be effective. Follow respirator manufacturer's directions for use. Wear the respirator for the whole time of spraying and until all vapors and mists are gone. NO PERSONS SHOULD BE ALLOWED IN THE AREA WHERE THIS PRODUCT IS BEING USED UNLESS EQUIPPED WITH THE SAME RESPIRATOR PROTECTION RECOMMENDED FOR THE PAINTERS.
When sanding or abrading the dried film, wear a particulate respirator approved by NIOSH/MSHA for protection against non-volatile materials in Section II.
PROTECTIVE GLOVES
Wear gloves which are recommended by glove supplier for protection against materials in Section II.
EYE PROTECTION
Wear safety spectacles with unperforated sideshields.
OTHER PROTECTIVE EQUIPMENT
Use barrier cream on exposed skin.

Section IX — PRECAUTIONS

DOL STORAGE CATEGORY – See TABLE.
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Contents are FLAMMABLE. Keep away from heat, sparks, and open flame.
During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition.
Consult NFPA Code. Use approved Bonding and Grounding procedures.
Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.
OTHER PRECAUTIONS
This product must be mixed with other components before use. Before opening the packages, READ AND FOLLOW WARNING LABELS ON ALL COMPONENTS.
Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

MATERIAL SAFETY DATA SHEET

SHERWIN WILLIAMS®
AUTOMOTIVE FINISHES

THE SHERWIN - WILLIAMS CO.
101 PROSPECT AVE. N.W.
CLEVELAND, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917
INFORMATION TELEPHONE NO.
(216) 566-2902

DATE OF PREPARATION
1 - APR - 91

ULTRA-FILL II® Acrylic Urethane System — *P-URE*

						Primer-Surfacers			*Sealer*		*Sealer*		
—— SECTION II —— CAS No.	HAZARDOUS INGREDIENT (percent by weight)	ACGIH TLV <STEL>	OSHA PEL <STEL>	UNITS	V.P.	P6A48 Gray	P6H49 Beige	R7K50 Accelerator Reducer	E6H59 Neutral	R7K60 Accelerator Reducer	E6C61 Transparent	V6V78 Undercoat Hardener	R7K89 Undercoat Reducer
64742-89-8	Lt. Aliphatic HC Solvent.	100	100	PPM	53.0			8		8			8
108-88-3 §	Toluene.	100 <150>	100 <150>	PPM	22.0	28	28	3	6	3	24		3
1330-20-7 §	Xylene.	100 <150>	100 <150>	PPM	5.9	10	11		9		17	11	
64742-95-6	Light Aromatic Naphtha.	100		PPM	3.8						8	4	
78-83-1	2-Methyl-1-Propanol	50	50	PPM	8.7						1		
78-93-3 §	Methyl Ethyl Ketone.	200 <300>	200 <300>	PPM	70.0						7		
108-10-1 §	Methyl Isobutyl Ketone.	50 <75>	50 <75>	PPM	16.0	3	3	15		16			16
590-01-2	n-Butyl Propionate.	Not Established						26		26			26
123-86-4	n-Butyl Acetate.	150 <200>	150 <200>	PPM	10.0			46	16	47	8	4	47
108-65-6	1-Methoxy-2-Propanol Acetate	Not Established			1.8	1							
Propriet.	Hexamethylene Diisocyanate Polymer.	1.0		Mg/M3 Supplier Limit								60	
822-06-0	Hexamethylene Diisocyanate Monomer	0.005		PPM	0.025							0.18	
7631-86-9	Amorphous Silica.	10	6	Mg/M3 as Dust			3						
14807-06-6	Talc	2	2	Mg/M3 as Resp. Dust		12	8		19		7		
471-34-1	Calcium Carbonate	10	15[5]	Mg/M3 as Dust [Resp. Fraction]					7				
7727-43-7	Barium Sulfate.	10	10[5]	Mg/M3 as Dust [Resp. Fraction]		9	9						
13463-67-7	Titanium Dioxide.	10	10[5]	Mg/M3 as Dust [Resp. Fraction]		8	6		14				
	Weight per Gallon (lbs.)					10.59	10.52	7.06	11.23	7.05	8.06	9.02	7.05
	VOC - Total Volatile Organic Compounds (lbs./gal.)					4.42	4.36	7.03	3.56	7.04	5.38	1.80	7.05
	VOC - Less Water and Exempt Solvents (lbs./gal.)					4.42	4.36	7.03	3.56	7.04	5.38	1.80	7.05
	Photochemically Reactive					Yes	Yes	No	Yes	No	Yes	Yes	No
	Flash Point (°F) / DOL Storage Category					49 / 1B	49 / 1B	67 / 1B	59 / 1B	67 / 1B	40 / 1B	60 / 1C	67 / 1B
	HMIS (NFPA) Rating (health - fire - reactivity)					2 3 0	2 3 0	2 3 0	2 3 0	2 3 0	2 3 0	2* 3 1	2 3 0
	PAINT-SAFE ® Personal Protection					K	K	K	K	K	K	K	K

§ Ingredient subject to the reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313, 40 CFR 372.65 C

Section III — PHYSICAL DATA

PRODUCT WEIGHT –	See TABLE	*EVAPORATION RATE* –	Slower than Ether
SPECIFIC GRAVITY –	0.85-1.3	*VAPOR DENSITY* –	Heavier than Air
BOILING RANGE –	174-360 °F	*MELTING POINT* –	N.A.
VOLATILE VOLUME –	25-100 %	*SOLUBILITY IN WATER* –	N.A.

Section IV — FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY CLASSIFICATION *FLASH POINT* See TABLE *LEL* 0.7 *UEL* 19.7

Red Label - Flammable, Flash below 100 °F

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS

Keep containers tightly closed. Isolate from heat, electrical equipment, sparks, and open flame. Closed containers may explode when exposed to extreme heat. Application to hot surfaces requires special precautions. During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used. Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Section V — HEALTH HAZARD DATA

ROUTES OF EXPOSURE

Exposure may be by INHALATION and/or SKIN or EYE contact, depending on conditions of use. Alcohols and acetates can be absorbed through the skin. To minimize exposure, follow recommendations for proper use, ventilation, and personal protective equipment.

ACUTE Health Hazards

EFFECTS OF OVEREXPOSURE

Irritation of eyes, skin and respiratory system. May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Activator/Hardener may cause allergic respiratory and/or skin reaction in susceptible persons or sensitization. This effect may be delayed several hours after exposure.

EMERGENCY AND FIRST AID PROCEDURES

If INHALED: If any breathing problems occur during use, LEAVE THE AREA and get fresh air. If problems remain or occur later, IMMEDIATELY get medical attention.

If on SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.

If in EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.

If SWALLOWED: Get medical attention.

CHRONIC Health Hazards

No ingredient in these products is an IARC, NTP or OSHA listed carcinogen.

Prolonged overexposure to solvent ingredients in Section II may cause adverse effects to the liver, urinary, blood forming, cardio-vascular, and reproductive systems.

Persons sensitive to isocyanates will experience increased allergic reaction on repeated exposure to isocyanates in Activator/Hardener.

Methyl Ethyl Ketone may increase the nervous system effects of other solvents.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

Section VI — REACTIVITY DATA

STABILITY – Stable

INCOMPATIBILITY

Contamination of Activator/Hardener with Water, Alcohols, Amines, and other compounds which react with isocyanates, may result in dangerous pressure in, and possible bursting of closed containers.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION – Will Not Occur

Section VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate and remove with inert absorbent.

If Activator/Hardener is spilled, all personnel in the area should be protected as in Section VIII. Cover spill with absorbent material. Deactivate spilled material with a 10% ammonium hydroxide solution (household ammonia). After 10 minutes, collect in open containers and add more ammonia. Cover loosely. Wash spill area with soap and water.

WASTE DISPOSAL METHOD

Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers. Waste from products containing Methyl Ethyl Ketone may also require testing for extractability.

Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State, and Local regulations regarding pollution.

Section VIII — PROTECTION INFORMATION

PRECAUTIONS TO BE TAKEN IN USE

NO PERSON SHOULD USE THESE PRODUCTS OR BE IN THE AREA WHERE THE HARDENERS ARE BEING USED, IF THEY HAVE CHRONIC (LONG-TERM) LUNG OR BREATHING PROBLEMS OR IF THEY EVER HAD A REACTION TO ISOCYANATES.

Use all products only with adequate ventilation. Avoid breathing vapor and spray mist. Avoid contact with skin and eyes. Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section II) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section II, the applicable limits for nuisance dusts are ACGIH TLV 10 mg./m3 (total dust), OSHA PEL 15 mg./m3 (total dust), 5 mg./m3 (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section II is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

Where overspray is present, a positive pressure air supplied respirator (T1C19C NIOSH/MSHA approved) should be worn. If unavailable, a properly filited organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section II may be effective. Follow respirator manufacturer's directions for use. Wear the respirator for the whole time of spraying and until all vapors and mists are gone. NO PERSONS SHOULD BE ALLOWED IN THE AREA WHIRE THIS PRODUCT IS BEING USED UNLESS EQUIPPED WITH THE SAME RESPIRATOR PROTECTION RECOMMENDED FOR THE PAINTERS.

When sanding or abrading the dried film, wear a particulate respirator approved by NIOSH/MSHA for protection against non-volatile materials in Section II.

PROTECTIVE GLOVES

Wear gloves which are recommended by glove supplier for protection against materials in Section II.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

OTHER PROTECTIVE EQUIPMENT

Use barrier cream on exposed skin.

Section IX — PRECAUTIONS

DOL STORAGE CATEGORY – See TABLE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Keep away from heat, sparks, and open flame.

During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition.

Consult NFPA Code. Use approved Bonding and Grounding procedures.

Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

OTHER PRECAUTIONS

These products may be mixed with other components before use. Before opening the packages, READ AND FOLLOW WARNING LABELS ON ALL COMPONENTS.

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

MATERIAL SAFETY DATA SHEET

WESTERN Automotive Finishes

WESTERN AUTOMOTIVE FINISHES
101 PROSPECT AVE. N.W.
CLEVELAND, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917
INFORMATION TELEPHONE NO.
(216) 566-2902

DATE OF PREPARATION
2 - Dec - 91

HI-GLO® Synthetic Enamel System

ENL/W1

—SECTION II— CAS No.	HAZARDOUS INGREDIENT (percent by weight)	ACGIH TLV <STEL>	OSHA PEL <STEL>	Units	Vapor Pressure (mm Hg)	HG- series: Pb/Pd LEAD FREE CADMIUM FREE	HG- series: Pb/Pd CONTAINS LEAD CADMIUM FREE	HG- series: Pb/Cd LEAD FREE CONTAINS CADMIUM	HG- series: Pb/Cd CONTAINS LEAD CONTAINS CADMIUM
64742-48-9	V. M. & P. Naphtha	300	300 <400>	PPM	12.0	13-20	13-20	13-20	13-20
64742-47-8	Mineral Spirits	100	100	PPM	2.0	26-35	26-35	26-35	26-35
108-88-3 §	Toluene.	100 <150>	100 <150>	PPM	22.0	4-8	4-8	4-8	4-6
1330-20-7 §	Xylene.	100 <150>	100 <150>	PPM	5.9	1-2	1-2	1-2	1-2
64742-95-6	Light Aromatic Naphtha.	100		PPM	3.8	0-5	0-5	0-5	0-5
123-86-4	n-Butyl Acetate	150 <200>	150 <200>	PPM	10.0	3-4	3-4	3-4	3-4
13463-67-7	Titanium Dioxide	10	10[5]	Mg/M3 [Resp.	as Dust Fraction]	0-18	0-16	0-18	0-18
Unknown	Coated Mica	3	3	Mg/M3	as Dust	0-18	0-18	0-18	0-18
1344-37-2 12656-85-8	Lead Chromate Molybdate Orange.	0.05	0.05	Mg/M3			<23		<23
12626-36-7	Cadmium Red.	0.05	0.05	Mg/M3				<10	<10
§	Lead compound (maximum) [% Lead]						23[13.9]		23[13.9]
§	Chromium compound (maximum) [% Chromium]						23[13.9]		23[13.9]
§	Cadmium Compound (maximum) [% Cadmium]							10[3.3]	10[3.3]
	Weight per Gallon (lbs.)					7.5-9.0	7.5-9.0	7.5-9.0	7.5-9.0
	VOC - Total Volatile Organic Compounds (lbs./gal.)					4.21-4.67	4.21-4.67	4.21-4.67	4.21-4.67
	VOC - Less Water and exempt Solvents (lbs./gal.)					4.21-4.67	4.21-4.67	4.21-4.67	4.21-4.67
	Photochemically Reactive					No	No	No	No
	Flash Point (°F)					72	72	72	72
	HMIS® (NFPA) Rating (health - fire - reactivity)					2 3 0	2* 3 0	2* 3 0	2* 3 0
	PAINT-SAFE® Personal Protection					J3	J3	J3	J3

§ Ingredient subject to the reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313, 40 CFR 372.65 C

Section III — PHYSICAL DATA

PRODUCT WEIGHT –	See TABLE	*EVAPORATION RATE* –	Slower than Ether
SPECIFIC GRAVITY –	0.9-1.1	*VAPOR DENSITY* –	Heavier than Air
BOILING RANGE –	222-395 °F	*MELTING POINT* –	N.A.
VOLATILE VOLUME –	60-70 %	*SOLUBILITY IN WATER* –	N.A.

Section IV — FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY CLASSIFICATION *FLASH POINT* See TABLE *LEL* 0.7 *UEL* 13.1

RED LABEL – Flammable, Flash below 100 F

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS

Keep containers tightly closed. Isolate from heat, electrical equipment, sparks, and open flame. Closed containers may explode when exposed to extreme heat. Application to hot surfaces requires special precautions. During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used. Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Section V — HEALTH HAZARD DATA

ROUTES OF EXPOSURE

Exposure may be by INHALATION and/or SKIN or EYE contact, depending on conditions of use. Alcohols and Acetates can be absorbed through the skin. To minimize exposure, follow recommendations for proper use, ventilation, and personal protective equipment.

ACUTE Health Hazards

EFFECTS OF OVEREXPOSURE

Irritation of eyes, skin and respiratory system. May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

Certain colors contain Lead and/or Cadmium (See TABLE and PRODUCT LABEL). Acute occupational exposure to Lead and/or Cadmium is uncommon, but results in symptoms similar to chronic overexposure described below.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None known.

EMERGENCY AND FIRST AID PROCEDURES

If INHALED: If any breathing problems occur during use, LEAVE THE AREA and get fresh air. If problems remain or occur later, IMMEDIATELY get medical attention.

If on SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.

If in EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.

If SWALLOWED: Get medical attention.

CHRONIC Health Hazards

Certain colors contain Lead, Chromate and/or Cadmium (See TABLE and PRODUCT LABEL).

Chronic overexposure to Lead may result in damage to the blood-forming, nervous, urinary, and reproductive systems (including embryotoxic effects). Symptoms include abdominal discomfort or pain, constipation, loss of appetite, metallic taste, nausea, insomnia, nervous irritability, weakness, muscle and joint pains, headache and dizziness.

Chromates are listed by IARC and NTP. Although studies have associated exposure to Chromium VI compounds with an increased risk of respiratory cancer, available evidence indicates that Lead Chromate (Chrome Yellow, Molybdate Orange) DOES NOT present this hazard.

Cadmium compounds are listed by IARC and NTP. Evidence exists linking certain Cadmium compounds to cancer in animals and possibly humans. Chronic overexposure to Cadmium may result in damage to the kidneys, and the cardiovascular and respiratory system.

Prolonged overexposure to solvent ingredients in Section II may cause adverse effects to the liver, urinary, blood forming, cardio-vascular, and reproductive systems.

Rats exposed to titanium dioxide dust at 250 mg./m3 developed lung cancer, however, such exposure levels are not attainable in the workplace.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

Section VI — REACTIVITY DATA

STABILITY – Stable

INCOMPATIBILITY

Metallics contain Aluminum. Contamination with Water, Acids, or Alkalis can cause evolution of hydrogen, which may result in dangerously increased pressures in closed containers.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide, Oxides of Metals in Section II

HAZARDOUS POLYMERIZATION – Will Not Occur

Section VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate and remove with inert absorbent.

WASTE DISPOSAL METHOD

Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers. Waste from products containing Lead, Chromium, or Cadmium must be tested for extractability.

Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State, and Local regulations regarding pollution.

Section VIII — PROTECTION INFORMATION

PRECAUTIONS TO BE TAKEN IN USE

Certain colors contain Lead (See TABLE and PRODUCT LABEL). Before initial use of Lead-containing colors, consult OSHA's Standard for Occupational Exposure to Lead (29 CFR 1910.1025).

Use only with adequate ventilation. Avoid breathing vapor and spray mist. Avoid contact with skin and eyes. Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section II) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section II, the applicable limits for nuisance dusts are ACGIH TLV 10 mg./m3 (total dust), OSHA PEL 15 mg./m3 (total dust), 5 mg./m3 (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section II is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section II.

When sanding, wirebrushing, abrading, burning, or welding the dried film, wear a particulate respirator approved by NIOSH/MSHA for protection against non-volatile materials in Section II.

PROTECTIVE GLOVES

Wear gloves which are recommended by glove supplier for protection against materials in Section II.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

Section IX — PRECAUTIONS

DOL STORAGE CATEGORY – 1B

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Contents are FLAMMABLE. Keep away from heat, sparks, and open flame.

During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition.

Consult NFPA Code. Use approved Bonding and Grounding procedures.

Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

OTHER PRECAUTIONS

Certain colors contain Lead and/or Cadmium (See TABLE and PRODUCT LABEL). Do not apply Lead-containing or Cadmium-containing colors on toys or other children's articles, furniture, or any interior surface of a dwelling or facility which may be occupied or used by children. Do not apply on any exterior surface of dwelling units, such as window sills, porches, stairs, or railings to which children may be commonly exposed.

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

MATERIAL SAFETY DATA SHEET

SHERWIN WILLIAMS
AUTOMOTIVE FINISHES

THE SHERWIN - WILLIAMS CO.
101 PROSPECT AVE. N.W.
CLEVELAND, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917
INFORMATION TELEPHONE NO.
(216) 566-2902

DATE OF PREPARATION
1 - APR - 91

Water-reducible Primers

P-WR

						AQUA-FILL™	*AQUA II™*		
—SECTION II— CAS No.	HAZARDOUS INGREDIENT (percent by weight)	ACGIH TLV <STEL>	OSHA PEL <STEL>	UNITS	V.P.	W7A2250 Single Component Primer-Surfacer	W8A2500 Epoxy Primer Base	V8W2501 Primer-Sealer Activator	V8W2503 Primer-Surfacer Activator
2807-30-9 §	2-Propoxyethanol	Not Established			1.3		9	8	8
25265-77-4	Trimethylpentanediol Isobutyrate.	Not Established			0.01			5	
111-40-0	Diethylenetriamine.	4	4	Mg/M3				13	
Propriet.	Epoxy Polymer.	Not Established					24		
14807-96-6	Talc	2	2	Mg/M3	as Resp. Dust	20			3
471-34-1	Calcium Carbonate	10	15[5]	Mg/M3	as Dust [Resp. Fraction]		10	7	15
7727-43-7	Barium Sulfate.	10	10[5	Mg/M3	as Dust [Resp. Fraction]			9	
13463-67-7	Titanium Dioxide.	10	10[5]	Mg/M3	as Dust [Resp. Fraction]	5	17		8
	Weight per Gallon (lbs.)					10.22	11.21	10.99	10.90
	Percent Water					30.9	23.2	39.5	55.3
	VOC - Total Volatile Organic Compounds (lbs./gal.)					0.34	1.12	1.52	0.95
	VOC - Less Water and exempt Solvents (lbs./gal.)					1.05	1.94	2.19	1.96
	Photochemically Reactive					No	No	No	No
	Flash Point (°F)					>199	>199	>199	>199
	pH					9.6	8.0	9.0	8.4
	HMIS (NFPA) Rating (health - fire - reactivity)					1 0 0	2* 0 0	2 1 0	2 0 0
	PAINT-SAFE® Personal Protection					J3	J3	J3	J3

§ Ingredient subject to the reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313, 40 CFR 372.65 C

Section III — PHYSICAL DATA

PRODUCT WEIGHT –	See TABLE	*EVAPORATION RATE* –	Slower than Ether
SPECIFIC GRAVITY –	1.2-1.3	*VAPOR DENSITY* –	Heavier than Air
BOILING RANGE –	212-308 °F	*MELTING POINT* –	N.A.
VOLATILE VOLUME –	50-72 %	*SOLUBILITY IN WATER* –	N.A.

Section IV — FIRE AND EXPLOSION HAZARD DATA

AMMABILITY CLASSIFICATION *FLASH POINT* See TABLE *LEL* 1.3 *UEL* 15.8
Not Applicable
TINGUISHING MEDIA
Carbon Dioxide, Dry Chemical, Foam
USUAL FIRE AND EXPLOSION HAZARDS
Closed containers may explode (due to the build-up of pressure) when exposed to extreme heat.
ECIAL FIRE FIGHTING PROCEDURES
Full protective equipment including self-contained breathing apparatus should be used.
ter spray may be ineffective. If water is used, fog nozzles are preferable. Water may be
ed to cool closed containers to prevent pressure build-up and possible autoignition or
plosion when exposed to extreme heat.

Section V — HEALTH HAZARD DATA

UTES OF EXPOSURE
Exposure may be by INHALATION and/or SKIN or EYE contact, depending on conditions of use. To
nimize exposure, follow recommendations for proper use, ventilation, and personal protective
ipment.
UTE Health Hazards
FECTS OF OVEREXPOSURE
Irritation of eyes, skin and respiratory system. May cause nervous system depression.
treme overexposure may result in unconsciousness and possibly death.
DICAL CONDITIONS AGGRAVATED BY EXPOSURE
Exposure to Epoxy Polymer in Epoxy Primer may cause allergic skin reaction in susceptible
rsons.
ERGENCY AND FIRST AID PROCEDURES
If INHALED: If any breathing problmes occur during use, LEAVE THE AREA and get fresh air.
If problems remain or occur later IMMEDIATELY get medical attention.
If on SKIN: Wash affected area thoroughly with soap and water.
Remove contaminated clothing and launder before re-use.
If in EYES: Plush eyes with large amounts of water for 15 minutes. Get medical attention.
F SWALLOWED: Get medical attention.
RONIC Health Hazards
No ingredient in these products product is an IARC, NTP, or OSHA listed carcinogen.
Prolonged overexposure to solvent ingredients in Section II may cause adverse effects to
e liver and urinary systems.
Rats exposed to titanium dioxide dust at 250 mg./m3 developed lung cancer, however, such
posure levels are not attainable in the workplace.
leports have associated repeated and prolonged overexposure to solvents with permanent brain
l nervous system damage.

Section VI — REACTIVITY DATA

ABILITY – Stable
COMPATIBILITY
None known.
ZARDOUS DECOMPOSITION PRODUCTS
By fire: Carbon Dioxide, Carbon Monoxide
ZARDOUS POLYMERIZATION – Will Not Occur

Section VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Remove all sources of ignition. Ventilate and remove with inert absorbent.
WASTE DISPOSAL METHOD
Waste from these products is not hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.
Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State, and Local regulations regarding pollution.

Section VIII — PROTECTION INFORMATION

PRECAUTIONS TO BE TAKEN IN USE
Use only with adequate ventilation. Avoid breathing vapor and spray mist. Avoid contact with skin and eyes. Wash hands after using.
VENTILATION
Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section II is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.
RESPIRATORY PROTECTION
If personal exposure cannot be controlled below applicable limits by ventilation wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section II.
When sanding or abrading the dried film, wear a particulate respirator approved by NIOSH/MSHA for protection against non-volatile materials in Section II.
PROTECTIVE GLOVES
Wear gloves which are recommended by glove supplier for protection against materials in Section II. Use of barrier cream on exposed skin is recommended when using the Epoxy Primer.
EYE PROTECTION
Wear safety spectacles with unperforated sideshields.

Section IX — PRECAUTIONS

DOL STORAGE CATEGORY – 3B
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

MATERIAL SAFETY DATA SHEET

SHERWIN WILLIAMS®
AUTOMOTIVE FINISHES

THE SHERWIN - WILLIAMS CO.
101 PROSPECT AVE. N.W.
CLEVELAND, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917
INFORMATION TELEPHONE NO.
(216) 566-2902

DATE OF PREPARATION
1 - APR - 91

SUNFIRE® Acrylic Urethane Reducers

URE/2

—SECTION II— CAS No.	HAZARDOUS INGREDIENT (percent by weight)	ACGIH TLV <STEL>	OSHA PEL <STEL>	UNITS	V.P.	R7K6200 Very Fast	R7K6202 Fast	R7K6204 Medium	R7K6206 Slow	R7K6208 Retarder	R7K7206 Slow
108-88-3 §	Toluene.	100 <150>	100 <150>	PPM	22.0	20					
1330-20-7 §	Xylene.	100 <150>	100 <150>	PPM	5.9						15
78-93-3 §	Methyl Ethyl Ketone.	200 <300>	200 <300>	PPM	70.0	60					
108-10-1 §	Methyl Isobutyl Ketone.	50 <75>	50 <75>	PPM	16.0						72
123-86-4	n-Butyl Acetate.	150 <200>	150 <200>	PPM 72	10.0		87	71	55		
90438-79-2	Oxo-Heptyl Acetate	Not Established			0.8						5
112-07-2 §	2-Butoxyethyl Acetate.	50		PPM	1.0		2	18	32		
108-65-6	1-Methoxy-2-Propanol Acetate	Not Established			1.8		11	11	14		
106-65-0	Dimethyl Succinate.	81		PPM Supplier Limit	0.3					29	2
1119-40-0	Dimethyl Glutarate.	87		PPM Supplier Limit	0.1					70	5
	Weight per Gallon (lbs.)					6.77	7.39	7.46	7.55	9.15	6.87
	VOC - Total Volatile Organic Compounds (lbs./gal.)					6.77	7.39	7.46	7.55	9.15	6.87
	VOC - Less Water and exempt Solvents (lbs./gal.)					6.77	7.39	7.46	7.55	9.15	6.87
	Photochemically Reactive					No	No	No	No	No	Yes
	Flash Point (°F)					12	72	72	72	>199	62
	Flammability Class					Flammable	Flammable	Flammable	Flammable	Not Applicable	Flammable
	DOL Storage Category					1B	1B	1B	1B	3B	1B
	HMIS (NFPA) Rating (health - fire - reactivity)					2 3 0	2 3 0	2 3 0	2 3 0	1 1 0	2 3 0
	PAINT-SAFE® Personal Protection					K	K	K	K	K	K

§ Ingredient subject to the reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313, 40 CFR 372.65 C

Section III — PHYSICAL DATA

PRODUCT WEIGHT – See TABLE
SPECIFIC GRAVITY – 0.81-1.1
BOILING RANGE – 174-384° F
VOLATILE VOLUME – 100 %
EVAPORATION RATE – Slower than Ether
VAPOR DENSITY – Heavier than Air
MELTING POINT – N.A.
SOLUBILITY IN WATER – N.A.

Section IV — FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY CLASSIFICATION See TABLE *FLASH POINT* See TABLE *LEL* 0.7 *UEL* 6.7

EXTINGUISHING MEDIA
Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS
Keep containers tightly closed. Isolate from heat, electrical equipment, sparks, and open flame. Closed containers may explode when exposed to extreme heat. Application to hot surfaces requires special precautions. During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIRE FIGHTING PROCEDURES
Full protective equipment including self-contained breathing apparatus should be used. Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Section V — HEALTH HAZARD DATA

ROUTES OF EXPOSURE
Exposure may be by INHALATION and/or SKIN or EYE contact, depending on conditions of use. Alcohols and acetates can be absorbed through the skin. Follow recommendations for proper use, ventilation, and personal protective equipment to minimize exposure.

ACUTE Health Hazards

EFFECTS OF OVEREXPOSURE
Irritation of eyes, skin and respiratory system. May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

SIGNS AND SYMPTOMS OF OVEREXPOSURE
Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.
Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
None generally recognized.

EMERGENCY AND FIRST AID PROCEDURES
If INHALED: If affected, remove from exposure. Restore breathing. Keep warm and quiet.
If on SKIN: Wash affected area thoroughly with soap and water.
Remove contaminated clothing and launder before re-use.
If in EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.
If SWALLOWED: Get medical attention.

CHRONIC Health Hazards
No ingredient in these products is an IARC, NTP or OSHA listed carcinogen.
Methyl Ethyl Ketone may increase the nervous system effects of other solvents.
Prolonged overexposure to solvent ingredients in Section II may cause adverse effects to the liver, urinary, blood forming, cardio-vascular, and reproductive systems.
Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

Section VI — REACTIVITY DATA

STABILITY – Stable
INCOMPATIBILITY
None known.
HAZARDOUS DECOMPOSITION PRODUCTS
By fire: Carbon Dioxide, Carbon Monoxide
HAZARDOUS POLYMERIZATION – Will Not Occur

Section VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Remove all sources of ignition. Ventilate and remove with inert absorbent.

WASTE DISPOSAL METHOD
Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers. Waste from products containing Methyl Ethyl Ketone may also require extractability testing.
Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State, and Local regulations regarding pollution.

Section VIII — PROTECTION INFORMATION

PRECAUTIONS TO BE TAKEN IN USE
Use only with adequate ventilation. Avoid breathing vapor and spray mist. Avoid contact with skin and eyes. Wash hands after using.

VENTILATION
Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section II is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION
If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section II.

PROTECTIVE GLOVES
Wear gloves which are recommended by glove supplier for protection against materials in Section II.

EYE PROTECTION
Wear safety spectacles with unperforated sideshields.

Section IX — PRECAUTIONS

DOL STORAGE CATEGORY – See TABLE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Keep away from heat, sparks, and open flame.
During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition.
Consult NFPA Code. Use approved Bonding and Grounding procedures.
Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

OTHER PRECAUTIONS
Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

MATERIAL SAFETY DATA SHEET

WESTERN Automotive Finishes
WESTERN AUTOMOTIVE FINISHES
101 PROSPECT AVE. N.W.
CLEVELAND, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917
INFORMATION TELEPHONE NO.
(216) 566-2902

DATE OF PREPARATION
2 - DEC - 91

HI-GLO® Synthetic Enamel

ENL/W3

						Clearcoats		*Hardeners*						
—SECTION II— CAS No.	HAZARDOUS INGREDIENT (percent by weight)	ACGIH TLV <STEL>	OSHA PEL <STEL>	Units	Vapor Pressure (mm Hg)	W159 Clearcoat	W160 High Performance	W1001 GLOSS ONE® Gloss	W1010 MAXI-GLOSS® High Gloss	W1016 High Solids	W1020 INTERLOCK™ Gloss	W1029 HI-GLO™ GLASPAK™	W1030 HI-GLO™ GLASPAK™	W1032 HS Hardener
64742-48-9	V. M. & P. Naphtha	300	300 <400>	PPM	12.0	7								
64742-47-8	Mineral Spirits	100	100	PPM	2.0	23								
108-88-3 §	Toluene.	100 <150>	100 <150>	PPM	22.0	5	3							
100-41-4 §	Ethylbenzene.	100 <125>	100 <125>	PPM	7.1				2					2
1330-20-7 §	Xylene.	100 <150>	100 <150>	PPM	5.9	6	5		39	10		5		13
64742-95-6	Light Aromatic Naphtha.	100		PPM	3.8			10	11	13	10	4	14	16
111-76-2 §	2-Butoxyethanol	25	25	PPM (Skin)	0.6							2	2	
107-87-9 §	Methyl n-Propyl Ketone.	200 <250>	200 <250>	PPM	27.8			2						
95-48-7	2-Methylphenol	5	5	PPM (Skin)	0.3			2						
90-05-1	2-Methoxyphenol	Not Established			99.8					2				
141-78-6	Ethyl Acetate	400	400	PPM	86.0							56	26	
123-86-4	n-Butyl Acetate.	150 <200>	150 <200>	PPM	10.0	14	43	27	5	17	27	13	27	9
112-07-2 §	2-Butoxyethyl Acetate.	50		PPM	1.0								11	
108-65-6	1-Methoxy-2-Propanol Acetate	Not Established			1.8		10	19			19			
Proprietary	Hexamethylene Diisocyanate Polymer.	0.5 <1.0>		Mg/M3 Supplier Limit				13		20	13	6	6	
822-06-0	Hexamethylene Diisocyanate Monomer	0.005		PPM	0.025			0.04		0.04	0.03	0.01	0.01	
Proprietary	Isophorone Diisocyanate Polymer	Not Established						31	38	40	31	13	14	60
4098-71-9	Isophorone Diisocyanate Monomer	0.005	0.005 <0.02>	PPM				0.31	0.38	0.40	0.31	0.13	0.14	0.60
	Weight per Gallon (lbs.)					7.66	8.12	8.37	8.04	8.55	8.36	7.77	7.79	8.54
	VOC - Total Volatile Organic Compounds (lbs./gal.)					4.36	5.00	4.61	4.94	3.42	4.61	6.17	6.10	3.41
	VOC - Less Water and exempt Solvents (lbs./gal.)					4.36	5.00	4.61	4.94	3.42	4.61	6.17	6.10	3.41
	Photochemically Reactive					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Flash Point (°F) / DOL Storage Category					78 / 1C	58 / 1B	78 / 1C	78 / 1C	30 / 1B	80 / 1C	30 / 1B	30 / 1B	80 / 1C
	HMIS® (NFPA) Rating (health - fire - reactivity) / PAINT-SAFE®					2*3 0 / K	2*3 0 / K	3*3 0 / K	3*3 1 / K	3*3 1 / K	3*3 1 / K	3*3 1 / K	3*3 1 / K	3*3 0 / K

§ Ingredient subject to the reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313, 40 CFR 372.65 C

HI-GLO Synthetic Enamel System

Section III — PHYSICAL DATA

PRODUCT WEIGHT –	See TABLE	*EVAPORATION RATE* –	Slower than Ether
SPECIFIC GRAVITY –	0.92-1.03	*VAPOR DENSITY* –	Heavier than Air
BOILING RANGE –	163-401 °F	*MELTING POINT* –	N.A.
VOLATILE VOLUME –	48-84 %	*SOLUBILITY IN WATER* –	N.A.

Section IV — FIRE AND EXPLOSION HAZARD DATA

ABILITY CLASSIFICATION *FLASH POINT* See TABLE *LEL* 0.5 *UEL* 99.8
) LABEL – Flammable, Flash below 100 F
GUISHING MEDIA
:bon Dioxide, Dry Chemical, Foam
AL FIRE AND EXPLOSION HAZARDS
:p containers tightly closed. Isolate from heat, electrical equipment, sparks, and open . Closed containers may explode when exposed to extreme heat. Application to hot ces requires special precautions. During emergency conditions overexposure to position products may cause a health hazard. Symptoms may not be immediately apparent. n medical attention.
AL FIRE FIGHTING PROCEDURES
:l protective equipment including self-contained breathing apparatus should be used. spray may be ineffective. If water is used, fog nozzles are preferable. Water may be :o cool closed containers to prevent pressure build-up and possible autoignition or sion when exposed to extreme heat.

Section V — HEALTH HAZARD DATA

S OF EXPOSURE
)osure may be by INHALATION and/or SKIN or EYE contact, depending on conditions of use. ols and acetates can be absorbed through the skin. To minimize exposure, follow recommen- ns for proper use, ventilation, and personal protective equipment.
: Health Hazards
TS OF OVEREXPOSURE
:itation of eyes, skin and respiratory system. May cause nervous system depression. ne overexposure may result in unconsciousness and possibly death.
AND SYMPTOMS OF OVEREXPOSURE
adache, dizziness, nausea, and loss of coordination are indications of excessive exposure)ors or spray mists.
iness and itching or burning sensation may indicate eye or excessive skin exposure.
AL CONDITIONS AGGRAVATED BY EXPOSURE
:deners CONTAIN ISOCYANATES. May cause allergic respiratory and/or skin reaction in ptible persons or sensitization. This effect may be delayed several hours after exposure.
ENCY AND FIRST AID PROCEDURES
: INHALED: If any breathing problems occur during use, LEAVE THE AREA and get fresh air. If problems remain or occur later, IMMEDIATELY get medical attention.
: on SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.
: in EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.
SWALLOWED: Get medical attention.
NIC Health Hazards
ingredient in these products is an IARC, NTP or OSHA listed carcinogen.
)longed overexposure to solvent ingredients in Section II may cause adverse effects to liver, urinary, blood forming, cardiovascular, and reproductive systems.
:deners CONTAIN ISOCYANATES. Persons sensitive to isocyanates will experience increased gic reaction on repeated exposure.
)orts have associated repeated and prolonged overexposure to solvents with permanent brain ervous system damage.

Section VI — REACTIVITY DATA

LITY – Stable
PATIBILITY
ntamination of hardeners with Water, Alcohols, Amines, and other compounds which react with anates, may result in dangerous pressure in, and possible bursting of, closed containers.
DOUS DECOMPOSITION PRODUCTS
fire: Carbon Dioxide, Carbon Monoxide, Oxides of Nitrogen, possibility of Hydrogen Cyanide
DOUS POLYMERIZATION – Will Not Occur

Section VII — SPILL OR LEAK PROCEDURES

TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
move all sources of ignition. Ventilate and remove with inert absorbent.
hardener is spilled, all personnel in the area should be protected as in Section VIII. spill with absorbent material. Deactivate spilled material with a 10% ammonium hydroxide ion (household ammonia). After 10 minutes, collect in open containers and add more ammo- Cover loosely. Wash spill area with soap and water.

WASTE DISPOSAL METHOD
Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.
Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State, and Local regulations regarding pollution.

Section VIII — PROTECTION INFORMATION

PRECAUTIONS TO BE TAKEN IN USE
NO PERSON SHOULD USE THESE PRODUCTS, OR BE IN THE AREA WHERE THESE PRODUCTS ARE BEING USED, IF THEY HAVE CHRONIC (LONG-TERM) LUNG OR BREATHING PROBLEMS OR IF THEY EVER HAD A REACTION TO ISOCYANATES.
Use only with adequate ventilation. Avoid breathing vapor and spray mist. Avoid contact with skin and eyes. Wash hands after using.
This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section II) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section II, the applicable limits for nuisance dusts are ACGIH TLV 10 mg./m3 (total dust), OSHA PEL 15 mg./m3 (total dust), 5 mg./m3 (respirable fraction).
VENTILATION
Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section II is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.
RESPIRATORY PROTECTION
Where overspray is present, a positive pressure air supplied respirator (TC19C NIOSH/MSHA approved) should be worn. If unavailable, a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section II may be effective. Follow respirator manufacturer's directions for use. Wear the respirator for the whole time of spraying and until all vapors and mists are gone. NO PERSONS SHOULD BE ALLOWED IN THE AREA WHERE THIS PRODUCT IS BEING USED UNLESS EQUIPPED WITH THE SAME RESPIRATOR PROTECTION RECOMMENDED FOR THE PAINTERS.
When sanding or abrading the dried film, wear a particulate respirator approved by NIOSH/MSHA for protection against non-volatile materials in Section II.
PROTECTIVE GLOVES
Wear gloves which are recommended by glove supplier for protection against materials in Section II.
EYE PROTECTION
Wear safety spectacles with unperforated sideshields.
OTHER PROTECTIVE EQUIPMENT
Use barrier cream on exposed skin.

Section IX — PRECAUTIONS

DOL STORAGE CATEGORY – See TABLE.
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Contents are FLAMMABLE. Keep away from heat, sparks, and open flame.
During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition.
Consult NFPA Code. Use approved Bonding and Grounding procedures.
Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.
OTHER PRECAUTIONS
This product must be mixed with other components before use. Before opening the packages, READ AND FOLLOW WARNING LABELS ON ALL COMPONENTS.
Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

MATERIAL SAFETY DATA SHEET

WESTERN Automotive Finishes
WESTERN AUTOMOTIVE FINISHES
101 PROSPECT AVE. N.W.
CLEVELAND, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917
INFORMATION TELEPHONE NO.
(216) 566-2902

DATE OF PREPARATION
2 - DEC - 91

HI-GLO® Synthetic Enamel Factory Packaged Colors *W500/W2*

—SECTION II— CAS No.	HAZARDOUS INGREDIENT (percent by weight)	ACGIH TLV <STEL>	OSHA PEL <STEL>	Units	Vapor Pressure (mm Hg)	W546 Embassy Red	W547 Porsche Red	W549 Cherry Red Metallic	W551 Antique White	W552 Wimbledon White	W553 Cream Beige	W554 Light Buckskin	W556 Corvette Yellow	W557 Cashmere Beige Met.	W558 Pure White	W559 Fleet White	W560 Light Blue
64742-48-9	V. M. & P. Naphtha	300	300 <400>	PPM	12.0	16	15	11	15	15	15	15	17	15	15	15	14
64742-47-8	Mineral Spirits	100	100	PPM	2.0	29	28	32	23	23	26	24	26	32	23	24	25
108-88-3 §	Toluene.	100 <150>	100 <150>	PPM	22.0	5	5	6	4	4	5	5	5	6	4	4	5
1330-20-7 §	Xylene.	100 <150>	100 <150>	PPM	5.9	2	2	2			1	1	1	1			1
64742-95-6	Light Aromatic Naphtha.	100		PPM	3.8									1			
123-86-4	n-Butyl Acetate.	150 <200>	150 <200>	PPM	10.0	4	4	4	3	3	3	3	4	4	3	3	3
13463-67-7	Titanium Dioxide.	10	10[5]	Mg/M3 [Resp.	as Dust Fraction]				22	22	14	16	2		22	22	18
8007-18-9	Nickel Antimony Titanate.	0.5	0.5	Mg/M3									4				
§	Nickel compound [% Nickel]												4[0.2]				
§	Antimony compound [%Antimony]												4[0.6]				
	Weight per Gallon (lbs.)					7.55	7.61	7.65	8.92	8.92	8.37	8.59	7.98	7.54	8.92	8.91	8.64
	VOC - Total Volatile Organic Compounds (lbs./gal.)					4.29	4.18	4.21	4.17	4.17	4.28	4.20	4.24	4.45	4.17	4.17	4.16
	VOC - Less Water and exempt Solvents (lbs./gal.)					4.29	4.18	4.21	4.17	4.17	4.28	4.20	4.24	4.45	4.17	4.17	4.16
	Photochemically Reactive					Yes	No	Yes	No	No	No	No	No	Yes	Yes	No	No
	Flash Point (°F)					72	72	72	72	72	72	72	72	72	72	72	72
	HMIS®(NFPA) Rating (health - fire - reactivity)					2 3 0	2 3 0	2 3 0	2 3 0	2 3 0	2 3 0	2 3 0	2 3 0	2 3 1	2 3 0	2 3 0	2 3 0
	PAINT-SAFE® Personal Protection					J3	J3	J3	J3	J3	J3	J3	J3	J3	J3	J3	J3

§ Ingredient subject to the reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313, 40 CFR 372.65 C

[illegible] Synthetic Enamel Factory Packaged Colors W5[illegible]/W

Section III — PHYSICAL DATA

PRODUCT WEIGHT – See TABLE
SPECIFIC GRAVITY – 0.89-1.1
BOILING RANGE – 178-437 °F
VOLATILE VOLUME – 63-71 %
EVAPORATION RATE – Slower than Ether
VAPOR DENSITY – Heavier than Air
MELTING POINT – N.A.
SOLUBILITY IN WATER – N.A.

Section IV — FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY CLASSIFICATION *FLASH POINT* See TABLE *LEL* 0.7 *UEL* 13.1
RED LABEL - Flammable. Flash below 100 °F
EXTINGUISHING MEDIA
Carbon Dioxide, Dry Chemical, Foam
UNUSUAL FIRE AND EXPLOSION HAZARDS
Keep containers tightly closed. Isolate from heat, electrical equipment, sparks, and open flame. Closed containers may explode when exposed to extreme heat. Application to hot surfaces requires special precautions. During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent.
SPECIAL FIRE FIGHTING PROCEDURES
Full protective equipment including self-contained breathing apparatus should be used. Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Section V — HEALTH HAZARD DATA

ROUTES OF EXPOSURE
Exposure may be by INHALATION and/or SKIN or EYE contact, depending on conditions of use. Alcohols and acetates can be absorbed through the skin. To minimize exposure, follow recommendations for proper use, ventilation, and personal protective equipment.
ACUTE Health Hazards
EFFECTS OF OVEREXPOSURE
Irritation of eyes, skin and respiratory system. May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.
SIGNS AND SYMPTOMS OF OVEREXPOSURE
Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.
Redness and itching or burning sensation may indicate eye or excessive skin exposure.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
None generally recognized.
EMERGENCY AND FIRST AID PROCEDURES
If INHALED: If affected, remove from exposure. Restore breathing. Keep warm and quiet.
If on SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.
If in EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.
If SWALLOWED: Never give anything by mouth to an unconscious person. DO NOT INDUCE VOMITING. Give several glasses of water. Seek medical attention.
CHRONIC Health Hazards
No ingredient in these products is an IARC, NTP, or OSHA listed carcinogen.
Prolonged overexposure to solvent ingredients in Section II may cause adverse effects to the liver, urinary, blood forming, cardio-vascular, and reproductive systems.
Rats exposed to titanium dioxide dust at 250 mg./m3 developed lung cancer, however, such exposure levels are not attainable in the workplace.
Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

Section VI — REACTIVITY DATA

STABILITY – Stable
INCOMPATIBILITY
Metallics contain Aluminum. Contamination with Water, Acids, or Alkalis can cause evolution of hydrogen, which may result in dangerously increased pressures in closed containers.
HAZARDOUS DECOMPOSITION PRODUCTS
By fire: Carbon Dioxide, Carbon Monoxide, Oxides of Metals in Section II
HAZARDOUS POLYMERIZATION – Will Not Occur

Section VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Remove all sources of ignition. Ventilate and remove with inert absorbent.
WASTE DISPOSAL METHOD
Waste from these products may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Waste must be tested for ignitability to determine the applicable EPA hazardous waste number. Waste from products containing Chromium may also require testing for extractability.
Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State, and Local regulations regarding pollution.

Section VIII — PROTECTION INFORMATION

PRECAUTIONS TO BE TAKEN IN USE
Use only with adequate ventilation. Avoid breathing vapor and spray mist. Avoid contact with skin and eyes. Wash hands after using.
This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section II) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section II, the applicable limits for nuisance dusts are ACGIH TLV 10 mg./m3 (total dust), OSHA PEL 15 mg./m3 (total dust), 5 mg./m3 (respirable fraction).
VENTILATION
Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section II is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.
RESPIRATORY PROTECTION
If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section II.
When sanding, wirebrushing, abrading, burning or welding the dried film, wear a particulate respirator approved by NIOSH/MSHA for protection against non-volatile materials in Section II.
PROTECTIVE GLOVES
Wear gloves which are recommended by glove supplier for protection against materials in Section II.
EYE PROTECTION
Wear safety spectacles with unperforated sideshields.

Section IX — PRECAUTIONS

DOL STORAGE CATEGORY – 1B
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Contents are FLAMMABLE. Keep away from heat, sparks, and open flame.
Consult NFPA Code. Use approved Bonding and Grounding procedures.
Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.
OTHER PRECAUTIONS
Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

MATERIAL SAFETY DATA SHEET

WESTERN Automotive Finishes

WESTERN AUTOMOTIVE FINISHES
101 PROSPECT AVE. N.W.
CLEVELAND, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917
INFORMATION TELEPHONE NO.
(216) 566-2902

DATE OF PREPARATION
2 - Dec - 91

HI-GLO® Synthetic Enamel Reducers

ENL/W2

—SECTION II— CAS No.	HAZARDOUS INGREDIENT (percent by weight)	ACGIH TLV <STEL>	OSHA PEL <STEL>	Units	Vapor Pressure (mm Hg)	WS4575 Fast	WS6590 Medium	WS85100 Slow	WS59 Fast	WS60 Medium	WS61 Slow	WS5 Easy Blend
64742-89-8	Lt. Aliphatic HC Solvent.	100	100	PPM	53.0	25	25	25				
64742-48-9	V. M. & P. Naphtha	300	300 <400>	PPM	12.0				24	45	42	24
108-88-3 §	Toluene.	100 <150>	100 <150>	PPM	22.0	64	34	28	10	17	16	5
1330-20-7 §	Xylene.	100 <150>	100 <150>	PPM	5.9		4		8			
64742-95-6	Light Aromatic Naphtha.	100		PPM	3.8	11	32	37				
64742-94-5	Heavy Aromatic Naphtha	50		PPM	0.1		4	11				
64-17-5	Ethanol	1000	1000	PPM	44.0				3			3
67-63-0 §	2-Propanol	400 <500>	400 <500>	PPM	33.0				9			9
111-76-2 §	2-Butoxyethanol	25	25	PPM (Skin)	0.6					9		
141-78-6	Ethyl Acetate	400	400	PPM	86.0				22	25	24	22
108-65-6	1-Methoxy-2-Propanol Acetate	Not Established			1.8				21		12	21
106-65-0	Dimethyl Succinate.	61		PPM Supplier Limit	0.3				1	1	2	1
1119-40-0	Dimethyl Glutarate.	67		PPM Supplier Limit	0.1				3	3	4	3
	Weight per Gallon (lbs.)					6.64	6.66	6.67	7.11	6.84	6.95	7.11
	Percent Water								0.12			0.20
	VOC - Total Volatile Organic Compounds (lbs./gal.)					6.64	6.66	6.67	7.10	6.84	6.95	7.10
	VOC - Less Water and exempt Solvents (lbs./gal.)					6.64	6.66	6.67	7.11	6.84	6.95	7.11
	Photochemically Reactive					Yes	Yes	Yes	No	Yes	No	No
	Flash Point (°F)					45	70	39	5	5	5	5
	HMIS® (NFPA) Rating (health - fire - reactivity)					2 3 0	2 3 0	2 3 0	2 3 0	2 3 0	2 3 0	2 3 0
	PAINT-SAFE® Personal Protection					J3	J3	J3	J3	J3	J3	J3

§ Ingredient subject to the reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313, 40 CFR 372.65 C

Section III — PHYSICAL DATA

PRODUCT WEIGHT –	See TABLE	*EVAPORATION RATE* –	Slower than Ether
SPECIFIC GRAVITY –	0.82-0.85	*VAPOR DENSITY* –	Heavier than Air
BOILING RANGE –	163-419 °F	*MELTING POINT* –	N.A.
VOLATILE VOLUME –	100 %	*SOLUBILITY IN WATER* –	N.A.

Section IV — FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY CLASSIFICATION *FLASH POINT* See TABLE *LEL* 0.7 *UEL* 99.8
Flammable, Flash below 100 °F
EXTINGUISHING MEDIA
Carbon Dioxide, Dry Chemical, Foam
UNUSUAL FIRE AND EXPLOSION HAZARDS
Keep containers tightly closed. Isolate from heat, electrical equipment, sparks, and open flame. Closed containers may explode when exposed to extreme heat. Application to hot surfaces requiree special precautions. During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.
SPECIAL FIRE FIGHTING PROCEDURES
Full protective equipment including self-contained breathing apparatus should be used. Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Section V — HEALTH HAZARD DATA

ROUTES OF EXPOSURE
Exposure may be by INHALATION and/or SKIN or EYE contact, depending on conditions of use. Alcohols and acetates can be absorbed through the skin. Follow recommendations for proper use, ventilation, and personal protective equipment to minimize exposure.
ACUTE Health Hazards
EFFECTS OF OVEREXPOSURE
Irritation of eyes, skin and respiratory system. May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.
SIGNS AND SYMPTOMS OF OVEREXPOSURE
Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.
Redness and itching or burning sensation may indicate eye or excessive skin exposure.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
None generally recognized.
EMERGENCY AND FIRST AID PROCEDURES
If INHALED: If affected, remove from exposure. Restore breathing. Keep warm and quiet.
If on SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.
If in EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.
If SWALLOWED: Never give anything by mouth to an unconscious person. DO NOT INDUCE VOMITING. Give several glasses of water. See medical attention.
CHRONIC Health Hazards
No ingredient in these products is an IARC, NTP or OSHA listed carcinogen.
Prolonged overexposure to solvent ingredients in Section II may cause adverse effects to the liver, urinary, blood forming, cardio-vascular, and reproductive systems.
Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

Section VI — REACTIVITY DATA

STABILITY – Stable
INCOMPATIBILITY
None known.
HAZARDOUS DECOMPOSITION PRODUCTS
By fire: Carbon Dioxide, Carbon Monoxide
HAZARDOUS POLYMERIZATION – Will Not Occur

Section VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Remove all sources of ignition. Ventilate and remove with inert absorbent.
WASTE DISPOSAL METHOD
Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.
Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State, and Local regulations regarding pollution.

Section VIII — PROTECTION INFORMATION

PRECAUTIONS TO BE TAKEN IN USE
Use only with adequate ventilation. Avoid breathing vapor and spray mist. Avoid contact with skin and eyes. Wash hands after using.
VENTILATION
Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section II is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.
RESPIRATORY PROTECTION
If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section II.
PROTECTIVE GLOVES
Wear gloves which are recommended by glove supplier for protection against materials in Section II.
EYE PROTECTION
Wear safety spectacles with unperforated sideshields.

Section IX — PRECAUTIONS

DOL STORAGE CATEGORY – IB
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Contents are FLAMMABLE. Keep away from heat, sparks, and open flame.
During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition.
Consult NFPA Code. Use approved Bonding and Grounding procedures.
Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.
OTHER PRECAUTIONS
Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

Appendix D-10

Compost Facility O&M Plan

COMPOST FACILITY

8.0 ODOR CONTROL SYSTEM O AND M PLAN

8.1 Introduction

Odor emission is a natural part of composting and all decomposition processes. However, proper operation of the composting facility will reduce the amount of odor generated. The following are some necessary guidelines for proper operation of the facility:

1. Never allow un-composted biosolids or mixtures of biosolids and amendment to sit for prolonged periods without agitation and controlled aeration. All material should be mixed and loaded into the reactors by the end of the operation shift. Piles of biosolids and input mixtures should not sit overnight on the mixing floor.
2. Maintain aeration to the compost reactors as uniformly as possible. Prolonged periods (6 hours or more) in the absence of air will significantly increase odors. Aeration cycle times in the front ends of the reactors should be adjusted so that aeration is obtained even though temperatures have not achieved "set points."
3. Do not allow temperatures to consistently rise to above 65°C. As temperatures increase, the generation of odorous compounds will be increased.
4. Reactors must be agitated and aerated on a consistent schedule. Rapid swings in compost aeration and temperature can result in the release of excessive odors. If blowers have been disabled for prolonged periods, start aeration only a few reactors at a time to minimize the release of odors.

III.I.3 16
III.I.7 16

5. Maintain a clean environment in the facility. Do not allow pools of water to sit on the floor or aisles. Spills of biosolids and unprocessed compost should be cleaned up immediately. The main floor and mixing equipment should be cleaned regularly.

6. Maintain proper moisture levels in the compost. Excessive moisture (low dry solids) in the input mix or inadequate mix porosity will lead to excessive odor.

7. The biosolids/amendment mixture should be well mixed; balls of unmixed material will result in the generation of odors and the reduction of composting efficiency.

8. Maintain the biofilter in accordance with the instructions provided. Adequate moisture throughout the biofilter is imperative to proper performance.

Each IPS composting system is equipped with an exhaust system which ventilates the interior of the compost building. This air normally is removed and sent through a biofiltration system. The biofiltration systems designed by IPS are used to remove organics and odorous compounds from the air.

8.2 Building Exhaust System

While the aeration system provides oxygen and cools the compost within the reactors, it also removes decomposition byproducts. The composting process generates heat, moisture, carbon dioxide, and other organic compounds. These byproducts are then evacuated from the composting building and sent through the biofilter for purification.

The main objectives of the building exhaust system is to contain odors until they can be processed by the biofilter, provide air quality for the employees within the compost building, provide aeration air for the composting process, and to provide for exhaust of decomposition byproducts to the biofilter.

The exhaust system is an important element of the composting process. Maintaining negative air pressures within the composting building improves the containment of odors within the composting building. Efficient removal of the moisture laden odorous air is an important factor in maintaining air quality for employees within the composting building.

The warm, humid, and odorous air is removed from the composting building by ventilation blowers. Each ventilation blower may discharge to the atmosphere directly or to the biofilter. The discharge path is controlled with a manually operated damper. The blower motors are two speed, capable of operating at high speed when discharging to the biofilter and at low speed when discharging directly to the atmosphere. The resistance to air flow through the biofilter requires more discharge pressure and thus higher speed.

Air is removed from the building for the comfort of people working in the area. The normal path of ventilation air is through the blowers to the biofilter. Discharge to the atmosphere is limited to times when there is little or no odor in the building, when

atmospheric conditions permit the direct exhaust, or when work is being done on the biofilter.

As an exhaust blower is taken out of service, the airflow to the biofilter is changed. This makes it necessary to monitor the biofilter for operational changes. Buildup of water in the base of the biofilter should be prevented. Once the exhaust fan has been restarted, fan amps and backpressure should be measured to ensure a return to normal operations.

8.2.1 HVAC Control

The ventilation blowers are controlled with the same control computer and workstation that controls the aeration blowers in the building. The blowers are started or stopped by computer controlled relays located in the control computer cabinet. These relays are wired into the motor starter control circuits.

There are two computer controlled relays in the control computer cabinet for each ventilation blower. There is one relay which is wired to the motor starter to close the contacts for four seconds, start the motor, and then open them again. There is one relay which is wired to the motor starter for four seconds to stop the motor and is then closed.

Due to the nature of the composting operation, the blowers will run in the high speed mode to the biofilter most of the time. Low speed control of the two-speed blowers will be a secondary operation; therefore, this control will be manually

activated. **The operator can only control the low speed at the motor control center, not via the computer workstation.** At the computer workstation, the operators can control the blowers on high speed or off. The discharge damper also will be controlled manually.

For the occasions that the blowers will be discharging to the atmosphere, the operator will establish procedures for proper operation. The blowers shall be turned off and the operator will manually change and check (verify) the damper positions. Low speed control will then be manually activated at the MCC. Damper positioning must be checked prior to engaging in speed changes. The same procedure shall be established when changing back to the normal (high speed) control operation.

The control computer communicates with the operator workstation computer. The operation of the ventilation blowers is controlled from the ventilation screen on the operator workstation. The ventilation screen on the workstation displays the temperatures, the ON/OFF status of the blower, the control mode, the start/stop times, and the temperature set point. The control computer reads the temperatures from thermocouples located in the building. A total of four temperature inputs will be provided for each set of twelve reactors.

Summary of HVAC Controls

Fan Speed	Damper Position	On/Off Control
Low	To Atmosphere	Manual at MCC
High	To Biofilter	Either manual at MCC or Computer (Auto)

8.2.2 Computer Control Functions

The computer system controls the operation of the blowers only when in the high speed (to biofilter) mode.

The computer controls the ventilation blowers based on the control mode which is selected by the operator from the ventilation screen. The control modes are listed below followed by a detailed description. At the motor starter the blower is placed in manual or automatic. When in manual, the blower can be in either high or low speed. When in the automatic mode, the blower will only operate in high speed for the computer control to be activated.

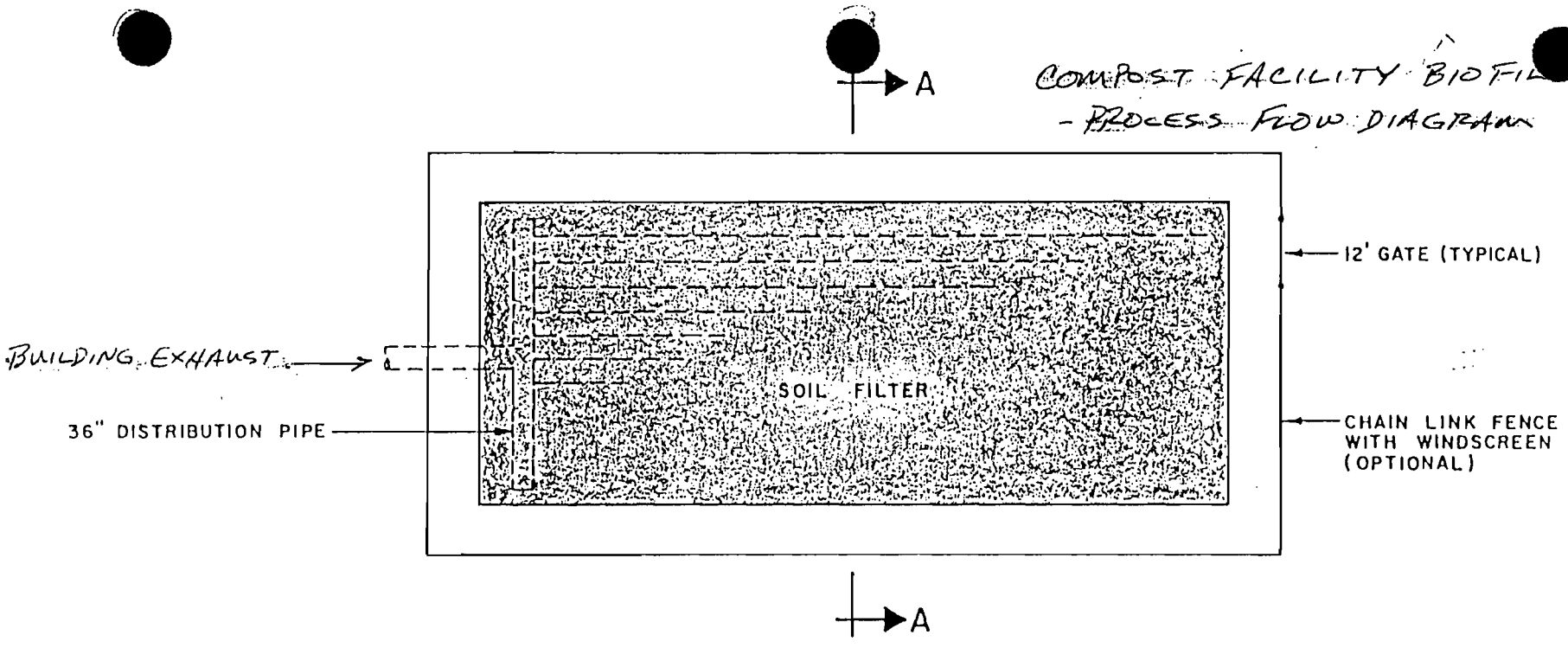
1. Manual - In manual mode the blower is started and stopped by a keyboard entry at the operator workstation. If the blower is ON in manual mode and power is lost to the control computer, the blower stops and restarts when power is restored. Manual operation through the computer workstation should not be confused with local control at the motor control center (MCC).

2. Timer - In timer mode the control computer starts and stops the blower at the start hour and stop hour entered on the ventilation screen. If the blower is ON in timer mode and power is lost to the control computer, it stops and restarts the blower.

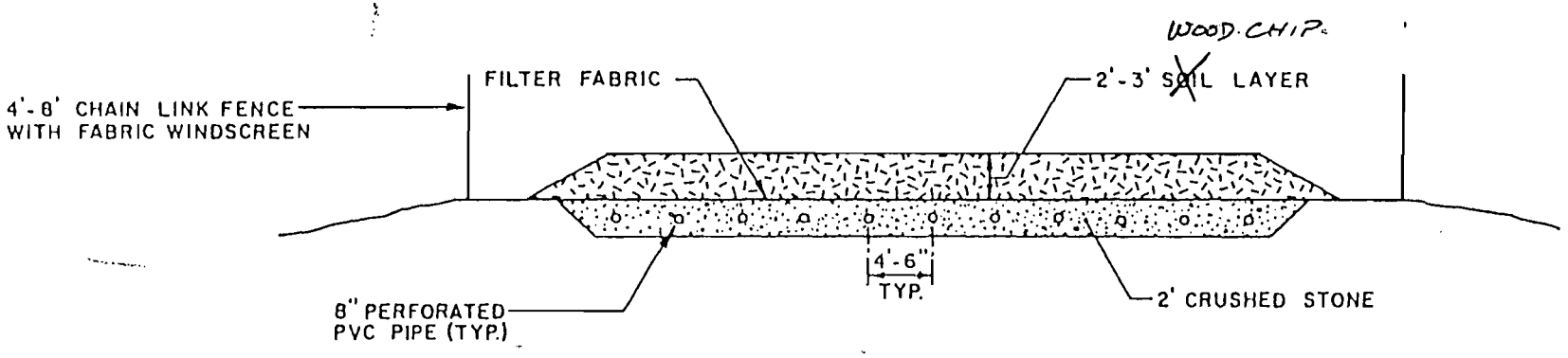
3. Temperature - In temperature mode the control computer starts the blower if the temperature of any thermal sensor in the reactors is above the set point. It will stop the blower if the temperature is below the set point by more than 2°C. The set point is entered at the workstation on the ventilation screen. If power is lost to the control computer, it stops the blower and places it in the status dictated by the temperature.

4. Timer-Temp - This mode is a combination of each of the above. In timer-temp mode the control computer starts the blower at the start hour and turns it off at the stop hour. In the time interval the blower is not activated, it will be controlled by the temperature mode.

COMPOST FACILITY BIOFILTER
- PROCESS FLOW DIAGRAM



PLAN



SECTION A-A

WOOD CHIP

SOIL FILTER FOR ODOR CONTROL

INTERNATIONAL
PROCESS SYSTEMS

Appendix D-11

Landfill Gas System Construction

WASTE ENERGY TECHNOLOGY, INCORPORATED

11 Tupelo Avenue, S.E. · Fort Walton Beach, Florida 32548-5414
FAX (904) 243-0077 · TEL (904) 243-0033

June 23, 1995

Mr. Raymond C. Porter
Camp Dresser & McKee Inc.
Ten Cambridge Center
Cambridge, MA 02142

Re: LFG Utility Flame Emissions
LFG System Design
SWA NCRRF Site 7 Class I and III Landfills

Dear Ray:

As per your request, please find background information for Pollutant and Emissions Unit Supplemental Information required for preparation of the Air Permit Application.

Each landfill, Class I and III, is proposed to have a 900 CFM blower/flare skid unit installed to provide vacuum and incineration of the LFG. This volume will provide capacity until 2005 for Class I and 2002 for Class III, based on the gas model projections enclosed. Based on the maximum inlet flow the following, expected flare emissions per a typical vendor data enclosed, are as follows:

FLARE EMISSIONS: EXPECTED

Inlet Flow	900 SCFM
Percent Methane	50%
Inlet Sulphur as H_2S	400 PPM (Typical this Site)
Inlet NMOC	200 PPM
Flare Efficiency	98%
Flare Operating Temperature	1400°F
Flare Stack Height	23 ft. OAH
Flare Stack Diameter	8"
Stack Effluent (Cal at Above Conditions):	
Flow, MMSCFD	21.6
N_2% Volume	73.5
O_2 % Volume	13.6
CO_2, % Volume	6.0
H_2O, % Volume	6.9
NO_x lbs. per MMBtu	0.068
NO_x, lbs. per hr.	1.65
CO, lbs per MMBTu	0.37
CO, lbs. per hr.	8.99

Since flare manufacturers of utility flares meet the 98% overall destruction of total hydrocarbons by definition in constructing their flare to 40 CFR 60.18, I have also included EPA backup information which the vendor used in formulation of enclosed emission rates.

Please call if you have any comments, questions or need further assistance.

Sincerely,

Waste Energy Technology, Inc.

James Getting

James A. Getting, PE
Project Manager

JAG W:\PROJECT\SWAS7296\L29610.WPX

Enclosures: as noted above

cc: Alex Makled, CDM West Palm Beach

8. BLOWER/FLARE SKID SPECIFICATIONS

.1 GENERAL DESCRIPTION AND OPERATION

The blower/flare skid shall be a self-contained pre-piped and pre-wired completely operable system consisting of centrifugal blowers, utility (candlestick) style flare, and control system to operate all components in a totally automatic and safe sequence. The blowers and associated valving and interconnect piping shall be configured to provide for operation of blowers in a parallel mode, 100% standby and with manual valving adjustments provide for doubling of system vacuum by operating both blowers concurrently in series.

The following is a brief outline of the flare control system start-up and operating sequence.

Automatic operation. Placing the flare control panel selector switch in the "Automatic" mode will initiate start-up of the spark ignitor and propane pilot. Once the pilot proves, the ignition cycle ceases, the landfill gas inlet valve is opened and the blower(s) is started allowing landfill gas to flow to the flare tip. When the main tip thermocouple proves, the pilot gas solenoid valve is closed.

The automatic re-ignition cycle will also be initiated upon loss of the main landfill gas flame as detected by the thermocouples. The following sequence will occur when this happens:

1. The blower will shut off
2. The landfill gas inlet valve will close
3. The pilot gas solenoid valve will open and the ignition sequence will begin.

3a. If pilot re-ignition does not occur within a specified period the landfill gas inlet valve will remain closed, the blower(s) will remain off and the control panel will shut down. A contact is activated to signal an alarm condition.

4. Upon ignition of the pilot the landfill gas inlet valve will open and the blower(s) will start allowing normal operation of the flare assembly.

4a. If the main flame does not light within a specified time period, the blower(s) will stop and the control panel will shut down. A contact is activated to signal an alarm condition.

Automatic start/restart. The unit shall automatically start up whenever power is supplied to the unit. If the unit shuts down for any reason except high flame arrestor temperature, the flare will automatically try three times to restart the system. Upon failure to restart an alarm condition will be issued.

Manual Operation. The unit shall also feature a manual operations switch which will allow the operator to completely bypass the automatic controls and operate the blowers and flare manually.

.2 DESIGN OPERATING CONDITIONS

Landfill Gas composition is:

Maximum:	Minimum:	Typical Operating Range:
60% CH_4	30% CH_4	45-55% CH_4
35% CO_2	20% CO_2	40-45% CO_2
5% Air & Inerts	50% Air & Inert	0-20% Air & Inerts
120°F	45°F	55°F

Maximum Flow Rate: 900 CFM
Minimum Flow Rate: 90 CFM
Operating Temperature: 1400 to 1800°F
Flame Stability: Over Entire Maximum/Minimum Methane and Flow Ranges
Smokeless Flow: 100%
Total Hydrocarbon (THC) Destruction Efficiency: Greater than 98% by weight
Total Non-methane Hydrocarbon (NMHC) Destruction Efficiency: Greater than 98% by weight
Design Wind Speed of 100 MPH
Ambient Temperature: -20 to 120°F
Maximum Flare Radiation at 5 ft. above Ground Elevation: 500 BTU/HR/SF
Corrosion Allowance: 0.0
Operation Elevation: 15 MSL
Minimum Available Vacuum: 20" wc at inlet side of skid at maximum design flow.
Pilot Gas: Maximum of 30 scfh of propane at 20 psig, used only on flame ignition.
Bottled Nitrogen: 80 psig bottled supply, used for fail closed landfill gas inlet valve only on opening and closing.
Electrical Service: 460v/3ph/60Hz. Vendor responsible for stepping down to 110v for control usage.
Area Classification: Due to the presence of an open flame, the blower/flare skid will be located fenced controlled access area, and in a non-hazardous (NEMA4) electrical area.

.3 SKID ASSEMBLY

All equipment shall be mounted on a structurally-designed steel skid with non-skid floor plate constructed to withstand all loading and hauling forces. Skid shall be constructed to be freestanding and structurally self-supporting. All necessary bracing, mounting pads and piping supports shall be provided for proper equipment installation and alignment. Overall skid assembly dimensions shall not exceed common carrier hauling load requirements of 8 ft. wide, 40 ft. long and 13 ft. high (ground to top of load).

.4 FLARE TIP AND STACK ASSEMBLY

Unit shall be a Utility Flare Tip with an energy efficient propane pilot, spark ignitor, and both pilot and main flame prove Type K thermocouples. The flare tip shall be sized to meet velocity requirements of Federal Regulations 40 CFR 60.18. Stack height shall be sized to achieve a maximum of 500 BTU/HR/SQ FT heat radiation level measured 5 ft. above any grade level location in any wind condition. The upper section of the flare stack and components shall be constructed of high temperature stainless steel materials, and the lower station of carbon steel primed and painted with high heat gray paint. The stack shall be provided with a flanged inlet to match the flame arrestor flange drilling.

.5 FLAME ARRESTOR

One (1) 8" ANSI 150 lb. flanged inlet/outlet flame arrestor with aluminum housing and aluminum internals. Configuration shall be as such to facilitate removal and cleaning of elements, without removing the housing from the header. Pressure drop of gas flow through unit shall not exceed 2.5" wc for maximum flare design flow.

Flame arrestor shall be fitted with a thermocouple near the flare stack face to detect combustion on the face of the flame arrestor elements, thereby signaling a flame arrestor high temperature shutdown.

.6 CONDENSATE KNOCKOUT DRUM

Unit shall be a 24 in. diameter by 48 in. high knockout constructed of HDPE with 8", ANSI 150 lb. flanged inlet and outlet connections, removable lid to facilitate inspection of unit, liquid level site gauge, and drain connection piped to edge of skid.

.7 LANDFILL GAS BLOWERS

The Landfill Gas Blowers shall consist of the following features:
High Pressure Centrifugal Blower: Aerovent Series 14, 530(21)-200(8) 10HP, or equal
Arrangement 8 (bearing mounted blower shaft w/coupling mounted motor)
Inlet and discharge configuration to match manufacturer's layout
3450 RPM
32" wc static pressure at 0 to 1000 cfm at 25 feet MSL elevation, and 100°F
10 HP 3450 RPM 230V/460V 3 Phase 60 Hz totally enclosed fan cooled explosion proof electric motor mounted on Blower base
Flanged Inlet and Outlet (8") with 150 lb. flange bolt pattern
Unit to be of spark proof construction with steel housing and aluminum blower wheel nominal airtight construction w/shaft seals, approved for landfill gas service.
Lubrication Lines extended or accessible through Bearing Guard

.8 SKID INLET PNEUMATIC ACTUATOR VALVE

8" actuated butterfly valve similar to Item .9 below, located at the skid inlet to automatically isolate the flare system in the event of a system shutdown or on start-up. Valve assembly shall include a pneumatic, nitrogen operated, fail-closed actuator, with a 3-way solenoid valve; or electric operated, battery fail-closed actuator.

.9 BLOWER MANUAL CONTROL VALVE(S)

Six (6) each, 8" ANSI 150 lb., Lug Style Valve with bubble tight closure to 10 psig, located at the blower inlets and outlets to facilitate parallel or series operation. Valves may be either PVC body, Polypropylene disc and Nitrile seats, or carbon steel body, 316SS disk, for landfill gas service.

.10 FLARE CONTROL PANEL

Weatherproof (NEMA 4) Painted Steel enclosures, Steel Support Rack mounted. All electrical/ignition components to be shop prewired and UL approved as a complete unit.

.A Pilot gas control system including pressure regulator, fail closed shut down solenoid valves, manual block valves, pressure regulator, pressure gauge, and 1/2" gas piping connections.

.B Automatic ignition system including ignition transformer, and controls.

.C Panel mounted Automatic/Off/Manual start up selector switch.

.D Panel mounted Manual/Off/Automatic blower selector switch (for each blower), with panel mounted blower motor hour meter and AC ammeter with 200% scale on each gas blower circuit, visible in panel window.

.E The following panel mounted indicator lights:

- Panel Power On
- Ignition On
- Blower(s) On
- Pilot On
- Flame Proved
- Flame Failure
- Flame Arrestor High Temp Shutdown

.F Visual alarm beacon, red strobe style light mounted on top of skid control panel.

.G Panel mounted temperature control with display for:

- Pilot Thermocouple
- Main Flame Thermocouple
- Flame Arrestor Thermocouple

.H Mass flow meter with display, associated transmitters, totalizer and optional strip chart recorder.

.I 15 amp convenience outlet (duplex) with weatherproof cover for temporary use of electrical equipment required at the flare station.

.J A 100W high pressure sodium security light with photocell and on/off switch.

.K All high voltage, 460V, items to be enclosed in weatherproof (NEMA 4) Painted Steel enclosures, mounted on above Steel Support Rack including:

.1 460V main power supply disconnect.
.2 460V to 120V stepdown.
.3 Two motor starters for landfill gas blower motors (230v/460v/3PH/10 HP).

.L All electrical components shall be provided with power surge protection at the main electrical distribution panel and all electronic controls.

.M Flare skid shall be provided with grounding lugs for lightning and electrical grounding.

.11 SAMPLING PORTS

For sampling of skid operating parameters, 1/4" NPT plugged taps shall be provided on the immediate inlet/outlet of the flame arrestor and each blower.

.12 CONSUMABLES

The nitrogen and propane cylinders on the blower/flare skid are to be leased and serviced by the Owner and provided to the Contractor for installation.

.13 FINISH PAINT

External carbon steel surfaces receive a "commercial" sandblast to remove mill lacquer, corrosion products, mill scale, and foreign material. Surfaces then to be primed with a 2-3 mils single coat of inorganic zinc primer, and an overccat of heavy duty industrial enamel (gray color).

.14 SHOP DRAWINGS

General Assembly shop drawings to be submitted by the Vendor/Contractor to the Project Design Engineer to approve the complete blower/flare system operable unit. Submittal to include the necessary dimensions, nozzle placements, loadings, structural details, process and instrumentation diagram, and equipment cut sheets, etc. required to describe blower/flare skid to be furnished.

.15 FUNCTIONAL SHOP TEST

At the vendor's shop, prior to unit shipment, the entire skid unit shall be operated as a complete unit to ensure all equipment and controls are functioning at the desired capacity, set points and sequences. The Project Design Engineer shall be notified one week before this functional shop test, and shall at his expense have the option of being present during the test.

.16 OPERATIONS AND MAINTENANCE MANUAL

Blower flare skid vendor shall supply five copies of the operational and maintenance manual for equipment supplied. Manual shall include, but not be limited to, all information required to assemble, start-up, operate, maintain, troubleshoot, and parts replacement; and include equipment component cut sheets and record shop drawings.

.17 EQUIPMENT WARRANTY

Vendor shall guarantee the equipment furnished for a period of eighteen months from date of shipment or twelve months from date of start-up, whichever occurs first.

W:\PROJECT\SWAS72S6\FLRSPEC1.WPX

LFG SPECIALTIES, INC. DATE: 6/6/95

REV. 6/6/95

TECHNICAL DATA

A. Flare Tip size -- 8 in.

B. Overall Height -- 23 ft.

C. Turndown Ratio -- 10:1

D. Destruction efficiency at 900 SCFM flow with gas methane content 40 to 60% - 98% overall destruction of total hydrocarbons

Guaranteed to meet E.P.A. emission standards for landfill gas disposal in utility "candle type" flares.

Note: Flare is designed in accordance with the United States Environmental Protection Agency (EPA) established criteria for open flares, 40 CFR 60.18

E. Minimum flow rate to maintain stable flame and 98% destruction efficiency -- 90 SCFM

F. Minimum methane content required to maintain stable flame and 98% destruction efficiency -- 30%

G. Flow/Emissions (expected) at design flow and 1400°F combustion temperature:

Effluent Gas Flow	21.6	MMSCFD		
N_2	73.5	% vol.		
O_2	13.6	% vol.		
CO_2	6.0	% vol.		
H_2O	6.9	% vol.		
NO_2	0.068	lbs./MMBTU	or	1.65 lbs/hour
CO	0.37	lbs./MMBTU	or	8.99 lbs/hour

H. Equipment drawing -- typical attached

I. P&ID -- typical attached

NOTE:

Wind loads: Designed for 100 mph wind loading (per ASCE 7-88, Exp. C)

Approximate package weight - 20,000 lbs.

Appendix E-1

Description of Stack Sampling Facilities

NEW EPA SAMPLING PORT LOCATIONS

PER EPA METHOD 1 CRITERIA

$$D_e = \frac{2LW}{(L+W)} = \frac{2 \times 7.375' \times 7.375'}{(7.375' + 7.375')}$$

$D_e = 7.375'$

MINIMUM REQUIREMENTS

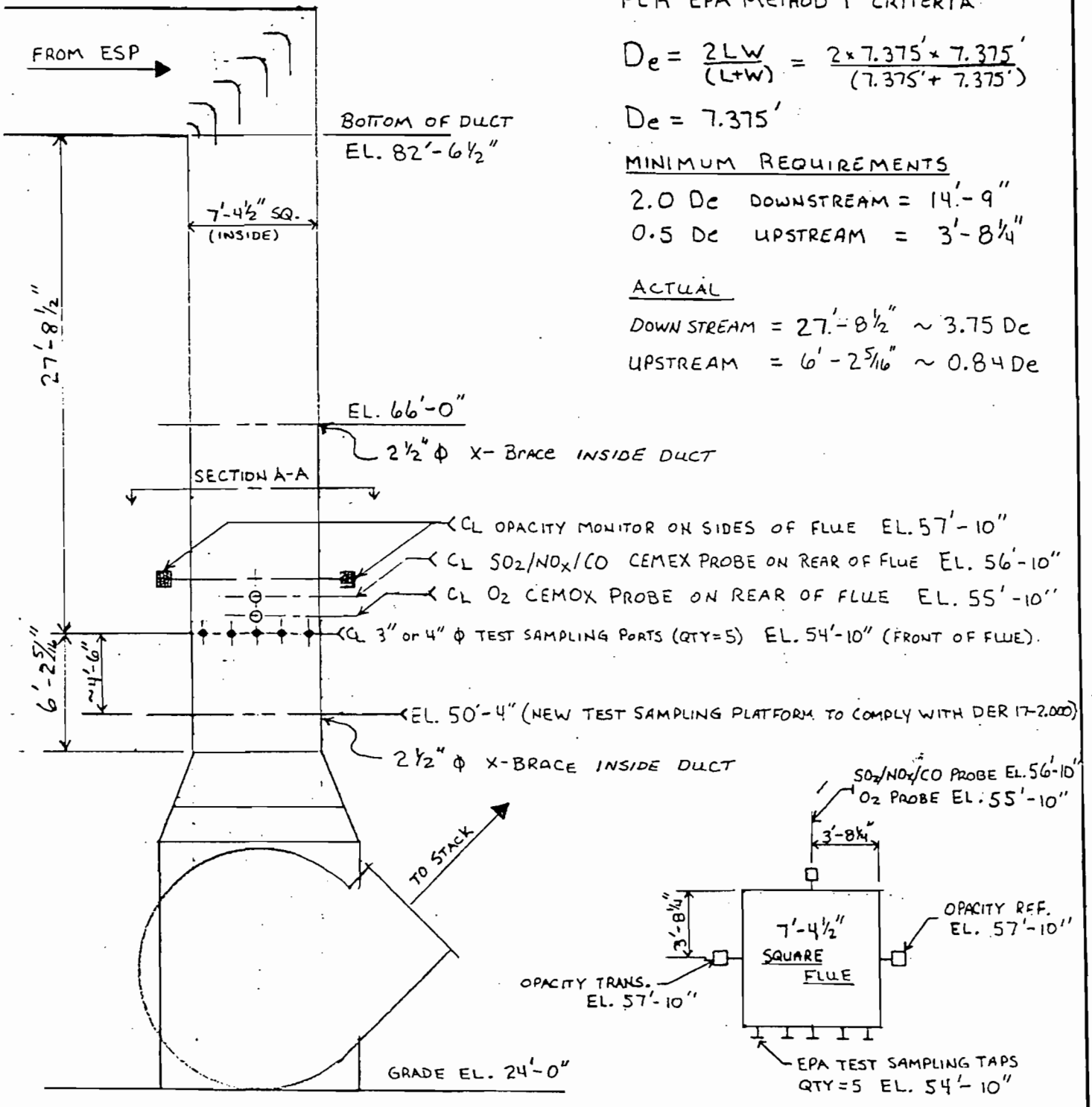
2.0 De DOWNSTREAM = 14'-9"

0.5 De UPSTREAM = 3'-8¼"

ACTUAL

DOWN STREAM = 27'-8½" ~ 3.75 De

UPSTREAM = 6'-2 5/16" ~ 0.84 De

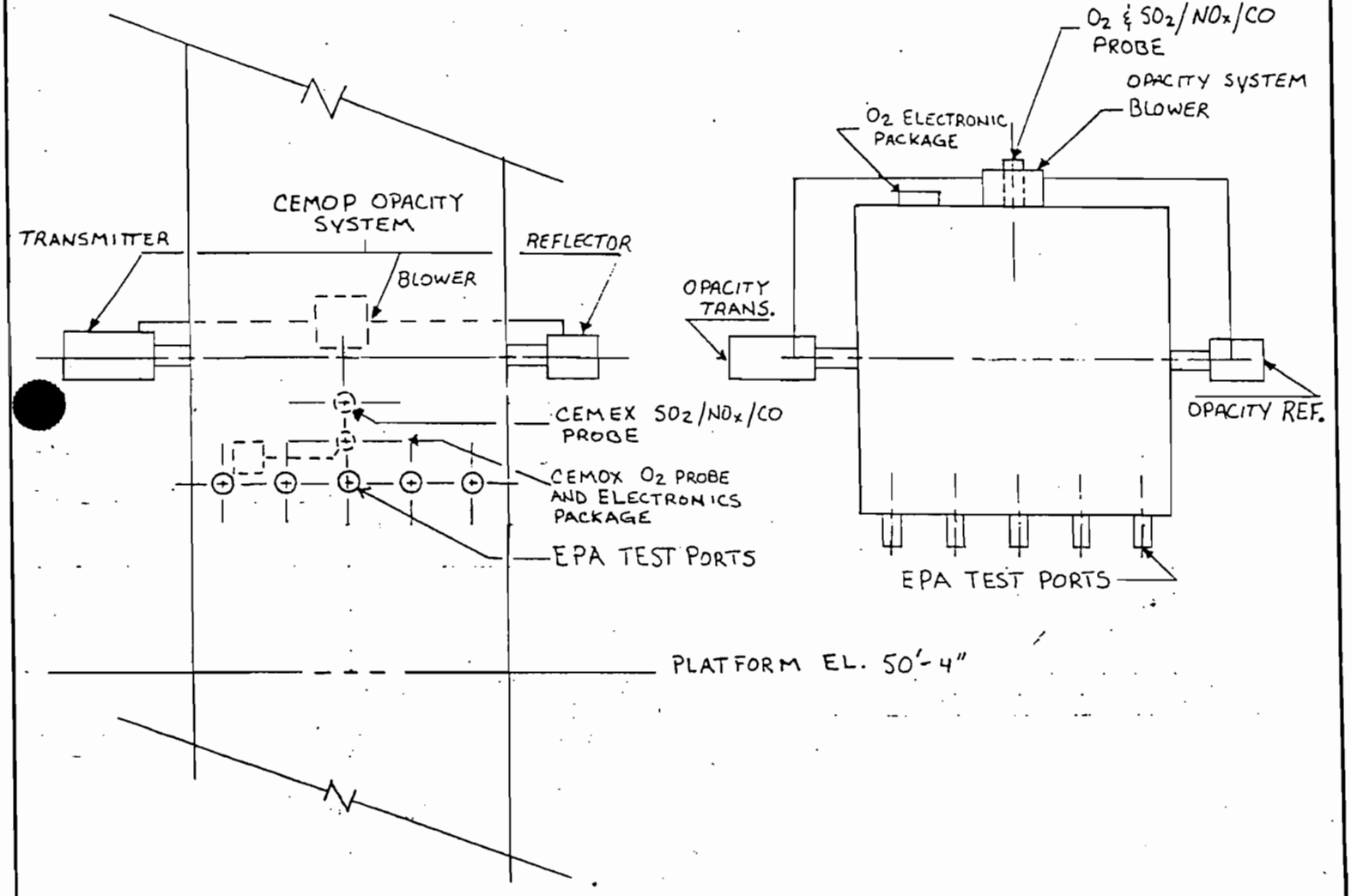


SIDE ELEVATION VIEW

SECTION A-A
PLAN VIEW

CUSTOMER PBEA	JOB No. 023-0001
SUBJECT ALTERNATE EPA TEST SAMPLING PORT LOCATIONS IN ESP OUTLET DUCT	
	BY D.E. BURNHAM
	DATE 7/25/89 REV. 1

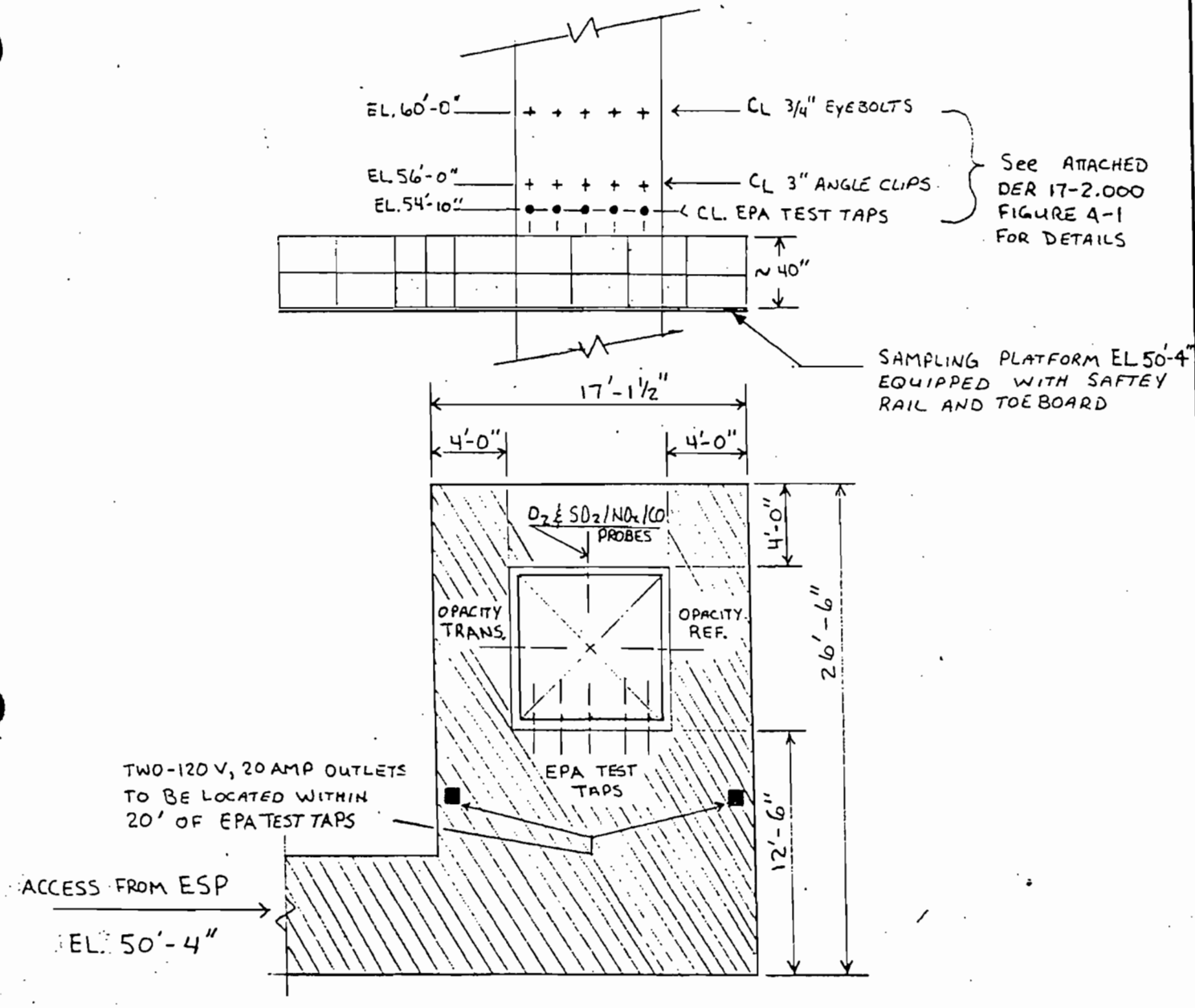
THE BABCOCK & WILCOX COMPANY



GENERAL ARRANGEMENT OF
EPA TEST SAMPLE PORTS AND ENVIROPLAN CEM EQUIPMENT

CUSTOMER	PBEA	JOB No. 023-0001
SUBJECT	EPA TEST SAMPLING PORTS AND ENVIROPLAN EQUIPMENT ARRANGEMENT AT ESP OUTLET FLUE.	BY D.E. BURNHAM
		DATE 7-25-89. REV. 1

BDS 3027

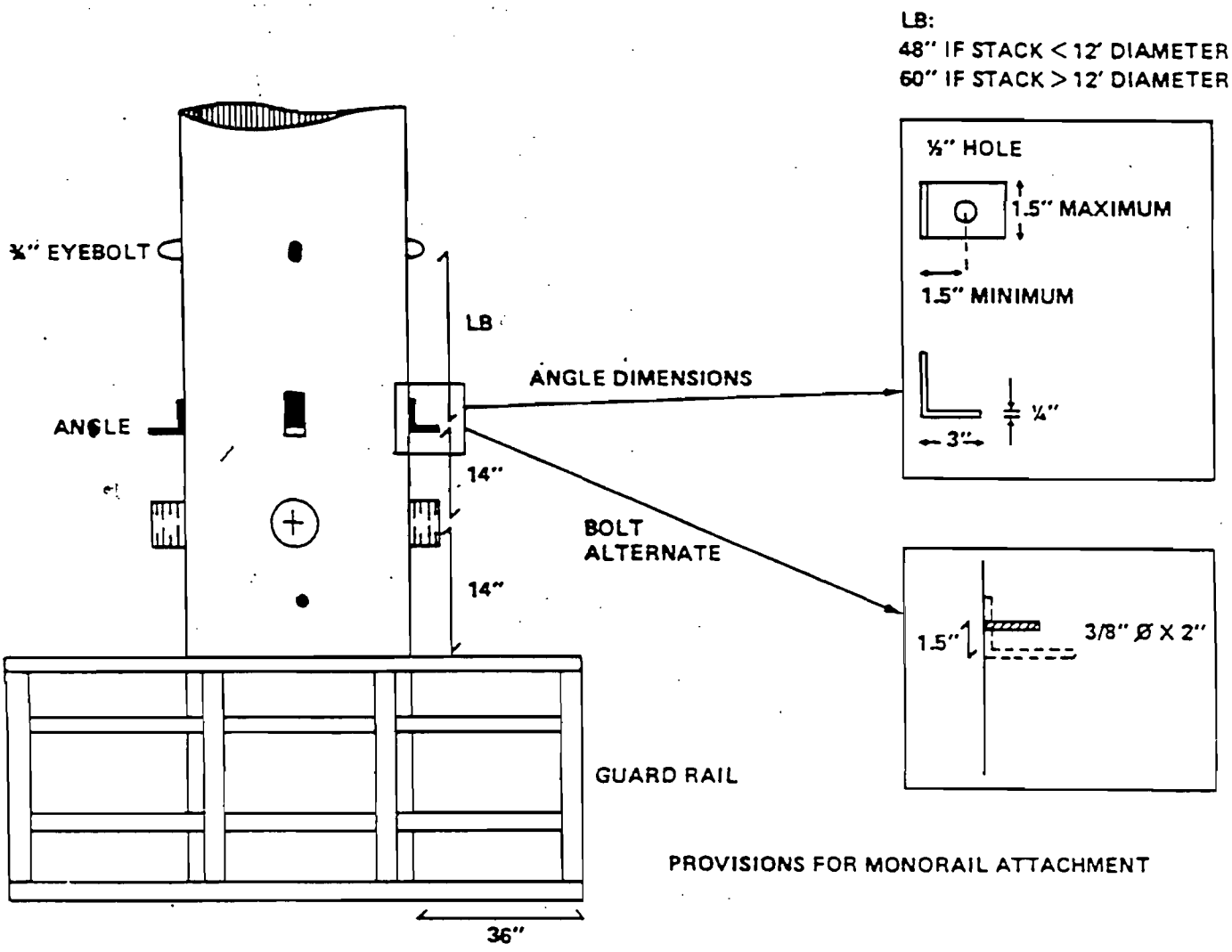


EPA TEST SAMPLING PLATFORM
AT ESP OUTLET FLUE EL. 50'-4"
(TO COMPLY WITH DER 17-2.000 CRITERIA)

EAST SIDE UNIT PLATFORM SHOWN
WEST SIDE UNIT IS OPPOSITE HAND.

CUSTOMER PBEA	JOB No. 023-0001
SUBJECT	
New EPA TEST SAMPLING PLATFORM.	BY D.E. BURNHAM
	DATE 7-25-89 REVI.

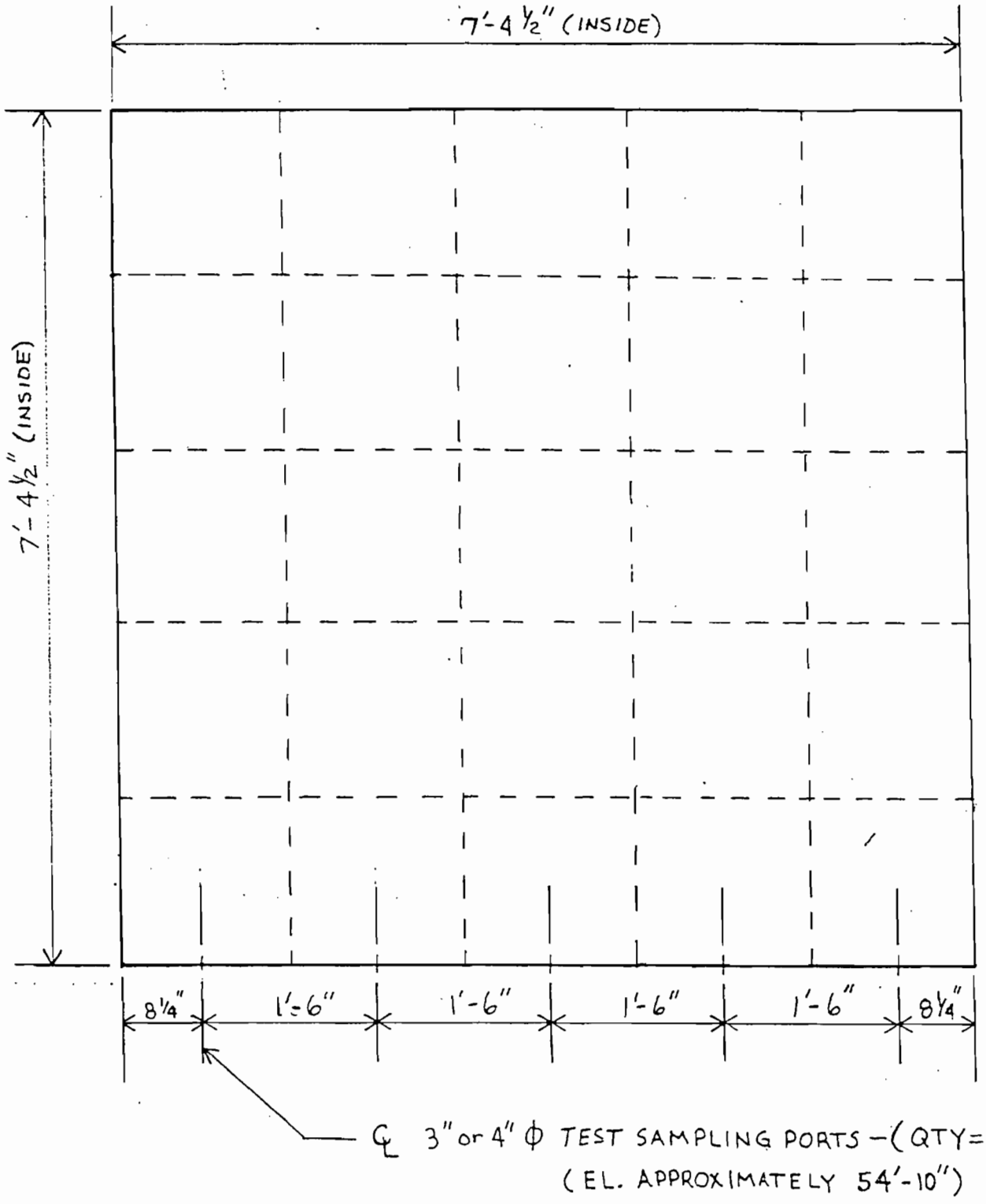
Figure 4-1
[Reference: 17-2.700(4)(c)5.a.]



STACK SAMPLING FACILITIES:
PROVISIONS FOR MONORAIL ATTACHMENT

IF EYEBOLT IS MORE THAN 120 INCHES ABOVE THE PLATFORM A PIECE OF CHAIN SHOULD BE ATTACHED TO IT TO BRING THE POINT OF ATTACHMENT WITHIN SAFE REACH. THE EYEBOLT SHOULD BE CAPABLE OF SUPPORTING A 500 POUND WORKING LOAD.

ALTERNATE EQUIPMENT SUPPORT AS SPECIFIED IN THE RULES MAY BE SUBSTITUTED FOR THE EYEBOLT AND ANGLE.



SECTION A-A

CUSTOMER PBEA	JOB No. 023-0001
SUBJECT SECTION VIEW ESP OUTLET DUCT EPA TEST SAMPLING PORTS & 25 PT. SAMPLING GRID IN ESP OUTLET FLUE	SCALE 3/4" = 1'
	BY D. E. BURNHAM
	DATE 7-11-89

BDS 3027

SAIC

Florida Department of Environmental Regulation

Southeast District ● 1900 S. Congress Ave., Suite A ● West Palm Beach, Florida 33406 ● 407-964-9668

Bob Martinez, Governor | Dale Twachtmann, Secretary | John Shearer, Assistant Secretary
Scott Benyon, Deputy Assistant Secretary

July 27, 1989

Marc C. Bruner, Ph. D.
Solid Waste Authority of
Palm Beach County
5114 Okeechobee Boulevard, Suite 2C
West Palm Beach, Florida 33417

Dear Marc:

RE: NCRRRF Sampling Port Relocation

Your submittal of July 25, 1989 has been reviewed and found to comply with the requirements for permanent stack sampling facilities under 17-2.700.

Sincerely,

Joseph Kahn
Air Compliance Engineer

JK/k44

cc: I. Goldman
Alex Pavda

SOLID WASTE AUTHORITY

OF PALM BEACH COUNTY

5114 Okeechobee Boulevard, Suite 2C
West Palm Beach, Florida 33417
Telephone: 407/471-5770

July 25, 1989

Department of Environmental Regulation
1900 S. Congress Avenue, Suite A
West Palm Beach, FL 33406

Attn: Alex Padva

Subject: NCRRRF Conditions of Certification XIIII.A.3.b
Sampling Port Location

Dear Alex:

Attached for your review and consideration is a set of drawings showing an alternative for the location of the emission monitoring ports and continuous emission monitoring equipment for the NCRRRF Facility. We submit this information with a request that this alternative location be approved as the permanent sample location for all air compliance tests.

We have discussed this sample port location with DER staff, and we believe it is acceptable. In addition to meeting all the required technical criteria, this location affords easier access, and is in a much more conducive environment for the CEM equipment and for personnel involved with stack testing.

Your prompt attention in this matter would be most appreciated. If you have any questions or I can be of further assistance, please do not hesitate to contact me.

Very truly yours,

Marc C. Bruner, Ph.D.
Section Chief
Environmental Programs

MCB/dp

cc: Timothy F. Hunt, SWA
Joe Kahn, DER
Joe Lurix, DER
Doug Burnham, B&W
Jim Dickinson, B&W

Babcock & Wilcox

a McDermott company

Power Generation Group

20 S. Van Buren Avenue
P.O. Box 351
Barberton, OH 44203-0351
(216) 753-4511

July 25, 1989

Solid Waste Authority of Palm Beach County
5114 Okeechobee Blvd., Suite 2C
West Palm Beach, FL 33417

Attn: Mr. Marc C. Bruner

Cust: North County Regional Resource Recovery Facility
Subj: CEM & Test Port Relocations - Revision 1

Dear Marc:

Please find enclosed revised sketches showing general details on the proposed alternate sampling/CEM locations and new access platforms. The revisions are based on input and recommendations from Joe Kahn of DER.

Please forward these revised sketches to DER for final review and approval.

Should you have any further questions, please call me at 216-860-6794.

Sincerely,

THE BABCOCK & WILCOX COMPANY

D E Burnham

Douglas E. Burnham

DEB016/lak
cc: J. A. Dickinson - B&W Site
T. Farrell - B&W Site
L. Kreidler - BVCB3H
T. F. Lammers - BVCB3H
J. McMasters - B&W Site
E. Wells - B&W Site
A. W. Vargo - BVSO2A

Appendix E-2

Procedures for Startup and Shutdown

STARTUP, SHUTDOWN AND MALFUNCTION CONDITIONS

1. Introduction

The United States Environmental Protection Agency (USEPA) has recognized that the rule promulgated in the New Source Performance Standards (NSPS, Subpart Ea 40 CFR 60.5 et seq.) and the proposed Emission Guidelines (EG, Subpart Ca 40 CFR 60.3 et seq.) for municipal waste combustors (MWC) can only be met under steady state conditions and by employing "Good Combustion Practices". The USEPA has included exclusions for a period of startup, shutdown and malfunction in both the NSPS and EG for MWC.

These exclusionary periods were provided in the MWC standards and guidelines, since operation during these periods is unstable, transitory in nature and usually outside the normal control range of the equipment and typically results in higher emissions.

The following sections define the operational scenarios which are granted exceptions from the NSPS.

2. Startup

Specific startup practices for the North County Resource Recovery Facility (NCRRF) will vary depending on the conditions at startup. The two conditions are a "cold start" when the NCRRF is started when all equipment is at ambient temperature, and a "hot start" or restart when the facility is restarted after a fan trip failure.

a. To begin a cold start, combustion equipment will be started from the back of the combustion train moving toward the furnace. Cold startup will include the firing of auxiliary fuel (natural gas) until such time as RDF is introduced to the boiler. The firing of auxiliary fuel shall continue until the lime spray dryer and particulate control device are fully operational. It is anticipated that up to three hours will be required to achieve full load on RDF.

b. For a restart, generally only the equipment which experienced at trip related failure will need to be restarted. Trip failures will be cleared from the back of the combustion train moving toward the furnace. If the firing of RDF has stopped, auxiliary fuel combustion will be initiated until such time as maximum load can be maintained by the combustion of RDF.

3. Shutdown

The general procedure for shutdown will be to stop feeding RDF and fire auxiliary fuel until the grates are clear of RDF. Auxiliary fuel combustion will begin when RDF feed has been stopped. The shutdown procedure is expected to take up to three hours after stopping RDF feed. Once the grates are clear of RDF, the combustion train equipment will be shut down beginning at the furnace and moving to the back of the unit.

4. Malfunction

In addition to scheduled startup and shutdowns, malfunctions can be expected to occur. While unexpected, malfunction do occur during normal operations and can be classified into four categories. These are boiler malfunctions, air pollution control malfunctions, fuel feed malfunctions and miscellaneous malfunctions.

a. Boiler Malfunctions

Boiler malfunctions include tube ruptures, trip failures of the forced draft fans or other combustion equipment, grate failures and other similar occurrences. Tube ruptures and grate failures will generally require shutdown of the boiler to make repairs followed by a cold start. Trip failures of combustion related equipment can usually be quickly rectified allowing for a restart.

b. Air Pollution Control Malfunctions

Malfunctions in this group can range from loss of a field in the ESP to failure of the lime slurry system to a failure of the SDA atomizers. Because all of the pollution control equipment systems have redundant capacity, it is not anticipated that shutdown and a cold start would be required except in the case of failure of the redundant equipment.

c. Fuel Feed Malfunctions

These malfunctions include RDF conveyor failures and fuel feed system failures. Conveyor failures generally do not affect boiler operation due to the redundant system in place and since most conveyor problems can be rectified in a short period of time. The most common fuel feed system malfunction is clogging or jamming of the various pieces. Since there are six feeders for each boiler the loss of a single feeder would only result in unbalanced fuel feed and combustion air delivery. Unless the fuel clog has damaged equipment, the fuel feeders can be returned to service in a short period of time.

d. Miscellaneous Malfunctions

Miscellaneous malfunctions are related to equipment and processes not directly tied to the boilers, APC, or fuel feed systems. They may include, turbine trips, loss of electrical feed to the power grid, lack of fuel, cooling tower and water chemistry problems.

Appendix E-3
Operations and Maintenance Plan

The Operations and Maintenance Plan is on file at the Authority's office. For additional information, or to review the Plan, please contact the Authority directly.

Appendix E-4

Compost Facility Operations and Maintenance Plan

8.3 Biofiltration

As the compost building air is passed through the biofilter, odorous compounds can be adsorbed into the particles of organic material or absorbed into water droplets within the biofilter. Like composting, the biofilter involves a biological process. Microbes within the biofilter media eventually break down odorous compounds. In order for the biofilter to remain viable over time, a healthy environment for microbial growth is needed. The

environment should include aerobic conditions and adequate moisture. **Moisture content within the biofilter media should be in the range of 50% to 75% and also should be as uniform as possible.**

Regularly scheduled monitoring is necessary to maintain proper biofilter operating conditions. Addition of water will be necessary, particularly during summer months and in warm climates, in order to maintain proper moisture levels. The amount of water addition required to maintain sufficient moisture will fluctuate depending on conditions both within and outside the composting building. Ambient conditions such as precipitation, humidity, and temperature will influence the moisture content of the biofilter. Conditions within the compost building such as the number of active reactors, humidity, and the number of exhaust fans operating will influence the moisture level of the biofilter.

Homogeneity of the biofilter media usually ensures even air flows throughout the biofilter. However, high air flows or rapidly increasing air flows in isolated areas of a biofilter indicates that air short circuiting is occurring. In this situation, more air flow is present in one section of the biofilter than other areas of the biofilter. Increased air flow can lead to drying of the biofilter media in the area receiving higher air flow.

The facility biofilter should be monitored periodically to ascertain the air flows and the air flow trends of the entire biofilter. Measurements which indicate either drying of

biofilter sections or increasing air flows should be addressed promptly. Any drying areas should be re-wet in order to return the media to the correct moisture content. Increasing the moisture content of a dry section of biofilter will improve its ability to absorb odorous compounds, reduce air flows to normal levels, and improve the overall operation of the biofilter. Monitoring the operation of the biofilter allows changes to be made which ensure efficient long-term biofilter operations.

In most compost facilities, the total amount of air sent to the biofilter is quite significant. Under continuous operations, the biofilter may receive up to one billion pounds of air in one year. Even very low concentrations of materials in this air represents many pounds over the course of a year. For example, 1 ppm of ammonia in the billion pounds of air represents about 1,000 pounds of ammonia to the biofilter during a one year period.

Plant growth is common on the surface of biofilters. The necessary nutrients and environment exists for significant growth. If the growth of weeds or grass becomes thick enough, and the root system dense enough, this may eventually act as an additional layer of resistance to air flow and will increase the head pressure in the bed. However, if the roots of plants are large enough, they can also form tiny channels through which millions of cubic feet of air can flow, gradually developing into a short circuit of air through the media.

Even if the exhaust system is able to accommodate the additional head pressure, a thick growth of weeds and grass on the biofilter surface will not be the most efficient method of long-term operation. The additional head pressure may significantly increase power consumption and may reduce the anticipated normal operational life of the exhaust fans at the facility. Some facilities may find the aesthetic improvement of grass on the biofilter surface offsets a small additional operating expense.

8.4 Biofilter Monitoring

8.4.1 Daily Biofilter Monitoring

Daily maintenance of the biofilter may be required and plant operators should always be aware of biofilter performance. Since changes in biofilter performance may occur gradually, relying on visual indications of changing biofilter performance may be inadequate. In order to improve the analysis of subtle changes in biofilter performance, a regular program of monitoring and inspection is recommended.

8.4.2 Weekly Biofilter Monitoring

Perform a complete inspection of the entire biofilter each week. The biofilter surface should be checked for the presence of animal borrows and for proper moisture. If animal borrows are discovered, they should be filled and the biofilter media should be returned to its original condition.

Moist biofilter media is essential for good odor absorption. Biofilter drying may be most noticeable in the morning when dew still covers the remainder of the

biofilter surface. Dry areas must be re-wetted. If an irrigation system is utilized, the exhaust blower to the treated zone should be turned off during irrigation to enhance even wetting of the entire section of biofilter. A tree root watering device, which is available from most lawn and garden stores, may also be placed in the dry spots. This method usually works best if the affected area is 18 inches in diameter or less, which allows a full soaking and re-wetting of the affected media. Even moisture distribution promotes even air flows throughout the biofilter media.

Maintaining even air flows improves the long-term performance of the biofilter. Dry areas present less air flow resistance than areas with normal moisture, which can result in increased air flow to the dry area. Areas which display lower than desired moisture during the weekly visual inspection should be re-wetted. Monitor the area which experienced drying more closely in the future to ensure early detection of changes in biofilter media moisture content.

Standing water on the biofilter surface presents significant air flow resistance. Under these conditions, air flow to this section of the biofilter will be significantly reduced, even if air is seen bubbling through the surface. Much of the air flow will short circuit to an area of less resistance. The reason behind the accumulation of standing water should be addressed. Repair may entail removal and

replacement of the top layer of media in order to achieve original biofilter media conditions. Any deviation from proper moisture levels should be addressed.

The static head pressure at each exhaust blower should be measured with a calibrated manometer and recorded each week. Static head changes over time will give an indication of the rate at which the biofilter is increasing the back pressure of the fans.

Significant increases in head pressure may be a result of a number of biofilter operational factors, including over watering the biofilter or accelerated compaction of the biofilter media. Also, if significant changes are being registered by one or a select few exhaust blowers, these blowers may be experiencing changes which have nothing to do with biofilter operation; determining the reasons for increased head pressures at individual blowers may require isolation and testing. Significant short-term head pressure changes may be caused by heavy rainfall or other temporary changes. Weekly measurements will permit trend analysis which can improve and ease the trouble-shooting process if problems arise.

8.4.3 Monthly Biofilter Monitoring

Sample the biofilter surface media each month testing for porosity and moisture. **Moisture of the biofilter media should be in the range of 50%-75%.**

Visual confirmation of dense fog in the air leaving the biofilter surface does not guarantee that all portions of the biofilter media are properly watered. Air moving through the exhaust blowers is warmed slightly and its relative humidity may be reduced to less than 100% before reaching the biofilter. This air will reduce the moisture content of the biofilter media as it passes upward and out through the surface of the biofilter. Lower portions of biofilters have historically become dry more frequently than upper portions. Air which is exhausted from the compost building enters the lowest portion of the biofilter and has a drying effect on the lower portion of the biofilter.

A regular schedule of moisture monitoring and control should be implemented at each biofilter installation. Watering of biofilter media should be accomplished through application of water using a hose or sprinkler system which achieves a full coverage of the biofilter surface. To allow water to penetrate evenly into the media, it is preferable to irrigate the filter when ventilation of the filter is not occurring. Another alternative is to place a misting device in the duct downstream of the exhaust blowers which will assure that the air flowing to the biofilter is fully saturated with moisture.

Another impact of biofilter dryness is reduced ammonia removal capacity. Water in the biofilter media absorbs ammonia from air exhausted from the compost building. Without moisture, the ability of the biofilter media to absorb ammonia

is greatly reduced. In addition, the micro-organisms in the media require moisture for life processes. A weekly log should be maintained showing how much water has been added. At least once per week, the operator should review the moisture condition of the biofilter and adjust the watering schedule accordingly.

Biofilters have a great deal of buffering capacity, and generally maintain a neutral or slightly higher than neutral pH. Biofilter media pH should be measured monthly. A shovel or coring tool should be used to take samples at least 12 inches below the biofilter surface at two or more random locations. The pH should be in the range between 5.5 and 8.0. Media acidification below a pH less than 5.5 may indicate the conversion of ammonia to nitrate or the formation of organic acids due to anaerobic conditions. IPS representatives should be made aware if wide pH variations are observed or if any biofilter operating parameters change to the point that biofilter performance may be affected.

8.4.4 Annual Biofilter Monitoring

An annual biofilter evaluation is recommended. The surface of the biofilter may deteriorate depending on the exposure to severe weather and other effects throughout the year. Thick plant growth can be removed from the biofilter surface to avoid head pressure problems. Evaluate the top layer of mulch each year to determine if new material should be spread over the surface. The biofilter medium should be sampled at all depths from the biofilter surface down to the rounded stone. Sampling should be done at random locations throughout the

biofilter. The biofilter media samples should be analyzed for pH, moisture, ammonia, and nitrogen content; a breakdown of the concentration of each form of nitrogen should be requested with the report.

Any ammonia generated by the compost facility is sent to the biofilter via the building exhaust system and biofilter- air distribution system. Ammonia is absorbed by moisture in the biofilter media. Microbes eventually convert the ammonia to nitrate. Testing the biofilter media for ammonia and nitrate generates data which can be used in trend analyses. In general, ammonia and nitrate ion concentrations on a dry basis will range between **0 and 2.0%.** Reference the discussion of sampling methods in this manual when sampling the biofilter media since obtaining a representative sample is a critical step in the process.

The September 7, 1994 letter and related documents on the following pages detail the monitoring which should be performed on the biofilters. These documents include checksheets which should be filled in during the biofilter monitoring.

Appendix E-5

Landfill Operations and Maintenance Plan

QUARTERLY FLARE MAINTENANCE SCHEDULE

An LFG Specialties enclosed flare and controller system requires very little maintenance. A few preventative maintenance steps should be taken, however, to insure the life of the flare and proper operation of the system. These steps include:

1) Maintain the finish on the flare stack by cleaning any scratches or chipping with a wire brush and repainting with touch-up paint supplied. Note: no maintenance is required on the stainless steel portion of the flare.

2) Inspect all wiring and connections for any wear and replace as necessary.

3) Inspect spark plug igniter for electrode wear and replace as necessary.

4) Check pilot nozzle for obstructions and clean as necessary. Note: pilot nozzle is a small jet which will require fine wire or needle type cleaner.

5) Check all piping connections for tightness and leaks, replace gaskets as necessary and retorque bolts.

6) For maintenance directions on peripheral equipment, see manufacturers instructions in back of this manual.

9) When blower is included in scope of supply

   A) Lubricate the blower and motor bearings as specified by manufacturer (see lubrication instructions in the blower operation and maintenance section).

   B) Check and adjust tension on drive belts when applicable.

If any problems arise in the operation of your LFG Specialties flare and controller system that cannot be easily remedied, please notify us immediately for service advice. If the problem cannot be corrected via phone conversation, a service representative can be sent to the site to fully investigate and resolve the problem.

Appendix F-1

Auxiliary Burner Emission Calculations

NORTH COUNTY RESOURCE RECOVER FACILITY

AXILLARY BURNER EMISSIONS (Emission Units 1 and 2)

EMISSION CALCULATIONS

$$\frac{22\ MMBTU}{hour} \times \frac{1}{1056.7\ BTU/cu.ft} = 0.0208\ MM\ cu.ft$$

Each Burner =

Number of Burners Per Boiler = 4

POLLUTANT	AP-42 EMISSION FACTOR (lb/MM cu.ft.)	EMISSIONS (lb/hr/unit)	EMISSIONS FOR 8 BURNERS (lbs/hr)	ANNUAL EMISSIONS 8 BURNERS (tpy)
PM	13.7	0.2849	2.279	0.1094
SO_2	0.6	0.01248	0.0998	4.8×10^{-3}
NO_x	140.0	2.912	23.296	1.12
CO	35.0	0.728	5.824	0.28
TOC	5.8	0.1206	0.9651	0.0464

Each Warm-up Period = 3 hours

Assume Maximum of 20 Warm-up Periods = 60 hours/year

Annual Gas Usage for Warm-up = 0.0208 MM cu.ft/hr x 80 hours/year x 8 = 13.31 MM cu.ft/year

+ 20% Low BTU Waste = 15.97 MM cu.ft./year

≈ 16 MM cu.ft/year

Appendix F-2
Auto Spray Booth
VOC Emission Calculations

NORTH COUNTY RESOURCE RECOVERY FACILITY

AUTO SPRAY BOOTH (Emission Unit 15)

VOC EMISSION CALCULATIONS

PAINT

Estimated usage based on purchase records = 271 gallons/year

VOC lb/gallon = 4.17

Annual VOC Emissions = 4.17 x 271 = 1130 lbs/yr

REDUCER

Estimated usage based on purchase records = 8.75 gallons/year

VOC lb/gallon = 6.86

Annual VOC Emissions = 6.86 x 8.75 = 60.02 lbs/yr

THINNER

Estimated usage based on purchase records = 50 gallons/year

VOC lb/gallon = 7.0

Annual VOC Emissions = 7.0 x 50 = 350 lbs/yr

Total VOC Emissions = 1130 + 60.02 + 350 = 1540 lbs/yr

Operating Time 10 hours/week x 52 weeks/year = 520 hours/year

VOC = 1540/520 = 2.96 lbs/hr

Appendix F-3
Composting Area
VOC Emission Calculation

NORTH COUNTY RESOURCE RECOVERY FACILITY

COMPOSTING AREA (Emission Unit 16)

VOC EMISSION CALCULATIONS

Total Amount Composted = 110,000 tons per year

Assume 15% Volatiles in the Compost = 16,500 tons per year

Assume 2% of Volatiles Released as VOCs with the remaining volatiles synthesized or Used to Form Aerobic Products.

VOC = 0.02 x 16,500 = 330 tons per year

Assume 90% Reduction in Biofilter Beds

VOC Emissions = 33.0 tons per year

$$\frac{33.0 \times 2000}{8760} = \frac{7.53\ lb}{hr}$$

Appendix F-4

Landfill Emission Calculations

NORTH COUNTY RESOURCE RECOVERY FACILITY

LANDFILL (Emission Unit 17)

EMISSION CALCULATIONS

LANDFILL GAS RATE:

$Q_{CH_4} = L_o R (e^{-kc} - e^{-kt})$ Landfill Air Emissions Estimation Model from AP-42

Q_{CH_4} = Methane Generation Rate at Time t m^3/year

L_o = 125 m^3/mg (Default Value)

R = Average Refuse Acceptance Rate = 358,000 tons per year
= 325,454.5 mg/year

K = 0.04 year (Default Value)

C = 0

t = 6 years

$Q_{CH_4} = 125 \times 325{,}454.5 \ (e^{-0.04 \times 0} - e^{0.04 \times 6})$

$= 8.68 \times 10^6$ m^3/year
$= 306.49 \times 10^6$ cu.ft./year

Assume NMOC Concentration of 1170 ppm as Hexane.

NMOC Emissions =

$$306.49 \times \frac{10^6 \ cu.ft}{yr} \times 2 \times \frac{1170 \ ppm}{10^6} \times \frac{lb \ mole}{259 \ ft^3} \times \frac{86 \ lb}{lb \ mole}$$

$$= \frac{171{,}805.1 \ lbs. \ VOC}{yr}$$

= 85.9 tons per year

Assume 98% Control Efficiency for Flares

NMOC Emissions = 85.9 (1 - 0.98) = 1.72 tons per year

SECONDARY COMPOUND EMISSIONS FROM LANDFILL WITH FLARES[a]

POLLUTANT	EMISSION[b] FACTOR UNCONTROLLED METHANE (lb/hr/dscfm)	EMISSIONS (lb/hr)
CO_2	8.450	4927.36
NO_2	0.007	4.08
CO	0.05	29.15

[a]AP-42
[b]Uncontrolled methane gas rate = 583.12 dscfm

SO_2 EMISSIONS

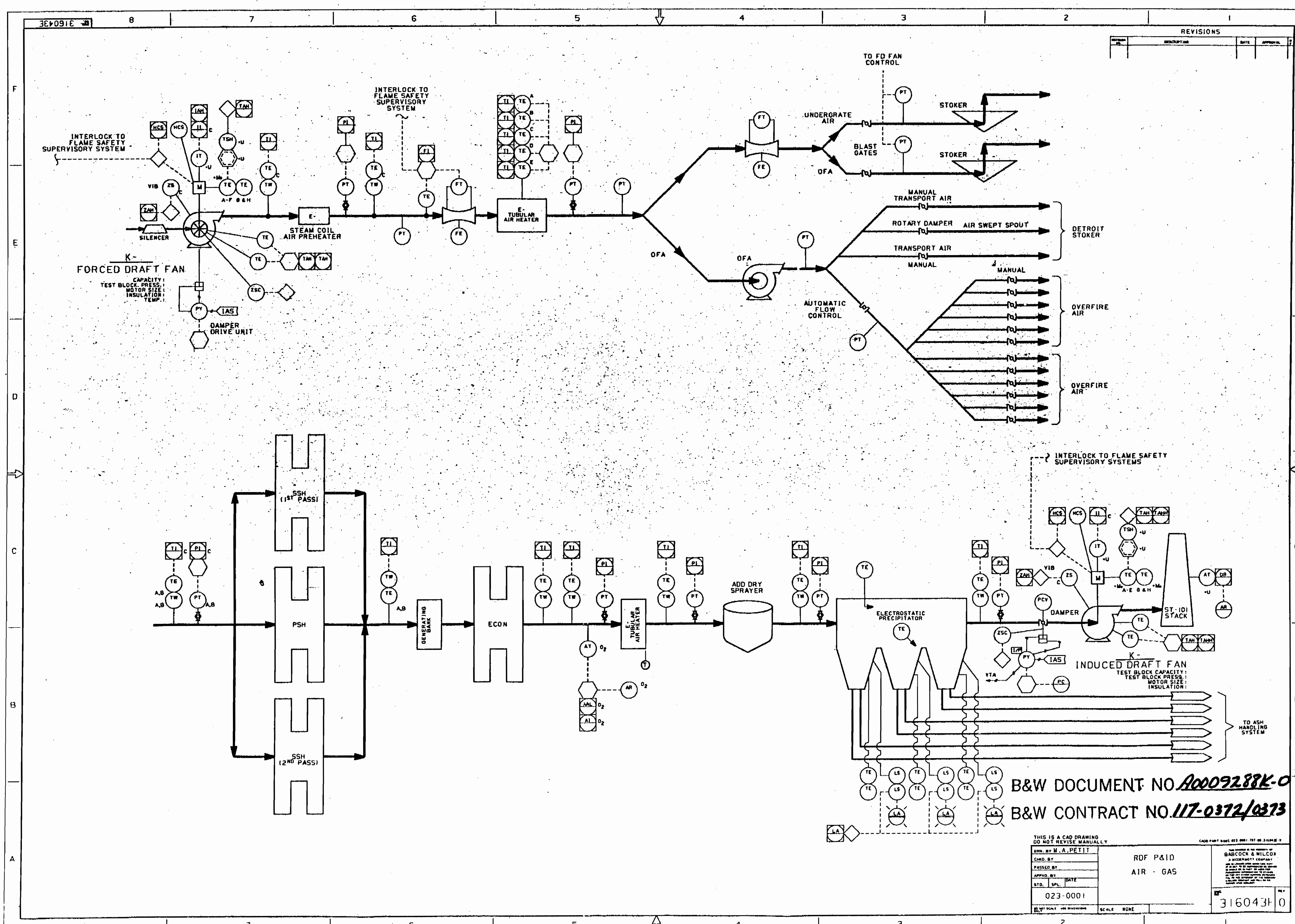
$$S + O_2 \rightarrow SO_2$$

Assume 100% S $\rightarrow$ SO_2

35 lbs/ mole $\rightarrow$ 67 lbs/mole

Assume S = 0.65 lbs/hr $\rightarrow$ (67/35) x 0.65 = <u>1.24 lbs/hr</u>

0990234



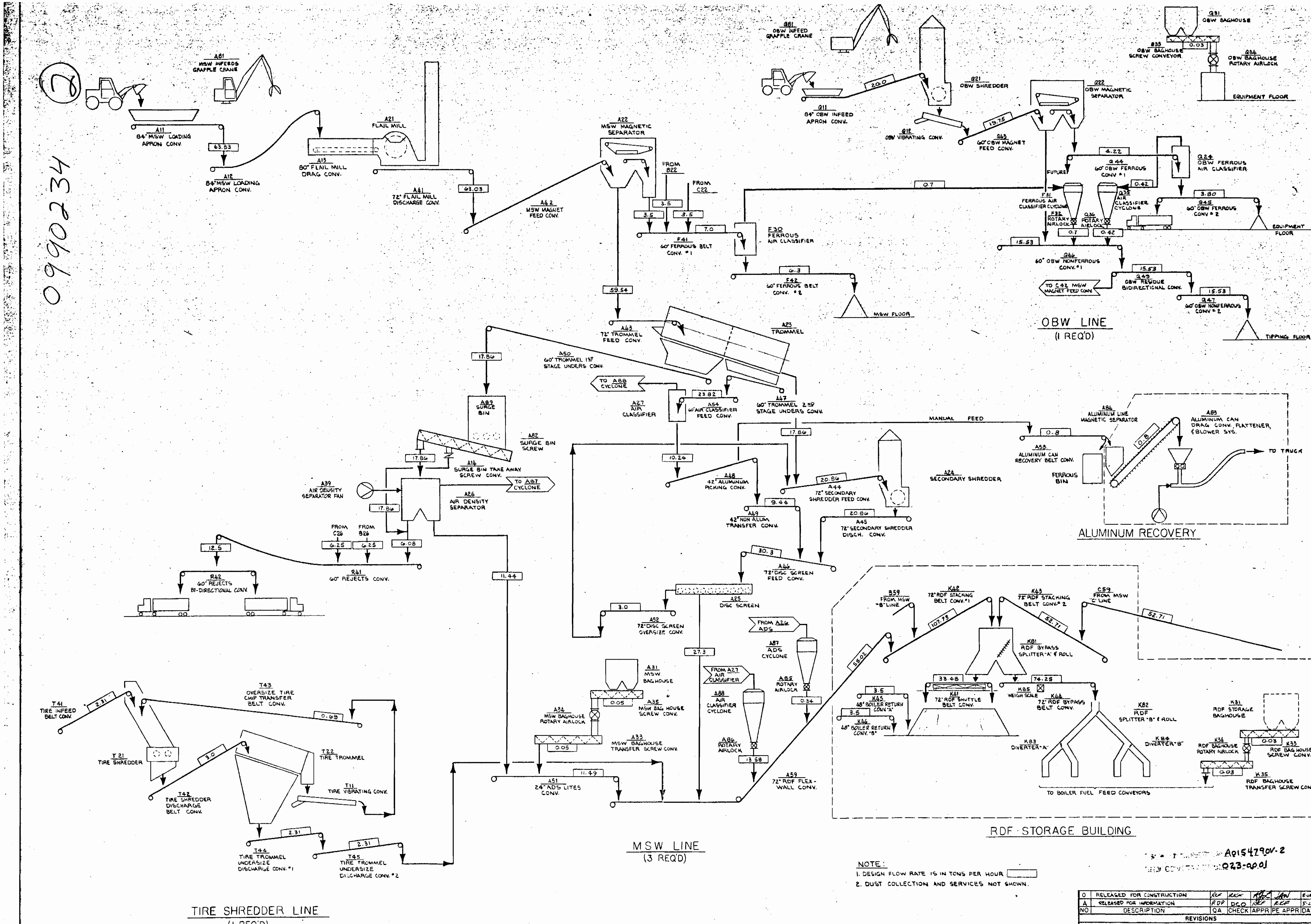
INTERLOCK TO FLAME SAFETY SUPERVISORY SYSTEM
SILENCER
K-
FORCED DRAFT FAN
CAPACITY:
TEST BLOCK PRESS.:
MOTOR SIZE:
INSULATION:
TEMP.:
DAMPER DRIVE UNIT
STEAM COIL AIR PREHEATER
INTERLOCK TO FLAME SAFETY SUPERVISORY SYSTEM
E-
TUBULAR AIR HEATER
TO FD FAN CONTROL
UNDERGRATE AIR
BLAST GATES
OFA
STOKER
STOKER
MANUAL TRANSPORT AIR
ROTARY DAMPER
AIR SWEPT SPOUT
TRANSPORT AIR
MANUAL
DETROIT STOKER
AUTOMATIC FLOW CONTROL
OVERFIRE AIR
OVERFIRE AIR
SSH (1ST PASS)
PSH
SSH (2ND PASS)
GENERATING BANK
ECON
ADD DRY SPRAYER
ELECTROSTATIC PRECIPITATOR
INTERLOCK TO FLAME SAFETY SUPERVISORY SYSTEMS
DAMPER
K-
INDUCED DRAFT FAN
TEST BLOCK CAPACITY:
TEST BLOCK PRESS.:
MOTOR SIZE:
INSULATION:
ST-101 STACK
TO ASH HANDLING SYSTEM
REVISIONS

B&W DOCUMENT NO. A0009288K-0

B&W CONTRACT NO. 117-0372/0373

THIS IS A CAD DRAWING
DO NOT REVISE MANUALLY

DWN. BY M.A. PETIT	RDF P&ID	BABCOCK & WILCOX
CHKD. BY	AIR - GAS	A MCDERMOTT COMPANY
PASSED BY		
APPVD. BY		
STD. / SPL. / DATE		
023-0001	SCALE NONE	316043E REV 0



0990234
A11 84" MSW LOADING APRON CONV.
A12 84" MSW LOADING APRON CONV.
A61 MSW INFEEDS GRAPPLE CRANE
63.33
A13 80" FLAIL MILL DRAG CONV.
A21 FLAIL MILL
A41 72" FLAIL MILL DISCHARGE CONV.
63.03
A42 MSW MAGNET FEED CONV.
A22 MSW MAGNETIC SEPARATOR
FROM B22
FROM C22
3.5
3.5
3.5
7.0
F41 60" FERROUS BELT CONV. #1
F30 FERROUS AIR CLASSIFIER
6.3
F42 60" FERROUS BELT CONV. #2
MSW FLOOR
59.54
A43 72" TROMMEL FEED CONV.
A23 TROMMEL
17.86
A50 60" TROMMEL 1ST STAGE UNDERS CONV.
TO A88 CYCLONE
23.82
A27 AIR CLASSIFIER
A54 60" AIR CLASSIFIER FEED CONV.
A47 60" TROMMEL 2ND STAGE UNDERS CONV.
17.86
MANUAL FEED
A89 SURGE BIN
A82 SURGE BIN SCREW
17.86
A16 SURGE BIN TAKE AWAY SCREW CONV.
A39 AIR DENSITY SEPARATOR FAN
TO A87 CYCLONE
A26 AIR DENSITY SEPARATOR
17.86
FROM C26
FROM B26
6.25
6.25
6.08
12.5
R41 60" REJECTS CONV.
R42 60" REJECTS BI-DIRECTIONAL CONV.
11.44
10.24
A48 42" ALUMINUM PICKING CONV.
9.44
A49 42" NON ALUM. TRANSFER CONV.
20.56
A44 72" SECONDARY SHREDDER FEED CONV.
A24 SECONDARY SHREDDER
20.86
A45 72" SECONDARY SHREDDER DISCH. CONV.
30.3
A46 72" DISC SCREEN FEED CONV.
A25 DISC SCREEN
3.0
A52 72" DISC SCREEN OVERSIZE CONV.
27.3
FROM A26 ADS
A87 ADS CYCLONE
A85 ROTARY AIRLOCK
0.34
FROM A27 AIR CLASSIFIER
A88 AIR CLASSIFIER CYCLONE
A86 ROTARY AIRLOCK
13.58
A31 MSW BAGHOUSE
A35 MSW BAG HOUSE SCREW CONV.
0.05
A34 MSW BAGHOUSE ROTARY AIRLOCK
A33 MSW BAGHOUSE TRANSFER SCREW CONV.
0.05
A51 24" ADS LITES CONV.
11.49
A59 72" RDF FLEX-WALL CONV.
55.02
MSW LINE
(3 REQ'D)
A53 ALUMINUM CAN RECOVERY BELT CONV.
0.8
A84 ALUMINUM LINE MAGNETIC SEPARATOR
A83 ALUMINUM CAN DRAG CONV., FLATTENER, & BLOWER SYS.
TO TRUCK
FERROUS BIN
ALUMINUM RECOVERY
G81 OBW INFEED GRAPPLE CRANE
G11 84" OBW INFEED APRON CONV.
20.0
G21 OBW SHREDDER
G12 OBW VIBRATING CONV.
15.75
G43 60" OBW MAGNET FEED CONV.
G22 OBW MAGNETIC SEPARATOR
G31 OBW BAGHOUSE
0.03
G33 OBW BAGHOUSE SCREW CONVEYOR
G34 OBW BAGHOUSE ROTARY AIRLOCK
EQUIPMENT FLOOR
4.22
G44 60" OBW FERROUS CONV. #1
G24 OBW FERROUS AIR CLASSIFIER
FUTURE
0.7
0.42
F31 FERROUS AIR CLASSIFIER CYCLONE
G35 AIR CLASSIFIER CYCLONE
F32 ROTARY AIRLOCK
G36 ROTARY AIRLOCK
3.80
G45 60" OBW FERROUS CONV. #2
EQUIPMENT FLOOR
0.7
0.42
15.53
G46 60" OBW NONFERROUS CONV. #1
15.53
G49 OBW RESIDUE BIDIRECTIONAL CONV.
TO C42 MSW MAGNET FEED CONV.
15.53
G47 60" OBW NONFERROUS CONV. #2
TIPPING FLOOR
OBW LINE
(1 REQ'D)
B59 FROM MSW "B" LINE
K42 72" RDF STACKING BELT CONV. #1
107.75
K43 72" RDF STACKING BELT CONV. #2
52.71
C59 FROM MSW "C" LINE
52.71
K81 RDF BYPASS SPLITTER "A" & ROLL
33.48
74.25
3.5
K45 48" BOILER RETURN CONV. "A"
3.5
K46 48" BOILER RETURN CONV. "B"
K41 72" RDF SHUTTLE BELT CONV.
K85 WEIGH SCALE
K44 72" RDF BYPASS BELT CONV.
K82 RDF SPLITTER "B" & ROLL
K83 DIVERTER "A"
K84 DIVERTER "B"
K31 RDF STORAGE BAGHOUSE
K36 RDF BAGHOUSE ROTARY AIRLOCK
0.03
K33 RDF BAG HOUSE SCREW CONV.
0.03
K35 RDF BAGHOUSE TRANSFER SCREW CONV.
TO BOILER FUEL FEED CONVEYORS
RDF STORAGE BUILDING
T41 TIRE INFEED BELT CONV.
2.31
T43 OVERSIZE TIRE CHIP TRANSFER BELT CONV.
0.69
T21 TIRE SHREDDER
3.0
T42 TIRE SHREDDER DISCHARGE BELT CONV.
T22 TIRE TROMMEL
T11 TIRE VIBRATING CONV.
2.31
T44 TIRE TROMMEL UNDERSIZE DISCHARGE CONV. #1
2.31
T45 TIRE TROMMEL UNDERSIZE DISCHARGE CONV. #2
TIRE SHREDDER LINE
(1 REQ'D)
A0154290V-2
023-00.01
NOTE:
1. DESIGN FLOW RATE IS IN TONS PER HOUR
2. DUST COLLECTION AND SERVICES NOT SHOWN.

NO	DESCRIPTION	QA	CHECK	APPR	PE APPR	DATE
0	RELEASED FOR CONSTRUCTION					6-26-87
A	RELEASED FOR INFORMATION	RDP	DCO			5-22-87

REVISIONS

PROPRIETARY

NATIONAL ECOLOGY
TIMONIUM, MARYLAND

DESIGNED BY | DRAWN BY G&T | CHECKED BY

PALM BEACH COUNTY SOLID WASTE AUTHORITY
PALM BEACH COUNTY, FLORIDA

MATERIAL FLOW DIAGRAM
MSW RDF PRODUCTION

SHEET NO 522-P2-001
REV. 0
FILE NO
SCALE
DATE 5/8/87

3

0990234

PLANT WATER — 18 GPM — HV Q21-2B — FV Q21-2B

PLANT FIRE PROTECTION WATER — -FW- 40 GPM — HV Q21-2A — FV Q21-2A — BECHTEL SCOPE — NET SCOPE

HALON STORAGE BOTTLES (6) — FV Q21-7 (6) — EXPLOSION SUPPRESSION SYSTEM — UAH Q21-7B

UAH Q21-7A — ASH Q21-7 — AE Q21-7 COMBUST-IBLES — PE Q21-7D — PE Q21-7C

COOLING WATER SUPPLY 522-P1-021 — -CW- — HV Q81-2 — UAH Q81-1B — TSH Q81-1 — M — PSV Q81-1 — UAL Q81-1 — UAH Q81-1A — PSL Q81-1 — PSH Q81-1 — LSL Q81-1 — FV Q81-1 — FIC Q81-2 — -CW- — COOLING WATER RETURN 522-P1-019

GRAPPLE CRANE HYDRAULIC CONTROLS SEE

Q81
OBW INFEEDS GRAPPLE CRANE

DRIP OILER SUPPLY TANK — FV Q11-3 — HV Q11-3

SI Q11-1 — SC Q11-1 — M — HC Q11-1

Q21
OBW SHREDDER

UAH Q21-8 — LSH Q21-8A,B (2)

Q91
OBW SHREDDER MOTOR

Q11
84" OBW INFEED APRON CONV.

SS Q11-1 — HS Q11-2A,B (2)

IE Q91-3 — SE Q91-2 — TE Q91-1A — TE Q91-1B — TE Q21-1A — TE Q21-1B — IT Q91-3 — II Q91-3 — ST Q91-2 — TT Q91-1A — TT Q91-1B — TT Q21-1A — TT Q21-1B — TO LIQUID RHEOSTAT CONTROL — SSL Q91-2 — TSH Q91-1A — TSH Q91-1B — TSH Q21-1A — TSH Q21-1B — UAL Q91-2 — UAH Q91-1A — UAH Q91-1B — UAH Q21-1A — UAH Q21-1B

COOLING WATER SUPPLY 522-P1-021 — -CW- — HV Q91-4 — COOLING WATER RETURN 522-P1-021 — -CW- — FIC Q91-4

PE Q21-7B — PE Q21-7A

PIN PULLER

Q21-1
OBW SHREDDER HYDRAULIC PACKAGE

FSV Q21-3 — PI Q21-3 — HV Q21-3 — M — UAH Q21-3 — TSH Q21-3 — UAL Q21-3A — LSL Q21-3 — LI Q21-3 — F — FV Q21-5 — FV Q21-4 — HV Q21-5A — HV Q21-5B — HV Q21-4A — HV Q21-4B — PSV Q21-4A — PSV Q21-4B — -HY-

TO FAR SIDE DRIVE SHAFT BEARING — 3/8-HY- — 1¼-HY- — 3/8-HY- — 1¼-HY-

HV Q21-6B — -CW- — COOLING WATER SUPPLY 522-P1-021 — NEI SCOPE — BECHTEL SCOPE — -CW- — COOLING WATER RETURN 522-P1-021 — FIC Q21-6 — FV Q21-6 — HV Q21-6C — HV Q21-6D — HV Q21-6E — F — M — PSV Q21-6 — PI Q21-6 — HV Q21-6A — LI Q21-6 — LSL Q21-6 — TSL Q21-6 — TSH Q21-6 — UAL Q21-6A — UAL Q21-6B — UAH Q21-6 — 1¼-HY-

Q21-2
OBW SHREDDER LUBE OIL PACKAGE

FSL Q21-6A — UAL Q21-6C — FSL Q21-6B

TSH Q22-6 — TT Q22-6 — UAH Q22-6 — TE Q22-6 — SS Q22-2

Q22
OBW MAGNETIC SEPARATOR

AE Q22-3 COMBUST-IBLES — ASH Q22-3 — UAH Q22-3 — MAGNET CONTROL — M

PLANT FIRE PROTECTION WATER — 200 GPM — HV Q43-4 — FV Q43-4 — BECHTEL SCOPE — NET SCOPE

Q43
OBW MAGNETIC SEPARATOR FEED CONV.

ZS Q43-3C — ZS Q43-3D — SS Q22-1

Q12
OBW VIBRATING CONV.

SS Q43-1 — HS Q43-2 — ZS Q43-3A — ZS Q43-3B

Q44
60' OBW FERROUS CONVEYOR #1

SS Q44-1 — HS Q44-2A,B (2) — LSH Q39-2 — UAH Q39-2

Q24
FERROUS AIR CLASSIFIER
SEE DWG 522-P1-020

FUTURE — ZS Q45-3B — ZS Q45-3A — ZS Q45-3C — ZS Q45-3D

SS Q45-1 — HS Q45-2

Q45
60' OBW FERROUS CONVEYOR #2

F31
FERROUS AIR CLASSIFIER CYCLONE
SEE DWG 522-P1-018 — SSL F32-1

F32
FERROUS AIR CLASSIFIER CYCLONE ROTARY AIRLOCK — M

Q35
OBW AIR CLASSIFIER CYCLONE
SEE DWG 522-P1-018 — SSL Q36-1

Q36
OBW AIR CLASSIFIER CYCLONE ROTARY AIRLOCK — M

Q46
60' OBW NON-FERROUS CONVEYOR #1

ZS Q49-3A — ZS Q49-3B — M — HS Q46-2 — SS Q46-1

Q49
OBW RESIDUE BIDIRECTIONAL CONV.

Q47
60' OBW NON FERROUS CONVEYOR #2

ZS Q47-3C — ZS Q47-3A — ZS Q47-3B — HS Q49-2 — ZS Q49-3C — ZS Q49-3D — SS Q49-1 — HS Q47-2 — SS Q47-1 — ZS Q47-3D

TO Q42 MGW MAGNET FEED CONV. 522-P1-010

291	HS Q91-9A	HS Q91-9B	HS Q91-9C	HS Q91-9D	L Q91-9A	L Q91-9B	L Q91-9C	HS Q91-9E								
081	HS Q81-9A		* HS Q81-9C	HS Q81-9D	L Q81-9A	L Q81-9B	L Q81-9C			HS Q81-9G	HS Q81-9H	L Q81-9D	L Q81-9E	L Q81-9F		JOG IS FORWARD & REVERSE
047	HS Q47-9A	HS Q47-9B	HS Q47-9C	HS Q47-9D	L Q47-9A	L Q47-9B	L Q47-9C	HS Q47-9E								
044	HS Q44-9A	HS Q44-9B	HS Q44-9C	HS Q44-9D	L Q44-9A	L Q44-9B	L Q44-9C	HS Q44-9E								
045	HS Q45-9A	HS Q45-9B	HS Q45-9C	HS Q45-9D	L Q45-9A	L Q45-9B	L Q45-9C	HS Q45-9E								
064	HS Q64-9A	HS Q64-9B	HS Q64-9C	HS Q64-9D	L Q41-9A	L Q64-9B	L Q64-9C	HS Q64-9E								
063	HS Q63-9A	HS Q63-9B	HS Q63-9C	HS Q63-9D	L Q45-9A	L Q63-9B	L Q63-9C	HS Q63-9E					L Q63-9E			
Q21-2	HS Q21-9J		HS Q21-9L	HS Q21-9M	L Q21-9G	L Q21-9H	L Q21-9J									
Q21-1	HS Q21-9A		HS Q21-9C	HS Q21-9D	L Q21-9A	L Q21-9B	L Q21-9C		HS Q21-9F							LOCAL PENDANT CONTROL FOR CYLINDERS
Q12	HS Q12-9A	HS Q12-9B	HS Q12-9C	HS Q12-9D	L Q12-9A	L Q12-9B	L Q12-9C	HS Q12-9E					L Q12-9E			
Q11	HS Q11-9A	HS Q11-9B	HS Q11-9C	HS Q11-9D	L Q11-9A	L Q11-9B	L Q11-9C	HS Q11-9E	HS Q11-9F	HS Q11-9G	HS Q11-9H	L Q11-9D	L Q11-9E	L Q11-9F		
EQUIP. NO.	LOCAL LOCK OUT STOP	LOCAL JOG	STOP	START	STOP LT.	RUN LT.	READY LT.	JOG ENAB.	LOC./ PNL.	STOP	START	STOP LT.	RUN LT.	READY LT.		REMARKS
			MAIN CONTROL ROOM PANEL							GRAPPLE CONTROL PANEL						

CONTROL DEVICES

A01547971-2
023-0001

NO	DESCRIPTION	QA	CHECK	APPR	PE APPR	DATE
0	ISSUED FOR CONSTRUCTION					8-18-81

REVISIONS

NATIONAL ECOLOGY
TIMONIUM, MARYLAND

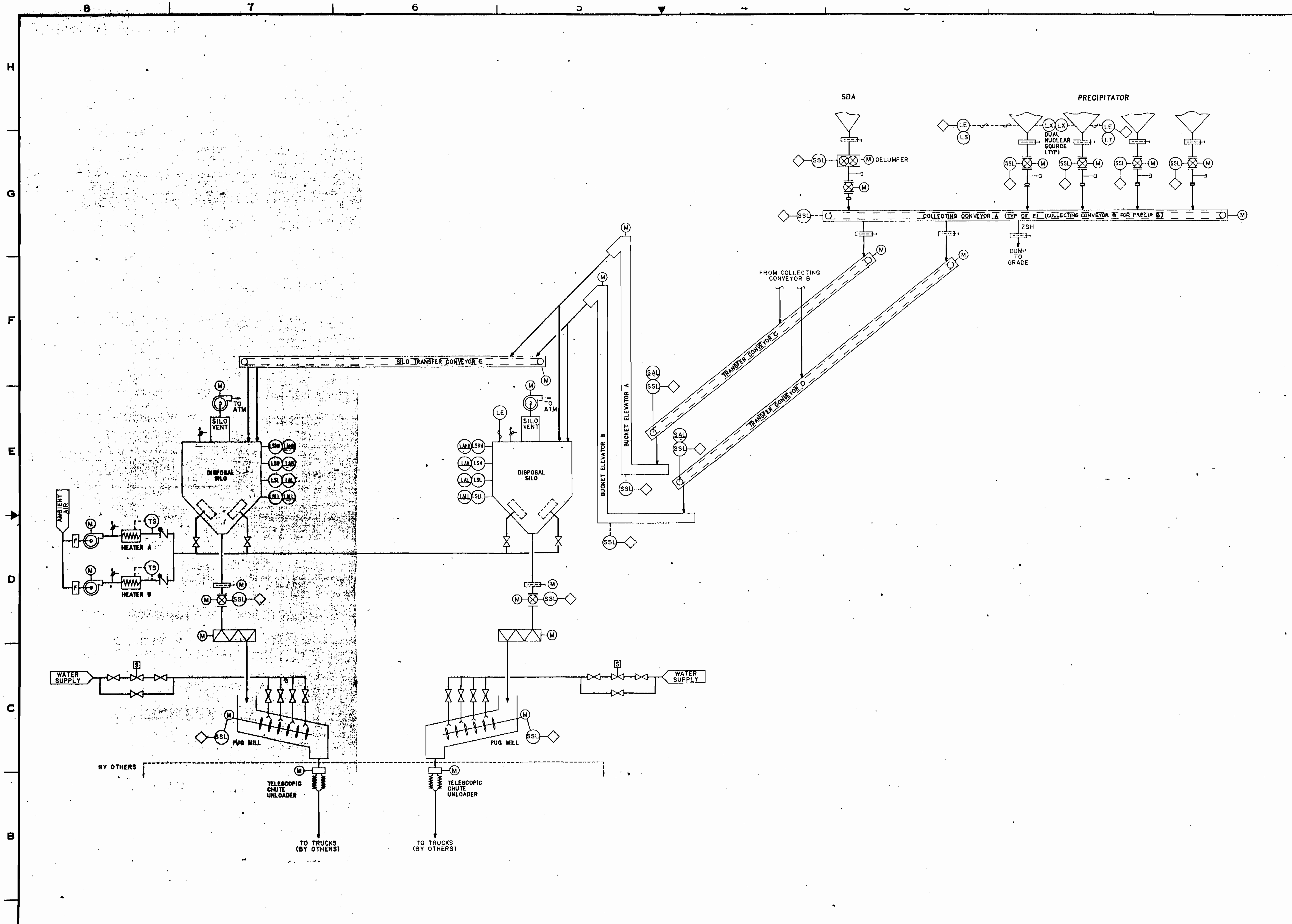
DESIGNED BY | DRAWN BY WALKER | CHECKED BY

PALM BEACH COUNTY
SOLID WASTE AUTHORITY
PALM BEACH COUNTY, FLORIDA

PROCESS & INSTRUMENTATION DIAGRAM
OBW SYSTEM

SHEET NO. 522-P1-015
REV. 0
FILE NO.
SCALE NONE
DATE 9-11-82

0990234 (4)



SDA
PRECIPITATOR
DELUMPER
DUAL NUCLEAR SOURCE (TYP)
COLLECTING CONVEYOR A (TYP OF 2) (COLLECTING CONVEYOR B FOR PRECIP B)
ZSH
DUMP TO GRADE
FROM COLLECTING CONVEYOR B
TRANSFER CONVEYOR C
TRANSFER CONVEYOR D
BUCKET ELEVATOR A
BUCKET ELEVATOR B
SILO TRANSFER CONVEYOR E
TO ATM
SILO VENT
DISPOSAL SILO
AMBIENT AIR
HEATER A
HEATER B
WATER SUPPLY
PUG MILL
BY OTHERS
TELESCOPIC CHUTE UNLOADER
TO TRUCKS (BY OTHERS)

B&W DOCUMENT NO. A0153858V-0
B&W CONTRACT NO. 023-0001

DRAWN BY	4-10-87
ENGINEER	4-10-87
CHECKED BY	4-10-87
CHIEF ENG	4-10-87
PROJ ENG	

WESTERN PRECIPITATION DIVISION
JOY MANUFACTURING COMPANY
LOS ANGELES, CALIF. U.S.A.

BABCOCK AND WILCOX
PALM BEACH COUNTY SOLID WASTE AUTHORITY
WEST PALM BEACH, FLORIDA
ASH CONVEYING SYSTEM
P AND I DIAGRAM

SCALE N.T.S.
JOB 87-062
DWG 4-1502
REV A

A PRELIMINARY ISSUE

0490234 (5)

LIME
LIME
SILO VENT
TO ATMOSPHERE
LIME SILO A1
LIME SILO A2
TO ATMOSPHERE
SILO VENT
DISTRIBUTED CONTROL SYSTEM
DISTRIBUTED CONTROL SYSTEM
VIBRATOR
VIBRATOR
SLIDE GATE A1
SLIDE GATE A2 (NC)
SCREW FEEDER A1
SCREW FEEDER A2
SLAKING WATER
TO FEED HEAD TANK AREA
SLAKER A1
SLAKER A2
GRIT SCREEN A1
GRIT SCREEN A2
GRIT SCREW A1
GRIT SCREW A2
GRIT DISPOSAL
GRIT DISPOSAL
LIME SLURRY TANK A1
LIME SLURRY TANK A2
FLUSH WATER
LIME SLURRY FEED PUMPS A1 AND A2
DISTRIBUTED CONTROL SYSTEM
FEED HEAD TANK A1
FEED HEAD TANK A2
WATER FROM LIME SLAKING AREA
FLUSH WATER
CONTINUATION ON DWG. 4-1503

B&W DOCUMENT NO. A01E3157K-D
B&W CONTRACT NO. 033-0001

REV	DATE	PRELIMINARY ISSUE	BY	APP	APP
A					

REFERENCES — DRG NO — TITLE

REVISION RECORD

REV NO	DATE	REV BY	CHD BY	ENG APP	ENG APP

DRAWN BY
ENGINEER
CHECKED BY
LIMER ENG
PROJ ENG

JOY — WESTERN PRECIPITATION DIVISION, JOY MANUFACTURING COMPANY, LOS ANGELES CALIF. U.S.A.

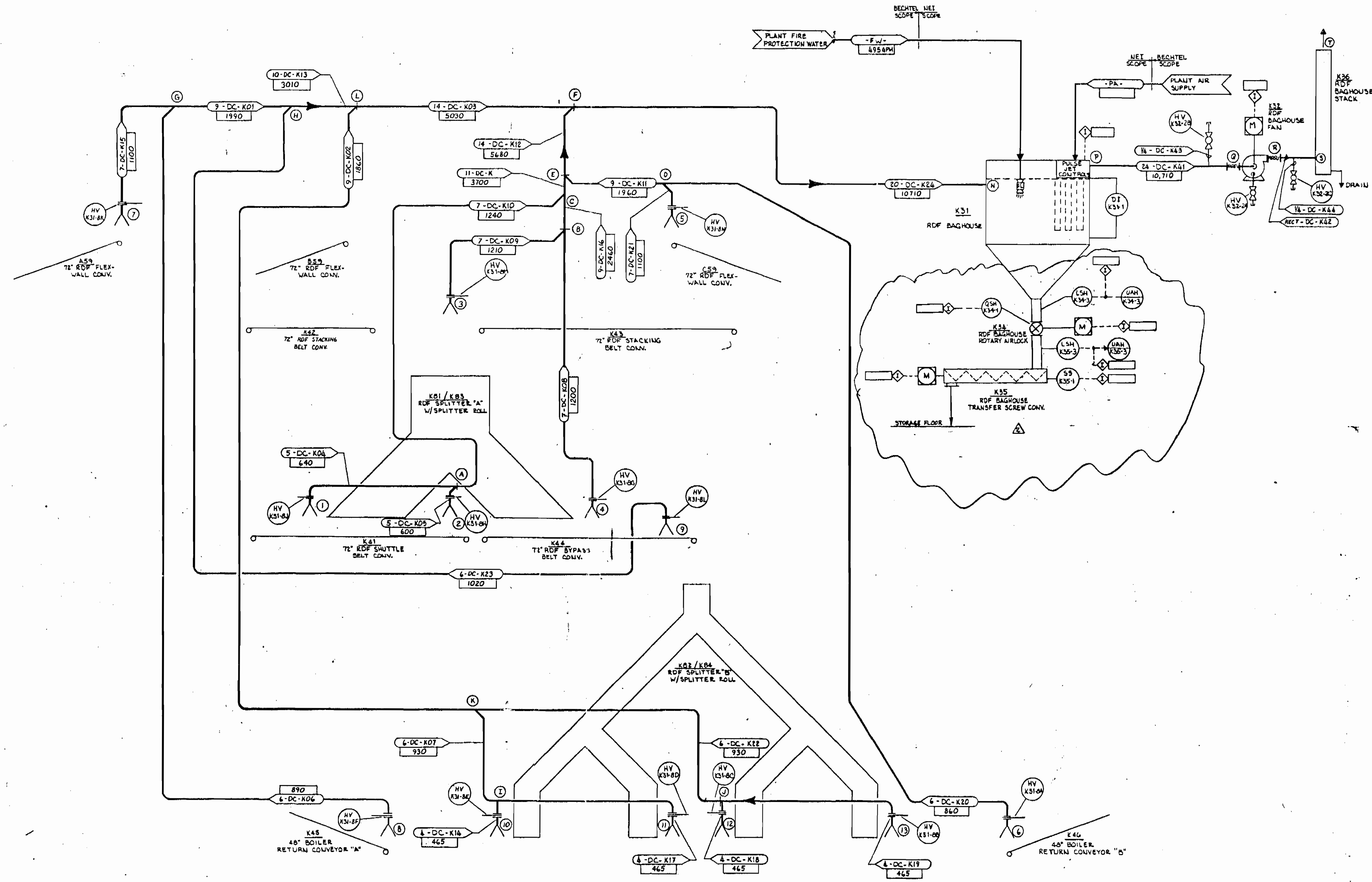
BABCOCK AND WILCOX
PALM BEACH COUNTY SOLID WASTE AUTHORITY
WEST PALM BEACH, FLORIDA

LIME SLAKING AND FEEDING SYSTEM
P AND I DIAGRAM

SCALE
DRAWING NO
JOB 87-062
DWG 4-1501
REV A

WP.ME.87062.4.1501

0990234 (6)



NOTES:
1) (X) INDICATES LOCATIONS USED IN SYSTEM CALCULATIONS
2) WHERE ONE CHARACTER IS SHOWN FOR THE SYSTEM CODE IN INSTRUMENT & VALVE TAG BUBBLES, A PREFIX "J" IS ASSUMED BEFORE THE CHARACTER.

EQUIP. NO.	LOCK OUT STOP	JOG	STOP (PANEL I)	START (PANEL I)	STOP LT. (PANEL I)	RUN LT. (PANEL I)	READY LT. (PANEL I)	JOG ENAB. (PANEL I)	LOC./PNL. (PANEL I)	REMARKS
K35	HS K35-9A	HS K35-9B	HS K35-9C	HS K35-9D	L K35-9A	L K35-9B	L K35-9C	HS K35-9E		
K34	HS K34-9A	HS K34-9B	HS K34-9C	HS K34-9D	L K34-9A	L K34-9B	L K34-9C	HS K34-9E		
(2)										
K32	HS K32-9A		HS K32-9C	HS K32-9D	L K32-9A	L K32-9B	L K32-9C			

CONTROL DEVICES

NCRRF

NO	DESCRIPTION	QA	CHECK	APPR	PE APPR	DATE
2	REMOVED K33 AND REVISED BAGHOUSE SCREW	DFS	SJC	DMC	JAW	
1	GENERAL REVISION	EJG		DMC		
0	ISSUED FOR CONSTRUCTION					7/?/87

REVISIONS

NATIONAL ECOLOGY
TIMONIUM, MARYLAND

DESIGNED BY | DRAWN BY POH | CHECKED BY

PALM BEACH COUNTY
SOLID WASTE AUTHORITY
PALM BEACH COUNTY, FLORIDA

PROCESS & INSTRUMENTATION DIAGRAM
RDF STORAGE BAGHOUSE SYSTEM

SHEET NO. 522-P1-01[illegible]
REV. 2
FILE NO.
SCALE NONE
DATE 7/24/87