



November 14, 2022

Environmental Approvals Branch
Manitoba Environment, Climate and Parks
1007 Century Street
Winnipeg, MB
R3H 0W4

RE: ENVIRONMENTAL ACT PROPOSAL – JELD-WEN OF CANADA LTD., WINNIPEG FACILITY

Dear Director,

Enclosed with this letter is an Environmental Act Proposal (EAP) application prepared by JELD-WEN of Canada Ltd. (JELD-WEN) for their door and window manufacturing facility located in Winnipeg, Manitoba (the Facility).

Based on the requirements for a Class 2 facility under the Classes of Development Regulation M.R. 164/88, please find enclosed the following: two (2) hard copies of the unredacted EAP application package, one (1) electronic copy of the unredacted EAP application package, two (2) hard copies of the redacted version of the EAP application package for public distribution, and one (1) electronic copy of a redacted version of the EAP application package for public distribution. The EAP application fee of \$7,500 has been submitted separately by cheque.

The EAP application package includes:

1. A cover letter
2. The Environment Act Proposal Form
3. Supporting EAP Report

We trust that the proposal contains the necessary information to support JELD-WEN's EAP application.

Please do not hesitate to reach out to the undersigned with any comments or questions.

Regards,



JELD-WEN, Inc.

2645 Silver Crescent Drive, Charlotte, NC 28273 USA

www.jeld-wen.com



Environment Act Proposal Form



Name of the development: JELD-WEN of Canada Ltd. Winnipeg Facility	
Type of development per Classes of Development Regulation (Manitoba Regulation 164/88): Class 2 - Manufacturing	
Legal name of the applicant: JELD-WEN of Canada Ltd.	
Mailing address of the applicant: 550 Munroe Avenue, Winnipeg, MB R2K 4H3	
Contact Person: Manny Mandilaras	
City: Winnipeg	Province: MB Postal Code: R2K 4H3
Phone Number: (204) 661-7709	Fax: email: mmandilaras@jeldwen.com
Location of the development: 550 Munroe Avenue, Winnipeg, MB R2K 4H3	
Contact Person: Manny Mandilaras	
Street Address: 550 Munroe Avenue & 485 Watt Street	
Legal Description: Lot I, Plan 20790 #189961 / Lot 2, Plan 20790 #1058060	
City/Town: Winnipeg	Province: MB Postal Code: R2K 4H3
Phone Number: (204) 661-7709	Fax: email: mmandilaras@jeldwen.com
Name of proponent contact person for purposes of the environmental assessment: Aaron Brite, Regional Environmental Manager	
Phone: (336) 479-1925	Mailing address: 2645 Silver Cres. Dr., Charlotte, NC 28273 USA
Fax:	
Email address: abrite@jeldwen.com	
Webpage address: www.jeld-wen.com	
Date: 2022-11-22	Signature of proponent, or corporate principal of corporate proponent: 
	Printed name: Manny Mandilaras

PRINT

RESET

A complete **Environment Act Proposal (EAP)** consists of the following components:

- ☒ **Cover letter**
- ☒ **Environment Act Proposal Form**
- ☒ **Reports/plans supporting the EAP** (see "Information Bulletin - Environment Act Proposal Report Guidelines" for required information and number of copies)
- ☒ **Application fee** (Cheque, payable to Minister of Finance, for the appropriate fee)

Per Environment Act Fees Regulation (Manitoba Regulation 168/96):	
Class 1 Developments	\$1,000
Class 2 Developments	\$7,500
Class 3 Developments:	
Transportation and Transmission Lines ..	\$10,000
Water Developments	\$60,000
Energy and Mining.....	\$120,000

Submit the complete EAP to:

Director
Environmental Approvals Branch
Manitoba Environment, Climate and Parks
1007 Century Street
Winnipeg, Manitoba R3H 0W4

For more information:

Email: EABDirector@gov.mb.ca
Phone: (204) 945-8321
Fax: (204) 945-5229
https://www.gov.mb.ca/sd/permits_licenses_approvals/eal/licence/index.html



**Application and Supporting Documentation for
an Environment Act Proposal (EAP)**

**JELD-WEN of Canada Ltd.
Window and Door Manufacturing Facility**

Report to: Ministry of the Environment, Climate and Parks
Environmental Approvals Branch
1007 Century Street
Winnipeg, Manitoba
R3H 0W4

Submitted by: JELD-WEN of Canada Ltd.

Site Address: 550 Munroe Avenue
Winnipeg, Manitoba
R2K 4H3

Date: November 2022

EXECUTIVE SUMMARY

This application has been prepared by JELD-WEN of Canada Ltd. (JELD-WEN) in support of an Environment Act Proposal (EAP) under the Manitoba Environment Act and Licensing Procedures Regulation 163/88 for their facility located at 550 Munroe Avenue and 485 Watt Street in Winnipeg, Manitoba (Facility).

This application has been prepared in accordance with *Licensing Procedures Regulation 163/88*; the Manitoba Environment, Climate and Parks' (MECP's) *Information Bulletin – Environmental Assessment and Licensing under The Environment Act* (October 2018); and MECP's *Information Bulletin – Environment Act Proposal Report Guidelines* (February 2022) (EAP Report Guidelines).

The Winnipeg Facility will typically operate from 7 am to midnight, 5 days per week. Operations include vinyl window production, pre-hung door operation, and interior door production. The facility produces vinyl windows and patio doors, pre-hung steel and fiberglass insulated exterior doors and wood faced interior doors.

The site is located in an industrial corridor along Raleigh Street, close to several residential developments, in the centre of the City of Winnipeg. The facility is bordered by residential to the west across Watt Street, industrial and then residential to the north across Golspie Street, residential to the east across Raleigh Street, and both residential (across Ottawa Avenue) and industrial to the south.

This EAP application package provides a description of the facility, its operations, processes and describes any potential impacts to the natural environment and human health. As described in this report, there are no anticipated significant adverse impacts to the natural environment or human health from the continued operation of the JELD-WEN Winnipeg facility.



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1.0 INTRODUCTION AND BACKGROUND

This application has been prepared by JELD-WEN of Canada Ltd. (JELD-WEN) in support of an Environment Act Proposal (EAP) application for their window and door manufacturing facility located at 550 Munroe Avenue and 485 Watt Street, in Winnipeg, Manitoba.

This application has been prepared in accordance with *Licensing Procedures Regulation 163/88*; the Manitoba Environment, Climate and Parks' (MECP's) *Information Bulletin – Environmental Assessment and Licensing under The Environment Act* (October 2018); and MECP's *Information Bulletin – Environment Act Proposal Report Guidelines* (February 2022) (EAP Report Guidelines).

1.1 Background Information and Data

JELD-WEN has operated their window and door manufacturing facility at 550 Munroe Avenue and 485 Watt Street in Winnipeg for 23 years. The facility employs approximately 284 people and produces approximately 200,000 doors and 145,000 windows annually. The Winnipeg facility produces vinyl windows and patio doors, pre-hung steel and fiberglass faced insulated exterior doors, and recently added wood faced interior doors (both hollow and solid).

This EAP was completed based on information provided by key JELD-WEN personnel including the Facility's Plant Manager, and the Maintenance Manager, as well as JELD-WEN's Regional Environmental Manager. Information was also used from the Weather Underground and Manitoba Historical Society websites, as well as Google Earth.



2.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT

2.1 Location and Certificate of Title

The Certificate of Title (number 2857510/1) shows the registered owner (JELD-WEN of Canada, Ltd.), legal description of the land, active instructions, address for service, title district and land index. A copy of the Certificate of Title provided in Appendix A.

The Winnipeg facility property covers an area of approximately 9 hectares or 90,255 square metres. The approximate coordinates of the southeast corner of the property are 49.914003° N, -97.090596° W, as shown in Figure 3 (Appendix B).

2.2 Owner of Land and Mineral Rights

JELD-WEN of Canada, Ltd. is the owner of the land and mineral rights.

2.3 Existing Land Use

The site is located in an industrial corridor along Raleigh Street, close to several residential developments. The facility is bordered by residential to the west across Watt Street, industrial and then residential to the north across Golspie Street, residential to the east across Raleigh Street, and both residential (across Ottawa Avenue) and industrial to the south. Specific nearby sensitive land uses north of the western end of the property include Holy Eucharist Ukrainian Catholic Parish, Holy Eucharist Parish Centre, Polson School, Munroe Junior High School, and Elmwood Community Resource Centre (see Figures 2 and 3).

The site is zoned M1 Manufacturing – Light under The City of Winnipeg Zoning By-law 200/06. No changes to land use are required or requested under this EAP application. The facility's operations are current compatible with the surrounding land uses. JELD-WEN took over the facility from Willmar in 1998/1999, and Willmar started in 1980.

2.4 Proposed Development and Operations

The proposed development is an existing facility, which JELD-WEN started operating in 1998/1999. The existing facility operates 8 hours per day, 5 days per week.

There are several existing buildings on the property. The main facility at 550 Munroe Avenue contains primary operations, including shipping, receiving and the office. Other buildings include Corporate (at 485 Watt Street), Millwork (at 485 Watt Street) which houses interior door production, and Chemcrest (south lot) for storage. The site also has a large, paved employee parking area, as well as an unpaved parking area for trailers and equipment. Refer to Figure 3 in Appendix B.



The facility's operations are comprised of three production units: vinyl window production, pre-hung door production, and interior door production. Detailed process flow diagrams for the facility operations are presented in Appendix C.

2.4.1 Vinyl Window Production

Glass for vinyl windows is procured in sheets which are cut, washed, and the edges are ground (chamfer and/or to remove coating as needed) before assembly of insulated glass (IG) units. An IG spacer is formed from aluminium strips and matrix (hot melt material with moisture absorbing properties) on the inside and hot melt sealant on the outside to form the edge and centre grid of the window. The grid and two sheets of glass are sandwiched and heated in an oven and then pressed to form a bond. Cooled units are then filled with argon gas.

The facility manufactures frames and sliders up to patio door size. Patio doors are supplied pre-assembled. Lineal vinyl is procured from an outside supplier in base colours, laminated on for permanence, and extruded to specific shapes for product types with needed channels for weather stripping, insulating foam, and metal reinforcements molded in. Special colours are applied as needed using automotive finishes in the paint spray booth. Lineals are cut to the required lengths and angles with fine tooth saws. Holes are punched as needed for drainage, fasteners, etc. Steel or aluminum reinforcements are added as needed.

The frame and inserts are assembled using electric resistance element welding to form the window bodies (frames and sliders). Welds are cleaned using either a knife or a fine tooth saw. Insulated glass units are inserted into the window inserts and bedded with window assembly or glazing sealant. Inserts are assembled into frames and hardware is installed to form complete window units.

2.4.2 Pre-Hung Door Production

Doors are procured from JELD-WEN operations in Quebec to include interior hollow and solid core doors, fiberglass and steel faced exterior doors. Door frame components (i.e., wood side and head jambs, wood or mulls (vertical joining pieces to connect two doors together, metal sills), and lights (windows)) are also procured from suppliers.

Door slabs are machined as needed for handles, lock sets, windows and hinges. Waste dust is collected by dust collectors and sent off-site for disposal. Doors to be pre-finished are transferred to the paint spray booth. Lights (windows) are installed using Dow 1199 and surrounded using screws. Door frames are machined to match door slabs and assembled around the door using screws. Door hardware is installed and completed units are packaged for shipping. Additional components, such as mulls, are used to form specialty doors (e.g., French or garden style).

2.4.3 Interior Door Production

Wood stiles (vertical sides), wood rails (top and bottom), lock blocks (internal reinforcement for handles), and cardboard or Styrofoam core pieces (coated with PVA adhesive in a glue roll applicator) are assembled with two composite wood door skins. Assembled hollow doors are



stacked as made, then transferred to a cold press where they are pressed until the glue is set. Stacks are inspected and unstacked into the trim saw where the doors are sized to final dimensions, squared, and printed with ID information. Doors are edge primed manually using paint rollers on individual doors in the prime paint booth. Completed doors are then shipped or moved to pre-hang.

Solid core doors are similar except lockblock and core are replaced by a solid piece of medium density fiberboard that has been routed on both faces to match the pattern of the door skin to be applied to both faces.

Individual and very small batch doors are made very similarly except assembled individually, pressed in a heated process individually, and machined individually on a CNC. Materials are the same.

2.5 Other Approvals, Licences or Permits

The JELD-WEN facility submitted a Pollution Prevention Plan under Sewer By-law 92/2010 to the City of Winnipeg in October 2014.

2.6 Funding

JELD-WEN privately funds the planning, development, and operations of the Winnipeg facility.

2.7 Public Consultation

It is expected that any public comments will be received by MECP through the public registry during the EAP review period. No other public consultation will be completed by JELD-WEN.



3.0 DESCRIPTION OF EXISTING ENVIRONMENT IN THE PROJECT AREA

3.1 Location and Topography

The facility is located in the City of Winnipeg and is bounded by Raleigh Street, Ottawa Avenue, Golspie Street and Munroe Avenue. The facility is on relatively flat grade and does not have any significant topographical features.

3.2 Climate

The closest meteorological station is the Kildonan North Station (ID IWNNI72), located northeast of the site at 49.918°N and 97.051°W at an elevation of 233m. Wind direction at the site is predominately from the south.

3.3 Local and Regional Surface Waterbodies

The nearest major water body is Red River which is located approximately 1.1 km northwest of the facility (see Figure 1 in Appendix B). It is therefore not expected that any accidentally spilled materials, drainage or runoff would result in any impacts to surface waterbodies.

3.4 Wildlife, Fisheries and Vegetation

The facility is located in a fully developed urban area. The site is mostly paved, with an unpaved traffic area with an entrance off of Munroe Avenue and a grass landscaped area at the southeast end of the property. The landscaped area contains a few trees along Raleigh Street. The site has no other vegetation or wildlife habitat. The facility is not located adjacent to any natural environmental features. Refer to Figures 1 to 3 in Appendix B.

3.5 Agriculture, Mining and Forestry

There are no agricultural, mining or forestry activities on the site or within the vicinity of the facility.

3.6 Socioeconomic Environment

The Manitoba Historical Society: Historic Sites of Manitoba website identified three historic buildings in the vicinity of the site: Holy Eucharist Ukrainian Catholic Parish, Polson School and Munroe Junior High School. These sites are shown on Figure 2 in Appendix B.

There are no Indigenous communities in the vicinity of the facility. There are no protected areas (e.g., national or provincial parks) in the vicinity of the facility.

There are no existing public safety and human health risks with this development. The facility has operated at this location since 1999 and the site is zoned for light manufacturing.



4.0 DESCRIPTION OF ENVIRONMENTAL AND HUMAN HEALTH EFFECTS

4.1 Wildlife, Fisheries, Vegetation and Surface Water Bodies

As described in section 3, there are no wildlife habitats, fisheries, vegetation (other than urban landscaping) or surface water bodies on the site or in close proximity to the facility. Therefore, impacts to the biophysical environment from the facility are not expected.

4.2 Air Emissions

The facility maintains an up-to-date inventory of all potential air emissions at the site. Emissions were estimated using U.S. Environmental Protection Agency emission factors, engineering calculations and mass balance calculations. A copy of the facility's air emission calculations are provided in Appendix D.

The facility has one dust collector to collect particulate emissions, which vents inside the building. The facility has one paint spray booth with filter controls to reduce particulate emissions. Fugitive particulate emissions may also be released from the door repair tables. Small quantities of particulate and metal fume emissions are released from maintenance welding operations.

Volatile organic compounds (VOCs) are released to the atmosphere as fugitive emissions from the use of glass and vinyl cleaners, adhesives, sealants, glazings and touch-up painting in various production processes, as well as from vinyl extrusion. In addition, VOCs are released to the atmosphere from the spray booth stack.

The facility uses natural gas-fired HVAC units for comfort heating. The facility has no natural gas-fired production equipment. The facility production process uses electrically powered ovens for curing production parts, bending parts and heating oil.

4.3 Noise and Odour Impacts

Noise is typically generated from routine operation of processing equipment and from trucks coming and leaving the site. The facility has received two noise complaints and city by-law officer visits regarding noise from the new compressor room of the Interior Door production. Several corrective actions are in progress including installation of a duct silencer, re-routing of the discharge exhaust above the roof line, utilization of a second stage compressor for small loads, and steps for room temperature control.

For deliveries the facility has two main receiving areas. Area 1 is the southwest side of the Main building and north side of the Interior Door building, accessed from Golspie Street. Typically, this area receives approximately 14-16 53-foot tractor trailers a week from March to September, and 7-8 trailers a week from October to February. In addition, this area typically receives one courier van a day.



Area 2 is the north side of the Main building, accessed from Munroe Avenue. Typically, this area receives approximately 4-8 trailers a week from March to September, and 2-4 trailers a week from October to February.

All shipping for the facility occurs at the east end of the Main building, accessed off of Munroe Avenue. Typically, from March to September, approximately 15-20 trailers per week and 3 5-ton vans per day are shipped. From October to February approximately 7-8 trailers per week and 1-2 vans per day are shipped.

There are no concerns regarding odour from the facility. The facility has not recently received any odour complaints, nor is the facility aware of any complaints that may have occurred in the past.

4.4 Wastewater

The facility does not discharge any wastewater to the natural environment. All wastewater is discharged to infrastructure owned and operated by the City of Winnipeg. The facility follows the requirements in the City of Winnipeg Sewer By-law 106/2018.

The facility submitted a Pollution Prevention Plan in October 2014 under the City's Sewer Bylaw 92/2010, identifying that the only pollutant of concern, toluene was from historical use of solvent to clean paint spray guns, which are no longer used. The facility now employs an ultrasonic cleaner with a water-based solution for cleaning paint spray guns.

As part of vinyl window production, wastewater is generated from glass washing and vinyl cleaning and discharged to the sanitary sewer. As part of interior door assembly, excess glue from the glue assembly is collected for waste disposal and the machine is washed to a trench or pit with the glue wash water pumped into totes to undergo pre-treatment on-site, involving decanting, filtering and the use of a neutralizing agent. The pre-treated wastewater is then discharged to the city sewer and the remaining sludge is sent off-site for waste disposal. JELD-WEN is in communication with the City of Winnipeg regarding the discharge specifics and testing requirements.

4.5 Wastes

All wastes are sent off-site for recycling or disposal by qualified third parties. While on-site, wastes are stored in a designated waste area in the maintenance shed, and are managed in a manner consistent with industry best practices that prevent litter and fugitive wastes from leaving the waste storage area.

Hazardous wastes, such as waste paint, waste solvent cleaner and aerosol cans, are properly stored to prevent leaks or spills of the waste and prevent damage to or deterioration of the containers.

Container materials at the site are compatible with the waste storage and labelled with the name of the waste stream. They are recycled or disposed of as per regulatory requirements. Waste generation is tracked, and annual records are kept.



4.6 Chemicals and Fuels

The facility stores only a few chemicals in bulk. Typically, the facility has approximately 12 totes (250 USG each) of synthetic resin adhesive, and approximately 20 drums (400 kg each) of hot melt sealants. In addition, the facility stores liquid argon in cryogenic storage dewars (330L each) and a central 5,000 L tank.

The facility has an outdoor 400-gallon propane storage tank (which is inspected and certified annually), as well as 33 lb propane cylinders for the forklifts. In a large storage shed, the facility stores two 45-gallon drums of diesel fuel, which are used by the loader and forklift.

4.7 Health and Safety

The potential impact on human health and safety during the operation of the facility is minimal. For consistency across their operations, JELD-WEN's management systems are structured to align with ISO 14001 and 45001 requirements. The Winnipeg facility provides their employees with a range of safety training programs as described in section 5.3.

4.8 Socioeconomic

The facility employs approximately 284 people from the local community. As described in section 3.6, no other socioeconomic impacts from the facility are expected.

5.0 MITIGATION MEASURES TO PROTECT THE ENVIRONMENT AND HUMAN HEALTH

5.1 Air Emission Controls

The primary air emission sources are controlled with a dust collector and spray booth filters. These controlled are industry best practices for these types of emission sources.

5.2 Chemicals and Spill Containment

Chemicals are stored in designated chemical storage areas. The facility has oil spill kits in the maintenance areas. These spill kits are inspected regularly (quarterly) and checked for continued ease of access. The facility only has floor drains in the restrooms and the glass washer area, which discharge to the sanitary sewer. The remainder of the production building floor is covered with an impervious surface. Therefore, the facility has a low risk of any adverse impacts from spills.

5.3 Protection of Environment and Human Health

JELD-WEN has management systems which are structured to align with ISO 14001 and 45001 requirements, effectively protecting both the environment and human health. All employees are required to report any spills or releases of materials. Employees are also required to complete training specified by the facility. Depending on an employee's role at the facility this training may include, but is not limited to:

- WHMIS and GHS Training
- Emergency Preparedness Training
- First Air Training and Certification
- Operation and Maintenance of Air Pollution Control Equipment Training
- Waste Management Training
- Chemical Management Training
- Lift Truck / PIT Training
- Crane Training
- Chop Saw Training
- Slips, Trips and Falls Training
- PPE Training
- Annual Hearing Tests
- Paint Respirator Fit Testing
- Working at Heights Training
- Confined Space Training
- Fasteners and Hand Tools Training
- Lifting and Twisting Techniques Training



6.0 FOLLOW-UP PLANS, INCLUDING MONITORING AND REPORTING

The JELD-WEN facility will remain in compliance with all applicable environmental, health and safety regulations. All required procedures will be followed, and personal protective equipment will be worn. Any reportable environmental spills or incidents will be recorded and reported in a timely manner.

7.0 CONCLUSION

In conclusion, the JELD-WEN Winnipeg facility requires an Environmental Act License for continued operations in accordance with the Environment Act and the Classes of Development Regulation. This EAP submission to MECP is for the Environmental Assessment Branch's review and approval of the Winnipeg facility. The continued operation of the facility as described within this EAP is not anticipated to cause any adverse effects to human health, the community or the natural environment.



Appendix A

Certificate of Title



STATUS OF TITLE

Title Number **2857510/1**
Title Status **Accepted**
Client File



1. REGISTERED OWNERS, TENANCY AND LAND DESCRIPTION

JELD-WEN OF CANADA, LTD.

IS REGISTERED OWNER SUBJECT TO SUCH ENTRIES RECORDED HEREON
IN THE FOLLOWING DESCRIBED LAND:

LOT 2 PLAN 20790 WLTO
IN RL 94 PARISH OF KILDONAN

The land in this title is, unless the contrary is expressly declared, deemed to be subject to the reservations and restrictions set out in section 58 of *The Real Property Act*.

2. ACTIVE INSTRUMENTS

Instrument Type: **Caveat**
Registration Number: **2143877/1**
Instrument Status: **Accepted**

Registration Date: 1997-05-22
From/By: THE CHEMCREST CORPORATION LTD.
To: AGENT A.DAVID MARSHALL

Amount:
Notes: No notes
Description: LEASE COMMENCING 1997/03/01 ENDING 2002/04/30

3. ADDRESSES FOR SERVICE

JELD-WEN OF CANADA, LTD.
485 WATT STREET
WINNIPEG MB
R2K 2R9

4. TITLE NOTES

No title notes

5. LAND TITLES DISTRICT

Winnipeg

6. DUPLICATE TITLE INFORMATION

Duplicate not produced

7. FROM TITLE NUMBERS

1496689/1 All

8. REAL PROPERTY APPLICATION / CROWN GRANT NUMBERS

No real property application or grant information

9. ORIGINATING INSTRUMENTS

Instrument Type: **Request To Issue Title**

Registration Number: **4756362/1**

Registration Date: 2016-08-19

From/By: JELD-WEN OF CANADA, LTD.

To:

Amount:

10. LAND INDEX

Lot 2 Plan 20790

CERTIFIED TRUE EXTRACT PRODUCED FROM THE LAND TITLES DATA STORAGE
SYSTEM OF TITLE NUMBER 2857510/1

Appendix B

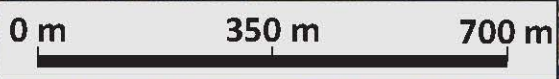
Figures





Legend

--- Property Line



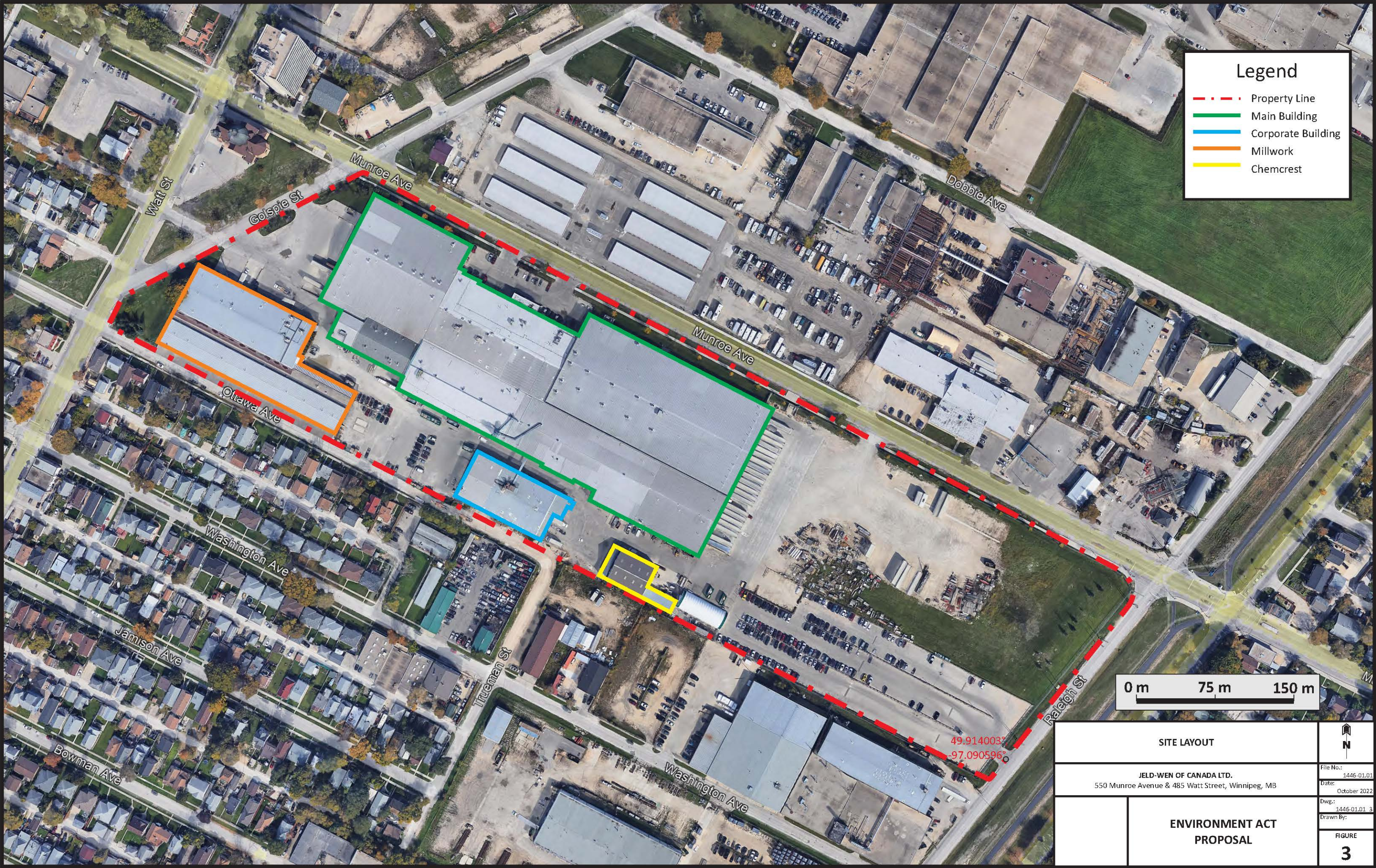
SITE LOCATION - SURROUNDING AREA AND DISTANCE TO MAJOR WATER BODY

JELD-WEN OF CANADA LTD.
550 Munroe Avenue & 485 Watt Street, Winnipeg, MB

ENVIRONMENT ACT
PROPOSAL

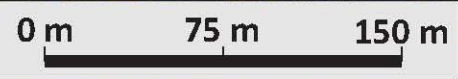
File No.: 1446-01.01
Date: October 2022
Dwg.: 1446-01.01_1
Drawn By:
FIGURE
1





Legend

Property Line

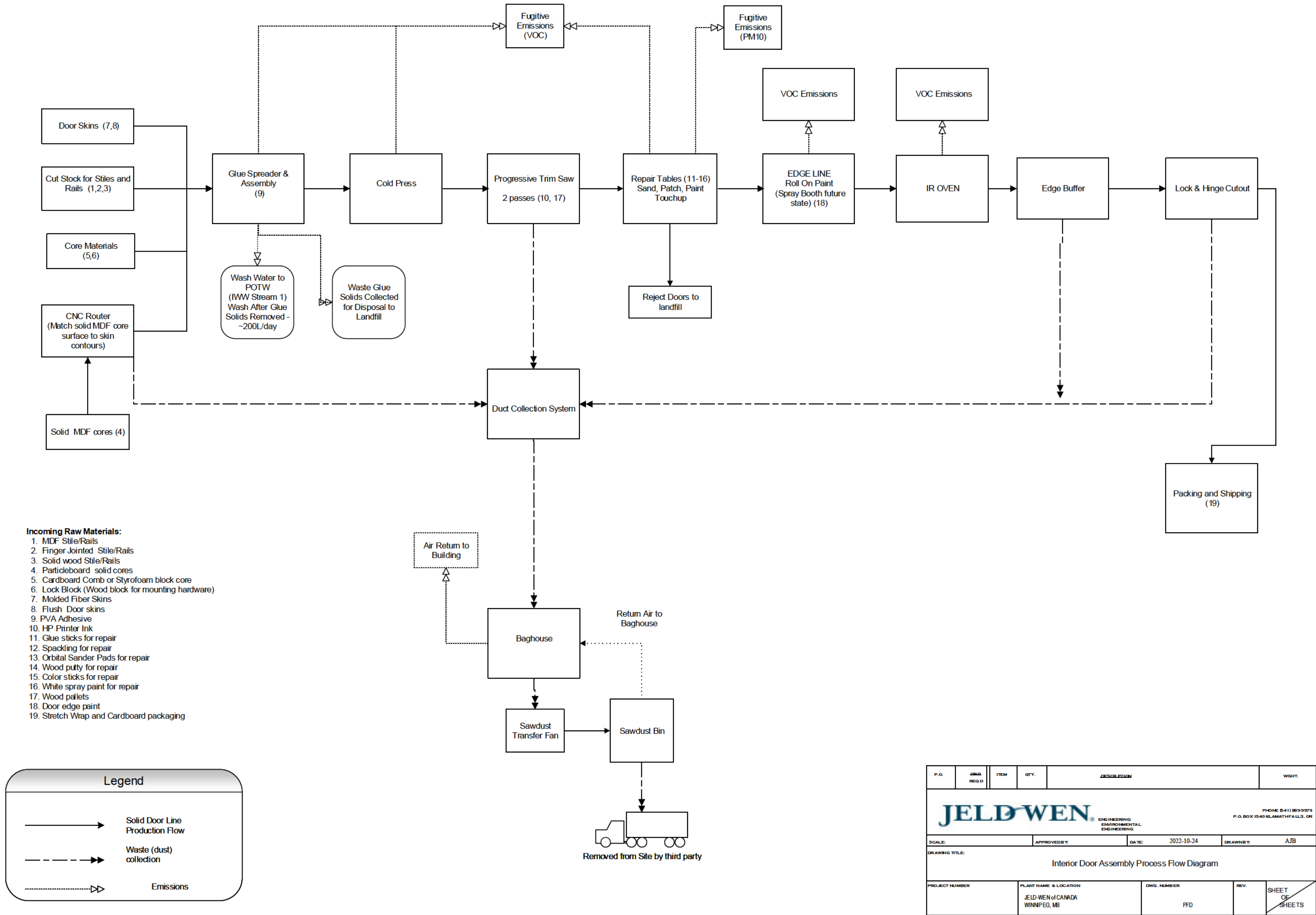
Main Building

SITE LAYOUT		
JELD-WEN OF CANADA LTD. 550 Munroe Avenue & 485 Watt Street, Winnipeg, MB		File No.: 1446-01.01 Date: October 2022
	ENVIRONMENT ACT PROPOSAL	Dwg.: 1446-01.01 3 Drawn By:
		FIGURE 3

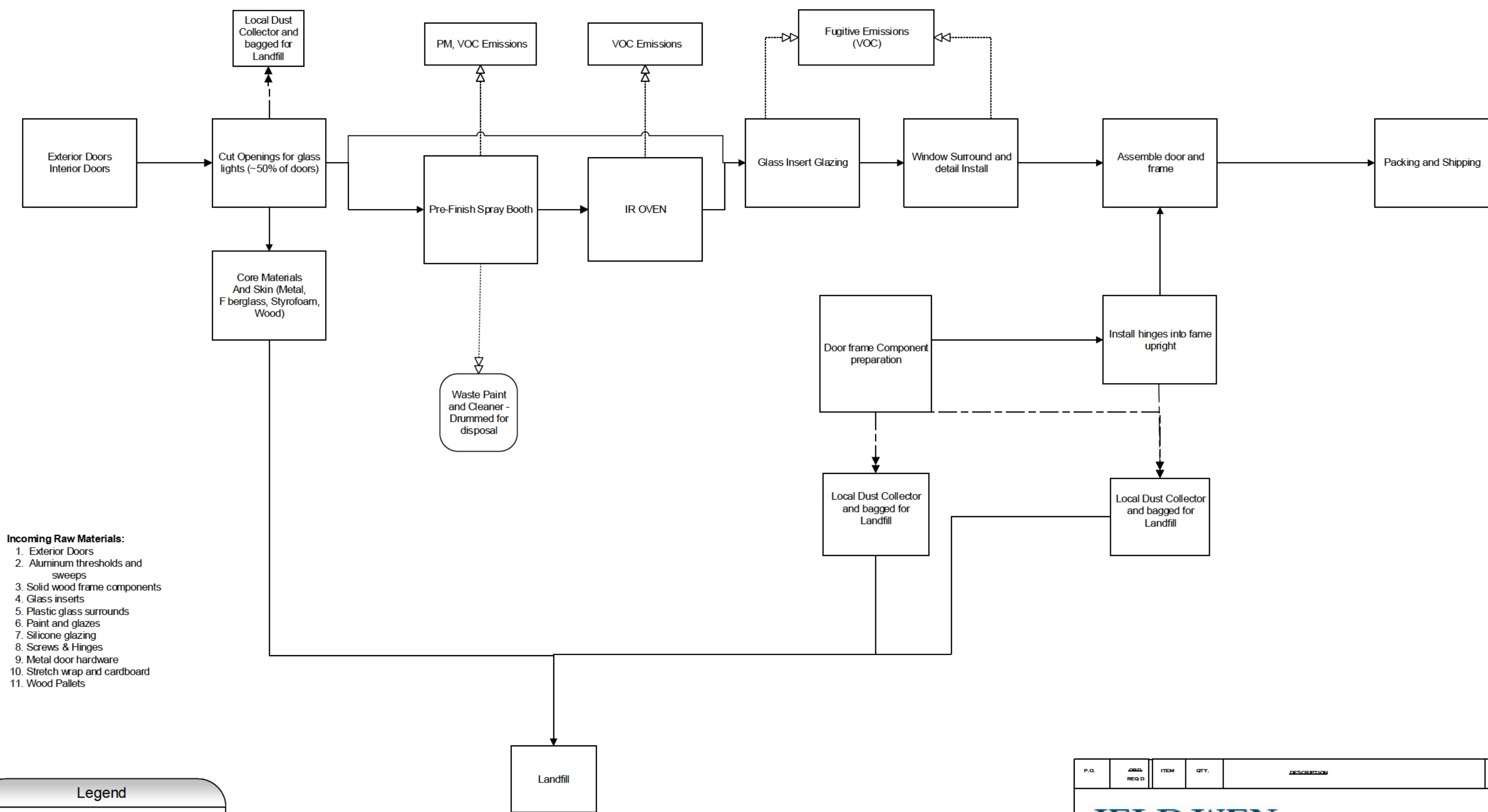
Appendix C

Process Flow Diagrams





P.O.	QTY REQ'D	ITEM	QTY.	DESCRIPTION	WGHT.
JELD-WEN.[®] ENGINEERING: ENVIRONMENTAL ENGINEERING PHONE (541) 853-3373 P.O. BOX 1540 KLAMATH FALLS, OR					
SCALE:		APPROVED BY:		DATE: 2022-10-24	DRAWN BY: AJB
DRAWING TITLE: Interior Door Assembly Process Flow Diagram					
PROJECT NUMBER		PLANT NAME & LOCATION JELD-WEN of CANADA WINNIPEG, MB		DWG. NUMBER PFD	REV. SHEET OF SHEETS



- Incoming Raw Materials:**
- 1. Exterior Doors
 - 2. Aluminum thresholds and sweeps
 - 3. Solid wood frame components
 - 4. Glass inserts
 - 5. Plastic glass surrounds
 - 6. Paint and glazes
 - 7. Silicone glazing
 - 8. Screws & Hinges
 - 9. Metal door hardware
 - 10. Stretch wrap and cardboard
 - 11. Wood Pallets

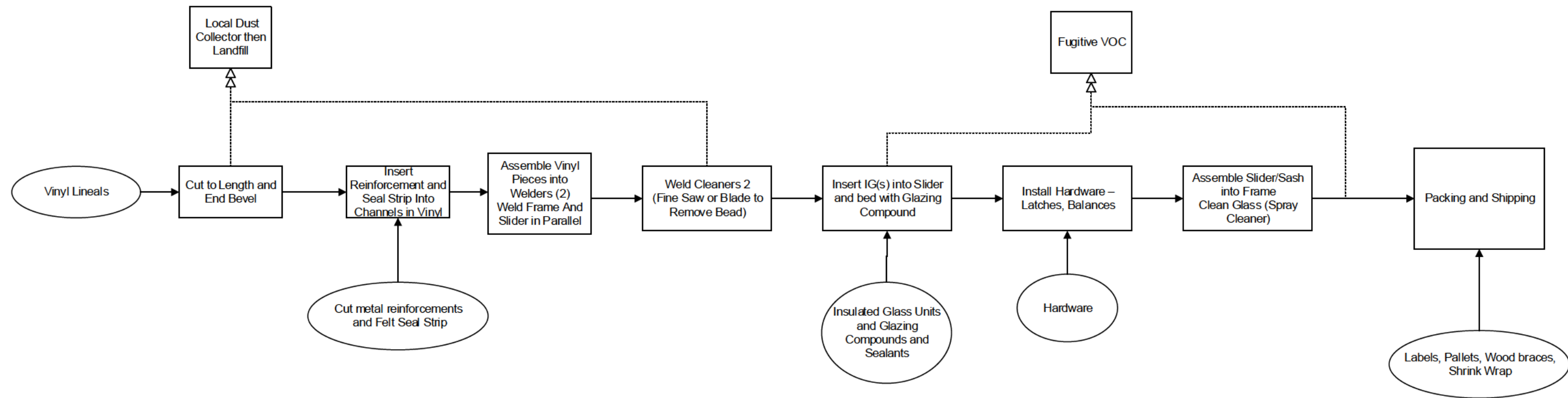
Legend

Pre-Hung Door Line Production Flow

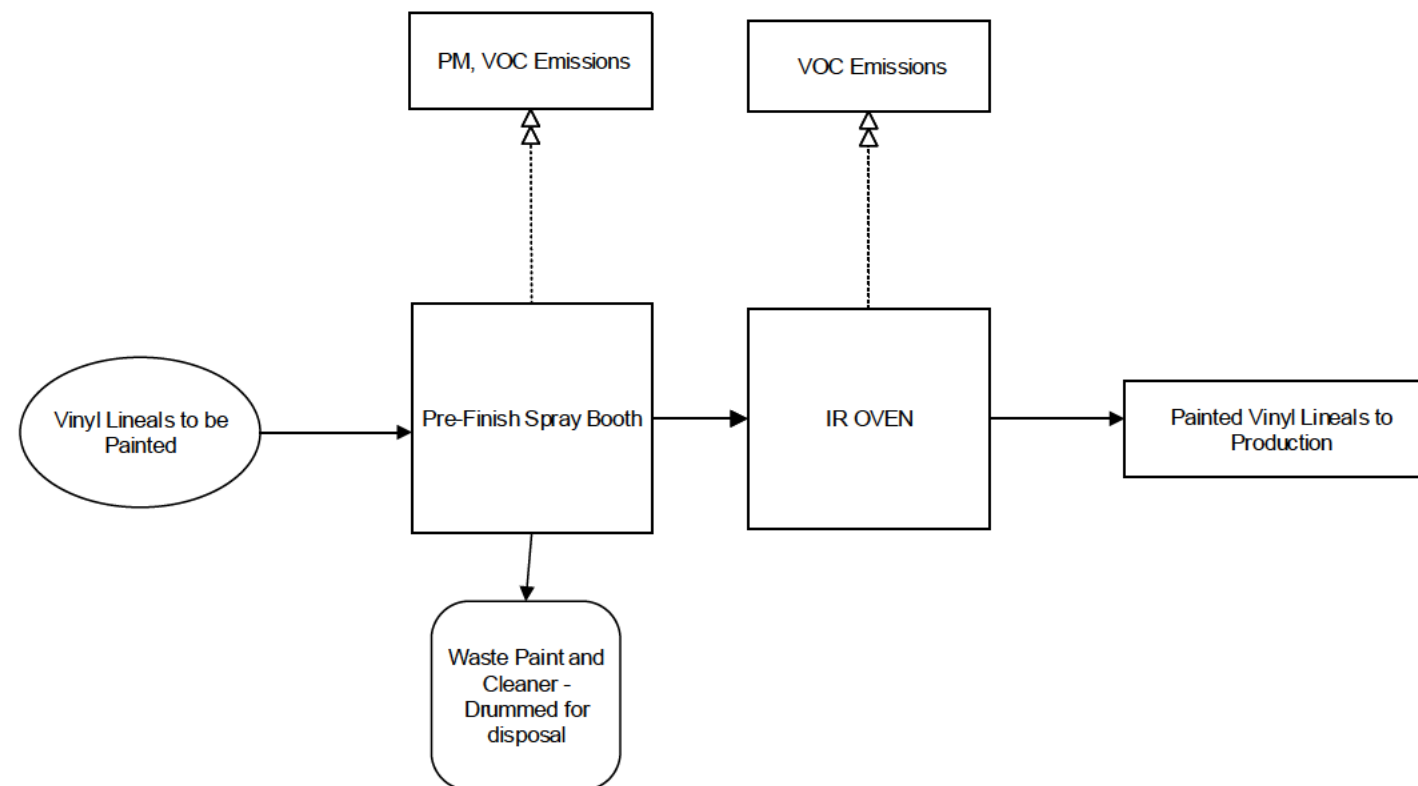
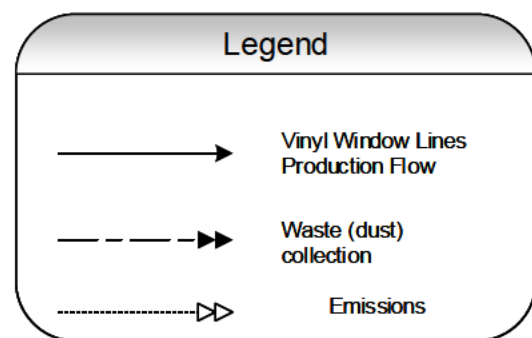
Waste (dust) collection

Emissions

P.O.	JELD REQ D	ITEM	QTY.	DESCRIPTION	WGHT.
JELD-WEN ENGINEERING: ENVIRONMENTAL ENGINEERING PHONE (541) 883-3373 P.O. BOX 1540 KLAMATH FALLS, OR					
SCALE:		APPROVED BY:		DATE: 2022-10-24	DRAWN BY: AJB
DRAWING TITLE: Pre-Hung Door Assembly Process Flow Diagram					
PROJECT NUMBER		PLANT NAME & LOCATION JELD-WEN of Canada WINNPEG, MB		DWG. NUMBER PFD	REV. SHEET OF SHEETS



- Incoming Raw Materials:**
- 1. Vinyl Lineals in Primary Colors
 - 2. Insulated Glass Units
 - 3. Metal Bracing
 - 4. Sealants
 - 5. Paint
 - 6. Cleaner (acetone)
 - 7. Pallets and wood for bracing
 - 8. Stretch Wrap



P.O.	ADD REQ D	ITEM	QTY.	DESCRIPTION	WGHT.
JELD-WEN ENGINEERING: ENVIRONMENTAL ENGINEERING PHONE (541) 883-3373 P.O. BOX 1540 KLAMATH FALLS, OR					
SCALE:			APPROVED BY:	DATE: 2022-10-24	DRAWN BY: AJB
DRAWING TITLE: Vinyl Window Process Flow Diagram					
PROJECT NUMBER		PLANT NAME & LOCATION JELD-WEN of CANADA WINNIPEG, MB		DWG. NUMBER PFD	REV. SHEET OF SHEETS

Appendix D

Air Emission Calculations



Table 1 - Product Input Sheet
JELD-WEN of Canada LTD.
Window and Doors - Winnipeg
Product Input Sheet

Description	Maximum Process Rates Short Term			Maximum Process Rates Long Term	
Interior Door Operations:					
Total Door Production	107	Doors/hr	(a), (3)	200,000	Doors/yr
Solid Door CNC Routed Core	6	Doors/hr	(a), (3)	10,950	Doors/yr
Trim/Cut Saw & CNC Trim	107	Doors/hr	(a), (h)	200,000	Doors/yr
Trim/Cut Saw & CNC Waste	73	kgs/hr	(a), (b)	136	mt/yr
Core Router Waste	35	kgs/hr	(a), (c)	65	mt/yr
Hollow Corel Door Adhesive Usage	44	kgs/hr	(a), (f)	81,818	kgs/yr
Solid Core Door adhesive usage	2	kgs/hour	(a), (f)	13,936	kgs/year
Door Edge Paint	107	Doors/hr	(a), (d)	200,000	Doors/yr
Door Edge Paint Usage	8.5	L/hr	(a), (d)	16,000	L/yr
Window Operations:					
Vinyl Window/Patio Door Production	77	units/hr		145,000	units/yr
Vinyl Window Lineal Painted	16	feet/hr	(a) (3)	30,000	feet/yr
Vinyl Window Paint Usage	0.2	L/hr	(a), (h)	420	L/yr
Door Distribution Operations:					
Doors Prehung	16	Doors/hr	(a), (1)	30,000	Doors/yr
Light cut out and other trim work	3	Doors/hr	(j), (1)	6,000	Doors/yr
Doors Prefinished	1	Doors/hr	(j), (1)	1,600	Doors/yr
Door Finish Coating Usage	1.3	L/hr	(a), (d)	2,400	L/yr
Touch-up Spray Paint Usage	0.18	L/hr	(1)	328	L/yr
Door Distribution Machining Waste	1.46	kg/hr	(i) (2)	3	mt/yr

Notes:

- (a) Hours of operation (hours/year) = (8 hrs/day) x (260 days/year) x 90% operation time
Annual Hours of Operation (hrs/year) = 1872
- (b) Trim Saw Wood Waste (kgs) = Number of doors through Trim Saw x Amount Wood Waste (kgs/door)
Trim Saw Wood Waste (kg/door) = 0.68
- (c) CNC Routed CORE wood waste (kgs) = Number of CNC Door Core Processed x Amount Wood Waste (kgs/door)
CNC Door Core Wood Waste (kg/door) = 5.91
- (d) Door Edge Primer Usage (L) = Number of Doors x Paint Usage (L/door)
Door Edge Primer Usage (L/door) = 0.08
- (e) Adhesive Usage Hollow Doors (kgs) = Number of Hollow Doors Processed x Adhesive (kgs/door)
Hollow Core Doors Adhesive Usage (kg/door) = 0.41
- (f) Adhesive Usage Solid Core Doors (kgs) = Number of Solid Core Doors x Adhesive Usage Rate (kgs/door)
Solid Core Adhesive Usage Rate (kg/door) = 1.27
- (g) Door Coatings Usage (gal) = Number of Doors x Paint Usage (gal/door)
Door Coating Usage (L/door) = 1.5
- (h) Window Coatings Usage (gal) = Number of Doors x Paint Usage (gal/window)
Window Coating Usage (L/lineal foot) = 0.014
- (i) Millwork Waste (kgs) = Number of doors through Door Machining x Amount Wood Waste (kgs/door)
Commander/990 Wood Waste (kg/door) = 0.09
- (j) Light cut out in steel and fiberglass results in large particles that are TSP or larger and are swept up.

References:

- (1) Based on JELD-WEN Engineering Estimate.
(2) Based on waste generated by same equipment at other locations.
(3) Volume based on business forecast and average product mix for market

Table 2 - Production
JELD-WEN of Canada LTD.
Window and Doors - Winnipeg
Process & Product Usage VOC PTE

Raw Material ⁽¹⁾		Hourly Usage (a)	Annual Usage (a)	Units	Pollutant		Estimated PTE ⁽²⁾	
Product Name	Density (kg/L)				VOC	VOC kg/hr (b)	VOC mt/yr (d)	
INTERIOR DOOR								
Synthetic Resin Adhesive	1.10	46	95,755	kgs	Total VOC %	1.4%	0.66	1.37
Glue Release	0.96	NA	260	L	Total VOC %	0.0%		0.00
VINYL WINDOW								
Hot Melt Adhesive	0.98	34.3	64,300	L	Total VOC	0.0%	0.00	0.00
Window Assembly Adhesive		3.8	7,200	L	Total VOC (g/L)	13	0.05	0.09
Silicone Glazing Sealant	1.04	1.0	1,800	L	Total VOC (g/L)	43.9	0.04	0.08
Weatherproofing Sealant	4.51	0.1	200	L	Total VOC %	31.0%	0.00003	0.06
Foam sealant	1.01	2.4	4,500	L	Total VOC (g/L)	1.80	0.004	0.01
Construction Sealant	1.40	1.3	2,500	L	Total VOC %	0.04%	0.001	0.001
Acetone	0.79	0.3	652	kg	Total VOC %	100.0%	0.27	0.51
Total						Total	1.03	2.13

Notes:

- (a) Hourly Usage [unit/hour] = (Per Door Usage [unit/door]) x (Doors Produced)
Annual Usage [unit/year] = (Per Door Usage [unit/door]) x (Doors Produced)
(b) Hourly PTE VOC (kgs/hr) = (VOC content [wt%]) / 100 x (Hourly usage [kgs/hr])
Hourly PTE VOC (kgs/hr) = (VOC content [kg/gal]) x (Hourly usage [gal/hr])
(d) Annual PTE VOC (tonnes/yr) = (VOC content [wt%]) / 100 x (Annual usage [kgs/yr]) / (1000 [kgs/tonne])
Annual PTE VOC (tonnes/yr) = (VOC content [kg/gal]) x (Annual usage [gal/yr]) / (1000 [kgs/tonne])

References:

- (1) From Vendor SDS, Regulatory/environmental Data Sheets, Product Information Sheets, or conversations with vendors.
(2) Provided by JELD-WEN; based on usage rates at similar facilities.
(3) See Table 1 Product Input Sheet.
(4) Glue Release applied at end of production day. 1 L/day = 260 L/yr

Table 3 - Coatings
JELD-WEN of Canada LTD.
Window and Doors - Winnipeg
Coating Estimated VOC/PM/PM₁₀ PTE

								Estimated PTE			
Raw Material ⁽¹⁾				Hourly Usage ⁽²⁾ (L/hr)	Annual Usage ⁽²⁾ (L/yr)					PM Emissions if Sprayed in vented booth	
Product	Supplier	Density (kg/L)	Solids Content (wt %)			VOC in Product	Units	VOC (a) (kg/hr)	VOC (b) (mt/yr)	TSP (c) (kg/hr)	TSP (d) (mt/yr)
INTERIOR DOOR										0.06	0.11
Off White Door Edge Primer	Sherwin-Williams	1.53	62%	9	16,000	0.5%	%wt	0.04	0.08		
Waterborne Sealer	Sherwin-Williams	1.04	34%	0.9	1,600	7.2%	%wt	0.06	0.12		
Custom Aerosol Primer (Custom colors in standard base)	Sherwin-Williams	0.8	13%	0.18	328	408.3	g/L	0.07	0.13		
VINYL WINDOW										0.003	0.01
Urethane coating, water based	CCI	1.1	32%	1.3	2,400	46.76	g/L	0.06	0.11		
PRE-HUNG DOORS										0.002	0.004
Automotive Refinish Solvent	BASF	1.7	73%	0.2	420	457.70	g/L	0.10	0.2		
						Total:		0.34	0.6	0.06	0.1

Method of application for edge primer is by roller or brush. As such, there will be no PM emissions to be controlled.

Notes:

(a) Hourly PTE VOC emissions (kg/hr) = ((VOC content [g/l] x (hourly usage [L/hr])) or ((VOC content %wt] x (density) X (hourly usage [L/hr]))

(b) Annual PTE VOC emissions (mt/yr) = ((VOC content [g/l] x (annual PTE usage [L/yr])) / (1000000 g/tonnes) or ((VOC content %wt] x (density) X (annual PTE usage [L/yr])) / (1000 kg/tonnes)

(c) Hourly PTE TSP emissions (kg/hr) = (hourly PTE usage [gal/hr]) x (density [kg/gal]) x ((1 - spray transfer efficiency [%]) / 100) x (solids content [wt %] / 100)

(d) Annual PTE TSP emissions (tonnes/yr) = (annual PTE usage [gal/yr]) x (density [kg/gal]) x ((1 - spray transfer efficiency [%]) / 100) x (solids content [wt %] / 100) x (1 tonnes / 2,000 kg)

Spray transfer efficiency (%) = 65 (3)

Spray booth filter efficiency (%) = 98 (3)

References:

(1) From Vendor SDS, Product Information Sheets, or conversations with vendors.

(2) See Table 1 Product Input Sheet.

(3) 100% of PM is assumed to be PM₁₀. It is further assumed that solids contained in the paint applied on the door are not emitted.

Table 4 - Dust Collection
JELD-WEN of Canada LTD.
Window and Doors - Winnipeg
 Baghouse Particulate PTE

Process			Baghouse Efficiency TSP/PM & PM2.5 (%)		Waste to Truck Bin (mt/yr) ^(a)	TSP/PM10 PTE Into Building		PM2.5 PTE Into Building	
	kg/hr	Total (mt/yr)				Short-term ^(b) (kg/hr)	Long-term ^(c) (mt/yr)	Short-term ^(b) (kg/hr)	Long-term ^(c) (mt/yr)
Conventional Trim Saw	72.84	136.4	99.95%	99.99%	136.3	0.04	0.07	0.01	0.01
Core CNC	34.56	64.7	99.95%	99.99%	64.7	0.02	0.03	0.003	0.01
Panel Saw	0.44	0.8	99.95%	99.99%	0.8	0.0002	0.0004	0.00004	0.0001
Baghouse Total	107.85	201.9			201.8	0.1	0.1	0.01	0.02
Door machining	1.46	2.7	99.95%	99.99%	0.03	0.001	0.001	0.0001	0.0003
Dust Collector Total	1.46	2.7			0.03	0.001	0.001	0.0001	0.0003

Baghouse and stand alone dust collectors recirculated back into the building. Dust bin exhaust is recirculated back into dust collector.

Notes:

(a) Waste to Truck Bin (tons/yr) = (waste [tons/yr]) x (baghouse efficiency [%/100])

(b) Estimated PTE Short-term Emissions (lbs/hr) = (PTE Long-term Emissions [tons/yr]) x (2,000 [lbs/ton]) / (annual hours of operation [hrs/yr])

Annual hours of operation [hrs/yr] = 1,872 (1)

(c) Estimated PTE Long-term Emissions (tons/yr) = (throughput [tons/yr] - (waste [tons/yr])

(d) Panel saw waste estimated at 0.03 lbs/skin trimmed to size. Estimate of 15% of skins are trimmed prior to assembly of doors.

Skins trimmed= 15% * (# doors *2) = 32 skins/day 60000 skins/year Sawdust = 0.014 kg/skin

References:

(1) See Table 1 Product Input Sheet.

Table 5 - NG Heat Emissions
JELD-WEN of Canada LTD.
Window and Doors - Winnipeg
Natural Gas Emissions

Criteria Pollutant	Emission Factor (kg/MMscf)	Potential Emissions	
		kg/hr ^(a)	mt/yr ^(b)
PM ₁₀ ⁽⁵⁾	3.45 (1)	2.32E+01	5.10E-02
SO ₂	0.27 (1)	1.83E+00	4.02E-03
CO	38.18 (2)	2.56E+02	5.63E-01
NO _x	45.45 (2)	3.05E+02	6.70E-01
VOC	2.50 (1)	1.68E+01	3.69E-02

Notes:

(a) Hourly emissions (kg/hr) = (annual PTE emissions [mt/yr]) x (1000kg/mt) / (Annual hours of operation [hrs/yr])

$$\text{Annual hours of operation [hrs/yr]} = 1,872 \quad (6)$$

(b) Annual emissions (mt/yr) PTE = (emission factor [kg/MMscf]) x (maximum natural gas usage [MMscf/yr]) / (1000 kg/mt)

$$\text{Maximum natural gas usage (MMscf/yr)} = 14.75 \quad (c)$$

(c) Lbs/MMscf provided by AP-42 divided by 2.2 lbs/kg to convert to kg/MMscf

References:

- (1) Emission factors were taken from AP-42, Chapter 1.4, Table 1.4-2, Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion (July 1998).
- (2) Emission factors were taken from AP-42, Chapter 1.4, Table 1.4-1, Emission Factors for Nitrogen Oxides and Carbon Monoxide from Natural Gas Combustion (July 1998).
- (3) All PM is assumed to be less than 10 microns in size.

Table 6 - Summary
JELD-WEN of Canada LTD.
Window and Doors - Winnipeg
 Facility Summary

Source	Emission Rates (mt/yr)						
	TSP	PM ₁₀	PM _{2.5}	SO ₂	CO	NO _x	VOC
Production	---	---	---	---	---	---	2.1
Coatings	0.4	0.4	---	---	---	---	0.6
Dust Collection- No outside emissions	0.00	0.00	0.00	---	---	---	---
Natural Gas Heat	5.10E-02	5.10E-02	5.10E-02	4.02E-03	5.63E-01	6.70E-01	3.7E-02
Total	0.5	0.5	0.1	4.0E-03	0.6	0.7	2.8