Access to Environmental Information
Pilot Project Report

Final Report

April 2007

Environmental Protection Office
416-392-6788

Toronto Public Health

TORONTO

Ulli S. Watkiss
City Clerk

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March 16, 2007

Response to the Groff Associates Inc. Report to Toronto Public Heath, Environmental Protection Office on technical assistance to implement pollution prevention pilot project at COT Printing facility at 90 Niagara Street, February 15, 2007

Staff at 90 Niagara Street printing facility found this review very useful. Not only in identifying opportunities and corrective actions but in documenting the compliance and pro-active initiatives already in progress.

The print facility has also been audited and approved for Forestry Stewardship Council (FSC) certification in 2006 and will be issued a certification number when the agreement has been processed. The unit will also be pursuing EcoLogo certification in 2007/2008.

In response to the recommendations of the report, we will be implementing the following initiatives:

1. Environmental Regulatory Compliance:

We will dismantle and remove the vent for exhausting shrink wrap fumes to conform to Section 9 of the Ontario Environmental Protection Act.

In addition, we will implement a process change in our bindery/finishing area. Finished products, which were previously shrink wrapped, will now be wrapped with a kraft recycled paper band using the banding machine.

2. Chemical/Waste Water Effluent:

In the unlikely event that the photographic fixer and developer should become contaminated, the chemicals will be collected for safe disposal as is the current practice for the plate processor.

The plate developing wash water has been rerouted to the sanitary sewer.

Our fountain solution system is a replenishing system which very rarely requires draining. Should fountain solution become contaminated, the chemical will be collected for safe disposal.

Arrangements for testing the press bucket waste water have been made to confirm compliance with the sewer use by-law. Previously, the press bucket water was changed daily. Now it is changed after each press wash up.

3. Solid Waste Disposal:

We will annually complete a waste audit and keep it on file for review by the Ministry of the Environment.

4. Pollution Prevention Opportunities:

Once the Computer to Plate (CtP) technology is implemented in 2007, the Raster Image Processor (RIP) will be operational and compatible with the CtP and the new proofing technology. With the implementation of the CtP technology the use of photographic fixer and developer chemicals will be eliminated.

Divisional IT staff and Printing staff have been working on a paper management system within our existing docketing system database. This was a requirement in order to receive Forestry Stewardship Council (FSC) certification. It will be applied to all jobs in order to monitor paper waste.

The unit has recently had an infrared scan performed on all electrical distribution equipment, with no faults found. Facilities & Real Estate (F&RE) will be requested to conduct a “Clean Volt” review of power consumption at 90 Niagara Street.

Quarterly Health and Safety staff meetings are scheduled prior to the Joint Health & Safety Committee meetings. These staff meetings will now also include our P2 program.

The recommendations on page 9 of the report relating to the new facility will be reviewed with F&RE and implemented, where feasible.

Sean Fennell
Manager Printing & Distribution
Records and Information Management
City Clerk’s Office

Report to

Toronto Public Health

(Environmental Protection Office)

On

Technical Assistance to Implement Pollution Prevention Pilot Project

At

City of Toronto Print Shop
90 Niagara Street
Toronto, Ontario

Prepared by
Douglas Groff

Feb 15, 2007

Distribution:

3 Copies -	City of Toronto
1 Copy -	Groff Associates Inc.

City of Toronto

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1.0 Introduction / Scope

1.1: Introduction:

Groff Associates Inc. was contracted to conduct a review at the City of Toronto Print Shop with the following criteria / project parameters:

1. Conduct a baseline review of the City of Toronto print shop facility located at 90 Niagara street, which will include:
    - Inventorying of inputs, product outputs and non-product outputs (losses)
    - Conducting a “materials account balance” assessment of the facility that will identify the flows and storage of priority toxic substances and wastes
    - Assess environmental regulatory compliance
    - Outline the costs that are relevant to current operations;
2. Identify pollution prevention opportunities &/or practices including product redesign, material & feedstock substitutions, equipment modifications and process changes, inventory management, operating efficiencies, training & on-site recycling. Where possible, recommendations will include large, small & long- and short-term improvements & indicate relative costs and cost savings;
3. Provide feed back on opportunities to communicate P2 activities to the public;
4. Identify opportunities for solid waste reduction;
5. Present environmentally-related recommendations for relocating and designing of the future facility;
6. Provide a written report of findings to Toronto Public Health.

1.2: Scope of review:

Information reviewed and tasks carried out during this assessment included:

- A site reconnaissance of the City of Toronto Print Shop
- A review of available City of Toronto Print Shop documentation
- A review of the following documents (in part or whole):
    - CleanPrint Canada – Checksheet / Guidebook
    - Ontario – Environmental Protection Act
        - Regulation 346 – Air Approvals
        - Regulation 347 – Hazardous Waste
        - Regulation 127 – Contaminant Reporting
        - Regulation 102 – Solid Waste Audits / Workplans
    - Environmental Choice Guideline – ECP 58 Lithographic Printing
    - City of Toronto Sewer Use Bylaw
- Meetings / discussions with City of Toronto personnel as required to gather background information
- Preparation of report documentation to conform to project scope requirements.

2.0 Executive Summary

A baseline review of the City of Toronto print shop facility located at 90 Niagara Street was conducted as part of a pollution prevention and community right-to-know project spearheaded by Toronto Public Health.

The review was completed in accordance with the Request For Quotation parameters detailed in Section 1.1 and with the full support of the print shop personnel. The facility management team, along with Toronto Public Health actively participated in the review and provided much of the information used in the report.

While the report details a number of areas where improvements can and should be made to the printing process to reduce environmental impacts, the most significant pollution prevention opportunity identified at the facility is the implementation of direct to printing plate and digital proofing technology.

The implementation of this technology will eliminate a number of solid and chemical waste streams including photographic film; colour-proofing materials, spent fixer, developer, corrugated boxes and film wash water. Subsequent improvements to the production flow should also help to reduce paper and ink waste.

Groff Associates Inc.

Douglas Groff
Principle

3.0 Background / Baseline Review Information

Facility Information:
The City of Toronto Print Shop is a full service facility, with integrated pre-press, press and finishing operations. The facility provides a wide range of printed documents in support of City operations including letterhead, brochures, constituent documents, reports and pamphlets.

The facility is approximately 13,000 square feet in size and employs 24 people on a one shift per day operation. Facility hours are 7:00 am to 5:00 pm, Monday to Friday. Adjacent properties include private residences, office buildings, light manufacturing and a large abattoir that produces very strong noxious odours.

There are no records indicating the presence of above or below ground storage tanks on the facility property or history of chemical spills and/or soil, ground water contamination.

Material Inputs / Outputs:

Primary inputs include materials and chemicals for the production of:

- Photographic film
- Printed product
- Binding and shipping of printed product

Primary product outputs include:

- Printed materials for customer use and distribution

Primary non-product outputs include:

- Spent photographic film
- Waste paper
- Spent metal plates
- Waste ink
- Waste corrugated cardboard
- Chemical / wash water effluent
- Fugitive air emissions

For the 2005 calendar year the facility generated 97.8 metric tonne of solid waste of which, 86.25 tonne or 88.2% was diverted for re-cycling. The percentage recycling number consists of fine paper, metal plates and corrugated, but does not include metals recovered from empty ink cans.

Chemical waste collected during 2005 totalled 760 litres and consisted of plate developer, plate gum, ink sludge and machine oil. Solvent residue from press cleaning operations was disposed of in press wiper pails; photo-processing liquids, spent fountain solution and press bucket water via discharge to sanitary sewer. **Note:** spent fixer was de-silvered prior to discharge. Collected silver was taken off-site and reclaimed. No additional priority toxic substances were noted during the site review.

Details of inputs / outputs are provided in Figure 1 of the appendices.

Environmental Regulatory Compliance:

Air Emissions:

Although there are minimal process air contaminants emitted by the facility, one process vent was installed several years ago to exhaust fumes / low-level odour from the shrink-wrap unit to the outside atmosphere in the bindery area. This vent is no longer in use.

On entry to the facility a detectable odour was noted, which varied according to the operation being performed (e.g. printing / equipment cleanup). This low level odour is consistent with similar types of printing operations. Vents in the main work areas exhaust air to the outside atmosphere. There have been no odour or noise complaints from neighbouring properties, according to staff at the facility.

Section 9 of the Ontario Environmental Protection Act requires companies to obtain an approval before construction, alteration, extension or replacement of any equipment or structure that may emit or from which may be emitted a contaminant into the natural environment, other than water. Approval is also required for the ongoing operation of any equipment that may discharge a contaminant to the atmosphere.

The wording of Section 9 is broad with the result that most industrial processes or modifications to industrial processes and equipment require the submission of an application for a Certificate of Approval.

To ensure conformance with Section 9 requirements, the vent installed for exhausting shrink-wrap fumes should be dismantled and removed.

Chemical / Waste Water Effluent:

Four potential waste effluent streams were noted at the facility and these include:

- Discharges of spent fixer, developer and film wash water from the photographic film processor to sanitary sewer.
- Discharge of plate developing wash water to storm drain
- Disposal of spent fountain solution via sink / sanitary sewer.
- Disposal of press bucket wash water via sink / sanitary sewer.

Effluent discharge practices should be monitored to ensure conformance with applicable bylaws for the following reasons:

- The disposal of fixer and developer reservoirs in any volume may exceed Sewer Use By-Law parameters for solids and BOD (Biological Oxygen Demand).
- Discharge of process waste streams to storm drain is generally prohibited.
- Spent fountain solution and water from press buckets will likely contain contaminants from the printing process including residual solvents, printing inks and paper dust.

Solid waste disposal:
The facility has in place a well-organized recycling program and as a consequence 88.2% of all solid waste produced as a byproduct of facility operations is diverted from landfill to recycling.

The facility will require the completion of a waste audit summary as dictated by Ontario Regulation 102. This should include a review of items currently sent to landfill to ensure that all recyclable items have been captured and dealt with accordingly. **Note:** copy of waste audit summary, completed for 2005 by Groff Associates Inc. is included in Appendix A. This audit form and waste reduction work plan should be completed on an annual basis as required by Ontario Regulation 102.

Cost Review:
The following areas of facility operations, which may impact on the current cost structure, require further review:

- The facility buys approximately $910,000.00 worth of paper products annually for use in the production process. There is no formal tracking of paper waste and as a consequence it is not known whether the percentage waste is in keeping with industry norms for this type of operation (see Section 4).
- Facility electric power consumption is a primary expense. The quality of the power supplied, load factors and efficiency of use should be monitored to determine if savings could be obtained (see Section 4).
- Should an air permit be required the cost to apply for and obtain the permit will need to accounted for – estimate cost at $12,000.00
- Should a review of effluent discharge practices determine that chemistry currently sent to drain, be collected for secure disposal, these additional costs will need to be accounted for – cost estimate not known at this time.

4.0 Pollution Prevention Opportunities

Based on the review of facility operations the following pollution prevention practices / opportunities have been identified.

Direct to Plate Technology:
Printing and Distribution management has proposed the installation of direct to plate technology, which would replace the current photographic film to printing plate system. Implementation of this process technology should be given priority as it would significantly reduce facility environmental impacts through:

- The reduction of solid waste - spent film, masking materials and corrugated boxes
- Elimination of photographic chemistry and the resultant effluent streams.
- Reduction in use of film cleaners and subsequent VOC (Volatile Organic Compound) emissions

Cost savings developed as part of facility capital request – append to report as available.

Digital proofing technology:
Printing and Distribution management has purchased a digital inkjet-proofing device for making customer proofs. Implementation of this process technology should be given priority as it would significantly reduce facility environmental impacts through:

- The reduction of solid waste - proofing - masking materials and corrugated boxes
- Elimination of photographic development chemistry and the resultant effluent streams.

Cost savings developed as part of facility capital request – append to report as available.

Paper Management Systems:
There is currently no system in place for measuring paper waste or job overruns. Print shop management should consider implementation of a “war on waste” campaign to determine what reductions could be obtained in paper usage. At a minimum a sampling of job dockets should be undertaken to ensure waste percentages in keeping with industry norms.

Electric power consumption:
Most printing facilities can benefit from a review of electrical energy use, as internal power grids are generally inefficient and peak demand erratic. Reductions in power consumption would improve on facility environmental impacts. Recommend having “CleanVolt” review operations and provide feed back on potential savings. **Note:** Savings of 10 –15 % not unusual.

Process Control Measures:
The following process control measures should be investigated and implemented as appropriate:

- Press blanket “mileage”, failure rate and cause should be tracked to ensure maximum life span. Recording “mileage” on the back of blanket could do this.
- Rubber roller

Chemical Handling and Control:

- In the event that spent photographic fixer and developer occurs, the waste chemical should be collected for secure disposal i.e. if cleaning of film processor reservoirs required (which is the current practice for the plate processor) – this will reduce the sanitary sewer loadings. **Note:** film wash water can continue to go to drain.
- Press bucket wash water should be changed on a regular schedule to ensure contaminant levels kept to a minimum. Press bucket wash water effluent should be tested to ensure conformance with sewer use by-law.
- In the event that spent fountain solution occurs i.e. reservoirs become contaminated, the waste chemical should be collected for secure disposal to ensure contaminants handled in an appropriate manner.

Employee Training:
Employee knowledge and training will need to keep pace with P2 (Pollution Prevention) program enhancements. Recommend monthly meetings / training sessions (can be one hour or less) be instituted to ensure conformance with requirements. **Note:** would also suggest initiating P2 information board detailing status of facility projects and attainment of goals.

5.0 P2 Communication Activities:

Communicating P2 activities to the public can be achieved through the following:

- Print Shop management should develop and publish an environmental policy detailing their environmental program and process activities / standards. Note: This could include documentation of work procedures; including job requirement for pollution prevention activities and inspection checklist of key environmental activities / equipment. This policy once adopted could be broadcast through the City of Toronto web site and written communication to stakeholders.
- Certification to the EcoLogo ECP-58 standard and subsequent use of the ecologo mark on published information would attest to Print shop commitment to the environment. Information on the standard could be incorporated into printed information.
- After the new facility is operational an open house could be organized to showcase environmental programs and processes.
- Information specific to print shop facility environmental programs and processes could be developed provided as part of the broader public consultation (i.e. information brochure)

6.0 Recommendations / Opportunities for Solid Waste Reductions:

Based on the review of facility operations the following solid waste reduction opportunities have been identified.

Paper Management Systems:
As identified in Section 3, there is currently no system in place for measuring paper waste or job overruns. Print shop management should consider implementation of a “war on waste” campaign to determine what reductions could be obtained in paper usage. At a minimum a sampling of job dockets should be undertaken to ensure waste percentages in keeping with industry norms.

Landfill Waste Streams:
An audit of items / waste streams sent to landfill should be undertaken to ensure that all recyclables are dealt with appropriately. This could form the basis for the facility waste reduction waste plan as required by Ontario Regulation 102 requirements. Note: this type of review is often referred to as “Dumpster Diving”

7.0 New Facility Planning Criteria:

The following environmentally related “conceptual-level” considerations and recommendations are provided for relocating and designing the future facility

- The new facility should ideally not be located by or in close proximity to residential housing (i.e. distance from the closest residence should be not less than 500 metres).
- Consideration should be given to minimizing the extent to which process vents, HVAC equipment generate noise or emit odour, which can impact on neighbouring residences, businesses and offices.
- As with the current facility access to public transit is required and employees encouraged not to, drive to work.
- Floor drains and sinks should not be permitted in production areas.
- Process emissions should be inventoried and a facility wide air permit obtained prior to the facility starting operation.
- A designated area should be established for the storage of solid waste materials.
- A chemical storage area / room should be provided for inventoried products, storage of soiled press wipers and hazardous waste accumulation. **Note:** must conform to Fire Code, Part 4 requirements
- A vacuum operated paper trim disposal system should be considered for the bindery finishing equipment (folders, saddle stitchers, etc), which would collect and store accumulated paper waste. This would eliminate the need for paper bins on the floor, ensure that all paper waste was collected as required and improve on plant house keeping conditions.
- Energy efficient lighting and electrical distribution systems should be installed to minimize power consumption.
- The installation of a humidification system should be considered to ensure appropriate relative humidity levels maintained in the paper storage, pressroom and finishing areas. Maintaining a constant humidity at the required level will improve on the printing and processing of paper stocks and reduce solid waste generation.

8.0 Conclusion:

Facility operations were found to be well managed and print shop employees very supportive of the review. Plant conditions are in keeping with what can be found in facilities using comparable equipment and producing like product.

While the report details a number of areas where improvements can and should be made to the printing process to reduce environmental impacts, the most significant pollution prevention opportunity identified at the facility is the implementation of direct to printing plate and digital proofing technology. The implementation of this technology will eliminate a number of solid and chemical waste streams including photographic film; colour-proofing materials, spent fixer, developer, corrugated boxes and film wash water. Subsequent improvements to the production flow should also help to reduce paper and ink waste.

Certification to the EcoLogo ECP-58 standard and subsequent use of the EcoLogo mark on published information would attest to facility commitment to the environment. In addition, the facility may also want to consider Forest Stewardship Council (FSC) Certification, which denotes the use of paper manufactured using sustainable practices. The FSC logo as with EcoLogo is a widely recognized designation for environmentally responsible firms.

P2 / Regulatory Summary:

Issue / Opportunity	**Suggested Action:**
1. Production of photographic film results in waste chemistry and film	Install direct-to-plate technology as proposed.
2. Review of solid waste disposal required	Initiate “war on waste” team to reduce solid waste production. Complete waste audit summary as required by Ontario Regulation 102
3. Process air emissions discharged to outside atmosphere	Review requirement for air permit – submit application as or if required.
4. Chemical Handling and Control procedures require review.	When changing chemistry in reservoirs - collect spent solutions for secure disposal **Note**: wash water is suitable for sanitary drain disposal. Reroute spent plate developing wash water / solution to sanitary sewer system Collect spent fountain solution for recycling or secure disposal Collect cleaning solutions from press wash up for secure disposal.
5. Electric power consumption	Review plant operations via CleanVolt or like organization to determine what savings can be achieved
6. Process control measures	Review press blanket and roller usage to ensure adequate “mileage” achieved.
7. Employee training / awareness	Provide training to employees in pollution prevention / regulatory requirements.

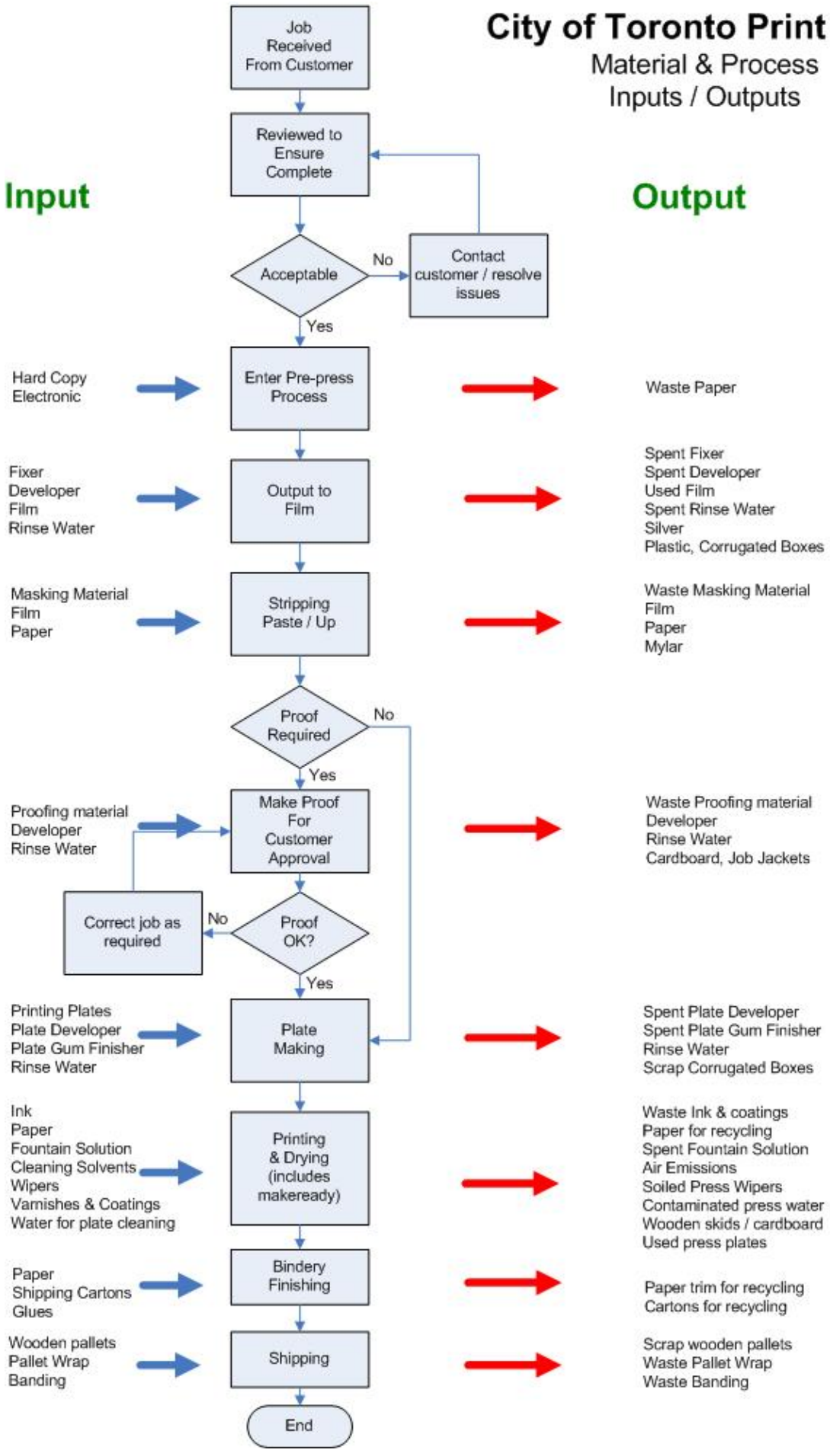
APPENDIX

Chemical Usage Data
2005

Chemical Name	% VOC Content	Quantity Purchased	% Recycled / Secure disposal	Quantity used
Isopropyl alcohol	100%	182 kg	0	182 kg
Econowash (Blanket roller wash)	100%	1010 kg	0	1010 kg
Rubber Rejuvenator	100%	105 kg	0	105 kg
Printing Ink	Various	1466 kg	{To be advised}	TBA

City of Toronto Print Shop

Material & Process Inputs / Outputs



Waste Audit Summary - Industrial, Commercial and Institutional Establishments (*As required by Ontario Regulation 102*)

Company / Institution	City of Toronto Print Shop
Contact Person	Vito Farella
Site Address	90 Niagara Street, Toronto M5V1C5
Telephone	416-397-0323
Current year	2005

Type of Establishment		☐ Educational	Enrolment
☐ Restaurant	☐ Over $3 million	☑ Manufacturing	Hours 20,000+
☐ Hospital	O.R. 964 Class A, B, F	☐ Office Building	sq.m.
☐ Hotel/Motel	No. of Units	☐ Retail Shopping	sq.m.

Waste Management Summary (Quantities in Tonnes)

Waste Category	Generated			Reused			Recycled			Disposed		
	Base Year	Current Year	∇	Base Year	Current Year	∇	Base Year	Current Year	∇	Base Year	Current Year	∇
Fine Paper	83.4	83.4		∅	∅		83.4	83.4		∅	∅	
Cardboard	1.69	1.69		∅	∅		1.69	1.69		∅	∅	
Aluminum plates												
General garbage	11.5	11.5		∅	∅		∅	∅		11.5	11.5	
Total	96.6	96.6	N/A	∅	∅	N/A	85.1	85.1	N/A	11.5	11.5	N/A
Per cent Change												

Recycled Content of Materials (bought or sold)

Material	(%)	Material	(%)	Material	(%)	Material	(%)	Material	(%)
Fine paper	20								
Cardboard	20								

I hereby certify that the information provided is complete and correct, and the establishment complies with all the requirements of Regulation 102/94.

Signature of authorized official	Title	Date

Waste Audit Summary Instructions - Industrial, Commercial and Institutional Establishments

Company / Institution	The name of the company or institution responsible for the establishment.
Contact Person	The name of the person to contact regarding the audit.
Site Address	Address of the establishment for which the audit is being conducted.
Telephone	Telephone number for the Contact person.
Type of Establishment	Check off the type of establishment for which the audit is being conducted. Indicate the size or other parameter as per the followir classification: • Educational institution (enrollment) • Restaurant (annual sales) • Hospital (Reg 964 Class A, B or F) • Hotel / motel (Number of units) • Manufacturing (Hours worked per month) • Office building or complex (Floor area used for offices in sq. m.) • Retail complex or establishment (Floor area in sq. m.)
Waste Management Summary	This is where you record the quantity (tonnes) for each of the material categories listed in the first column in either the Base Yeai Current Year column and calculate a Total for each column.
Waste Category	The categories used in your waste composition analysis (e.g. fine paper, glass, newspaper). These categories will form the basis and monitoring system.
Base Year	The baseline period for measuring progress, prior to implementing a waste reduction workplan. Usually this is the first year an au can be any year prior to an audit provided there is adequate waste generation data available.
Current Year	Any year following the base year.
∇	The difference between the Current year amount and the Base year amount. A negative number means the quantity has gone do number means the quantity has gone up. For example, Base year = 1000, Current Year = 750. ∇ = 750 - 1000 = -250.
Reused	Any item that would have become waste except that it is used again for the same purpose.
Recycled	Any waste material that is sent for use as a feedstock in an industrial process. Sometimes wastes are sent directly to a user and are sent to processors who convert them to usable materials. Both should be included as Recycled.
Disposed	Any waste material that is sent to a landfill, incinerator or similar facility.
Generated	Waste generated should equal the total of waste reused, recycled and disposed.
Per cent Change	Divide ∇ by the Base year amount and multiply by 100. This is one way to track the progress of your waste reduction activities rel year.

Have an authorized official of your company sign and date the summary, stating his or her title.