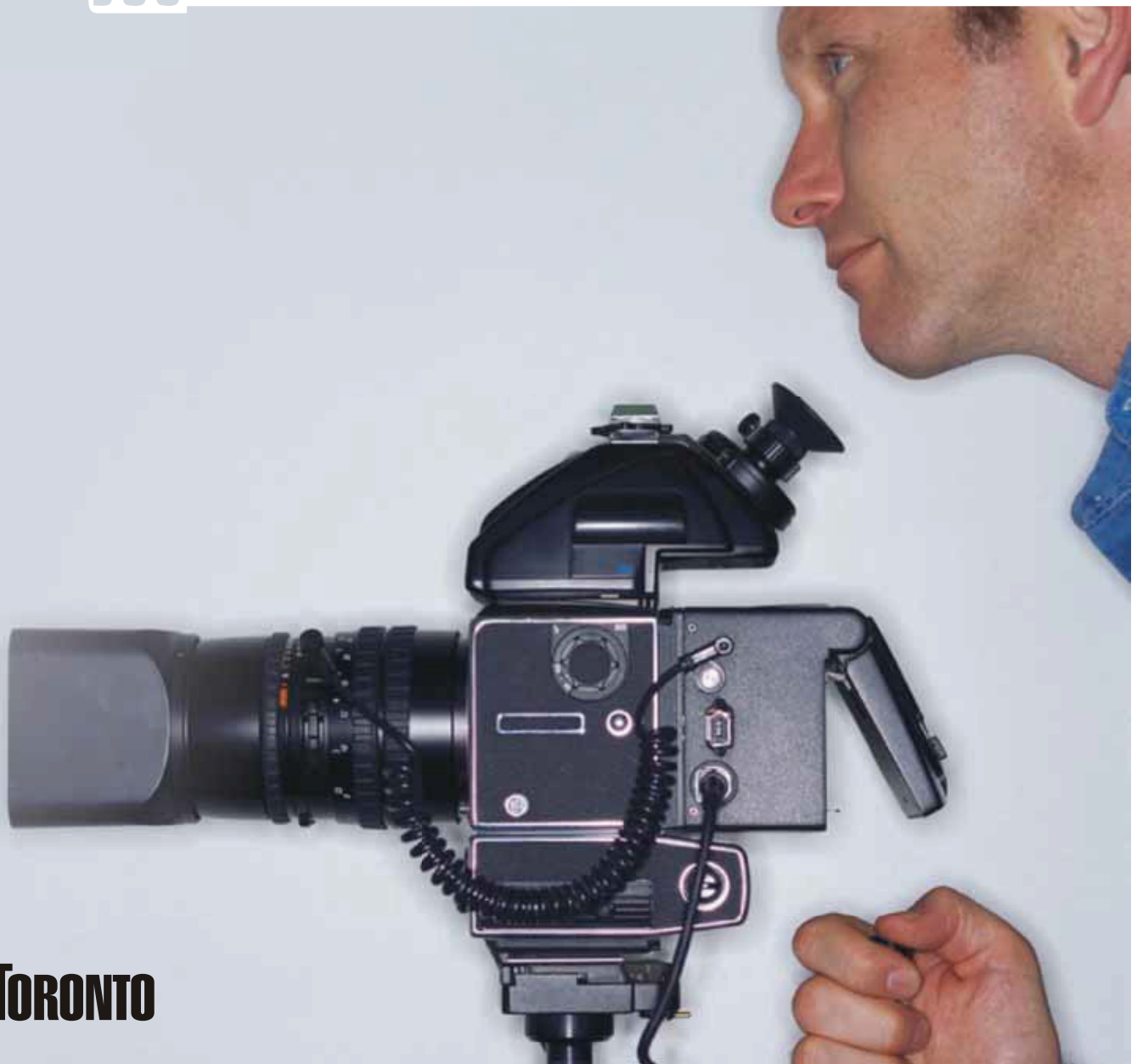


Environmental Best Management Practices for

photo finishing operations

in the City of Toronto



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1 Introduction

The City of Toronto's Environmental Monitoring and Protection Unit, within Toronto Water Division, has developed the Environmental Best Management Practices (BMP) for Photo Finishing Operations. Serving as a guide to the sections of the City of Toronto Municipal Code Chapter 681- Sewers that apply to the photo finishing industry, this document provides guidance and information on meeting with the compliance requirements and improving environmental performance for photo finishing business owners/operators to minimize the effects of their operations on the quantity and quality of wastewater and contaminants discharged to sewers.

The City of Toronto Municipal Code Chapter 681 requires all businesses that use or produce subject pollutants to submit a Pollution Prevention Plan. If a photo finishing operation adopts the guidance of this Best Management Practice and meets with the requirements, the requirement of a detailed Pollution Prevention Plan can be **waived**. A copy of the “**Declaration by Photo Finishing Facilities for Implementing Environmental Best Management Practices (BMP)**” is still required to be completed and submitted to the City of Toronto as declaration of practicing best management in daily photo finishing activities.

The Best Management Practice (BMP) is intended for guidance purposes only and should there be any discrepancy between the BMP and current versions of the applicable Federal and Provincial Acts or Regulations and/or Municipal By-laws, the Acts, Regulations and/or By-laws take precedence.

1.1 Why is the Effluent from Photo Finishing Operations A Concern?

While a single photo finishing operation might contribute small quantities of substances of concern to a sewer system, collectively the operations of the photo finishing industry as a whole can be a significant contributor. It is therefore critical that each and every photo finishing operation does whatever is economically practical to reduce substances of concern that are discharged into sewers.

The potential issues in photo finishing industry are:

- Substances can structurally damage sewer systems by plugging or corrosion (e.g. iron-containing sludge from silvery recovery process, corrosive effluents).
- If large quantity/high concentrations of pollutants enter sewer systems, photo finishing chemicals can react with other materials/chemicals and release toxic substances (e.g. ammonia, etc.), which can put sewer systems and sewage treatment workers' health and safety at risk. Also corrosive chemicals (base and acid) can kill micro-organisms in the bio-treatment processes and affect the wastewater treatment efficiencies. Therefore, controlling the photo finishing chemicals at the source is for the protection of human health, the environment and structural integrity of the sewer system.
- Silver released from photo finishing operations is a non-renewable and precious material and shall be recovered for recycle and reuse.

2 Background

Generally, sewage, including industrial wastewater, has to be treated before discharge from sanitary sewer systems into aquatic and marine environments such as creeks, rivers, lakes, seas and oceans.

Federal and Provincial governments regulate and limit the quality and quantity of substances of concern discharged into the environment via municipal sewer systems. As a result, municipalities have by-laws within their jurisdictions that control the quality and quantity of those substances discharged into sewer systems by wastewater generators, among which the photo finishing industry is one of. The objective is to prevent or limit discharges so as to:

- protect public health and safety,
- protect natural environment, and
- maintain sewer systems and sewage treatment processes.

3 Scope

This document (BMP) is intended to assist the following groups of photo finishing labs to meet with compliance requirements:

- a retail mini-lab processing location
- a wholesale photofinisher
- a commercial photo-finishing laboratory
- corporate labs, law enforcement labs, institutional labs, and other labs

Pollutants and wastes targeted in this document are:

- Silver contained in the photo processing effluents (e.g. spent silver-rich fixers and bleach-fixers).
- Depending on supplier and manufacturer, film and photo paper processing chemicals may contain certain amounts of subject pollutants such as zinc, surfactants (i.e. nonylphenols and nonylphenol ethoxylates), and other trace substances, which are regulated in the Toronto Municipal Code Chapter 681. It is important that the photo finishing owners/operators do everything practical to reduce the quantities and types of these regulated substances from discharge into sewers.
- Hazardous wastes and recyclable wastes generated in the photo finishing operations.

4 Licensing

Licensing is not applicable for photo finishing operations operating in the City of Toronto.

5 Summary of Regulatory Requirements

5.1 Federal Government

Improper connections to sanitary or storm sewers, or runoff that introduce controlled substances (i.e. pollutants) to local watercourses, may cause a violation of the [Federal Fisheries Act](#). All wastewater shall be directed into the sanitary sewer with only stormwater runoff (rain and snow melt) allowed to enter the stormwater collection system.

5.2 Provincial Government

In Ontario, **Spills** - Part X of the [Environmental Protection Act](#) (EPA) imposes certain duties on persons who cause a spill or are in control of a material that is spilled. In addition to containing and cleaning up the spill, they shall also report the spill to the Ministry of the Environment, Conservation and Parks (MECP), the municipality and the owner of the material spilled. The [Spills Regulation](#) (O. Reg. 360) defines those duties and rights of parties subject to Part X.

The [Ontario Fire Code](#) (O. Reg. 388/97) has specific requirements on the storage, handling and identification of corrosive and oxidizing materials.

Additionally, there is provincial legislation that regulates occupational health and safety in Ontario:

- The [Occupational Health and Safety Act and Regulations](#), which specify duties and responsibilities on employers in charge of workplaces where hazardous materials are used, to ensure safe working environment and to provide workers education programs to prevent them from occupational health and safety risks and hazards.
- The [Workplace Hazardous Material Information System \(WHMIS\) Regulation](#) (O. Reg. 860), which sets out in detail the employer's duties and responsibilities on identifying and labeling hazardous materials in workplace, provision of the material safety data sheets (MSDS) and education to workers.

The Ontario Ministry of Municipal Affairs & Housing has set out the [Building Code Act and Regulations](#) and [Ontario Building Code](#), which prescribe mandatory standards for building construction, including construction, plumbing and on-site sewage disposal systems in Ontario.

The Ontario MECP [Environmental Protection Act](#) requires that environmental compliance approval (ECA) shall be obtained prior to construct, alter, extend or replace any plant, structure, equipment, apparatus, mechanism or thing that may discharge or from which may be discharged a contaminant into any part of the natural environment other than water. This requirement applies to photo finishing operations if air emissions from photo processing equipment are discharged into the open air environment.

The Ontario MECP also has set out the [General - Waste Management](#) (O. Reg. 347), which requires specific waste disposal and record keeping for designated industrial and hazardous wastes.

5.3 Municipal Government

The Sewers By-law – the City of Toronto Municipal Code Chapter 681 has given the City of Toronto the authority to regulate discharges to sanitary and storm sewers within its jurisdiction. The intent of the Sewers By-law is to protect:

- all aquatic receiving environments including creeks, rivers and Lake Ontario
- public health and safety in Toronto
- sanitary and storm sewer systems
- efficiency of the sewage treatment processes
- biosolids quality; and
- promote responsible waste management practices.

5.4 Discharge Prohibition

In addition to the following list (refer to the City of Toronto Municipal Code Chapter 681 for definitions and details), the owner/operator of a photo finishing operation shall not discharge into the sanitary, storm, or combined sewers any waste that is in contravention to Municipal Code Chapter 681, Article I, § 681-2 and § 681-4 as amended from time to time. Photo finishing operations shall not discharge into the sanitary sewer non-domestic waste that contains:

1. Acute hazardous waste chemicals
2. Combustible liquids
3. Dyes or colouring materials which may or could pass through a sewage works and discolour the sewage works effluent
4. Hauled Waste
5. Ignitable waste
6. Hazardous industrial waste
7. Hazardous waste chemicals
8. Severely toxic waste
9. Water originating from a source other than the city water supply
10. Stormwater as defined by the By-law (the wash area shall be designed to prevent stormwater from outside the wash area and roof drain, from flowing into the sewer connected to a sanitary sewer)
11. Contaminated groundwater as defined in applicable provincial regulation (disposal of treated groundwater into the sanitary sewer requires an authorization from the City)
12. Effluents from photo processing and equipment cleaning that has a low pH (<6.0) or high pH (>11.5)

6 Onsite Silver Recovery

6.1 Onsite Silver Recovery Equipment

There are a variety of onsite silver recovery technologies and equipment available. Understanding the operational process, amount of effluents, and the silver discharge limit, will help determine the technology (e.g. metallic replacement, electrolytic recovery, chemical recovery, precipitation, evaporation/distillation, or ion exchange) and equipment that are needed by a photo finishing operation owner/operator. Information provided by industrial associations can help select providers of silver recovery services. Also, equipment supplier/manufacturer can help an owner/operator choose the most suitable silver recovery technology and equipment to suit the operation's business volume, facility size and layout, and budget.

6.2 Standards

All photo finishing operations that discharge non-domestic photo finishing wastewater (other than from washrooms and kitchen facilities) into a sanitary sewer shall have silver recovery equipment installed and all spent silver-rich photo finishing effluents (e.g. used fixers, bleaches, bleach-fixers, etc.) must flow through the equipment to recover silver prior to discharge into a sanitary sewer. The silver recovery equipment shall be designed to ensure that the sewage, at the discharge from the photo finishing operation, contains silver in a concentration **not in excess of 5 milligrams per litre (mg/L)**.

6.3 Installation, Inspection and Maintenance

The owner/operator of a photo finishing operation is required to:

- Install silver recovery equipment. For example, metallic replacement cartridges can provide silver recovery efficiency for most photo finishing operations.
- Obtain published data and information from the manufacturer/supplier with demonstration of the capacity and efficiency of the equipment, also follow the supplier's recommendations for preventive maintenance and keep accurate maintenance records.
- Keep a log to record all of the inspection and maintenance activities.

6.4 Monitoring

The owner/operator of a photo finishing operation shall routinely monitor the silver recovery equipment to ensure recovery efficiency. The monitoring options are self monitoring or monitoring by a supplier/contractor.

6.4.1 Self Monitoring

A photo finishing operation may choose a combination of strip testing and analytical lab testing to monitor silver concentrations in sewage discharge.

- You may need to contact your supplier/installer of silver recovery equipment for recommendations on using test strips. Also, staff should be well trained on using test strips.
- Test strips can provide an approximation of silver recovery efficiency. There are two types of test strips available. Paper test strips can test for the presence of silver at concentrations of 1000 mg/L or more. Copper test strips can test whether silver is present in a concentration of 50 mg/L or more. Follow the instructions provided by the test strip supplier to conduct routine and frequent testing.
- Analytical lab testing shall also be conducted to verify effectiveness and efficiency of the silver recovery equipment. Use licensed analytical laboratories to conduct analytical testing. When collecting sample effluents for analytical testing of silver, ask the lab not to add nitric acid to preserve the sample. Nitric acid causes the silver to precipitate out of solution resulting in an artificially-low silver reading.
- Monitoring with test strips must be done at least weekly. Analytical lab testing shall be conducted at least once per year to verify the efficiency of the system
- All testing results shall be recorded and kept in log book for a minimum of seven years (see Appendix II for a log book example on how to keep testing results).

6.4.2 Monitoring by Supplier/Contractor

A photo finishing operation may use their equipment supplier or a third-party contractor to monitor silver concentration.

- A written monitoring program must be developed showing the silver recovery equipment is adequately monitored.
- The replacement of the metallic replacement cartridge(s) is done based on sound science. A conservative assumption approach involving historical production data and end-of-life analytical data is acceptable to define the correct cartridge replacement time.
- The photo finishing operation, working with their equipment supplier or a third-party contractor, shall at all times be able to document that the silver recovery equipment is operating within the parameters set out in this document and explain how the system works.

7 Subject Pollutants

Wastewater discharged from photo finishing operations, depending on types of films, photo paper and associated processing solutions used, may contain subject pollutants of **zinc, nonylphenols and nonylphenol ethoxylates**, etc. as listed in Municipal Code Chapter 681, Article I, § 681-5.

The owner/operator of a photo finishing operation shall:

- Choose suppliers and products that can reduce or eliminate such subject pollutant(s).
- Request its suppliers to investigate product formulations and alternatives to reduce or eliminate such subject pollutant(s).

8 Chemical and Chemical Waste Labelling and Storage

The owner/operator of a photo finishing operation shall:

- Ensure that all materials, especially chemicals and chemical wastes, are stored in the proper containers with the correct label in accordance with the appropriate WHMIS procedures. An up-to-date MSDS, available from the product's supplier, should be kept for each hazardous product. Follow the supplier's specifications to stock photo-finishing chemicals (i.e. storage height, recommended temperature, etc.) so as to minimize product damage and scrap.
- Store incompatible chemicals separately to prevent cross contamination and chemical reactions. Individual packages/containers of photo-chemistry (e.g. developers, fixers, bleach-fixers and replenishers), if mixed together, can result in strong chemical reactions. Therefore, they shall be separated for safe storage in case of spill or emergency.

9 Waste Disposal and Recycling

9.1 Hazardous Waste Disposal

The hazardous wastes generated in a photo finishing operation may include expired and/or scrap concentrates of:

- developer
- fixer and bleach-fixer

- bleach
- stabilizer
- processing kit, which contains combination of components of developers, fixer, bleach-fixers and stabilizer
- acidic solution including acids for equipment cleaning and maintenance

The owner/operator and all staff of a photo finishing operation shall:

- Handle chemical concentrates carefully to avoid contact,
- Ensure all chemical wastes are properly contained and labeled in case of spill or leak,
- **Never pour** chemical concentrates down into sewer drains,
- Properly dispose offsite all expired, off-specification or scrap chemical concentrates by choosing MECP-approved and licensed waste haulers and receivers,
- Only spent photo finishing effluents may be discharged into the sanitary sewer. Before discharging, the effluents must have silver concentration not in excess of 5 mg/L,
- **Never dilute** effluents with clean water to lower silver concentration or balance the pH. Dilution for discharge is prohibited by environmental legislation.

9.2 Non-Hazardous Waste Recycling

Recyclable wastes generated in photo finishing operations include recovered silver, used one-time-use cameras, used batteries, expired/scrap films and photo paper containing silver, empty film canisters, plastic cores and cases and packaging materials.

Product manufacturers have specific recycling programs to take back recyclable materials and recycle/reuse in productions. Work with product suppliers/distributors to determine methods and channels to recycle and reuse as much as possible. If a photo finishing operation runs business within a large commercial building/unit, check with the property manager to find out if any recycling programs have been established for the whole premise.

The below table lists the majority of frequently generated hazardous and non-hazardous wastes that shall be properly disposed and recycled by photo finishing operations:

Waste Name	Concern or Value	How to Dispose/Recycle
Hazardous Wastes		
Developer concentrate	High pH	Offsite disposal to a MECP approved waste disposal site
Fixer, bleach-fixers concentrate	Chemical	Offsite disposal to a MECP approved waste disposal site
Bleach concentrate	Chemical	Offsite disposal to a MECP approved waste disposal site
Stabilizer concentrate	Chemical	Offsite disposal to a MECP approved waste disposal site
Acidic cleaning solutions	Low pH	Offsite disposal to a MECP approved waste disposal site

Waste Name	Concern or Value	How to Dispose/Recycle
Full and half-full processing kits containing components of developer, fixer, bleach-fixers and bleach	Various	Offsite disposal to a MECP approved waste disposal site
Spent silver bearing effluents	Silver	Recover silver through silver recovery equipment, then co-mingled in holding tank before discharge into sanitary sewer (silver concentration must be $\leq 5 \text{ mg/L}$)
Spent non-silver bearing effluents	N/A	Co-mingled in holding tank with effluents from silver recovery equipment, then discharged into sanitary sewer
Empty processing kits	Chemical residue	Rinse all chemical containers (must be residue free) and then dispose into general garbage
Non-Hazardous Wastes		
Recovered silver	Silver	Commercial recycler, or manufacturer sponsored recycling program
Expired/scrap silver-rich film, and photo paper	Silver	Commercial recycler, or manufacturer sponsored recycling program
Used one-time-use cameras	Camera	Manufacturer sponsored recycling program
Empty film canisters	Metal	Manufacturer sponsored recycling program, or local recycling bin
Film plastic cores and cases	Plastic	Local recycling bin
Used batteries	Battery	Manufacturer sponsored recycling program, or recycling programs supported by the City of Toronto
Corrugated packaging materials	Paper	Commercial recycler, or local recycling bin
Used digital photography equipment	E-waste	Manufacturer sponsored recycling program, commercial or city-supported electronic waste recycling program
Office recyclables (i.e. aluminum cans, paper, glass/plastic bottles, etc.)	Various	Local recycling bin
Processed film tails	N/A	General garbage
Processed photo paper	N/A	General garbage
Organic food and degradable wastes	N/A	Compost as much as possible, if not, general garbage
Other office garbage	N/A	General garbage

10 Spill Response Plan

The owner/operator of a photo finishing operation shall ensure that:

- All the staff in the lab knows the products, associated potential health & safety risks and environmental impact, and necessary personal protection equipment (PPE) in response to a chemical spill. Products such as fixers and bleach-fixers can react with strong acids or bases such as household bleach to release toxic vapors/fumes including chlorine gas.
- The facility has an up-to-date and regularly tested spill response plan.
- The following information be included in the spill response plan:
 - An inventory of all the chemicals and quantities stored/used in the facility;
 - A floor plan showing the location of all chemicals, floor drains, fire extinguishers, exits, and spill response supplies including spill absorbents and personal protective equipment (PPE);
 - A description of the containment used for silver recovery cartridge, mixing tanks, chemical storage, and any other containers that could leak or spill; and
 - Emergency/spill response procedure including emergency contact person and number, spill response team, and internal and external resources, as needed.
- The spill response plan is easy to access and spill response equipment and supplies are kept in stock at all times.
- Spills can be properly and immediately cleaned up.

11 Record Keeping and Retention

The owner/operator of a photo finishing operation shall ensure that:

- Up-to-date written records of site activities (e.g. Spill Response Plan, a copy of completed and signed Declaration by Photo Finishing Facilities for Implementing Environmental Best Management Practices (BMP), etc.) are kept to show due diligence and to demonstrate that best management practices have been followed.
- Accurate and up-to-date inspections and maintenance records (a sample log sheet is included for reference in the Appendix) are kept for onsite silver recovery equipment for a minimum period of seven (7) years from the date of inspection and/or maintenance. The record should include:
 - dates of inspection or maintenance,
 - description of inspection or maintenance, and
 - types and quantities of materials removed from the photo finishing operation.
- Waste manifests used for waste disposal, and/or shipping documents are kept, unless the manifest is not required under an exemption.

12 Best Management Practices

In addition to the requirements specified in Sections 4 to 11 of this BMP, this Section defines the Best Management Practices (BMPs) that can assist to reduce the discharge of pollutants, comply with regulations and improve overall environmental performance. All these BMPs are based on the Pollution Prevention (P2) principle that emphasizes reducing or eliminating pollutants and toxic materials at source rather than removing them from a mixed waste stream or through treatment processes. Preference should be given to practices in the following pollution prevention hierarchy (the lower the number, the higher the hierarchy):

1. Avoidance, elimination or substitution of polluting products or materials
2. Reduction in the use of polluting products or materials
3. Elimination and reduction of the generation of polluting by-products
4. Re-use and recycling of polluting by-products
5. Energy recovery from polluting by-products
6. Treatment or containment of polluting residual by-products
7. Remediation of contaminated sites

Specifically for photo finishing operations, the following best practices have been specified to help decrease the contaminants discharged, meet with compliance, improve operation efficiency and save costs through implementing the above pollution prevention practices. Owners/operators are also encouraged to influence their suppliers by requesting more environmentally friendly products or alternatives and purchasing from suppliers who take materials and substances back for recycling and reuse.

12.1 Employee Awareness and Education

The owner/operator of a photo finishing operation shall ensure that all employees:

- are well trained in using existing and new equipment and processes, and are aware of the “best available technologies (BAT)” or the most practical technologies suitable to the lab’s business operations,
- are familiar with the health and safety hazards associated with the products and processes (WHMIS), and the potential environmental pollution/impact,
- understand the purpose of a spill response plan and are properly trained in spill response, and
- have access to Material Safety Data Sheets (MSDS) of all the products being used, and know the location of spill response materials and personal protective equipment (PPE).

12.2 Spill Response

The owner/operator of a photo finishing operation shall:

- Implement a spill response plan (See section 10 in this document for details).
- Report a spill to provincial and municipal authorities if a spill occurs and chemicals have entered the natural environment and/or sewer systems:
 - **Ministry of the Environment, Conservation and Parks** 24-hour reporting number: **416-325-3000**
 - **City of Toronto** 24-hour reporting number: **311**
- When responding to a spill, separate incompatible damaged products and soaked absorbents, after clean-up of leakage or spill, to prevent chemical reactions. MECP “General – Waste Management” (O. Reg. 347) requests proper waste classification and packaging for waste transportation and disposal.
- After spill clean-up, the facility should be inspected and verified, if necessary, before resuming wastewater discharge from the operations.

12.3 Proactive Pollution Prevention

Some simple and inexpensive pollution prevention can produce effective results:

- **Preventive Maintenance:** this may be the first option of pollution prevention. Implement maintenance recommendations specified in the equipment operating manual and/or from the equipment supplier so that the equipment can work at its optimal level and keep waste at a minimum.
- **Process Control:** follow the equipment and product specifications to monitor variables that affect the quality and efficiency so as to ensure that the photo processors function under best conditions. The variables may include: chemical mixing ratio, replenishment rates, and processing temperatures.
- **Inventory Control:** managing the chemical inventory includes rotating the stock to ensure first in, first used. Maintain an appropriate stock level so as to reduce the risk of high scrap and expiry, and save storage space and inventory cost.
- **Storage and Containment:** all chemical wastes shall be shipped offsite for disposal as soon as possible. Besides proper labeling, all chemicals and chemical wastes, especially when handling large quantities, shall be stored with secondary spill containment. Also, the storage areas, whether indoor or outdoor, shall not be connected directly or indirectly to a sanitary sewer or storm sewer.
- **Good Housekeeping:** a clean and orderly photo finishing lab has better control over materials, chemicals and equipment and is less likely to have spills, which results in less operational wastes and more pollution prevention.

12.4 Digital Technology

The digital photographic industry has introduced digital cameras, non-silver halide based printing methods and other computer associated technologies. The owner/operator of a photo finishing operation shall recycle digital electronic wastes including used digital cameras, digital printers and computer equipment through supplier sponsored and/or local recycling programs.

13 Implementation Plan of Best Management Practice

The implementation plan of this document by the City of Toronto includes the following components:

- Education
- Industry/Business' Adoption and Practice
- Inspection
- Monitoring
- Enforcement
- Administration
- Review and Update

14 Inspections, Monitoring, and Enforcement

The City of Toronto's Environmental Monitoring and Protection Unit and Provincial Offences Officers may carry out inspections and examination of records or other documents. The inspector may take samples of effluent for analysis as specified under the City of Toronto Municipal Code Chapter 681. **Corrective measures will be imposed** by the inspector/officer if it is determined that the BMP implementation procedures are not properly followed. Where corrective measures are not met with the requirements of Pollution Prevention, approval for this BMP can be revoked.

Any offences under the Municipal Code will be enforced as per the provisions in **§ 681-14 Offences**.

15 More Information

For more information about the BMP, please contact:

Toronto Water
City of Toronto
Environmental Monitoring & Protection Unit
416-392-9940
p3help@toronto.ca

For reporting a **spill, illegal discharge, and non-drinking water quality complaints or concerns**, such as odours emanating from sewers or basement drains or discoloured discharge from storm outfalls, call City of Toronto's 24-hour reporting line at 311.

16 Appendix I – Glossary of Terms

Best Management Practice (BMP): Best Management Practices (BMP) means an integrated plan to control and reduce the release of restricted and prohibited waste into the sewage works to a practicable extent and in accordance with applicable Laws, through methods including physical controls, pre-treatment processes, operational procedures and staff training.

Bleach: A chemical bath to convert the black metallic silver that forms a photographic image into a compound such as silver halide, which performs three functions: (1) Stops the action of the developer by lowering the pH, (2) Oxidize the insoluble, light sensitive silver halide so that it can react with the bleach to form a soluble silver compound, and, (3) Converts any incompletely formed dye into visible dye.

Bleach-Fixer: A chemical bath in which bleach and fixer haven been combined in colour processing which performs several functions: (1) Stops the action of the developer by lowering the pH, (2) Oxidize the insoluble, light sensitive silver halide so that it can react with the bleach to form a soluble silver compound, (3) The ammonium or sodium thiosulphate dissolves the silver halides so that they can be removed from the paper either in the bleach fixer or the final water wash, and, (4) Completes the formation of the cyan dye.

Contaminant: A substance that is not naturally present in the environment or is present in elevated amounts, which, if in sufficient concentration, can adversely affect human health, flora, fauna and/or the natural environment.

Developer: A weak reducing alkaline solution that is used during the first step in creating an image on light sensitive medium (film or photo paper). In this step the developing agent acts upon all the exposed silver halides to convert them to visible black metallic silver.

Effluent: Liquid flowing out from a facility or household into a sewer system or water body.

Fixer: A thiosulphate solution used to dissolve the remaining unexposed silver on the film. The dissolved silver leaves the emulsion and remains in the fixing bath solution.

Heavy metals: Metallic elements with high atomic weights, such as silver, iron, zinc, copper, lead, mercury, cadmium and arsenic. They are generally persistent in the environment, have the potential to accumulate in the food chain and sewage treatment plant sludge and can cause health effects in organisms.

Milligrams per Litre (mg/L): The weight of a substance in milligrams in one litre of wastewater (may also be referred to as parts per million or ppm).

Mini-Lab: An establishment having a colour and/or black and white film processor and a combined paper printer and processor, capable of providing onsite photographic film and paper processing and printing services to the general public.

MSDS: Material Safety Data Sheet

Pollution Prevention: The use of processes, practices, materials, products or energy that avoids or minimizes the creation of pollutants and wastes, at the source.

Photo Finishing: A sequence of chemical treatments or baths that convert a latent image in a photographic emulsion into a stable and visible one, and, then if applicable, transfer it to a receiving material.

Processing Kit: A combination of components of developer, acidic stop bath, fixer, bleach, and/or bleach-fixers/bleach, which are assembled and packed as a whole package that is ready-to-use by plugging onto the photo finishing equipment.

Sanitary Sewer: A sewer for the collection and transmission of domestic or industrial sewage or any combination thereof.

Spill Containment: Any impervious structure that surrounds a container or works that is sufficient to hold the larger of 110 percent of the largest volume of free liquid in the container or works or 25 percent of the total volume of free liquid in storage.

Spill Response Plan: A written plan developed by an owner or operator of a Photo Finishing Facility to respond to any spills at the facility's site.

Stabilizer: A solution that is used to preserve the colour film dyes against oxidation and ultraviolet degradation.

Standard Methods: A procedure or method set out in *Standard Methods for the Examination of Water and Wastewater* published jointly by the American Public Health Association, American Water Works Association and the Water Environmental Federation, latest edition.

Storm Sewer: A sewer for the collection and transmission of uncontaminated water, storm water, drainage from land or from a watercourse or any combination thereof.

Wastewater: Any liquid containing animal, vegetable, mineral or chemical matter in solution or in suspension but does not include storm water or uncontaminated water.

WHMIS: The Workplace Hazardous Material Information System.

17 Appendix II – Log of Record Keeping

RECORDS OF BEST MANAGEMENT PRACTICES

i. Silver Recovery Equipment & Spill Response Plan			
Date	Inspection/Maintenance Activity	Remarks	Conducted by

BLANK FORM

RECORDS OF BEST MANAGEMENT PRACTICES – EXAMPLE

i. Silver Recovery Equipment & Spill Response Plan			
Date	Inspection/Maintenance Activity	Remarks	Conducted by
Dec-31/05	Initial installation	Installed by ABC Company	F_Name L_Name
Jan-31/06	Monthly routine equipment inspection	Inspection passed	F_Name L_Name
Feb-15/06	Quarterly spill response inspection	Containment intact, absorbent and PPE available	F_Name L_Name
Feb-20/06	Verify MSDSs of all chemicals	MSDSs are all available onsite and up-to-date	F_Name L_Name
Mar-30/06	Equipment preventive maintenance	Silver recovery cartridge replaced	F_Name L_Name

EXAMPLE

RECORDS OF BEST MANAGEMENT PRACTICES

ii. Silver Concentration Test

Date	Silver Concentration Test	Silver Concentration	Conducted by

BLANK FORM

Note: 1. Test strips provide an approximation of silver recovery efficiency.
2. Analytical lab testing verifies effectiveness and efficiency of silver recovery equipment.

RECORDS OF BEST MANAGEMENT PRACTICES – EXAMPLE

ii. Silver Concentration Test			
Date	Silver Concentration Test	Silver Concentration	Conducted by
Dec-24/05	Weekly paper (or copper) strip test	Silver = 0.5 mg/L	F_Name L_Name
Dec-30/05	Weekly paper (or copper) strip test	Silver = 0.6 mg/L	F_Name L_Name
Dec-30/05	Also sampling for silver analysis at licensed ABC Analytical Lab	Silver = 0.65 mg/L in analytical report received on Feb-28/06.	F_Name L_Name

EXAMPLE

Note: 1. Test strips provide an approximation of silver recovery efficiency.
 2. Analytical lab testing verifies effectiveness and efficiency of silver recovery equipment.

RECORDS OF BEST MANAGEMENT PRACTICES – EXAMPLE

iii. Waste Disposal and Recycling

Date	Waste Type	Quantity and Remarks	Conducted By
Mar-30/06	Recovered silver recycled at ABC Silver Recycling Company	10 kilograms – Shipping Doc. #	F_Name L_Name
Jan-01/07	Hazardous wastes disposed at XYZ Disposal Company (MECP licensed)	200 litres – Manifest #	F_Name L_Name

EXAMPLE

Note: Hauler and receiver that remove hazardous wastes from this facility for treatment and/or disposal must be licensed and approved by MECP in accordance with the General - Waste Management (O. Reg. 347).