



## GLOBAL WATER RESOURCES (“GLOBAL WATER”)

### DESIGN STANDARD

#### PHOTOGRAPHIC IMAGING OPERATIONS

##### APPLICATION

This Design Standard defines mandatory requirements for managing non-domestic waste discharged directly or indirectly into a sewer connected to a sewage facility. This Design Standard applies to photographic imaging operations. Definitions are included in Design Standard, Definitions.

##### DISCHARGE REGULATIONS

An operator of a photographic imaging operation must not discharge waste which, at the point of discharge into a sewer, contains:

- a. silver in a concentration that is in excess of 5 milligrams per liter (mg/L) as analyzed in a grab sample;
- b. exceeds the limits established in Design Standard, Definitions for restricted wastes; or
- c. includes prohibited waste, special waste, storm water, or uncontaminated water.
- d.

An operator of a photographic imaging operation that produces liquid waste containing silver must either:

- a. collect and transport the waste from the photographic imaging operation for off-site waste management; or
- b. treat the waste at the photographic imaging operation site prior to discharge to the sewer using one of the following silver recovery technologies:
  - I. two chemical recovery cartridges connected in a series;
  - II. an electrolytic recovery unit followed by two chemical recovery cartridges connected in series; or
  - III. any other silver recovery technology, or combination of technologies, capable of reducing the concentration of silver in the waste to 5 mg/L or less where valid analytical test data has been submitted to, and accepted by, the Engineer.



## **OPERATION**

An operator of a photographic imaging operation shall:

- a. install and maintain silver recovery technology according to the manufacturer's or supplier's recommendations.
- b. collect all liquid waste containing silver in a holding tank and must deliver this waste to the chemical recovery cartridges using a metering pump.
- c. calibrate the metering pump at least once per year.

### Spill/Leak Prevention

An operator of a photographic imaging operation must locate the silver recovery system in such a manner that an accidental spill, leak or container failure will not result in liquid waste containing silver in concentrations greater than 5 mg/L entering any sewer.

If a location referred to above is not available, an operator of a photographic imaging operation must do one of the following:

- a. install spill containment to contain spills or leaks from the silver recovery system; or
- b. cap all floor drains into which liquid spilled from the silver recovery system would normally flow.

### Testing

When using two separate chemical recovery cartridges, an operator of a photographic imaging operation must test the discharge from the first cartridge for silver content at least once per month using either silver test paper or a portable silver test kit.

When the discharge from the first chemical recovery cartridge referred to above cannot be sampled, an operator of a photographic imaging operation must:

- a. install a cumulative flow meter on the silver recovery system; and
- b. test the discharge from the second chemical recovery cartridge once per week using silver test paper or a silver test kit.

## Cartridge Replacement

An operator of a photographic imaging operation must replace the chemical recovery cartridges when any one of the following occurs<sup>1 2 3</sup>:

- a. the manufacturer's or supplier's recommended expiry date, as shown on each cartridge, has been reached;
- b. eighty percent (80%) of the manufacturer's or supplier's maximum recommended capacity, or total cumulative flow, for each cartridge has been reached;
- c. test data, using silver test paper or a silver test kit, indicates that the discharge from the first cartridge is greater than 1000 mg/L; or
- d. analytical data using a method of analysis outlined in standard methods, or an alternative method of analysis approved by the manager, having a method detection limit of 0.5 mg/L silver or lower, indicates that the concentration of silver in the discharge from the silver recovery system is greater than, or equal to, 5 mg/L.

## **RECORD KEEPING AND RETENTION**

An operator of a photographic imaging operation that uses a silver recovery system must keep, at the photographic imaging operation site, an operation and maintenance manual pertaining to all equipment used in the silver recovery system.

An operator of a photographic imaging operation that uses two chemical recovery cartridges connected in series must keep a record book at the photographic imaging operation site which includes the following information recorded for the previous two years:

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<sup>1</sup> If treatment of liquid waste with two chemical recovery cartridges connected in series is the only silver recovery technology being used, then the owner of the photographic imaging operation must replace both chemical recovery cartridges when one of the events referred to occurs.

<sup>2</sup> If treatment of liquid waste with two chemical recovery cartridges connected in series is used following treatment by an electrolytic recovery unit, the second cartridge may replace the used first cartridge and a new second cartridge may be installed when one of the events referred to occurs.

<sup>3</sup> Both chemical recovery cartridges used following an electrolytic recovery unit must be replaced by the operator of the photographic imaging operation when one of the events referred to above occurs if this is recommended by the manufacturer or supplier of the cartridges.

- a. serial number of each chemical recovery cartridge used;
- b. installation date of each chemical recovery cartridge used;
- c. expiry date of each chemical recovery cartridge used (where provided by manufacturers or suppliers);
- d. maximum recommended capacity, or total cumulative flow, of each chemical recovery cartridge used;
- e. dates of all metering pump calibrations;
- f. monthly silver test results on the discharge from the first chemical recovery cartridge; or where the discharge from the first cartridge cannot be sampled, weekly silver test results on the discharge from the second chemical recovery cartridge and weekly cumulative flows through the silver recovery system; and
- g. dates and descriptions of all operational problems associated with the chemical recovery cartridges and remedial actions taken.

An operator of a photographic imaging operation that uses an electrolytic recovery unit in addition to two chemical recovery cartridges connected in series must keep a record book at the photographic imaging operation site which includes the following information recorded for the previous two years:

- a. all information specified above;
- b. date of each removal of silver from the electrolytic recovery unit;
- c. date of each maintenance check on the electrolytic recovery unit;
- d. dates and descriptions of all operational problems associated with the electrolytic recovery unit and remedial actions taken.

Records are required to be available to a Global Water inspector on request.