



SUMMARY DOCUMENT

Dallas Water Utilities

Best Management Practice for Silver Dischargers



GENERAL DESCRIPTION

The new regulatory program for silver users being introduced by the City of Dallas, Department of Water Utilities is based on a concept known as Best Management Practices. Best Management Practices are facility specific plans implemented by an industry sector for the purpose of controlling and reducing certain pollutants—including those discharged to the wastewater treatment plant. A specific set of Best Management Practices has been developed for facilities processing radiographic and photographic film and paper.

These Best Management Practices for silver imaging facilities have been codified into a program called the Code of Management Practice for Silver Dischargers. This BMP for silver-imaging facilities was developed by the Silver Council and the Association of Metropolitan Sewerage Agencies (AMSA) to reduce and control the amount of silver discharged to the local wastewater treatment plant. The Code of Management Practice (CMP) has been adopted by cities of varying sizes across the United States. It has proven successful in 1) reducing the amount of silver discharged to the wastewater treatment facility; 2) increasing the amount of silver recovered; 3) easing the administrative burden on both the wastewater treatment facility and silver users; 4) encouraging water conservation and pollution prevention efforts.

BMP presents an alternative method of controlling silver discharges from image processors. It does not rely on typical concentration based (numerical) discharge limits that are used by most wastewater treatment facilities or Publicly Owned Treatment Works (POTWs) to control the amount of silver discharged by silver users. With concentration-based limits, all facilities generating silver-bearing waste must comply with the same regulations, regardless of the amount of silver-bearing waste they generate. Under the BMP, each facility has a recommended performance category or percentage of silver they must recover from their silver-bearing wastes depending on the total gallons per day of photo processing effluent they generate.

The BMP establishes a set of operating procedures designed to reduce both the amount of silver and the overall volume of solution discharged to the drain while using economically viable and currently available silver recovery techniques.

Numerical Limits vs. BMP Program

Under the Dallas Water Utilities BMP program, facilities generating silver-rich solution from the photographic and radiographic development process would have to either comply with the existing numerical limit of 0.36 mg/L for silver discharges as stated in the Dallas City Code (Chapter 49-43) or adopt and implement a Best Management Practice Plan. Facilities not implementing a BMP must continue **to comply with the numerical silver local limit or be subject to more stringent regulation under the Dallas Water Utilities Pretreatment Program. Regulatory requirements for those facilities not implementing the BMP or complying with the numerical limit would include issuance of an Industrial User Discharge Permit, self-monitoring, Dallas Water Utilities compliance monitoring and enforcement of other rules and regulations. Facilities not in compliance might also be subject to costs that may include permit fees, sampling expenses and monetary penalties for noncompliance with the regulations.**

Category Determination

Participation in the BMP program is simple. First, determine the total volume of processing effluent or the volume of silver-rich solution generated by your developing operations on a typical day. **Processing effluent** is the total volume of all water and liquid waste that is generated by film processing operations--including developer and rinse water. **Silver-rich solution** is defined as “*a solution containing sufficient silver that cost-effective recovery can be conducted on-site or off-site.*” Silver-rich solutions include

fixers, bleach-fixers, stabilizers from low-flow washes, and all functionally similar solutions. For radiographic processes, silver-rich solutions are limited to the fixer solution. **Developer solution and wash waters are not considered silver-rich solutions.**

Maintain a written record of your calculations demonstrating how the volume of total process effluent or silver rich solution was determined. There are BMP guidebooks (if available) that may help you calculate the total processing effluent volume. Review this calculation annually to determine if the total volume of silver-rich or total process effluent has changed. These volumes will determine the category--or size--of the facility (Small, or Large) and the percentage of silver that must be recovered from the silver-rich solution prior to discharge.

The categories are (volumes are in gallons per day or gpd):

Small: Less than or equal to 10,000 gpd of total process effluent **OR** less than or equal to 20 gpd of silver-rich solution.

Large: More than 10,000 gpd but less than 25,000 gpd of total process effluent **OR** more than 20 gpd of silver-rich solution.

Facilities discharging more than or equal to 25,000 gpd of process wastewater are defined as Significant Industrial Users (SIUs) by the United States Environmental Protection Agency. Significant Industrial Users are permitted and monitored under a separate program and therefore are required to obtain permits and meet other specific requirements in addition to the BMP program requirements.

To determine the size of the facility using a water bill, subtract from the total gallons per day (gpd) any water not used in the photo processing operations; including domestic sewage (usually 20 gpd/per employee), landscape irrigation, and non-contact cooling water. Specific information about how to determine facility size can be obtained from the City of Dallas Water Utilities Department, Pretreatment and Laboratory Services Division.

Silver Recovery Requirements

For each user category there are recommended technology options and specified percentage levels of silver that need to be recovered from the silver-rich solution generated. These recommended technologies and required silver recovery amounts are:

Small--95% Silver Recovery	Large--99% Silver Recovery
<ol style="list-style-type: none">1. Terminal electrolytic unit followed by at least one metallic replacement cartridge (MRC)2. In-line electrolytic unit with at least one metallic replacement cartridge3. Two or more MRCs with manufacturer-specified flow control4. Alternative technology providing at least 95% silver recovery5. Off-site management	<ol style="list-style-type: none">1. Terminal electrolytic unit followed by at least one metallic replacement cartridge (MRC)2. In-line electrolytic unit with two metallic replacement cartridges3. Evaporation/Distillation Unit (used in conjunction with off-site management).4. Ion Exchange Technology5. Alternative technology providing at least 99% silver recovery6. Off-site management

It is important to note, the silver recovery percentage amounts required under the BMP program deal only with the silver-rich solutions generated at your facility. As discussed (see **Category Determination**

discussion above), silver-rich solution is different from the volume of total process effluent generated at a facility.

City of Dallas, Water Utilities Department Pretreatment and Laboratory Services Silver Best Management Practice Program--General Program Participation Details

- The Silver BMP program became effective January 31, 2003. However, Dallas Water Utilities did not commence enforcement activities until after July 1, 2003.
- All facilities must maintain records in a designated logbook verifying the volume of total process effluent or the amount of silver-rich solution they generate. (see discussion of Category Determination above)
- Facilities adopting the BMP must annually submit a “**Letter of Participation**” by January 31st each year. A “**Letter of Participation**” is included and a copy should be retained with your records for a minimum of three years.

REQUIREMENTS FOR FACILITIES CONDUCTING ON-SITE SILVER RECOVERY

- Facilities conducting silver recovery on-site must perform monthly (or more frequent if desired) tests using silver test paper or copper strips to verify that the silver recovery equipment is functioning properly. The results of these silver strip tests must be kept on site at your facility for at least three years in a designated logbook. Many facilities perform this screening protocol on a weekly basis.
- Facilities conducting on-site silver recovery must maintain operation and maintenance records for silver recovery equipment in a designated logbook. These records are to be kept on site at your facility for a minimum of three years.
- Facilities conducting on-site silver recovery must conduct the specified number of analytical tests on the influent (prior to recovery) and effluent (after recovery) from their silver recovery units in order to verify silver recovery percentage for facilities of that size.
- Facilities conducting on-site silver recovery must verify analytic test results and percent recovery to the Dallas Water Utilities Department Pretreatment and Laboratory Services annually by January 31st. These results are to be recorded on the **Letter of Participation** form that is to be submitted by January 31st.

SMALL facilities must perform at least one analytical test annually and **LARGE** facilities must perform at least two analytical tests annually and report the results of both tests on the January 31st deadline. **All analytical tests must be conducted by a laboratory qualified to conduct tests on metals in wastewater and in conformance with the provisions of 40 Code of Federal Regulations (CFR), Part 136.** For a listing of analytical labs check your phone book or contact your silver recovery equipment vendor for a list of labs qualified to conduct tests on metals in wastewater.

REQUIREMENTS FOR FACILITIES OPTING FOR OFF-SITE MANAGEMENT

Facilities that do not conduct on-site silver recovery--opting for off-site management--must maintain records verifying 1) the amount of solution transported off-site; 2) the date(s) the solution was transported off-site; and 3) the name of the entity or company that transported the solutions off-site; 4) the name of the facility where the transported solutions were taken.

- Facilities opting for off-site management must submit an annual **CERTIFICATION OF NO DISCHARGE**. This is accomplished by checking the appropriate box on the **LETTER OF PARTICIPATION** form and submitting it to the Dallas Water Utilities Department by January 31st of each year.
- Facilities opting for off-site management must maintain hauling receipts/invoices or manifests (as required by law) in a designated logbook. These records should be kept at your facility for a minimum of three (3) years.

- Facilities opting for off-site management of their silver waste are not required to conduct silver strip tests or analytical tests.

As a generator of hazardous waste, each facility is responsible for ensuring that their waste is handled according to federal and state hazardous waste laws. Facilities therefore should only contract with a reputable state licensed waste-hauler. A list of hazardous waste transportation companies can be found in the YELLOW PAGES or consult with your silver recovery equipment or photochemical supply vendor.

ACKNOWLEDGEMENT of COMPLIANCE and ENFORCEMENT MEASURES

- Facilities that submit the required annual **Letter of Participation** or **Certification of No Discharge** will receive a certificate indicating they are in compliance with the required local provisions and are acting to benefit the local environment.
- Dallas Water Utilities Pretreatment and Laboratory Services will conduct a minimal amount of on-site inspections of facilities that certify compliance annually. Facilities that do not submit the required Annual **Letter of Participation** or **Certification of No Discharge** will be put on a priority list to be inspected, monitored, and possibly permitted to discharge to the sanitary sewer system with strict compliance, reporting, and discharge limits.

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