



Environment

INFORMATION FROM KODAK

Dealing with Hazardous Waste and Processing Effluents at Photographic Processing Facilities

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Some used photographic processing materials or associated products may be considered a "regulated" waste. Federal, state, and local laws must be followed when managing these wastes at your facility.



Photographic processing and its related activities produce waste. The best way to manage this waste is to minimize it. Wherever possible by using the 3Rs—reduce, reuse and recycle—these are the most cost-effective and environmentally responsible methods of dealing with waste.

Most of the waste your photographic processing facility produces is nonhazardous. In addition, your facility may also generate some waste that is defined by environmental authorities as

hazardous, meaning it is capable of affecting human health or the environment if it is not managed properly. Kodak is committed to providing owners and operators of photographic processing facilities with easy-to-use recycling programs and timely information on waste management and recovery options. The information in this publication will help you characterize and manage both hazardous waste and processing effluents.



TABLE OF CONTENTS

Subject	Page #
Step 1—Is the Waste Hazardous?	4
Step 2—Is the Waste a Processing Effluent?	6
Step 3—Does your Facility Discharge to a Municipal Sewer System?	6
Step 4—Does the Processing Effluent Comply with the Local Sewer Use Code?	8
Step 5—Does the Processing Effluent Meet with the Silver Limit in the Local Sewer Use Code?	9
Step 6—Does the Processing Effluent Comply with All Local Sewer Use Code Limits?	10
Step 7—Can the Processing Effluent Be Minimized On-Site?	10
Step 8—Discharge the Processing Effluent to the Sanitary Sewer	11
Step 9—Can the Hazardous Waste Be Managed On-Site?	12
Step 10—Send the Hazardous Waste Off-Site for Treatment and Disposal	13
More Information	19

Federal, state and municipal governments are involved in regulating waste. You will learn which laws apply to your activities and what your options are for complying. With this information, you can decide how to manage your waste and whether to use an on-site or off-site waste management system.

This publication is organized according to the steps you would typically take in deciding how to deal with waste. These steps are shown in Diagram 1, starting with the question “Is the waste hazardous?” Once you have answered this question, the diagram takes you in one of two regulatory directions. Take a minute now to review the diagram because you will be referring to it as you read through this publication.

If a specific step on the diagram does not apply to your operation, simply skip it and go on to the next one.

Diagram 1. Dealing with Hazardous Waste and Processing Effluents



STEP 1—IS THE WASTE HAZARDOUS?

Create an inventory of all the wastes generated in your facility using the Facility Solid Waste Assessment Tool in KODAK Publication No. J-410, *Waste Management Strategies for Photographic Processing Facilities*.

After identifying all the wastes, examine each one to see if it fits within the U.S. Environmental Protection Agency's (EPA) definition of hazardous waste. The criteria that determine whether or not a waste is

hazardous are defined in Table 1. For a waste to be considered hazardous, the following must apply:

- It must be included in the definition of solid waste and must not be *specifically excluded* from the definition.
- It must have either a hazardous nature (characteristic) or be on one of EPA's lists of hazardous wastes.

If it does not meet these criteria, the waste is not hazardous. These definitions are part of the federal regulations. In Table 1 the specific Code of Federal Regulations (CFR) citation is included along with each criteria so that you can consult the regulation for greater detail.

Facility Waste Management Assessment Tool

Category	Type of Solid Waste	Quantity Generated at Your Facility (Example: pounds per month)	Disposal Costs Before Waste Reduction Efforts	Disposal Costs After Waste Reduction Efforts	Type of Waste Reduction Effort Used (Reduce, reuse or recycled)	KODAK Recycling Program Available ✓	Other KODAK Publications Available (in addition to this series)
BATTERIES	Alkaline-Manganese						
	Small Sealed Lead-acid						
	Mercuric oxide						
	Nickel-Cadmium					✓	
	Nickel Metal Hydride						
	Silver oxide						
	Lithium						
CHEMICALS	Discontinued						
	Unused (virgin)						
	Expired						
	Processed (contaminated/used)						
EFFLUENTS	Silver bearing					✓	CIS-57, CIS-147, CIS-164, J-212, J-215
	Non-silver bearing					✓	CIS-57, CIS-147
EQUIPMENT	Processors, monitors, scanners						
	Miscellaneous electronics						

Table 1. Federal Hazardous Waste Identification Process

Is the material a solid waste?	The EPA uses a very broad definition for solid waste that is based on <i>whether or not the material is a waste</i> , not its physical form. The definition encompasses garbage, refuse, and other discarded materials, including solid, semisolid, liquid, or contained gaseous materials resulting from industrial and commercial activities. (40 CFR 261.2)
Is the waste specifically excluded from the definition of solid or hazardous waste?	1. Processing effluent that is mixed with domestic sewage and is discharged to a municipal wastewater treatment plant (called a publicly owned treatment works - POTW) is excluded from the definition of solid waste. Since these wastes are not considered to be solid wastes, they cannot be hazardous wastes. Discharges to a POTW are governed under the federal Clean Water Act and local sewer use codes. (40 CFR 261.4) 2. Recyclable materials from which precious metals are recovered are exempt from full hazardous waste regulation. This includes silver recovery residuals such as silver flake and the sludge from precipitation and metallic replacement cartridges. (40 CFR 266.70)
Is the waste a characteristic hazardous waste?	EPA identified four properties or characteristics that would make a solid waste a hazardous waste. <i>Ignitability</i> - Ignitable wastes can easily catch fire and sustain combustion. For example, a flammable film cleaner would be a characteristic hazardous waste. (40 CFR 261.21) <i>Corrosivity</i> - Corrosive wastes are acids or bases that are capable of corroding metal containers such as processing and storage tanks. Photographic bleach and bleach-fix solutions may be corrosive characteristic hazardous wastes. (40 CFR 261.22) <i>Reactivity</i> - Reactive wastes can readily explode or undergo violent reactions. These wastes are typically not found in photographic processing facilities. (40 CFR 261.23) <i>Toxicity</i> - Toxic wastes may leach (drain) at concentrations that could negatively impact ground water when the wastes are disposed of in a landfill. Solutions containing silver, such as silver-rich fixer and bleach-fix, may be characteristic hazardous wastes. (40 CFR 261.24)
Is the waste a listed hazardous waste?	Listed hazardous wastes are known to be harmful to human health and the environment when not managed properly, regardless of their concentrations. While none of the photographic processing chemicals are listed wastes, other materials used in your facility may be. The lists include three types of wastes. <i>Nonspecific source wastes</i> - These are material-specific wastes, such as spent solvents, generated by different industries. An example would be acetone. (40 CFR 261.31) <i>Specific source wastes</i> - These are wastes from specifically identified industries. Photographic processing is not included. (40 CFR 261.32) <i>Discarded commercial chemical products</i> - These are off-specification products, container residuals, spill residue runoff, or active ingredients that have spilled or are unused and intended to be discarded. This category does not include used chemicals or photoprocessing solutions (concentrate or mixed). (40 CFR 261.33)

After examining each waste in light of the EPA's definition, you should be able to answer the question: Is the waste hazardous? Look again at Diagram 1. "Yes" and "No" answers lead to different approaches for managing the waste. As an example, assume the answer is no, the waste is not hazardous. Now proceed to Step 2.

STEP 2—IS THE WASTE A PROCESSING EFFLUENT?

A "No" Answer. Many of the wastes produced in photographic processing facilities include things such as the plastic and steel from empty film containers, chemical containers, and shipping and packing materials. Manage these nonhazardous materials using the principles of pollution prevention — reuse, reduce and recycle — to minimize the amount of waste produced. For more information, refer to KODAK Publication No. J-412, *Waste Prevention and Recycling Options for Photographic Processing Facilities*.

A "Yes" Answer. Processing effluents account for much of the waste produced in your facility. Remember that wastes mixed with domestic sewage and discharged to a POTW are excluded from the definition of solid waste and, therefore, are not hazardous waste. Sewer discharges are, however, subject to the Clean Water Act, which impacts photographic processing facilities via their local sewer use code. Again, as an example, assume the waste is a processing effluent and go to Step 3 on Diagram 1.

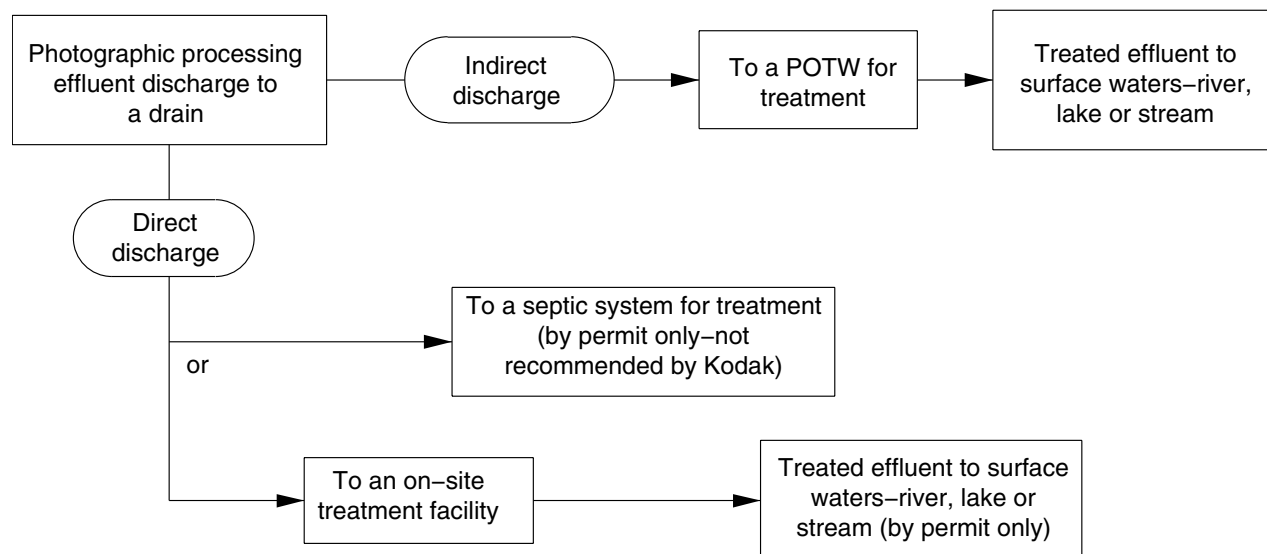
STEP 3—DOES YOUR FACILITY DISCHARGE TO A MUNICIPAL SEWER SYSTEM?

Once it leaves your facility through a drain, where does the liquid waste from photographic processing go? The drains lead to one of four places:

- a publicly owned treatment works (POTW), which is a municipal sanitary sewage treatment system,
- a septic system,
- an on-site treatment facility, or
- local surface waters—river, lake or stream.

As you read the information that follows, refer to Diagram 2 to see the path of both indirect and direct discharges.

Diagram 2. Indirect Discharges (to a POTW) and Direct Discharges (to a Septic System or to Surface Waters)



TO A POTW (INDIRECT DISCHARGE)

Discharging to a POTW is called an indirect discharge because the effluent does not go directly to the environment. Once the wastewater leaves your facility, it travels via the sewer pipes to the POTW for treatment. Most POTWs have both primary and secondary treatment. Primary treatment removes solid pieces of matter that settle out of the wastewater. This step is followed by secondary treatment, a biological process that uses microorganisms to feed on the complex organic matter in the waste and reduce it to a more simple and nonobjectionable state.

POTWs must ensure that the waste they receive from businesses, including photographic processing facilities, will not upset this biological process or pass through the POTW untreated.

Looking at Diagram 2, you can see that after treating the waste, the POTW discharges it to local surface

waters—a river, lake or stream. To ensure the quality of this treated water, every POTW operates under a discharge permit issued to it by either the state or the EPA. To comply with its discharge permit, the POTW can only accept wastewater that it can effectively treat. POTW authorities control the influent wastewater to the plant through the local sewer use code (discussed in Step 4).

TO A SEPTIC SYSTEM OR SURFACE WATERS (DIRECT DISCHARGE)

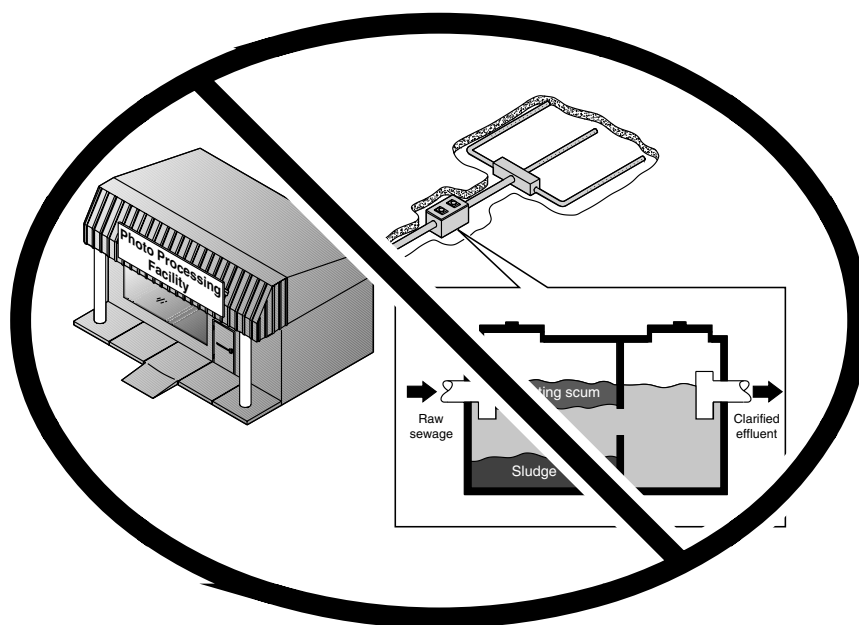
Discharging to a septic system or to the environment following on-site treatment is called a *direct* discharge because the effluent goes directly from your facility into the environment.

Septic systems are underground holding tanks and leach fields that are designed for domestic sewage, not industrial effluent. Septic systems *do not* have the ability to

treat photographic processing solutions properly. Discharging to a septic system typically requires a permit from the state or local authorities and is not recommended by Kodak.

Discharging treated photographic processing effluent directly to surface waters also requires a permit. Before issuing a permit, the state would require proof that the facility was sufficiently treating the effluent so that it did not negatively affect the river, lake or stream that was receiving it. Given the high cost of owning and operating an on-site treatment system, very few photo processors choose this option.

If you do not know where the drains in your facility lead, check with your landlord or consult the building plans. It is also possible that some of the drains lead to the POTW while some are connected to storm sewers that lead directly to surface waters. You must have this information because it dictates your options for managing the processing effluents.



Discharge to a septic system is not recommended by Kodak.

STEP 4—DOES THE PROCESSING EFFLUENT COMPLY WITH THE LOCAL SEWER USE CODE?

Businesses pay for the privilege of using the sanitary sewer and having their wastewater treated at the POTW. The local sewer use code is a municipal ordinance (passed by the town or city government) that details the terms for using the sewer. The purpose of the local sewer use code is to ensure that nothing is discharged to the municipal system that could either upset the POTW or pass through it untreated. It does this by limiting the discharge of wastes to amounts the

POTW can treat. In this way, the municipality protects the ground and surface waters as well as ensures the POTW complies with its permit.

Table 2 contains a list of parameters that are often regulated in local sewer use codes. The second column in the table lists the typical sewer use code limit ranges for each parameter. The other columns list the concentrations of these parameters typically found in four photographic processes: conventional color (with washwater), washless color, black-and-white and E-6. As you can see, there is significant variation among sewer use codes as well as photographic processing effluents. At the end of this publication there is a chart that defines each of these regulated parameters.

Table 2. Sewer Use Code Parameters, Limits and Photographic Characteristics*

Parameter	Typical Limit Range	Color (w/washwater)	Color (washless)	Black-and-White	E-6
Ammonia	50 - 100	20 - 300	6,000 - 10,000	350 - 4,300	10 - 150
BOD5	200 - 1,200	200 - 3,000	5,000 - 14,000	300 - 5,000	2,000 - 7,000
COD	500 - 2,500	400 - 5,000	30,000 - 36,000	2,000 - 10,000	4,000 - 10,000
Flammable or explosive	none	none	none	none	none
Oils and grease	15 - 300	none	none	none	none
pH	5.5 - 10.5	6.5 - 9.5	6.5 - 9.5	6.5 - 9.5	6.5 - 9.5
Phenolic compounds	0.002 - 20.0	none	none	<0.2	none
Silver (following silver recovery)	0.1 - 5	<5	<5	<5	<5
Temperature	<150°F	80 - 110°F	<95°F	60 - 110°F	80 - 110°F
Total suspended solids (TSS)	250 - 1,000	<50	<50	<50	<50

* With the exception of temperature and pH, all the numbers represent parts per million (ppm)

COMPLYING WITH THE LOCAL SEWER USE CODE

If you discharge a processing effluent, you are responsible for complying with the local sewer use code. If you do not already have a copy, call the municipal clerk's office and ask for one. If you need some help understanding the local sewer use code, talk with your Kodak representative or call Kodak Environmental Services at 1-716-477-3194.

Municipal inspectors may occasionally visit your facility and take an effluent sample to verify compliance with the local sewer use code. If the

sample shows noncompliance, in most cases, the city will work with you to develop a compliance program that could require you to install specific treatment equipment and implement best management practices. In extreme situations, the municipality could issue a regulatory compliance order, and/or a fine. Noncompliance can also result in negative publicity. These are all good reasons to ensure that your facility complies with the local sewer use code.

Most photographic processing facilities produce silver-rich solutions. Proceed to Step 5 on Diagram 1 to review silver recovery.

STEP 5—DOES THE PROCESSING EFFLUENT MEET THE SILVER LIMIT IN THE LOCAL SEWER USE CODE?

Fixer, bleach-fix, stabilizers from washless processes and low-flow wash processing effluents are silver-rich solutions. To meet the silver limit in the local sewer use code, the photographic processing facility must recover the silver from these solutions before discharging them to the drain. For a complete discussion of on-site silver recovery options, refer to KODAK Publications J-212, *The Technology of Silver Recovery for Photographic Processing Facilities* and J-215, *Recovering Silver from Photographic Processing Solutions*. Below is a brief summary of the on-site silver recovery options.

OPTIONS FOR RECOVERING SILVER ON-SITE

The three types of silver recovery typically used in photographic processing facilities include metallic replacement, electrolytic and precipitation. These systems are available in sizes and price ranges that are appropriate for small to large photographic processing facilities.

Metallic Replacement

Metallic replacement cartridges (MRCs) contain metallic iron. When photographic solutions pass through an MRC at a controlled flow rate the silver complexes in the solution react with the iron. The silver is reduced to its metallic form and stays in the cartridge while the iron is oxidized and passes into solution. MRC systems can reduce silver concentration levels to less than 5 mg/L and can be used alone or in conjunction with other silver recovery systems.

Most photographic solutions can be desilvered by the proper use of MRCs except the following: fixer preceded directly by ferricyanide bleach and seasoned ferric-ammonia EDTA bleach-fix with a highly alkaline pH. Your silver recovery vendor can help you determine which effluents are appropriate for use with MRCs.

Electrolytic

In electrolytic silver recovery, a direct current is passed through a silver-rich solution circulating between a positive electrode (the anode) and a negative electrode (the cathode). The silver, which is converted to its metallic state, adheres to the cathode, producing a nearly pure metallic silver.

Photographic facilities commonly use in-line or terminal electrolytic silver-recovery systems. In-line systems remove silver continuously from the fixer tank, thereby reducing the amount of silver lost to fixer carryover. Terminal systems recover silver from solutions that will not be reused.

Precipitation

Precipitation is a process where a chemical agent is added to a silver-rich solution, causing the silver to precipitate or fall out of solution and settle in a filter or in the bottom of a holding tank. Typically, precipitation reduces silver concentration levels to below 1.0 mg/L.

Note: There is a federal regulation that may affect discharges of silver-rich effluent. A facility must notify the local sewer authority, the state hazardous waste agency and the EPA Regional office if it discharges to a sewer a substance that, if otherwise disposed of, would be considered a hazardous waste. This would be the case if your facility discharges to the sewer effluent containing 5 mg/L or more of silver.

Once the silver has been recovered, arrange to send it off-site for refining. For more information, refer to KODAK Publication No. J-213, *Refining Silver Recovered from Photographic Processing Facilities*, or call Kodak Environmental Services at 1-716-477-3194.

OFF-SITE SILVER RECOVERY

If you choose not to recover silver on-site, cannot meet the silver limit in the local sewer use code or discharge to a septic system, you must manage the effluent off-site. Steps 9 and 10 discuss the regulatory requirements for off-site waste management and hazardous waste minimization.

The KODAK RELAY Program provides an easy option for managing photoprocessing effluents off-site. The program is an effluent pickup service, contracted through Safety-Kleen Corporation, a nationally known, fully licensed environmental service company. Your effluent is picked up and transported to a Safety-Kleen facility for treatment and/or disposal in accordance with applicable state and federal regulations. As part of the service, they provide containers, paperwork, and other assistance. The Relay program may also be a cost-effective waste management system for very small facilities. For more information, call Kodak Environmental Services at 1-716-477-3194.

CODE OF MANAGEMENT PRACTICE FOR SILVER DISCHARGERS



Some municipalities have adopted the Code of Management Practice (CMP) for Silver Dischargers as part of their local sewer use code. The CMP is a set of operating procedures designed to reduce both the amount of silver and the overall volume of solutions discharged to the drain. Under the CMP, the photographic processing facility can choose either to recover silver on-site or manage the silver-rich solutions off-site. Compliance with the CMP may be an alternative to meeting numerical limits in the local sewer use code. If your municipality has adopted the CMP, ask them for a copy of the guidance manual to help you fully implement the CMP in your facility. You may also download a copy from the Silver Council Internet website at www.silvercouncil.org. For more information, refer to KODAK Publication No. J-217, *Using the Code of Management Practice to Manage Silver in Photographic Processing Facilities*, or call Kodak Environmental Services at 1-716-477-3194.

For now, let us assume that you have desilvered the processing effluent so that it meets the silver limit in the local sewer use code. Proceed to Step 6 on Diagram 1.

STEP 6—DOES THE PROCESSING EFFLUENT COMPLY WITH ALL LOCAL SEWER USE CODE LIMITS?

Either through analytical testing or by using data supplied by Kodak, verify that the processing effluent complies with all the limits in the local sewer use code. Typically, the municipal compliance point is the location where all of the wastewater from your facility enters the sewer main—a point commonly called the property line. At this point, all of the wastewater from your facility—both domestic and industrial—is commingled or mixed together. The data from Kodak reflects the concentration of the parameters at the end of the photographic processing. It does not take commingling into consideration because processing conditions are different for each facility.

A "Yes" Answer. If the total facility discharge complies with the local sewer use code, proceed to Step 8.

A "No" Answer. If there are parameters that do not comply, go to Step 7.

STEP 7—CAN THE PROCESSING EFFLUENT BE MINIMIZED ON-SITE?

Kodak chemicals provide optimum results with the least environmental impact possible. In addition to using Kodak chemicals, there are many things you can do to minimize processing effluent in order to comply with the local sewer use code. These include process control, routine preventive maintenance, employee training and good housekeeping. For more information about waste minimization, refer to KODAK Publication No. J-412, *Photographic Processing Facilities for Prevention and Recycling Options*.

After implementing waste minimization practices, if the processing effluent complies with the local sewer use code, proceed to Step 8. If it still does not comply with the sewer use code, you must send the waste off-site for treatment and disposal (Step 10).

STEP 8—DISCHARGE THE PROCESSING EFFLUENT TO THE SANITARY SEWER

For processing effluents that meet the limits in the local sewer use code, this is the final step: your facility may discharge these solutions to the sanitary sewer.

In addition to meeting limits, some local sewer use codes may require dischargers to complete an industrial waste survey and may require routine sampling.

INDUSTRIAL WASTE SURVEY

Municipalities typically want to know who is using the sewer system and the type of effluent they are discharging. For a new business, the municipality may require this information before allowing you to discharge to the sewer. If you have been operating a while and have never completed a survey, consider calling the municipality and asking them if they would like you to do so. If you need help completing the survey, call Kodak Environmental Services at 1-716-477-3194. The type of information typically required on a survey includes the following:

- general information about your company and physical layout (sketch)
- description of your operations and processes
- average daily water consumption
- known characteristics of the discharge (see Table 2)
- pretreatment systems (e.g., silver recovery)

ROUTINE SAMPLING

Depending upon your answers in the industrial waste survey, your municipality may decide to issue you a discharge permit. If the terms of the permit require routine sampling, either the municipality will conduct the sampling or require you to do it. Where it is the responsibility of your facility, you can make arrangements with Kodak Environmental Analytical Services for the sample analysis. If the municipality conducts the sampling, consider asking for a split sample — an equal amount of what they have taken from your facility — so that you can have an independent analysis performed to verify the municipality's results.

Your discharge permit may require you to conduct the sampling and submit the results to the municipality. When sampling, there are very specific procedures to follow. For details, please refer to KODAK Publication No. J-211, *Measuring Silver in Photographic Processing Facilities*. While it primarily addresses silver, the publication contains valuable information about sampling in general. There is a table at the end of this publication that identifies and briefly outlines the sampling procedures.

SUMMARY—MANAGING PROCESSING EFFLUENTS

The most effective way to deal with processing effluents is to discharge them to the sanitary sewer.

Typically, after it is desilvered, the effluent will meet the local sewer use code limits for silver. In some cases, your facility may need to treat the effluent to meet limits for nonsilver parameters. The procedure for managing processing effluents is outlined in Steps 1 through 8. The final two steps, Steps 9 and 10, outline the process to follow if you determine that the waste is hazardous.

STEP 9—CAN THE HAZARDOUS WASTE BE MANAGED ON-SITE?

You may manage your hazardous waste at your own facility but **ONLY** if you are permitted, licensed, or authorized by the EPA or the state to do so. Certain kinds of exempted activities and recycling, such as silver recovery, can usually be conducted on-site without a permit.

Refer to Table 3 of Typical Hazardous Wastes from Photographic Processing Facilities to see if your facility generates any of these wastes and review the options for handling these wastes.

One example of on-site hazardous waste treatment is elementary neutralization. Where it is allowed, facilities that produce corrosive wastes, such as some plate processing solutions, should consider elementary neutralization to render these corrosive waste nonhazardous so they can be discharged to the drain. Before using elementary neutralization, verify that your state regulations allow it and whether there are any additional requirements. For instructions on neutralizing plate chemicals, refer to KODAK Publication No. AE-122, *Treatment and Disposal of Plate Developer*.

A "Yes" Answer. If you can manage the waste on-site so that it is no longer a hazardous waste, Diagram 1 directs you to Step 2 to examine whether the waste is a processing effluent. If it is, review Steps 3 to 7, to determine whether the waste can be discharged to the sewer. If it is not hazardous and not a processing effluent, use the principles of reduce, reuse and recycle to minimize the waste.

A "No" Answer. If the waste cannot be handled on-site, your only option is to send it off-site for treatment and disposal as a hazardous waste. Proceed to Step 10 for information about managing waste off-site.

Table 3. Typical Hazardous Wastes from Photographic Processing Facilities*

Description of the Waste	Recommendations for Handling
Silver-rich processing effluents (silver is not recovered on-site)	Where it is not practical to recover silver on-site, use KODAK RELAY Program for off-site waste management.
Ferricyanide bleaches (ferricyanide is not recovered on-site)	Where it is not practical to recover ferricyanide on-site, use KODAK RELAY Program for off-site waste management.
Plate activators/plate developers	Replace with an alternative. Neutralize and discharge to drain where allowed. Use KODAK RELAY Program for off-site waste management.
Unused photographic processing chemicals (discontinued, contaminated)	Trickle to sanitary sewer drain along with processing effluents, where it is permitted. Use KODAK RELAY Program for off-site waste management. Drop off at a local household hazardous waste depot, where it is permitted.
Lead from intraoral dental film	Recycle using the KODAK Dental Film Lead Recycling program.
Lead from medical X-ray cassettes	Contract with a recycler.
Systems cleaners (chromium)	Replace with a nonchromium-based cleaner. Use KODAK RELAY Program for off-site waste management.
Cleaners (e.g., common household bleach)	Replace with a nonhazardous alternative. Use KODAK RELAY Program for off-site waste management.
Processor filters	Processing filters that remove particulate from processing solutions are constructed of many different types of plastic and cloth material. Filters used for silver-bearing solutions, such as fixer or bleach-fix, should be rinsed prior to disposal or sent to a hazardous waste treatment facility. The rinse water should be collected and treated in your silver-recovery system.
Equipment components (e.g., circuit boards with lead solder or mercury switches or mercury lamps)	Contract with a recycler.
Batteries	
Lead acid	Contract with a recycler.
Mercury oxide	Do not offer for sale. Contract with a recycler.
Silver oxide	Contract with a recycler.
Nickel cadmium (Ni-Cd)	Recycle through the Rechargeable Battery Recycling Corporation (RBRC). Call 1-800-8-Battery for the RBRC designated battery collection point nearest you. Kodak is a member of the RBRC.

* Always check with your state agency for clarification since not all classify materials in the same way.

STEP 10—SEND THE HAZARDOUS WASTE OFF-SITE FOR TREATMENT AND DISPOSAL

Federal and state hazardous waste regulations are very specific regarding off-site waste management. For detailed information, please refer to KODAK Publication No. J-214, *The Regulation of Silver in Photographic Processing Facilities*. Some of the federal regulatory requirements are listed in Table 4 and briefly summarized in the following discussion.

Table 4. Federal Requirements for Hazardous Waste

Requirement	CESQG	SQG	LQG	Overview of the Requirement
Hazardous waste identification	X	X	X	Audit all the wastes produced in your facility and identify which are hazardous.
Generator category	X	X	X	Count the amount of hazardous waste your facility produces in one month to determine the generator category.
EPA identification (ID) number		X	X	Obtain a form from your state agency to apply for an EPA ID number. This number, to be used on all shipping documents, identifies both your facility and the specific hazardous waste it generates.
Accumulation	X	X	X	Use appropriate containers, mark them as hazardous waste, inspect accumulation areas weekly, and never exceed time or quantity limitations for your generator category.
Emergency planning		X	X	Develop a plan to respond to emergencies involving hazardous waste. For LQGs, this includes a formal training program for proper handling of hazardous waste and emergency procedures. While the program need not be formal, SQGs must also train their employees.
Shipping		X	X	Package, label and mark the containers properly. Prepare the shipping manifest. (CESQGs are exempted from the manifest requirement.)
Reporting		X	X	Notify the state agency if the treatment facility does not acknowledge receipt of the waste. LQGs must also report every two years on hazardous waste activities.
Record-keeping	X	X	X	Keep records — waste analysis, manifests, reports — on file for at least three years.
Land disposal restrictions (LDR) notice		X	X	Notify the waste treatment facility that your facility generates a hazardous waste that is restricted under the land disposal restrictions.
Hazardous waste minimization		X	X	LQGs and SQG must certify on the manifest that they are working to minimize hazardous waste generation.

IDENTIFY THE HAZARDOUS WASTES YOU GENERATE

You completed this hazardous waste inventory in Step 1 by first auditing all the wastes in your facility and then determining which of them were hazardous.

DETERMINING YOUR GENERATOR CATEGORY

There are three federal generator categories: conditionally exempt small quantity generator (CESQG), small quantity generator (SQG) and large quantity generator (LQG). Determining which category applies to you is a matter of counting the amount of hazardous waste your facility generates in one calendar month. This includes any hazardous waste that is accumulated on your site before disposal or recycling.

Note: Silver-rich processing effluent containing 5 mg/L or more of silver is a countable hazardous waste if it is stored or accumulated before it is recycled on-site or if it is sent off-site. If it is removed from the processing machine and immediately transferred to the silver-recovery unit it does not need to be counted.

Table 5 lists the three categories of hazardous waste generators and the amount of waste allowed for each category. For example, if your facility produces less than 100 kg or about 25 gallons per month, it would be categorized as a CESQG. Accurately determining your facility's category is critical because the regulatory requirements for managing hazardous waste off-site range from only a few for CESQGs to several for LQGs.

Once you have identified your facility's generator category, review Table 4 to find out which of the requirements applies to you.

Table 5. Federal Hazardous Waste Generator Categories*

Generator Category	Amount Generated per Month
Conditionally exempt small quantity generator (CESQG)	<100 kg/month (200 lb or 25 gallons)
Small quantity generator (SQG)	100 - 1,000 kg/month (220 to 2,200 lb or 25 to 250 gallons)
Large quantity generator (LQG)	>1,000 kg/month (2,200 lb or 250 gallons)

* Some state requirements may be more stringent.

EPA IDENTIFICATION NUMBER

An EPA identification (ID) number identifies your facility and the specific hazardous waste it generates. SQGs and LQGs must use their ID number on all shipping documents, allowing the EPA or the state hazardous waste authorities to track the waste from cradle-to-grave — from the time it leaves your facility until it is safely disposed. Obtain the application form for your ID number from your state agency. You can find the telephone number in the Yellow Pages, by contacting Kodak Environmental Services at 1-716-477-3194 or by calling the RCRA hotline at 1-800-424-9346.

ACCUMULATION

In hazardous waste regulations, the word *accumulation* has a very specific meaning. It is used to distinguish between the short-term collection of waste by generators and the long-term storage of waste at treatment, storage and disposal facilities (TSDFs). The regulations anticipate that generators will accumulate a limited volume of hazardous waste on-site to make shipping it more cost effective. The time and quantity limits for accumulation are listed in Table 6. A CESQG that exceeds accumulation limits becomes an SQG. If an SQG or an LQG exceeds these limits, it will be considered a TSDF, no longer simply a generator, and will be subjected to very onerous requirements. **Never exceed these limits.**

Table 6. Federal Accumulation Limits for Hazardous Waste*

Generator Category	Limits—Time and Quantity
Conditionally exempt small quantity generator (CESQG)	Up to 1,000 kg (2,200 lb) at any one time
Small quantity generator (SQG)	Up to 6,000 kg (13,200 lb) for up to 180 days
Large quantity generator (LQG)	Any amount for fewer than 90 days

* A generator who exceeds the accumulation limits becomes an operator of a TSDF and is subject to strict permitting requirements. **Never exceed these limits.**

The regulations make an exception for remote locations. SQGs who are 200 miles or more from the off-site TSDF may accumulate hazardous waste on-site for 270 days or less *without* a permit provided they never exceed 6,000 kg and they follow the regulations for container marks and emergency preparedness and prevention.

In addition to time and quantity limits, the regulations require facilities to accumulate hazardous waste in containers that are in good condition and are compatible with the waste. You are also required to check the container accumulation area weekly to look for spills and deteriorating or leaking containers. While it is not required, it is a very good idea to keep a log of all inspections. As soon as you begin to use a container to accumulate hazardous waste, you must mark it with the words “hazardous waste” and the date when accumulation began.

EMERGENCY PLANNING

SQGs and LQGs must have a plan for responding to a hazardous waste emergency—a spill, fire or explosion—that could happen in their facility. The plan must identify an emergency coordinator, appropriate emergency equipment, emergency procedures, and any arrangements the facility has made with local emergency response service providers (e.g., hospitals, police, fire departments, etc.). Employees must receive emergency response training that is in keeping with their responsibilities. In the case of LQGs, the plan must be written. LQGs must also keep written records of employee emergency preparedness training. For more information about emergency planning, refer to the KODAK Publication No. J-316, *Emergency Preparedness for Photographic Processing Facilities*.

SHIPPING

Requirements for shipping hazardous waste cover packaging, marks, labels, manifests and placards, according to Department of Transportation (DOT) regulations. Most licensed waste haulers will help you comply with these requirements, as discussed next.

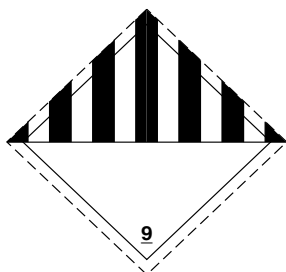
Packaging. Use packaging that is appropriate for the type of waste you are shipping. Typically, the packaging will be the same containers used to accumulate the waste. Some waste haulers will supply you with appropriate packaging.

Marks. Not to be confused with a label, a shipping mark identifies the generator and its EPA ID number, manifest number and the proper shipping name under the Department of Transportation (DOT) regulations. The illustration below shows an example of a shipping mark that has been completed for shipping silver-rich solution off-site.

HAZARDOUS WASTE			
Federal Law Prohibits Improper Disposal			
If found, contact the nearest police or public safety authority, or the U.S. Environmental Protection Agency			
Accumulation start date:	June 6, 19XX	EPA Waste #	D011
Generator Name:	Northwest Photo		
Address:	1523 Northpark Rd.		
City:	Buffalo	State:	NY Zip Code: 02143
EPA ID #	XYZ123456789	Manifest #	R295J7
DOT Proper Shipping Name, Class UN#, and packing group:			
Waste environmentally hazardous substance, liquid, N.O.S.			
(silver), class 9, UN 3082, packing group III			

Mark for Shipping Hazardous Waste

Labels. The regulations use the term “label” to describe the shipping symbol required under the DOT regulations. The illustration below shows the label you would apply to containers of silver-rich solutions being transported off-site for treatment and disposal.



Label for Shipping Miscellaneous Hazardous Waste

Manifests. The shipping manifest is a multi-copy document linking you, the hazardous waste generator, with the transporter and the receiver.

- When preparing the waste for shipping, the *generator* must complete the manifest sections for the generator and give all copies of the manifest to the transporter.
- When picking up the waste, the *transporter* must complete the manifest section for the transporter, give a copy of the manifest to the generator, and take the remaining copies.
- When receiving the waste from the transporter, the *TSDF* must complete the manifest section for the receiver, provide a copy to the transporter, send a copy to the generator, and keep a copy.

The manifest is a key element of the cradle-to-grave system for tracking waste. The waste generator is responsible for obtaining blank manifests from the state hazardous waste agency. Some states use the EPA Uniform Hazardous Waste Manifest form and some have developed their own. Your licensed waste hauler will help you obtain the correct form. See the following example of the EPA form completed by the generator for shipping a silver-rich solution off-site.

Please print or type (Form designed for use on 11x17 (12-inch) paper)

Form Approved OMB No. 2050-0038 Expires 9-30-91

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of	Information in the shaded areas is not required by Federal law
3. Generator's Name and Mailing Address		6. US EPA ID Number		A. State Manifest Document Number	
4. Generator's Phone ()		7. Transporter 1 Company Name		B. State Generator's ID	
5. Transporter 1 Company Name		8. US EPA ID Number		C. State Transporter's ID	
7. Transporter 2 Company Name		9. US EPA ID Number		D. Transporter's Phone	
8. Designated Facility Name and Site Address		10. US EPA ID Number		E. State Transporter's ID	
				F. Transporter's Phone	
				G. State Facility's ID	
				H. Facility's Phone	
11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)		12. Containers	13. Total Quantity	14. Unit (WV)	15. Waste No.
a.		No.	Type		
b.					
c.					
d.					
J. Additional Descriptions for Materials Listed Above		K. Handling Codes for Wastes Listed Above			
19. Special Handling Instructions and Additional Information					
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport according to applicable international and national government regulations.					
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment. OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.					
Printed/Typed Name/Signature		Month		Day Year	
17. Transporter 1 Acknowledgement of Receipt of Materials		Signature		Month Day Year	
Printed/Typed Name		Signature		Month Day Year	
18. Transporter 2 Acknowledgement of Receipt of Materials		Signature		Month Day Year	
Printed/Typed Name		Signature		Month Day Year	
19. Discrepancy Indication Space					
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in its		m 19.		Month Day Year	
Printed/Typed Name		Signature		Month Day Year	

EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete.

Sample EPA Uniform Hazardous Waste Manifest

Placards. A placard is a sign placed on the outside of a transport vehicle identifying the DOT classification of the waste carried in the vehicle. The placard is a symbol that looks almost the same as the mark used on the hazardous waste shipping package. While it is the generator's responsibility to supply the placards, typically the transporter has them on hand.

CHOOSING YOUR OFF-SITE WASTE MANAGEMENT PARTNERS

The term cradle-to-grave also describes your responsibility for any hazardous waste you generate. In other words, even though you consign your waste to a transporter and a TSDF, you remain liable for the safe disposal of the waste. This makes it imperative that you choose the transport company and TSDF

very carefully. Review the following guidelines before you select a company to manage your hazardous waste:

- Use only authorized hazardous waste transporters with EPA ID numbers. Call your state for a listing of all permitted companies.
- Look for a transport company that can provide a full range of services (e.g., help you apply for an EPA ID number, provide waste containers and labels).
- Use only authorized hazardous waste TSDFs with EPA ID numbers. Call your state for a listing of all permitted companies.
- Ask Kodak, your other suppliers, trade associations and business associates for recommendations.
- Visit the facilities of both the transporter and the TSDF to see if they are well maintained. Check that they are fully permitted and insured. Ask if they have received any fines and if so, what were the circumstances.

REPORTING

There are two types of reports required for hazardous waste generators:

- Exception report - An LQG that does not receive a copy of the manifest from the TSDF within 35 days of shipment must try to find out the status of the waste and after 45 days must file an Exception Report with the regional EPA office. An SQG that does not receive a copy of the manifest from the TSDF within 60 days of shipment must file an Exception Report with the regional EPA office.
- Biennial report - Every two years, LQGs must submit information to the EPA about the type and amount of hazardous waste their facility ships off-site.

RECORD-KEEPING

You must keep copies of documents relating to hazardous waste for at least three years. These documents include results of waste analysis, manifests, Exception and Biennial reports, records of employee training for emergency planning and Land Disposal Restriction notification (discussed next).

LAND DISPOSAL RESTRICTIONS (LDR)

The hazardous waste generator must provide a one-time notification to the TSDF indicating the following:

- the constituent of concern and the EPA hazardous waste number (e.g., silver is D011),
- the manifest number(s) of the first shipment,
- a statement indicating that the waste is restricted under the Land Disposal Restrictions (LDR) and that the waste does not yet meet treatment standards,
- any analytical data (if it is available), and
- an indication of whether the waste is a wastewater or nonwastewater.

HAZARDOUS WASTE MINIMIZATION

LQGs must certify on the manifest that they have implemented an economically practicable program to reduce the volume and toxicity of waste they generate. They must also certify that they have selected the available method of treatment, storage or disposal that minimizes the risk to human health and the environment.

SQGs must certify on the manifest that they are making an effort to minimize the waste they produce by using the best waste management method that is available and affordable.

SUMMARY—MANAGING HAZARDOUS WASTE

Regulations dictate how to manage hazardous waste. In some cases you can manage it on-site without a permit. Hazardous wastes that can not be managed on-site must be sent via a permitted transporter to a permitted off-site treatment, storage and disposal facility. Choose your waste management partners carefully because you retain responsibility for the waste even after it leaves your site.

DEALING WITH HAZARDOUS WASTE AND PROCESSING EFFLUENTS

Photographic processing and its related activities produce waste. Most of the waste, whether it is nonhazardous or hazardous, can best be managed by minimizing it wherever possible. Reducing, reusing and recycling are generally more efficient and cost-effective ways of dealing with waste than treating it after it has been created.

Your facility may discharge processing effluents to the drain, including the desilvered solutions provided they comply with the local sewer use code.

Wastes that are designated as hazardous by the EPA and cannot be managed on-site must be sent off-site for treatment and disposal and must meet the requirements for EPA ID numbers, container management, manifesting, emergency planning, shipping and record keeping.

Kodak has developed programs and support services to help you manage the processing effluents and hazardous waste generated by your facility. When you have questions, review the information in this publication, talk with your Kodak representative, call Kodak Environmental Services at 1-716-477-3194, or visit our website at www.kodak.com/go/kes.

Procedures for Sampling for Analysis

Identify the parameters for analysis	Find out which parameters are regulated and analyze for those parameters only. Analysis is expensive and there is no sense in generating unnecessary data.
Select an analytical laboratory	Use Kodak Environmental Analytical Services or a lab that has been recommended by industry colleagues or the regulatory agency. Use a certified laboratory if your state requires certification. Thoroughly discuss your needs with the laboratory.
Determine the type of sample needed	The local sewer use code usually describes the type of sample required: grab or <i>composite</i> . A <i>grab</i> sample is taken by "grabbing" a small amount of effluent at a particular time. A <i>composite</i> sample consists of taking a number of small samples over a period of time and combining them into one sample.
Determine where to sample	This location is generally specified in the local sewer use code. Typically, it is at the property line manhole or at a point where a representative sample of your whole facility can be collected.
Determine how often to sample	The frequency is also specified in the local sewer use code. It could be monthly, quarterly or annually depending on the type and volume of your facility's discharge.
Collect the sample	Obtain instructions from the analytical lab. Ask them to provide an appropriate container. For metals such as silver, use a polyethylene container. Ensure the collection equipment (tubing, etc.) is clean. Avoid sample contamination that could lead to a false-positive result.
Send the sample to the analytical lab	Follow the procedures outlined by the analytical lab. Cap and properly label the sample. Complete the chain of custody paperwork that identifies your sample to the lab. Send the sample to the analytical lab as soon as possible after collecting it. Ensure the analytical lab runs quality control checks on their procedures and equipment.
Maintain reports of sample analysis	Keep copies of the analysis reports on file for at least three years. Submit the reports to the municipality as required.

MORE INFORMATION

If you have environmental or safety questions about Kodak products or services, contact Kodak Environmental Services at 1-716-477-3194, between 8 a.m. and 5 p.m. (Eastern time) or visit KES on-line at www.kodak.com/go/kes.

Kodak also maintains a 24-hour health hotline to answer questions about the safe handling of photographic chemicals. If you need health-related information about Kodak products, call 1-716-722-5151.

For questions concerning the safe transportation of Kodak products, call Kodak Transportation Services at 1-716-722-2400.

Additional information is available on the Kodak website and through the U.S.A./Canada faxback systems.

The products and services described in this publication may not be available in all countries. In countries other than the U.S., contact your local Kodak representative, or your usual supplier of Kodak products.

The following publications are available from Kodak Customer Service or from dealers who sell Kodak products.

- J-208 *Introducing the 'Silver Management' Series*
- J-314 *Indoor Air Quality and Ventilation in Photographic Processing Facilities*
- J-410 *An Introduction to Waste Management Options for Photographic Processing Facilities*
- J-412 *Waste Prevention and Recycling Options for Photographic Processing Facilities*



For more information about Kodak Environmental Services,
visit Kodak on-line at:
www.kodak.com/go/kes

Many technical support publications for
Kodak products can be sent to your fax machine
from the Kodak Information Center. Call:
U.S. 1-800-242-2424, Ext. 33 / Canada 1-800-295-5531
—Available 24 hours a day, 7 days a week—

If you have questions about Kodak products, call Kodak.
In the U.S.A.:
1-800-242-2424, Ext. 19, Monday–Friday
9 a.m.–7 p.m. (Eastern time)
In Canada:
1-800-465-6325, Monday–Friday
8 a.m.–5 p.m. (Eastern time)

This publication is a guide to the Federal Environmental Regulations that apply to a typical photographic processing facility. Local or state requirements may also apply. Verify the specific requirements for your facility.

**This publication is printed on recycled paper that contains
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