**PROCESS WASTE ASSESSMENT:
BLACK AND WHITE PRINT/FILM PROCESSING AND
PHOTOMECHANICAL TRANSFER (PMT)**

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Final Report

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Abstract

This process waste assessment was performed to determine quantitatively the chemicals and materials used in the black and white print/film process, to determine their ultimate destination, and to explore options for reduced usage. It was determined that the volume of materials and water used for this process can be reduced; however, there would be significant restrictions on the types of reproductions available to customers. The process cannot be eliminated because of the classified artwork requirements.

Summary

A photomechanical transfer (PMT) camera is used to expose a negative paper (positive image) or reversal paper (negative image). These papers are then contacted to either a paper or film material and are then developed using Kodak PMT III Activator. The contacted product is separated and the negative or reversal paper is disposed. The resultant product is rinsed in a continuous flow water rinse and then mechanically dried. The product is used as is to continue the graphics process. The final rinse water, mixed with a minute amount of these chemicals, is then disposed through the industrial wastewater drain. Spent chemicals are disposed to Waste Management. The developer is drained weekly.

PMT activator is mixed with stop bath, developer, and fixer from another process and then disposed to Waste Management approximately every 1.5 months using a 5-gal. alkaline carboy. A hazardous waste identification tag is attached which states that the mixture contains silver. Waste Management then processes the mixture according to procedural guidelines.

Three options explored included redefining the limit of black and white reproduction, substitution of new products from Eastman

Kodak, and greater use of Varityper processing to regenerate past and future artwork.

Of these three options, only the redefinition of the limit of black and white reproduction seems presently feasible.

Discussion

Process Description

This process waste assessment was performed to determine quantitatively the chemicals used in the black and white print/film processing involving the use of a photomechanical transfer camera to expose negative paper (positive image) or reversal paper (negative image). These papers are then contacted to either a paper or film material and are then developed using Kodak PMT III Activator. The contacted product is separated and the negative or reversal paper is disposed. The resultant product is rinsed in a continuous flow water rinse and then mechanically dried. The product is used "as is" to continue the graphics process. The process flow diagram is shown in the Appendix.

Process Assessment

A. Methodology

Mass balances were determined by inventory records and personal judgment.

B. Mass Balance

Mass balance worksheets are shown in the Appendix.

C. Waste Stream Summary

The waste stream description worksheets are shown in the Appendix.

Option Summary and Analysis

The following three options were researched for this process.

- Redefining the absolute limit on black and white reproduction to 11 by 17 could result in significant reductions in material and water usage. Existing paper/film processing equipment that uses current computer technology is already being used.
- Substitution of new products from Eastman Kodak or another supplier could result in lower toxicity and might reduce chemical usage. This option appears to be unlikely at present due to research and development costs that would ultimately be paid by the consumer.
- Greater use of of current black and white Vartyper equipment on past and future computer generated artwork could limit material usage. The process cannot be eliminated unless all artwork is regenerated by computer. Classified artwork requirements prohibit exclusive Vartyper use.

Conclusion

Due to customer requirements, the PMT process must remain. The costs associated with this process (about \$70.00 a year for water, \$300.00 a year for chemicals, and \$2100.00 for paper) are not inexpensive.

Recommendations

Plantwide opinions on the limits of black and white print reproduction using the PMT camera should be reviewed. Greater emphasis should be placed on computer generated black and white artwork. Sizes of artwork should also be evaluated. Shelf-life is also a consideration for chemicals since they must be disposed even when they are not used.

Appendix A

Worksheets

PROCESS WASTE ASSESSMENT

PWA TEAM

PWA TITLE Black & White Print/Film Processing - Photomechanical Transfer (PMT)

PWA ID CODE(S) _____

<u>NAME</u>	<u>EMP. #</u>	<u>DEPT.</u>	<u>MAIL CODE</u>	<u>EXT.</u>
-------------	---------------	--------------	------------------	-------------

_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

* Team Leader

ADDITIONAL RESOURCES:

<u>DEPT.</u>	<u>NAME</u>	<u>EXT.</u>
--------------	-------------	-------------

Environmental Protection
Environmental Protection
Environmental Protection
Emission Factors
Waste Water Pretreatment

Fire Protection
Industrial Hygiene
Facilities Engineering (Cost Engineering)
Waste Management
Safety
Maintenance (Equipment)
Analytical Lab Testing

PROCESS WASTE ASSESSMENT

PROCESS DESCRIPTION

PWA TITLE Black & white Print/Film Processing - Photomechanical Transfer (PMT)

PWA ID CODE(S) Z951554-GA001

PROCESS LOCATION D/554 OB48

PROCESS DESCRIPTION

The process involves the use of a Photomechanical Transfer (PMT) camera (CE#63841) to expose a negative paper (positive image) or reversal paper (negative image). These papers are then contacted to either a paper or film material and are then developed using Kodak PMT III Activator (98600043). The contacted product is separated and the negative or reversal paper is scrapped. The resultant product is rinsed in a continuous flow water rinse and then mechanically dried (CE#73486). The product is used as is to continue the graphics process.

MAJOR PRODUCTS (Optional):

WASTE STREAM AFFECTED: (Circle One)

PLATING

SOLVENT

POLYMER

MISCELLANEOUS

PROCESS WASTE ASSESSMENT

FACILITY LAYOUT

PWA TITLE or PWA ID CODE(S) Z951554-GA001

PROCESS WASTE ASSESSMENT

PROCESS FLOW DIAGRAM

PWA TITLE or PWA ID CODE(S) Z951554-GA001

(INDICATE THE PWA ID(S) ASSOCIATED WITH THE PROCESS ON THE DIAGRAM.)

PROCESS WASTE ASSESSMENT

MASS BALANCE

WORKSHEET 5
ISSUE DATE _____
REVISED _____
Page 1 of 8

PWA TITLE or PWA ID CODE: Z951554-GA001

From 1/1/92
To 12/31/92

From 1/1/92 To 12/31/92		OUTPUT (LBS.)										
Material Standard No. 5064 Support Stores No. 98600043 Name Kodak PMT Activator	Component Input Qty. (lbs.) 446.5 (Component Name and %)	Total Output Matl./Comp. Reaction Prod.	Waste Mgmt. Empty Cont. *3	Waste Mgmt. Liquid *4	Waste Mgmt. Solid *5	Point Source Air *6	Fugitive Air *7	Water (Sanit.) *8	Water (Indust.) *9	Input To Another Process (Proc. ID) *10	Product (Retained on) *11	Other *12
	Water	Water 390.69		390.69								
%	87.5			100								
	Sodium Sulfite	Sodium Sulfite 33.49		33.49								
%	7.5			100								
	Sodium Thiosulfate	Sodium Thiosulfate 8.93		8.93								
%	2.0			100								
TOTAL												

* These are the process releases as coded in the directions for Worksheet 4.

MASS BALANCE

From 1/1/92
To 12/31/92

Material Standard No. 5064 Support Stores No. 98600043 Name Kodak PMT Activator	Component Input Qty. (lbs.) 446.5 (Component Name and %)	Total Output Matl./Comp. Reaction Prod.	Waste Mgmt. Empty Cont. *3	Waste Mgmt. Liquid *4	Waste Mgmt. Solid *5	Point Source Air *6	Fugitive Air *7	Water (Sanit.) *8	Water (Indust.) *9	Input To Another Process (Proc. ID) *10	Product (Retained on) *11	Other *12
	2-Methyl- aminoethanol	2-Methylaminoethanol 8.93		8.93								
%	2.0			100								
	Glycerol	Glycerol 8.93		8.93								
%	2.0			100								
%												
TOTAL	101	450.97		450.97								

M-087

PROCESS WASTE ASSESSMENT

MASS BALANCE

PWA TITLE or PWA ID CODE: Z951554-GA001

From 1/1/92
To 12/31/92

From 1/1/92		OUTPUT (LBS.)										
To 12/31/92												
Material Standard No.	Component Input Qty. (lbs.)	Total Output 104 Matl./Comp. Reaction Prod.	Waste Mgmt. Empty Cont. *3	Waste Mgmt. Liquid *4	Waste Mgmt. Solid *5	Point Source Air *6	Fugitive Air *7	Water (Sanit.) *8	Water (Indust.) *9	Input To Another Process (Proc. ID) *10	Product (Retained on) *11	Other *12
Support Stores No.	104 (Component Name and %)											
Name: Kodak PMT Neg. Paper												
98600165	Kodak PMT Neg. Paper (20x24)	Kodak PMT Neg. Paper (20x24) 79.0			79.0							
%	100				100							
98600166	Kodak PMT Neg. Paper (11x14)	Kodak PMT Neg. Paper (11x14) 18.75			18.75							
%	100				100							
98600167	Kodak PMT Neg. Paper (10x12)	Kodak PMT Neg. Paper (10x12) 6.25			6.25							
%	100				100							
TOTAL	100	104			104							

* These are the process releases as coded in the directions for Worksheet 4.

PROCESS WASTE ASSESSMENT

MASS BALANCE

WORKSHEET 5
ISSUE DATE _____
REVISED _____
Page 4 of 8

PWA TITLE or PWA ID CODE: Z951554-GA001

From 1/1/92
To 12/31/92

From 1/1/92 To 12/31/92		OUTPUT (LBS.)										
Material Standard No.	Component Input Qty. (lbs.) 0.8	Total Output 0.8 Matl./Comp. Reaction Prod.	Waste Mgmt. Empty Cont. *3	Waste Mgmt. Liquid *4	Waste Mgmt. Solid *5	Point Source Air *6	Fugitive Air *7	Water (Sanit.) *8	Water (Indust.) *9	Input To Another Process (Proc. ID) *10	Product (Retained on) *11	Other _____ *12
Support Stores No.	(Component Name and %)											
Name Kodak PMT Rev. Paper												
98600168	Kodak PMT Rev. Paper (12x18)	Kodak PMT Rev. Paper (12x18) 0.6			0.6							
%	100				100							
98600169	Kodak PMT Rev. Paper (10x12)	Kodak PMT Rev. Paper (10x12) 0.2			0.2							
%	100				100							
%					100							
TOTAL	100	0.8			0.8							

* These are the process releases as coded in the directions for Worksheet 4.

PROCESS WASTE ASSESSMENT

MASS BALANCE

WORKSHEET 5
 ISSUE DATE _____
 REVISED _____
 Page 5 of 8

PWA TITLE or PWA ID CODE: Z951554-GA001

From 1/1/92

To 12/31/92

From 1/1/92 To 12/31/92		OUTPUT (LBS.)										
Material Standard No.	Component Input Qty. (lbs.) 76.5	Total Output 76.5 Matl./Comp. Reaction Prod.	Waste Mgmt. Empty Cont. *3	Waste Mgmt. Liquid *4	Waste Mgmt. Solid *5	Point Source Air *6	Fugitive Air *7	Water (Sanit.) *8	Water (Indust.) *9	Input To Another Process (Proc. ID) *10	Product (Retained on) *11	Other _____
Support Stores No.	(Component Name and %)											
98600162	Kodak PMT Rec. Paper (20x24)	Kodak PMT Rec. Paper (20x24) 59.0			11.8					47.2		
%	100				20					80		
98600160	Kodak PMT Rec. Paper (11x14)	Kodak PMT Rec. Paper (11x14) 12.5			2.5					10.0		
%	100				20					80		
98600161	Kodak PMT Rec. Paper (10x12)	Kodak PMT Rec. Paper (10x12) 5.0			1.0					4.0		
%	100				20					80		
TOTAL	100	76.5			15.3					61.2		

* These are the process releases as coded in the directions for Worksheet 4.

PROCESS WASTE ASSESSMENT

MASS BALANCE

PWA TITLE or PWA ID CODE: Z951554-GA001

From 1/1/92 To 12/31/92		OUTPUT (LBS.)												
Material Standard No.	Component Input Qty. (lbs.) 2625	Total Output 26.25 Mati./Comp. Reaction Prod.	Waste Mgmt. Empty Cont. *3	Waste Mgmt. Liquid *4	Waste Mgmt. Solid *5	Point Source Air *6	Fugitive Air *7	Water (Sanit.) *8	Water (Indust.) *9	Input To Another Process (Proc. ID) *10	Product (Retained on) *11	Other *12		
Support Stores No.	(Component Name and %)													
Name Kodak PMT Rec. Film														
98600163	Kodak PMT Rec. Film (18x24)	Kodak PMT Rec. Film (18x24) 17.5			3.5					14.0				
%	100				20					80				
98600164	Kodak PMT Rec. Film (11x14)	Kodak PMT Rec. Film (11x14) 7.5			1.5					6.0				
%	100				20					80				
98600170	Kodak PMT Rec. Film (10x12)	Kodak PMT Rec. Film (10x12) 1.25			0.25					1.0				
%	100				20					80				
TOTAL	100	26.25			5.25					21.0				

* These are the process releases as coded in the directions for Worksheet 4.

PROCESS WASTE ASSESSMENT

MASS BALANCE

WORKSHEET 5
ISSUE DATE _____
REVISED _____
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PWA TITLE or PWA ID CODE: Z951554-GA001

From 1/1/92

To 12/31/92

From 1/1/92 To 12/31/92		OUTPUT (LBS.)										
Material Standard No.	Component Input Qty. (lbs.)	Total Output Matl./Comp. Reaction Prod.	Waste Mgmt. Empty Cont.	Waste Mgmt. Liquid	Waste Mgmt. Solid	Point Source Air	Fugitive Air	Water (Sanit.)	Water (Indust.)	Input To Another Process (Proc. ID)	Product (Retained on)	Other
Support Stores No.	(Component Name and %)		*3	*4	*5	*6	*7	*8	*9	*10	*11	*12
	Activator Boxes (Empty)	Activator Boxes (Empty) 19.5	19.5									
%	100		100									
	Activator Bottles (Empty)	Activator Bottles (Empty) 16.8	16.8									
%	100		100									
	Paper/Film Boxes (Empty)	Paper/Film Boxes (Empty) 47.8			47.8							
%	100		100		100							
TOTAL			36.3									

* These are the process releases as coded in the directions for Worksheet 4.

PROCESS WASTE ASSESSMENT

MASS BALANCE

WORKSHEET 5
ISSUE DATE _____
REVISED _____
Page 8 of 8

PWA TITLE or PWA ID CODE: Z951554-GA001

From 1/1/92
To 12/31/92

From 1/1/92 To 12/31/92		OUTPUT (LBS.)										
Material Standard No.	Component Input Qty. (lbs.)	Total Output Matl./Comp. Reaction Prod.	Waste Mgmt. Empty Cont.	Waste Mgmt. Liquid	Waste Mgmt. Solid	Point Source Air	Fugitive Air	Water (Sanit.)	Water (Indust.)	Input To Another Process (Proc. ID)	Product (Retained on)	Other
Support Stores No.	(Component Name and %)		*3	*4	*5	*6	*7	*8	*9	*10	*11	*12
	Plastic Liners Paper/Film	Plastic Liners Paper/film 3.2			3.2							
%	100				100							
	Rinse Water	Rinse Water 81,236.5							81,236.5			
%	100								100			
%					100				100			
TOTAL					51.0				81,236.5			

* These are the process releases as coded in the directions for Worksheet 4.

PROCESS WASTE ASSESSMENT

WASTE STREAM SUMMARY

(Only required for Multi-Waste Streams with the same Process Release Code.)

PWA TITLE or PWA ID CODE(S): Z951554-GA001

ATTRIBUTE	Process Release Code 4	Process Release Code 3	Process Release Code 5	Process Release Code 10	Process Release Code	Process Release Code
WASTE STREAM NAME	Used Chemicals	Empty Containers	Scrap Materials	Finished Product		
ANNUAL GENERATION RATE (lbs.) From 1/1/92 To 12/31/92 <i>Components:</i>	OVERALL OUTPUT FOR EACH PROCESS RELEASE CODE					
	450.97	36.3	176.35	82.2		
Kodak PMT Activator	450.97					
PMT Activator Boxes		19.5				
PMT Activator Bottles		16.8				
Paper/Film Boxes			47.8			
Paper/Film Liners			3.2			
Reversal Paper			0.8			
Receiver Paper			15.3	61.2		
FINAL DISPOSITION	Waste Management	Waste Management	Waste Management	Customer

PROCESS WASTE ASSESSMENT

WASTE STREAM SUMMARY

(Only required for Multi-Waste Streams with the same Process Release Code.)

PWA TITLE or PWA ID CODE(S): Z951554-GA001

ATTRIBUTE	Process Release Code 5	Process Release Code 10	Process Release Code 9	Process Release Code	Process Release Code
WASTE STREAM NAME	Scrap Materials	Finished Product	Rinse Water		
OVERALL OUTPUT FOR EACH PROCESS RELEASE CODE					
ANNUAL GENERATION RATE (lbs.) From 1/1/92 To 12/31/92 Components:			81,236.5		
Receiver Film	5.25	21.0			
Rinse Water			81,236.5		
Negative Paper	104.0				
FINAL DISPOSITION	Waste Management	Customer	Industrial Drain

PROCESS WASTE ASSESSMENT

WORKSHEET 7
ISSUE DATE _____
REVISED _____
Page 1 of 2

MATERIAL COST SHEET

PWA TITLE or PWA ID CODE(S) Z951554-GA001

COST OF INPUT MATERIALS:

Material(s)	MS/SS Number	Cost Per Unit _____	Annual Cost
Kodak PMT Activator	98600043	\$5.88 per gal.	\$294.00
Kodak PMT Negative Paper (20x24)	98600165	\$1.10 per sht..	\$869.00
Kodak PMT Negative Paper (11x14)	98600166	\$0.36 per sht.	\$216.00
Kodak PMT Negative Paper (10x12)	98600167	\$0.27 per sht.	\$ 67.50
Kodak PMT Receiver Paper (20x24)	98600162	\$0.52 per sht.	\$306.80
Kodak PMT Receiver Paper (11x14)	98600160	\$0.17 per sht.	\$ 68.00
Kodak PMT Receiver Paper (10x12)	98600161	\$0.13 per sht.	\$ 26.00
Kodak PMT Receiver Film (18x24)	98600163	\$1.84 per sht.	\$368.00
Kodak PMT Receiver Film (11x14)	98600164	\$0.66 per sht.	\$132.00
Kodak PMT Receiver Film (10x12)	98600170	\$0.52 per sht.	\$ 26.00

OTHER INFORMATION: _____

COST OF DISPOSAL OF OUTPUT MATERIAL(S):

Material(s)/Waste Streams	MS/SS Number (if applicable)	Cost Per Unit _____	Annual Cost
Kodak PMT Activator (Liquid-Alkaline)	98600043	\$0.32 per lb.	\$144.31
Paper/Film/Packaging Mat'l (Solid)	-----	\$0.13 per lb.	\$ 28.97
Water (Industrial Drain)	-----	\$6.29/1000 Gal.	\$ 61.56

OTHER INFORMATION: _____

PROCESS WASTE ASSESSMENT

WORKSHEET 7
ISSUE DATE _____
REVISED _____
Page 2 **of** 2

MATERIAL COST SHEET

PWA TITLE or PWA ID CODE(S) Z951554-GA001

COST OF INPUT MATERIALS:

Material(s)	MS/SS Number	Cost Per Unit _____	Annual Cost
Kodak PMT Reversal Paper (12x18)	98600168	\$0.92 per sht.	\$9.20
Kodak PMT Reversal Paper (10x12)	98600169	\$0.39 per sht.	\$1.95
Water	-----	\$6.55/1000 Cu. Ft.	\$8.57

OTHER INFORMATION: _____

COST OF DISPOSAL OF OUTPUT MATERIAL(S):

Material(s)/Waste Streams	MS/SS Number (if applicable)	Cost Per Unit _____	Annual Cost

OTHER INFORMATION: _____

PROCESS WASTE ASSESSMENT

OPTION DESCRIPTION

PWA TITLE or PWA ID CODE(S) Z951554-GA001

OPTION NAME and DESCRIPTION:

(Include input materials or components affected. Optional--Include products affected.)

OPTION 1 : Redefining the absolute limit on B & W reproduction to approximately 11x17 could result in significant reductions in material and water usage requirements. Existing paper/film processing equipment utilizing current computer technology is already in plant.

		Consider: Yes ☒ No ☐
Source Reduction	☒	Recycling/Reuse ☐
Procedure Change	☒	Other ☐

OPTION 2 : Substitution of new products from Eastman Kodak or other supplier could result in lower toxicity and might result in reduced chemical usage. This option, at present, appears an unlikely choice until such time that manufacturers are willing to incur the increased costs of research and development. These costs would probably be reflected in higher costs to the consumer.

		Consider: Yes ☒ No ☐
Source Reduction	☒	Recycling/Reuse ☐
Procedure Change	☒	Other Toxicity ☐

OPTION 3 : Greater utilization of current B & W varityper equipment on past and future computer generated artwork would reduce material usage significantly. The process could not be eliminated unless all artwork was regenerated by computer. Classified artwork would still require the use of this system.

		Consider: Yes ☒ No ☐
Source Reduction	☒	Recycling/Reuse ☐
Procedure Change	☒	Other ☐

OPTION : _____

		Consider: Yes ☐ No ☐
Source Reduction	☐	Recycling/Reuse ☐
Procedure Change	☐	Other ☐

PROCESS WASTE ASSESSMENT

OPTIONS SUMMARY

WORKSHEET 11
ISSUE DATE _____
REVISED _____
Page 1 of 3

PWA TITLE or PWA ID CODE(S): Z951554-GA001

Contact(s): D. L. Albers, D. J. Crockett

Waste Stream Affected (Circle One): Plating Solvent Polymer Miscellaneous

CONSIDERED OPTIONS	Option Score or Rank	Qty. Material Used (Lbs.) From <u>1/192</u> To <u>12/31/92</u> (List Material)	Estimated Implementation Cost	Feasibility	Anticipated Reduction Qty. (Lbs.)	Estimated Cost Savings
Greater utilization of current equipment	1	PMT Activator- 450.97	\$0.00	Excellent	0	0
		PMT Negative Paper-104			41.6	\$403.30
		PMT Reversal Paper-0.8			0.8	\$ 11.15
		PMT Receiver Paper-76.5			30.6	\$141.52
		PMT Receiver Film-26.25			10.5	\$105.20
		Empty Containers - 36.3			0	Figured in Paper/Film costs
		Empty Boxes/ Liners-51			5.1	Figured in Paper/Film costs
		Rinse Water- 81,236.5			16247.3	0

PROCESS WASTE ASSESSMENT

WORKSHEET 11
ISSUE DATE _____
REVISED _____
Page 2 of 3

OPTIONS SUMMARY

PWA TITLE or PWA ID CODE(S): Z951554-GA001

Contact(s): D. L. Albers, D. J. Crockett

Waste Stream Affected (Circle One): Plating Solvent Polymer **Miscellaneous**

CONSIDERED OPTIONS	Option Score or Rank	Qty. Material Used (Lbs.) From <u>1/1/92</u> To <u>12/31/92</u> (List Material)	Estimated Implementation Cost	Feasibility	Anticipated Reduction Qty. (Lbs.)	Estimated Cost Savings
Set Limits on B & W Reproduction	2	PMT Activator- 450.97	\$0.00	Fair	0	0
		PMT Negative Paper-104			41.6	\$346.60
		PMT Reversal Paper-0.8			0.8	\$ 11.15
		PMT Receiver Paper-76.5			30.6	\$122.72
		PMT Receiver Film-26.25			10.5	\$73.60
		Empty Containers - 36.3			0	Figured in Paper/Film costs
		Empty Boxes/ Liners-51			5.1	Figured in Paper/Film costs
		Rinse Water- 81,236.5			16247.3	0

PROCESS WASTE ASSESSMENT

OPTIONS SUMMARY

WORKSHEET 11
ISSUE DATE _____
REVISED _____
Page 3 of 3

PWA TITLE or PWA ID CODE(S): Z951554-GA001

Contact(s): D. L. Albers, D. J. Crockett

Waste Stream Affected (Circle One): Plating Solvent Polymer Miscellaneous

CONSIDERED OPTIONS	Option Score or Rank	Qty. Material Used (Lbs.) From 1/1/92 To 12/31/92 (List Material)	Estimated Implementation Cost	Feasibility	Anticipated Reduction Qty. (Lbs.)	Estimated Cost Savings
Replace current chemistry #2	3	PMT Activator- 450.97	\$300.00	Poor	0	0
		PMT Negative Paper-104			0	0
		PMT Reversal Paper-0.8			0	0
		PMT Receiver Paper-76.5			0	0
		PMT Receiver Film-26.25			0	0
		Empty Containers - 36.3			0	0
		Empty Boxes/ Liners-51			0	0
		Rinse Water- 81,236.5			0	0

PROCESS WASTE ASSESSMENT

REGULATORY REPORTING REQUIREMENTS

PWA TITLE or PWA ID CODE(S) Z951554-GA001

MATERIAL NAME	Kodak PMT Activator
MS/SS #	98600043
CAS #	
STORAGE LOC. (MFL)	OB48 (300)
PHYSICAL STATE	Liquid
SARA CODES	N,K (1, 4)
ANNUAL USE CY92	450.97
MAX STORED	107.16
VERIFIED BY:	Inventory Record/Personnel Judgement

	COMPONENT	COMPONENT	COMPONENT	COMPONENT	COMPONENT
COMPONENT	Water	Sodium Sulfite	Sodium Thiosulfate	2-Methyl-aminoethanol	Glycerol
COMPONENT %	87.5	7.5	2.0	2.0	2.0
CAS #	7732-18-5	77578-83-7	7772-98-7	109-83-1	56-81-5.
PHYSICAL STATE	Liquid	Liquid	Liquid	Liquid	Liquid
ANNUAL USAGE	390.69	33.49	8.93	8.93	8.93
MAX STORED	93.77	8.04	2.14	2.14	2.14
FUGITIVE EM	-----	-----	-----	-----	-----
POINT SOURCE EM	-----	-----	-----	-----	-----
STACK NO.	-----	-----	-----	-----	-----
DEPT. TREATMENT QTY. (RECYCLING)	-----	-----	-----	-----	-----
DEPT. TREATMENT EFFICIENCIES	-----	-----	-----	-----	-----
WASTE MANAGEMENT DISPOSAL QTY. CY	390.69	33.49	8.93	8.93	8.93

PROCESS WASTE ASSESSMENT

REGULATORY REPORTING REQUIREMENTS (COMPLETE APPLICABLE INFORMATION)

PWA TITLE or PWA ID CODE(S) Z951554-GA001

SURFACE FINISHING OPERATION

MATERIAL NAME	N/A				
MS/SS #					
	COMPONENT	COMPONENT	COMPONENT	COMPONENT	COMPONENT
COMPONENT					
SUBSTRATE					
APPLICATION METHOD					
COATING TYPE					
COATING USE/RATE					
SOLVENT/% OF COATING					
THINNER AND % OF COATING AND THINNER MIXTURE					
STRIPPER AND %					

EMISSION CONTROL EQUIPMENT

TYPE	N/A
CE#	
PROCESS CONTROLLED	
EFFICIENCY	

DEGREASER/SPRAY EQUIPMENT

CE#	N/A
SOLVENT(S)	
CAPACITY	
DEPARTMENT/POST LOCATION	

PROCESS WASTE ASSESSMENT

WASTE MANAGEMENT OPERATIONS REGULATORY REPORTING REQUIREMENTS

PWA TITLE or PWA ID CODE(S) Z951554-GA001

Process Release Code Worksheet 4	Waste Stream Name	* Ind./EPA Hazard Waste No.	Waste Mixed Yes/No	Current Waste Container or Disposal Method
4	PMT Activator (Liquid)	N/A	Yes	5 Gallon Carboy
5	PMT Negative Paper (Solid)	N/A	Yes	Regular Trash
5	PMT Reversal Paper (Solid)	N/A	Yes	Regular Trash
5	PMT Positive Paper (Solid)	N/A	Yes	Regular Trash
5	PMT Positive Film (Solid)	N/A	Yes	Regular Trash
3	Empty Containers (Solid)	N/A	Yes	Regular Trash
9	Rinse Water (Liquid)	N/A	Yes	Industrial Drain

* Consult Waste Management Contact for EPA Hazard Code.

Is recycling performed within the department? Yes _____ No X

Method of Recycling: _____

Is the reclaimed material returned to the department? Yes _____ No X

Used by others? Yes _____ No X

If used by others, in what way? _____

**PROCESS WASTE ASSESSMENT
EMPLOYEE EXPOSURE ASSESSMENT INFORMATION
(FOR ALL MATERIALS COVERED BY PWA)**

PWA TITLE Black & White Print/Film Processing

PWA ID CODE(S) Z951554-GA001

1. Number of personnel that work directly with this process. 5
2. Are there any KCD known or suspected carcinogens used or produced in this process? Yes No
3. How could employees directly involved with the process be exposed during performance of the process? (Mark more than one if needed.)
 - ☒ (a) Inhalation of airborne contaminant
 - ☒ (b) Eye/skin absorption by direct contact with substance
 - ☒ (c) Ingestion of substance
 - ☒ (d) Injection or entry through cuts, scrapes, burns, or other open wounds
 - ☐ e. No exposure or not possible
4. Does the process release airborne contaminants (e.g. dusts, mists, fumes) into the work area? (disregard engineering controls)
 - ☐ a. Airborne or high potential to become airborne
 - ☒ (b) Airborne or moderate potential to become airborne
 - ☐ c. Airborne or low potential to become airborne
 - ☐ d. Not airborne but may be released by an incident
 - ☐ e. Not airborne, or not possible
5. Can employees recognize if they are exposed to the substance in the work area?
 - ☐ a. Not perceptible, no warning properties (e.g., no odor)
 - ☒ (b) Barely perceptible, poor warning properties
 - ☐ c. Perceptible, good warning properties
 - ☐ d. Highly perceptible, warning properties at very low levels

6. What types of air contaminants could be released into the work area? (Mark more than one if needed.)

- ☒ a. Gas Photographic materials passed through a processor containing developer (activator)
- b. Dust
- c. Aerosol
- d. None

7. What type of administrative or process controls are used in the work area during the process? (Mark more than one if needed.)

- a. Carcinogen Control Program
- b. Mandatory employee rotation or time limit
- c. Written safe work practices or supervision
- ☒ d. Employee information and training
- e. No administrative controls, or not required

8. In the near proximity of the process, how many employees are potentially exposed?

- a. More than 50 employees
- b. 11 to 50 employees
- c. 3 to 10 employees
- ☒ d. 1 to 3 employees
- e. No employees exposed

9. For employees directly involved with the process, how long per day are employees potentially exposed in the work area? (Mark all that apply and indicate number of employees.)

	<u># Exposed</u>
a. Full-shift exposure, more than 5 hours	_____
b. Partial shift exposure, 3 to 5 hours	_____
c. Partial shift exposure, 1 to 3 hours	_____
☒ d. Partial shift exposure, less than 1 hour	<u>1-3</u>
☒ e. Short-term exposure, less than 15 minutes	<u>1-3</u>
☒ f. Incidental, caused by incident or nonroutine	<u>1-3</u>
g. No exposure, or not possible	_____

10. For employees directly involved with the process, how long are employees potentially exposed on a typical monthly basis? (Choose maximum for any employee.)

- a. High (40 hours/month or greater)
- b. Medium (4-39 hours/month)
- ☒ c. Low (less than 4 hours/month)
- d. No exposure, or not possible

11. Is respiratory protective equipment (RPE) worn by employees in the work area during the process?

- a. Mandatory use of RPE (required by GPI or work instructions)
- b. Optional use of RPE (used by employee even though not required)
- ☒ c. No RPE used

12. What type of engineering controls are used during the process?

- a. Dilution ventilation (e.g., general room heating, ventilation and cooling)
- b. Local exhaust on the process
- c. Containment or enclosure w/o exhaust
- d. Containment or enclosure w/exhaust
- ☒ e. No engineering controls

13. What are the primary types of controls used during the process? (Mark more than one if needed.)

- a. Personal protective equipment (PPE)
- b. Respiratory protective equipment (RPE)
- c. Administrative controls (e.g., employee job rotation or certified operators)
- d. Engineering controls (e.g., local exhaust)
- e. Process control (e.g., work instructions)

No Controls Currently Used

14. Concerns/Comments Safety glasses/gloves are available, low hazard rating for chemical used

Process Waste Assessment: Supplemental Data

To clarify data used to estimate the volume of water used in the final rinse process for PWA Z951554-GA001, the following judgments and equations were used.

Since this process is a continuous flow rinse, a rate of flow was required. The holding tank was measured in cubic inches and that result was converted to gallons. The tank was then filled with water to the overflow mark and timed. Rate of flow was determined to be 4.35 gallons per minute. This particular process was then determined to be in use an average of 45 minutes per week. The following formula was then used to determine yearly usage in pounds.

$$4.35 \text{ gal/min.} \times 45 \text{ min./wk.} = 195.75 \text{ gal./wk.} \times 50 \text{ wk./yr.} = 9,787.5 \text{ gal./yr.} \times 8.3 \text{ lbs.} = 81,236.5 \text{ lbs./yr.}$$

All subsequent calculations were then based upon this number 81,236.5 lbs./yr.

Paper and film costs and usage were primarily based upon estimates as these materials were never required to be inventoried and in some cases no records were kept. All material costs are currently being inventoried departmentally and through the stores tracking system.

END

**DATE
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11 / 4 / 93