

# Memorandum



**To:** Jacek Anuszewski, PE, Facility Manager, DOE Water Quality Program  
**From:** Doug Moody, CIH, EHS Manager

**Date:** February 6, 2020  
**Re:** Water Quality Permit Application

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FEB 07 2020

WA State Department  
of Ecology (SWRO)

Thank you for discussing our recent water quality permit. As discussed, I am including in this letter the original signed paperwork for the permit which was submitted on January 31, 2020 on Water Quality Permit Portal on Secure Access Washington (SAW).

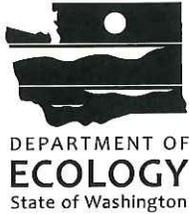
In that submittal I made the following comments and am including them below as well:

*"ADI is hereby submitting the attached permit application for our WWT permit renewal. We are requesting the following adjustments:*

- 1) increase daily average monthly flow 10% from 299,000 to 328,900 gpd*
- 2) increase daily max flow 10% from 367,500 to 404,300 gpd,*
- 3) increase fluoride average and daily max limit to align with the 76.6 lbs/day as defined in the City of Camas local limits.*

*Market conditions, efficiency and schedule changes are driving increases in our activity level for the site. Our original full build out assumption was 3800 wafers/week, but our current full build out estimate is 5200 wafers/week. There are no other significant changes to our activities on site."*

Please let me know if there are any questions.



# Application for a State Waste Discharge Permit to Discharge Industrial Wastewater to a Publicly-Owned Treatment Works (POTW)

This application is for a state waste discharge permit for a discharge of industrial wastewater to a publicly-owned treatment works (POTW) as required by Chapter 90.48 RCW and Chapter 173-216 WAC. It is designed to provide Ecology with information on pollutants in the waste stream, materials that may enter the waste stream, and the flow characteristics of the discharge.

Ecology may request additional information to clarify the conditions of this discharge. The applicant should reference information previously submitted to Ecology that applies to this application in the appropriate section.

## SECTION A. GENERAL INFORMATION

1. Applicant Name: Analog Devices Inc.
  
2. Facility Name: Same as Above  
(if different from Applicant)
  
3. Applicant Mail Address: 4200 NW Pacific Rim Blvd.  
Street  
  
Camas, WA 98607  
City/State Zip
  
4. Facility Location Address: Same as Above  
(if different from 3 above) Street  
  
\_\_\_\_\_  
City/State Zip
  
5. UBI No. 600 412  
304  
Sometimes called a registration, tax, "C," or resale number, the Unified Business Identifier (UBI) number is a nine-digit number used to identify persons engaging in business activities. The number is assigned when a person completes a [Master Business Application](#) to register with or obtain a license from state agencies. The Departments of Revenue, Licensing, Employment Security, Labor and Industries, and the Corporations Division of the Secretary of State are among the state agencies participating in the UBI program.
  
6. Latitude/longitude of the facility as decimal degrees (NAD83/WGS84):  
45.5990 / -122.4521

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of Ecology (SWRO)

<b>FOR OFFICE USE ONLY</b>		Check One:    New/Renewal <input type="checkbox"/> Modification <input type="checkbox"/>	
Date Application Received _____	Date Fee Paid _____	Application/Permit No. _____	Date Application Accepted _____

7. Person to contact who is familiar with the information contained in this application:

Doug Moody

Name

EHS Manager

Title

360-954-9235

Telephone number

360-834-1996

Fax number

8. Check One:

**Permit Renewal** (including renewal of temporary permits)

Does this application request a greater amount of wastewater discharge, a greater amount of pollutant discharge, or a discharge of different pollutants than specified in the last permit application for this facility?  YES  NO

For permit renewals, the current permit is an attachment, by reference, to this application.

**Permit Modification**

**Existing Unpermitted Discharge**

**Proposed Discharge**

Anticipated date of discharge: \_\_\_\_\_

*I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and/or imprisonment for knowing violations.*

Jim Nagle

Signature\*

1/31/20

Date

General Manager.

Title

Jim Nagle

Printed Name

\*Applications must be signed as follows: corporations, by a principal executive officer of at least the level of vice-president; partnership, by a general partner; sole proprietorship, by the proprietor. If these titles do not apply to your organization, the person who makes budget decisions for this facility must sign the application.

The application signatory may delegate signature authority for submittals required by the permit, such as monthly reports, to a suitable employee. You can delegate this authority to a qualified individual or to a position, which you expect to fill with a qualified individual. If you wish to delegate signature authority, please complete the following:

Doug Moody

Signature of delegated employee

1/30/2020

Date

EHS Manager

Title or function at the facility

Doug Moody

Printed name

## SECTION B. PRODUCT INFORMATION

- Briefly describe all manufacturing processes and products, and/or commercial activities, at this facility. Provide the applicable Standard Industrial Category (SIC) and the North American Industry Classification System (NAICS) Code(s) for each activity (see *North American Industrial Classification System*, 2007 ed.). You can find the 1997 NAICS codes and the corresponding 1987 Standard Industry Category (SIC) codes at (<http://www.census.gov/epcd/naics/frames3.htm>).

Description: SIC code 3674 Semiconductors and Related Devices and NAICS code 334413, Semiconductor and Related Device Manufacturing.

This site manufactures semiconductor products (e.g., CMOS, BiCMOS, Bipolar) using standard semiconductor manufacturing processes such as diffusion, epi/implant, photolithography, thin films, miscellaneous fab and fab support operations. Various chemical liquids and gases are required by the processes. These major processes are described in Attachment B-1 which describes the primary sources of liquid wastes that are discharged by the facility.

- List raw materials and products used at his facility:

Type	RAW MATERIALS	Quantity
<i>Grapes (Example)</i>		<i>1,000 tons per year</i>
See Attachment B.2		
Type	PRODUCTS	Quantity
<i>Grape Juice(Example)</i>		<i>300,000 gallons per year</i>
6-inch diameter wafers of semiconductors		Current: 3,250 wafer starts per week (wspw)
		Original Full Build Estimate: 3,000 wspw
		Current Full Build Estimate: 5,200 wspw

**SECTION C. PLANT OPERATIONAL CHARACTERISTICS**

1. For each process listed in B.1. that generates wastewater, list the process, assign the waste stream a name and an ID # and describe whether it is a batch or continuous flow.

Process	Waste Stream Name	Waste Stream ID#	Batch (B) or Continuous (C) Process
Same as previous applications			

2. On a separate sheet, produce a schematic drawing showing production processes, water flow through the facility, wastewater treatment devices and waste streams as named above. The drawing should indicate the source of intake water and show the operations contributing wastewater to the effluent. The treatment units should be labeled. Construct a water balance by showing average flows between intakes, operations, treatment units, and points of discharge to the POTW. (See the example on page 16 of this application form.)

3. What is the maximum daily wastewater discharge flow?

max daily: 327,257 gpd  
\*\*\*\*\*

Current permit max daily:  
367,500 gpd

Requested max daily (+10%):  
404,300 gallons/day

What is the maximum average monthly wastewater discharge flow (daily flows averaged over a month)?

Current measured avg mthly:  
287,600 gpd \*\*\*\*\*

Current permit avg mthly:  
299,000 gpd

Requested avg mthly (+10%):  
328,900 gallons/day

4. Describe any planned wastewater treatment improvements or changes in wastewater disposal methods, and the schedule for these improvements. *(Use additional sheets, if necessary and label as attachment C4.)*

We are currently reviewing options to expand our fluoride wastewater treatment system treat higher flow, lower PPM fluoroide waste, but the design is being finalized. That will come under a separate permit submittal / engineering report when ready.

The City of Camas adopted local limits recently. In that process, ADI was allocated 76.6 lb/day for fluorides. We request a consideration of an upwards revision of our fluoride limit from 17.4 ppm to someone more comensurate with 76.6 lb/d.

5. If production processes are subject to seasonal variations, provide the following information. The combined value for each month should equal the estimated total monthly flow. Please indicate the proper flow unit by checking one of the following boxes:

gallons per day                       gallons per month                       million gallons per month

Waste Stream ID#	MONTHS											
	J	F	M	A	M	J	J	A	S	O	N	D
Provided in DMR												
<b>Estimated Total Monthly Flow (GPD)</b>												

6. How many hours a day does this facility typically operate?                      24  
 How many days a week does this facility typically operate?                      6

How many weeks per year does this facility typically operate? 50

7. List all incidental materials, such as oil, paint, grease, solvents, and cleaners, that are used or stored on site (*list only those with quantities greater than 10 gallons for liquids and 50 pounds for solids*). For solvents and solvent-based cleaners, include a copy of the material safety data sheet and estimate the quantity used. (*Use additional sheets, if necessary, and label as attachment C.7.*)

Materials/Quantity Stored: See SDS Master Index, Attachment C.7

- | 8. | Some types of facilities are required to have spill or waste control plans. Does this facility have:  | Yes                                 | No                                  |
|----|---|-------------------------------------|-------------------------------------|
| a. | A spill prevention, control, and countermeasure plan (40 CFR 112)?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| b. | An Oil Spill Contingency Plan (chapter 173-182 WAC)?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| c. | An emergency response plan (per WAC 173-303-350)?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| d. | A runoff, spillage, or leak control plan (per WAC 173-216-110(f))?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| e. | Any spill or pollution prevention plan required by local, state or federal authorities? If yes specify: <u>Solvent Management Plan, SARA III, IFC, WAC 296-62, WAC 296-24</u> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| f. | A solid waste control plan?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| g. | A Slug Discharge Control Plan (40 CFR 403.8(f)(2)(v))?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |



## SECTION E. WASTEWATER INFORMATION

1. How are the water intake and effluent flows measured?

Intake: mechanical meter

Effluent magnetic flow meter

2. Describe the collection method for the samples analyzed below. (*i.e.*, grab, 24-hour composite). Applicants may analyze grab samples (not composites) for analysis of pH, temperature, cyanide, total phenols, residual chlorine, oil and grease (including E. coli), and Enterococci (previously known as fecal streptococcus at § 122.26 (d)(2)(iii)(A)(3)).

The collection methods are as required according to ADI's current State Waste Discharge Permit #ST 6154

3. Has the effluent been analyzed for any other parameters than those identified in question E.4.?  YES  
If yes, attach results and label as attachment E.4. This data must clearly show the date, method and location. (*Ecology may require additional testing.*)

4. Provide measurements or range of measurements for treated wastewater prior to discharge to the POTW for each parameter listed in the table below. Place an "X" in the left column. If you obtain the application from the internet, contact Ecology's regional office for more information. A subset of these parameters is permissible. All analyses (except pH) must be conducted by a laboratory registered with the Department of Ecology (WAC 173-216-125). If this is an application for permit renewal, provide data for the last year for which data are routinely measured. For parameters measured only for this application, place the values under "Maximum Value".

The Permittee must use the specified analytical methods, detection limits (DLs) and quantitation levels (QLs) listed in the table unless Ecology approves an alternate method **or the method used produces measurable results in the table listed it as an EPA approved method in 40 CFR Part 136. If the Permittee uses an alternative method as all reported, report the test method, DL, and QL on the discharge monitoring report or in the required report.**

X	Parameter	Measurement Values			Number of Analyses	Analytical Methods Std. Methods 19 <sup>th</sup> , 2 <sup>nd</sup> edition or EPA
		Minimum	Maximum	Average		
X	BOD (5 day)		<2.92		1	SM 5210 B
	COD					SM 5220 D
X	Total suspended solids		5.00		1	SM 2540 D
	Fixed Dissolved Solids					SM 2540 E
X	Total dissolved solids	1,370,000	2,080,000	1,715,000	4	SM 2540 C
	Conductivity (micromhos/cm)					SM 2510 B
X	Ammonia-N as N	12.2	30.0	20.3	4	SM 4500-NH <sub>3</sub> C
X	pH	6.3	9.9	7.3	continuous	SM 4500-H
	Fecal coliform (organisms/100 mL)					SM 9221 E or 9222
	Total coliform (organisms/100 mL)					SM 9221 B or 9222
	Dissolved oxygen					SM 4500-O C/G
	Nitrate + nitrite-N as N					SM 4500-NO <sub>3</sub> E
	Total kjeldahl N as N					SM 4500-N <sub>org</sub> C/E/F
	Ortho-phosphate-P as P					SM 4500-P E/F
	Total-phosphorous-P as P					SM 4500-P E/P/F
X	Total Oil & grease		<4.67		1	EPA 1664A
	NWTPH - Dx					Ecology NWTPH E
	NWTPH - Gx					Ecology NWTPH C
	Calcium					EPA 200.7
	Chloride					SM 4500-Cl C
X	Fluoride	6.0	11.3	9.0	48	SM 4500-F E
	Magnesium					EPA 200.7
	Potassium					EPA 200.7
	Sodium					EPA 200.7
X	Sulfate	755,000	1,000,000	887,000	4, lbs/day	SM 4500-SO <sub>4</sub> C/I
X	Arsenic(total)		<1.0		1	EPA 200.8

X	Parameter	Measurement Values			Number of Analyses	Analytical Methods 19 <sup>th</sup> Edition or EPA
		Minimum	Maximum	Average		
	Barium (total)				1	EPA 200.8
X	Cadmium (total)		<0.2		1	EPA 200.8
X	Chromium (total)		3.64		1	EPA 200.8
X	Copper (total)		6.72		1	EPA 200.8
X	Lead (total)		<0.2		1	EPA 200.8
X	Mercury (total) pg/L		Pending		1	EPA 1631E
X	Molybdenum(total)		18.3		1	EPA 200.8
X	Nickel(total)		7.63		1	EPA 200.8
X	Selenium (total)		<1.0		1	EPA 200.8
X	Silver (total)		<0.2		1	EPA 200.8
X	Zinc (total)		4.67		1	EPA 200.8

6. Does this facility use any of the following chemicals as raw materials or produce them as part of the process, or are they present in the wastewater?  YES  NO

*(The number in the column next to the chemical name is the Chemical Abstract Service (CAS) reference in identifying the compound.)*

If yes, specify how the chemical is used and the quantity used or produced: Silver is used as a target in the Arsenic and antimony are reaction by-products. 1,2-Trans-Dichloroethylene is used in the cleaning of diffusers. These chemicals are not present in significant concentrations in the wastewater. The chemicals and concentrations in wastewater incidental to our process are indicated above.

METALS, CYANIDE & TOTAL PHENOLS			
Antimony, Total	7440-36-0	Nickel, Total	7440-02-0
Arsenic, Total	7440-38-2	Selenium, Total	7782-49-2
Beryllium, Total	7440-41-7	Silver, Total	7440-22-4
Cadmium, Total	7440-43-9	Thallium, Total	7440-28-0
Chromium (hex) dissolved	18540-29-9	Zinc, Total	7440-66-6
Chromium, Total	7440-47-3		
Copper, Total	7440-50-8	Cyanide, Total	57-12-5
Lead, Total	7439-92-1	Cyanide, Weak Acid Dissociable	
Mercury, Total	7439-97-6)	Phenols, Total	

PESTICIDES			
Aldrin	309-00-2	Endrin	72-20-8
alpha-BHC	319-84-6	Endrin Aldehyde	7421-93-4
beta-BHC	319-85-7	Heptachlor	76-44-8
gamma-BHC	58-89-9	Heptachlor Epoxide	1024-57-3
delta-BHC	319-86-8	PCB-1242	53469-21-9
Chlordane	57-74-9	PCB-1254	11097-69-1
4,4'-DDT	50-29-3	PCB-1221	11104-28-2
4,4'-DDE	72-55-9	PCB-1232	11141-16-5
4,4' DDD	72-54-8	PCB-1248	12672-29-6
Dieldrin	60-57-1	PCB-1260	11096-82-5
alpha-Endosulfan	959-98-8	PCB-1016	12674-11-2
beta-Endosulfan	33213-65-9	Toxaphene	8001-35-2
Endosulfan Sulfate	1031-07-8		

VOLATILE COMPOUNDS			
Acrolein	107-02-8		
Acrylonitrile	107-13-1	1,1-Dichloroethylene	75-35-4
Benzene	71-43-2	1,2-Dichloropropane	78-87-5
Bromoform	75-25-2	1,3-dichloropropene (mixed isomers) (1,2-dichloropropylene)	542-75-6
Carbon tetrachloride	56-23-5	Ethylbenzene	100-41-4
Chlorobenzene	108-90-7	Methyl bromide (Bromomethane)	74-83-9
Chloroethane	75-00-3	Methyl chloride (Chloromethane)	74-87-3
2-Chloroethylvinyl Ether	110-75-8	Methylene chloride)	75-09-2
Chloroform	67-66-3	1,1,2,2-Tetrachloroethane	79-34-5
Dibromochloromethane	124-48-1	Tetrachloroethylene	127-18-4
1,2-Dichlorobenzene	95-50-1	Toluene (108-88-3)	
1,3-Dichlorobenzene	(541-73-1)	1,2-Trans-Dichloroethylene (Ethylene dichloride)	156-60-5
1,4-Dichlorobenzene	106-46-7	1,1,1-Trichloroethane	71-55-6
Dichlorobromomethane	75-27-4	1,1,2-Trichloroethane	79-00-5
1,1-Dichloroethane	75-34-3	Trichloroethylene	79-01-6
1,2-Dichloroethane	107-06-2	Vinyl chloride	75-01-4

ACID COMPOUNDS			
2-Chlorophenol	95-57-8	4-nitrophenol	100-02-7
2,4-Dichlorophenol	120-83-2	Parachlorometa cresol (4-chloro-3-methylphenol)	59-50-7
2,4-Dimethylphenol	105-67-9	Pentachlorophenol	87-86-5
4,6-dinitro-o-cresol (2-methyl-4,6,-dinitrophenol)	534-52-1	Phenol	108-95-2
2,4 dinitrophenol	51-28-5	2,4,6-Trichlorophenol	88-06-2
2-Nitrophenol	88-75-5		

BASE/NEUTRAL COMPOUNDS (compounds in bold are Ecology PBTs)			
Acenaphthene	83-32-9	3,3-Dichlorobenzidine	91-94-1
Acenaphthylene	208-96-8	Diethyl phthalate	84-66-2
Anthracene	120-12-7	Dimethyl phthalate	131-11-3
Benzidine	92-87-5	Di-n-butyl phthalate)	84-74-2
Benzyl butyl phthalate	85-68-7	2,4-dinitrotoluene	121-14-2
Benzo(a)anthracene	56-55-3	2,6-dinitrotoluene	606-20-2
Benzo(b)fluoranthene (3,4-benzofluoranthene)	205-99-2	Di-n-octyl phthalate	117-84-0
<b>Benzo(j)fluoranthene</b>	<b>205-82-3</b>	1,2-Diphenylhydrazine (as <i>Azobenzene</i> )	122-66-7
Benzo(k)fluoranthene (11,12-benzofluoranthene)	207-08-9	Fluoranthene	206-44-0
<b>Benzo(r,s,t)pentaphene</b>	<b>189-55-9</b>	Fluorene	86-73-7
Benzo(a)pyrene	50-32-8	Hexachlorobenzene	118-74-1
Benzo(ghi)Perylene	191-24-2	Hexachlorobutadiene	87-68-3
Bis(2-chloroethoxy)methane	111-91-1	Hexachlorocyclopentadiene	77-47-4
Bis(2-chloroethyl)ether	111-44-4	Hexachloroethane	67-72-1
Bis(2-chloroisopropyl)ether	39638-32-9	Indeno(1,2,3-cd)Pyrene	193-39-5
Bis(2-ethylhexyl)phthalate	117-81-7	Isophorone	78-59-1
4-Bromophenyl phenyl ether	101-55-3	<b>3-Methyl cholanthrene</b>	<b>56-49-5</b>
2-Chloronaphthalene	91-58-7	Naphthalene	91-20-3
4-Chlorophenyl phenyl ether	7005-72-3	Nitrobenzene	98-95-3
Chrysene	218-01-9	N-Nitrosodimethylamine	62-75-9
<b>Dibenzo (a,j)acridine</b>	<b>224-42-0</b>	N-Nitrosodi-n-propylamine	621-64-7
<b>Dibenzo (a,h)acridine</b>	<b>226-36-8</b>	N-Nitrosodiphenylamine	86-30-6
Dibenzo(a-h)anthracene (1,2,5,6-dibenzanthracene)	53-70-3	<b>Perylene</b>	<b>198-55-0</b>
Dibenzo(a,e)pyrene	192-65-4	Phenanthrene	85-01-8
Dibenzo(a,h)pyrene	189-64-0	Pyrene	129-00-0
		1,2,4-Trichlorobenzene	120-82-1

7. Are any other pesticides, herbicides or fungicides used at this facility?  YES  NO

If yes, specify the material and quantity used:

As required to maintain landscaped areas of the site.

8. Are there other pollutants that you know of or believe to be present?  YES  NO

If yes, specify the pollutants and their concentration if known  
(attach laboratory analyses if available as Attachment E8):

9. Is the wastewater being discharged, or proposed for discharge, to the POTW designated as a dangerous waste according to the procedures in Chapter 173-303 WAC?

YES  NO  DON'T KNOW

10. If the answer to question 9 above is yes, how did the waste designate as a dangerous waste (check appropriate box)?

For Listed and TCLP Characteristic Wastes only, also provide the Dangerous Waste Number(s).

**Listed Waste**  Dangerous Waste Number(s) \_\_\_\_\_

**Characteristic Wastes** Dangerous Waste Number(s) \_\_\_\_\_

Ignitable

Reactive

Corrosive

TCLP

**State Only Dangerous Wastes** Dangerous Waste Number(s) \_\_\_\_\_

Toxicity

Persistent

For questions about waste designation under the *Dangerous Waste Regulations*, Chapter 173-303 WAC, contact Ecology's Hazardous Waste and Toxics Program at:

Northwest Regional Office - Bellevue	(425) 649-7000
Southwest Regional Office - Lacey	(360) 407-6300
Central Regional Office - Yakima	(509) 575-2490
Eastern Regional Office - Spokane	(509) 329-3400

## SECTION F. SEWER INFORMATION

1. Is an inspection and sampling manhole or similar structure available on-site?  YES  NO  
*If yes, attach a map or hand drawing of the facility that shows the location of these structures  
(Label as attachment F1 or this may be combined with map in H8, if H8 is applicable to your  
facility.)*

## SECTION G. OTHER PERMITS

1. List all environmental control permits or approvals needed for this facility; for example, air emission permits.

Air Discharge Permit, Southwest Clean Air Agency

## SECTION H. STORMWATER

1. Do you have coverage under the Washington State Industrial Stormwater NPDES General Permit?  YES  NO

If yes, please list the permit number here. Certificate of No Exposure

If no, have you applied for a Washington State Stormwater Industrial Stormwater General Permit?  YES  NO

If you answered no to both questions above, complete the following questions 2 through 5.

2. Does your facility discharge stormwater: *(Check all that apply)*

To storm sewer system *(provide name of storm sewer system operator: \_\_\_\_\_)*

Directly to any surface waters of Washington State *(e.g., river, lake, creek, estuary, ocean).*

Specify waterbody name(s) \_\_\_\_\_

Indirectly to surface waters of Washington State *(i.e., flows over adjacent properties first).*

To a Sanitary Sewer

Directly to ground waters of Washington State via:

Dry well

Drainfield

Other

3. Areas with industrial activities at facility: *(check all that apply)*

Manufacturing Building

Material Handling

Material Storage

Hazardous Waste Treatment, Storage, or Disposal *(Refers to RCRA, Subtitle C Facilities Only)*

Waste Treatment, Storage, or Disposal

Application or Disposal of Wastewaters

Storage and Maintenance of Material Handling Equipment

Vehicle Maintenance

Areas Where Significant Materials Remain

Access Roads and Rail Lines for Shipping and Receiving

Other (please specify): \_\_\_\_\_

## 4. Material handling/management practices

a. Types of materials handled and/or stored outdoors: *(check all that apply)*

- |                          |                                     |                          |                                    |
|--------------------------|-------------------------------------|--------------------------|------------------------------------|
| <input type="checkbox"/> | Solvents                            | <input type="checkbox"/> | Hazardous Wastes                   |
| <input type="checkbox"/> | Scrap Metal                         | <input type="checkbox"/> | Acids or Alkalies                  |
| <input type="checkbox"/> | Petroleum or Petrochemical Products | <input type="checkbox"/> | Paints/Coatings                    |
| <input type="checkbox"/> | Plating Products                    | <input type="checkbox"/> | Woodtreating Products              |
| <input type="checkbox"/> | Pesticides                          | <input type="checkbox"/> | Other <i>(please list)</i> : _____ |

b. Identify existing management practices employed to reduce pollutants in industrial stormwater discharges: *(check all that apply)*

- |                          |                             |                          |                                    |
|--------------------------|-----------------------------|--------------------------|------------------------------------|
| <input type="checkbox"/> | Oil/Water Separator         | <input type="checkbox"/> | Detention Facilities               |
| <input type="checkbox"/> | Containment                 | <input type="checkbox"/> | Infiltration Basins                |
| <input type="checkbox"/> | Spill Prevention            | <input type="checkbox"/> | Operational BMPs                   |
| <input type="checkbox"/> | Surface Leachate Collection | <input type="checkbox"/> | Vegetation Management              |
| <input type="checkbox"/> | Overhead Coverage           | <input type="checkbox"/> | Other <i>(please list)</i> : _____ |

5. Attach a facility site map showing stormwater drainage/collection areas, disposal areas and discharge points. This may be a hand-drawn map if no other site map is available *(See example on page 16 of this application)*. Label this as attachment H.5.

## SECTION I. OTHER INFORMATION

1. Describe liquid wastes or sludges being generated by your facility that are not disposed of in the waste stream(s) and how they are being disposed of. For each type of waste, provide type of waste and the name, address, and phone number of the hauler.

Liquid wastes include waste photoresist, SOG, ST-200, SRS-100 , EKC265/IPA, oil.

Univar, 3950 NW Yeon Ave., Portland, OR 97210, 503-222-1721

2. Describe storage areas for raw materials, products, and wastes.

Storage areas are inside or otherwise protected, segregated by hazard class, provided with secondary containment, and labeled as required.

3. Have you designated the wastes described above according to the applicable  YES  NO procedures of Dangerous Waste Regulations, Chapter 173-303 WAC?

**SECTION J. CERTIFICATIONS**

**1. Approval by Publicly-Owned Treatment Works [required by WAC 173-216-070(4)(b)]**

*I approve of the discharge as described in this application. The applicant is:*

(Please check the appropriate box below.)

A Significant Industrial User (see Definitions at the end of this Section)

A Categorical Industrial User

Neither of the above

Name and location of sewer system to which this project will be tributary:

City of Camas

Treatment Works Owner: City of Camas

Street: 616 NE 4TH AVE

City/State: Camas, WA

Zip: 98607



1/28/2020

WWTP Operations  
Supervisor

Signature of Treatment Works Authority

Date

Title

Robert Busch

Printed Name

**2. Application review by Intermediate Sewer Owner at point of discharge (if applicable)**

*I hereby acknowledge that I have reviewed the application for discharge to this sewer system.*

Name and location of sewer system to which this project will be tributary:

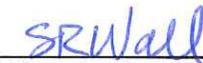
City of Camas

Sewer System Owner: City of Camas

Street: 616 NE 4TH AVE.

City/State: Camas, WA

Zip: 98607



1/28/2020

Public Works Director

Signature of Sewer System Authority

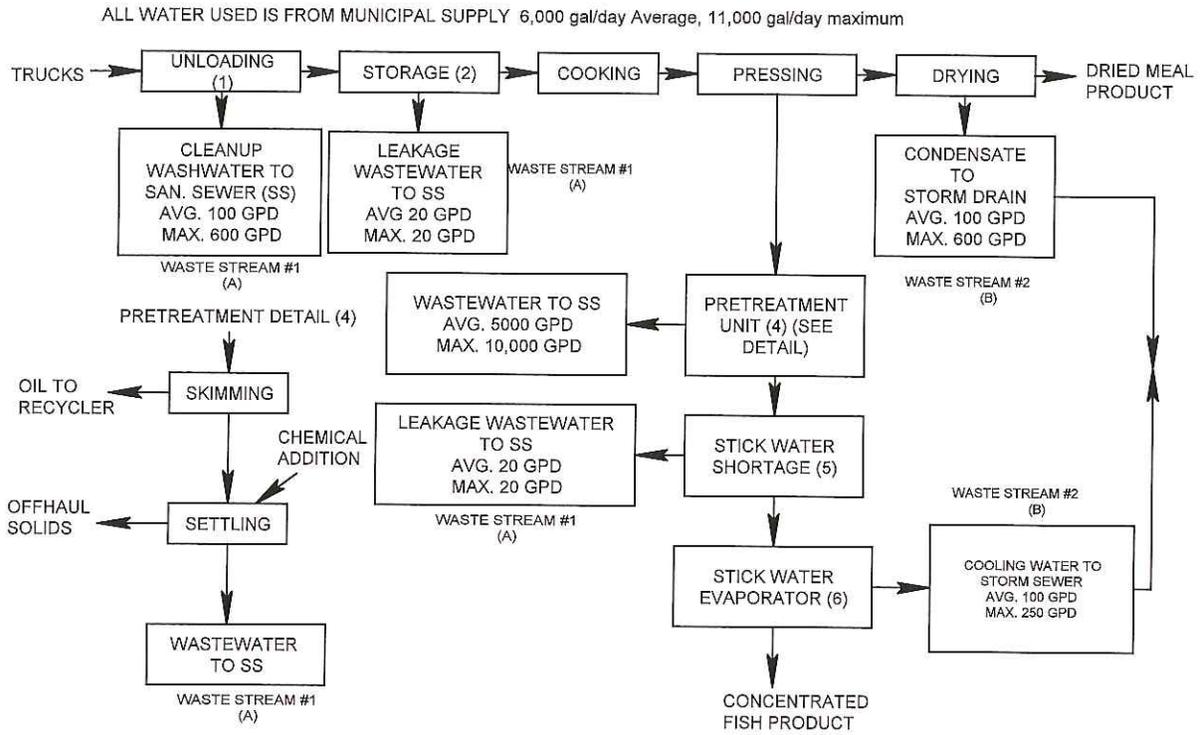
Date

Title

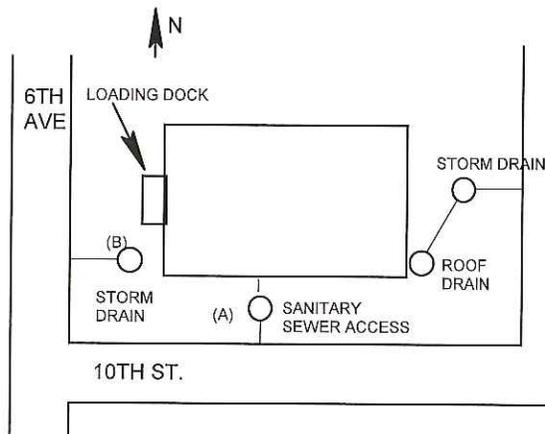
Steven R. Wall

Printed Name

Example 1 for application section C.2. (SCHEMATIC DIAGRAM)



Example 2 for application section F1 or H8 (FACILITY SITE MAP)



## DEFINITIONS

### Significant Industrial User (SIU)--

- 1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N; and
- 2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

**Control Authority** - means the Washington State Department of Ecology in the case of non-delegated POTWs or means the POTW in the case of delegated POTWs.

**Categoric Industrial User (CIU):** An industrial user subject to national categorical pretreatment standards promulgated by EPA (40 CFR 403.6 and 40 CFR parts 405-471).

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### Summary of Attachments That May be Required for This Application:

*(Please check those attachments that are included)*

- |                                     |                          |      |   |
|-------------------------------------|--------------------------|------|---|
| <input type="checkbox"/>            | <input type="checkbox"/> | C.2. | Production schematic flow diagram and water balance |
| <input type="checkbox"/>            | <input type="checkbox"/> | C.4. | Wastewater treatment improvements                   |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | C.7. | Additional incidental materials                     |
| <input type="checkbox"/>            | <input type="checkbox"/> | E.8. | Additional results of effluent testing              |
| <input type="checkbox"/>            | <input type="checkbox"/> | F.1. | Facility site map                                   |
| <input type="checkbox"/>            | <input type="checkbox"/> | H.5. | Stormwater drainage map                             |

*If you need this document in a format for the visually impaired, call the Water Quality Program at 360-407-6600. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.*

## **Attachment B-1: Description of Manufacturing Processes and Products from the site:**

### **INTRODUCTION**

This site manufactures semiconductor products (e.g., CMOS, BiCMOS, Bipolar) using standard semiconductor manufacturing processes such as diffusion, epi/implant, photolithography, thin films, miscellaneous fab and fab support operations. Various chemical liquids and gases are required by the processes. These major processes are described below and include liquid wastes that will be discharged by the facility.

### **DIFFUSION**

Diffusion is a process by which atoms of a specific chemical are diffused into the substrate (usually silicon) or a specific layer. The processes are carried out at elevated temperatures in a furnace with an atmosphere of a specific chemical composition to meet the product requirements.

Oxidation is another thermal process used to produce a layer of oxide material on the substrate. The process is performed in a furnace at elevated temperatures in an atmosphere that will produce the oxide at the specific rate.

Liquid wastes are generated in the diffusion area from several operations. A wet chemical bench is used to clean and prepare wafers for other process steps. The wet bench consists of chemical tanks and deionized water tanks. The chemical tanks provide the required process operation, and the water tanks are used to quench the chemical activity and remove all traces of the chemicals from the product. Once the product is rinsed, it is placed in a spin rinse dryer where additional rinsing of the product is performed, and the wafers are dried.

Additional equipment in the diffusion area that produces liquid wastes include a box washer which used deionized water and possibly a cleaning compound to remove contamination from the boxes used to transport the product wafers through the Fab. Quartz tubes and other quartz parts are used in the diffusion process. This hardware must be cleaned periodically to assure minimum production contamination. A mixed acid solution is used to clean the quartz equipment. After the acid cleaning the parts are rinsed with deionized water and dried.

### **EPI/IMPLANT**

The Epi/Implant area contains additional equipment for performing specific wafer processing operations. The Epi process is used to deposit an epitaxial layer of silicon onto the wafer surface using gaseous reactants at specific conditions of temperature and pressure. The implant area contains ion implantation equipment that is used to "dope" the silicon at specific locations with specific chemical which will give the silicon required electrical properties.

Equipment that produces liquid wastes is also associated with the process area. Wet processing equipment utilizes chemicals and ultrasonic baths to clean the product wafers and prepare them for additional processing. Deionized water rinses are used to remove residual chemicals and rinse the product. Spin rinse dryers perform a final rinse and then dry the product. The area also

contains a quartz cleaning tool that cleans, rinses, and dries quartz parts associated with these and other processes.

## PHOTOLITHOGRAPHY

Photolithography is used for numerous steps in the manufacturing process. A basic photolithography operation consists of wafer cleaning, surface preparation, application of a photoresist material, exposure of the material, and development of the image. Chemicals are used for cleaning, surface preparation, the photoresist, and for image development. Additional materials are applied to the required areas of the wafer, and the residual resist is then stripped off in a chemical process.

A 'mask' is used to define the patterns that are to be established on the wafer during the photolithography operations. Various masks are used at different stages of the process and various products have their own sets of masks. The masks are sealed within a 'pellicle' that protects the mask from contamination and damage. The pellicle must be cleaned periodically to assure that they are free of contamination that might be projected onto the wafer. Specialized equipment is used to clean the pellicle. Cleaning solutions and deionized water are used, and these liquids will contribute to the liquid waste streams from the Fab.

The photographic images on the wafers are developed by a chemical developer. Again, wet chemical processing is used to perform the developing. Deionized water rinses halt the chemical reactions and remove residual resist. The wafers are again further rinsed and dried. Other chemical processing operations are associated with the photolithography area. Chemical benches include chemical baths of buffered oxide etch (BOE), hot phosphoric acid, metal etchants, and photoresist strippers. These benches include deionized rinse water tanks as well as spin rinse and vapor dry equipment.

## THIN FILMS

The Thin Films area utilizes equipment that deposits thin layers of metal on the wafers to provide connections for the circuitry. The metals are sputtered on the wafer surface. The metals may then be etched to establish the required pattern. Wet chemical processing equipment is used in the area to clean the product wafers prior to certain process steps. The wet chemical process is followed by deionized water rinsing and processing in a spin rinse dryer.

Upon completion of the process, the wafers are processed through a back-grinding operation. The process reduces the thickness of the non-functional substrate (e.g., silicon) on the backside of the wafer. The grinding is done with an abrasive slurry. Liquid wastes are produced by this process step. Additional wet processing equipment is used to clean, rinse and dry the product.

## MISCELLANEOUS FAB OPERATIONS

The production process requires various operations to assure product quality and continuing operations. Areas of the fab building have been designated for product quality activities, sorting of wafers, and process equipment maintenance. Each of these areas will contain equipment that

utilizes various chemicals and deionized water to process limited quantities of product or test wafers and equipment. This Equipment will consist of chemical baths, deionized water rinse tanks, and spin rinse dryers for handling wafers.

#### FAB SUPPORT

A full array of systems is required to support the manufacturing operation of the Fab. Many of these systems will produce liquid wastes that will contribute to the discharge from the facility. The air handling systems will contribute water from condensation removed from the incoming air, water blowdown from the cooling towers and boilers will occur periodically. The ammonia, acid, and EPI scrubbers reduce air emissions but produce a continuous stream of water and chemical to maintain peak efficiency and comply with our air permit. The compressed dry air system will produce some moisture during the compression and drying of air. The process cooling water system has periodic blowdown to maintain water quality. Liquid ring vacuum pumps have a continuous discharge of liquid to drain to maintain a level of water quality in the system. The Reverse Osmosis / Deionized Water (RO/DI) system will generate various liquid wastes as systems are flushed, regenerated, and cleaned.

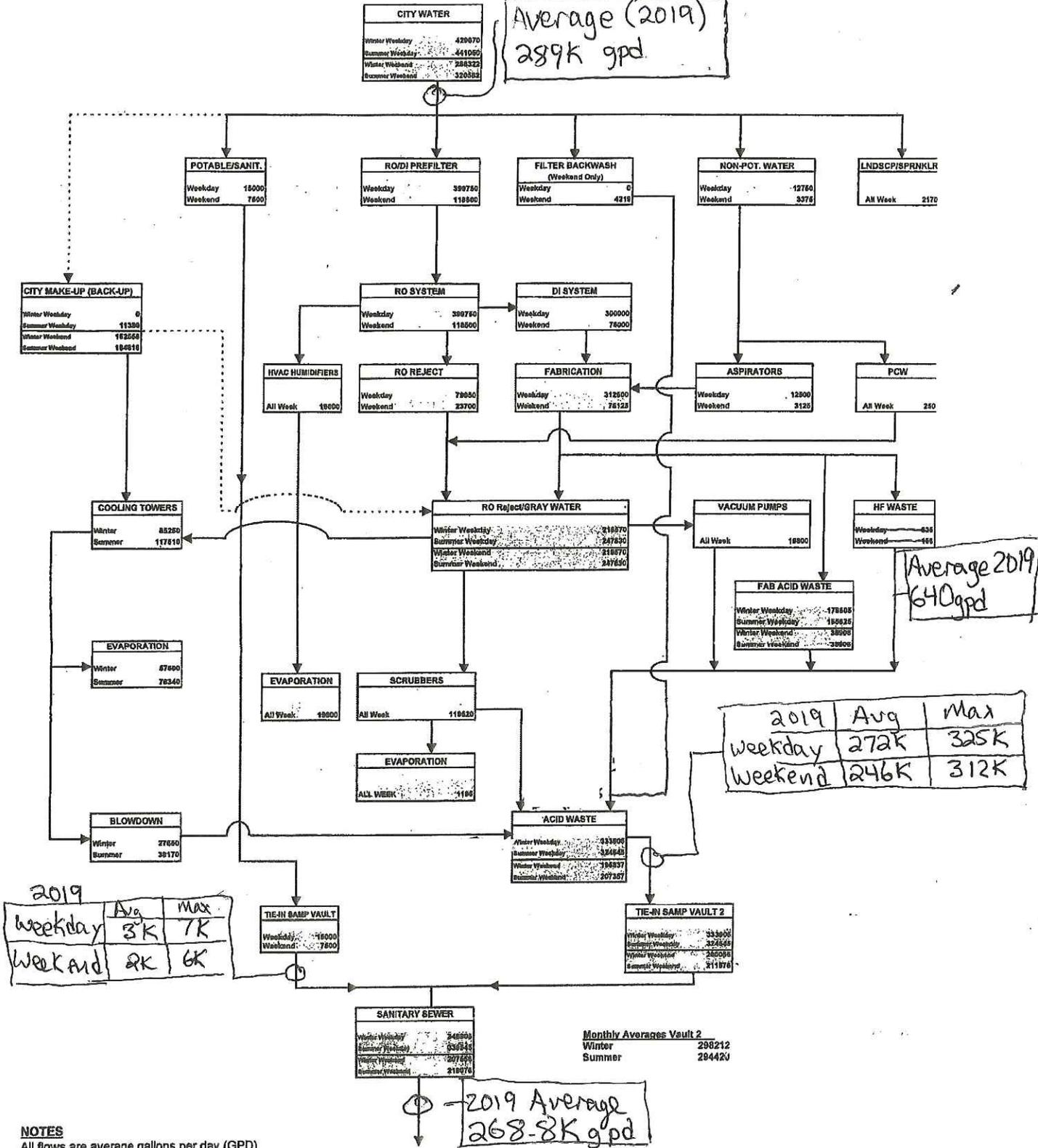
A Attachment B-2

2018 Liquid Chemical Use

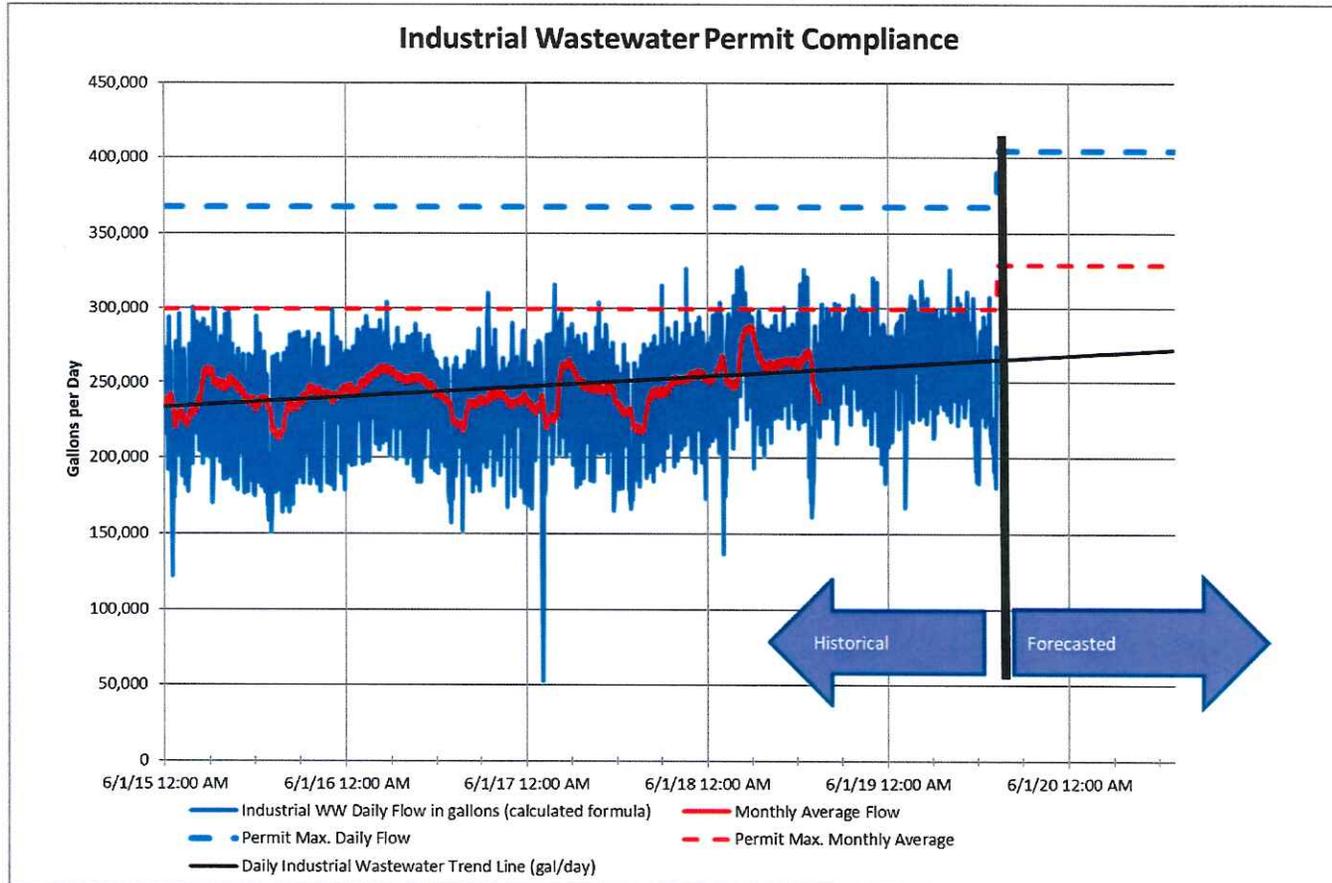
Part Description	2018 total UOM Count	UOM	lbs/UOM	2018 Total (lbs)
POCL3	40	Each 1500	5.5556424	222
H.F DEGLAZE 10:1 (5% HF)	661	Case	33.047784	21,845
PHOSPHORIC ACID 85%	150	Case	56.414904	8,462
HYDROFLUORIC ACID 49%	1026	Case	40.05792	41,099
HCL,37-38%	376	Case	39.390288	14,811
AMMONIUM HYDROXIDE 28-30%	1003	Case	30.04344	30,134
SULFURIC ACID,95-97%	4914	Case	61.422144	301,828
SULFURIC ACID,95-97%	284	Drums	844.55448	239,853
HYDROG.PEROXIDE 30-32%	4671	Case	37.053576	173,077
NITRIC ACID,69-70%	88	Case	42	3,696
Chromium Trioxide, 100%	0	bottle	1.10231	-
POTASSIUM HYDROXIDE 100%	16	Bottle	5	80
BOE 15:1 (27% NH4OH, 5% HF)	132	Case	37.1203392	4,900
ALUMINUM ETCH (2% acetic acid, 2% nitric acid, 83% phosphoric acid)	783	Case	55.12303608	43,161
BOE 9:2 (27% HF, 5% HF)	414	Case	37.1203392	15,368
BOE 6:1 (30% NH4OH, 9% HF)	379	Case	37.1203392	14,069
HF 20:1, 2.5% HF	71	Case	33.047784	2,346
POLY ETCH, 40:1:1:20 (10%acetic,4%HF,4% HNO3)	177	Case	36.385944	6,440
DILUTE HF 100:1 (0.6% HF)	117	Case	35.88522	4,199
SUPER Q ETCH (34% NH4OH, 3% H3PO4)	226	Case	38.5891296	8,721
25% Sodium Hydroxide (Bulk Caustic Per consumption Report)	192,767	Gallon	10.6	2,043,072
Sulfuric Acid 95-97%	112	Gallon	15.3	1,716
AZ 300 MIF DEVELOPER (2.4% TMAH)	5094	Case	33.3816	170,046
AZ 726 MIF DEVELOPER (2.4% TMAH)	2965	Case	33.3816	98,976
<b>Chemicals segregated into collection systems / minimal wastewater exposure</b>				
TRANS 1,2 DICHLOROETHYLENE 100%	178	Cylinder	3.858024691	687
TEOS,100%	10	Each	7.89264	79
ST-200 POLYMER STRIPPER (15% NH4OH)	217	Case	36.052128	7,823
PROPYLENE GLYCOL 100%	170	Case	34.58667576	5,880
ETHYLENE GLYCOL,100%	7	Case	36.71976	257
SRS 100 STRIPPER (NMP 60%)	470	Each	35.718312	16,788
ANTIMONY TRIOXIDE, 10GMS	700	Each	0.022045855	15
ISOPROPYL ALCOHOL 100%	1917	Case	26.371464	50,554
ACETONE 100%	97	Case	26.371464	2,558
EKC265 (60% amino-2-ethoxy)-2 ethanol, 18% hydroxylamin, 5% catechol)	189	Case	36.052128	6,814
AZ1512 PHOTORESIST (other)	127	Case	34.6501008	4,401
AZ1518-SFD (70% PGMEA, resin, other)	0	Case	33.3816	-
MEGAPOSIT RESIST,#SPR3617M (57% ethyl lactate, 3% 2-methylbutyl acetate, 3% n-amyl acetate, <1% Cresol)	60	Gallon	8.929578	536
5720 PHOTORESIST (<1% 1,4-Dioxane, other)	549	Gallon	7.677768	4,215
AR65 PHOTORESIST (<1% 1,4-Dioxane, 65% 2-Heptanone, other)	48	Gallon	7.677768	369
AR65 DYED PHOTORESIST (<1% 1,4-Dioxane, 8% n-butyl acetate, other)	36	Gallon	8.929578	321
AZ AQUATAR COATING (other)	60	Gallon	8.3454	501
AZ MiR 703-DS PHOTORESIST (15% n-butyl acetate, other)	16	Gallon	8.846124	142
AR87 PHOTORESIST (<1% 1,4-Dioxane, 8% N-butyl acetate, other)	64	Gallon	9.013032	577
AZ MIR 900 PHOTORESIST (10% n-butyl acetate, other)	23	Each	9.435626102	217
211 SOG, 1L (7% 1-butanol, 20% acetone, 18% ethanol, 41% IPA)	462	Each	1.873897707	866
211 SOG, 250mL (7% 1-butanol, 20% acetone, 18% ethanol, 41% IPA)	512	Each	0.468474427	240
AZ EBR 55 gal drum, 100% PGMEA	167	Each	442.9012346	73,965
HMDS 100%	1788	Pint	38.9062548	69,564

Note: This is at 2750 wspw and full build out is 5200 wspw. Gases not included. Concentrations are midpoints of SDS ranges.

**FIGURE C-2  
LINEAR TECHNOLOGY WATER BALANCE DIAGRAM**



# Attachment C3: Trend and Forecast Since Last Permit Revision



Attachment C3

# Attachment C.7

Product Name	Manufacturers	Synonyms	Internal part number
>1.7% to <10% Phosphine in Nitrogen	MATHESON TRI-GAS, INC.		6735C
1% Germane in Hydrogen Mixture	MATHESON TRI-GAS, INC.		
2,3,4-Trihydroxybenzophenone	Sigma-Aldrich Corporation		
21F Spin On Glass	Filmtronics Inc.	Methylsiloxane Spin-on Glass, SOG, Inter-level dielectric	65-6577C
	2221 Watercare Industrial Services		FAC
	2316 Watercare Industrial Services		FAC
	2500 Watercare Industrial Services		FAC
	2531 Watercare Industrial Services		FAC
272 Threadlocker High Strength	Henkel Corporation		
	2938 Watercare Industrial Services	Industrial Water Treatment	FAC
2-Heptanone	Thermo Fisher Scientific	Methyl amyl ketone, Laboratory chemicals	
50-200 ppmv Arsine in Hydrogen	MATHESON TRI-GAS, INC.	arsine gas mixture	6709
Accuglass T-11 (111, 111TS, 211, 311) Spin-On Glass	Honeywell International	Electronic Materials, SOG 211	6577C
Acetic Acid, Glacial	Thermo Fisher Scientific	Glacial acetic acid; Methanecarboxylic acid; Ethanoic acid	
Acetic Acid, Glacial	Thermo Fisher Scientific	Glacial acetic acid; Methanecarboxylic acid; Ethanoic acid	
Acetone	High Purity Products	Dimethylketone; 2-propanone; dimethylketal	6513
Acid Reagent	Hach Company	Silica determination	FAC
Activated Alumina	BASF CORPORATION		
ADHESION PROMOTER 100%	FUJIFILM U.S.A.	Silanamine, 1,1,1-trimethyl-N-(trimethylsilyl)-; 1,1,1,3,3,3	6531
AERO 30V SPRING FLOWERS	Interline Brands Inc		
Air	Airgas, Inc.	Compressed Air ; Breathing Quality Air ; synthetic air, rex	6702
AIR, COMPRESSED	MATHESON TRI-GAS, INC.	MTG MSDS 2; AIR; UN 1002	FAC
all Multi-Purpose Powder Detergent	Sealed Air Corporation	Laundry care	
Aluminum Etch 40:1:1	COLUMBUS CHEMICAL INDUSTRIES, INC.		6554
Amino Acid F Dilution Solvent	Hach Company		FAC
Amino Acid F Reagent	Hach Company		FAC
Amino Acid F Reagent Powder for Analyzers	Hach Company		FAC
Amino Acid F Reagent Powder for Analyzers	Hach Company	Indicator for silica	FAC
Ammonia	Linde Industrial Gases U.S.	Ammonia, Anhydrous; Anhydrous Ammonia	6710
Ammonium Fluoride Crystals, ACS	COLUMBUS CHEMICAL INDUSTRIES, INC.		
Ammonium Formate	Sigma-Aldrich Corporation	Formic acidammonium salt	
AMMONIUM HYDROXIDE 10-35%	High Purity Products	Ammonium hydroxide solutions; ammonia aqueous; am	6507
AMMONIUM HYDROXIDE 1-2%	High Purity Products	Ammonium hydroxide solutions; ammonia aqueous; am	6507
Ammonium Hydroxide 1-9%	High Purity Products	Ammonium hydroxide solutions; ammonia aqueous; am	6507
Antichlor 427	Avista Technologies (UK) Ltd		FAC
Antimony(III) oxide	ALFA AESAR		6525
Aqua Regia, HNO <sub>3</sub> : HCl : H <sub>2</sub> O - 4:2:4	Ricca Chemical Company		
Argon	Airgas, Inc.		6705, 6768
ARSINE, ADSORBED	Entegris, Inc.		6746
AZ 1512 Photoresist	EMD Performance Materials Corp., an Affiliate of Merck KGaA		6541C
AZ 1518-SFD Photoresist	EMD Performance Materials Corp., an Affiliate of Merck KGaA		6561
AZ 300 MIF Developer	EMD Performance Materials Corp., an Affiliate of Merck KGaA		6598
AZ 726 MIF Developer	EMD Performance Materials Corp., an Affiliate of Merck KGaA		6599
AZ Aquatar Coating	EMD Performance Materials Corp., an Affiliate of Merck KGaA		6596
AZ EBR Solvent	EMD Performance Materials Corp., an Affiliate of Merck KGaA		6569C
AZ Exp. AQUARISTI-III45	EMD Performance Materials Corp., an Affiliate of Merck KGaA		
AZ MIR 703-DS Photoresist 25cps	EMD Performance Materials Corp., an Affiliate of Merck KGaA		6597
AZ MIR-900 (60CP) Resist	EMD Performance Materials Corp., an Affiliate of Merck KGaA		6606
Badger Multi-Purpose ABC Dry Chemical (Fire Extinguis	Badger Fire Protection, Inc.	90% MAP, Ammonium Phosphate, Monoammonium Ph	
Boron Reagent	General Electric Company		FAC
Boron Reagent	General Electric Company		FAC
BORON TRICHLORIDE	MATHESON TRI-GAS, INC.	MTG MSDS 8; BORON CHLORIDE; CHLORURE DE BORE; 6718A, 6775	
BORON TRIFLUORIDE, ADSORBED	Entegris, Inc.	TRIFLUOROBORANE; BORON FLUORIDE; BORON FLUOF	6756
Braycote 600 EF	BP America		
Buffer solution pH 4 red coloured	VWR International, LLC		FAC
Buffer, pH 2.00	COLUMBUS CHEMICAL INDUSTRIES, INC.		FAC
Buffer, Reference Standard, pH 0.50	Ricca Chemical Company	1485-1, 1485-16, 1485-32	FAC
Buffered Ammonium Persulfate	General Electric Company	Buffered Ammonium Persulfate Solution	FAC
Buffered Ammonium Persulfate Solution	General Electric Company	Analytical reagent	
BUFFERED ETCH 15:1 W/OHS; SEMI GRADE	FUJIFILM U.S.A.	Ammonium hydrogen fluoride solution	6545
BUFFERED ETCH 6:1 W/OHS; SEMI GRADE	FUJIFILM U.S.A.	Ammonium hydrogen fluoride solution	6570
BUFFERED ETCH 9:2 w/OHS; CPG grade	FUJIFILM U.S.A.	Ammonium hydrogen fluoride solution	6555
Calcium Chloride Solution	NorthStar Chemicals, Inc.		
Carbon Dioxide	Praxair, Inc.	Medipure Carbon Dioxide, Industrial: analytical, lasers; sr	6776
Cellite 209	CELITE CORPORATION	Natural Diatomaceous Earth	FAC
Chloride Reagent	Taylor Technologies, Inc.		FAC
Chlorine	Linde Industrial Gases U.S.	Bertholite; Molecular Chlorine	6734C

Chromate Indicator	Taylor Technologies, Inc.		
CHROMIUM TRIOXIDE	Avantor Performance Materials		6521
Citric Acid	Hach Company	2-Hydroxy-1,2,3-Propanetricarboxylic Acid	FAC
Citric Acid F Reagent	Hach Company		FAC
CLR Calcium, Lime & Rust Remover	JELMAR	Aqueous Acidic Cleaner for Removal of Calcium, Lime, a	FAC
CONTEMPO COFFEE & TEA SOLUTION	Spartan Chemical Company, Inc.	Carpet cleaner	
COTTON FRESH MB3000	Interline Brands Inc		
Crew Clinging Toilet Bowl Cleaner	Sealed Air Corporation		
CUPRIC NITRATE	Avantor Performance Materials		
CURTAIL Herbicide	The Dow Chemical Company		FAC
Delineation Etch/TFA (Reveal)	Colonial Metals, Inc.	2,2,2-Trifluoroacetamide, TFA 2,2,2-Trifluoroacetamide,	
DIBORANE (<1%) In HYDROGEN	Linde Industrial Gases U.S.		6744C
DIBORANE (1.6-<8%) In ARGON, HELIUM, or NITROGE	Linde Industrial Gases U.S.		6736C
Dichlorosilane	Praxair, Inc.		6707, 6764H
DILUTE HYDROFLUORIC ACID 100:1; SEMI GRADE	FUJIFILM U.S.A.	Hydrogen fluoride; fluorohydric acid	6580
DOUBLE PLAY CREME CLEANSER	Sealed Air Corporation	Cleaning product	
DPD Compound for Free and Total Chlorine Analyzers	Hach Company		FAC
DPD Free Chlorine Reagent	Hach Company	Laboratory Use Determination of Free Chlorine	FAC
DPD Total Chlorine Reagent	Hach Company	Laboratory Reagent Indicator for total chlorine	FAC
DRYWALL PRIMER 5-GL	Rust-Oleum Corporation		FAC
Eco-Lyme Descaler (4167-01, 4167-05, 4167-08)	Nu-Calgon	Descaler	FAC
EKC265 Plasmasolv Post-Etch Residue Remover	EKC Technology, Inc.	Post-etch residue remover	6563
Emerel Plus Creme Cleanser	Sealed Air Corporation	Cleaning product	
Envirocide	Metrex Research, LLC	Hard surface cleaner and disinfectant	
EnviroCide	Metrex Research, LLC	Hard surface cleaner and disinfectant	
Epigrade S111 Silicon Source for CVD	NovaMOS Division		
Epigrade XE10 Xenon Source for Etching	Advanced Delivery & Chemical Systems, Ltd.		
Equi-Transferrant 7 pH Buffer for pH Sensor	Hach Company		FAC
Ethanol	Acros Organics BVBA	Ethyl alcohol; Absolute ethanol	
Ethyl Lactate	PHARMCO-AAPER	L-Ethyl Lactate; lactic acid ethyl ester; 2-Hydroxypropan	
ETHYL SILICATE	Sigma-Aldrich Corporation		
Ethylene Glycol	Avantor Performance Materials	1,2-Ethanediol; 1,2-dihydroxyethane; Ethylene alcohol	6603
Ferriin Indicator	Taylor Technologies, Inc.		FAC
FINAL STEP 512 Sanitizer	Diversey	Sanitizer	
Flammable HC POLYCOLD Refrigerant: PT-13, PT-14, P	Brooks Automation	Refrigerant Gas for PCC, CRYOTIGER and AquaTrap Coo	
Fluoride Adjustment Buffer Powder Pillows	Hach Company		FAC
Fluoride Electrolyte	Hach Company		FAC
FLUORIDE REAGENT 3	ABB INC.		FAC
Fluoride Standard Solution 1.00 mg/L as F	Hach Company		FAC
Fluoride Standard Solution 10.0 mg/l as F-	Hach Company		FAC
Fluoride Standard Solution 100 ± 1mg/l as F-	Hach Company		FAC
FLUORIDE, VOLUMETRIC STANDARD, 100 PPM SOLUTI	ABB INC.	FLUORIDE STANDARD, 30 PPM	FAC
FogShield XP	BAUSCH & LOMB		77-7738
FOMBLIN Y-LVAC 25/6	AUSIMONT USA, Inc.	Propene, 1,1,2,3,3,3-hexafluoro, oxidized, polymerized	
Free Chlorine Buffer for CL-17 Analyzer	Hach Company	Laboratory Reagent	FAC
Free Chlorine Indicator Solution for CL-17 Analyzer	Hach Company	Laboratory Reagent Determination of Free Chlorine	FAC
Galden HT 110	Solvay Solexis, Inc.	Propene, 1,1,2,3,3,3-hexafluoro, oxidized, polymerized	
Gallium	PPM Pure Metals GMBH		
General Purpose Spotter	Sealed Air Corporation	Carpet Care	
Germane	Airgas, Inc.	Germane; Monogermane; Germanomethane; Germaniur	
GERMANE (0.1-<12.44%) in HYDROGEN	Linde Industrial Gases U.S.		
G-Force B3 H2O2 Multi-Surface Cleaner	Sealed Air Corporation	Cleaning product	
GLANCE NA Glass & Multi-Purpose Cleaner Non-Amm	Sealed Air Corporation	Cleaning product	
GOJO Green Certified Foam Hand Cleaner	GOJO Industries, Inc.		FAC
GOJO LUXURY FOAM ANTIBACTERIAL HANDWASH	GOJO Industries, Inc.	ANTIBACTERIAL SOAP	FAC
Gold	Tosoh USA, Inc.		
Halocarbon C-318 (Octafluorocyclobutane)	Airgas, Inc.	Cyclobutane, 1,1,2,2,3,3,4,4-octafluoro-; Cyclobutane, oc	6774C
Halocarbon R-116 (Hexafluoroethane)	Airgas, Inc.	Ethane, 1,1,1,2,2,2-hexafluoro-; Ethane, hexafluoro-; Hex	67-6739C
Halocarbon R-14 (Tetrafluoromethane)	Airgas, Inc.	arcton 0; carbon fluoride; f 14; fc 14; freon 14; halon 14;	6738
Halocarbon R-23 (Trifluoromethane)	Airgas, Inc.	Fluoroform; Arcton 1; Fluoryl; Freon F-23; Freon 23; Gen	6741
Halon 1211 (Fire Extinguishing Agent)	Badger Fire Protection, Inc.	Chlorodifluorobromomethane	
HALOTRON I	American Pacific Corporation	HCFC Blend B, Halotron I Pre-Sat Base	
Halotron-1 (Fire Extinguishing Agent with Expellant)	Badger Fire Protection, Inc.	HCFC Blend B, Halocarbon Agent	
Hardness Buffer	Taylor Technologies, Inc.		FAC
Hardness Indicator Powder	Taylor Technologies, Inc.		FAC
Hardness Reagent	Taylor Technologies, Inc.		FAC
Helium	Airgas, Inc.	helium (dot); Helium-4; He; o-Helium; UN 1046	6703
HYDROCHLORIC ACID, 33 - 40%	High Purity Products	Muriatic acid; hydrogen chloride, aqueous	6506

HYDROFLUORIC ACID	High Purity Products	Fluorohydric acid; fluoric acid; Hydrogen fluoride solutio	6503
HYDROFLUORIC ACID 2.5% (20:1)	High Purity Products	Fluorohydric acid; fluoric acid; Hydrogen fluoride solutio	6572
HYDROFLUORIC ACID 5%	High Purity Products	Fluorohydric acid; fluoric acid; Hydrogen fluoride solutio	6501
Hydrogen (Refrigerated)	Air Products and Chemicals, Inc.	Hydrogen (refrigerated), Cryogenic Liquid Hydrogen, Lic FAC	
Hydrogen Bromide	Linde Industrial Gases U.S.	Anhydrous Hydrobromic Acid; Hydrogen Bromide, anhyd	6747
Hydrogen Chloride	Linde Industrial Gases U.S.	Hydrochloric Acid; Anhydrous Hydrochloric Acid; Hydroc	6711
Hydrogen Chloride (0.0001% - 0.02%) in Nitrogen	AIR LIQUIDE AMERICA CORPORATION		67-6711
HYDROGEN PEROXIDE 30%	High Purity Products	Peroxide; 100 volume peroxide; Hydrogen dioxide soluti	6509
Inland TW	INLAND VACUUM INDUSTRIES	Lubricating Oil	
Iodide Iodate Reagent	Taylor Technologies, Inc.		
Iodine	Avantor Performance Materials		
ISHINE	Spartan Chemical Company, Inc.	Floor Finish	
Isopropyl Alcohol (90 - 100%)	High Purity Products	2-Propanol; sec-propyl alcohol; isopropanol; sec-propan	6512
KL 1000 Powder Membrane Cleaner	King Lee Technologies		N/A
KL 2000 Powder Membrane Cleaner	King Lee Technologies		N/A
KL Silica	King Lee Technologies		N/A
KLEBOSOL 1501-50	EMD Performance Materials Corp., an / Polishing agent for surfaces		71-8000
Kolorsafe Liquid Acid Neutralizer	NPS Corporation		71-7210
Kolorsafe Liquid Base Neutralizer	NPS Corporation		71-7209
Liquichlor 10-16% (Sodium Hypochlorite 10-16%)	UNIVAR USA, INC.		
Liquid Scour Cleanser	Interline Brands Inc	Creme Cleanser	
MAE 12	High Purity Products	Mixed Acid Etch 12	
MEGAPOSIT SPR 3617M POSITIVE PHOTORESIST	The Dow Chemical Company		6582
Mercuric Nitrate Titrating Solution	Taylor Technologies, Inc.		
MERCURY	Avantor Performance Materials		
Meropa 68, 100, 150, 220, 320, 460, 680, 1000, 1500	Chevron Corporation	Meropa 68, 100, 150, 220, 320, 460, 680 ISOCLEAN Cert FAC	
Methane	Air Liquide Canada Inc.	Methane or natural gas but excluding refrigerated liqui	
Methanol	ALFA AESAR		
Methyl Fluoride (Refrigerant Gas R41)	Praxair, Inc.	Fluoromethane (R41)	6759
m-HPC Broth	MilliporeSigma Corporation	Aqueous solution containing Glycerol, Gelatins, and Pep	
Mixed Poly Etch 40:1:2:20	FUJIFILM U.S.A.		6575
MOBILITH SHC 220	Exxon Mobil Corporation	MOBILITH SHC 220 ELECTROLUBER, Synthetic Base Stoc	
Molybdate 3 Reagent for Silica	Hach Company		FAC
Molybdate Reagent	Hach Company	Molybdate (MoO4 <sup>2-</sup> ), disodium	FAC
Molybdate Reagent for Silica	Hach Company	Molybdate (MoO4 <sup>2-</sup> ), disodium	FAC
Morning Mist Neutral Disinfectant Cleaner	Sealed Air Corporation	Disinfectant Cleaner	
MPO 10	DUBOIS CHEMICALS, INC.		
NITRIC ACID, 50-70%	High Purity Products	Aqua Fortis; Azotic Acid; Nitric Acid 50%; Nitric Acid 65%	6510
Nitrogen	Airgas, Inc.	nitrogen (dot); nitrogen gas; Nitrogen NF, Nitrogen FG	6706, 6762
Nitrogen (Refrigerated)	Air Products and Chemicals, Inc.	Nitrogen (refrigerated), Liquid Nitrogen, LIN, Cryogenic	67-6762, 67-6706
Nitrogen trifluoride	Air Liquide UK Ltd.		6749
Nitrous oxide	Versum Materials US, LLC		FAC
Non - Flammable Gas Mixture Containing One or More AIR LIQUIDE AMERICA CORPORATION	AIR LIQUIDE AMERICA CORPORATION	10048981, 10049056, 10125948, 10125948, 10150609,	
NON-FLAMMABLE GAS MIXTURE Containing One or M AIR LIQUIDE AMERICA CORPORATION	AIR LIQUIDE AMERICA CORPORATION	Calibration of Monitoring and Research Equipment	6769
NON-FLAMMABLE GAS MIXTURE Containing One or M AIR LIQUIDE AMERICA CORPORATION	AIR LIQUIDE AMERICA CORPORATION		
NON-FLAMMABLE GAS MIXTURE Containing One or M AIR LIQUIDE AMERICA CORPORATION	AIR LIQUIDE AMERICA CORPORATION		
Nonflammable Gas Mixture: Helium 1-99% / Nitrogen	Airgas, Inc.	Purge Gas	6766
Nonflammable Gas Mixture: Helium 78.5-99% / Oxygen	Airgas, Inc.		6751
Nonflammable Gas Mixture: Helium 80.51-99% / Oxygen	Airgas, Inc.		6755
Nonflammable Gas Mixture: Hydrogen 0.1-5.5% / Nitro	Airgas, Inc.		67-6733C
Optics Cleaning Mixture L	Carl Zeiss Jena GmbH		
OXONIA ACTIVE	Ecolab Inc.		FAC
Oxygen (Refrigerated)	Air Products and Chemicals, Inc.	Oxygen (refrigerated), Oxygen USP, LOX, Cryogenic Liqu	
Oxygen (Refrigerated)	Air Products and Chemicals, Inc.	Oxygen (refrigerated), Oxygen USP, LOX, Cryogenic Liqu	67-6702
Pad Etch 1 NP with Surfactant	KMG ELECTRONIC CHEMICALS INC		
PERdiem 58 General Purpose Cleaner with Hydrogen Pero	Sealed Air Corporation	Cleaning product	65-6509
PERdiem General Purpose Cleaner with Hydrogen Pero	Sealed Air Corporation	Cleaning product	
Phosphine	Praxair, Inc.	Industrial use. Use as directed.	6745
PHOSPHINE (1%) in HYDROGEN	Linde Industrial Gases U.S.		6760
PHOSPHINE, ADSORBED	Entegris, Inc.	HYDROGEN PHOSPHIDE; PHOSPHORUS TRIHYDRIDE	
PHOSPHORIC ACID	High Purity Products	Ortho-phosphoric acid; white phosphoric acid	6502
Phosphoric Acid 45%	General Electric Company	Analytical reagent	
Platinum Deposition	Colonial Metals, Inc.	Trimethyl [(1,2,3,4,5-ETA.)-1 Methyl 2, 4-Cyclopentadien	
POCL3	Versum Materials US, LLC	Phosphorus oxychloride; Phosphoryl trichloride; Phosphi	6303
Porphyrin 1 Reagent	Hach Company		FAC
Porphyrin 2 Reagent	Hach Company	Dithionous acid, disodium salt	FAC
Potassium Chloride 3.5 Molar Solution	AQUA SOLUTIONS, INC.		
Potassium Hydroxide, Pellets	Avantor Performance Materials		6515

Potassium iodide	Avantor Performance Materials		
Potassium Permanganate Solution 1.0 g/l	Hach Company		FAC
ProClassic Waterborne Interior Acrylic Semi-Gloss Enam	THE SHERWIN-WILLIAMS COMPANY		
PROPYLENE GLYCOL METHYL ETHER ACETATE	SPECTRUM LABORATORY PRODUCTS	1-Methoxy-2-acetoxypropane, 1-Methoxy-2-propyl ace	
PSR 200 POST SOLVENT RINSE	Entegris, Inc.	semiconductor manufacture	6602
PURELL Instant Hand Sanitizer	GOJO Industries, Inc.		77-7795
Raindance SC Low Foam Neutral Floor Cleaner	Sealed Air Corporation	Neutral cleaner	
REFRON -134a	Refron Inc	1,1,1,2-Tetrafluoroethane	
Renown Pink Hand Soap	Interline Brands Inc	Skin-care	FAC
Renown Waterbased Stainless Steel Cleaner	Interline Brands Inc		FAC
RoQuest 6000	Avista Technologies Inc		
Schimmel Etch	KMG ELECTRONIC CHEMICALS INC		
SILANE	MATHESON TRI-GAS, INC.	MTG MSDS 78; MONOSILANE (SIH4); SILICANE; SILICON	6704C
Silica 3 Reagent	Hach Company	Sulfurous acid, disodium salt	FAC
Silica Standard Solution 500 µg/l as SiO2	Hach Company		FAC
Simple Green	Sunshine Makers, Inc.	Cleaner & Degreaser for water tolerant surfaces	
SMS-2070-C	Copper Harbor Company, Inc.	Non-Aqueous Organic Solvent Blend	6562
Sodium Carbonate Solution	General Electric Company		
Sodium Hydroxide Standard Solution 0.01 N	Hach Company		FAC
SODIUM HYDROXIDE, Silica Monitor wash solution	Scientific Instruments		FAC
Spray Buff	Interline Brands Inc		
SRS-100	High Purity Products		6607
ST-200 PLASMA RESIDUE REMOVER	ATMI, INC.	cleaner	6594
Stride Citrus SC 3 Neutral Cleaner	Sealed Air Corporation	Neutral cleaner	
Sucrose Solutions	General Electric Company	Reference Standard, STD 92060, STD 92070, STD 92080,	
Sulfamic Acid	Hach Company		FAC
Sulfite 1 Reagent	Hach Company		FAC
Sulfite 3 Reagent	Hach Company		FAC
Sulfur Dioxide in Nitrogen	AIR LIQUIDE AMERICA CORPORATION		
SULFUR HEXAFLUORIDE	MATHESON TRI-GAS, INC.	MTG MSDS 81; SULFUR FLUORIDE; SULPHUR HEXAFLUC	6720
SULFURIC ACID, 52 - 100 %	High Purity Products	Oil of vitriol; Babcock acid; sulphuric acid	6508, 6508C
SUPER Q ETCH W/OHS, PPB GRADE	FUJIFILM U.S.A.		6583
SYNFILM 68	ROYAL PURPLE, INC.		FAC
TDMR-AR65 HP	Tokyo Ohka Kogyo America, Inc.	Photoresist	6586
TDMR-AR87 LB	Tokyo Ohka Kogyo America, Inc.	Photoresist, TDMR-AR87 LB (B)	6600
TDMR-AR87 LB 25cP	Tokyo Ohka Kogyo America, Inc.	Photoresist	65-6600
TDMR-AR89 LB	Tokyo Ohka Kogyo America, Inc.	Photoresist	
TEOS	Versum Materials US, LLC	Ethyl Silicate; Tetraethoxysilane; Tetraethyl Silicate	6592
THERMEXE HEAT TRANSFER FLUID	Accurate Gas Control Systems Inc	All proper and legal purposes, propylene glycol	6535
THMR-IP5700 HP	Tokyo Ohka Kogyo America, Inc.	Photoresist	
THMR-IP5720 HP	Tokyo Ohka Kogyo America, Inc.	Photoresist	6584
Trane Oil 22	TRANE U.S. INC.		FAC
Trans-LC	Versum Materials US, LLC	trans-1,2-dichloroethylene; trans-dichloroethylene acety	6564
Trichlorosilane	Linde Industrial Gases U.S.	Silicochloroform; Trichloromonosilane	6743
Trifluoroacetamide	Sigma-Aldrich Corporation	Delineation Etch/TFA (Reveal)	
TRISTAR 8.5 SL	Nufarm Americas Inc.	Acetamiprid	
TRITON CF-10 (90% ACTIVES) SURFACTANT	Dow Chemical Canada ULC		
TSCR-110i 15 LB	Tokyo Ohka Kogyo America, Inc.	Photoresist	6587
TUNGSTEN HEXAFLUORIDE	MATHESON TRI-GAS, INC.	Industrial and Specialty Gas Applications.	6758
Ultra-Sol 550L	EMINESS Technologies, Inc.		71-7115
UniVer 3 Hardness Reagent	Hach Company		FAC
Virex II 256 One-Step Disinfectant Cleaner and Deodor	Sealed Air Corporation	Disinfectant	
Vitec 1400	Avista Technologies Inc	Organic Amine salt	FAC
Vitec 3000	Avista Technologies Inc	Organo-phosphorous compounds	FAC
Vitec 4000	Avista Technologies Inc	Organic Acid, terpolymer	FAC
WATER (REAGENT WATER, Rw)	General Electric Company	90017, 90018, 90019, 90020, 90022, 90023, 90025, 9002	
WD-40 Smart Straw Aerosol	WD-40 Company		FAC
Wright Etch	High Purity Products	An aqueous, acidic solution	
Xenon	Praxair, Inc.		6757
Xenon difluoride	Thermo Fisher Scientific	Xenon fluoride	
XYLENES	Avantor Performance Materials		