APPLICANT'S NAME: NORTHROP GRUMMAN SPACE & MISSIONS SYSTEMS

FACILITY PERMIT ID# 800408

CONTACT PERSON: RON FRAZER

MAILING ADDRESS: ONE SPACE PARK
BUILDING CS1/1800
REDONDO BEACH, CA 90278

EQUIPMENT ADDRESS: 1700 ROSECRANS AVE., BLDG D1
MANHATTAN BEACH, CA 90266

Title V/RECLAIM Permit Revision:
Application No. XXXXXX

PERMIT TO OPERATE
CHANGE OF CONDITION

Equipment Description: (Previous 441114)

PROCESS 9: BPL LAB
SYSTEM #3 Wet Chemical Processing

Equipment	Device ID	Connected To	Source Type/ Monitoring Unit	Emissions	Equipment Specific Conditions
BENCH, ETCHING STATION, WITH FOUR SINKS, HEIGHT: 5FT 10IN; LENGTH: 6FT; WIDTH: 7FT 10IN Reference A/N ~~441114~~ 474046	D440	C6			B59.20
BENCH, POLISHING STATION, WITH FOUR SINKS, HEIGHT: 5FT 10IN; LENGTH: 8FT; WIDTH: 7FT 10IN Reference A/N ~~441114~~ 474046	D441	C6			59.20, C1.29
BENCH, WET PROCESS STATION, WITH TWO SINKS, HEIGHT: 5FT 10IN; LENGTH: 8FT; WIDTH: 7FT 10IN Reference A/N ~~441114~~ 474046	D442	C6			59.20
BENCH, PLATING STATIONS #1 & #2, WITH A 10 VOLT, 3 AMPERE RECTIFIER, HEIGHT: 5FT 10IN; LENGTH: 8FT; WIDTH: 7FT 10IN Reference A/N ~~441114~~ 474046	D439	C6			~~59.20~~ B59.64

B59.20 The operator shall not use the following materials in this device:

Toxic air contaminants in table one of rule 1401 with a listing date of 3/4/05 or earlier except hydrochloric acid, hexavalent chrome, hydrofluoric acid, nickel sulfamate, nitric acid, and phosphoric acid.

B59.64 The operator shall not use the following materials in this device:

Toxic air contaminants in table one of rule 1401 with a listing date of 3/4/05 or earlier except hydrochloric acid, hexavalent chrome, hydrofluoric acid, nickel sulfamate, nitric acid, phosphoric acid, sulfuric acid, copper and copper sulfate.

C1.29 The operator shall limit the material processed to no more than 27 lbs in any one month

For the purpose of this condition, material process shall be defined as potassium dichromate added to batch.

Background

Northrop filed application 474046 on September 26, 2007 as a change of condition to include chemicals used in copper plating to condition no. B59.20 applicable to devices in Process 9, system 3. Currently condition B59.20 limits materials used in this process to hydrochloric acid, hexavalent chrome, hydrofluoric acid, nickel sulfamate, nitric acid, and phosphoric acid. However, it was later determined that Northrop needed to add copper plating to D439 only. This would impact condition B59.20 as it applies to device D439 by adding a new condition listing sulfuric acid, copper and copper sulfate to the exception of 1401 compounds.

This is a RECLAIM Cycle 1 title V facility. The proposed project is considered as a "de minimus" significant permit revision to this facility's title V permit.

The facility has had no citizen complaints filed or Notices to Comply issued in the last two years. However, the facility was issued a Notice of Violation on 11/8/2006 for failure to submit 3rd quarter, cycle 1 RECLAIM emission report in a timely manner. The facility is currently operating in compliance with all applicable rules and regulations.

Process Description:

Wet Chemical Process:

The wet chemical process consists of one wet process plating station (D439), one Au-Ti etching station (D440), one wet process polish station (D441), and one wet process station (D442). The wet process plating station is used to metal plate the wafers. The sinks in the etching bench are supplied with a lid that covers the open surface area while

the sink is not in use. The wet process stations are used for the removal of oxides and the etching of Au-Ti from wafers during the wafer production process.

Emissions Calculations:

A/N 474046 (Prev. 441114)

Wet Chemical Process:

The sinks are slightly heated to 25 degrees C in this process, they are not air agitated and the plating tank is rectified with a 3amp 10v rectifier. The dilution ratio is such that the vapor pressure from these acids would be negligible. The emission estimates submitted by the applicant are based on a 10% loss which would be acceptable. TRW had performed testing using acetone to determine emission losses. The evaporative losses were determined to be about 10%. Since the acids are diluted, the vapor pressures would be less than that of acetone. Any emissions that did occur would be controlled by a scrubber which would satisfy any BACT requirements.

C6 has a packing bed of 4ft deep. The actual control efficiency should be in excess of 95%. The applicant has used 90% which is a conservative estimate.

The emissions from the current operation were calculated and accounted for under the previous application. The only new emissions that will be added to this line are due the use of copper, copper sulfate and sulfuric acid due to the addition of copper plating in device D439.

The plating operation in D439 utilizes a 3 amp maximum capacity rectifier. The plating operation PM equation is:

R1 = (0.505)(w)(100-N)
R1 = mp/amp-hr
w = weight fraction of dissolved chemical
N = plating efficiency, Worst case N = 0

Materials used in the copper plating operation:
Copper plating solution (copper sulfate/sulfuric acid solution)
Hydrochloric acid
Technic FB brightener
Copper anode
Plating solution temperature = 100 oF

Emissions Calculated from the attached Open Process Tank form.
PM emissions;

R1 = 0.000105 lbs/hr
R2 = 0.0000105 lbs/hr

RISK Assessment:

The addition of copper, copper sulfate or sulfuric acid will not pose a significant increase in risk. The emissions are less than the Tier 1 screening emission levels. Compliance is expected.

RULE EVALUATION

Rule 212 (c)(1):This section requires a public notice for all new or modified permit units that emit air contaminants located within 1,000 feet from the outer boundary of a school.

No public notice is required since no school is located within 1,000 ft from the above site.

Rule 212 (c)(2):This section requires a public notice for all new or modified facilities that have on-site emission increases exceeding any of the daily maximums as specified by Rule 212(g).

The proposed project will result in a small emission increase for the entire facility. A Rule 212(c) (2) notice will not be triggered since the emission increase is below the daily maximum specified in Rule 212(g).

Rule 212(c)(3):This section requires a public notice for all new or modified permit unit with increases in emissions of toxic air contaminants listed in Table I of Rule 1401 resulting in MICR greater than 1E-6 per permit unit or greater than 10E-6 per facility.

The proposed project will not result in an emission increase of toxic emissions in excess of a Acute Hazard index of 1.0 nor will there be an increase MICR in excess of one in a million. Therefore Public Notice is not required under this section of the rule.

Rule 212(g): This section requires a public notice for all new or modified sources that result in emission increases exceeding any of the daily maximums as specified by Rule 212(g).

The emission increase due to the operation of this equipment is negligible and the following summarizes the emission increase:

	Maximum Daily Emissions					
	ROG	NO_x	PM_{10}	SO_2	CO	Pb
Emission increase	0	0	0	0	0	0
MAX Limit (lb/day)	**30**	**40**	**30**	**60**	**220**	**3**
Compliance Status	Yes	Yes	Yes	Yes	Yes	Yes

No public notice is required since the emission increase is below the thresholds.

Rule 401: With the proper maintenance and operation of this equipment, compliance with this rule is expected.

Rule 402: With proper maintenance and operation, this equipment is not expected to create a nuisance.

Rule 1303(a):The emissions from this system including the copper plating operation are vented to a scrubber which will satisfy the BACT requirements for this type of operation. Compliance with BACT is achieved.

Rules 1303(b)(1) modeling:
The PM emissions from this operation are well below the Appendix A Screening value of 0.41 lbs/hr. Compliance is expected.

Rule 1303(b)(2) Offsets:
No offsets are required for this operation. The PM emissions are negligible.

Rule 1303(b)(4): The facility is expected to be in full compliance with all applicable rules and regulations of the District.

Rule 1401: The change in the equipment operation will cause an emission increase of copper and sulfuric acid but will not exceed the Tier 1 screening emission levels. The equipment will be conditioned such that copper, copper compounds and sulfuric acid are added to the exception of toxic compounds allowed to be used. Compliance with this rule is expected.

RULE 2005: Northrop Grumman is a NOx RECLAIM facility. The proposed project will not result in an increase in NOx emissions. Compliance with rule is expected.

REGULATION XXX:

This facility is in the RECLAIM program. The proposed project is considered as a "de minimis significant permit revision" for non-RECLAIM pollutants to the RECLAIM/Title V permit for this facility.

Non-RECLAIM Pollutants or HAPs

Rule 3000(b)(6) defines a "de minimis significant permit revision" as any Title V permit revision where the cumulative emission increases of non-RECLAIM pollutants or HAPs from these permit revisions during the term of the permit are not greater than any of the following emission threshold levels:

Air Contaminant	Daily Maximum (lbs/day)
HAP	30
VOC	30
NOx*	40
PM_{10}	30
SOx*	60
CO	220

* Not applicable if this is a RECLAIM pollutant

To determine if a project is considered as a "de minimis significant permit revision" for non-RECLAIM pollutants or HAPs, emission increases for non-RECLAIM pollutants or HAPs resulting from all permit revisions that are made after the issuance of the Title V renewal permit shall be accumulated and compared to the above threshold levels. This proposed project is the 6th permit revision to the Title V renewal permit issued to this facility on July 9, 2006. The following table summarizes the cumulative emission increases resulting from all permit revisions since the Title V renewal permit was issued:

Revision	HAP	VOC	NOx*	PM10	SOx	CO
Previous Permit Revision Total Cummulative to date. Title V permit renewed July 9, 2006	0	0	1	5	0	1
6th revision by adding copper, copper sulfate and sulfuric acid to the list of materials used in D439	0	0	0	0	0	0
Cumulative Total	0	0	1*	5	0	1
Maximum Daily	30	30	40*	30	60	220

* RECLAIM pollutant, not subject to emission accumulation requirements

Since the cumulative emission increases resulting from all permit revisions are not greater than any of the emission threshold levels, this proposed project is considered as a "de minimis significant permit revision" for non-RECLAIM pollutants or HAPs.

RECOMMENDATION

The proposed project is expected to comply with all applicable District Rules and Regulations. Since the proposed project is considered as a "de minimis significant permit revision" for non-RECLAIM pollutants, it is exempt from the public participation requirements under Rule 3006 (b). A proposed permit incorporating this permit revision will be submitted to EPA for a 45-day review pursuant to Rule 3003(j). If EPA does not raise any objections within the review period, a revised Title V permit will be issued to this facility.

Conclusion:

This equipment will operate in compliance with all District Rule and Regulations. A Permit to Operate is recommended for application number 474046 subject to preceding conditions.