Michigan Department of Environmental Quality
Air Quality Division

State Registration Number

B2644

RENEWABLE OPERATING PERMIT STAFF REPORT

ROP Number

MI-ROP-B2644-2011

Hemlock Semiconductor Corporation

and

Praxair, Inc.

SRN: B2644

Located at

12334 Geddes Road, Hemlock, Saginaw County, Michigan 48626-0080

Permit Number: MI-ROP-B2644-2011

Staff Report Date: January 31, 2011

This Staff Report is published in accordance with Sections 5506 and 5511 of Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451). Specifically, Rule 214(1) requires that the Michigan Department of Natural Resources and Environment (MDNRE), Air Quality Division (AQD), prepare a report that sets forth the factual basis for the terms and conditions of the Renewable Operating Permit (ROP).

TABLE OF CONTENTS

1/31/2011 DRAFT ROP STAFF REPORT

Purpose

Major stationary sources of air pollutants, and some non-major sources, are required to obtain and operate in compliance with a ROP pursuant to Title V of the federal Clean Air Act of 1990 and Michigan's Administrative Rules for air pollution control pursuant to Section 5506(1) of Act 451. Sources subject to the ROP program are defined by criteria in Rule 211(1). The ROP is intended to simplify and clarify a stationary source's applicable requirements and compliance with them by consolidating all state and federal air quality requirements into one document.

This report, as required by Rule 214(1), sets forth the applicable requirements and factual basis for the draft permit terms and conditions including citations of the underlying applicable requirements, an explanation of any equivalent requirements included in the draft permit pursuant to Rule 212(5), and any determination made pursuant to Rule 213(6)(a)(ii) regarding requirements that are not applicable to the stationary source.

General Information

Stationary Source Mailing Address:	Hemlock Semiconductor Corporation 12334 Geddes Road Hemlock, Michigan 48626-0080
Source Registration Number (SRN):	B2644
North American Industry Classification System (NAICS) Code:	331419
Number of Stationary Source Sections:	2
Is Application for a Renewal or Initial Issuance?	Renewal
Application Number:	201000016
Responsible Official:	Section 1 Mr. James B. Cross, Site Manager (989) 301-5520 Section 2 Mr. Sean Durbin, Vice President (716) 879-7065
AQD Contact:	Ms. Kathy L. Brewer, EQA (989) 894-6214
Date Permit Application Received:	March 8, 2010
Date Application Was Administratively Complete:	March 8, 2010
Is Application Shield In Effect?	Yes
Date Public Comment Begins:	
Deadline for Public Comment:	

Source Description

Hemlock Semiconductor Corporation (HSC), located at 12334 Geddes Road, Hemlock, Michigan, produces a variety of high purity polycrystalline silicon for semiconductor and photovoltaic manufacturers. Section 1 of the ROP covers the HSC operations in Hemlock, Michigan. Section 2 of the ROP was established for the Praxair Inc. operations located at the HSC Hemlock site. Praxair Inc., produces hydrogen and nitrogen for use at HSC.

The HSC site operates several chemical vapor deposition vessels where chlorosilanes are converted to polycrystalline silicon in a batch process operated under high temperature conditions. The polycrystalline silicon manufacturing process includes raw material storage, polycrystalline silicon production, and silane and chloride recovery. A majority of the process exhaust associated with the production of polycrystalline silicon is recovered for reuse or sale via vent vapor recovery systems. Process exhaust which cannot be recovered is vented to the caustic scrubber associated with each vapor recovery system.

HSC uses nitric acid and hydrofluoric acid for etching and washing of silicon. Caustic scrubbers are used to control emission from the etching and washing activities. Emissions from material handling of hydrofluoric acid are also controlled by a caustic scrubber.

HSC operates two natural gas fired boilers with a heat capacity of 90 MM Btu/hr, each controlled by a low nitrogen oxide burner, that provide steam for process heat. Several smaller steam and hot water boilers and natural gas fired process heaters throughout the site provide additional process heat for a variety of production activities.

The HSC facility has hydrochloric acid (HCL) stored on-site. The chlorosilanes used at the HSC facility become hydrochloric acid (HCL) upon contact with air. Only small amounts of HCL are released during normal processing but there is the potential for larger releases due to leaks and upset conditions.

Some maintenance performed on site generates emissions from parts cleaners, sandblasting, and painting.

The Praxair, Inc., plant produces gaseous hydrogen from natural gas feedstock by the steam methane reforming process. A cryogenic air separation plant produces gaseous nitrogen.

The following table lists stationary source emission information as reported to the Michigan Air Emissions Reporting System in the 2009 submittal.

TOTAL STATIONARY SOURCE EMISSIONS

Pollutant	Tons per Year
Carbon Monoxide (CO)	34
Lead (Pb)	0
Nitrogen Oxides (NO_x)	37
Particulate Matter (PM)	5
Sulfur Dioxide (SO_2)	0.2
Volatile Organic Compounds (VOCs)	4.2
Nitric Acid	0.1
Individual Hazardous Air Pollutants (HAPs) **	
Hydrogen Fluoride	0.1
Methanol	0.6
Total Hazardous Air Pollutants (HAPs)	0.7

**As listed pursuant to Section 112(b) of the federal Clean Air Act.

See Parts C and D in the draft ROP for summary tables of all processes at the stationary source that are subject to process-specific emission limits or standards.

Regulatory Analysis

The following is a general description and history of the source. Any determinations of regulatory non-applicability for this source are explained below in the Non-Applicable Requirement part of the Staff Report and identified in Part E of the ROP.

The stationary source is located in Saginaw County, which is currently designated by the U.S. Environmental Protection Agency (USEPA) as attainment/unclassified for all criteria pollutants.

The stationary source is subject to Title 40 of the Code of Federal Regulations (CFR), Part 70, because the potential to emit nitrogen oxides (NOx) exceeds 100 tons per year. The NOx emission potential of over 100 tons per year is generated from the combined emissions of multiple boilers, and, the etching, washing, and polycrystalline silicon manufacturing processes.

The stationary source is not considered a major source of Hazardous Air Pollutant (HAP) emissions because the potential to emit of any single HAP regulated by the federal Clean Air Act, Section 112, is less than 10 tons per year and/or the potential to emit of all HAPs combined is less than 25 tons per year.

No emissions units at the stationary source are currently subject to the Prevention of Significant Deterioration (PSD) regulations of Part 18, Prevention of Significant Deterioration of Air Quality of Act 451, because at the time of New Source Review permitting the potential to emit of each criteria pollutant was less than 100 tons per year. However, modifications to this source may be subject to PSD regulations.

Emissions from the vapor deposition processes are monitored and controlled pursuant to Part 55, Air Pollution Control Rules, Rule 290 (R 336.1290) and the requirements contained in the ROP for Flexible Group FGRULE290

The Praxair methane reformer EUH2PLANT is subject to the Maximum Achievable Control Technology Standards for Chemical Manufacturing Area Sources promulgated in 40 CFR, Part 63, Subparts A and VVVVVV. The site is an existing source with the requirements and associated conditions of MACT VVVVVV applicable starting October 29, 2012.

A caustic scrubber is considered Best Available Control Technology (BACT) for the processes with potential hydrofluoric or nitric acid emissions. The two 90 MM BTU/hr steam boilers are equipped with low NOx burners for control of emissions. “Good combustion practices” are BACT for VOC at the Praxair hydrogen plant/steam methane reformer plant.

The monitoring conditions contained in the ROP are necessary to demonstrate compliance with all applicable requirements and are consistent with the MDNRE’s "Procedure for Evaluating Periodic Monitoring Submittals."

No emission units are subject to the federal Compliance Assurance Monitoring rule under 40 CFR, Part 64, because all emission units at the stationary source either do not have a control device or those with a control device do not have potential pre-control emissions over the major source thresholds.

Please refer to Parts B, C and D in the draft ROP for detailed regulatory citations for the stationary source. Part A contains regulatory citations for general conditions.

Source-wide Permit to Install (PTI)

Rule 214a requires the issuance of a Source-wide PTI within the ROP for conditions established pursuant to Rule 201. All terms and conditions that were initially established in a PTI are identified with a footnote designation in the integrated ROP/PTI document.

The following table lists all individual PTIs that were incorporated into previous ROPs. PTIs issued after the effective date of ROP No. MI-ROP-B2644-2005b are identified in Appendix 6 of the ROP.

PTI Number			
83-04	80-83B	363-06	

Equivalent Requirements

This permit does not include any equivalent requirements pursuant to Rule 212(5). Equivalent requirements are enforceable applicable requirements that are equivalent to the applicable requirements contained in the original PTI, a Consent Order/Judgment, and/or the State Implementation Plan.

Non-applicable Requirements

Part E of the draft ROP lists requirements that are not applicable to this source as determined by the AQD, if any were proposed in the application. These determinations are incorporated into the permit shield provision set forth in Part A (General Conditions 26 through 29) of the draft ROP pursuant to Rule 213(6)(a)(ii).

Processes in Application Not Identified in Draft ROP

The following table lists processes that were included in the ROP application as exempt devices under Rule 212(4). These processes are not subject to any process-specific emission limits or standards in any applicable requirement.

Exempt Emission Unit ID	Description of Exempt Emission Unit	ROP Exemption	PTI Permit Exemption
EUS24001STMBLR	S-24 No. 1, 32 MMBtu/hr steam boiler	R 336.1212(4)(b)	R 336.1282(b)(i)
EUS24002STMBLR	S-24 No. 2, 16 MMBtu/hr steam boiler	R 336.1212(4)(b)	R 336.1282(b)(i)
EUS24003STMBLR	S-24 No. 3, 16 MMBtu/hr steam boiler	R 336.1212(4)(b)	R 336.1282(b)(i)
EUS24004STMBLR	S-24 No. 4, 32 MMBtu/hr steam boiler	R 336.1212(4)(b)	R 336.1282(b)(i)
EUS24005STMBLR	S-24 No. 5, 32 MMBtu/hr steam boiler	R 336.1212(4)(b)	R 336.1282(b)(i)
EUS24HWBLR1	S-24 hot water boiler #1, 8370 MBtu/hr	R 336.1212(4)(b)	R 336.1282(b)(i)
EUS15HWBLR1	S-15 hot water boiler #1, 957 Mbtu/hr	R 336.1212(3)(b)	R 336.1282(b)(i)
EUS15HWBLR2	S-15 hot water boiler #2, 957 Mbtu/hr	R 336.1212(3)(b)	R 336.1282(b)(i)
EUS15HWBLR3	S-15 hot water boiler #3, 957	R 336.1212(4)(b)	R 336.1282(b)(i)

Exempt Emission Unit ID	Description of Exempt Emission Unit	ROP Exemption	PTI Permit Exemption
	Mbtu/hr		
EUFIREDHTR1	STC fired heater 9.2 MMBtu/hr	R 336.1212(4)(b)	R 336.1282(b)(i)
EUFIREDHTR2	H2 fired heater 5.5 MM BTU/hr	R 336.1212(4)(b)	R 336.1282(b)(i)
EUFIREDHTR3	Heat transfer fluid fired heater 10.5 MM Btu/hr	R 336.1212(4)(b)	R 336.1282(b)(i)
EUSANDBLASTING	Sandblast cleaning on nonproduction basis	R 336.1212(4)(a) R 336.1212(3)(f)	R 336.1281(j), R336.1285(l)(vi),

Draft ROP Terms/Conditions Not Agreed to by Applicant

This permit does not contain any terms and/or conditions that the AQD and the applicant did not agree upon pursuant to Rule 214(2).

Compliance Status

The AQD finds that the stationary source is expected to be in compliance with all applicable requirements as of the effective date of this ROP.

Action taken by the DNRE

The AQD proposes to approve this permit. A final decision on the ROP will not be made until the public and affected states have had an opportunity to comment on the AQD's proposed action and draft permit. In addition, the U.S. Environmental Protection Agency (USEPA) is allowed up to 45 days to review the draft permit and related material. The AQD is not required to accept recommendations that are not based on applicable requirements. The delegated decision maker for the AQD is Chris Hare, Saginaw Bay District Supervisor. The final determination for ROP approval/disapproval will be based on the contents of the permit application, a judgment that the stationary source will be able to comply with applicable emission limits and other terms and conditions, and resolution of any objections by the USEPA.

Michigan Department of Environmental Quality
Air Quality Division

State Registration Number
B2644

RENEWABLE OPERATING PERMIT

ROP Number
MI-ROP-B2644-2011

3/9/2011 STAFF REPORT ADDENDUM

Purpose

A Staff Report dated January 31, 2011, was developed in order to set forth the applicable requirements and factual basis for the draft Renewable Operating Permit (ROP) terms and conditions as required by R 336.1214(1). The purpose of this Staff Report Addendum is to summarize any significant comments received on the draft ROP during the 30-day public comment period as described in R 336.1214(3). In addition, this addendum describes any changes to the draft ROP resulting from these pertinent comments.

General Information

Responsible Official:	Section 1 Mr. James B. Cross, Site Manager (989) 301-5520 Section 2 Mr. Sean Durbin, Vice President (716) 879-7065
AQD Contact:	Ms. Kathy L. Brewer, EQA (989) 894-6214

Summary of Pertinent Comments

No pertinent comments were received during the 30-day public comment period.

Changes to the January 31, 2011, Draft ROP

No changes were made to the draft ROP.

Michigan Department of Environmental Quality
Air Quality Division

State Registration Number	RENEWABLE OPERATING PERMIT	ROP Number
B2644		MI-ROP-B2644-2011

4/19/2011 STAFF REPORT ADDENDUM

Purpose

A Staff Report dated January 31, 2011, was developed in order to set forth the applicable requirements and factual basis for the draft Renewable Operating Permit (ROP) terms and conditions as required by R 336.1214(1). The purpose of this Staff Report Addendum is to summarize any significant comments received on the draft ROP during the 45-day EPA comment period as described in R 336.1214(3). In addition, this addendum describes any changes to the proposed ROP resulting from these pertinent comments.

General Information

Responsible Official:	Section 1 Mr. James B. Cross, Site Manager (989) 301-5520 Section 2 Mr. Sean Durbin, Vice President (716) 879-6214
AQD Contact:	Ms. Kathy L. Brewer, EQA (989) 894-6214

Summary of Pertinent Comments

No pertinent comments were received during the 45-day EPA comment period.

Changes to the March 9, 2011 Proposed ROP

No changes were made to the proposed ROP.