

GREEN ENVIRONMENTAL MANAGEMENT SYSTEM (GEMS) PERMIT REVIEW REPORT

for

LSI Logic
23400 NE Glisan Street, M/S R-120, Gresham, OR 97030-8411
(503) 618-4755
Contact: Morgan Rider

FACILITY DESCRIPTION

1. The permittee operates a semiconductor facility at 23400 NE Glisan Street, Gresham, Oregon. The process includes the manufacture of a broad line of application specific integrated circuits (ASIC's), including cell-based ASIC's which integrate random logic, microprocessors, memory and analog functions. The facility has been operating at this location since 1996 and began its first full year of manufacturing in 1998. The permittee currently plans to construct four more fabrication facilities at this address.

REGULATORY STATUS

2. The regulatory status of the permittee is summarized in the following table:

MEDIA PROGRAM	TYPE OF PERMIT/ REGISTRATION	PERMIT/ REGISTRATION NUMBER
Air Quality	Air Contaminant Discharge Permit (ACDP)	26-0027
Water Quality	Local POTW Pretreatment Permit	332 (City of Gresham)
Hazardous Waste	Generator Status ☐ CEG ☐ SQG ☒ LQG	ORQ000004382

ENVIRONMENTAL IMPACTS

3. The facility is located in the Portland-Vancouver Air Quality Management Area (AQMA). The airshed is a designated maintenance area for carbon monoxide and ozone.
4. The facility is located in the Columbia Slough watershed. This basin is water quality limited for chlorophyll a (Spring through Fall), dissolved oxygen (annual), pH (Spring through Fall), phosphorous

(Spring through Fall), DDE, DDT, PCBs, Dieldrin, Lead, and bacteria (Spring through Fall, and Summer).

5. Existing key environmental aspects identified at the facility consist of the following:

Key Aspect	Related Environmental Impacts
Chemical Reduction / Pollution Prevention	Hazardous waste generation and disposal, wastewater discharges, air emissions
Water Conservation	Water use, wastewater discharges
Energy Conservation	Electricity use, natural gas use
Solid Waste Reduction	Solid waste generation and disposal
Transportation/Trip Reduction	Air emissions

CRITERIA FOR ISSUANCE OF A GEMS PERMIT

6. The Department has verified that the permittee has met the tier achievement criteria for the following GEMS Permit elements, as discussed below:
- EMS performance;
 - baseline performance report;
 - performance achievements;
 - performance measures; and
 - stakeholder involvement plan.

Environmental Management System (EMS) Performance

7. The permittee has implemented a robust environmental management system that is certified as meeting the ISO 14001 standard, or meets the purpose or intent of each of the ISO 14001 clauses and supports verification.
8. The following is a summary of the EMS as it was implemented:

EMS ELEMENT	IMPLEMENTATION DATE
Environmental Policy Statement	November 1998
Identification of Environmental Aspects and Impacts	November 1998
Setting Objectives and Targets	November 1998
Structure and Responsibility	February 1999
Training	February 1999
External Communication	November 1999
Monitoring and Measurement	November 1998
Auditing	November 1998
Management Review	February 1999

Certification	June 2000
---------------	-----------

Baseline Performance Report

9. The permittee has submitted a baseline performance report that summarizes:
 - a. Environmental policies affecting the permittee's operations;
 - b. Environmental information regarding significant environmental impacts; and
 - c. The environmental program that will achieve the results anticipated by evaluating the environmental impacts of the permittee's regulated pollutants and setting objectives and targets.
10. The permittee has demonstrated that it has reduced overall environmental impacts in the three (3) year period prior to applying to the GEMS Permit, or, for new facilities, has demonstrated that it has minimized environmental impacts through measures implemented during the design and construction of the facility.

The permittee's baseline year for measuring aggregate environmental performance is 1998 (first full year of manufacturing), and therefore, three years of environmental performance data is unavailable. However, the permittee has tracked environmental impact reductions from specific environmental improvement activities implemented in 1998 and 1999 respectively. These performance results are summarized below:

1998 Performance Results:

- * Chemical Use Reduction: 12,000 gallons
- * Water Use Reduction: 10,000,000 gallons
- * Energy Use Reduction: 4,462,000 kilowatt hours
- * Spent Chemicals Recycling : 25,000 gallons
- * Solid Waste Reduction: 4,400 pounds

1999 Performance Results

- * Chemical Use Reduction: 25,000 gallons
- * Energy Use Reduction: 627,000 kilowatt hours
- * Spent Chemicals Recycling: 51,300 gallons
- * Solid Waste Reduction: 5,575 pounds
- * Solid Waste Recycling: 9,600 pounds

Since there are currently two years of environmental performance data available, a comparison between 1999 performance and the 1998 baseline can be made using data normalized for production. Below is a summary of the percentage reductions-- per unit of production -- in environmental impacts by the permittee between 1998 and 1999:

- * Hazardous Waste = 88% reduction
- * Wastewater = 60% reductions
- * Ultra-Pure Water Use = 79% reduction

- * Chemical Consumption = 62% reduction
- * Electrical Power = 73%
- * Natural Gas Consumption = 56%

The permittee also provided documentation regarding the pollution prevention and resource conservation measures designed into the original construction of its facility and manufacturing equipment. For instance, the permittee acquired and installed equipment that exceeds industry standards for energy and water efficiency .

Performance Achievement

11. The permittee has developed a program that will achieve environmental results that are significantly better than otherwise required by law.

Department staff have reviewed and evaluated the permittee's environmental management system. After implementing a limited number of recommended modifications, the permittee's EMS met the GEMS Achiever criteria. The robust nature of the EMS is exemplified by the designation of environmental management as one of the overall company goals for the facility. As a result of this designation, every section of the permittee's corporate structure must demonstrate its contribution to the environmental goal, and therefore, each employee is evaluated for his or her contribution toward this goal. The institutionalization of environmental goals and objectives ensures a consistent commitment to continual improvement. In addition, it should be noted that the facility achieved ISO 14000 registration in June of 2000, after an April audit by a third party registrar. Regarding specific environmental initiatives, the permittee is currently evaluating the feasibility of installing a water recycling system that will reclaim 90% of manufacturing process wastewater. If implemented, this system could save about 175 million of gallons of water per year.

For GEMS Achiever (Tier II) Permits

12. The permittee has evaluated environmental impacts and set objectives and targets that meet the expectations for a GEMS Achiever (Tier II) Permit and will achieve superior environmental performance for all site-based aspects that have significant impacts, taking into consideration both regulated and unregulated pollutants and other environmental impacts.

Performance Measures

13. The permittee has established performance measures that will be used to explain environmental information in context with past performance.

The permittee maintains metrics to evaluate the effectiveness of its environmental management system (EMS) and the environmental impacts from operations. A comprehensive range of environmental impacts is measured, including those for which objectives and targets have been established. Metrics are updated on a monthly basis and presented to senior management quarterly. Monthly reports are also provided to Corporate Environmental Health and Safety (EHS). Annually, chemical, water, energy and hazardous waste progress is measured by normalizing pollution generation and resource use levels

to production unit (e.g., "X%" reduction in waste per square inch of wafer produced). Additionally, the permittee prepares an annual report to Multnomah County as part of the Strategic Investment Program (SIP) Agreement that provides a summary of our progress towards zero impact on the environment.

Stakeholder Involvement Plan

14. The permittee has developed a stakeholder involvement plan that includes activities that provide for dialogue regarding environmental performance and a mechanism for receiving, considering and responding to comments received. The permittee must:
- Encourage public inquiries and comments regarding the permittee's environmental performance;
 - Provide mechanisms to discuss the environmental policy, annual performance report, environmental aspects and impacts, and establishing of objectives and targets; and
 - Consider the results of the stakeholder involvement in decisionmaking and respond to comments received.

Current and Historical Stakeholder Involvement Activities

On-going Stakeholder involvement activities include participating in community environmental organizations, such as the Columbia Slough Watershed Council and the Fairview Creek Water Conservation Group. These organizations facilitate discussion with active members of the community. As the result of its participation in Multnomah County's Strategic Investment Program, the permittee has shared environmental performance information with the County Commission and the public each year since 1997. This information is included in a report that is distributed to the public. In addition, as a pilot Green Permit facility, the permittee has participated in two public meetings on Green Permits and has engaged various media outlets in a discussion of its EMS and environmental performance. The permittee has been the subject of two Oregonian articles and a segment on Oregon Public Broadcasting radio. Another set of ancillary stakeholder activities relate to the work of the permittee's employee Green Team. This team focuses on pollution prevention, waste reduction, recycling, energy and water conservation, and trip reduction, which are the five significant aspects of LSI's operations. Many of the Green Team's activities include work in the community, such as the "adoption" of Salish Ponds, part of the Fairview Creek Watershed, to help with the watershed restoration over the next three to five years.

Stakeholder Involvement Work Plan

PAST ACTIVITIES

Task	Completion Date
Met with the Gresham Downtown Development Association Board, Greater Gresham Board of Realtors, Mount Hood Community College, Gresham/Troutdale Chamber of Commerce and Gresham City employees to review environmental programs and issues. Also, held an evening public	July, 1995

Community Forum to review environmental issues.	
Presented corporate environmental programs and achievements in public hearings to Multnomah County Commissioners and Portland Development Commission prior to facility construction.	August, 1995
Forwarded DEQ Public Notice for proposed Air Contaminant Discharge Permit and request for comments to local stakeholders.	May 1996
Met with the Gresham Neighborhood Associations to review environmental programs and storm water and road improvements	February 1997
Held open house for neighbors to visit LSI Logic site and to provide opportunity for discussion of issues.	February 1999
Presentated EMS information at local environmental conferences.	Fall 1998 and Spring 1999
Presented EMS information two DEQ sponsored public informational meetings on the Green Permit program	August, 1999
Posted corporate environmental report on internet web site (www.lsillogic.com). Information includes environmental policy, achievements, certifications and email contact.	1995
Sent questionnaire to potential stakeholders to solicit feedback on EMS interest.	September 1999
Met with Key Stakeholders to initiate forum for EMS discussion.	September 2000

ON-GOING AND FUTURE ACTIVITIES

Task	Targeted Completion Date
Participate in Columbia Slough Watershed Council Activities. Opportunity for interested parties to provide information on watershed protection and performance measures.	On-Going
Participate in the meetings and activities of Friends of Fairview Creek.	On-going
Participate with the City of Fairview and SOLV to adopt Salish Ponds for restoration. Project duration expected to be 5 years.	On-Going
Submit annual Strategic Investment Program Report	Annually (first submittal is April 1, 2001)

and Green Permit Report, summarizing performance achievements, EMS assessments, and stakeholder involvement activities.	
Hold monthly Green Team meetings to discuss environmental issues with internal stakeholders	Monthly
Review EMS progress with senior site management.	Quarterly
Track and respond to customer environmental questionnaires	Ongoing
Prepare biannual newsletters to update key external stakeholders on environmental activities.	Biannually (Initiate February 2001)
Update company web site to include basic EMS information and recent environmental performance achievements	January 2001
Meet with local neighborhood associations to present EMS and performance achievement information, and respond to questions or concerns	Periodic (Initiate Spring 2001)
Present EMS and annual environmental performance information to Multnomah County Board of Commissioners as part of Strategic Investment Program activities	Annual (Initiated 1997)

Thus far, the public input provided to the permittee through its stakeholder involvement activities has consisted of clarification questions about environmental impacts and performance improvement plans. Stakeholders have not yet expressed concerns or provided suggestions regarding the permittee's EMS or environmental management activities. The permittee will continue to solicit public input through the planned activities listed above.

NOTIFICATIONS AND REPORTING

15. The annual GEMS update report required in GEMS Permit Condition 3.3 would include:
 - a. Performance achievements, and, if appropriate, a description of any obstacles encountered and how addressed;
 - b. Environmental management system deficiencies and how addressed; and
 - c. Compliance issues and how addressed
 - d. Stakeholder involvement activities, and input received from stakeholders and how addressed;
 - e. Revised objectives and targets for targeted impacts

SPECIAL CONDITIONS – DEPARTMENT COMMITMENTS

Single Point of Contact - GEMS Permit Condition 4.2

16. The Single Point of Contact (SPOC) will act as a facilitator or team leader, keep other Department staff apprised of issues, and facilitate resolution of any environmental issues as quickly as possible in a partnership mode. The SPOC does not have the authority to make decisions regarding regulatory compliance with the GEMS Permit or any other permits issued by the Department, but will facilitate decisions that are made.

Technical Assistance - GEMS Permit Condition 4.3

17. Technical assistance will be available to the permittee from the Department regarding environmental issues and issues associated with the GEMS Permit program.

Enforcement Response - GEMS Permit Condition 4.4

18. See the “Internal Management Directive for Green Environmental Management Systems (GEMS) Permits Enforcement Response”.

Public Recognition – GEMS Permit Condition 4.5

19. The Department will establish a program for recognizing achievements of facilities that have an approved GEMS Permit commensurate with the type of GEMS Permit approved.
20. Permittees with an approved GEMS Permit may promote their achievements in a manner that is commensurate with the type and duration of GEMS permit approved. The GEMS permittee may use the Green Permits program identity only in reference to the facility that has received the Green Permit. The Green Permit program identity may not be used for product labeling.

Maximum Review Time for Permit Applications and Modifications – GEMS Permit Condition 4.6

21. Permit applications and modifications submitted to DEQ by LSI shall be reviewed, processed and sent out for public notice within 120 days of receipt. An exception to this review time frame could be invoked if an NPDES permit application triggers an Endangered Species Act (ESA) review due to the potential impact on fish species in the Columbia River.

Permit Flexibility for Process Changes and Construction – GEMS Permit Condition 4.7

22. This condition applies to Air Contaminant Discharge Permit (ACDP) No. 26-0027. The permittee has applied for, and the Department has approved, the permittee’s request to make changes to specific process lines that affect air emissions levels. This application satisfies the requirement to submit Notice of Construction Forms or permit modification applications to the Department for the approved changes. The permittee is approved to make changes in accordance with the following conditions: the emissions involved cannot exceed the plant site emission limits established in the ACDP. The permittee must notify the Department of these changes in its annual Green Permit performance report. The Department will require permit modifications if changes result in the generation of pollutants that exceed allowable limits established in the ACDP or new pollutants not regulated in the ACDP. The changes involved

must meet a number of additional conditions established in the Green Permit Condition 4.7 and must not violate or contradict any expressed permit condition (not including general conditions) in the ACDP.

Consolidated Reporting – GEMS Permit Condition 4.8

23. In lieu of the annual compliance reporting dates specified in Air Contaminant Discharge Permit No. 26-0027, Condition 20; OAR 340-102-041 of the state hazardous waste regulations, and OAR 340-135-0070(3) of the Toxics Use and Hazardous Waste Reduction Regulations, the permittee must submit data required by these permit conditions and rules with its annual GEMS Update Report on April 1 of each year. All of the information currently collected as part of existing Department reporting requirements must be submitted with this report.

Extended Air Quality Source Testing – GEMS Permit Condition 4.9

24. In lieu Air Contaminant Discharge Permit (ACDP) No. 26-0027, Condition 15, the permittee must submit the results of a source test with the submission of an ACDP permit renewal application. If changes in the type and quantity of air emissions require a permit modification prior to the end of the permit period, the source testing shall occur at the time of the modification.

Storm Water Pollution Prevention Procedures – GEMS Permit Condition 4.10

25. The Department's general 1200-Z NPDES Storm Water Permit provides an exemption from permit requirements for facilities meeting the criteria for "no exposure." A Department technical assistance site evaluation, arranged through the Green Permits Program, determined that the permittee meets these no exposure criteria and, therefore, is exempt from Storm Water permitting requirements. Additional measures to minimize potential contamination of surface waters, beyond the NPDES no exposure criteria, were identified during the Department site evaluation. The permittee must implement the following measures and procedures, and incorporate them into the facility environmental management system:
- Inspect fire pumps and fuel tank storage areas twice daily;
 - Inspect filter cake accumulation area twice daily;
 - Install spill kits at loading dock and fire pumps, with visible markings; and
 - Evaluate, actively control, and monitor chemical use by permittee's landscape contractor.

To fully comply with the NPDES permit requirements, the permittee must complete and sign a certification stating there are no discharges of storm water contaminated by exposure to industrial materials and activities from the entire facility. The permittee must then submit the signed certification to the Department prior to the issuance of this GEMS Achiever Permit and once every five years after the first submittal.

RCRA Subpart BB: Potential EPA Commitments Evaluated for Inclusion in Permit

26. Subpart BB of the Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments (HSWA), establishes regulations that, among other things, apply to equipment that contains or contacts hazardous waste with an organic concentration of at least 10% by weight (40 CFR 265.1050 to 265.1064) and sets out requirements for equipment standards as well as requirements for

monitoring such equipment and detecting and repairing leaks from such equipment. The Environmental Protection Agency (EPA), exercising its HSWA authority where the authorized state has not received authorization for a HSWA regulation, finds that while the permittee's facility does not fully meet the technical provisions of the Subpart BB standards, it is possible that the facility meets and/or exceeds the underlying environmental performance standard of the rule through alternative controls for at least a portion of the facility. Based on this finding, EPA has committed to a further evaluation of the portion of the facility that seems to meet or exceed the underlying environmental performance standard of Subpart BB. If this evaluation confirms that this portion of the facility consistently meets/exceeds the underlying standard of the affected rule without meeting its explicit provisions, EPA may consider undertaking the development and adoption of a site-specific rule that will apply to this portion of the LSI facility.

NATIONAL PERFORMANCE TRACK

27. The permittee has also submitted an application for acceptance as a charter member of EPA's National Performance Track program. This program is similar to DEQ's Green Permits Program in that it offers recognition and other incentives to participating facilities that demonstrate environmental performance that exceeds traditional pollution control requirements.

COST RECOVERY AGREEMENT (OAR 340-014-0165)

28. The permittee must fully reimburse the Department for the Department's invoiced direct and indirect cost for the following:
- a. conducting the review of the permittee's environmental management system and performance achievements;
 - b. negotiating the relevant permit provisions;
 - c. responding to public comment;
 - d. administering the GEMS Permit;
 - e. monitoring compliance with the conditions of the GEMS Permit and environmental outcomes resulting from the GEMS Permit; and
 - f. publicizing and conducting the public hearings.

PUBLIC NOTICE

29. Pursuant to OAR 340-014-045, the proposed GEMS permit was placed on public notice from September 29, 2000 through November 1, 2000. The Department received three inquiries about the permit, but no comments were received by the close of the public comment period.