Exelon Nuclear
Limerick Generating Station
P.O. Box 2300
Sanatoga, PA 19464

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Exelon Nuclear

T.S. 6.9.1.8

April 26, 2002

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Limerick Generating Station, Unit 1 and 2
Facility Operating License Nos. NPF-39 and NPF-85
NRC Docket Nos. 50-352 and 50-353

Subject: 2001 Annual Radioactive Effluent Release Report

Gentlemen:

In accordance with Section 6.9.1.8 of Limerick Generating Station (LGS) Technical Specifications and 10CFR50.36(a), attached are following reports:

-The 2001 Annual Radioactive Effluent Release Report No. 27, for LGS
-The 2001 Annual Tower No. 1 Joint Frequency Distributions of Wind Direction and Speed by Atmospheric Stability Class Report No. 17 for LGS,
-Exelon Nuclear Process Control Program (RW-AA-100, Rev 2, Effective 9/4/01)

If you have any questions or require additional information, please do not hesitate to contact us.

Sincerely,

William Levis
Vice President-LGS

Attachment

cc: H. J. Miller, Administrator, Region I, USNRC
A. L. Burritt, LGS USNRC Senior Resident Inspector
J. C. Jang, Inspector Region I, USNRC

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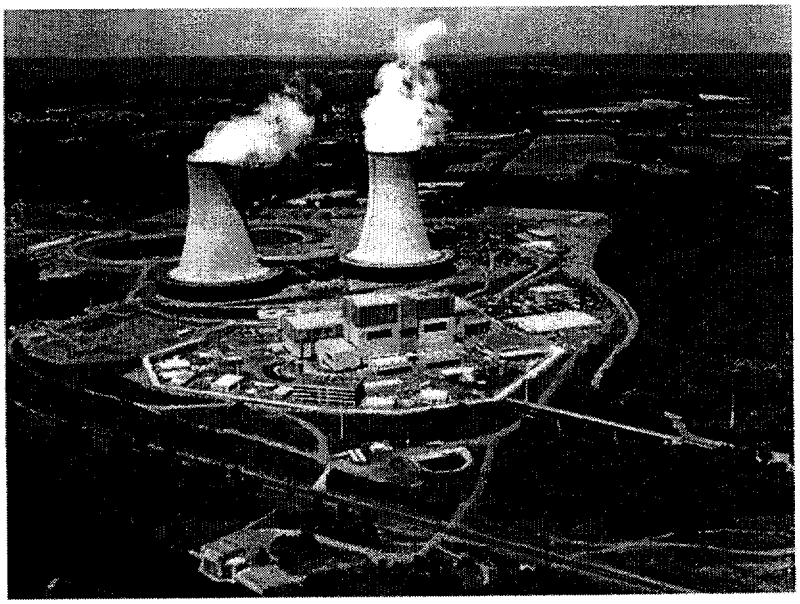

# Annual Radioactive Effluent Release Report

## 2001

## Limerick Generating Station

# ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT
# NO. 27
# January 1, 2001 Through December 31, 2001

## EXELON NUCLEAR

## LIMERICK GENERATING STATION
## UNITS NO. 1 AND 2

DOCKET NO. 50-352 (Unit 1)

DOCKET NO. 50-353 (Unit 2)

Submitted to
The United States Nuclear Regulatory Commission
Pursuant to
Facility Operating License NPF-39 (Unit 1)
and NPF-85 (Unit 2)

TABLE OF CONTENTS

## I. INTRODUCTION

This submittal complies with the format described in Regulatory Guide 1.21, "Measuring, Evaluating and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water Cooled Nuclear Power Plants", Revision 1, June, 1974.

The following information is included as Tables to this report:

- A summary of the gaseous and liquid effluent releases for the report period. Where "0.00E+00" is used, it denotes that no activity was found for analyzed nuclides. All non-natural nuclides reported on the gamma isotopic reports are listed in the tables. Only the non-gamma nuclides listed in the ODCM were analyzed and are reported in the tables. All LLD requirements listed in the ODCM were met. The estimated total errors stated in the gaseous and liquid summation of releases were the values quoted in past reports. The monitor data is analyzed to report noble gas effluent activities. When no activity is found in the Isotopic Analysis, the isotopic mixture is assumed to be that evaluated in the UFSAR (section 11.5, Table 11.5-4). If activity is found in the Isotopic Analysis, the isotopic mixture for the noble gas monitor is determined from the Isotopic Analysis. The reported Noble Gas activities for gaseous releases are higher than actual Noble Gas releases due to a very high natural background of radon. The radon levels can vary by a wide margin from day to day and contribute to the majority of the noble gas monitor response.

- Composite particulate air samples and liquid radwaste composites, counted for beta emitters (e.g. Fe-55, Sr-89, Sr-90) and gross alpha (air samples only), were submitted to an offsite vendor laboratory for analysis. Other required analyses were performed onsite. All vendor results were received and included in the report calculations. Therefore the 2001 report is complete.

- A summary of solid waste dispositioned during the report period, to include: total activity shipped by waste type and the estimated composition of each type of waste by isotope; and the number of shipments, mode of transportation, destination, type of container, total container volume, and solidification agent.

Additional Information:

- There were no changes to Radioactive Waste Treatment Systems during the report period.

- The Activities and Doses listed in this report are within the limits specified in 40CFR Part 190.

## II. TABLES

### A. SUMMARY OF RADIOACTIVE GASEOUS EFFLUENTS

January 1, 2001 to December 31, 2001
(13 pages of Tables)

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
EFFLUENT REPORT - 2001
DATE: 02/11/2002 4:46:12 PM
GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

| | Units | Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 |
|---|---|---|---|---|---|
| A. FISSION AND ACTIVATION GASES (estimated total error: 45.3 %) | | | | | |
| 1. Total Release | Ci | 3.06E+02 | 3.31E+02 | 3.60E+02 | 3.47E+02 |
| 2. Average Release Rate for Period | uCi/sec | 3.89E+01 | 4.21E+01 | 4.57E+01 | 4.27E+01 |
| B. IODINES (estimated total error: 45.3 %) | | | | | |
| 1. Total I-131 | Ci | 0.00E+00 | 1.56E-06 | 0.00E+00 | 0.00E+00 |
| 2. Average Release Rate for Period | uCi/sec | 0.00E+00 | 1.99E-07 | 0.00E+00 | 0.00E+00 |
| C. PARTICULATES (estimated total error: 45.3 %) | | | | | |
| 1. Particulates with T ½ > 8 days | Ci | 2.03E-06 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2. Average Release Rate for Period | uCi/sec | 2.59E-07 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 3. Gross Alpha | Ci | 2.52E-06 | 2.16E-06 | 1.33E-06 | 2.03E-06 |
| D. TRITIUM (estimated total error: 45.3 %) | | | | | |
| 1. Total Release | Ci | 6.11E+00 | 7.82E+00 | 9.75E+00 | 1.31E+01 |
| 2. Average Release | uCi/sec | 7.78E-01 | 9.96E-01 | 1.24E+00 | 1.61E+00 |

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
EFFLUENT REPORT - 2001
DATE: 02/11/2002 4:46:12 PM
GASEOUS EFFLUENTS FOR RELEASE POINT - NORTH STACK

| Nuclide Released | Units | Continuous Mode Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 |
|---|---|---|---|---|---|
| 1. FISSION AND ACTIVATION GASES | | | | | |
| AR-41 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-83M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-85 | Ci | 9.51E+00 | 1.17E+01 | 1.30E+01 | 1.18E+01 |
| KR-85M | Ci | 2.51E+00 | 3.10E+00 | 3.43E+00 | 3.11E+00 |
| KR-87 | Ci | 4.41E+00 | 5.44E+00 | 6.01E+00 | 5.46E+00 |
| KR-88 | Ci | 7.80E+00 | 9.62E+00 | 1.06E+01 | 9.65E+00 |
| KR-89 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-90 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-131M | Ci | 2.38E-01 | 2.94E-01 | 3.25E-01 | 2.95E-01 |
| XE-133 | Ci | 8.87E-01 | 1.09E+00 | 1.21E+00 | 1.10E+00 |
| XE-133M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-135 | Ci | 3.47E+01 | 4.28E+01 | 4.73E+01 | 4.29E+01 |
| XE-135M | Ci | 2.21E+01 | 2.73E+01 | 3.02E+01 | 2.74E+01 |
| XE-137 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-138 | Ci | 4.74E+01 | 5.85E+01 | 6.47E+01 | 5.87E+01 |
| TOTAL FOR PERIOD (ABOVE) | Ci | 1.30E+02 | 1.60E+02 | 1.77E+02 | 1.60E+02 |
| 2. IODINES | | | | | |
| I-130 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-131 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-132 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-133 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-134 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-135 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL FOR PERIOD (ABOVE) | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
EFFLUENT REPORT - 2001
DATE: 02/11/2002 4:46:12 PM
GASEOUS EFFLUENTS FOR RELEASE POINT - NORTH STACK

| Nuclide Released | Units | Continuous Mode Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 |
|---|---|---|---|---|---|
| 3. PARTICULATES (T ½ > 8 DAYS) | | | | | |
| C-14 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| P-32 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CR-51 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| MN-54 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FE-55 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FE-59 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CO-58 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CO-60 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NI-63 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ZN-65 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RB-86 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| SR-89 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| SR-90 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Y-91 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ZR-95 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NB-95 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RU-103 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RU-106 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| AG-110M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-125M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-127M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-129M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CS-134 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CS-136 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CS-137 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BA-140 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CE-141 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CE-144 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PR-143 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ND-147 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL FOR PERIOD (ABOVE) | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
EFFLUENT REPORT - 2001
DATE: 02/11/2002 4:46:12 PM
GASEOUS EFFLUENTS FOR RELEASE POINT - UNIT 1 SOUTH STACK

| Nuclide Released | Units | Continuous Mode Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 |
|---|---|---|---|---|---|
| 1. FISSION AND ACTIVATION GASES | | | | | |
| AR-41 | Ci | 5.89E+00 | 5.28E+00 | 5.08E+00 | 6.40E+00 |
| KR-83M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-85 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-85M | Ci | 1.41E+00 | 1.26E+00 | 1.22E+00 | 1.53E+00 |
| KR-87 | Ci | 1.41E+00 | 1.26E+00 | 1.22E+00 | 1.53E+00 |
| KR-88 | Ci | 1.41E+00 | 1.26E+00 | 1.22E+00 | 1.53E+00 |
| KR-89 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-90 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-131M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-133 | Ci | 3.06E+01 | 2.74E+01 | 2.64E+01 | 3.33E+01 |
| XE-133M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-135 | Ci | 1.60E+01 | 1.43E+01 | 1.38E+01 | 1.74E+01 |
| XE-135M | Ci | 2.17E+01 | 1.94E+01 | 1.87E+01 | 2.35E+01 |
| XE-137 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-138 | Ci | 3.30E+00 | 2.96E+00 | 2.84E+00 | 3.59E+00 |
| TOTAL FOR PERIOD (ABOVE) | Ci | 8.17E+01 | 7.32E+01 | 7.04E+01 | 8.88E+01 |
| 2. IODINES | | | | | |
| I-130 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-131 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-132 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-133 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-134 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-135 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL FOR PERIOD (ABOVE) | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
EFFLUENT REPORT - 2001
DATE: 02/11/2002 4:46:12 PM
GASEOUS EFFLUENTS FOR RELEASE POINT - UNIT 1 SOUTH STACK

| Nuclide Released | Units | Continuous Mode Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 |
|---|---|---|---|---|---|
| 3. PARTICULATES (T ½ > 8 DAYS) | | | | | |
| C-14 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| P-32 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CR-51 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| MN-54 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FE-55 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FE-59 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CO-58 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CO-60 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NI-63 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ZN-65 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RB-86 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| SR-89 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| SR-90 | Ci | 1.02E-06 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Y-91 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ZR-95 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NB-95 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RU-103 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RU-106 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| AG-110M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-125M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-127M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-129M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CS-134 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CS-136 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CS-137 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BA-140 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CE-141 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CE-144 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PR-143 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ND-147 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL FOR PERIOD (ABOVE) | Ci | 1.02E-06 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
EFFLUENT REPORT - 2001
DATE: 02/11/2002 4:46:12 PM
GASEOUS EFFLUENTS FOR RELEASE POINT - UNIT 2 SOUTH STACK

| Nuclide Released | Units | Continuous Mode Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 |
|---|---|---|---|---|---|
| 1. FISSION AND ACTIVATION GASES | | | | | |
| AR-41 | Ci | 6.83E+00 | 7.04E+00 | 8.10E+00 | 7.02E+00 |
| KR-83M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-85 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-85M | Ci | 1.64E+00 | 1.69E+00 | 1.94E+00 | 1.68E+00 |
| KR-87 | Ci | 1.64E+00 | 1.69E+00 | 1.94E+00 | 1.68E+00 |
| KR-88 | Ci | 1.64E+00 | 1.69E+00 | 1.94E+00 | 1.68E+00 |
| KR-89 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-90 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-131M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-133 | Ci | 3.55E+01 | 3.65E+01 | 4.21E+01 | 3.65E+01 |
| XE-133M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-135 | Ci | 1.85E+01 | 1.91E+01 | 2.20E+01 | 1.91E+01 |
| XE-135M | Ci | 2.51E+01 | 2.59E+01 | 2.98E+01 | 2.58E+01 |
| XE-137 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-138 | Ci | 3.82E+00 | 3.94E+00 | 4.53E+00 | 3.93E+00 |
| TOTAL FOR PERIOD (ABOVE) | Ci | 9.47E+01 | 9.76E+01 | 1.12E+02 | 9.74E+01 |
| 2. IODINES | | | | | |
| I-130 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-131 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-132 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-133 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-134 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-135 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL FOR PERIOD (ABOVE) | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
EFFLUENT REPORT - 2001
DATE: 02/11/2002 4:46:12 PM
GASEOUS EFFLUENTS FOR RELEASE POINT - UNIT 2 SOUTH STACK

| Nuclide Released | Units | Continuous Mode Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 |
|---|---|---|---|---|---|
| 3. PARTICULATES (T ½ > 8 DAYS) | | | | | |
| C-14 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| P-32 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CR-51 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| MN-54 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FE-55 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FE-59 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CO-58 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CO-60 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NI-63 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ZN-65 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RB-86 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| SR-89 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| SR-90 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Y-91 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ZR-95 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NB-95 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RU-103 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RU-106 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| AG-110M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-125M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-127M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-129M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CS-134 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CS-136 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CS-137 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BA-140 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CE-141 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CE-144 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PR-143 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ND-147 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL FOR PERIOD (ABOVE) | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
EFFLUENT REPORT - 2001
DATE: 02/11/2002 4:46:12 PM
GASEOUS EFFLUENTS FOR RELEASE POINT - HOT MAINTENANCE SHOP

| Nuclide Released | Units | Continuous Mode Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 |
|---|---|---|---|---|---|
| 1. FISSION AND ACTIVATION GASES | | | | | |
| AR-41 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-83M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-85 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-85M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-87 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-88 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-89 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-90 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-131M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-133 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-133M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-135 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-135M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-137 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-138 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL FOR PERIOD (ABOVE) | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2. IODINES | | | | | |
| I-130 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-131 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-132 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-133 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-134 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-135 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL FOR PERIOD (ABOVE) | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
EFFLUENT REPORT - 2001
DATE: 02/11/2002 4:46:12 PM
GASEOUS EFFLUENTS FOR RELEASE POINT - HOT MAINTENANCE SHOP

| Nuclide Released | Units | Continuous Mode Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 |
|---|---|---|---|---|---|
| 3. PARTICULATES (T ½ > 8 DAYS) | | | | | |
| C-14 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| P-32 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CR-51 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| MN-54 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FE-55 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FE-59 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CO-58 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CO-60 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NI-63 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ZN-65 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RB-86 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| SR-89 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| SR-90 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Y-91 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ZR-95 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NB-95 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RU-103 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RU-106 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| AG-110M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-125M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-127M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-129M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CS-134 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CS-136 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CS-137 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BA-140 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CE-141 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CE-144 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PR-143 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ND-147 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL FOR PERIOD (ABOVE) | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
EFFLUENT REPORT - 2001
DATE: 02/11/2002 4:46:12 PM
GASEOUS EFFLUENTS FOR RELEASE POINT - OIL INCINERATION

| Nuclide Released | Units | Batch Mode Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 |
|---|---|---|---|---|---|
| 1. FISSION AND ACTIVATION GASES | | | | | |
| AR-41 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-83M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-85 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-85M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-87 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-88 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-89 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-90 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-131M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-133 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-133M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-135 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-135M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-137 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-138 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL FOR PERIOD (ABOVE) | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2. IODINES | | | | | |
| I-130 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-131 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-132 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-133 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-134 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-135 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL FOR PERIOD (ABOVE) | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
EFFLUENT REPORT - 2001
DATE: 02/11/2002 4:46:12 PM
GASEOUS EFFLUENTS FOR RELEASE POINT - OIL INCINERATION

| Nuclide Released | Units | Batch Mode Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 |
|---|---|---|---|---|---|
| 3. PARTICULATES (T ½ > 8 DAYS) | | | | | |
| C-14 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| P-32 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CR-51 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| MN-54 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FE-55 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FE-59 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CO-58 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CO-60 | Ci | 9.56E-07 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NI-63 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ZN-65 | Ci | 5.52E-08 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RB-86 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| SR-89 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| SR-90 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Y-91 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ZR-95 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NB-95 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RU-103 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RU-106 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| AG-110M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-125M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-127M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-129M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CS-134 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CS-136 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CS-137 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BA-140 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CE-141 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CE-144 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PR-143 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ND-147 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL FOR PERIOD (ABOVE) | Ci | 1.01E-06 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
EFFLUENT REPORT - 2001
DATE: 02/11/2002 4:46:12 PM
GASEOUS EFFLUENTS FOR RELEASE POINT - OTHER BATCH RELEASES

| Nuclide Released | Units | Batch Mode Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 |
|---|---|---|---|---|---|
| 1. FISSION AND ACTIVATION GASES | | | | | |
| AR-41 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-83M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-85 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-85M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-87 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-88 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-89 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-90 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-131M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-133 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-133M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-135 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-135M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-137 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-138 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL FOR PERIOD (ABOVE) | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2. IODINES | | | | | |
| I-130 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-131 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-132 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-133 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-134 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-135 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL FOR PERIOD (ABOVE) | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
EFFLUENT REPORT - 2001
DATE: 02/11/2002 4:46:12 PM
GASEOUS EFFLUENTS FOR RELEASE POINT - OTHER BATCH RELEASES

| Nuclide Released | Units | Batch Mode Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 |
|---|---|---|---|---|---|
| 3. PARTICULATES (T ½ > 8 DAYS) | | | | | |
| C-14 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| P-32 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CR-51 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| MN-54 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FE-55 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FE-59 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CO-58 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CO-60 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NI-63 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ZN-65 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RB-86 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| SR-89 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| SR-90 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Y-91 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ZR-95 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NB-95 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RU-103 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RU-106 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| AG-110M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-125M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-127M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-129M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CS-134 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CS-136 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CS-137 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BA-140 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CE-141 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CE-144 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PR-143 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ND-147 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL FOR PERIOD (ABOVE) | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

II. TABLES

B. SUMMARY OF RADIOACTIVE LIQUID EFFLUENTS

January 1, 2001 to December 31, 2001
(4 pages of Tables)

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
EFFLUENT REPORT - 2001
DATE: 02/13/2002 2:59:24 PM
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

| | Units | Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 |
|---|---|---|---|---|---|
| A. FISSION AND ACTIVATION PRODUCTS (estimated total error: 62.8 %) | | | | | |
| 1. Total Release (not including tritium, gasses, alpha) | Ci | 1.14E-03 | 2.80E-03 | 6.78E-04 | 2.30E-04 |
| 2. Average diluted concentration during period | uCi/sec | 1.32E-08 | 2.22E-08 | 9.51E-09 | 6.05E-09 |
| B. TRITIUM (estimated total error: 62.8 %) | | | | | |
| 1. Total Release | Ci | 1.37E+01 | 1.60E+01 | 8.74E+00 | 3.43E+00 |
| 2. Average diluted concentration during period | uCi/sec | 1.58E-04 | 1.27E-04 | 1.23E-04 | 9.04E-05 |
| C. DISSOLVED AND ENTRAINED GASSES (estimated total error: 62.8 %) | | | | | |
| 1. Total Release | Ci | 2.69E-03 | 1.29E-03 | 1.65E-04 | 7.84E-06 |
| 2. Average diluted concentration during period | uCi/sec | 3.11E-08 | 1.02E-08 | 2.31E-09 | 2.07E-10 |
| D. GROSS ALPHA RADIOACTIVITY (estimated total error: 62.8 %) | | | | | |
| 1. Total Release | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| E. VOLUME OF WASTE RELEASED (PRIOR TO DILUTION) (est. total error: .0 %) | | | | | |
| 1. Volume Released | Liters | 3.00E+06 | 4.67E+06 | 2.70E+06 | 1.22E+06 |
| F. VOLUME OF DILUTION WATER DURING PERIOD (est. total error: .0 %) | | | | | |
| 1. Dilution Volume | Liters | 8.35E+07 | 1.21E+08 | 6.86E+07 | 3.67E+07 |

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
EFFLUENT REPORT - 2001
DATE: 02/13/2002 2:59:24 PM
LIQUID EFFLUENTS FOR RELEASE POINT - LIQUID RADWASTE DISCHARGE TO SCHULYKILL RIVER

| Nuclide Released | Units | Batch Mode Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 |
|---|---|---|---|---|---|
| AG-110M | Ci | 0.00E+00 | 0.00E+00 | 9.48E-07 | 0.00E+00 |
| BA-139 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BA-140 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BA-141 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BA-142 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BR-83 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BR-84 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BR-85 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| C-14 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CE-141 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CE-143 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CE-144 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CO-58 | Ci | 2.87E-05 | 3.56E-04 | 6.17E-06 | 0.00E+00 |
| CO-60 | Ci | 5.06E-04 | 9.92E-04 | 4.84E-04 | 2.08E-04 |
| CR-51 | Ci | 4.45E-04 | 4.76E-04 | 2.44E-05 | 0.00E+00 |
| CS-134 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CS-136 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CS-137 | Ci | 5.07E-06 | 2.23E-05 | 0.00E+00 | 2.17E-05 |
| CS-138 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CU-64 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FE-55 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FE-59 | Ci | 0.00E+00 | 1.80E-05 | 0.00E+00 | 0.00E+00 |
| H-3 | Ci | 1.37E+01 | 1.60E+01 | 8.74E+00 | 3.43E+00 |
| I-130 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-131 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-132 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-133 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-134 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| I-135 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| LA-140 | Ci | 0.00E+00 | 6.50E-06 | 0.00E+00 | 0.00E+00 |
| LA-142 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| MN-54 | Ci | 2.70E-05 | 6.49E-04 | 5.69E-05 | 0.00E+00 |
| MN-56 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| MO-99 | Ci | 0.00E+00 | 5.19E-06 | 3.21E-07 | 0.00E+00 |
| NA-24 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NB-95 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ND-147 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NI-63 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
EFFLUENT REPORT - 2001
DATE: 02/13/2002 2:59:24 PM
LIQUID EFFLUENTS FOR RELEASE POINT - LIQUID RADWASTE DISCHARGE TO SCHULYKILL RIVER

| Nuclide Released | Units | Batch Mode Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 |
|---|---|---|---|---|---|
| NI-65 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NP-239 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| P-32 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PR-143 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PR-144 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RB-86 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RB-88 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RB-89 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RU-103 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RU-105 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RU-106 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| SR-89 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| SR-90 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| SR-91 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| SR-92 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TC-101 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TC-99M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-125M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-127M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-127 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-129M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-129 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-131M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-131 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TE-132 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| W-187 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Y-90 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Y-91M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Y-91 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Y-92 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Y-93 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ZN-65 | Ci | 7.84E-04 | 2.17E-03 | 2.40E-05 | 4.64E-05 |
| ZN-69 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ZR-95 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ZR-97 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Total For Above | Ci | 9.67E+00 | 8.77E+00 | 4.48E+00 | 1.32E+01 |

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
EFFLUENT REPORT - 2001
DATE: 02/13/2002 2:59:24 PM
LIQUID EFFLUENTS FOR RELEASE POINT - LIQUID RADWASTE DISCHARGE TO SCHULYKILL RIVER

| Nuclide Released | Units | Batch Mode Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 |
|---|---|---|---|---|---|
| AR-41 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-83M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-85 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-85M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-87 | Ci | 0.00E+00 | 2.47E-06 | 0.00E+00 | 0.00E+00 |
| KR-88 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-89 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| KR-90 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-131M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-133 | Ci | 1.03E-03 | 4.73E-04 | 4.43E-05 | 0.00E+00 |
| XE-133M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-135 | Ci | 1.66E-03 | 8.14E-04 | 1.20E-04 | 7.84E-06 |
| XE-135M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-137 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| XE-138 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Total For Above | Ci | 2.69E-03 | 1.29E-03 | 1.65E-04 | 7.84E-06 |

II. TABLES

C. SOLID WASTE DISPOSITION REPORT

January 1, 2001 to December 31, 2001
(7 pages of Tables)

A. Solid waste shipped offsite for burial or disposal (not irradiated fuel) 1/1/01 - 12/31/01

| 1. Type of waste | Unit | 12 Month Period | Estimated Error % |
|---|---|---|---|
| a. Spent resin, filters, sludges, evaporator bottoms, etc. | Cubic Meter<br>Ci | 30.37<br>7.88E+02 | 25% |
| b. Dry compressible waste, contaminated equipment, etc. | Cubic Meter<br>Ci | 52.58<br>2.48E+00 | 25% |
| c. Irradiated components, control rods, etc. | Cubic Meter<br>Ci | 6.54<br>7.41E+04 | 25% |
| d. Other (Describe) | None | None | |

## Estimate of Major Nuclide Composition (By Waste Type)

Category A - Spent Resin, Filters, Sludges, Evaporator Bottoms, etc.

| Isotope | Waste Class A Curies | Percent Abundance | Waste Class B Curies | Percent Abundance | Waste Class C Curies | Percent Abundance |
|---|---|---|---|---|---|---|
| H-3 | 2.75E-01 | 0.24% | 4.61E+00 | 0.69% | 7.98E-03 | 0.14% |
| C-14 | 2.20E+00 | 1.92% | 4.95E+00 | 0.74% | 3.02E+00 | 54.12% |
| Cr-51 | 3.28E+01 | 28.69% | 3.11E+00 | 0.47% | 0.00E+00 | 0.00% |
| Mn-54 | 4.76E+00 | 4.16% | 4.43E+01 | 6.63% | 7.28E-02 | 1.30% |
| Fe-55 | 2.10E+01 | 18.37% | 1.02E+02 | 15.27% | 1.39E-01 | 2.49% |
| Co-58 | 2.61E-01 | 0.23% | 2.09E+00 | 0.31% | 1.47E-03 | 0.03% |
| Ni-59 | 1.08E-04 | 0.00% | 1.77E-03 | 0.00% | 5.33E-03 | 0.10% |
| Co-60 | 3.49E+01 | 30.53% | 2.73E+02 | 40.87% | 6.68E-01 | 11.97% |
| Ni-63 | 3.81E-01 | 0.33% | 9.26E+00 | 1.39% | 1.06E+00 | 19.00% |
| Zn-65 | 1.62E+01 | 14.17% | 2.02E+02 | 30.24% | 2.20E-01 | 3.94% |
| Sr-90 | 5.97E-03 | 0.01% | 3.77E-01 | 0.06% | 2.15E-04 | 0.00% |
| Tc-99 | 1.71E-01 | 0.15% | 6.82E-01 | 0.10% | 2.49E-02 | 0.45% |
| Ru-106 | 0.00E+00 | 0.00% | 6.72E-01 | 0.10% | 0.00E+00 | 0.00% |
| I-129 | 2.54E-03 | 0.00% | 1.50E-02 | 0.01% | 2.12E-03 | 0.04% |
| Cs-134 | 0.00E+00 | 0.00% | 1.27E+00 | 0.19% | 5.22E-03 | 0.09% |
| Cs-137 | 1.32E-01 | 0.12% | 1.09E+01 | 1.63% | 8.30E-02 | 1.49% |
| Ce-141 | 0.00E+00 | 0.00% | 1.90E-04 | 0.00% | 2.68E-04 | 0.00% |
| Ce-144 | 1.23E-00 | 1.08% | 8.64E+00 | 1.29% | 2.67E-01 | 4.78% |
| Pu-238 | 1.15E-04 | 0.00% | 1.63E-03 | 0.00% | 1.83E-06 | 0.00% |
| Pu-239/40 | 0.00E+00 | 0.00% | 3.57E-04 | 0.00% | 6.45E-07 | 0.00% |
| Pu-241 | 0.00E+00 | 0.00% | 4.56E-02 | 0.01% | 0.00E+00 | 0.00% |
| Am-241 | 8.47E-05 | 0.00% | 8.99E-04 | 0.00% | 9.67E-07 | 0.00% |
| Cm-242 | 8.18E-05 | 0.00% | 7.74E-04 | 0.00% | 2.22E-06 | 0.00% |
| Cm-243/44 | 1.58E-04 | 0.00% | 1.75E-03 | 0.00% | 1.45E-06 | 0.00% |
| Nb-94 | 3.46E-07 | 0.00% | 2.83E-02 | 0.00% | 0.00E-00 | 0.00% |
| Ba-140 | 0.00E+00 | 0.00% | 1.59E-03 | 0.00% | 2.65E-03 | 0.05% |
| I-131 | 0.00E+00 | 0.00% | 1.51E-04 | 0.00% | 2.59E-04 | 0.00% |
| La-140 | 0.00E+00 | 0.00% | 1.27E-06 | 0.00% | 1.28E-05 | 0.00% |
| TOTALS | 1.14E+02 | 100.00% | 6.68E+02 | 100.00% | 5.58E+00 | 100.00% |

Activity is estimated

## Estimate of Major Nuclide Composition (By Waste Type)

Category B - Dry Compressible Waste, Contaminated Equipment, etc.

| Isotope | Waste Class A Curies | Percent Abundance |
|---|---|---|
| H-3 | 8.22E-03 | 0.33% |
| C-14 | 6.22E-04 | 0.03% |
| Cr-51 | 2.45E-01 | 9.87% |
| Mn-54 | 1.59E-01 | 6.40% |
| Fe-55 | 9.54E-02 | 3.84% |
| Co-58 | 4.12E-01 | 16.59% |
| Fe-59 | 2.95E-03 | 0.12% |
| Ni-59 | 1.67E-05 | 0.00% |
| Co-60 | 6.41E-01 | 25.82% |
| Ni-63 | 5.05E-02 | 2.03% |
| Zn-65 | 7.45E-01 | 30.00% |
| Sr-89 | 2.57E-03 | 0.10% |
| Sr-90 | 3.21E-04 | 0.01% |
| Zr-95 | 1.96E-02 | 0.79% |
| Cs-134 | 5.44E-03 | 0.22% |
| Cs-137 | 3.02E-02 | 1.22% |
| Ce-144 | 1.50E-02 | 0.60% |
| Am-241 | 6.30E-06 | 0.00% |
| Cm-242 | 1.71E-05 | 0.01% |
| Co-57 | 2.61E-04 | 0.01% |
| Nb-95 | 4.99E-02 | 2.01% |
| TOTALS | 2.48E+00 | 100.00% |

Activity is estimated

## Estimate of Major Nuclide Composition (By Waste Type)

Category C - Irradiated Components, Control Rods, etc.

| Isotope | Waste Class A Curies | Percent Abundance | Waste Class A Curies | Percent Abundance |
|---|---|---|---|---|
| H-3 | 4.50E-05 | 0.00% | 2.33E-01 | 0.00% |
| C-14 | 3.60E-05 | 0.00% | 3.18E+00 | 0.00% |
| Cr-51 | 4.90E+00 | 32.92% | 4.77E+02 | 0.64% |
| Mn-54 | 3.46E-01 | 2.32% | 1.15E+03 | 1.55% |
| Fe-55 | 2.84E+00 | 19.08% | 3.46E+04 | 46.69% |
| Ni-59 | 0.00E+00 | 0.00% | 1.16E+01 | 0.02% |
| Co-60 | 4.78E+00 | 32.11% | 3.48E+04 | 46.96% |
| Ni-63 | 0.00E+00 | 0.00% | 2.09E+03 | 2.82% |
| Zn-65 | 2.02E+00 | 13.57% | 0.00E+00 | 0.00% |
| Zr-95 | 0.00E+00 | 0.00% | 4.96E+00 | 0.01% |
| Tc-99 | 1.94E-04 | 0.00% | 1.14E-02 | 0.00% |
| Sb-125 | 0.00E+00 | 0.00% | 9.68E+02 | 1.31% |
| I-129 | 2.91E-06 | 0.00% | 0.00E+00 | 0.00% |
| Pu-238 | 0.00E+00 | 0.00% | 1.08E-02 | 0.00% |
| PU-239/40 | 0.00E+00 | 0.00% | 1.83E-05 | 0.00% |
| Pu-241 | 0.00E+00 | 0.00% | 3.36E-03 | 0.00% |
| Am-241 | 0.00E+00 | 0.00% | 6.28E-06 | 0.00% |
| Cm-242 | 0.00E+00 | 0.00% | 1.14E-03 | 0.00% |
| Cm-243/44 | 0.00E+00 | 0.00% | 5.05E-04 | 0.00% |
| Nb-94 | 0.00E+00 | 0.00% | 6.94E-02 | 0.00% |
| U-235 | 0.00E+00 | 0.00% | 7.63E-08 | 0.00% |
| Np-237 | 0.00E+00 | 0.00% | 7.89E-07 | 0.00% |
| Pu-242 | 0.00E+00 | 0.00% | 1.27E-06 | 0.00% |
| Am-243 | 0.00E+00 | 0.00% | 6.24E-07 | 0.00% |
| TOTALS | 1.49E+01 | 100.00% | 7.41E+04 | 100.00% |

Activity is estimated

Category A - 23 shipments Type A LSA
Category A - 2 shipments Type A LSA
Category A - 3 shipments Type B
Category B - 59 shipments Type A LSA
Category C - 4 shipments Type B
Category D - No Shipments Made

## Solid Waste (Disposition)

| Number of Shipments Made | Mode of Transportation | Destination |
|---|---|---|
| 23 | Truck | Studsvik (THOR) to Barnwell |
| 24 | Truck | Duratek to Envirocare |
| 3 | Truck | Allied Technology Group (QCEP) to Barnwell |
| 7 | Truck | Allied Technology Group (DAW) to Envirocare |
| 1 | Truck | US Ecology to Barnwell |
| 17 | Truck | US Ecology to Envirocare |
| 7 | Truck | Manufacturing Sciences Corp. to Envirocare |
| 7 | Truck | Limerick Generating Station to Barnwell |

Comments:

4 Shipments were made from Limerick to Duratek for processing
6 Shipments were made from Limerick to US Ecology for processing
9 Shipments were made from Limerick to Allied Technology Group (DAW) for processing
14 Shipments were made from Limerick to Studsvik (THOR) for processing
No solidifications were performed

## Irradiated Fuel Shipments (Disposition)

| Number of Shipments Made | Mode of Transportation | Destination |
|---|---|---|
| 0 | N/A | N/A |

Major Changes to Plant Radwaste Systems

There were no major changes to plant Radwaste Systems.

Changes to procedure RW-C-100, Solid Radwaste System Process Control Program (PCP)

RW-C-100 was superceded by RW-AA-100 Rev.2 in order to be common with the other Exelon Nuclear facilities. The purpose of the Process Control Program (PCP) is as follows:

- Establish the process and boundary conditions for the preparation of specific procedures for processing, sampling, analysis, packaging, storage, and shipment of solid radwaste in accordance with local, state, and federal requirements.

- Establish parameters which will provide reasonable assurance that all Low Level Radioactive Wastes (LLRW), processed by the in-plant waste process systems on-site OR by on-site vendor supplied waste processing systems, meet the acceptance criteria to a licensed burial facility, as required by 10CFR Part 20, 10CFR Part 61, 10CFR Part 71, 49CFR Parts 171-172, Technical Position on Waste Form (Revision 1) [1/91], Low-Level Waste Licensing Branch Technical Position on Radioactive Waste Classification [5/83], and the Station Technical Specifications, as applicable.

- Provide reasonable assurance that waste placed in on-site storage meets the requirements as addressed within the Safety Analysis Reports for the low level radwaste storage facilities for dry and/or processed wet waste.

II. TABLES

D. OFFSITE RADIATION DOSE ASSESSMENT

January 1, 2001 to December 31, 2001
(1 page of Tables)

LIMERICK GENERATING STATION - Units 1 & 2
SUMMARY OF MAXIMUM INDIVIDUAL DOSES FOR PERIOD:
01/01/01 0:00 TO 12/31/01 23:59

| EFFLUENT | APPLICABLE ORGAN | EST. DOSE (MREM) | AGE GROUP | LOCATION DIST (M) | DIR (TOWARD) | % OF APPLICABLE LIMIT | LIMIT (MREM) |
|---|---|---|---|---|---|---|---|
| LIQUID | TOTAL BODY | 2.52E-03 | CHILD | RECEPTOR 1 | | 4.20E-02 | 6.0 |
| LIQUID | LIVER | 2.52E-03 | ADULT | RECEPTOR 1 | | 1.26E-02 | 20.0 |
| NOBLE GAS | AIR DOSE (GAMMA-MRAD) | 4.54E-01 | ALL | 762. | ESE | 2.27E+00 | 20.0 |
| NOBLE GAS | AIR DOSE (BETA-MRAD) | 2.69E-01 | ALL | 762. | ESE | 6.73E-01 | 40.0 |
| NOBLE GAS | T.BODY (GAMMA) | 3.00E-01 | ALL | 762. | ESE | 1.50E+00 | 20.0 |
| NOBLE GAS | SKIN (BETA) | 5.64E-01 | ALL | 762. | ESE | 1.41E+00 | 40.0 |
| IODINE, PARTICULATE +TRITIUM DOSE (1) | SKIN | 5.64E-01 | ALL | 805. | ESE | 1.88E-01 | 30.0 |

(1) includes Plume Dose

II. TABLES

E. RADIATION DOSES TO MEMBERS OF THE PUBLIC DUE TO THEIR ACTIVITIES INSIDE SITE BOUNDARY

January 1, 2001 to December 31, 2001
(2 pages of Tables)

## RADIATION DOSES TO MEMBERS OF THE PUBLIC DUE TO THEIR ACTIVITIES INSIDE SITE BOUNDARY

Per ODCM Control 3.6, the Annual Effluent Release Report shall include an assessment of the radiation doses from radioactive liquid and gaseous effluents to members of the public due to activities inside the Site Boundary during the report period. ODCM Controls state that Members of the Public shall include all persons not occupationally associated with the plant. This category does not include employees of the utility or contractors. Also excluded from this category are persons who enter the site to service equipment or to make deliveries. This category does include persons who use portions of the site for recreational, occupational education, or other purposes not associated with the plant. The Limerick Information Center on Longview Road near the rear exit of the plant, Frick's Lock on the west shore of the river and the railroad tracks which run above the east shore of the Schuylkill River are all areas within the site boundary where radiation dose of this type could occur. The radiation doses to Members of the Public have been estimated using methodology stated in the ODCM. The maximum gaseous dose to members of the public at these locations is based on the following assumptions:

1. Yearly average meteorology and actual effluent releases.

2. Beta air dose attributed to noble gas releases.

3. Highest exposed sector of the railroad tracks (W), and the sectors enclosing Frick's Lock and the Information Center available for occupancy.

4. The maximum expected occupancy factor is 25% of a working year in all locations.

5. Distance to the railroad tracks, which pass through the Site Boundary in the W sector, is approximately 225 meters.

6. Distance to the Limerick Information Center is approximately 884 meters in the ESE sector.

7. Distance to Frick's Lock is approximately 450 meters in the WSW sector.

A summary of gaseous radiation doses to members of the public at these locations is included in this Attachment.

RADIATION DOSE TO MEMBERS OF THE PUBLIC WITHIN LIMERICK GENERATING STATION SITE BOUNDARY FOR AFFECTED SECTORS AND DISTANCES

| LOCATION | SECTOR | APPROX. DISTANCE (METERS) | GAMMA AIR DOSE, MRAD[1] | BETA AIR DOSE, MRAD[2] | IODINE/PART/H3 /PLUME ORGAN DOSE, MREM[3] | IODINE/PART/H3 /PLUME INGEST DOSE, MREM[4] |
|---|---|---|---|---|---|---|
| FRICK'S LOCK | WSW | 450 | 2.16E-02 | 1.28E-02 | 2.68E-02 | 8.18E-04 |
| INFO. CENTER | ESE | 884 | 9.09E-02 | 5.40E-02 | 1.13E-01 | 3.44E-03 |
| R.R. TRACKS | W | 225 | 9.66E-02 | 5.74E-02 | 1.20E-01 | 3.66E-03 |

Notes:

(1) The limit for Gamma Air Dose = 20 mrad/y (ref. ODCM I3.3.3b)
(2) The limit for Beta Air Dose = 40 mrad/y (ref. ODCM I3.3.3b)
(3) The limit for Iodine/Particulate/H3 Organ Dose = 30 mrem/y (ref. ODCM I3.3.4b)
(4) The limit for Iodine/Particulate/H3 Ingestion Dose = 30 mrem/y (ref. ODCM I3.3.4b)

III. ATTACHMENTS

A. SUPPLEMENTAL INFORMATION

Facility: Limerick Generating Station - Units 1 and 2
License : NPF-39 (Unit 1) and NPF-85 (Unit 2)

1. Regulatory Limits (Technical Specification Limits)

A. Noble Gases:

| | | | |
|---|---|---|---|
| 1. | ≤ 500 mRem/y | - total body | – "instantaneous" limits |
| | ≤ 3000 mRem/y | - skin | per ODCM Control 3.3.2 |
| 2. | ≤ 10 mRad | - air gamma | – quarterly air dose limits |
| | ≤ 20 mRad | - air beta | per ODCM Control 3.3.3 |
| 3. | ≤ 20 mRad | - air gamma | – yearly air dose limits |
| | ≤ 40 mRad | - air beta | per ODCM Control 3.3.3 |

B. Iodines, tritium, particulates with half life > 8 days:

| | | | |
|---|---|---|---|
| 1. | ≤ 1500 mRem/y | - any organ (inhalation path) | - "instantaneous" limits per ODCM Control 3.3.2 |
| 2. | ≤ 15 mRem | - any organ | - quarterly dose limits per ODCM Control 3.3.4 |
| 3. | ≤ 30 mRem | - any organ | - yearly dose limits per ODCM Control 3.3.4 |

C. Liquid Effluents:

| | | | |
|---|---|---|---|
| 1. | Concentration - ≤ 10CFR20 Appendix B, Table II, Col.2 | | -"instantaneous" limits - per ODCM Control 3.2.2 |
| 2. | ≤ 3 mRem | - total body | – quarterly dose limits |
| | ≤ 10 mRem | - any organ | per ODCM Control 3.2.3 |
| 3. | ≤ 6 mRem | - total body | – yearly dose limits |
| | ≤ 20 mRem | - any organ | per ODCM Control 3.2.3 |

2. Maximum Permissible Concentrations

Per LGS ODCM Control 3.2.2, MPCs are not used to calculate permissible release rates and concentrations for gaseous releases. The MPCs specified in 10CFR20, Appendix B, Table II, Column 2 for identified nuclides are used to calculate permissible release rates and concentrations for liquid releases.

III. ATTACHMENTS (continued)

3. Measurements and Approximations of Total Radioactivity

A. Fission and Activation Gases in Gaseous Effluents:

The method used for Gamma Isotopic Analysis is the Canberra Genie System with a gas Marinelli beaker. Noble gas releases are continuously monitored with the data stored on a computer system. The monitor data is analyzed to report noble gas effluent activities. When no activity is found in the Isotopic Analysis, the isotopic mixture is assumed to be that evaluated in the UFSAR (section 11.5, Table 11.5-4). If activity is found in the Isotopic Analysis, the isotopic mixture for the noble gas monitor is determined from the Isotopic Analysis.

B. Iodine in Gaseous Effluents:

The method used is the Canberra Genie System with a charcoal cartridge.

C. Particulate in Gaseous Effluents:

The method used is the Canberra Genie System with an air particulate sample, 47 mm filter.

D. Gamma Isotopic Analysis in Liquid Effluents:

The method used is the Canberra Genie System using a 1.0 liter Marinelli beaker. A Radwaste Liquid Discharge Pre-Release report is generated to ensure that the dose and activity to be released is within limits.

E. Tritium in Liquid and Gaseous Effluents:

Tritium in Liquid Effluents is analyzed using a Liquid Scintillation Counter.

Air from stack effluents is passed through two bubblers in series and an aliquot of the water from each bubbler analyzed using a Liquid Scintillation Counter.

III. ATTACHMENTS (continued)

4. Batch Liquid Releases Summary

January 1, 2001 to December 31, 2001
(1 page of Tables)

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
EFFLUENT REPORT - 2001
DATE: 02/13/2002 2:59:24 PM
LIQUID EFFLUENTS FOR RELEASE POINT - LIQUID RADWASTE DISCHARGE TO SCHULYKILL RIVER

| | Batch Mode | | | |
|---|---|---|---|---|
| | Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 |
| Number of Batch Releases | 4.40E+01 | 6.70E+01 | 4.40E+01 | 2.10E+01 |
| Total time period for batch releases (min) | 3.58E+03 | 5.48E+03 | 3.18E+03 | 1.54E+03 |
| Maximum time period for batch release (min) | 1.04E+02 | 1.04E+02 | 9.98E+01 | 1.02E+02 |
| Average time period for batch release (min) | 8.15E+01 | 8.18E+01 | 7.23E+01 | 7.36E+01 |
| Minimum time period for batch release (min) | 3.41E+01 | 3.23E+01 | 2.24E+01 | 1.94E+01 |
| Average stream flow (Schuylkill River) during periods of release of effluents into a flowing stream (gpm) | 8.98E+05 | 1.10E+06 | 3.64E+05 | 2.44E+05 |

III. ATTACHMENTS (continued)

5. Batch Gaseous Release (January 1, 2001 to December 31, 2001)

(1 page of Tables)

- Oil Incineration
- Other Batch Releases
- Average Energy of Release

GASEOUS EFFLUENTS FOR RELEASE POINT - OTHER BATCH RELEASES

| | Batch Mode | | | |
|---|---|---|---|---|
| | Qtr 1 | Qtr 2 | Qtr 3 | Qtr 4 |
| Number of Batch Releases | 0.00E+00 | 2.00E+00 | 0.00E+00 | 0.00E+00 |
| Total time period for batch releases (min) | 0.00E+00 | 3.35E+03 | 0.00E+00 | 0.00E+00 |
| Maximum time period for batch release (min) | 0.00E+00 | 1.90E+03 | 0.00E+00 | 0.00E+00 |
| Average time period for batch release (min) | 0.00E+00 | 1.68E+03 | 0.00E+00 | 0.00E+00 |
| Minimum time period for batch release (min) | 0.00E+00 | 1.45E+03 | 0.00E+00 | 0.00E+00 |

AVERAGE ENERGY OF DECAY FOR ACTIVATION AND FISSION GASES FOR 2001

| | |
|---|---|
| Average Beta Energy of decay: | 3.15E-01 MeV |
| Average Gamma Energy of decay: | 5.33E-01 MeV |

III. ATTACHMENTS (continued)

6. Abnormal Releases

A. Liquid

There were no significant abnormal liquid releases for year 2001.

B. Gaseous

There were no significant abnormal gaseous releases for year 2001.

7. Description of LGS Effluent Release Points

Gaseous Release Point = North Stack, Common

Gaseous Release Point = Unit 1 South Stack

Gaseous Release Point = Unit 2 South Stack

Gaseous Release Point = Hot Maintenance Shop

Gaseous Release Point = Oil Incineration - Aux Boiler A

Gaseous Release Point = Other Batch Releases

Liquid Release Point = Liquid Radwaste Discharge

8. Description of LGS Liquid Dose Receptors

Receptor 1 = LGS Liquid Radwaste Discharge Point

Receptor 2 = Citizens Home Water Company

Receptor 3 = Phoenixville Water Company

Receptor 4 = Philadelphia Suburban Water Company

Receptor 5 = City of Philadelphia Crew Course

B. RADIATION MONITORS OUT-OF-SERVICE CONDITION

There are no radiation monitor out-of-service conditions to report.

III. ATTACHMENTS (continued)

C. REVISION TO PREVIOUS SUBMITTAL

There are no revisions to previous submittals.

D. OFFSITE DOSE CALCULATION MANUAL REVISIONS

The ODCM was not revised during the year 2001.

E. EVENTS

1. Traces of Tritium found in Holding Pond

In the third quarter of 2001 a quarterly routine survey for tritium in the Spray Pond, Cooling Towers and Holding Pond was initiated. The procedure requires meeting an LLD of 1E-5 uCi/ml. This LLD is the same as that used for effluent releases via radwaste discharge and RHR/RHR Service water continuous release analyses. The actual LLD achieved was 1.5E-6 uCi/ml. All of the third quarter samples were less than LLD. The fourth quarter samples were analyzed to an LLD of 3.24E-7 uCi/ml. A trace of tritium activity was found in the Holding Pond. The sample was recounted and the Holding Pond was resampled and reanalyzed. The activity of the samples ranged from 2.36E-7 to 5.88E-7 uCi/ml. These activities are in the range of tritium found in the environment and less than the required LLD used to analyze environmental samples. ODCM Control Section 3.4 requires an Environmental LLD of 2E-6 uCi/ml for REMP sampling. Assuming that an activity of 5.88E-7 uCi/ml was released from the Holding Pond all year, a total activity of 0.2 Ci was released. This activity is insignificant when compared to the tritium released during 2001 via radwaste discharges of 41.9 Ci.

III. ATTACHMENTS (continued)

2. Unit 2 CST Steam Heating Coil Break Results in Potential Contamination of Auxiliary Boiler

On October 30, 2001 Plant Heating Steam was placed in service to the Unit 2 CST heating coil. This followed replacement of the heating coil discharge steam trap, which had been identified as the root cause for historical heating coil water hammer. After heating steam was applied, water hammer was again observed and an investigation was started to determine why the new steam trap was not preventing the water hammer. It was found that the actual heating coil inside the Unit 2 CST had developed a leak and at heating steam pressures lower than CST head pressure, cold CST water would enter the heating coil and cause water hammer when mixed with steam. The leak was identified as being a nominal ½ gpm and was being returned to the Aux Boilers through the normal Plant Heating Steam condensate return system. It is believed that the leak in the heating coil started when heating steam was initially placed in service, since no leakage was identified during system maintenance late in Spring 2001. The system was isolated throughout the summer up to the time when heating steam was placed back in service. When the leak was discovered the heating coil was isolated to prevent any additional contamination of the Heating Steam and Aux Steam systems. It is estimated that the leak was actively getting into the heating steam return lines for about 24 hours prior to isolation. This is based on when heating steam was applied, which is assumed to be when the coil leak developed, and the period of time when ambient temperature was warm enough to allow heating steam pressure to drop below CST head pressure. This equates to about 700 gallons of CST water being sent to the Plant Heating Steam and Aux Steam System.

Since the actual CST heating coil could not be repaired until a Unit shutdown, a clearance was placed on the heating coil inlet and outlet valves to maintain the coil isolated. The clearance did provide the ability to apply steam to the coil, and to drain directly to the CST dike in the event of extremely cold weather, which could lower CST temperature below the alarm limit. Plant heating steam pressure, which is regulated based on ambient temperature, was adjusted such that at its minimum pressure, the pressure would remain above the head pressure of the CST.

III. ATTACHMENTS (continued)

A sample of the return line to the auxiliary boilers was counted on the gamma spectrometer. Mn-54 (2.74E-8 uCi/ml) and Co-60 (3.33E-8 uCi/ml) were detected. No gamma activity was detected in the auxiliary boilers. The CST also had tritium activity (approximately 6E-3 uCi/ml). It is estimated that 700 gallons returned to the auxiliary boilers. The contaminants were eventually discharged to the Holding Pond via boiler blow downs and leaks and then released to the river. The activity released and associated doses are insignificant when compared to the amount released during 2001 from liquid radwaste discharges. Some tritium was also released due to steam leaks in the boiler system. For 2001, the amount of tritium released via the stacks was 36.8 Ci. The activity of tritium released and associated doses from this event are insignificant when compared to the amount released via the stacks.

| | Curies Released From Auxiliary Boiler | Curies Released From Radwaste Discharges |
|---|---|---|
| Mn-54 | 7.26E-8 Ci | 7.33E-4 Ci |
| Co-60 | 8.82E-8 Ci | 2.19E-3 Ci |
| H-3 | 1.6 E-2 Ci | 4.19E+1 Ci |

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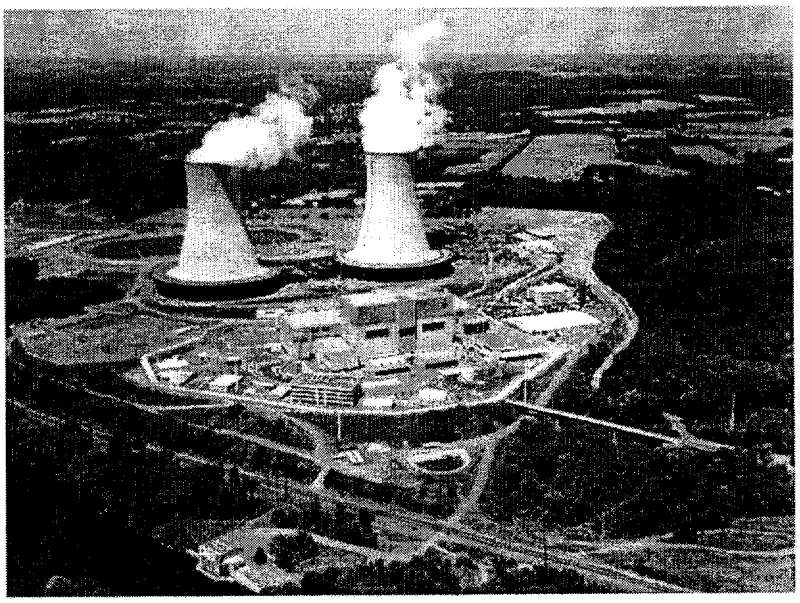
Nuclear



# Joint Frequency Distribution of Wind Speed and Direction by Atmospheric Stability Class

2001

Limerick Generating Station

Exelon Nuclear

LIMERICK GENERATING STATION

DOCKET NO. 50-352 (Unit 1)
DOCKET NO. 50-353 (Unit 2)

# Tower No. 1
# Joint Frequency Distributions of Wind Speed and Direction by Atmospheric Stability Class
# 2001
# Report No. 17

Submitted to
The United States Nuclear Regulatory Commission
Pursuant to
Facility Operating License NPF-39 (Unit 1)
and NPF-85 (Unit 2)

February 12, 2002

Mr. Ed Frick
Limerick Generating Station
P.O. Box 2300, MS SSB2-1
Evergreen and Sanatoga Roads
Pottstown, PA 19464

RE: Transmittal of LGS 2001 Dispersion Values and Joint Frequency Distributions

Dear Ed:

Enclosed you will find the annual X/Q and D/Q values and the joint frequency distributions of wind speed, wind direction and atmospheric stability class for your use in preparing the LGS year 2001 effluent report. As per our recent email exchange, these are the identical receptors and pathways submitted for the 2000 report.

**Dispersion Calculations** - The annual X/Q and D/Q values were computed using a program developed at MES called LGSAPENI. This program utilizes the dispersion methodologies of Regulatory Guide 1.111, and was designed to utilize the same assumptions and calculation techniques as the LGS RMMS system. The model, therefore, computes annual X/Q and D/Q values as an accumulation of hourly X/Q's, rather than inputting the meteorological data from a joint frequency distribution. The results are presented for the receptors pertinent to your needs in the following set of tables. The full computer outputs from these runs are included as Attachment 1.

Table 1 - This table contains X/Q, depleted X/Q and D/Q values from the combined North Vent at the site boundary in each sector, the onsite receptors along the railroad right-of-way, the Information Center and Fricks Lock. The combined vent was modeled with a nominal flow rate of 363,000 cfm. The depleted X/Q values are also decayed with an 8.05 day half life.

Table 2 - This table contains X/Q, depleted X/Q and D/Q values from the Unit 1 and Unit 2 South Vents at the site boundary in each sector, the onsite receptors along the railroad right-of-way, the Information Center and Fricks Lock. The values are valid for either the Unit 1 or Unit 2 vent, and are based upon a nominal flow rate of 144,000 cfm. The depleted X/Q values are also decayed with an 8.05 day half life.

**METEOROLOGICAL EVALUATION SERVICES CO., INC.** 631 - 691 - 3395
165 BROADWAY, AMITYVILLE, NEW YORK 11701 FAX 631 - 691 - 3550

Table 3 - This table contains X/Q, depleted X/Q and D/Q values from the combined North Vent for the plume inhalation pathway receptors. The combined vent was modeled with a nominal flow rate of 363,000 cfm. The depleted X/Q values are also decayed with an 8.05 day half life.

Table 4 - This table contains X/Q, depleted X/Q and D/Q values from the Unit 1 and Unit 2 South Vents for the plume inhalation pathway receptors. The values are valid for either the Unit 1 or Unit 2 vent, and are based upon a nominal flow rate of 144,000 cfm. The depleted X/Q values are also decayed with an 8.05 day half life.

Table 5 - This table contains D/Q values from the combined North Vent for the ingestion pathway receptors. These include the vegetation, meat, cow and goat pathways. The combined vent was modeled with a nominal flow rate of 363,000 cfm.

Table 6 - This table contains D/Q values from the Unit 1 and Unit 2 South Vents for the ingestion pathway receptors. These included the vegetation, meat, cow and goat pathways. The values are valid for either the Unit 1 or Unit 2 vent, and are based upon a nominal flow rate of 144,000 cfm.

**Joint Frequency Distributions** - Annual joint frequency distributions of wind speed, wind direction and atmospheric stability class are presented in Attachment 2. These distributions are computed for the 30-ft and 175-ft levels of Meteorological Tower No. 1, but utilize the allowable substitutions for missing data from the equivalent levels of Meteorological Tower No. 2, as specified in Table I 3.1-1 of the LGS ODCM. The joint frequency distributions are identified as Wind Level 1, which is the Tower 1 30-ft level, allowing substitution of data from the Tower 2 159-ft level, and Wind Level 2, which is the Tower 1 175-ft level, allowing substitution of data from the Tower 2 304-ft level. Atmospheric stability class in both distributions is based upon the Tower 1 266-26 ft delta temperature, with substitution for missing data from the Tower 2 300-26 ft delta temperature, again as specified in Table I 3.1-1.

Because the ODCM allows the Tower 2 substitutions, the annual joint data recovery rates at each level are excellent, with a 99.91% annual recovery rate at both Wind Level 1 (30-ft), and Wind Level 2 (175-ft). These recovery rates are well in excess of the NRC 90% joint data recovery requirement.

Graphical representations of these distributions of wind direction and speed (wind roses) are attached as Figure 1 for Wind Level 1 and Figure 2 for Wind Level 2. These distributions are based upon all available hours at each level, and are not a function of stability class.

Please call if you have any questions regarding these outputs.

Sincerely yours,

Patrick T. Brennan

PTB:bp
Enclosures
cc: D. Wahl - Exelon, Kennett Square
E. Langley - LGS
C. Paukowits - MES

2001

# ANNUAL DISPERSION CALCULATIONS

# AT SPECIFIC POINTS OF INTEREST

**Table 1**
**Limerick Generating Station**
**2001 Annual Dispersion Calculations at Specific Points of Interest**
**North Vent, Flow = 363,000 cfm**

| Type of Location | Direction | Distance | | X/Q No Decay Undepleted | X/Q 8.05 Day Decay Depleted | D/Q |
|---|---|---|---|---|---|---|
| | | (miles) | (meters) | ($sec/m^3$) | ($sec/m^3$) | ($m^{-2}$) |
| Site Boundary | S | 0.47 | 762 | 2.876E-07 | 2.640E-07 | 2.284E-09 |
| Site Boundary | SSW | 0.47 | 762 | 2.306E-07 | 2.118E-07 | 1.531E-09 |
| Site Boundary | SW | 0.55 | 884 | 1.298E-07 | 1.180E-07 | 7.170E-10 |
| Site Boundary | WSW | 0.53 | 854 | 1.684E-07 | 1.533E-07 | 1.331E-09 |
| Site Boundary | W | 0.53 | 854 | 2.355E-07 | 2.147E-07 | 2.122E-09 |
| Site Boundary | WNW | 0.49 | 793 | 1.576E-07 | 1.443E-07 | 1.241E-09 |
| Site Boundary | NW | 0.47 | 762 | 1.576E-07 | 1.445E-07 | 1.392E-09 |
| Site Boundary | NNW | 0.55 | 884 | 1.617E-07 | 1.473E-07 | 1.288E-09 |
| Site Boundary | N | 0.55 | 884 | 3.575E-07 | 3.257E-07 | 2.435E-09 |
| Site Boundary | NNE | 0.49 | 793 | 7.002E-07 | 6.431E-07 | 4.798E-09 |
| Site Boundary | NE | 0.49 | 793 | 5.929E-07 | 5.452E-07 | 3.473E-09 |
| Site Boundary | ENE | 0.49 | 793 | 5.181E-07 | 4.764E-07 | 3.294E-09 |
| Site Boundary | E | 0.47 | 762 | 1.122E-06 | 1.033E-06 | 7.662E-09 |
| Site Boundary | ESE | 0.47 | 762 | 2.374E-06 | 2.177E-06 | 1.364E-08 |
| Site Boundary | SE | 0.47 | 762 | 1.280E-06 | 1.175E-06 | 1.153E-08 |
| Site Boundary | SSE | 0.63 | 1006 | 3.070E-07 | 2.767E-07 | 3.161E-09 |
| Railroad Tracks | S | 0.19 | 300 | 1.315E-06 | 1.260E-06 | 8.334E-09 |
| Railroad Tracks | SSW | 0.14 | 225 | 1.734E-06 | 1.677E-06 | 7.490E-09 |
| Railroad Tracks | SW | 0.14 | 225 | 1.222E-06 | 1.182E-06 | 4.137E-09 |
| Railroad Tracks | WSW | 0.14 | 225 | 1.477E-06 | 1.428E-06 | 7.678E-09 |
| Railroad Tracks | W | 0.14 | 225 | 1.964E-06 | 1.899E-06 | 1.333E-08 |
| Railroad Tracks | WNW | 0.21 | 345 | 5.823E-07 | 5.552E-07 | 4.048E-09 |
| Railroad Tracks | NW | 0.28 | 450 | 3.455E-07 | 3.253E-07 | 2.833E-09 |
| Information Ctr. | ESE | 0.55 | 884 | 1.900E-06 | 1.726E-06 | 1.102E-08 |
| Fricks Lock | WSW | 0.28 | 450 | 4.469E-07 | 4.209E-07 | 3.094E-09 |

**Table 2**
**Limerick Generating Station**
**2001 Annual Dispersion Calculations at Specific Points of Interest**
**South Vent, Flow = 144,000 cfm**

| Type of Location | Direction | Distance | | X/Q No Decay Undepleted | X/Q 8.05 Day Decay Depleted | D/Q |
|---|---|---|---|---|---|---|
| | | (miles) | (meters) | ($sec/m^3$) | ($sec/m^3$) | ($m^{-2}$) |
| Site Boundary | S | 0.47 | 762 | 3.222E-07 | 2.959E-07 | 2.483E-09 |
| Site Boundary | SSW | 0.47 | 762 | 2.565E-07 | 2.357E-07 | 1.651E-09 |
| Site Boundary | SW | 0.55 | 884 | 1.463E-07 | 1.331E-07 | 7.657E-10 |
| Site Boundary | WSW | 0.53 | 854 | 1.868E-07 | 1.702E-07 | 1.543E-09 |
| Site Boundary | W | 0.53 | 854 | 2.657E-07 | 2.424E-07 | 2.617E-09 |
| Site Boundary | WNW | 0.49 | 793 | 1.804E-07 | 1.651E-07 | 1.393E-09 |
| Site Boundary | NW | 0.47 | 762 | 1.769E-07 | 1.623E-07 | 1.487E-09 |
| Site Boundary | NNW | 0.55 | 884 | 1.869E-07 | 1.708E-07 | 1.374E-09 |
| Site Boundary | N | 0.55 | 884 | 4.131E-07 | 3.774E-07 | 2.594E-09 |
| Site Boundary | NNE | 0.49 | 793 | 7.969E-07 | 7.329E-07 | 5.512E-09 |
| Site Boundary | NE | 0.49 | 793 | 6.701E-07 | 6.172E-07 | 4.224E-09 |
| Site Boundary | ENE | 0.49 | 793 | 5.853E-07 | 5.393E-07 | 3.878E-09 |
| Site Boundary | E | 0.47 | 762 | 1.274E-06 | 1.174E-06 | 9.437E-09 |
| Site Boundary | ESE | 0.47 | 762 | 2.581E-06 | 2.368E-06 | 1.449E-08 |
| Site Boundary | SE | 0.47 | 762 | 1.394E-06 | 1.279E-06 | 1.261E-08 |
| Site Boundary | SSE | 0.63 | 1006 | 3.387E-07 | 3.055E-07 | 3.555E-09 |
| Railroad Tracks | S | 0.19 | 300 | 1.469E-06 | 1.408E-06 | 9.268E-09 |
| Railroad Tracks | SSW | 0.14 | 225 | 1.915E-06 | 1.852E-06 | 8.271E-09 |
| Railroad Tracks | SW | 0.14 | 225 | 1.368E-06 | 1.323E-06 | 4.531E-09 |
| Railroad Tracks | WSW | 0.14 | 225 | 1.622E-06 | 1.568E-06 | 8.290E-09 |
| Railroad Tracks | W | 0.14 | 225 | 2.198E-06 | 2.125E-06 | 1.523E-08 |
| Railroad Tracks | WNW | 0.21 | 345 | 6.651E-07 | 6.342E-07 | 4.617E-09 |
| Railroad Tracks | NW | 0.28 | 450 | 3.857E-07 | 3.632E-07 | 3.084E-09 |
| Information Ctr. | ESE | 0.55 | 884 | 2.068E-06 | 1.880E-06 | 1.167E-08 |
| Fricks Lock | WSW | 0.28 | 450 | 4.913E-07 | 4.628E-07 | 3.398E-09 |

**Table 3**
**Limerick Generating Station**
**2001 Annual Dispersion Calculations for Inhalation Pathway Receptors**
**North Vent, Flow = 363,000 cfm**

| Direction | Distance | | X/Q No Decay Undepleted | X/Q 8.05 Day Decay Depleted | D/Q |
|---|---|---|---|---|---|
| | (miles) | (meters) | ($sec/m^3$) | ($sec/m^3$) | ($m^{-2}$) |
| N | 0.60 | 965 | 3.193E-07 | 2.896E-07 | 2.187E-09 |
| NNE | 0.50 | 805 | 6.858E-07 | 6.293E-07 | 4.702E-09 |
| NE | 0.80 | 1287 | 3.212E-07 | 2.903E-07 | 1.833E-09 |
| ENE | 0.60 | 965 | 3.983E-07 | 3.624E-07 | 2.550E-09 |
| E | 0.60 | 965 | 8.086E-07 | 7.343E-07 | 5.530E-09 |
| ESE | 0.50 | 805 | 2.187E-06 | 1.999E-06 | 1.260E-08 |
| SE | 1.00 | 1609 | 4.232E-07 | 3.723E-07 | 3.820E-09 |
| SSE | 1.00 | 1609 | 1.617E-07 | 1.429E-07 | 1.703E-09 |
| S | 0.80 | 1287 | 1.364E-07 | 1.216E-07 | 1.145E-09 |
| SSW | 1.00 | 1609 | 8.662E-08 | 7.695E-08 | 6.984E-10 |
| SW | 0.60 | 965 | 1.145E-07 | 1.035E-07 | 6.543E-10 |
| WSW | 0.80 | 1287 | 1.031E-07 | 9.234E-08 | 9.310E-10 |
| W | 0.60 | 965 | 1.986E-07 | 1.797E-07 | 1.855E-09 |
| WNW | 0.70 | 1126 | 9.659E-08 | 8.664E-08 | 7.803E-10 |
| NW | 1.30 | 2092 | 4.925E-08 | 4.401E-08 | 3.993E-10 |
| NNW | 0.90 | 1448 | 9.301E-08 | 8.383E-08 | 7.131E-10 |

**Table 4**
**Limerick Generating Station**
**2001 Annual Dispersion Calculations for Inhalation Pathway Receptors**
**South Vent, Flow = 144,000 cfm**

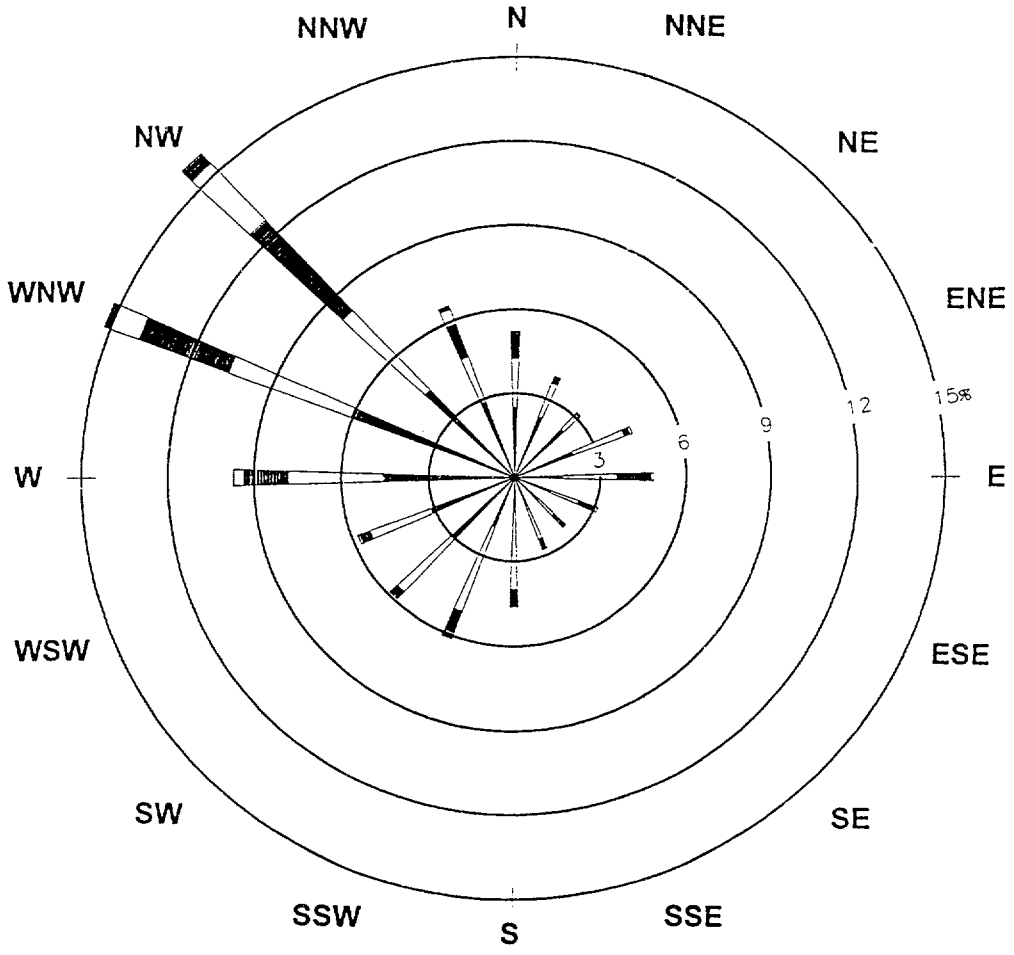
| Direction | Distance | | X/Q No Decay Undepleted | X/Q 8.05 Day Decay Depleted | D/Q |
|---|---|---|---|---|---|
| | (miles) | (meters) | ($sec/m^3$) | ($sec/m^3$) | ($m^{-2}$) |
| N | 0.60 | 965 | 3.727E-07 | 3.392E-07 | 2.319E-09 |
| NNE | 0.50 | 805 | 7.811E-07 | 7.178E-07 | 5.398E-09 |
| NE | 0.80 | 1287 | 3.867E-07 | 3.523E-07 | 2.226E-09 |
| ENE | 0.60 | 965 | 4.577E-07 | 4.181E-07 | 3.011E-09 |
| E | 0.60 | 965 | 9.308E-07 | 8.477E-07 | 6.753E-09 |
| ESE | 0.50 | 805 | 2.379E-06 | 2.175E-06 | 1.337E-08 |
| SE | 1.00 | 1609 | 4.658E-07 | 4.104E-07 | 4.046E-09 |
| SSE | 1.00 | 1609 | 1.832E-07 | 1.624E-07 | 1.783E-09 |
| S | 0.80 | 1287 | 1.539E-07 | 1.374E-07 | 1.228E-09 |
| SSW | 1.00 | 1609 | 1.028E-07 | 9.201E-08 | 7.607E-10 |
| SW | 0.60 | 965 | 1.294E-07 | 1.170E-07 | 7.122E-10 |
| WSW | 0.80 | 1287 | 1.195E-07 | 1.076E-07 | 1.090E-09 |
| W | 0.60 | 965 | 2.248E-07 | 2.035E-07 | 2.265E-09 |
| WNW | 0.70 | 1126 | 1.109E-07 | 9.956E-08 | 9.402E-10 |
| NW | 1.30 | 2092 | 6.361E-08 | 5.759E-08 | 4.198E-10 |
| NNW | 0.90 | 1448 | 1.168E-07 | 1.064E-07 | 7.409E-10 |

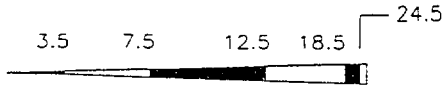
**Table 5**
**Limerick Generating Station**
**2001 Annual Dispersion Calculations for Ingestion Pathway Receptors**
**North Vent, Flow = 363,000 cfm**

| | Vegetation Pathway | | | Meat Pathway | | | Cow Pathway | | | Goat Pathway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Distance | | D/Q | Distance | | D/Q | Distance | | D/Q | Distance | | D/Q |
| Direction | (miles) | (meters) | ($m^{-2}$) | (miles) | (meters) | ($m^{-2}$) | (miles) | (meters) | ($m^{-2}$) | (miles) | (meters) | ($m^{-2}$) |
| N | 1.60 | 2574 | 6.014E-10 | 2.12 | 3414 | 4.695E-10 | 4.70 | 7562 | 2.311E-10 | - | - | - |
| NNE | 0.50 | 805 | 4.702E-09 | 0.98 | 1585 | 1.808E-09 | - | - | - | - | - | - |
| NE | 1.50 | 2414 | 7.923E-10 | 0.68 | 1097 | 2.263E-09 | - | - | - | - | - | - |
| ENE | 1.80 | 2896 | 5.362E-10 | 2.41 | 3871 | 3.526E-10 | - | - | - | - | - | - |
| E | 1.10 | 1770 | 2.234E-09 | 1.17 | 1890 | 2.019E-09 | - | - | - | - | - | - |
| ESE | 1.20 | 1931 | 3.310E-09 | 2.80 | 4511 | 8.578E-10 | 1.10 | 1770 | 3.807E-09 | 1.10 | 1770 | 3.807E-09 |
| SE | 1.10 | 1770 | 3.303E-09 | 4.50 | 7241 | 3.332E-10 | - | - | - | - | - | - |
| SSE | 1.20 | 1931 | 1.297E-09 | 4.49 | 7224 | 1.945E-10 | 4.70 | 7562 | 2.015E-10 | - | - | - |
| S | 1.20 | 1931 | 6.821E-10 | 1.88 | 3018 | 4.144E-10 | 2.30 | 3701 | 3.013E-10 | - | - | - |
| SSW | 1.40 | 2253 | 4.649E-10 | 0.89 | 1433 | 7.654E-10 | 1.80 | 2896 | 3.283E-10 | - | - | - |
| SW | 0.60 | 965 | 6.543E-10 | 1.76 | 2835 | 2.424E-10 | 3.00 | 4827 | 1.261E-10 | - | - | - |
| WSW | 0.80 | 1287 | 9.310E-10 | 1.33 | 2134 | 5.936E-10 | 2.80 | 4505 | 2.349E-10 | - | - | - |
| W | 2.20 | 3540 | 3.443E-10 | 2.54 | 4084 | 2.918E-10 | - | - | - | - | - | - |
| WNW | 0.70 | 1126 | 7.803E-10 | - | - | - | - | - | - | - | - | - |
| NW | 1.60 | 2574 | 3.044E-10 | 4.14 | 6660 | 1.042E-10 | - | - | - | - | - | - |
| NNW | 1.20 | 1931 | 4.959E-10 | 3.93 | 6325 | 1.676E-10 | - | - | - | - | - | - |

**Table 6**
**Limerick Generating Station**
**2001 Annual Dispersion Calculations for Ingestion Pathway Receptors**
**South Vent, Flow = 144,000 cfm**

| | Vegetation Pathway | | | Meat Pathway | | | Cow Pathway | | | Goat Pathway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Distance | | D/Q | Distance | | D/Q | Distance | | D/Q | Distance | | D/Q |
| Direction | (miles) | (meters) | ($m^{-2}$) | (miles) | (meters) | ($m^{-2}$) | (miles) | (meters) | ($m^{-2}$) | (miles) | (meters) | ($m^{-2}$) |
| N | 1.60 | 2574. | 7.480E-10 | 2.12 | 3414. | 6.364E-10 | 4.70 | 7562. | 2.329E-10 | - | - | - |
| NNE | 0.50 | 805. | 5.398E-09 | 0.98 | 1585. | 2.101E-09 | - | - | - | - | - | - |
| NE | 1.50 | 2414. | 8.653E-10 | 0.68 | 1097. | 2.785E-09 | - | - | - | - | - | - |
| ENE | 1.80 | 2896. | 5.996E-10 | 2.41 | 3871. | 3.687E-10 | - | - | - | - | - | - |
| E | 1.10 | 1770. | 2.588E-09 | 1.17 | 1890. | 2.325E-09 | - | - | - | - | - | - |
| ESE | 1.20 | 1931. | 3.408E-09 | 2.80 | 4511. | 8.966E-10 | 1.10 | 1770. | 3.928-E-09 | 1.10 | 1770. | 3.928E-09 |
| SE | 1.10 | 1770. | 3.470E-09 | 4.50 | 7241. | 3.386E-10 | - | - | - | - | - | - |
| SSE | 1.20 | 1931. | 1.341E-09 | 4.49 | 7224. | 2.362E-10 | 4.70 | 7562. | 2.175E-10 | - | - | - |
| S | 1.20 | 1931. | 7.856E-10 | 1.88 | 3018. | 4.263E-10 | 2.30 | 3701. | 3.229E-10 | - | - | - |
| SSW | 1.40 | 2253. | 4.823E-10 | 0.89 | 1433. | 8.723E-10 | 1.80 | 2896. | 3.489E-10 | - | - | - |
| SW | 0.60 | 965. | 7.122E-10 | 1.76 | 2835. | 2.525E-10 | 3.00 | 4827. | 1.402E-10 | - | - | - |
| WSW | 0.80 | 1287. | 1.090E-09 | 1.33 | 2134. | 6.149E-10 | 2.80 | 4505. | 2.507E-10 | - | - | - |
| W | 2.20 | 3540. | 3.825E-10 | 2.54 | 4084. | 3.251E-10 | - | - | - | - | - | - |
| WNW | 0.70 | 1126. | 9.402E-10 | - | - | - | - | - | - | - | - | - |
| NW | 1.60 | 2574. | 3.193E-10 | 4.14 | 6660. | 1.279E-10 | - | - | - | - | - | - |
| NNW | 1.20 | 1931. | 5.625E-10 | 3.93 | 6325. | 1.742E -10 | - | - | - | - | - | - |

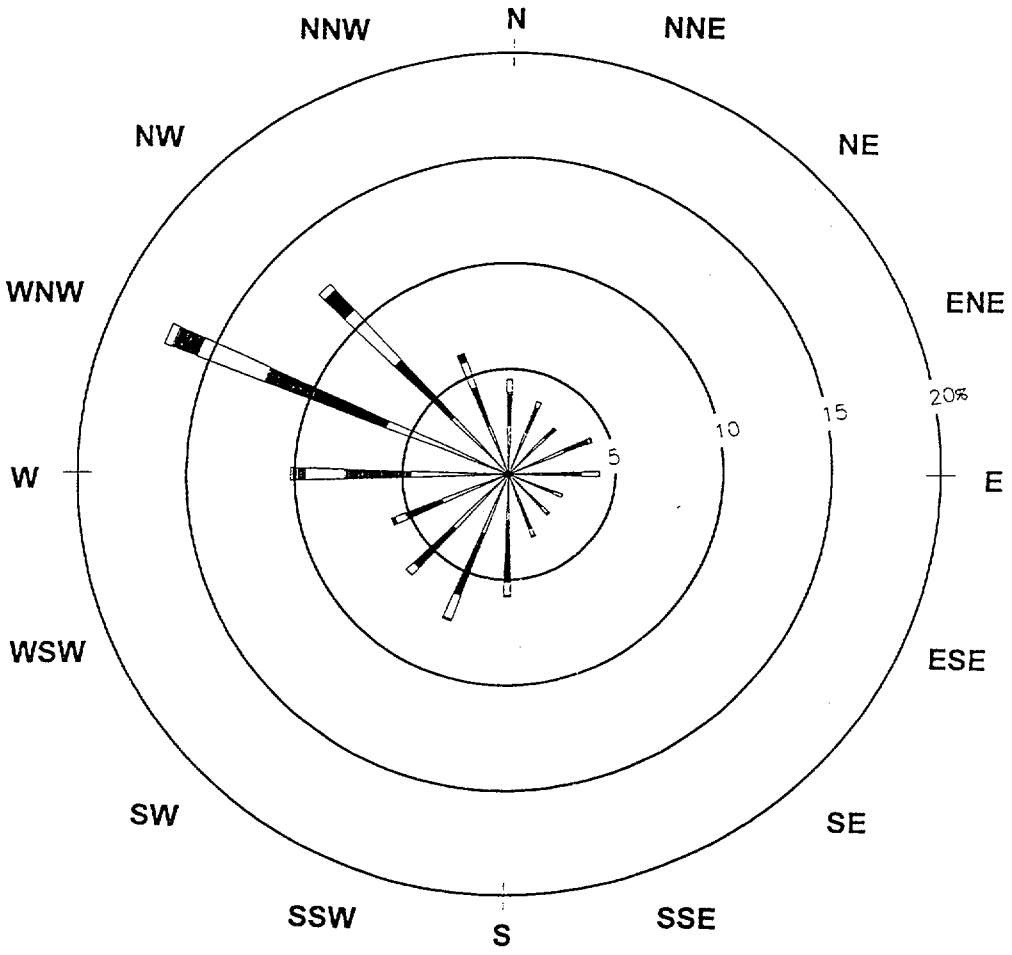


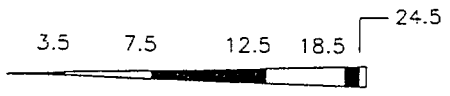




WIND SPEED CLASS BOUNDARIES
(MILES/HOUR)

NOTES:
DIAGRAM OF THE FREQUENCY OF OCCURRENCE OF EACH WIND DIRECTION. WIND DIRECTION IS THE DIRECTION FROM WHICH THE WIND IS BLOWING.

# Figure 1
## Limerick Gen. Sta.
Wind Level 1, 30-ft
2001 Annual
Wind Rose




WIND SPEED CLASS BOUNDARIES
(MILES/HOUR)

NOTES:
DIAGRAM OF THE FREQUENCY OF OCCURRENCE OF EACH WIND DIRECTION. WIND DIRECTION IS THE DIRECTION FROM WHICH THE WIND IS BLOWING.

# Figure 2
## Limerick Gen. Sta.
Wind Level 2, 175-ft
2001 Annual
Wind Rose

2001

ANNUAL DISPERSION CALCULATIONS

TOTAL

**Attachment 1**

**Limerick Generating Station**
**2001 Annual Dispersion Calculations**

Run 1 - Combined North Vent Annual X/Q Values

Run 2 - Combined North Vent Annual X/Q Values, Depleted and Decayed with an 8.05 Day Half Life

Run 3 - Combined North Vent Annual D/Q Values

Run 4 - Unit 1 and Unit 2 South Vent Annual X/Q Values

Run 5 - Unit 1 and Unit 2 South Vent Annual X/Q Values, Depleted and Decayed with an 8.05 Day Half Life

Run 6 - Unit 1 and Unit 2 South Vent Annual D/Q Values

CHI/Q (SEC/M3)

LGS 2001 EFFLUENT REPORT
ANNUAL DISPERSION CALCULATIONS
NORTH VENT; 363,000 cfm
Vs = 7.69 m/sec, VENT DIA = 5.33 m

SECTOR BEARING (DEGREES)

| DISTANCE METERS | NNE 22.5 | NE 45.0 | ENE 67.5 | E 90.0 | ESE 112.5 | SE 135.0 | SSE 157.5 | S 180.0 |
|---|---|---|---|---|---|---|---|---|
| 225.00 | 5.587E-06 | 4.676E-06 | 3.993E-06 | 8.134E-06 | 1.764E-05 | 9.354E-06 | 3.374E-06 | 2.155E-06 |
| 300.00 | 3.416E-06 | 2.878E-06 | 2.450E-06 | 5.004E-06 | 1.087E-05 | 5.765E-06 | 2.060E-06 | 1.315E-06 |
| 345.00 | 2.678E-06 | 2.264E-06 | 1.925E-06 | 3.934E-06 | 8.543E-06 | 4.532E-06 | 1.613E-06 | 1.029E-06 |
| 450.00 | 1.683E-06 | 1.430E-06 | 1.218E-06 | 2.490E-06 | 5.382E-06 | 2.864E-06 | 1.014E-06 | 6.454E-07 |
| 762.00 | 7.399E-07 | 6.266E-07 | 5.469E-07 | 1.122E-06 | 2.374E-06 | 1.280E-06 | 4.576E-07 | 2.876E-07 |
| 793.00 | 7.002E-07 | 5.929E-07 | 5.181E-07 | 1.062E-06 | 2.237E-06 | 1.207E-06 | 4.325E-07 | 2.717E-07 |
| 805.00 | 6.858E-07 | 5.808E-07 | 5.077E-07 | 1.040E-06 | 2.187E-06 | 1.181E-06 | 4.233E-07 | 2.660E-07 |
| 854.00 | 6.324E-07 | 5.357E-07 | 4.688E-07 | 9.577E-07 | 2.001E-06 | 1.081E-06 | 3.891E-07 | 2.444E-07 |
| 884.00 | 6.032E-07 | 5.112E-07 | 4.476E-07 | 9.129E-07 | 1.900E-06 | 1.027E-06 | 3.703E-07 | 2.326E-07 |
| 965.00 | 5.354E-07 | 4.546E-07 | 3.983E-07 | 8.086E-07 | 1.662E-06 | 8.991E-07 | 3.261E-07 | 2.047E-07 |
| 975.00 | 5.280E-07 | 4.485E-07 | 3.929E-07 | 7.972E-07 | 1.636E-06 | 8.851E-07 | 3.212E-07 | 2.016E-07 |
| 1006.00 | 5.064E-07 | 4.306E-07 | 3.772E-07 | 7.638E-07 | 1.561E-06 | 8.441E-07 | 3.070E-07 | 1.927E-07 |
| 1097.00 | 4.535E-07 | 3.867E-07 | 3.384E-07 | 6.815E-07 | 1.376E-06 | 7.441E-07 | 2.723E-07 | 1.708E-07 |
| 1126.00 | 4.389E-07 | 3.747E-07 | 3.276E-07 | 6.587E-07 | 1.324E-06 | 7.162E-07 | 2.625E-07 | 1.647E-07 |
| 1287.00 | 3.726E-07 | 3.212E-07 | 2.791E-07 | 5.544E-07 | 1.089E-06 | 5.880E-07 | 2.180E-07 | 1.364E-07 |
| 1433.00 | 3.289E-07 | 2.873E-07 | 2.473E-07 | 4.845E-07 | 9.316E-07 | 5.013E-07 | 1.882E-07 | 1.173E-07 |
| 1448.00 | 3.250E-07 | 2.844E-07 | 2.445E-07 | 4.783E-07 | 9.178E-07 | 4.936E-07 | 1.855E-07 | 1.156E-07 |
| 1585.00 | 2.949E-07 | 2.619E-07 | 2.227E-07 | 4.291E-07 | 8.079E-07 | 4.323E-07 | 1.648E-07 | 1.021E-07 |
| 1609.00 | 2.906E-07 | 2.587E-07 | 2.195E-07 | 4.218E-07 | 7.917E-07 | 4.232E-07 | 1.617E-07 | 1.001E-07 |
| 1770.00 | 2.652E-07 | 2.403E-07 | 2.010E-07 | 3.790E-07 | 6.985E-07 | 3.701E-07 | 1.443E-07 | 8.871E-08 |
| 1890.00 | 2.497E-07 | 2.293E-07 | 1.898E-07 | 3.527E-07 | 6.429E-07 | 3.380E-07 | 1.343E-07 | 8.197E-08 |
| 1931.00 | 2.449E-07 | 2.260E-07 | 1.864E-07 | 3.446E-07 | 6.261E-07 | 3.283E-07 | 1.313E-07 | 7.996E-08 |
| 2092.00 | 2.282E-07 | 2.139E-07 | 1.742E-07 | 3.165E-07 | 5.713E-07 | 2.961E-07 | 1.218E-07 | 7.330E-08 |
| 2134.00 | 2.242E-07 | 2.110E-07 | 1.713E-07 | 3.099E-07 | 5.592E-07 | 2.890E-07 | 1.197E-07 | 7.183E-08 |
| 2253.00 | 2.140E-07 | 2.034E-07 | 1.637E-07 | 2.929E-07 | 5.282E-07 | 2.707E-07 | 1.146E-07 | 6.815E-08 |
| 2414.00 | 2.018E-07 | 1.944E-07 | 1.548E-07 | 2.727E-07 | 4.924E-07 | 2.496E-07 | 1.091E-07 | 6.412E-08 |
| 2574.00 | 2.050E-07 | 1.902E-07 | 1.497E-07 | 2.573E-07 | 4.574E-07 | 2.318E-07 | 1.057E-07 | 6.208E-08 |
| 2835.00 | 2.151E-07 | 1.845E-07 | 1.430E-07 | 2.362E-07 | 4.094E-07 | 2.082E-07 | 1.023E-07 | 6.060E-08 |
| 2896.00 | 2.182E-07 | 1.833E-07 | 1.416E-07 | 2.318E-07 | 3.996E-07 | 2.035E-07 | 1.018E-07 | 6.051E-08 |
| 3018.00 | 2.255E-07 | 1.812E-07 | 1.391E-07 | 2.237E-07 | 3.813E-07 | 1.947E-07 | 1.010E-07 | 6.056E-08 |
| 3414.00 | 2.583E-07 | 1.758E-07 | 1.324E-07 | 2.017E-07 | 3.334E-07 | 1.727E-07 | 1.001E-07 | 6.209E-08 |
| 3540.00 | 2.699E-07 | 1.747E-07 | 1.307E-07 | 1.959E-07 | 3.211E-07 | 1.670E-07 | 1.002E-07 | 6.286E-08 |
| 3701.00 | 2.818E-07 | 1.737E-07 | 1.288E-07 | 1.890E-07 | 3.065E-07 | 1.604E-07 | 1.007E-07 | 6.396E-08 |
| 3871.00 | 2.872E-07 | 1.731E-07 | 1.271E-07 | 1.823E-07 | 2.924E-07 | 1.541E-07 | 1.016E-07 | 6.521E-08 |
| 4084.00 | 2.780E-07 | 1.737E-07 | 1.249E-07 | 1.739E-07 | 2.760E-07 | 1.463E-07 | 1.011E-07 | 6.610E-08 |
| 4505.00 | 2.427E-07 | 1.798E-07 | 1.192E-07 | 1.562E-07 | 2.470E-07 | 1.308E-07 | 9.073E-08 | 6.420E-08 |
| 4511.00 | 2.422E-07 | 1.799E-07 | 1.191E-07 | 1.560E-07 | 2.466E-07 | 1.306E-07 | 9.060E-08 | 6.418E-08 |
| 4827.00 | 2.189E-07 | 1.828E-07 | 1.157E-07 | 1.447E-07 | 2.281E-07 | 1.208E-07 | 8.402E-08 | 6.297E-08 |
| 6325.00 | 1.441E-07 | 1.442E-07 | 1.211E-07 | 1.149E-07 | 1.805E-07 | 8.936E-08 | 6.851E-08 | 5.367E-08 |
| 6660.00 | 1.343E-07 | 1.345E-07 | 1.245E-07 | 1.128E-07 | 1.787E-07 | 8.507E-08 | 6.805E-08 | 5.080E-08 |
| 7224.00 | 1.200E-07 | 1.205E-07 | 1.229E-07 | 1.103E-07 | 1.792E-07 | 7.886E-08 | 6.745E-08 | 4.656E-08 |
| 7241.00 | 1.196E-07 | 1.201E-07 | 1.227E-07 | 1.102E-07 | 1.792E-07 | 7.869E-08 | 6.743E-08 | 4.644E-08 |
| 7562.00 | 1.125E-07 | 1.132E-07 | 1.160E-07 | 1.051E-07 | 1.763E-07 | 7.640E-08 | 6.714E-08 | 4.671E-08 |
| 8047.00 | 1.031E-07 | 1.038E-07 | 1.069E-07 | 9.813E-08 | 1.727E-07 | 7.351E-08 | 6.649E-08 | 4.729E-08 |
| 16093.00 | 4.059E-08 | 4.137E-08 | 4.309E-08 | 5.099E-08 | 1.057E-07 | 5.476E-08 | 3.308E-08 | 2.942E-08 |
| 24140.00 | 2.306E-08 | 2.363E-08 | 2.452E-08 | 3.588E-08 | 6.158E-08 | 3.682E-08 | 1.872E-08 | 1.669E-08 |
| 32187.00 | 1.530E-08 | 1.571E-08 | 1.626E-08 | 2.401E-08 | 4.144E-08 | 2.448E-08 | 1.238E-08 | 1.104E-08 |
| 48280.00 | 8.815E-09 | 9.095E-09 | 9.329E-09 | 1.391E-08 | 2.404E-08 | 1.404E-08 | 7.101E-09 | 6.314E-09 |
| 64374.00 | 6.092E-09 | 6.294E-09 | 6.462E-09 | 9.659E-09 | 1.676E-08 | 9.733E-09 | 4.888E-09 | 4.349E-09 |
| 80467.00 | 4.548E-09 | 4.706E-09 | 4.837E-09 | 7.243E-09 | 1.261E-08 | 7.291E-09 | 3.638E-09 | 3.239E-09 |

**Run 1**
**North Vent X/Q**

CHI/Q (SEC/M3)

LGS 2001 EFFLUENT REPORT
ANNUAL DISPERSION CALCULATIONS
NORTH VENT; 363,000 cfm
Vs = 7.69 m/sec, VENT DIA = 5.33 m

SECTOR BEARING (DEGREES)

| DISTANCE METERS | SSW 202.5 | SW 225.0 | WSW 247.5 | W 270.0 | WNW 292.5 | NW 315.0 | NNW 337.5 | N 360.0 |
|---|---|---|---|---|---|---|---|---|
| 225.00 | 1.734E-06 | 1.222E-06 | 1.477E-06 | 1.964E-06 | 1.223E-06 | 1.150E-06 | 1.434E-06 | 3.285E-06 |
| 300.00 | 1.054E-06 | 7.405E-07 | 9.030E-07 | 1.199E-06 | 7.448E-07 | 7.019E-07 | 8.736E-07 | 1.995E-06 |
| 345.00 | 8.237E-07 | 5.778E-07 | 7.076E-07 | 9.387E-07 | 5.823E-07 | 5.493E-07 | 6.832E-07 | 1.559E-06 |
| 450.00 | 5.155E-07 | 3.608E-07 | 4.469E-07 | 5.924E-07 | 3.656E-07 | 3.455E-07 | 4.296E-07 | 9.746E-07 |
| 762.00 | 2.306E-07 | 1.602E-07 | 2.067E-07 | 2.756E-07 | 1.666E-07 | 1.576E-07 | 1.973E-07 | 4.343E-07 |
| 793.00 | 2.182E-07 | 1.514E-07 | 1.957E-07 | 2.609E-07 | 1.576E-07 | 1.491E-07 | 1.869E-07 | 4.121E-07 |
| 805.00 | 2.137E-07 | 1.482E-07 | 1.916E-07 | 2.555E-07 | 1.543E-07 | 1.460E-07 | 1.832E-07 | 4.040E-07 |
| 854.00 | 1.969E-07 | 1.363E-07 | 1.766E-07 | 2.355E-07 | 1.421E-07 | 1.345E-07 | 1.693E-07 | 3.739E-07 |
| 884.00 | 1.876E-07 | 1.298E-07 | 1.684E-07 | 2.245E-07 | 1.353E-07 | 1.282E-07 | 1.617E-07 | 3.575E-07 |
| 965.00 | 1.659E-07 | 1.145E-07 | 1.491E-07 | 1.986E-07 | 1.194E-07 | 1.135E-07 | 1.444E-07 | 3.193E-07 |
| 975.00 | 1.635E-07 | 1.128E-07 | 1.470E-07 | 1.958E-07 | 1.176E-07 | 1.119E-07 | 1.425E-07 | 3.152E-07 |
| 1006.00 | 1.565E-07 | 1.079E-07 | 1.408E-07 | 1.875E-07 | 1.125E-07 | 1.072E-07 | 1.371E-07 | 3.031E-07 |
| 1097.00 | 1.395E-07 | 9.603E-08 | 1.259E-07 | 1.675E-07 | 1.001E-07 | 9.585E-08 | 1.238E-07 | 2.731E-07 |
| 1126.00 | 1.348E-07 | 9.271E-08 | 1.218E-07 | 1.619E-07 | 9.659E-08 | 9.270E-08 | 1.202E-07 | 2.648E-07 |
| 1287.00 | 1.130E-07 | 7.757E-08 | 1.031E-07 | 1.364E-07 | 8.055E-08 | 7.846E-08 | 1.041E-07 | 2.273E-07 |
| 1433.00 | 9.866E-08 | 6.765E-08 | 9.129E-08 | 1.195E-07 | 6.981E-08 | 6.913E-08 | 9.388E-08 | 2.027E-07 |
| 1448.00 | 9.742E-08 | 6.680E-08 | 9.030E-08 | 1.181E-07 | 6.887E-08 | 6.832E-08 | 9.301E-08 | 2.006E-07 |
| 1585.00 | 8.793E-08 | 6.040E-08 | 8.304E-08 | 1.066E-07 | 6.147E-08 | 6.200E-08 | 8.634E-08 | 1.836E-07 |
| 1609.00 | 8.662E-08 | 5.955E-08 | 8.208E-08 | 1.049E-07 | 6.039E-08 | 6.108E-08 | 8.539E-08 | 1.811E-07 |
| 1770.00 | 7.971E-08 | 5.525E-08 | 7.754E-08 | 9.550E-08 | 5.432E-08 | 5.590E-08 | 8.015E-08 | 1.666E-07 |
| 1890.00 | 7.646E-08 | 5.352E-08 | 7.600E-08 | 9.025E-08 | 5.093E-08 | 5.298E-08 | 7.718E-08 | 1.579E-07 |
| 1931.00 | 7.568E-08 | 5.318E-08 | 7.578E-08 | 8.874E-08 | 4.996E-08 | 5.213E-08 | 7.631E-08 | 1.553E-07 |
| 2092.00 | 7.375E-08 | 5.271E-08 | 7.573E-08 | 8.384E-08 | 4.688E-08 | 4.925E-08 | 7.314E-08 | 1.459E-07 |
| 2134.00 | 7.350E-08 | 5.277E-08 | 7.589E-08 | 8.279E-08 | 4.624E-08 | 4.859E-08 | 7.237E-08 | 1.436E-07 |
| 2253.00 | 7.333E-08 | 5.335E-08 | 7.676E-08 | 8.022E-08 | 4.470E-08 | 4.693E-08 | 7.041E-08 | 1.378E-07 |
| 2414.00 | 7.415E-08 | 5.493E-08 | 7.867E-08 | 7.754E-08 | 4.319E-08 | 4.507E-08 | 6.812E-08 | 1.308E-07 |
| 2574.00 | 7.239E-08 | 5.481E-08 | 7.778E-08 | 7.492E-08 | 4.116E-08 | 4.317E-08 | 7.058E-08 | 1.331E-07 |
| 2835.00 | 7.013E-08 | 5.495E-08 | 7.659E-08 | 7.157E-08 | 3.847E-08 | 4.059E-08 | 7.544E-08 | 1.380E-07 |
| 2896.00 | 6.967E-08 | 5.501E-08 | 7.632E-08 | 7.090E-08 | 3.793E-08 | 4.005E-08 | 7.668E-08 | 1.393E-07 |
| 3018.00 | 6.879E-08 | 5.511E-08 | 7.576E-08 | 6.966E-08 | 3.692E-08 | 3.903E-08 | 7.920E-08 | 1.418E-07 |
| 3414.00 | 6.600E-08 | 5.501E-08 | 7.349E-08 | 6.617E-08 | 3.408E-08 | 3.601E-08 | 8.789E-08 | 1.514E-07 |
| 3540.00 | 6.516E-08 | 5.493E-08 | 7.272E-08 | 6.519E-08 | 3.331E-08 | 3.517E-08 | 9.100E-08 | 1.556E-07 |
| 3701.00 | 6.411E-08 | 5.479E-08 | 7.170E-08 | 6.399E-08 | 3.239E-08 | 3.414E-08 | 9.526E-08 | 1.619E-07 |
| 3871.00 | 6.300E-08 | 5.458E-08 | 7.058E-08 | 6.277E-08 | 3.147E-08 | 3.312E-08 | 9.997E-08 | 1.696E-07 |
| 4084.00 | 6.323E-08 | 5.525E-08 | 7.014E-08 | 6.131E-08 | 3.047E-08 | 3.286E-08 | 1.042E-07 | 1.775E-07 |
| 4505.00 | 7.195E-08 | 6.148E-08 | 7.365E-08 | 5.859E-08 | 2.899E-08 | 3.734E-08 | 1.034E-07 | 1.779E-07 |
| 4511.00 | 7.209E-08 | 6.157E-08 | 7.369E-08 | 5.855E-08 | 2.897E-08 | 3.741E-08 | 1.033E-07 | 1.779E-07 |
| 4827.00 | 7.979E-08 | 6.639E-08 | 7.587E-08 | 5.666E-08 | 2.792E-08 | 4.138E-08 | 1.001E-07 | 1.708E-07 |
| 6325.00 | 8.278E-08 | 7.419E-08 | 7.790E-08 | 5.866E-08 | 2.266E-08 | 5.737E-08 | 7.032E-08 | 1.156E-07 |
| 6660.00 | 7.733E-08 | 7.201E-08 | 7.617E-08 | 6.109E-08 | 2.150E-08 | 5.618E-08 | 6.547E-08 | 1.077E-07 |
| 7224.00 | 6.937E-08 | 6.733E-08 | 7.200E-08 | 6.039E-08 | 1.978E-08 | 5.154E-08 | 5.843E-08 | 9.623E-08 |
| 7241.00 | 6.915E-08 | 6.717E-08 | 7.185E-08 | 6.026E-08 | 1.973E-08 | 5.138E-08 | 5.824E-08 | 9.591E-08 |
| 7562.00 | 6.718E-08 | 6.448E-08 | 6.924E-08 | 5.713E-08 | 2.052E-08 | 4.853E-08 | 5.499E-08 | 9.030E-08 |
| 8047.00 | 6.311E-08 | 5.952E-08 | 6.401E-08 | 5.238E-08 | 2.199E-08 | 4.461E-08 | 5.049E-08 | 8.275E-08 |
| 16093.00 | 2.499E-08 | 2.325E-08 | 2.480E-08 | 2.009E-08 | 1.669E-08 | 1.735E-08 | 1.960E-08 | 3.234E-08 |
| 24140.00 | 1.404E-08 | 1.305E-08 | 1.379E-08 | 1.121E-08 | 9.392E-09 | 9.735E-09 | 1.101E-08 | 1.825E-08 |
| 32187.00 | 9.242E-09 | 8.592E-09 | 9.029E-09 | 7.358E-09 | 6.197E-09 | 6.404E-09 | 7.248E-09 | 1.204E-08 |
| 48280.00 | 5.275E-09 | 4.930E-09 | 5.146E-09 | 4.223E-09 | 3.547E-09 | 3.659E-09 | 4.141E-09 | 6.864E-09 |
| 64374.00 | 3.617E-09 | 3.377E-09 | 3.502E-09 | 2.880E-09 | 2.432E-09 | 2.505E-09 | 2.837E-09 | 4.720E-09 |
| 80467.00 | 2.683E-09 | 2.502E-09 | 2.580E-09 | 2.125E-09 | 1.803E-09 | 1.855E-09 | 2.103E-09 | 3.511E-09 |

DEPLETED CHI/Q (SEC/M3)

LGS 2001 EFFLUENT REPORT
ANNUAL DISPERSION CALCULATIONS
NORTH VENT; 363,000 cfm, 8.05 DAY DECAY
Vs = 7.69 m/sec, VENT DIA = 5.33 m

SECTOR BEARING (DEGREES)

| DISTANCE METERS | NNE 22.5 | NE 45.0 | ENE 67.5 | E 90.0 | ESE 112.5 | SE 135.0 | SSE 157.5 | S 180.0 |
|---|---|---|---|---|---|---|---|---|
| 225.00 | 5.403E-06 | 4.522E-06 | 3.862E-06 | 7.866E-06 | 1.706E-05 | 9.045E-06 | 3.263E-06 | 2.084E-06 |
| 300.00 | 3.275E-06 | 2.761E-06 | 2.349E-06 | 4.797E-06 | 1.042E-05 | 5.526E-06 | 1.974E-06 | 1.260E-06 |
| 345.00 | 2.554E-06 | 2.160E-06 | 1.836E-06 | 3.752E-06 | 8.144E-06 | 4.321E-06 | 1.538E-06 | 9.810E-07 |
| 450.00 | 1.587E-06 | 1.349E-06 | 1.148E-06 | 2.347E-06 | 5.067E-06 | 2.696E-06 | 9.551E-07 | 6.077E-07 |
| 762.00 | 6.810E-07 | 5.774E-07 | 5.038E-07 | 1.033E-06 | 2.177E-06 | 1.175E-06 | 4.200E-07 | 2.640E-07 |
| 793.00 | 6.431E-07 | 5.452E-07 | 4.764E-07 | 9.748E-07 | 2.046E-06 | 1.105E-06 | 3.960E-07 | 2.489E-07 |
| 805.00 | 6.293E-07 | 5.336E-07 | 4.664E-07 | 9.538E-07 | 1.999E-06 | 1.080E-06 | 3.873E-07 | 2.434E-07 |
| 854.00 | 5.784E-07 | 4.906E-07 | 4.294E-07 | 8.757E-07 | 1.822E-06 | 9.850E-07 | 3.547E-07 | 2.229E-07 |
| 884.00 | 5.506E-07 | 4.673E-07 | 4.092E-07 | 8.331E-07 | 1.726E-06 | 9.331E-07 | 3.368E-07 | 2.116E-07 |
| 965.00 | 4.863E-07 | 4.136E-07 | 3.624E-07 | 7.343E-07 | 1.501E-06 | 8.121E-07 | 2.948E-07 | 1.851E-07 |
| 975.00 | 4.793E-07 | 4.078E-07 | 3.573E-07 | 7.235E-07 | 1.476E-06 | 7.989E-07 | 2.902E-07 | 1.822E-07 |
| 1006.00 | 4.590E-07 | 3.910E-07 | 3.425E-07 | 6.921E-07 | 1.405E-06 | 7.603E-07 | 2.767E-07 | 1.737E-07 |
| 1097.00 | 4.100E-07 | 3.504E-07 | 3.066E-07 | 6.159E-07 | 1.234E-06 | 6.677E-07 | 2.446E-07 | 1.535E-07 |
| 1126.00 | 3.965E-07 | 3.393E-07 | 2.966E-07 | 5.948E-07 | 1.186E-06 | 6.419E-07 | 2.356E-07 | 1.478E-07 |
| 1287.00 | 3.355E-07 | 2.903E-07 | 2.520E-07 | 4.987E-07 | 9.697E-07 | 5.235E-07 | 1.944E-07 | 1.216E-07 |
| 1433.00 | 2.955E-07 | 2.595E-07 | 2.229E-07 | 4.346E-07 | 8.251E-07 | 4.438E-07 | 1.670E-07 | 1.040E-07 |
| 1448.00 | 2.920E-07 | 2.568E-07 | 2.203E-07 | 4.289E-07 | 8.124E-07 | 4.368E-07 | 1.646E-07 | 1.025E-07 |
| 1585.00 | 2.646E-07 | 2.366E-07 | 2.005E-07 | 3.839E-07 | 7.121E-07 | 3.806E-07 | 1.457E-07 | 9.014E-08 |
| 1609.00 | 2.606E-07 | 2.337E-07 | 1.976E-07 | 3.773E-07 | 6.974E-07 | 3.723E-07 | 1.429E-07 | 8.833E-08 |
| 1770.00 | 2.376E-07 | 2.174E-07 | 1.809E-07 | 3.383E-07 | 6.127E-07 | 3.238E-07 | 1.271E-07 | 7.792E-08 |
| 1890.00 | 2.237E-07 | 2.077E-07 | 1.709E-07 | 3.144E-07 | 5.624E-07 | 2.947E-07 | 1.181E-07 | 7.183E-08 |
| 1931.00 | 2.194E-07 | 2.047E-07 | 1.678E-07 | 3.071E-07 | 5.473E-07 | 2.859E-07 | 1.155E-07 | 7.001E-08 |
| 2092.00 | 2.044E-07 | 1.941E-07 | 1.569E-07 | 2.817E-07 | 4.984E-07 | 2.570E-07 | 1.071E-07 | 6.410E-08 |
| 2134.00 | 2.009E-07 | 1.916E-07 | 1.543E-07 | 2.758E-07 | 4.878E-07 | 2.507E-07 | 1.053E-07 | 6.281E-08 |
| 2253.00 | 1.918E-07 | 1.850E-07 | 1.476E-07 | 2.605E-07 | 4.605E-07 | 2.345E-07 | 1.009E-07 | 5.960E-08 |
| 2414.00 | 1.810E-07 | 1.771E-07 | 1.397E-07 | 2.424E-07 | 4.291E-07 | 2.158E-07 | 9.630E-08 | 5.612E-08 |
| 2574.00 | 1.851E-07 | 1.737E-07 | 1.355E-07 | 2.288E-07 | 3.979E-07 | 2.002E-07 | 9.365E-08 | 5.454E-08 |
| 2835.00 | 1.963E-07 | 1.692E-07 | 1.299E-07 | 2.101E-07 | 3.553E-07 | 1.795E-07 | 9.119E-08 | 5.366E-08 |
| 2896.00 | 1.997E-07 | 1.683E-07 | 1.288E-07 | 2.063E-07 | 3.466E-07 | 1.753E-07 | 9.086E-08 | 5.369E-08 |
| 3018.00 | 2.073E-07 | 1.666E-07 | 1.267E-07 | 1.991E-07 | 3.304E-07 | 1.677E-07 | 9.040E-08 | 5.395E-08 |
| 3414.00 | 2.362E-07 | 1.625E-07 | 1.211E-07 | 1.798E-07 | 2.884E-07 | 1.488E-07 | 9.040E-08 | 5.602E-08 |
| 3540.00 | 2.434E-07 | 1.618E-07 | 1.198E-07 | 1.747E-07 | 2.775E-07 | 1.439E-07 | 9.076E-08 | 5.692E-08 |
| 3701.00 | 2.483E-07 | 1.611E-07 | 1.182E-07 | 1.686E-07 | 2.647E-07 | 1.382E-07 | 9.147E-08 | 5.815E-08 |
| 3871.00 | 2.455E-07 | 1.608E-07 | 1.169E-07 | 1.627E-07 | 2.522E-07 | 1.328E-07 | 9.257E-08 | 5.952E-08 |
| 4084.00 | 2.303E-07 | 1.613E-07 | 1.151E-07 | 1.553E-07 | 2.377E-07 | 1.261E-07 | 9.236E-08 | 6.055E-08 |
| 4505.00 | 1.967E-07 | 1.642E-07 | 1.101E-07 | 1.392E-07 | 2.119E-07 | 1.124E-07 | 8.279E-08 | 5.897E-08 |
| 4511.00 | 1.963E-07 | 1.642E-07 | 1.100E-07 | 1.390E-07 | 2.116E-07 | 1.122E-07 | 8.266E-08 | 5.895E-08 |
| 4827.00 | 1.750E-07 | 1.624E-07 | 1.071E-07 | 1.287E-07 | 1.952E-07 | 1.035E-07 | 7.657E-08 | 5.793E-08 |
| 6325.00 | 1.106E-07 | 1.148E-07 | 1.081E-07 | 1.022E-07 | 1.544E-07 | 7.585E-08 | 6.246E-08 | 4.939E-08 |
| 6660.00 | 1.024E-07 | 1.065E-07 | 1.069E-07 | 1.006E-07 | 1.536E-07 | 7.215E-08 | 6.210E-08 | 4.667E-08 |
| 7224.00 | 9.049E-08 | 9.450E-08 | 9.743E-08 | 9.856E-08 | 1.553E-07 | 6.681E-08 | 6.150E-08 | 4.264E-08 |
| 7241.00 | 9.017E-08 | 9.417E-08 | 9.706E-08 | 9.851E-08 | 1.554E-07 | 6.666E-08 | 6.148E-08 | 4.253E-08 |
| 7562.00 | 8.433E-08 | 8.824E-08 | 9.084E-08 | 9.377E-08 | 1.530E-07 | 6.479E-08 | 6.090E-08 | 4.279E-08 |
| 8047.00 | 7.652E-08 | 8.030E-08 | 8.243E-08 | 8.732E-08 | 1.503E-07 | 6.247E-08 | 5.943E-08 | 4.329E-08 |
| 16093.00 | 2.727E-08 | 2.917E-08 | 2.879E-08 | 4.312E-08 | 8.060E-08 | 4.464E-08 | 2.246E-08 | 2.029E-08 |
| 24140.00 | 1.427E-08 | 1.536E-08 | 1.505E-08 | 2.506E-08 | 4.324E-08 | 2.366E-08 | 1.171E-08 | 1.061E-08 |
| 32187.00 | 8.727E-09 | 9.435E-09 | 9.215E-09 | 1.547E-08 | 2.683E-08 | 1.452E-08 | 7.159E-09 | 6.490E-09 |
| 48280.00 | 4.467E-09 | 4.617E-09 | 4.690E-09 | 7.866E-09 | 1.365E-08 | 7.377E-09 | 3.655E-09 | 3.298E-09 |
| 64374.00 | 2.798E-09 | 2.877E-09 | 2.941E-09 | 4.923E-09 | 8.572E-09 | 4.626E-09 | 2.282E-09 | 2.058E-09 |
| 80467.00 | 1.888E-09 | 1.942E-09 | 1.985E-09 | 3.313E-09 | 5.786E-09 | 3.124E-09 | 1.535E-09 | 1.383E-09 |

**Run 2**
**North Vent X/Q**
**Depleted and**
**Decayed**

DEPLETED CHI/Q (SEC/M3)

LGS 2001 EFFLUENT REPORT
ANNUAL DISPERSION CALCULATIONS
NORTH VENT; 363,000 cfm, 8.05 DAY DECAY
Vs = 7.69 m/sec, VENT DIA = 5.33 m

SECTOR BEARING (DEGREES)

| DISTANCE METERS | SSW 202.5 | SW 225.0 | WSW 247.5 | W 270.0 | WNW 292.5 | NW 315.0 | NNW 337.5 | N 360.0 |
|---|---|---|---|---|---|---|---|---|
| 225.00 | 1.677E-06 | 1.182E-06 | 1.428E-06 | 1.899E-06 | 1.183E-06 | 1.112E-06 | 1.387E-06 | 3.177E-06 |
| 300.00 | 1.010E-06 | 7.097E-07 | 8.656E-07 | 1.149E-06 | 7.139E-07 | 6.729E-07 | 8.375E-07 | 1.913E-06 |
| 345.00 | 7.853E-07 | 5.508E-07 | 6.746E-07 | 8.951E-07 | 5.552E-07 | 5.238E-07 | 6.515E-07 | 1.487E-06 |
| 450.00 | 4.854E-07 | 3.397E-07 | 4.209E-07 | 5.579E-07 | 3.442E-07 | 3.253E-07 | 4.046E-07 | 9.180E-07 |
| 762.00 | 2.118E-07 | 1.470E-07 | 1.899E-07 | 2.530E-07 | 1.529E-07 | 1.445E-07 | 1.811E-07 | 3.990E-07 |
| 793.00 | 2.000E-07 | 1.386E-07 | 1.793E-07 | 2.390E-07 | 1.443E-07 | 1.364E-07 | 1.713E-07 | 3.777E-07 |
| 805.00 | 1.956E-07 | 1.356E-07 | 1.755E-07 | 2.338E-07 | 1.412E-07 | 1.335E-07 | 1.677E-07 | 3.700E-07 |
| 854.00 | 1.796E-07 | 1.243E-07 | 1.611E-07 | 2.147E-07 | 1.295E-07 | 1.225E-07 | 1.545E-07 | 3.414E-07 |
| 884.00 | 1.708E-07 | 1.180E-07 | 1.533E-07 | 2.042E-07 | 1.230E-07 | 1.165E-07 | 1.473E-07 | 3.257E-07 |
| 965.00 | 1.501E-07 | 1.035E-07 | 1.350E-07 | 1.797E-07 | 1.079E-07 | 1.026E-07 | 1.309E-07 | 2.896E-07 |
| 975.00 | 1.479E-07 | 1.019E-07 | 1.330E-07 | 1.770E-07 | 1.062E-07 | 1.010E-07 | 1.291E-07 | 2.856E-07 |
| 1006.00 | 1.413E-07 | 9.723E-08 | 1.271E-07 | 1.691E-07 | 1.014E-07 | 9.664E-08 | 1.240E-07 | 2.742E-07 |
| 1097.00 | 1.256E-07 | 8.625E-08 | 1.133E-07 | 1.506E-07 | 8.986E-08 | 8.616E-08 | 1.119E-07 | 2.465E-07 |
| 1126.00 | 1.212E-07 | 8.318E-08 | 1.095E-07 | 1.455E-07 | 8.664E-08 | 8.327E-08 | 1.085E-07 | 2.389E-07 |
| 1287.00 | 1.011E-07 | 6.920E-08 | 9.234E-08 | 1.220E-07 | 7.182E-08 | 7.018E-08 | 9.383E-08 | 2.045E-07 |
| 1433.00 | 8.788E-08 | 6.011E-08 | 8.159E-08 | 1.065E-07 | 6.196E-08 | 6.168E-08 | 8.461E-08 | 1.821E-07 |
| 1448.00 | 8.675E-08 | 5.933E-08 | 8.070E-08 | 1.052E-07 | 6.110E-08 | 6.095E-08 | 8.383E-08 | 1.802E-07 |
| 1585.00 | 7.814E-08 | 5.355E-08 | 7.421E-08 | 9.477E-08 | 5.436E-08 | 5.524E-08 | 7.788E-08 | 1.649E-07 |
| 1609.00 | 7.695E-08 | 5.278E-08 | 7.337E-08 | 9.326E-08 | 5.338E-08 | 5.441E-08 | 7.704E-08 | 1.626E-07 |
| 1770.00 | 7.081E-08 | 4.901E-08 | 6.952E-08 | 8.483E-08 | 4.791E-08 | 4.980E-08 | 7.244E-08 | 1.496E-07 |
| 1890.00 | 6.804E-08 | 4.761E-08 | 6.840E-08 | 8.019E-08 | 4.490E-08 | 4.723E-08 | 6.987E-08 | 1.419E-07 |
| 1931.00 | 6.740E-08 | 4.737E-08 | 6.831E-08 | 7.886E-08 | 4.404E-08 | 4.649E-08 | 6.912E-08 | 1.395E-07 |
| 2092.00 | 6.602E-08 | 4.727E-08 | 6.872E-08 | 7.465E-08 | 4.140E-08 | 4.401E-08 | 6.642E-08 | 1.312E-07 |
| 2134.00 | 6.589E-08 | 4.742E-08 | 6.899E-08 | 7.376E-08 | 4.085E-08 | 4.345E-08 | 6.577E-08 | 1.292E-07 |
| 2253.00 | 6.606E-08 | 4.822E-08 | 7.013E-08 | 7.161E-08 | 3.958E-08 | 4.204E-08 | 6.410E-08 | 1.241E-07 |
| 2414.00 | 6.725E-08 | 5.005E-08 | 7.234E-08 | 6.944E-08 | 3.838E-08 | 4.048E-08 | 6.216E-08 | 1.179E-07 |
| 2574.00 | 6.585E-08 | 5.017E-08 | 7.176E-08 | 6.725E-08 | 3.663E-08 | 3.885E-08 | 6.482E-08 | 1.208E-07 |
| 2835.00 | 6.407E-08 | 5.063E-08 | 7.096E-08 | 6.448E-08 | 3.433E-08 | 3.662E-08 | 6.986E-08 | 1.263E-07 |
| 2896.00 | 6.371E-08 | 5.075E-08 | 7.078E-08 | 6.393E-08 | 3.387E-08 | 3.616E-03 | 7.111E-08 | 1.277E-07 |
| 3018.00 | 6.301E-08 | 5.097E-08 | 7.036E-08 | 6.292E-08 | 3.301E-08 | 3.528E-08 | 7.366E-08 | 1.304E-07 |
| 3414.00 | 6.074E-08 | 5.118E-08 | 6.849E-08 | 6.005E-08 | 3.059E-08 | 3.266E-08 | 8.238E-08 | 1.404E-07 |
| 3540.00 | 6.004E-08 | 5.118E-08 | 6.782E-08 | 5.923E-08 | 2.992E-08 | 3.191E-08 | 8.546E-08 | 1.445E-07 |
| 3701.00 | 5.914E-08 | 5.113E-08 | 6.692E-08 | 5.822E-08 | 2.913E-08 | 3.101E-08 | 8.933E-08 | 1.501E-07 |
| 3871.00 | 5.818E-08 | 5.101E-08 | 6.591E-08 | 5.718E-08 | 2.833E-08 | 3.011E-08 | 9.302E-08 | 1.558E-07 |
| 4084.00 | 5.853E-08 | 5.175E-08 | 6.555E-08 | 5.592E-08 | 2.747E-08 | 2.994E-08 | 9.535E-08 | 1.598E-07 |
| 4505.00 | 6.716E-08 | 5.794E-08 | 6.900E-08 | 5.353E-08 | 2.620E-08 | 3.445E-08 | 9.116E-08 | 1.531E-07 |
| 4511.00 | 6.729E-08 | 5.803E-08 | 6.904E-08 | 5.350E-08 | 2.618E-08 | 3.452E-08 | 9.107E-08 | 1.529E-07 |
| 4827.00 | 7.476E-08 | 6.276E-08 | 7.111E-08 | 5.180E-08 | 2.528E-08 | 3.843E-08 | 8.515E-08 | 1.410E-07 |
| 6325.00 | 6.957E-08 | 6.495E-08 | 6.943E-08 | 5.343E-08 | 2.050E-08 | 4.892E-08 | 5.467E-08 | 8.896E-08 |
| 6660.00 | 6.468E-08 | 6.116E-08 | 6.595E-08 | 5.346E-08 | 1.942E-08 | 4.560E-08 | 5.060E-08 | 8.236E-08 |
| 7224.00 | 5.757E-08 | 5.422E-08 | 5.891E-08 | 4.732E-08 | 1.783E-08 | 3.944E-08 | 4.470E-08 | 7.280E-08 |
| 7241.00 | 5.737E-08 | 5.401E-08 | 5.868E-08 | 4.708E-08 | 1.778E-08 | 3.929E-08 | 4.454E-08 | 7.254E-08 |
| 7562.00 | 5.385E-08 | 4.991E-08 | 5.413E-08 | 4.308E-08 | 1.858E-08 | 3.667E-08 | 4.146E-08 | 6.780E-08 |
| 8047.00 | 4.833E-08 | 4.481E-08 | 4.840E-08 | 3.897E-08 | 2.003E-08 | 3.324E-08 | 3.758E-08 | 6.149E-08 |
| 16093.00 | 1.681E-08 | 1.553E-08 | 1.656E-08 | 1.342E-08 | 1.124E-08 | 1.160E-08 | 1.308E-08 | 2.166E-08 |
| 24140.00 | 8.689E-09 | 8.014E-09 | 8.460E-09 | 6.892E-09 | 5.824E-09 | 5.990E-09 | 6.758E-09 | 1.125E-08 |
| 32187.00 | 5.279E-09 | 4.869E-09 | 5.109E-09 | 4.178E-09 | 3.522E-09 | 3.638E-09 | 4.106E-09 | 6.855E-09 |
| 48280.00 | 2.674E-09 | 2.476E-09 | 2.581E-09 | 2.128E-09 | 1.782E-09 | 1.841E-09 | 2.081E-09 | 3.470E-09 |
| 64374.00 | 1.658E-09 | 1.533E-09 | 1.588E-09 | 1.315E-09 | 1.105E-09 | 1.141E-09 | 1.290E-09 | 2.163E-09 |
| 80467.00 | 1.108E-09 | 1.023E-09 | 1.054E-09 | 8.753E-10 | 7.387E-10 | 7.622E-10 | 8.623E-10 | 1.454E-09 |

D/Q (/M2)

LGS 2001 EFFLUENT REPORT
ANNUAL DISPERSION CALCULATIONS
NORTH VENT; 363,000 cfm, 8.05 DAY DECAY
Vs = 7.69 m/sec, VENT DIA = 5.33 m

SECTOR BEARING (DEGREES)

| DISTANCE METERS | NNE 22.5 | NE 45.0 | ENE 67.5 | E 90.0 | ESE 112.5 | SE 135.0 | SSE 157.5 | S 180.0 |
|---|---|---|---|---|---|---|---|---|
| 225.00 | 2.475E-08 | 1.563E-08 | 1.632E-08 | 4.041E-08 | 7.867E-08 | 6.767E-08 | 2.668E-08 | 1.216E-08 |
| 300.00 | 1.731E-08 | 1.123E-08 | 1.152E-08 | 2.793E-08 | 5.362E-08 | 4.593E-08 | 1.813E-08 | 8.334E-09 |
| 345.00 | 1.434E-08 | 9.469E-09 | 9.602E-09 | 2.293E-08 | 4.352E-08 | 3.723E-08 | 1.472E-08 | 6.817E-09 |
| 450.00 | 1.015E-08 | 6.960E-09 | 6.876E-09 | 1.590E-08 | 2.943E-08 | 2.509E-08 | 9.971E-09 | 4.702E-09 |
| 762.00 | 5.061E-09 | 3.653E-09 | 3.472E-09 | 7.662E-09 | 1.364E-08 | 1.153E-08 | 4.642E-09 | 2.284E-09 |
| 793.00 | 4.798E-09 | 3.473E-09 | 3.294E-09 | 7.250E-09 | 1.288E-08 | 1.087E-08 | 4.385E-09 | 2.166E-09 |
| 805.00 | 4.702E-09 | 3.408E-09 | 3.229E-09 | 7.100E-09 | 1.260E-08 | 1.063E-08 | 4.292E-09 | 2.123E-09 |
| 854.00 | 4.338E-09 | 3.159E-09 | 2.986E-09 | 6.535E-09 | 1.157E-08 | 9.768E-09 | 3.945E-09 | 1.962E-09 |
| 884.00 | 4.140E-09 | 3.026E-09 | 2.857E-09 | 6.240E-09 | 1.102E-08 | 9.296E-09 | 3.759E-09 | 1.876E-09 |
| 965.00 | 3.681E-09 | 2.702E-09 | 2.550E-09 | 5.530E-09 | 9.731E-09 | 8.207E-09 | 3.339E-09 | 1.678E-09 |
| 975.00 | 3.631E-09 | 2.667E-09 | 2.520E-09 | 5.453E-09 | 9.588E-09 | 8.092E-09 | 3.294E-09 | 1.657E-09 |
| 1006.00 | 3.482E-09 | 2.561E-09 | 2.425E-09 | 5.219E-09 | 9.163E-09 | 7.746E-09 | 3.161E-09 | 1.593E-09 |
| 1097.00 | 3.071E-09 | 2.263E-09 | 2.135E-09 | 4.563E-09 | 7.989E-09 | 6.763E-09 | 2.786E-09 | 1.410E-09 |
| 1126.00 | 2.956E-09 | 2.179E-09 | 2.055E-09 | 4.384E-09 | 7.667E-09 | 6.500E-09 | 2.690E-09 | 1.360E-09 |
| 1287.00 | 2.444E-09 | 1.833E-09 | 1.710E-09 | 3.594E-09 | 6.241E-09 | 5.318E-09 | 2.256E-09 | 1.145E-09 |
| 1433.00 | 2.094E-09 | 1.591E-09 | 1.473E-09 | 3.068E-09 | 5.296E-09 | 4.532E-09 | 1.958E-09 | 1.004E-09 |
| 1448.00 | 2.063E-09 | 1.568E-09 | 1.451E-09 | 3.022E-09 | 5.212E-09 | 4.467E-09 | 1.937E-09 | 9.926E-10 |
| 1585.00 | 1.808E-09 | 1.387E-09 | 1.278E-09 | 2.648E-09 | 4.541E-09 | 3.907E-09 | 1.733E-09 | 8.849E-10 |
| 1609.00 | 1.766E-09 | 1.355E-09 | 1.249E-09 | 2.586E-09 | 4.430E-09 | 3.820E-09 | 1.703E-09 | 8.665E-10 |
| 1770.00 | 1.528E-09 | 1.201E-09 | 1.081E-09 | 2.234E-09 | 3.807E-09 | 3.303E-09 | 1.476E-09 | 7.611E-10 |
| 1890.00 | 1.385E-09 | 1.096E-09 | 9.853E-10 | 2.019E-09 | 3.428E-09 | 2.984E-09 | 1.338E-09 | 6.999E-10 |
| 1931.00 | 1.345E-09 | 1.068E-09 | 9.538E-10 | 1.953E-09 | 3.310E-09 | 2.887E-09 | 1.297E-09 | 6.821E-10 |
| 2092.00 | 1.202E-09 | 9.601E-10 | 8.491E-10 | 1.746E-09 | 2.916E-09 | 2.550E-09 | 1.149E-09 | 6.165E-10 |
| 2134.00 | 1.167E-09 | 9.309E-10 | 8.242E-10 | 1.694E-09 | 2.829E-09 | 2.471E-09 | 1.114E-09 | 6.040E-10 |
| 2253.00 | 1.089E-09 | 8.623E-10 | 7.679E-10 | 1.567E-09 | 2.596E-09 | 2.273E-09 | 1.030E-09 | 5.707E-10 |
| 2414.00 | 9.851E-10 | 7.923E-10 | 6.947E-10 | 1.417E-09 | 2.329E-09 | 2.038E-09 | 9.318E-10 | 5.339E-10 |
| 2574.00 | 9.298E-10 | 7.202E-10 | 6.332E-10 | 1.294E-09 | 2.099E-09 | 1.836E-09 | 8.347E-10 | 5.051E-10 |
| 2835.00 | 8.213E-10 | 6.307E-10 | 5.518E-10 | 1.126E-09 | 1.797E-09 | 1.572E-09 | 7.132E-10 | 4.483E-10 |
| 2896.00 | 7.987E-10 | 6.172E-10 | 5.362E-10 | 1.088E-09 | 1.736E-09 | 1.519E-09 | 6.873E-10 | 4.366E-10 |
| 3018.00 | 7.474E-10 | 5.803E-10 | 5.057E-10 | 1.024E-09 | 1.627E-09 | 1.421E-09 | 6.427E-10 | 4.144E-10 |
| 3414.00 | 7.945E-10 | 4.797E-10 | 4.266E-10 | 8.511E-10 | 1.336E-09 | 1.164E-09 | 5.621E-10 | 3.435E-10 |
| 3540.00 | 7.024E-10 | 4.536E-10 | 4.052E-10 | 8.066E-10 | 1.263E-09 | 1.097E-09 | 5.420E-10 | 3.243E-10 |
| 3701.00 | 6.118E-10 | 4.300E-10 | 3.790E-10 | 7.531E-10 | 1.177E-09 | 1.020E-09 | 5.106E-10 | 3.013E-10 |
| 3871.00 | 5.595E-10 | 4.223E-10 | 3.526E-10 | 7.012E-10 | 1.096E-09 | 9.490E-10 | 4.760E-10 | 2.844E-10 |
| 4084.00 | 7.167E-10 | 4.869E-10 | 3.277E-10 | 6.447E-10 | 1.009E-09 | 8.721E-10 | 4.389E-10 | 2.721E-10 |
| 4505.00 | 6.843E-10 | 4.490E-10 | 2.801E-10 | 5.483E-10 | 8.596E-10 | 7.421E-10 | 3.729E-10 | 2.387E-10 |
| 4511.00 | 6.829E-10 | 4.470E-10 | 2.794E-10 | 5.471E-10 | 8.578E-10 | 7.405E-10 | 3.721E-10 | 2.381E-10 |
| 4827.00 | 6.299E-10 | 3.626E-10 | 2.513E-10 | 4.895E-10 | 7.678E-10 | 6.625E-10 | 3.326E-10 | 2.157E-10 |
| 6325.00 | 4.044E-10 | 2.730E-10 | 2.388E-10 | 3.126E-10 | 5.095E-10 | 4.206E-10 | 2.112E-10 | 1.410E-10 |
| 6660.00 | 3.698E-10 | 2.526E-10 | 2.066E-10 | 2.865E-10 | 4.681E-10 | 3.847E-10 | 1.947E-10 | 1.293E-10 |
| 7224.00 | 3.213E-10 | 2.244E-10 | 1.992E-10 | 2.493E-10 | 4.028E-10 | 3.346E-10 | 1.945E-10 | 1.127E-10 |
| 7241.00 | 3.200E-10 | 2.236E-10 | 2.017E-10 | 2.484E-10 | 4.015E-10 | 3.332E-10 | 1.946E-10 | 1.123E-10 |
| 7562.00 | 2.973E-10 | 2.104E-10 | 1.948E-10 | 2.307E-10 | 3.727E-10 | 3.088E-10 | 2.015E-10 | 1.040E-10 |
| 8047.00 | 2.671E-10 | 1.933E-10 | 1.841E-10 | 2.076E-10 | 3.351E-10 | 2.780E-10 | 1.921E-10 | 9.827E-11 |
| 16093.00 | 8.061E-11 | 7.399E-11 | 6.398E-11 | 7.305E-11 | 1.962E-10 | 1.283E-10 | 6.630E-11 | 4.844E-11 |
| 24140.00 | 3.991E-11 | 4.079E-11 | 3.171E-11 | 6.374E-11 | 1.059E-10 | 7.228E-11 | 3.299E-11 | 2.458E-11 |
| 32187.00 | 2.433E-11 | 2.574E-11 | 1.925E-11 | 3.999E-11 | 6.608E-11 | 4.472E-11 | 2.008E-11 | 1.508E-11 |
| 48280.00 | 1.205E-11 | 1.060E-11 | 9.532E-12 | 1.944E-11 | 3.203E-11 | 2.179E-11 | 9.938E-12 | 7.449E-12 |
| 64374.00 | 6.983E-12 | 6.167E-12 | 5.522E-12 | 1.118E-11 | 1.833E-11 | 1.252E-11 | 5.777E-12 | 4.340E-12 |
| 80467.00 | 4.550E-12 | 4.018E-12 | 3.598E-12 | 7.233E-12 | 1.181E-11 | 8.091E-12 | 3.775E-12 | 2.844E-12 |

**Run 3**
**North Vent D/Q**

D/Q (/M2)

LGS 2001 EFFLUENT REPORT
ANNUAL DISPERSION CALCULATIONS
NORTH VENT; 363,000 cfm, 8.05 DAY DECAY
Vs = 7.69 m/sec, VENT DIA = 5.33 m

SECTOR BEARING (DEGREES)

| DISTANCE METERS | SSW 202.5 | SW 225.0 | WSW 247.5 | W 270.0 | WNW 292.5 | NW 315.0 | NNW 337.5 | N 360.0 |
|---|---|---|---|---|---|---|---|---|
| 225.00 | 7.490E-09 | 4.137E-09 | 7.678E-09 | 1.333E-08 | 7.308E-09 | 7.491E-09 | 8.516E-09 | 1.558E-08 |
| 300.00 | 5.186E-09 | 2.860E-09 | 5.316E-09 | 9.116E-09 | 4.977E-09 | 5.112E-09 | 5.795E-09 | 1.070E-08 |
| 345.00 | 4.281E-09 | 2.357E-09 | 4.387E-09 | 7.440E-09 | 4.048E-09 | 4.155E-09 | 4.703E-09 | 8.736E-09 |
| 450.00 | 3.019E-09 | 1.658E-09 | 3.094E-09 | 5.106E-09 | 2.755E-09 | 2.833E-09 | 3.190E-09 | 6.009E-09 |
| 762.00 | 1.531E-09 | 8.512E-10 | 1.586E-09 | 2.462E-09 | 1.310E-09 | 1.392E-09 | 1.544E-09 | 2.946E-09 |
| 793.00 | 1.457E-09 | 8.122E-10 | 1.512E-09 | 2.334E-09 | 1.241E-09 | 1.323E-09 | 1.467E-09 | 2.798E-09 |
| 805.00 | 1.430E-09 | 7.980E-10 | 1.485E-09 | 2.288E-09 | 1.216E-09 | 1.298E-09 | 1.439E-09 | 2.744E-09 |
| 854.00 | 1.328E-09 | 7.451E-10 | 1.385E-09 | 2.122E-09 | 1.123E-09 | 1.205E-09 | 1.334E-09 | 2.543E-09 |
| 884.00 | 1.273E-09 | 7.170E-10 | 1.331E-09 | 2.044E-09 | 1.074E-09 | 1.156E-09 | 1.288E-09 | 2.435E-09 |
| 965.00 | 1.149E-09 | 6.543E-10 | 1.209E-09 | 1.855E-09 | 9.605E-10 | 1.045E-09 | 1.162E-09 | 2.187E-09 |
| 975.00 | 1.136E-09 | 6.477E-10 | 1.199E-09 | 1.837E-09 | 9.484E-10 | 1.032E-09 | 1.148E-09 | 2.160E-09 |
| 1006.00 | 1.096E-09 | 6.278E-10 | 1.161E-09 | 1.772E-09 | 9.119E-10 | 9.952E-10 | 1.106E-09 | 2.079E-09 |
| 1097.00 | 9.817E-10 | 5.688E-10 | 1.055E-09 | 1.597E-09 | 8.082E-10 | 8.852E-10 | 9.832E-10 | 1.847E-09 |
| 1126.00 | 9.517E-10 | 5.543E-10 | 1.030E-09 | 1.551E-09 | 7.803E-10 | 8.554E-10 | 9.532E-10 | 1.784E-09 |
| 1287.00 | 8.358E-10 | 4.880E-10 | 9.310E-10 | 1.374E-09 | 6.670E-10 | 7.245E-10 | 8.104E-10 | 1.502E-09 |
| 1433.00 | 7.654E-10 | 4.606E-10 | 8.602E-10 | 1.239E-09 | 6.004E-10 | 6.438E-10 | 7.209E-10 | 1.320E-09 |
| 1448.00 | 7.607E-10 | 4.571E-10 | 8.689E-10 | 1.223E-09 | 5.937E-10 | 6.367E-10 | 7.131E-10 | 1.304E-09 |
| 1585.00 | 7.121E-10 | 4.272E-10 | 8.151E-10 | 1.109E-09 | 5.570E-10 | 5.743E-10 | 6.404E-10 | 1.167E-09 |
| 1609.00 | 6.984E-10 | 4.211E-10 | 8.038E-10 | 1.091E-09 | 5.455E-10 | 5.626E-10 | 6.272E-10 | 1.143E-09 |
| 1770.00 | 6.201E-10 | 3.822E-10 | 7.213E-10 | 9.601E-10 | 4.963E-10 | 4.944E-10 | 5.557E-10 | 9.997E-10 |
| 1890.00 | 5.709E-10 | 3.678E-10 | 6.736E-10 | 8.791E-10 | 4.566E-10 | 4.545E-10 | 5.103E-10 | 9.170E-10 |
| 1931.00 | 5.559E-10 | 3.596E-10 | 6.596E-10 | 8.526E-10 | 4.485E-10 | 4.433E-10 | 4.959E-10 | 8.906E-10 |
| 2092.00 | 5.112E-10 | 3.404E-10 | 6.065E-10 | 7.613E-10 | 4.115E-10 | 3.993E-10 | 4.480E-10 | 7.993E-10 |
| 2134.00 | 4.989E-10 | 3.330E-10 | 5.936E-10 | 7.402E-10 | 4.012E-10 | 3.892E-10 | 4.366E-10 | 7.800E-10 |
| 2253.00 | 4.649E-10 | 3.120E-10 | 5.585E-10 | 6.881E-10 | 3.814E-10 | 3.632E-10 | 4.102E-10 | 7.260E-10 |
| 2414.00 | 4.251E-10 | 2.937E-10 | 5.157E-10 | 6.220E-10 | 3.502E-10 | 3.336E-10 | 3.769E-10 | 6.625E-10 |
| 2574.00 | 3.871E-10 | 2.709E-10 | 4.726E-10 | 5.632E-10 | 3.184E-10 | 3.044E-10 | 3.630E-10 | 6.014E-10 |
| 2835.00 | 3.388E-10 | 2.424E-10 | 4.144E-10 | 4.870E-10 | 2.777E-10 | 2.655E-10 | 3.516E-10 | 5.817E-10 |
| 2896.00 | 3.283E-10 | 2.351E-10 | 4.018E-10 | 4.706E-10 | 2.691E-10 | 2.577E-10 | 3.459E-10 | 5.765E-10 |
| 3018.00 | 3.096E-10 | 2.217E-10 | 3.815E-10 | 4.404E-10 | 2.540E-10 | 2.432E-10 | 3.336E-10 | 5.601E-10 |
| 3414.00 | 2.611E-10 | 1.905E-10 | 3.237E-10 | 3.638E-10 | 2.133E-10 | 2.058E-10 | 2.733E-10 | 4.695E-10 |
| 3540.00 | 2.491E-10 | 1.822E-10 | 3.091E-10 | 3.443E-10 | 2.024E-10 | 1.958E-10 | 2.815E-10 | 4.988E-10 |
| 3701.00 | 2.355E-10 | 1.712E-10 | 2.918E-10 | 3.234E-10 | 1.903E-10 | 1.842E-10 | 3.070E-10 | 5.528E-10 |
| 3871.00 | 2.227E-10 | 1.615E-10 | 2.749E-10 | 3.069E-10 | 1.784E-10 | 1.736E-10 | 2.889E-10 | 5.091E-10 |
| 4084.00 | 2.116E-10 | 1.532E-10 | 2.602E-10 | 2.918E-10 | 1.666E-10 | 1.619E-10 | 2.576E-10 | 4.386E-10 |
| 4505.00 | 1.909E-10 | 1.389E-10 | 2.349E-10 | 2.605E-10 | 1.423E-10 | 1.413E-10 | 2.070E-10 | 3.413E-10 |
| 4511.00 | 1.912E-10 | 1.389E-10 | 2.348E-10 | 2.599E-10 | 1.420E-10 | 1.410E-10 | 2.063E-10 | 3.401E-10 |
| 4827.00 | 2.013E-10 | 1.261E-10 | 2.137E-10 | 2.385E-10 | 1.275E-10 | 1.344E-10 | 1.901E-10 | 4.064E-10 |
| 6325.00 | 1.490E-10 | 1.155E-10 | 1.802E-10 | 1.901E-10 | 8.248E-11 | 1.076E-10 | 1.676E-10 | 3.139E-10 |
| 6660.00 | 1.382E-10 | 1.028E-10 | 1.610E-10 | 1.789E-10 | 7.565E-11 | 1.042E-10 | 1.535E-10 | 2.871E-10 |
| 7224.00 | 1.232E-10 | 1.032E-10 | 1.423E-10 | 1.644E-10 | 6.602E-11 | 1.122E-10 | 1.336E-10 | 2.494E-10 |
| 7241.00 | 1.228E-10 | 1.034E-10 | 1.426E-10 | 1.648E-10 | 6.576E-11 | 1.117E-10 | 1.331E-10 | 2.484E-10 |
| 7562.00 | 1.249E-10 | 1.099E-10 | 1.496E-10 | 1.686E-10 | 6.053E-11 | 1.061E-10 | 1.268E-10 | 2.311E-10 |
| 8047.00 | 1.205E-10 | 1.065E-10 | 1.456E-10 | 1.533E-10 | 5.800E-11 | 9.574E-11 | 1.146E-10 | 2.081E-10 |
| 16093.00 | 3.981E-11 | 3.304E-11 | 4.543E-11 | 4.648E-11 | 2.956E-11 | 2.914E-11 | 3.477E-11 | 6.296E-11 |
| 24140.00 | 1.970E-11 | 1.635E-11 | 2.251E-11 | 2.301E-11 | 1.463E-11 | 1.443E-11 | 1.721E-11 | 3.118E-11 |
| 32187.00 | 1.196E-11 | 9.932E-12 | 1.367E-11 | 1.397E-11 | 8.940E-12 | 8.759E-12 | 1.045E-11 | 1.893E-11 |
| 48280.00 | 5.921E-12 | 4.919E-12 | 6.766E-12 | 6.917E-12 | 4.432E-12 | 4.339E-12 | 5.174E-12 | 9.377E-12 |
| 64374.00 | 3.433E-12 | 2.853E-12 | 3.920E-12 | 4.007E-12 | 2.568E-12 | 2.514E-12 | 2.997E-12 | 5.436E-12 |
| 80467.00 | 2.239E-12 | 1.862E-12 | 2.554E-12 | 2.611E-12 | 1.673E-12 | 1.638E-12 | 1.953E-12 | 3.542E-12 |

CHI/Q (SEC/M3)

LGS 2001 EFFLUENT REPORT
ANNUAL DISPERSION CALCULATIONS
SOUTH VENT; 144,000 cfm
Vs = 7.32 m/sec, VENT DIA = 3.44 m

SECTOR BEARING (DEGREES)

| DISTANCE METERS | NNE 22.5 | NE 45.0 | ENE 67.5 | E 90.0 | ESE 112.5 | SE 135.0 | SSE 157.5 | S 180.0 |
|---|---|---|---|---|---|---|---|---|
| 225.00 | 6.245E-06 | 5.166E-06 | 4.381E-06 | 9.063E-06 | 1.915E-05 | 1.018E-05 | 3.704E-06 | 2.407E-06 |
| 300.00 | 3.822E-06 | 3.188E-06 | 2.697E-06 | 5.586E-06 | 1.180E-05 | 6.276E-06 | 2.262E-06 | 1.469E-06 |
| 345.00 | 2.999E-06 | 2.511E-06 | 2.124E-06 | 4.397E-06 | 9.275E-06 | 4.934E-06 | 1.771E-06 | 1.150E-06 |
| 450.00 | 1.891E-06 | 1.592E-06 | 1.352E-06 | 2.792E-06 | 5.845E-06 | 3.118E-06 | 1.115E-06 | 7.219E-07 |
| 762.00 | 8.407E-07 | 7.065E-07 | 6.165E-07 | 1.274E-06 | 2.581E-06 | 1.394E-06 | 5.038E-07 | 3.222E-07 |
| 793.00 | 7.969E-07 | 6.701E-07 | 5.853E-07 | 1.208E-06 | 2.433E-06 | 1.315E-06 | 4.762E-07 | 3.045E-07 |
| 805.00 | 7.811E-07 | 6.569E-07 | 5.740E-07 | 1.184E-06 | 2.379E-06 | 1.286E-06 | 4.661E-07 | 2.981E-07 |
| 854.00 | 7.228E-07 | 6.090E-07 | 5.324E-07 | 1.094E-06 | 2.178E-06 | 1.178E-06 | 4.285E-07 | 2.740E-07 |
| 884.00 | 6.910E-07 | 5.832E-07 | 5.098E-07 | 1.045E-06 | 2.068E-06 | 1.118E-06 | 4.079E-07 | 2.607E-07 |
| 965.00 | 6.177E-07 | 5.244E-07 | 4.577E-07 | 9.308E-07 | 1.813E-06 | 9.797E-07 | 3.595E-07 | 2.297E-07 |
| 975.00 | 6.097E-07 | 5.181E-07 | 4.520E-07 | 9.183E-07 | 1.785E-06 | 9.645E-07 | 3.542E-07 | 2.262E-07 |
| 1006.00 | 5.865E-07 | 4.997E-07 | 4.355E-07 | 8.820E-07 | 1.703E-06 | 9.201E-07 | 3.387E-07 | 2.163E-07 |
| 1097.00 | 5.290E-07 | 4.540E-07 | 3.941E-07 | 7.913E-07 | 1.505E-06 | 8.116E-07 | 3.009E-07 | 1.919E-07 |
| 1126.00 | 5.131E-07 | 4.416E-07 | 3.828E-07 | 7.661E-07 | 1.449E-06 | 7.814E-07 | 2.904E-07 | 1.851E-07 |
| 1287.00 | 4.412E-07 | 3.867E-07 | 3.315E-07 | 6.511E-07 | 1.198E-06 | 6.428E-07 | 2.424E-07 | 1.539E-07 |
| 1433.00 | 3.933E-07 | 3.516E-07 | 2.977E-07 | 5.734E-07 | 1.030E-06 | 5.496E-07 | 2.107E-07 | 1.330E-07 |
| 1448.00 | 3.891E-07 | 3.485E-07 | 2.948E-07 | 5.665E-07 | 1.015E-06 | 5.413E-07 | 2.080E-07 | 1.312E-07 |
| 1585.00 | 3.554E-07 | 3.244E-07 | 2.711E-07 | 5.111E-07 | 8.987E-07 | 4.756E-07 | 1.863E-07 | 1.168E-07 |
| 1609.00 | 3.505E-07 | 3.209E-07 | 2.676E-07 | 5.027E-07 | 8.816E-07 | 4.658E-07 | 1.832E-07 | 1.147E-07 |
| 1770.00 | 3.212E-07 | 3.000E-07 | 2.469E-07 | 4.535E-07 | 7.829E-07 | 4.091E-07 | 1.653E-07 | 1.027E-07 |
| 1890.00 | 3.028E-07 | 2.868E-07 | 2.340E-07 | 4.228E-07 | 7.237E-07 | 3.749E-07 | 1.552E-07 | 9.576E-08 |
| 1931.00 | 2.971E-07 | 2.826E-07 | 2.300E-07 | 4.132E-07 | 7.058E-07 | 3.646E-07 | 1.523E-07 | 9.371E-08 |
| 2092.00 | 2.766E-07 | 2.673E-07 | 2.152E-07 | 3.796E-07 | 6.468E-07 | 3.302E-07 | 1.427E-07 | 8.691E-08 |
| 2134.00 | 2.718E-07 | 2.636E-07 | 2.117E-07 | 3.718E-07 | 6.338E-07 | 3.226E-07 | 1.406E-07 | 8.541E-08 |
| 2253.00 | 2.591E-07 | 2.537E-07 | 2.024E-07 | 3.513E-07 | 6.000E-07 | 3.029E-07 | 1.354E-07 | 8.167E-08 |
| 2414.00 | 2.438E-07 | 2.417E-07 | 1.912E-07 | 3.268E-07 | 5.607E-07 | 2.802E-07 | 1.299E-07 | 7.759E-08 |
| 2574.00 | 2.480E-07 | 2.356E-07 | 1.849E-07 | 3.081E-07 | 5.209E-07 | 2.608E-07 | 1.267E-07 | 7.607E-08 |
| 2835.00 | 2.605E-07 | 2.274E-07 | 1.763E-07 | 2.824E-07 | 4.661E-07 | 2.348E-07 | 1.234E-07 | 7.536E-08 |
| 2896.00 | 2.645E-07 | 2.257E-07 | 1.746E-07 | 2.771E-07 | 4.548E-07 | 2.296E-07 | 1.228E-07 | 7.542E-08 |
| 3018.00 | 2.739E-07 | 2.227E-07 | 1.713E-07 | 2.671E-07 | 4.337E-07 | 2.199E-07 | 1.220E-07 | 7.573E-08 |
| 3414.00 | 3.112E-07 | 2.158E-07 | 1.628E-07 | 2.400E-07 | 3.783E-07 | 1.950E-07 | 1.212E-07 | 7.771E-08 |
| 3540.00 | 3.195E-07 | 2.145E-07 | 1.607E-07 | 2.329E-07 | 3.640E-07 | 1.885E-07 | 1.215E-07 | 7.853E-08 |
| 3701.00 | 3.218E-07 | 2.133E-07 | 1.585E-07 | 2.244E-07 | 3.470E-07 | 1.809E-07 | 1.224E-07 | 7.966E-08 |
| 3871.00 | 3.123E-07 | 2.124E-07 | 1.567E-07 | 2.163E-07 | 3.306E-07 | 1.736E-07 | 1.239E-07 | 8.093E-08 |
| 4084.00 | 2.904E-07 | 2.125E-07 | 1.542E-07 | 2.062E-07 | 3.116E-07 | 1.647E-07 | 1.236E-07 | 8.170E-08 |
| 4505.00 | 2.495E-07 | 2.152E-07 | 1.472E-07 | 1.844E-07 | 2.779E-07 | 1.467E-07 | 1.103E-07 | 7.883E-08 |
| 4511.00 | 2.490E-07 | 2.152E-07 | 1.471E-07 | 1.842E-07 | 2.775E-07 | 1.465E-07 | 1.101E-07 | 7.879E-08 |
| 4827.00 | 2.239E-07 | 2.115E-07 | 1.427E-07 | 1.704E-07 | 2.562E-07 | 1.351E-07 | 1.017E-07 | 7.711E-08 |
| 6325.00 | 1.469E-07 | 1.502E-07 | 1.398E-07 | 1.350E-07 | 2.040E-07 | 9.940E-08 | 8.170E-08 | 6.512E-08 |
| 6660.00 | 1.368E-07 | 1.400E-07 | 1.384E-07 | 1.327E-07 | 2.033E-07 | 9.469E-08 | 8.079E-08 | 6.145E-08 |
| 7224.00 | 1.222E-07 | 1.252E-07 | 1.280E-07 | 1.295E-07 | 2.056E-07 | 8.789E-08 | 7.911E-08 | 5.603E-08 |
| 7241.00 | 1.218E-07 | 1.247E-07 | 1.276E-07 | 1.294E-07 | 2.058E-07 | 8.771E-08 | 7.906E-08 | 5.588E-08 |
| 7562.00 | 1.146E-07 | 1.174E-07 | 1.202E-07 | 1.231E-07 | 2.026E-07 | 8.533E-08 | 7.796E-08 | 5.614E-08 |
| 8047.00 | 1.050E-07 | 1.076E-07 | 1.101E-07 | 1.145E-07 | 1.984E-07 | 8.241E-08 | 7.588E-08 | 5.650E-08 |
| 16093.00 | 4.123E-08 | 4.246E-08 | 4.343E-08 | 5.686E-08 | 1.123E-07 | 6.010E-08 | 3.346E-08 | 2.997E-08 |
| 24140.00 | 2.341E-08 | 2.416E-08 | 2.471E-08 | 3.745E-08 | 6.468E-08 | 3.753E-08 | 1.890E-08 | 1.693E-08 |
| 32187.00 | 1.552E-08 | 1.603E-08 | 1.639E-08 | 2.491E-08 | 4.322E-08 | 2.491E-08 | 1.248E-08 | 1.117E-08 |
| 48280.00 | 8.946E-09 | 9.203E-09 | 9.405E-09 | 1.434E-08 | 2.488E-08 | 1.426E-08 | 7.159E-09 | 6.378E-09 |
| 64374.00 | 6.183E-09 | 6.368E-09 | 6.515E-09 | 9.938E-09 | 1.730E-08 | 9.880E-09 | 4.926E-09 | 4.388E-09 |
| 80467.00 | 4.616E-09 | 4.762E-09 | 4.877E-09 | 7.442E-09 | 1.300E-08 | 7.398E-09 | 3.665E-09 | 3.266E-09 |

**Run 4**
**South Vent X/Q**

CHI/Q (SEC/M3)

LGS 2001 EFFLUENT REPORT
ANNUAL DISPERSION CALCULATIONS
SOUTH VENT; 144,000 cfm
Vs = 7.32 m/sec, VENT DIA = 3.44 m

SECTOR BEARING (DEGREES)

| DISTANCE METERS | SSW 202.5 | SW 225.0 | WSW 247.5 | W 270.0 | WNW 292.5 | NW 315.0 | NNW 337.5 | N 360.0 |
|---|---|---|---|---|---|---|---|---|
| 225.00 | 1.915E-06 | 1.368E-06 | 1.622E-06 | 2.198E-06 | 1.397E-06 | 1.285E-06 | 1.607E-06 | 3.691E-06 |
| 300.00 | 1.164E-06 | 8.293E-07 | 9.918E-07 | 1.342E-06 | 8.506E-07 | 7.841E-07 | 9.794E-07 | 2.243E-06 |
| 345.00 | 9.101E-07 | 6.475E-07 | 7.773E-07 | 1.051E-06 | 6.651E-07 | 6.134E-07 | 7.662E-07 | 1.753E-06 |
| 450.00 | 5.705E-07 | 4.049E-07 | 4.913E-07 | 6.639E-07 | 4.178E-07 | 3.857E-07 | 4.821E-07 | 1.097E-06 |
| 762.00 | 2.565E-07 | 1.802E-07 | 2.283E-07 | 3.105E-07 | 1.906E-07 | 1.769E-07 | 2.246E-07 | 4.958E-07 |
| 793.00 | 2.428E-07 | 1.704E-07 | 2.163E-07 | 2.940E-07 | 1.804E-07 | 1.676E-07 | 2.135E-07 | 4.717E-07 |
| 805.00 | 2.378E-07 | 1.668E-07 | 2.119E-07 | 2.880E-07 | 1.766E-07 | 1.643E-07 | 2.095E-07 | 4.629E-07 |
| 854.00 | 2.193E-07 | 1.536E-07 | 1.957E-07 | 2.657E-07 | 1.626E-07 | 1.518E-07 | 1.948E-07 | 4.306E-07 |
| 884.00 | 2.091E-07 | 1.463E-07 | 1.868E-07 | 2.534E-07 | 1.549E-07 | 1.450E-07 | 1.869E-07 | 4.131E-07 |
| 965.00 | 1.853E-07 | 1.294E-07 | 1.663E-07 | 2.248E-07 | 1.367E-07 | 1.293E-07 | 1.690E-07 | 3.727E-07 |
| 975.00 | 1.827E-07 | 1.275E-07 | 1.640E-07 | 2.216E-07 | 1.347E-07 | 1.276E-07 | 1.671E-07 | 3.683E-07 |
| 1006.00 | 1.751E-07 | 1.221E-07 | 1.575E-07 | 2.125E-07 | 1.289E-07 | 1.226E-07 | 1.615E-07 | 3.555E-07 |
| 1097.00 | 1.566E-07 | 1.092E-07 | 1.420E-07 | 1.905E-07 | 1.148E-07 | 1.107E-07 | 1.479E-07 | 3.234E-07 |
| 1126.00 | 1.514E-07 | 1.057E-07 | 1.377E-07 | 1.844E-07 | 1.109E-07 | 1.074E-07 | 1.442E-07 | 3.145E-07 |
| 1287.00 | 1.284E-07 | 8.985E-08 | 1.195E-07 | 1.567E-07 | 9.309E-08 | 9.266E-08 | 1.279E-07 | 2.745E-07 |
| 1433.00 | 1.139E-07 | 8.024E-08 | 1.091E-07 | 1.388E-07 | 8.142E-08 | 8.327E-08 | 1.176E-07 | 2.481E-07 |
| 1448.00 | 1.127E-07 | 7.946E-08 | 1.083E-07 | 1.373E-07 | 8.041E-08 | 8.247E-08 | 1.168E-07 | 2.458E-07 |
| 1585.00 | 1.039E-07 | 7.411E-08 | 1.031E-07 | 1.253E-07 | 7.261E-08 | 7.625E-08 | 1.101E-07 | 2.272E-07 |
| 1609.00 | 1.028E-07 | 7.350E-08 | 1.025E-07 | 1.235E-07 | 7.149E-08 | 7.536E-08 | 1.091E-07 | 2.244E-07 |
| 1770.00 | 9.747E-08 | 7.110E-08 | 1.008E-07 | 1.140E-07 | 6.535E-08 | 7.034E-08 | 1.036E-07 | 2.078E-07 |
| 1890.00 | 9.568E-08 | 7.095E-08 | 1.013E-07 | 1.087E-07 | 6.204E-08 | 6.749E-08 | 1.004E-07 | 1.974E-07 |
| 1931.00 | 9.541E-08 | 7.116E-08 | 1.018E-07 | 1.072E-07 | 6.111E-08 | 6.665E-08 | 9.933E-08 | 1.941E-07 |
| 2092.00 | 9.529E-08 | 7.253E-08 | 1.038E-07 | 1.022E-07 | 5.817E-08 | 6.361E-08 | 9.542E-08 | 1.823E-07 |
| 2134.00 | 9.546E-08 | 7.300E-08 | 1.044E-07 | 1.012E-07 | 5.755E-08 | 6.288E-08 | 9.443E-08 | 1.794E-07 |
| 2253.00 | 9.639E-08 | 7.464E-08 | 1.062E-07 | 9.845E-08 | 5.609E-08 | 6.099E-08 | 9.182E-08 | 1.718E-07 |
| 2414.00 | 9.843E-08 | 7.738E-08 | 1.090E-07 | 9.553E-08 | 5.466E-08 | 5.876E-03 | 8.861E-08 | 1.625E-07 |
| 2574.00 | 9.605E-08 | 7.696E-08 | 1.071E-07 | 9.236E-08 | 5.219E-08 | 5.628E-08 | 9.166E-08 | 1.648E-07 |
| 2835.00 | 9.255E-08 | 7.627E-08 | 1.040E-07 | 8.801E-08 | 4.878E-08 | 5.272E-08 | 9.710E-08 | 1.690E-07 |
| 2896.00 | 9.176E-08 | 7.609E-08 | 1.033E-07 | 8.710E-08 | 4.807E-08 | 5.196E-08 | 9.842E-08 | 1.701E-07 |
| 3018.00 | 9.021E-08 | 7.568E-08 | 1.017E-07 | 8.536E-08 | 4.671E-08 | 5.048E-08 | 1.011E-07 | 1.724E-07 |
| 3414.00 | 8.517E-08 | 7.376E-08 | 9.630E-08 | 8.026E-08 | 4.280E-08 | 4.607E-08 | 1.110E-07 | 1.840E-07 |
| 3540.00 | 8.363E-08 | 7.309E-08 | 9.457E-08 | 7.878E-08 | 4.170E-08 | 4.480E-08 | 1.146E-07 | 1.896E-07 |
| 3701.00 | 8.169E-08 | 7.220E-08 | 9.235E-08 | 7.697E-08 | 4.037E-08 | 4.327E-08 | 1.193E-07 | 1.976E-07 |
| 3871.00 | 7.968E-08 | 7.123E-08 | 9.003E-08 | 7.514E-08 | 3.904E-08 | 4.174E-08 | 1.237E-07 | 2.055E-07 |
| 4084.00 | 7.919E-08 | 7.123E-08 | 8.836E-08 | 7.296E-08 | 3.757E-08 | 4.110E-08 | 1.257E-07 | 2.098E-07 |
| 4505.00 | 8.878E-08 | 7.746E-08 | 9.059E-08 | 6.902E-08 | 3.530E-08 | 4.602E-08 | 1.179E-07 | 1.968E-07 |
| 4511.00 | 8.893E-08 | 7.756E-08 | 9.062E-08 | 6.897E-08 | 3.527E-08 | 4.610E-08 | 1.178E-07 | 1.965E-07 |
| 4827.00 | 9.803E-08 | 8.250E-08 | 9.215E-08 | 6.632E-08 | 3.370E-08 | 5.076E-08 | 1.088E-07 | 1.794E-07 |
| 6325.00 | 8.984E-08 | 8.233E-08 | 8.721E-08 | 6.604E-08 | 2.654E-08 | 6.238E-08 | 7.167E-08 | 1.173E-07 |
| 6660.00 | 8.369E-08 | 7.801E-08 | 8.333E-08 | 6.664E-08 | 2.511E-08 | 5.880E-08 | 6.669E-08 | 1.092E-07 |
| 7224.00 | 7.475E-08 | 7.039E-08 | 7.575E-08 | 6.176E-08 | 2.299E-08 | 5.261E-08 | 5.946E-08 | 9.754E-08 |
| 7241.00 | 7.450E-08 | 7.017E-08 | 7.551E-08 | 6.156E-08 | 2.293E-08 | 5.244E-08 | 5.927E-08 | 9.722E-08 |
| 7562.00 | 7.062E-08 | 6.611E-08 | 7.119E-08 | 5.790E-08 | 2.381E-08 | 4.938E-08 | 5.578E-08 | 9.147E-08 |
| 8047.00 | 6.480E-08 | 6.054E-08 | 6.522E-08 | 5.294E-08 | 2.550E-08 | 4.522E-08 | 5.105E-08 | 8.376E-08 |
| 16093.00 | 2.518E-08 | 2.337E-08 | 2.491E-08 | 2.023E-08 | 1.685E-08 | 1.744E-08 | 1.971E-08 | 3.264E-08 |
| 24140.00 | 1.413E-08 | 1.312E-08 | 1.385E-08 | 1.128E-08 | 9.474E-09 | 9.783E-09 | 1.107E-08 | 1.842E-08 |
| 32187.00 | 9.301E-09 | 8.637E-09 | 9.068E-09 | 7.406E-09 | 6.243E-09 | 6.436E-09 | 7.291E-09 | 1.215E-08 |
| 48280.00 | 5.308E-09 | 4.956E-09 | 5.169E-09 | 4.250E-09 | 3.572E-09 | 3.676E-09 | 4.166E-09 | 6.931E-09 |
| 64374.00 | 3.639E-09 | 3.395E-09 | 3.517E-09 | 2.898E-09 | 2.449E-09 | 2.517E-09 | 2.854E-09 | 4.766E-09 |
| 80467.00 | 2.700E-09 | 2.515E-09 | 2.591E-09 | 2.138E-09 | 1.816E-09 | 1.864E-09 | 2.116E-09 | 3.546E-09 |

DEPLETED CHI/Q (SEC/M3)

LGS 2001 EFFLUENT REPORT
ANNUAL DISPERSION CALCULATIONS
SOUTH VENT; 144,000 cfm, 8.05 DAY DECAY
Vs = 7.32 m/sec, VENT DIA = 3.44 m

SECTOR BEARING (DEGREES)

| DISTANCE METERS | NNE 22.5 | NE 45.0 | ENE 67.5 | E 90.0 | ESE 112.5 | SE 135.0 | SSE 157.5 | S 180.0 |
|---|---|---|---|---|---|---|---|---|
| 225.00 | 6.040E-06 | 4.998E-06 | 4.237E-06 | 8.765E-06 | 1.852E-05 | 9.846E-06 | 3.582E-06 | 2.328E-06 |
| 300.00 | 3.665E-06 | 3.059E-06 | 2.587E-06 | 5.356E-06 | 1.131E-05 | 6.015E-06 | 2.168E-06 | 1.408E-06 |
| 345.00 | 2.862E-06 | 2.397E-06 | 2.027E-06 | 4.194E-06 | 8.842E-06 | 4.704E-06 | 1.689E-06 | 1.096E-06 |
| 450.00 | 1.783E-06 | 1.503E-06 | 1.275E-06 | 2.632E-06 | 5.502E-06 | 2.936E-06 | 1.050E-06 | 6.798E-07 |
| 762.00 | 7.746E-07 | 6.520E-07 | 5.690E-07 | 1.174E-06 | 2.368E-06 | 1.279E-06 | 4.625E-07 | 2.959E-07 |
| 793.00 | 7.329E-07 | 6.172E-07 | 5.393E-07 | 1.111E-06 | 2.226E-06 | 1.203E-06 | 4.361E-07 | 2.790E-07 |
| 805.00 | 7.178E-07 | 6.046E-07 | 5.285E-07 | 1.088E-06 | 2.175E-06 | 1.176E-06 | 4.265E-07 | 2.728E-07 |
| 854.00 | 6.623E-07 | 5.591E-07 | 4.889E-07 | 1.002E-06 | 1.984E-06 | 1.073E-06 | 3.907E-07 | 2.499E-07 |
| 884.00 | 6.322E-07 | 5.346E-07 | 4.674E-07 | 9.554E-07 | 1.880E-06 | 1.017E-06 | 3.711E-07 | 2.372E-07 |
| 965.00 | 5.628E-07 | 4.790E-07 | 4.181E-07 | 8.477E-07 | 1.638E-06 | 8.851E-07 | 3.252E-07 | 2.077E-07 |
| 975.00 | 5.552E-07 | 4.731E-07 | 4.128E-07 | 8.360E-07 | 1.611E-06 | 8.707E-07 | 3.201E-07 | 2.045E-07 |
| 1006.00 | 5.334E-07 | 4.558E-07 | 3.972E-07 | 8.018E-07 | 1.534E-06 | 8.289E-07 | 3.055E-07 | 1.951E-07 |
| 1097.00 | 4.803E-07 | 4.138E-07 | 3.590E-07 | 7.179E-07 | 1.351E-06 | 7.284E-07 | 2.705E-07 | 1.725E-07 |
| 1126.00 | 4.656E-07 | 4.024E-07 | 3.486E-07 | 6.946E-07 | 1.300E-06 | 7.005E-07 | 2.607E-07 | 1.662E-07 |
| 1287.00 | 3.995E-07 | 3.523E-07 | 3.015E-07 | 5.886E-07 | 1.068E-06 | 5.727E-07 | 2.165E-07 | 1.374E-07 |
| 1433.00 | 3.557E-07 | 3.205E-07 | 2.707E-07 | 5.173E-07 | 9.142E-07 | 4.870E-07 | 1.875E-07 | 1.182E-07 |
| 1448.00 | 3.518E-07 | 3.177E-07 | 2.679E-07 | 5.110E-07 | 9.007E-07 | 4.794E-07 | 1.850E-07 | 1.166E-07 |
| 1585.00 | 3.212E-07 | 2.960E-07 | 2.464E-07 | 4.602E-07 | 7.945E-07 | 4.193E-07 | 1.653E-07 | 1.034E-07 |
| 1609.00 | 3.167E-07 | 2.929E-07 | 2.433E-07 | 4.526E-07 | 7.789E-07 | 4.104E-07 | 1.624E-07 | 1.015E-07 |
| 1770.00 | 2.900E-07 | 2.741E-07 | 2.245E-07 | 4.075E-07 | 6.893E-07 | 3.587E-07 | 1.464E-07 | 9.061E-08 |
| 1890.00 | 2.733E-07 | 2.622E-07 | 2.128E-07 | 3.795E-07 | 6.359E-07 | 3.277E-07 | 1.374E-07 | 8.438E-08 |
| 1931.00 | 2.681E-07 | 2.585E-07 | 2.091E-07 | 3.707E-07 | 6.198E-07 | 3.183E-07 | 1.348E-07 | 8.254E-08 |
| 2092.00 | 2.496E-07 | 2.447E-07 | 1.958E-07 | 3.403E-07 | 5.672E-07 | 2.875E-07 | 1.264E-07 | 7.656E-08 |
| 2134.00 | 2.452E-07 | 2.413E-07 | 1.926E-07 | 3.332E-07 | 5.557E-07 | 2.808E-07 | 1.246E-07 | 7.526E-08 |
| 2253.00 | 2.338E-07 | 2.325E-07 | 1.842E-07 | 3.146E-07 | 5.259E-07 | 2.633E-07 | 1.203E-07 | 7.203E-08 |
| 2414.00 | 2.200E-07 | 2.217E-07 | 1.741E-07 | 2.924E-07 | 4.913E-07 | 2.432E-07 | 1.156E-07 | 6.855E-08 |
| 2574.00 | 2.250E-07 | 2.166E-07 | 1.687E-07 | 2.758E-07 | 4.557E-07 | 2.261E-07 | 1.131E-07 | 6.751E-08 |
| 2835.00 | 2.385E-07 | 2.096E-07 | 1.613E-07 | 2.528E-07 | 4.068E-07 | 2.033E-07 | 1.108E-07 | 6.741E-08 |
| 2896.00 | 2.427E-07 | 2.081E-07 | 1.598E-07 | 2.480E-07 | 3.967E-07 | 1.987E-07 | 1.105E-07 | 6.759E-08 |
| 3018.00 | 2.521E-07 | 2.056E-07 | 1.570E-07 | 2.391E-07 | 3.779E-07 | 1.902E-07 | 1.100E-07 | 6.810E-08 |
| 3414.00 | 2.775E-07 | 2.001E-07 | 1.498E-07 | 2.151E-07 | 3.289E-07 | 1.687E-07 | 1.101E-07 | 7.061E-08 |
| 3540.00 | 2.794E-07 | 1.991E-07 | 1.481E-07 | 2.087E-07 | 3.161E-07 | 1.631E-07 | 1.106E-07 | 7.155E-08 |
| 3701.00 | 2.734E-07 | 1.977E-07 | 1.463E-07 | 2.012E-07 | 3.011E-07 | 1.566E-07 | 1.117E-07 | 7.280E-08 |
| 3871.00 | 2.575E-07 | 1.960E-07 | 1.448E-07 | 1.940E-07 | 2.865E-07 | 1.502E-07 | 1.134E-07 | 7.417E-08 |
| 4084.00 | 2.356E-07 | 1.941E-07 | 1.428E-07 | 1.849E-07 | 2.696E-07 | 1.424E-07 | 1.134E-07 | 7.505E-08 |
| 4505.00 | 2.000E-07 | 1.899E-07 | 1.366E-07 | 1.650E-07 | 2.395E-07 | 1.265E-07 | 1.010E-07 | 7.251E-08 |
| 4511.00 | 1.995E-07 | 1.897E-07 | 1.365E-07 | 1.648E-07 | 2.391E-07 | 1.262E-07 | 1.009E-07 | 7.247E-08 |
| 4827.00 | 1.779E-07 | 1.801E-07 | 1.324E-07 | 1.522E-07 | 2.201E-07 | 1.161E-07 | 9.304E-08 | 7.099E-08 |
| 6325.00 | 1.123E-07 | 1.157E-07 | 1.187E-07 | 1.206E-07 | 1.753E-07 | 8.461E-08 | 7.465E-08 | 5.991E-08 |
| 6660.00 | 1.039E-07 | 1.071E-07 | 1.120E-07 | 1.187E-07 | 1.756E-07 | 8.054E-08 | 7.364E-08 | 5.641E-08 |
| 7224.00 | 9.184E-08 | 9.477E-08 | 9.705E-08 | 1.160E-07 | 1.791E-07 | 7.470E-08 | 7.102E-08 | 5.124E-08 |
| 7241.00 | 9.151E-08 | 9.443E-08 | 9.666E-08 | 1.159E-07 | 1.793E-07 | 7.454E-08 | 7.092E-08 | 5.110E-08 |
| 7562.00 | 8.556E-08 | 8.836E-08 | 9.032E-08 | 1.100E-07 | 1.767E-07 | 7.262E-08 | 6.888E-08 | 5.129E-08 |
| 8047.00 | 7.761E-08 | 8.022E-08 | 8.183E-08 | 1.019E-07 | 1.732E-07 | 7.029E-08 | 6.507E-08 | 5.119E-08 |
| 16093.00 | 2.762E-08 | 2.873E-08 | 2.898E-08 | 4.662E-08 | 8.090E-08 | 4.682E-08 | 2.254E-08 | 2.028E-08 |
| 24140.00 | 1.444E-08 | 1.506E-08 | 1.517E-08 | 2.447E-08 | 4.291E-08 | 2.327E-08 | 1.172E-08 | 1.055E-08 |
| 32187.00 | 8.838E-09 | 9.232E-09 | 9.287E-09 | 1.502E-08 | 2.645E-08 | 1.427E-08 | 7.155E-09 | 6.431E-09 |
| 48280.00 | 4.527E-09 | 4.642E-09 | 4.727E-09 | 7.638E-09 | 1.342E-08 | 7.258E-09 | 3.648E-09 | 3.263E-09 |
| 64374.00 | 2.838E-09 | 2.909E-09 | 2.964E-09 | 4.786E-09 | 8.427E-09 | 4.556E-09 | 2.275E-09 | 2.033E-09 |
| 80467.00 | 1.915E-09 | 1.964E-09 | 2.000E-09 | 3.227E-09 | 5.694E-09 | 3.080E-09 | 1.529E-09 | 1.365E-09 |

**Run 5**
**South Vent X/Q**
**Depleted and**
**Decayed**

DEPLETED CHI/Q (SEC/M3)

LGS 2001 EFFLUENT REPORT
ANNUAL DISPERSION CALCULATIONS
SOUTH VENT; 144,000 cfm, 8.05 DAY DECAY
Vs = 7.32 m/sec, VENT DIA = 3.44 m

SECTOR BEARING (DEGREES)

| DISTANCE METERS | SSW 202.5 | SW 225.0 | WSW 247.5 | W 270.0 | WNW 292.5 | NW 315.0 | NNW 337.5 | N 360.0 |
|---|---|---|---|---|---|---|---|---|
| 225.00 | 1.852E-06 | 1.323E-06 | 1.568E-06 | 2.125E-06 | 1.351E-06 | 1.242E-06 | 1.554E-06 | 3.570E-06 |
| 300.00 | 1.116E-06 | 7.948E-07 | 9.507E-07 | 1.287E-06 | 8.153E-07 | 7.516E-07 | 9.389E-07 | 2.150E-06 |
| 345.00 | 8.677E-07 | 6.173E-07 | 7.412E-07 | 1.002E-06 | 6.342E-07 | 5.849E-07 | 7.306E-07 | 1.672E-06 |
| 450.00 | 5.372E-07 | 3.813E-07 | 4.628E-07 | 6.253E-07 | 3.935E-07 | 3.632E-07 | 4.540E-07 | 1.033E-06 |
| 762.00 | 2.357E-07 | 1.654E-07 | 2.098E-07 | 2.851E-07 | 1.750E-07 | 1.623E-07 | 2.065E-07 | 4.561E-07 |
| 793.00 | 2.226E-07 | 1.561E-07 | 1.983E-07 | 2.694E-07 | 1.651E-07 | 1.535E-07 | 1.959E-07 | 4.331E-07 |
| 805.00 | 2.178E-07 | 1.527E-07 | 1.941E-07 | 2.637E-07 | 1.616E-07 | 1.503E-07 | 1.921E-07 | 4.248E-07 |
| 854.00 | 2.002E-07 | 1.401E-07 | 1.787E-07 | 2.424E-07 | 1.482E-07 | 1.384E-07 | 1.782E-07 | 3.941E-07 |
| 884.00 | 1.905E-07 | 1.331E-07 | 1.702E-07 | 2.307E-07 | 1.408E-07 | 1.319E-07 | 1.708E-07 | 3.774E-07 |
| 965.00 | 1.679E-07 | 1.170E-07 | 1.507E-07 | 2.035E-07 | 1.236E-07 | 1.171E-07 | 1.539E-07 | 3.392E-07 |
| 975.00 | 1.654E-07 | 1.153E-07 | 1.486E-07 | 2.005E-07 | 1.217E-07 | 1.155E-07 | 1.521E-07 | 3.351E-07 |
| 1006.00 | 1.582E-07 | 1.102E-07 | 1.425E-07 | 1.919E-07 | 1.162E-07 | 1.109E-07 | 1.469E-07 | 3.231E-07 |
| 1097.00 | 1.411E-07 | 9.826E-08 | 1.282E-07 | 1.716E-07 | 1.032E-07 | 9.983E-08 | 1.344E-07 | 2.935E-07 |
| 1126.00 | 1.363E-07 | 9.497E-08 | 1.243E-07 | 1.659E-07 | 9.956E-08 | 9.681E-08 | 1.311E-07 | 2.854E-07 |
| 1287.00 | 1.151E-07 | 8.044E-08 | 1.076E-07 | 1.405E-07 | 8.313E-08 | 8.338E-08 | 1.163E-07 | 2.488E-07 |
| 1433.00 | 1.019E-07 | 7.174E-08 | 9.835E-08 | 1.242E-07 | 7.246E-08 | 7.490E-08 | 1.071E-07 | 2.248E-07 |
| 1448.00 | 1.008E-07 | 7.105E-08 | 9.766E-08 | 1.228E-07 | 7.154E-08 | 7.418E-08 | 1.064E-07 | 2.227E-07 |
| 1585.00 | 9.300E-08 | 6.636E-08 | 9.327E-08 | 1.120E-07 | 6.448E-08 | 6.863E-08 | 1.004E-07 | 2.059E-07 |
| 1609.00 | 9.201E-08 | 6.584E-08 | 9.283E-08 | 1.104E-07 | 6.347E-08 | 6.783E-08 | 9.958E-08 | 2.033E-07 |
| 1770.00 | 8.751E-08 | 6.399E-08 | 9.180E-08 | 1.019E-07 | 5.800E-08 | 6.341E-08 | 9.478E-08 | 1.883E-07 |
| 1890.00 | 8.620E-08 | 6.417E-08 | 9.271E-08 | 9.730E-08 | 5.510E-08 | 6.093E-08 | 9.189E-08 | 1.790E-07 |
| 1931.00 | 8.608E-08 | 6.448E-08 | 9.326E-08 | 9.599E-08 | 5.430E-08 | 6.020E-08 | 9.100E-08 | 1.760E-07 |
| 2092.00 | 8.649E-08 | 6.621E-08 | 9.568E-08 | 9.176E-08 | 5.183E-08 | 5.759E-08 | 8.757E-08 | 1.654E-07 |
| 2134.00 | 8.679E-08 | 6.676E-08 | 9.635E-08 | 9.084E-08 | 5.133E-08 | 5.697E-08 | 8.671E-08 | 1.628E-07 |
| 2253.00 | 8.804E-08 | 6.862E-08 | 9.844E-08 | 8.860E-08 | 5.015E-08 | 5.535E-08 | 8.440E-08 | 1.560E-07 |
| 2414.00 | 9.042E-08 | 7.157E-08 | 1.015E-07 | 8.622E-08 | 4.906E-08 | 5.344E-08 | 8.156E-08 | 1.476E-07 |
| 2574.00 | 8.842E-08 | 7.139E-08 | 9.989E-08 | 8.352E-08 | 4.691E-08 | 5.125E-08 | 8.473E-08 | 1.503E-07 |
| 2835.00 | 8.541E-08 | 7.101E-08 | 9.717E-08 | 7.981E-08 | 4.393E-08 | 4.809E-08 | 9.023E-08 | 1.551E-07 |
| 2896.00 | 8.473E-08 | 7.089E-08 | 9.649E-08 | 7.903E-08 | 4.331E-08 | 4.740E-08 | 9.156E-08 | 1.562E-07 |
| 3018.00 | 8.337E-08 | 7.060E-08 | 9.509E-08 | 7.753E-08 | 4.212E-08 | 4.609E-08 | 9.427E-08 | 1.587E-07 |
| 3414.00 | 7.888E-08 | 6.899E-08 | 9.008E-08 | 7.313E-08 | 3.868E-08 | 4.211E-08 | 1.039E-07 | 1.703E-07 |
| 3540.00 | 7.748E-08 | 6.840E-08 | 8.845E-08 | 7.183E-08 | 3.771E-08 | 4.097E-08 | 1.069E-07 | 1.748E-07 |
| 3701.00 | 7.571E-08 | 6.760E-08 | 8.636E-08 | 7.022E-08 | 3.653E-08 | 3.957E-08 | 1.100E-07 | 1.800E-07 |
| 3871.00 | 7.387E-08 | 6.672E-08 | 8.415E-08 | 6.858E-08 | 3.534E-08 | 3.818E-08 | 1.119E-07 | 1.835E-07 |
| 4084.00 | 7.348E-08 | 6.677E-08 | 8.256E-08 | 6.662E-08 | 3.403E-08 | 3.765E-08 | 1.106E-07 | 1.820E-07 |
| 4505.00 | 8.280E-08 | 7.284E-08 | 8.459E-08 | 6.304E-08 | 3.201E-08 | 4.251E-08 | 9.895E-08 | 1.618E-07 |
| 4511.00 | 8.295E-08 | 7.293E-08 | 8.461E-08 | 6.299E-08 | 3.198E-08 | 4.258E-08 | 9.876E-08 | 1.614E-07 |
| 4827.00 | 9.098E-08 | 7.770E-08 | 8.593E-08 | 6.057E-08 | 3.057E-08 | 4.712E-08 | 8.830E-08 | 1.433E-07 |
| 6325.00 | 7.114E-08 | 6.747E-08 | 7.320E-08 | 5.812E-08 | 2.400E-08 | 4.988E-08 | 5.499E-08 | 8.964E-08 |
| 6660.00 | 6.589E-08 | 6.191E-08 | 6.753E-08 | 5.505E-08 | 2.267E-08 | 4.530E-08 | 5.085E-08 | 8.296E-08 |
| 7224.00 | 5.828E-08 | 5.373E-08 | 5.826E-08 | 4.662E-08 | 2.072E-08 | 3.977E-08 | 4.486E-08 | 7.328E-08 |
| 7241.00 | 5.807E-08 | 5.352E-08 | 5.801E-08 | 4.644E-08 | 2.066E-08 | 3.962E-08 | 4.469E-08 | 7.302E-08 |
| 7562.00 | 5.359E-08 | 4.975E-08 | 5.375E-08 | 4.329E-08 | 2.153E-08 | 3.697E-08 | 4.170E-08 | 6.824E-08 |
| 8047.00 | 4.834E-08 | 4.494E-08 | 4.852E-08 | 3.910E-08 | 2.315E-08 | 3.343E-08 | 3.769E-08 | 6.186E-08 |
| 16093.00 | 1.679E-08 | 1.557E-08 | 1.661E-08 | 1.351E-08 | 1.128E-08 | 1.164E-08 | 1.315E-08 | 2.182E-08 |
| 24140.00 | 8.664E-09 | 8.034E-09 | 8.493E-09 | 6.937E-09 | 5.833E-09 | 6.008E-09 | 6.797E-09 | 1.134E-08 |
| 32187.00 | 5.258E-09 | 4.879E-09 | 5.130E-09 | 4.205E-09 | 3.539E-09 | 3.649E-09 | 4.130E-09 | 6.908E-09 |
| 48280.00 | 2.658E-09 | 2.481E-09 | 2.592E-09 | 2.142E-09 | 1.794E-09 | 1.849E-09 | 2.093E-09 | 3.503E-09 |
| 64374.00 | 1.647E-09 | 1.536E-09 | 1.594E-09 | 1.323E-09 | 1.113E-09 | 1.146E-09 | 1.298E-09 | 2.184E-09 |
| 80467.00 | 1.099E-09 | 1.024E-09 | 1.058E-09 | 8.807E-10 | 7.437E-10 | 7.657E-10 | 8.674E-10 | 1.467E-09 |

D/Q (/M2)

LGS 2001 EFFLUENT REPORT
ANNUAL DISPERSION CALCULATIONS
SOUTH VENT; 144,000 cfm, 8.05 DAY DECAY
Vs = 7.32 m/sec, VENT DIA = 3.44 m

SECTOR BEARING (DEGREES)

| DISTANCE METERS | NNE 22.5 | NE 45.0 | ENE 67.5 | E 90.0 | ESE 112.5 | SE 135.0 | SSE 157.5 | S 180.0 |
|---|---|---|---|---|---|---|---|---|
| 225.00 | 3.011E-08 | 2.077E-08 | 1.962E-08 | 4.846E-08 | 8.437E-08 | 7.314E-08 | 2.900E-08 | 1.356E-08 |
| 300.00 | 2.103E-08 | 1.492E-08 | 1.391E-08 | 3.394E-08 | 5.742E-08 | 4.984E-08 | 1.977E-08 | 9.268E-09 |
| 345.00 | 1.736E-08 | 1.251E-08 | 1.159E-08 | 2.802E-08 | 4.657E-08 | 4.044E-08 | 1.606E-08 | 7.561E-09 |
| 450.00 | 1.209E-08 | 8.948E-09 | 8.239E-09 | 1.957E-08 | 3.141E-08 | 2.732E-08 | 1.090E-08 | 5.182E-09 |
| 762.00 | 5.825E-09 | 4.454E-09 | 4.090E-09 | 9.437E-09 | 1.449E-08 | 1.261E-08 | 5.099E-09 | 2.483E-09 |
| 793.00 | 5.512E-09 | 4.224E-09 | 3.878E-09 | 8.929E-09 | 1.367E-08 | 1.190E-08 | 4.818E-09 | 2.352E-09 |
| 805.00 | 5.398E-09 | 4.139E-09 | 3.800E-09 | 8.743E-09 | 1.337E-08 | 1.164E-08 | 4.716E-09 | 2.305E-09 |
| 854.00 | 4.980E-09 | 3.861E-09 | 3.521E-09 | 8.033E-09 | 1.227E-08 | 1.069E-08 | 4.363E-09 | 2.127E-09 |
| 884.00 | 4.782E-09 | 3.702E-09 | 3.368E-09 | 7.647E-09 | 1.167E-08 | 1.017E-08 | 4.182E-09 | 2.031E-09 |
| 965.00 | 4.256E-09 | 3.309E-09 | 3.011E-09 | 6.753E-09 | 1.028E-08 | 8.974E-09 | 3.760E-09 | 1.812E-09 |
| 975.00 | 4.217E-09 | 3.273E-09 | 2.968E-09 | 6.656E-09 | 1.013E-08 | 8.840E-09 | 3.712E-09 | 1.788E-09 |
| 1006.00 | 4.066E-09 | 3.133E-09 | 2.840E-09 | 6.382E-09 | 9.675E-09 | 8.442E-09 | 3.555E-09 | 1.717E-09 |
| 1097.00 | 3.601E-09 | 2.785E-09 | 2.513E-09 | 5.542E-09 | 8.406E-09 | 7.346E-09 | 3.124E-09 | 1.515E-09 |
| 1126.00 | 3.489E-09 | 2.705E-09 | 2.412E-09 | 5.314E-09 | 8.064E-09 | 7.041E-09 | 3.005E-09 | 1.460E-09 |
| 1287.00 | 2.870E-09 | 2.226E-09 | 2.002E-09 | 4.310E-09 | 6.523E-09 | 5.725E-09 | 2.463E-09 | 1.228E-09 |
| 1433.00 | 2.440E-09 | 1.927E-09 | 1.705E-09 | 3.629E-09 | 5.514E-09 | 4.837E-09 | 2.122E-09 | 1.086E-09 |
| 1448.00 | 2.400E-09 | 1.905E-09 | 1.678E-09 | 3.570E-09 | 5.425E-09 | 4.758E-09 | 2.091E-09 | 1.076E-09 |
| 1585.00 | 2.101E-09 | 1.660E-09 | 1.472E-09 | 3.094E-09 | 4.713E-09 | 4.147E-09 | 1.824E-09 | 9.784E-10 |
| 1609.00 | 2.053E-09 | 1.618E-09 | 1.441E-09 | 3.018E-09 | 4.597E-09 | 4.046E-09 | 1.783E-09 | 9.626E-10 |
| 1770.00 | 1.772E-09 | 1.387E-09 | 1.244E-09 | 2.588E-09 | 3.928E-09 | 3.470E-09 | 1.540E-09 | 8.720E-10 |
| 1890.00 | 1.600E-09 | 1.259E-09 | 1.125E-09 | 2.325E-09 | 3.530E-09 | 3.120E-09 | 1.387E-09 | 8.105E-10 |
| 1931.00 | 1.553E-09 | 1.215E-09 | 1.095E-09 | 2.245E-09 | 3.408E-09 | 3.014E-09 | 1.341E-09 | 7.856E-10 |
| 2092.00 | 1.376E-09 | 1.077E-09 | 9.645E-10 | 1.986E-09 | 2.992E-09 | 2.648E-09 | 1.186E-09 | 7.106E-10 |
| 2134.00 | 1.332E-09 | 1.047E-09 | 9.342E-10 | 1.923E-09 | 2.901E-09 | 2.563E-09 | 1.148E-09 | 6.967E-10 |
| 2253.00 | 1.232E-09 | 9.620E-10 | 8.629E-10 | 1.767E-09 | 2.659E-09 | 2.352E-09 | 1.057E-09 | 6.528E-10 |
| 2414.00 | 1.104E-09 | 8.653E-10 | 7.727E-10 | 1.580E-09 | 2.409E-09 | 2.105E-09 | 9.474E-10 | 6.033E-10 |
| 2574.00 | 1.013E-09 | 7.863E-10 | 7.102E-10 | 1.429E-09 | 2.177E-09 | 1.892E-09 | 8.462E-10 | 5.514E-10 |
| 2835.00 | 8.652E-10 | 6.695E-10 | 6.144E-10 | 1.221E-09 | 1.870E-09 | 1.611E-09 | 7.342E-10 | 4.704E-10 |
| 2896.00 | 8.542E-10 | 6.473E-10 | 5.966E-10 | 1.179E-09 | 1.807E-09 | 1.556E-09 | 7.223E-10 | 4.550E-10 |
| 3018.00 | 9.819E-10 | 6.098E-10 | 5.581E-10 | 1.102E-09 | 1.692E-09 | 1.452E-09 | 7.028E-10 | 4.263E-10 |
| 3414.00 | 7.394E-10 | 5.269E-10 | 4.525E-10 | 9.032E-10 | 1.398E-09 | 1.185E-09 | 6.025E-10 | 3.484E-10 |
| 3540.00 | 6.660E-10 | 5.853E-10 | 4.279E-10 | 8.511E-10 | 1.320E-09 | 1.115E-09 | 5.680E-10 | 3.288E-10 |
| 3701.00 | 6.131E-10 | 6.499E-10 | 3.971E-10 | 7.909E-10 | 1.231E-09 | 1.036E-09 | 5.309E-10 | 3.229E-10 |
| 3871.00 | 8.300E-10 | 6.225E-10 | 3.687E-10 | 7.334E-10 | 1.148E-09 | 9.626E-10 | 4.932E-10 | 3.132E-10 |
| 4084.00 | 8.539E-10 | 5.451E-10 | 3.417E-10 | 6.716E-10 | 1.057E-09 | 8.839E-10 | 4.526E-10 | 2.972E-10 |
| 4505.00 | 7.293E-10 | 4.001E-10 | 3.126E-10 | 5.696E-10 | 8.986E-10 | 7.516E-10 | 3.845E-10 | 2.543E-10 |
| 4511.00 | 7.277E-10 | 3.986E-10 | 3.128E-10 | 5.683E-10 | 8.966E-10 | 7.500E-10 | 3.837E-10 | 2.538E-10 |
| 4827.00 | 6.490E-10 | 3.315E-10 | 3.466E-10 | 5.073E-10 | 8.017E-10 | 6.707E-10 | 3.429E-10 | 2.274E-10 |
| 6325.00 | 4.079E-10 | 3.496E-10 | 2.189E-10 | 3.207E-10 | 5.209E-10 | 4.257E-10 | 2.290E-10 | 1.459E-10 |
| 6660.00 | 3.729E-10 | 3.199E-10 | 1.918E-10 | 2.946E-10 | 4.757E-10 | 3.893E-10 | 2.503E-10 | 1.336E-10 |
| 7224.00 | 3.239E-10 | 2.782E-10 | 2.447E-10 | 2.592E-10 | 4.134E-10 | 3.399E-10 | 2.362E-10 | 1.162E-10 |
| 7241.00 | 3.226E-10 | 2.771E-10 | 2.450E-10 | 2.583E-10 | 4.117E-10 | 3.386E-10 | 2.348E-10 | 1.157E-10 |
| 7562.00 | 2.994E-10 | 2.572E-10 | 2.292E-10 | 2.398E-10 | 3.824E-10 | 3.187E-10 | 2.175E-10 | 1.189E-10 |
| 8047.00 | 2.690E-10 | 2.313E-10 | 2.075E-10 | 2.155E-10 | 3.462E-10 | 3.020E-10 | 1.938E-10 | 1.311E-10 |
| 16093.00 | 8.093E-11 | 7.080E-11 | 6.405E-11 | 1.070E-10 | 2.027E-10 | 1.376E-10 | 6.665E-11 | 4.859E-11 |
| 24140.00 | 4.006E-11 | 3.544E-11 | 3.171E-11 | 6.773E-11 | 1.140E-10 | 6.753E-11 | 3.298E-11 | 2.404E-11 |
| 32187.00 | 2.435E-11 | 2.164E-11 | 1.925E-11 | 4.292E-11 | 7.198E-11 | 4.116E-11 | 2.002E-11 | 1.460E-11 |
| 48280.00 | 1.205E-11 | 1.063E-11 | 9.532E-12 | 2.062E-11 | 3.442E-11 | 2.034E-11 | 9.908E-12 | 7.225E-12 |
| 64374.00 | 6.983E-12 | 6.167E-12 | 5.522E-12 | 1.174E-11 | 1.947E-11 | 1.179E-11 | 5.748E-12 | 4.199E-12 |
| 80467.00 | 4.550E-12 | 4.018E-12 | 3.598E-12 | 7.525E-12 | 1.240E-11 | 7.684E-12 | 3.750E-12 | 2.744E-12 |

**Run 6**
**South Vent D/Q**

D/Q (/M2)

LGS 2001 EFFLUENT REPORT
ANNUAL DISPERSION CALCULATIONS
SOUTH VENT; 144,000 cfm, 8.05 DAY DECAY
Vs = 7.32 m/sec, VENT DIA = 3.44 m

SECTOR BEARING (DEGREES)

| DISTANCE METERS | SSW 202.5 | SW 225.0 | WSW 247.5 | W 270.0 | WNW 292.5 | NW 315.0 | NNW 337.5 | N 360.0 |
|---|---|---|---|---|---|---|---|---|
| 225.00 | 8.271E-09 | 4.531E-09 | 8.290E-09 | 1.523E-08 | 8.367E-09 | 8.267E-09 | 9.408E-09 | 1.738E-08 |
| 300.00 | 5.713E-09 | 3.125E-09 | 5.787E-09 | 1.050E-08 | 5.687E-09 | 5.619E-09 | 6.386E-09 | 1.187E-08 |
| 345.00 | 4.704E-09 | 2.571E-09 | 4.789E-09 | 8.602E-09 | 4.617E-09 | 4.556E-09 | 5.174E-09 | 9.664E-09 |
| 450.00 | 3.296E-09 | 1.799E-09 | 3.398E-09 | 5.967E-09 | 3.128E-09 | 3.084E-09 | 3.494E-09 | 6.591E-09 |
| 762.00 | 1.651E-09 | 9.130E-10 | 1.763E-09 | 2.983E-09 | 1.471E-09 | 1.487E-09 | 1.669E-09 | 3.162E-09 |
| 793.00 | 1.570E-09 | 8.702E-10 | 1.681E-09 | 2.835E-09 | 1.393E-09 | 1.412E-09 | 1.584E-09 | 2.997E-09 |
| 805.00 | 1.540E-09 | 8.547E-10 | 1.652E-09 | 2.782E-09 | 1.364E-09 | 1.385E-09 | 1.553E-09 | 2.938E-09 |
| 854.00 | 1.440E-09 | 7.967E-10 | 1.586E-09 | 2.617E-09 | 1.263E-09 | 1.283E-09 | 1.437E-09 | 2.715E-09 |
| 884.00 | 1.385E-09 | 7.657E-10 | 1.543E-09 | 2.512E-09 | 1.210E-09 | 1.229E-09 | 1.374E-09 | 2.594E-09 |
| 965.00 | 1.286E-09 | 7.122E-10 | 1.445E-09 | 2.265E-09 | 1.114E-09 | 1.104E-09 | 1.232E-09 | 2.319E-09 |
| 975.00 | 1.273E-09 | 7.077E-10 | 1.434E-09 | 2.235E-09 | 1.104E-09 | 1.091E-09 | 1.217E-09 | 2.289E-09 |
| 1006.00 | 1.243E-09 | 6.937E-10 | 1.398E-09 | 2.159E-09 | 1.064E-09 | 1.050E-09 | 1.170E-09 | 2.207E-09 |
| 1097.00 | 1.151E-09 | 6.320E-10 | 1.258E-09 | 1.914E-09 | 9.681E-10 | 9.351E-10 | 1.037E-09 | 1.950E-09 |
| 1126.00 | 1.124E-09 | 6.130E-10 | 1.224E-09 | 1.845E-09 | 9.402E-10 | 9.029E-10 | 1.001E-09 | 1.880E-09 |
| 1287.00 | 9.660E-10 | 5.764E-10 | 1.090E-09 | 1.541E-09 | 8.088E-10 | 7.668E-10 | 8.430E-10 | 1.571E-09 |
| 1433.00 | 8.723E-10 | 5.363E-10 | 9.899E-10 | 1.340E-09 | 7.308E-10 | 6.759E-10 | 7.496E-10 | 1.376E-09 |
| 1448.00 | 8.611E-10 | 5.308E-10 | 9.783E-10 | 1.325E-09 | 7.211E-10 | 6.729E-10 | 7.409E-10 | 1.363E-09 |
| 1585.00 | 7.772E-10 | 4.961E-10 | 9.015E-10 | 1.172E-09 | 6.549E-10 | 6.024E-10 | 6.708E-10 | 1.220E-09 |
| 1609.00 | 7.607E-10 | 4.914E-10 | 8.912E-10 | 1.145E-09 | 6.398E-10 | 5.898E-10 | 6.588E-10 | 1.196E-09 |
| 1770.00 | 6.697E-10 | 4.447E-10 | 7.886E-10 | 9.896E-10 | 5.588E-10 | 5.236E-10 | 6.039E-10 | 1.056E-09 |
| 1890.00 | 6.114E-10 | 4.160E-10 | 7.239E-10 | 8.966E-10 | 5.085E-10 | 4.818E-10 | 5.641E-10 | 9.689E-10 |
| 1931.00 | 5.908E-10 | 4.048E-10 | 7.037E-10 | 8.704E-10 | 4.982E-10 | 4.678E-10 | 5.625E-10 | 9.435E-10 |
| 2092.00 | 5.331E-10 | 3.667E-10 | 6.309E-10 | 7.745E-10 | 4.413E-10 | 4.198E-10 | 5.392E-10 | 8.546E-10 |
| 2134.00 | 5.191E-10 | 3.575E-10 | 6.149E-10 | 7.513E-10 | 4.309E-10 | 4.088E-10 | 5.296E-10 | 8.328E-10 |
| 2253.00 | 4.823E-10 | 3.426E-10 | 5.728E-10 | 6.941E-10 | 4.008E-10 | 3.807E-10 | 4.957E-10 | 7.786E-10 |
| 2414.00 | 4.375E-10 | 3.168E-10 | 5.231E-10 | 6.278E-10 | 3.622E-10 | 3.507E-10 | 4.570E-10 | 7.243E-10 |
| 2574.00 | 4.021E-10 | 2.902E-10 | 4.777E-10 | 5.675E-10 | 3.290E-10 | 3.193E-10 | 4.456E-10 | 7.480E-10 |
| 2835.00 | 3.565E-10 | 2.525E-10 | 4.224E-10 | 4.878E-10 | 2.850E-10 | 2.775E-10 | 3.821E-10 | 6.643E-10 |
| 2896.00 | 3.489E-10 | 2.444E-10 | 4.111E-10 | 4.714E-10 | 2.761E-10 | 2.691E-10 | 3.705E-10 | 6.417E-10 |
| 3018.00 | 3.326E-10 | 2.340E-10 | 3.973E-10 | 4.419E-10 | 2.605E-10 | 2.536E-10 | 3.488E-10 | 5.992E-10 |
| 3414.00 | 2.929E-10 | 2.023E-10 | 3.482E-10 | 3.850E-10 | 2.179E-10 | 2.126E-10 | 3.607E-10 | 6.364E-10 |
| 3540.00 | 2.775E-10 | 1.934E-10 | 3.335E-10 | 3.825E-10 | 2.067E-10 | 2.020E-10 | 3.511E-10 | 6.486E-10 |
| 3701.00 | 2.601E-10 | 1.853E-10 | 3.180E-10 | 3.688E-10 | 1.946E-10 | 1.901E-10 | 3.215E-10 | 5.642E-10 |
| 3871.00 | 2.441E-10 | 1.767E-10 | 2.996E-10 | 3.510E-10 | 1.824E-10 | 1.785E-10 | 2.809E-10 | 4.772E-10 |
| 4084.00 | 2.292E-10 | 1.675E-10 | 2.822E-10 | 3.251E-10 | 1.696E-10 | 1.653E-10 | 2.466E-10 | 4.138E-10 |
| 4505.00 | 2.017E-10 | 1.475E-10 | 2.507E-10 | 2.777E-10 | 1.454E-10 | 1.531E-10 | 2.202E-10 | 4.591E-10 |
| 4511.00 | 2.015E-10 | 1.471E-10 | 2.501E-10 | 2.770E-10 | 1.451E-10 | 1.530E-10 | 2.197E-10 | 4.612E-10 |
| 4827.00 | 2.327E-10 | 1.402E-10 | 2.265E-10 | 2.485E-10 | 1.303E-10 | 1.393E-10 | 2.467E-10 | 4.921E-10 |
| 6325.00 | 1.741E-10 | 1.106E-10 | 1.721E-10 | 2.002E-10 | 8.374E-11 | 1.134E-10 | 1.742E-10 | 3.172E-10 |
| 6660.00 | 1.601E-10 | 1.192E-10 | 1.585E-10 | 1.675E-10 | 7.679E-11 | 1.279E-10 | 1.593E-10 | 2.901E-10 |
| 7224.00 | 1.405E-10 | 1.260E-10 | 1.690E-10 | 1.839E-10 | 6.701E-11 | 1.156E-10 | 1.383E-10 | 2.519E-10 |
| 7241.00 | 1.400E-10 | 1.255E-10 | 1.688E-10 | 1.835E-10 | 6.675E-11 | 1.151E-10 | 1.378E-10 | 2.509E-10 |
| 7562.00 | 1.398E-10 | 1.206E-10 | 1.643E-10 | 1.714E-10 | 6.479E-11 | 1.075E-10 | 1.283E-10 | 2.329E-10 |
| 8047.00 | 1.310E-10 | 1.087E-10 | 1.497E-10 | 1.542E-10 | 6.019E-11 | 9.665E-11 | 1.153E-10 | 2.093E-10 |
| 16093.00 | 3.999E-11 | 3.315E-11 | 4.548E-11 | 4.648E-11 | 2.973E-11 | 2.916E-11 | 3.477E-11 | 6.305E-11 |
| 24140.00 | 1.980E-11 | 1.641E-11 | 2.252E-11 | 2.301E-11 | 1.472E-11 | 1.444E-11 | 1.721E-11 | 3.121E-11 |
| 32187.00 | 1.202E-11 | 9.964E-12 | 1.367E-11 | 1.397E-11 | 8.950E-12 | 8.765E-12 | 1.045E-11 | 1.895E-11 |
| 48280.00 | 5.951E-12 | 4.933E-12 | 6.769E-12 | 6.917E-12 | 4.432E-12 | 4.339E-12 | 5.174E-12 | 9.384E-12 |
| 64374.00 | 3.448E-12 | 2.858E-12 | 3.921E-12 | 4.007E-12 | 2.568E-12 | 2.514E-12 | 2.997E-12 | 5.436E-12 |
| 80467.00 | 2.246E-12 | 1.862E-12 | 2.555E-12 | 2.611E-12 | 1.673E-12 | 1.638E-12 | 1.953E-12 | 3.542E-12 |

**Attachment 2**

**Limerick Generating Station**
**2001 Annual Joint Frequency Distributions of Wind Speed, Wind Direction and Atmospheric Stability Class**

Level 1 - Meteorological Tower No. 1, 30-ft Level

Level 2 - Meteorological Tower No. 1, 175-ft Level

2001

JOINT FREQUENCY DISTRIBUTION (JFD's)

30 FOOT LEVEL

LIMERICK GENERATING STATION

DIGLAPSE VERSION 1.0

LAPSE RATE WIND ROSE PROGRAM TO COMPUTE

JOINT FREQUENCY DISTRIBUTIONS OF WIND DIRECTION

AND SPEED BY ATMOSPHERIC STABILITY CLASS

DIGLAPSE ALSO COMPUTES THE JOINT DATA RECOVERY RATE AS REQUIRED BY REGULATORY GUIDE 1.23. FOR BOTH THE JOINT FREQUENCY DISTRIBUTION AND DATA RECOVERY CALCULATIONS BOTH THE PRIMARY AND BACKUP SENSORS SPECIFIED IN TABLE I3.1-1 OF THE LGS OFFSITE DOSE CALCULATION MANUAL ARE USED.

THE PRIMARY AND BACK UP SENSORS USED IN THE ATTACHED DISTRIBUTIONS ARE AS FOLLOWS:

| PARAMETER | TOWER 1 (PRIMARY) | | TOWER 2 (BACKUP) |
|---|---|---|---|
| WIND SPEED | | | |
| LEVEL 1 | 30 FT. | OR | 159 FT. |
| LEVEL 2 | 175 FT. | OR | 304 FT. |
| WIND DIRECTION | | | |
| LEVEL 1 | 30 FT. | OR | 159 FT. |
| LEVEL 2 | 175 FT. | OR | 304 FT. |
| DELTA TEMPERATURE | | | |
| LEVELS 1 & 2 | 266-26 FT. | OR | 300-26 FT. |

LIMERICK MET DATA 1/01-12/01

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED
BY ATMOSPHERIC STABILITY CLASS
WIND: LEVEL 1
DELTA T: (266-26FT)

LAPSE RATE: LE -1.9 DEG C/100M
CLASS A

WIND SPEED GROUPS (MPH)

| | 0.0-0.5 | | 0.6-3.5 | | 3.6-7.5 | | 7.6-12.5 | | 12.6-18.5 | | 18.6-24.5 | | GE 24.6 | | SUM | PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIRECTION | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | | |
| N | 0 | 0.0 | 0 | 0.0 | 3 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 3 | 0.0 |
| NNE | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| NE | 0 | 0.0 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 0.0 |
| ENE | 0 | 0.0 | 0 | 0.0 | 2 | 0.0 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 4 | 0.0 |
| E | 0 | 0.0 | 0 | 0.0 | 1 | 0.0 | 3 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 4 | 0.0 |
| ESE | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 2 | 0.0 |
| SE | 0 | 0.0 | 0 | 0.0 | 1 | 0.0 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 3 | 0.0 |
| SSE | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 0.0 |
| S | 0 | 0.0 | 0 | 0.0 | 4 | 0.0 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 5 | 0.1 |
| SSW | 0 | 0.0 | 0 | 0.0 | 14 | 0.2 | 16 | 0.2 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 30 | 0.3 |
| SW | 0 | 0.0 | 0 | 0.0 | 36 | 0.4 | 7 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 43 | 0.5 |
| WSW | 0 | 0.0 | 0 | 0.0 | 16 | 0.2 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 18 | 0.2 |
| W | 0 | 0.0 | 0 | 0.0 | 17 | 0.2 | 3 | 0.0 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 22 | 0.3 |
| WNW | 0 | 0.0 | 0 | 0.0 | 7 | 0.1 | 13 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 20 | 0.2 |
| NW | 0 | 0.0 | 0 | 0.0 | 3 | 0.0 | 7 | 0.1 | 3 | 0.0 | 0 | 0.0 | 0 | 0.0 | 13 | 0.1 |
| NNW | 0 | 0.0 | 0 | 0.0 | 1 | 0.0 | 4 | 0.0 | 7 | 0.1 | 0 | 0.0 | 0 | 0.0 | 12 | 0.1 |
| | 0 | 0.0 | 1 | 0.0 | 105 | 1.2 | 63 | 0.7 | 12 | 0.1 | 0 | 0.0 | 0 | 0.0 | 181 | 2.1 |

MEAN WIND SPEED: 7.6
MISSING: 0

LIMERICK MET DATA 1/01-12/01

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED
BY ATMOSPHERIC STABILITY CLASS
WIND: LEVEL 1
DELTA T: (266-26FT)

LAPSE RATE: -1.8 TO -1.7 DEG C/100M
CLASS B

WIND SPEED GROUPS (MPH)

| | 0.0-0.5 | | 0.6-3.5 | | 3.6-7.5 | | 7.6-12.5 | | 12.6-18.5 | | 18.6-24.5 | | GE 24.6 | | SUM | PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIRECTION | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | | |
| N | 0 | 0.0 | 0 | 0.0 | 12 | 0.1 | 6 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 18 | 0.2 |
| NNE | 0 | 0.0 | 0 | 0.0 | 8 | 0.1 | 3 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 11 | 0.1 |
| NE | 0 | 0.0 | 0 | 0.0 | 4 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 4 | 0.0 |
| ENE | 0 | 0.0 | 1 | 0.0 | 10 | 0.1 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 13 | 0.1 |
| E | 0 | 0.0 | 1 | 0.0 | 5 | 0.1 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 7 | 0.1 |
| ESE | 0 | 0.0 | 0 | 0.0 | 2 | 0.0 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 3 | 0.0 |
| SE | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 2 | 0.0 |
| SSE | 0 | 0.0 | 0 | 0.0 | 2 | 0.0 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 3 | 0.0 |
| S | 0 | 0.0 | 1 | 0.0 | 6 | 0.1 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 9 | 0.1 |
| SSW | 0 | 0.0 | 1 | 0.0 | 21 | 0.2 | 13 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 35 | 0.4 |
| SW | 0 | 0.0 | 4 | 0.0 | 28 | 0.3 | 5 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 37 | 0.4 |
| WSW | 0 | 0.0 | 3 | 0.0 | 28 | 0.3 | 5 | 0.1 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 38 | 0.4 |
| W | 0 | 0.0 | 0 | 0.0 | 29 | 0.3 | 12 | 0.1 | 4 | 0.0 | 0 | 0.0 | 0 | 0.0 | 45 | 0.5 |
| WNW | 0 | 0.0 | 1 | 0.0 | 16 | 0.2 | 11 | 0.1 | 1 | 0.0 | 1 | 0.0 | 0 | 0.0 | 30 | 0.3 |
| NW | 0 | 0.0 | 0 | 0.0 | 11 | 0.1 | 39 | 0.4 | 6 | 0.1 | 1 | 0.0 | 0 | 0.0 | 57 | 0.7 |
| NNW | 0 | 0.0 | 0 | 0.0 | 10 | 0.1 | 10 | 0.1 | 6 | 0.1 | 0 | 0.0 | 0 | 0.0 | 26 | 0.3 |
| | 0 | 0.0 | 12 | 0.1 | 192 | 2.2 | 113 | 1.3 | 19 | 0.2 | 2 | 0.0 | 0 | 0.0 | 338 | 3.9 |

MEAN WIND SPEED: 7.4
MISSING: 0

LIMERICK MET DATA 1/01-12/01

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED
BY ATMOSPHERIC STABILITY CLASS
WIND: LEVEL 1
DELTA T: (266-26FT)

LAPSE RATE: -1.6 TO -1.5 DEG C/100M
CLASS C

WIND SPEED GROUPS (MPH)

| | 0.0-0.5 | | 0.6-3.5 | | 3.6-7.5 | | 7.6-12.5 | | 12.6-18.5 | | 18.6-24.5 | | GE 24.6 | | SUM | PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIRECTION | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | | |
| N | 0 | 0.0 | 2 | 0.0 | 12 | 0.1 | 12 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 26 | 0.3 |
| NNE | 1 | 0.0 | 1 | 0.0 | 9 | 0.1 | 3 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 14 | 0.2 |
| NE | 0 | 0.0 | 4 | 0.0 | 8 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 12 | 0.1 |
| ENE | 0 | 0.0 | 3 | 0.0 | 10 | 0.1 | 4 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 17 | 0.2 |
| E | 0 | 0.0 | 2 | 0.0 | 14 | 0.2 | 8 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 24 | 0.3 |
| ESE | 0 | 0.0 | 0 | 0.0 | 4 | 0.0 | 5 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 9 | 0.1 |
| SE | 0 | 0.0 | 1 | 0.0 | 1 | 0.0 | 4 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 6 | 0.1 |
| SSE | 0 | 0.0 | 0 | 0.0 | 2 | 0.0 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 3 | 0.0 |
| S | 0 | 0.0 | 4 | 0.0 | 6 | 0.1 | 6 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 16 | 0.2 |
| SSW | 0 | 0.0 | 4 | 0.0 | 29 | 0.3 | 12 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 45 | 0.5 |
| SW | 0 | 0.0 | 3 | 0.0 | 33 | 0.4 | 6 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 42 | 0.5 |
| WSW | 0 | 0.0 | 7 | 0.1 | 28 | 0.3 | 7 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 42 | 0.5 |
| W | 0 | 0.0 | 10 | 0.1 | 30 | 0.3 | 12 | 0.1 | 4 | 0.0 | 0 | 0.0 | 0 | 0.0 | 56 | 0.6 |
| WNW | 0 | 0.0 | 3 | 0.0 | 38 | 0.4 | 32 | 0.4 | 10 | 0.1 | 2 | 0.0 | 0 | 0.0 | 85 | 1.0 |
| NW | 0 | 0.0 | 0 | 0.0 | 29 | 0.3 | 61 | 0.7 | 34 | 0.4 | 3 | 0.0 | 0 | 0.0 | 127 | 1.5 |
| NNW | 0 | 0.0 | 0 | 0.0 | 16 | 0.2 | 8 | 0.1 | 3 | 0.0 | 5 | 0.1 | 0 | 0.0 | 32 | 0.4 |
| | 1 | 0.0 | 44 | 0.5 | 269 | 3.1 | 181 | 2.1 | 51 | 0.6 | 10 | 0.1 | 0 | 0.0 | 556 | 6.4 |

MEAN WIND SPEED: 7.8
MISSING: 0

LIMERICK MET DATA 1/01-12/01

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED
BY ATMOSPHERIC STABILITY CLASS
WIND: LEVEL 1
DELTA T: (266-26FT)

LAPSE RATE: -1.4 TO -0.5 DEG C/100M
CLASS D

WIND SPEED GROUPS (MPH)

| | 0.0-0.5 | | 0.6-3.5 | | 3.6-7.5 | | 7.6-12.5 | | 12.6-18.5 | | 18.6-24.5 | | GE 24.6 | | SUM | PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIRECTION | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | | |
| N | 0 | 0.0 | 54 | 0.6 | 86 | 1.0 | 55 | 0.6 | 4 | 0.0 | 0 | 0.0 | 0 | 0.0 | 199 | 2.3 |
| NNE | 0 | 0.0 | 62 | 0.7 | 66 | 0.8 | 10 | 0.1 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 139 | 1.6 |
| NE | 0 | 0.0 | 60 | 0.7 | 37 | 0.4 | 3 | 0.0 | 2 | 0.0 | 1 | 0.0 | 0 | 0.0 | 103 | 1.2 |
| ENE | 0 | 0.0 | 68 | 0.8 | 127 | 1.5 | 10 | 0.1 | 8 | 0.1 | 0 | 0.0 | 0 | 0.0 | 213 | 2.4 |
| E | 0 | 0.0 | 46 | 0.5 | 108 | 1.2 | 90 | 1.0 | 6 | 0.1 | 0 | 0.0 | 0 | 0.0 | 250 | 2.9 |
| ESE | 0 | 0.0 | 36 | 0.4 | 56 | 0.6 | 47 | 0.5 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 140 | 1.6 |
| SE | 0 | 0.0 | 34 | 0.4 | 50 | 0.6 | 31 | 0.4 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 116 | 1.3 |
| SSE | 0 | 0.0 | 30 | 0.3 | 74 | 0.8 | 27 | 0.3 | 3 | 0.0 | 0 | 0.0 | 0 | 0.0 | 134 | 1.5 |
| S | 0 | 0.0 | 35 | 0.4 | 107 | 1.2 | 30 | 0.3 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 174 | 2.0 |
| SSW | 0 | 0.0 | 46 | 0.5 | 105 | 1.2 | 31 | 0.4 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 183 | 2.1 |
| SW | 0 | 0.0 | 67 | 0.8 | 66 | 0.8 | 7 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 140 | 1.6 |
| WSW | 0 | 0.0 | 64 | 0.7 | 77 | 0.9 | 13 | 0.1 | 3 | 0.0 | 1 | 0.0 | 0 | 0.0 | 158 | 1.8 |
| W | 0 | 0.0 | 65 | 0.7 | 111 | 1.3 | 91 | 1.0 | 17 | 0.2 | 1 | 0.0 | 0 | 0.0 | 285 | 3.3 |
| WNW | 0 | 0.0 | 73 | 0.8 | 167 | 1.9 | 206 | 2.4 | 78 | 0.9 | 16 | 0.2 | 0 | 0.0 | 540 | 6.2 |
| NW | 0 | 0.0 | 57 | 0.7 | 169 | 1.9 | 238 | 2.7 | 193 | 2.2 | 39 | 0.4 | 2 | 0.0 | 698 | 8.0 |
| NNW | 0 | 0.0 | 49 | 0.6 | 75 | 0.9 | 84 | 1.0 | 29 | 0.3 | 8 | 0.1 | 0 | 0.0 | 245 | 2.8 |
| | 0 | 0.0 | 846 | 9.7 | 1481 | 16.9 | 973 | 11.1 | 349 | 4.0 | 66 | 0.8 | 2 | 0.0 | 3717 | 42.5 |

MEAN WIND SPEED: 7.1
MISSING: 0

LIMERICK MET DATA 1/01-12/01

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED
BY ATMOSPHERIC STABILITY CLASS
WIND: LEVEL 1
DELTA T: (266-26FT)

LAPSE RATE: -0.4 TO 1.5 DEG C/100M
CLASS E

WIND SPEED GROUPS (MPH)

| | 0.0-0.5 | | 0.6-3.5 | | 3.6-7.5 | | 7.6-12.5 | | 12.6-18.5 | | 18.6-24.5 | | GE 24.6 | | SUM | PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIRECTION | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | | |
| N | 0 | 0.0 | 64 | 0.7 | 38 | 0.4 | 8 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 110 | 1.3 |
| NNE | 2 | 0.0 | 65 | 0.7 | 29 | 0.3 | 7 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 103 | 1.2 |
| NE | 2 | 0.0 | 69 | 0.8 | 15 | 0.2 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 86 | 1.0 |
| ENE | 0 | 0.0 | 69 | 0.8 | 17 | 0.2 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 86 | 1.0 |
| E | 2 | 0.0 | 52 | 0.6 | 35 | 0.4 | 4 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 93 | 1.1 |
| ESE | 0 | 0.0 | 50 | 0.6 | 30 | 0.3 | 6 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 86 | 1.0 |
| SE | 0 | 0.0 | 23 | 0.3 | 31 | 0.4 | 7 | 0.1 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 63 | 0.7 |
| SSE | 0 | 0.0 | 40 | 0.5 | 30 | 0.3 | 3 | 0.0 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 74 | 0.8 |
| S | 0 | 0.0 | 42 | 0.5 | 110 | 1.3 | 14 | 0.2 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 167 | 1.9 |
| SSW | 0 | 0.0 | 71 | 0.8 | 101 | 1.2 | 17 | 0.2 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 190 | 2.2 |
| SW | 0 | 0.0 | 125 | 1.4 | 64 | 0.7 | 4 | 0.0 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 195 | 2.2 |
| WSW | 1 | 0.0 | 124 | 1.4 | 42 | 0.5 | 7 | 0.1 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 175 | 2.0 |
| W | 0 | 0.0 | 133 | 1.5 | 88 | 1.0 | 23 | 0.3 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 246 | 2.8 |
| WNW | 0 | 0.0 | 195 | 2.2 | 147 | 1.7 | 32 | 0.4 | 5 | 0.1 | 0 | 0.0 | 0 | 0.0 | 379 | 4.3 |
| NW | 0 | 0.0 | 117 | 1.3 | 111 | 1.3 | 42 | 0.5 | 6 | 0.1 | 0 | 0.0 | 0 | 0.0 | 276 | 3.2 |
| NNW | 2 | 0.0 | 69 | 0.8 | 42 | 0.5 | 5 | 0.1 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 120 | 1.4 |
| | 9 | 0.1 | 1308 | 14.9 | 930 | 10.6 | 179 | 2.0 | 23 | 0.3 | 0 | 0.0 | 0 | 0.0 | 2449 | 28.0 |

MEAN WIND SPEED: 3.9
MISSING: 0

LIMERICK MET DATA 1/01-12/01

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED
BY ATMOSPHERIC STABILITY CLASS
WIND: LEVEL 1
DELTA T: (266-26FT)

LAPSE RATE: 1.6 TO 4.0 DEG C/100M
CLASS F

WIND SPEED GROUPS (MPH)

| | 0.0-0.5 | | 0.6-3.5 | | 3.6-7.5 | | 7.6-12.5 | | 12.6-18.5 | | 18.6-24.5 | | GE 24.6 | | SUM | PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIRECTION | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUN | PERCENT | SUM | PERCENT | | |
| N | 0 | 0.0 | 47 | 0.5 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 49 | 0.6 |
| NNE | 1 | 0.0 | 32 | 0.4 | 4 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 37 | 0.4 |
| NE | 1 | 0.0 | 34 | 0.4 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 37 | 0.4 |
| ENE | 1 | 0.0 | 30 | 0.3 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 32 | 0.4 |
| E | 0 | 0.0 | 32 | 0.4 | 4 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 36 | 0.4 |
| ESE | 0 | 0.0 | 24 | 0.3 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 25 | 0.3 |
| SE | 0 | 0.0 | 13 | 0.1 | 3 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 16 | 0.2 |
| SSE | 0 | 0.0 | 18 | 0.2 | 3 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 21 | 0.2 |
| S | 0 | 0.0 | 19 | 0.2 | 5 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 24 | 0.3 |
| SSW | 0 | 0.0 | 27 | 0.3 | 9 | 0.1 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 37 | 0.4 |
| SW | 0 | 0.0 | 43 | 0.5 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 45 | 0.5 |
| WSW | 0 | 0.0 | 47 | 0.5 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 48 | 0.5 |
| W | 0 | 0.0 | 95 | 1.1 | 10 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 105 | 1.2 |
| WNW | 1 | 0.0 | 118 | 1.3 | 16 | 0.2 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 136 | 1.6 |
| NW | 1 | 0.0 | 92 | 1.1 | 17 | 0.2 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 110 | 1.3 |
| NNW | 2 | 0.0 | 50 | 0.6 | 4 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 56 | 0.6 |
| | 7 | 0.1 | 721 | 8.2 | 84 | 1.0 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 814 | 9.3 |

MEAN WIND SPEED: 2.1
MISSING: 0

LIMERICK MET DATA 1/01-12/01

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED
BY ATMOSPHERIC STABILITY CLASS
WIND: LEVEL 1
DELTA T: (266-26FT)

LAPSE RATE: GT 4.0 DEG C/100M
CLASS G

WIND SPEED GROUPS (MPH)

| | 0.0-0.5 | | 0.6-3.5 | | 3.6-7.5 | | 7.6-12.5 | | 12.6-18.5 | | 18.6-24.5 | | GE 24.6 | | SUM PERCENT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIRECTION | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | | |
| N | 2 | 0.0 | 50 | 0.6 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 54 | 0.6 |
| NNE | 3 | 0.0 | 34 | 0.4 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 37 | 0.4 |
| NE | 0 | 0.0 | 34 | 0.4 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 34 | 0.4 |
| ENE | 0 | 0.0 | 19 | 0.2 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 19 | 0.2 |
| E | 0 | 0.0 | 11 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 11 | 0.1 |
| ESE | 1 | 0.0 | 5 | 0.1 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 8 | 0.1 |
| SE | 1 | 0.0 | 5 | 0.1 | 4 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 10 | 0.1 |
| SSE | 1 | 0.0 | 5 | 0.1 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 7 | 0.1 |
| S | 0 | 0.0 | 7 | 0.1 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 9 | 0.1 |
| SSW | 0 | 0.0 | 16 | 0.2 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 17 | 0.2 |
| SW | 0 | 0.0 | 16 | 0.2 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 17 | 0.2 |
| WSW | 1 | 0.0 | 26 | 0.3 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 28 | 0.3 |
| W | 3 | 0.0 | 92 | 1.1 | 4 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 99 | 1.1 |
| WNW | 7 | 0.1 | 133 | 1.5 | 10 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 150 | 1.7 |
| NW | 5 | 0.1 | 106 | 1.2 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 113 | 1.3 |
| NNW | 3 | 0.0 | 79 | 0.9 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 84 | 1.0 |
| | 27 | 0.3 | 638 | 7.3 | 32 | 0.4 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 697 | 8.0 |

MEAN WIND SPEED: 1.6
MISSING: 0

LIMERICK MET DATA 1/01-12/01

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED
BY ATMOSPHERIC STABILITY CLASS
WIND: LEVEL 1
DELTA T: (266-26FT)

ALL STABILITY CLASSES

WIND SPEED GROUPS (MPH)

| | 0.0-0.5 | | 0.6-3.5 | | 3.6-7.5 | | 7.6-12.5 | | 12.6-18.5 | | 18.6-24.5 | | GE 24.6 | | SUM | PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIRECTION | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | | |
| N | 2 | 0.0 | 217 | 2.5 | 155 | 1.8 | 81 | 0.9 | 4 | 0.0 | 0 | 0.0 | 0 | 0.0 | 459 | 5.2 |
| NNE | 7 | 0.1 | 194 | 2.2 | 116 | 1.3 | 23 | 0.3 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 341 | 3.9 |
| NE | 3 | 0.0 | 202 | 2.3 | 66 | 0.8 | 3 | 0.0 | 2 | 0.0 | 1 | 0.0 | 0 | 0.0 | 277 | 3.2 |
| ENE | 1 | 0.0 | 190 | 2.2 | 167 | 1.9 | 18 | 0.2 | 8 | 0.1 | 0 | 0.0 | 0 | 0.0 | 384 | 4.4 |
| E | 2 | 0.0 | 144 | 1.6 | 167 | 1.9 | 106 | 1.2 | 6 | 0.1 | 0 | 0.0 | 0 | 0.0 | 425 | 4.9 |
| ESE | 1 | 0.0 | 115 | 1.3 | 95 | 1.1 | 61 | 0.7 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 273 | 3.1 |
| SE | 1 | 0.0 | 76 | 0.9 | 90 | 1.0 | 46 | 0.5 | 3 | 0.0 | 0 | 0.0 | 0 | 0.0 | 216 | 2.5 |
| SSE | 1 | 0.0 | 93 | 1.1 | 112 | 1.3 | 33 | 0.4 | 4 | 0.0 | 0 | 0.0 | 0 | 0.0 | 243 | 2.8 |
| S | 0 | 0.0 | 108 | 1.2 | 240 | 2.7 | 53 | 0.6 | 3 | 0.0 | 0 | 0.0 | 0 | 0.0 | 404 | 4.6 |
| SSW | 0 | 0.0 | 165 | 1.9 | 280 | 3.2 | 90 | 1.0 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 537 | 6.1 |
| SW | 0 | 0.0 | 258 | 2.9 | 230 | 2.6 | 29 | 0.3 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 519 | 5.9 |
| WSW | 2 | 0.0 | 271 | 3.1 | 193 | 2.2 | 34 | 0.4 | 6 | 0.1 | 1 | 0.0 | 0 | 0.0 | 507 | 5.8 |
| W | 3 | 0.0 | 395 | 4.5 | 289 | 3.3 | 141 | 1.6 | 29 | 0.3 | 1 | 0.0 | 0 | 0.0 | 858 | 9.8 |
| WNW | 8 | 0.1 | 523 | 6.0 | 401 | 4.6 | 295 | 3.4 | 94 | 1.1 | 19 | 0.2 | 0 | 0.0 | 1340 | 15.3 |
| NW | 6 | 0.1 | 372 | 4.3 | 342 | 3.9 | 387 | 4.4 | 242 | 2.8 | 43 | 0.5 | 2 | 0.0 | 1394 | 15.9 |
| NNW | 7 | 0.1 | 247 | 2.8 | 150 | 1.7 | 111 | 1.3 | 47 | 0.5 | 13 | 0.1 | 0 | 0.0 | 575 | 6.6 |
| | 44 | 0.5 | 3570 | 40.8 | 3093 | 35.3 | 1511 | 17.3 | 454 | 5.2 | 78 | 0.9 | 2 | 0.0 | 8752 | 100.0 |

MISSING HOURS: 8

MEAN WIND SPEED: 5.4

LIMERICK MET DATA 1/01-12/01

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED
BY ATMOSPHERIC STABILITY CLASS
WIND: LEVEL 1
DELTA T: (266-26FT)

DIRECTION VS SPEED ONLY

WIND SPEED GROUPS (MPH)

| | 0.0-0.5 | | 0.6-3.5 | | 3.6-7.5 | | 7.6-12.5 | | 12.6-18.5 | | 18.6-24.5 | | GE 24.6 | | SUM PERCENT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIRECTION | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | | |
| N | 2 | 0.0 | 217 | 2.5 | 155 | 1.8 | 81 | 0.9 | 4 | 0.0 | 0 | 0.0 | 0 | 0.0 | 459 | 5.2 |
| NNE | 7 | 0.1 | 194 | 2.2 | 116 | 1.3 | 23 | 0.3 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 341 | 3.9 |
| NE | 3 | 0.0 | 202 | 2.3 | 66 | 0.8 | 3 | 0.0 | 2 | 0.0 | 1 | 0.0 | 0 | 0.0 | 277 | 3.2 |
| ENE | 1 | 0.0 | 190 | 2.2 | 167 | 1.9 | 18 | 0.2 | 8 | 0.1 | 0 | 0.0 | 0 | 0.0 | 384 | 4.4 |
| E | 2 | 0.0 | 144 | 1.6 | 167 | 1.9 | 106 | 1.2 | 6 | 0.1 | 0 | 0.0 | 0 | 0.0 | 425 | 4.9 |
| ESE | 1 | 0.0 | 115 | 1.3 | 95 | 1.1 | 61 | 0.7 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 273 | 3.1 |
| SE | 1 | 0.0 | 76 | 0.9 | 90 | 1.0 | 46 | 0.5 | 3 | 0.0 | 0 | 0.0 | 0 | 0.0 | 216 | 2.5 |
| SSE | 1 | 0.0 | 93 | 1.1 | 112 | 1.3 | 33 | 0.4 | 4 | 0.0 | 0 | 0.0 | 0 | 0.0 | 243 | 2.8 |
| S | 0 | 0.0 | 108 | 1.2 | 240 | 2.7 | 53 | 0.6 | 3 | 0.0 | 0 | 0.0 | 0 | 0.0 | 404 | 4.6 |
| SSW | 0 | 0.0 | 165 | 1.9 | 280 | 3.2 | 90 | 1.0 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 537 | 6.1 |
| SW | 0 | 0.0 | 258 | 2.9 | 230 | 2.6 | 29 | 0.3 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 519 | 5.9 |
| WSW | 2 | 0.0 | 271 | 3.1 | 193 | 2.2 | 34 | 0.4 | 6 | 0.1 | 1 | 0.0 | 0 | 0.0 | 507 | 5.8 |
| W | 3 | 0.0 | 395 | 4.5 | 289 | 3.3 | 141 | 1.6 | 29 | 0.3 | 1 | 0.0 | 0 | 0.0 | 858 | 9.8 |
| WNW | 8 | 0.1 | 523 | 6.0 | 401 | 4.6 | 295 | 3.4 | 94 | 1.1 | 19 | 0.2 | 0 | 0.0 | 1340 | 15.3 |
| NW | 6 | 0.1 | 372 | 4.3 | 342 | 3.9 | 387 | 4.4 | 242 | 2.8 | 43 | 0.5 | 2 | 0.0 | 1394 | 15.9 |
| NNW | 7 | 0.1 | 247 | 2.8 | 150 | 1.7 | 111 | 1.3 | 47 | 0.5 | 13 | 0.1 | 0 | 0.0 | 575 | 6.6 |
| | 44 | 0.5 | 3570 | 40.8 | 3093 | 35.3 | 1511 | 17.3 | 454 | 5.2 | 78 | 0.9 | 2 | 0.0 | 8752 | 100.0 |

MISSING HOURS: 8

MEAN WIND SPEED: 5.4

2001

JOINT FREQUENCY DISTRIBUTION (JFD's)

175 FOOT LEVEL

LIMERICK GENERATING STATION
DATA RECOVERY SUMMARY

LEVEL 1 - TOWER 1 30' OR TOWER 2 159'

| PARAMETER | COUNT | PERCENT |
|---|---|---|
| PRIMARY SPEED GOOD HOURS | 7957 | 90.83% |
| BACKUP SPEED GOOD HOURS | 8468 | 96.67% |
| BACKUP SPEED HOURS USED | 795 | 9.08% |
| TOTAL AVAILABLE SPEED HOURS | 8752 | 99.91% |
| | | |
| PRIMARY DIRECTION GOOD HOURS | 7973 | 91.02% |
| BACKUP DIRECTION GOOD HOURS | 8501 | 97.04% |
| BACKUP DIRECTION HOURS USED | 779 | 8.89% |
| TOTAL AVAILABLE DIRECTION HOURS | 8752 | 99.91% |
| | | |
| PRIMARY (266-26') DELTA TEMP HOURS | 8091 | 92.36% |
| BACKUP (300-26') DELTA TEMP HOURS | 8473 | 96.72% |
| BACKUP DELTA TEMP HOURS USED | 661 | 7.55% |
| TOTAL AVAILABLE DELTA TEMP HOURS | 8752 | 99.91% |
| | | |
| LEVEL 1 JOINT DATA RECOVERY: | 8752 | 99.91% |

LIMERICK MET DATA 1/01-12/01

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED
BY ATMOSPHERIC STABILITY CLASS
WIND: LEVEL 2
DELTA T: (266-26FT)

LAPSE RATE: LE -1.9 DEG C/100M
CLASS A

WIND SPEED GROUPS (MPH)

| | 0.0-0.5 | | 0.6-3.5 | | 3.6-7.5 | | 7.6-12.5 | | 12.6-18.5 | | 18.6-24.5 | | GE 24.6 | | SUM PERCENT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIRECTION | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | | |
| N | 0 | 0.0 | 0 | 0.0 | 1 | 0.0 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 2 | 0.0 |
| NNE | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 0.0 |
| NE | 0 | 0.0 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 0.0 |
| ENE | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 4 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 4 | 0.0 |
| E | 0 | 0.0 | 0 | 0.0 | 1 | 0.0 | 3 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 4 | 0.0 |
| ESE | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 2 | 0.0 |
| SE | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 2 | 0.0 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 3 | 0.0 |
| SSE | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 0.0 |
| S | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 6 | 0.1 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 7 | 0.1 |
| SSW | 0 | 0.0 | 0 | 0.0 | 2 | 0.0 | 22 | 0.3 | 7 | 0.1 | 0 | 0.0 | 0 | 0.0 | 31 | 0.4 |
| SW | 0 | 0.0 | 0 | 0.0 | 10 | 0.1 | 27 | 0.3 | 6 | 0.1 | 0 | 0.0 | 0 | 0.0 | 43 | 0.5 |
| WSW | 0 | 0.0 | 0 | 0.0 | 4 | 0.0 | 10 | 0.1 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 16 | 0.2 |
| W | 0 | 0.0 | 0 | 0.0 | 3 | 0.0 | 15 | 0.2 | 7 | 0.1 | 2 | 0.0 | 0 | 0.0 | 27 | 0.3 |
| WNW | 0 | 0.0 | 0 | 0.0 | 2 | 0.0 | 6 | 0.1 | 7 | 0.1 | 1 | 0.0 | 0 | 0.0 | 16 | 0.2 |
| NW | 0 | 0.0 | 0 | 0.0 | 1 | 0.0 | 2 | 0.0 | 6 | 0.1 | 1 | 0.0 | 0 | 0.0 | 10 | 0.1 |
| NNW | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 3 | 0.0 | 7 | 0.1 | 3 | 0.0 | 0 | 0.0 | 13 | 0.1 |
| | 0 | 0.0 | 1 | 0.0 | 24 | 0.3 | 105 | 1.2 | 44 | 0.5 | 7 | 0.1 | 0 | 0.0 | 181 | 2.1 |

MEAN WIND SPEED: 11.2
MISSING: 0

LIMERICK MET DATA 1/01-12/01

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED
BY ATMOSPHERIC STABILITY CLASS
WIND: LEVEL 2
DELTA T: (266-26FT)

LAPSE RATE: -1.8 TO -1.7 DEG C/100M
CLASS B

WIND SPEED GROUPS (MPH)

| | 0.0-0.5 | | 0.6-3.5 | | 3.6-7.5 | | 7.6-12.5 | | 12.6-18.5 | | 18.6-24.5 | | GE 24.6 | | SUM PERCENT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIRECTION | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | | |
| N | 0 | 0.0 | 0 | 0.0 | 7 | 0.1 | 5 | 0.1 | 8 | 0.1 | 0 | 0.0 | 0 | 0.0 | 20 | 0.2 |
| NNE | 0 | 0.0 | 1 | 0.0 | 6 | 0.1 | 6 | 0.1 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 14 | 0.2 |
| NE | 0 | 0.0 | 0 | 0.0 | 2 | 0.0 | 4 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 6 | 0.1 |
| ENE | 0 | 0.0 | 0 | 0.0 | 1 | 0.0 | 8 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 9 | 0.1 |
| E | 0 | 0.0 | 0 | 0.0 | 3 | 0.0 | 3 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 6 | 0.1 |
| ESE | 0 | 0.0 | 0 | 0.0 | 2 | 0.0 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 4 | 0.0 |
| SE | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 0.0 |
| SSE | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 3 | 0.0 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 5 | 0.1 |
| S | 0 | 0.0 | 0 | 0.0 | 1 | 0.0 | 7 | 0.1 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 9 | 0.1 |
| SSW | 0 | 0.0 | 0 | 0.0 | 7 | 0.1 | 19 | 0.2 | 13 | 0.1 | 0 | 0.0 | 0 | 0.0 | 39 | 0.4 |
| SW | 0 | 0.0 | 0 | 0.0 | 15 | 0.2 | 19 | 0.2 | 5 | 0.1 | 0 | 0.0 | 0 | 0.0 | 39 | 0.4 |
| WSW | 0 | 0.0 | 0 | 0.0 | 16 | 0.2 | 11 | 0.1 | 2 | 0.0 | 2 | 0.0 | 1 | 0.0 | 32 | 0.4 |
| W | 0 | 0.0 | 2 | 0.0 | 13 | 0.1 | 21 | 0.2 | 10 | 0.1 | 3 | 0.0 | 2 | 0.0 | 51 | 0.6 |
| WNW | 0 | 0.0 | 0 | 0.0 | 6 | 0.1 | 9 | 0.1 | 6 | 0.1 | 3 | 0.0 | 1 | 0.0 | 25 | 0.3 |
| NW | 0 | 0.0 | 0 | 0.0 | 6 | 0.1 | 14 | 0.2 | 25 | 0.3 | 6 | 0.1 | 0 | 0.0 | 51 | 0.6 |
| NNW | 0 | 0.0 | 0 | 0.0 | 7 | 0.1 | 8 | 0.1 | 11 | 0.1 | 1 | 0.0 | 0 | 0.0 | 27 | 0.3 |
| | 0 | 0.0 | 3 | 0.0 | 92 | 1.1 | 139 | 1.6 | 85 | 1.0 | 15 | 0.2 | 4 | 0.0 | 338 | 3.9 |

MEAN WIND SPEED: 10.7
MISSING: 0

LIMERICK MET DATA 1/01-12/01

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED
BY ATMOSPHERIC STABILITY CLASS
WIND: LEVEL 2
DELTA T: (266-26FT)

LAPSE RATE: -1.6 TO -1.5 DEG C/100M
CLASS C

WIND SPEED GROUPS (MPH)

| DIRECTION | 0.0-0.5 | | 0.6-3.5 | | 3.6-7.5 | | 7.6-12.5 | | 12.6-18.5 | | 18.6-24.5 | | GE 24.6 | | SUM | PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | | |
| N | 0 | 0.0 | 1 | 0.0 | 8 | 0.1 | 6 | 0.1 | 9 | 0.1 | 0 | 0.0 | 0 | 0.0 | 24 | 0.3 |
| NNE | 0 | 0.0 | 1 | 0.0 | 10 | 0.1 | 6 | 0.1 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 19 | 0.2 |
| NE | 0 | 0.0 | 2 | 0.0 | 5 | 0.1 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 9 | 0.1 |
| ENE | 0 | 0.0 | 0 | 0.0 | 11 | 0.1 | 9 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 20 | 0.2 |
| E | 0 | 0.0 | 1 | 0.0 | 4 | 0.0 | 16 | 0.2 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 23 | 0.3 |
| ESE | 0 | 0.0 | 0 | 0.0 | 1 | 0.0 | 6 | 0.1 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 8 | 0.1 |
| SE | 0 | 0.0 | 0 | 0.0 | 2 | 0.0 | 0 | 0.0 | 4 | 0.0 | 0 | 0.0 | 0 | 0.0 | 6 | 0.1 |
| SSE | 0 | 0.0 | 0 | 0.0 | 1 | 0.0 | 1 | 0.0 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 3 | 0.0 |
| S | 0 | 0.0 | 0 | 0.0 | 4 | 0.0 | 8 | 0.1 | 3 | 0.0 | 0 | 0.0 | 0 | 0.0 | 15 | 0.2 |
| SSW | 0 | 0.0 | 0 | 0.0 | 15 | 0.2 | 30 | 0.3 | 11 | 0.1 | 0 | 0.0 | 0 | 0.0 | 56 | 0.6 |
| SW | 0 | 0.0 | 0 | 0.0 | 11 | 0.1 | 23 | 0.3 | 4 | 0.0 | 1 | 0.0 | 0 | 0.0 | 39 | 0.4 |
| WSW | 0 | 0.0 | 0 | 0.0 | 18 | 0.2 | 18 | 0.2 | 4 | 0.0 | 1 | 0.0 | 1 | 0.0 | 42 | 0.5 |
| W | 0 | 0.0 | 3 | 0.0 | 18 | 0.2 | 22 | 0.3 | 17 | 0.2 | 3 | 0.0 | 1 | 0.0 | 64 | 0.7 |
| WNW | 0 | 0.0 | 1 | 0.0 | 18 | 0.2 | 30 | 0.3 | 24 | 0.3 | 11 | 0.1 | 3 | 0.0 | 87 | 1.0 |
| NW | 0 | 0.0 | 0 | 0.0 | 11 | 0.1 | 21 | 0.2 | 51 | 0.6 | 22 | 0.3 | 3 | 0.0 | 108 | 1.2 |
| NNW | 0 | 0.0 | 1 | 0.0 | 7 | 0.1 | 11 | 0.1 | 7 | 0.1 | 6 | 0.1 | 1 | 0.0 | 33 | 0.4 |
| | 0 | 0.0 | 10 | 0.1 | 144 | 1.6 | 209 | 2.4 | 140 | 1.6 | 44 | 0.5 | 9 | 0.1 | 556 | 6.4 |

MEAN WIND SPEED: 11.1
MISSING: 0

LIMERICK MET DATA 1/01-12/01

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED
BY ATMOSPHERIC STABILITY CLASS
WIND: LEVEL 2
DELTA T: (266-26FT)

LAPSE RATE: -1.4 TO -0.5 DEG C/100M
CLASS D

WIND SPEED GROUPS (MPH)

| | 0.0-0.5 | | 0.6-3.5 | | 3.6-7.5 | | 7.6-12.5 | | 12.6-18.5 | | 18.6-24.5 | | GE 24.6 | | SUM PERCENT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIRECTION | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | | |
| N | 0 | 0.0 | 26 | 0.3 | 56 | 0.6 | 73 | 0.8 | 28 | 0.3 | 1 | 0.0 | 0 | 0.0 | 184 | 2.1 |
| NNE | 0 | 0.0 | 27 | 0.3 | 62 | 0.7 | 49 | 0.6 | 14 | 0.2 | 0 | 0.0 | 0 | 0.0 | 152 | 1.7 |
| NE | 0 | 0.0 | 28 | 0.3 | 72 | 0.8 | 24 | 0.3 | 2 | 0.0 | 1 | 0.0 | 1 | 0.0 | 128 | 1.5 |
| ENE | 0 | 0.0 | 35 | 0.4 | 97 | 1.1 | 68 | 0.8 | 10 | 0.1 | 6 | 0.1 | 1 | 0.0 | 217 | 2.5 |
| E | 0 | 0.0 | 14 | 0.2 | 42 | 0.5 | 103 | 1.2 | 66 | 0.8 | 2 | 0.0 | 0 | 0.0 | 227 | 2.6 |
| ESE | 0 | 0.0 | 14 | 0.2 | 32 | 0.4 | 53 | 0.6 | 31 | 0.4 | 0 | 0.0 | 0 | 0.0 | 130 | 1.5 |
| SE | 0 | 0.0 | 17 | 0.2 | 38 | 0.4 | 50 | 0.6 | 22 | 0.3 | 4 | 0.0 | 0 | 0.0 | 131 | 1.5 |
| SSE | 0 | 0.0 | 16 | 0.2 | 37 | 0.4 | 75 | 0.9 | 24 | 0.3 | 4 | 0.0 | 0 | 0.0 | 156 | 1.8 |
| S | 0 | 0.0 | 19 | 0.2 | 53 | 0.6 | 123 | 1.4 | 20 | 0.2 | 2 | 0.0 | 0 | 0.0 | 217 | 2.5 |
| SSW | 0 | 0.0 | 13 | 0.1 | 64 | 0.7 | 76 | 0.9 | 32 | 0.4 | 2 | 0.0 | 0 | 0.0 | 187 | 2.1 |
| SW | 0 | 0.0 | 25 | 0.3 | 60 | 0.7 | 59 | 0.7 | 10 | 0.1 | 0 | 0.0 | 0 | 0.0 | 154 | 1.8 |
| WSW | 0 | 0.0 | 20 | 0.2 | 52 | 0.6 | 51 | 0.6 | 24 | 0.3 | 7 | 0.1 | 1 | 0.0 | 155 | 1.8 |
| W | 0 | 0.0 | 20 | 0.2 | 68 | 0.8 | 105 | 1.2 | 96 | 1.1 | 40 | 0.5 | 5 | 0.1 | 334 | 3.8 |
| WNW | 0 | 0.0 | 17 | 0.2 | 96 | 1.1 | 155 | 1.8 | 207 | 2.4 | 91 | 1.0 | 27 | 0.3 | 593 | 6.8 |
| NW | 0 | 0.0 | 13 | 0.1 | 59 | 0.7 | 132 | 1.5 | 172 | 2.0 | 85 | 1.0 | 28 | 0.3 | 489 | 5.6 |
| NNW | 0 | 0.0 | 24 | 0.3 | 45 | 0.5 | 92 | 1.1 | 75 | 0.9 | 25 | 0.3 | 2 | 0.0 | 263 | 3.0 |
| | 0 | 0.0 | 328 | 3.7 | 933 | 10.7 | 1288 | 14.7 | 833 | 9.5 | 270 | 3.1 | 65 | 0.7 | 3717 | 42.5 |

MEAN WIND SPEED: 10.4
MISSING: 0

LIMERICK MET DATA 1/01-12/01

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED
BY ATMOSPHERIC STABILITY CLASS
WIND: LEVEL 2
DELTA T: (266-26FT)

LAPSE RATE: -0.4 TO 1.5 DEG C/100M
CLASS E

WIND SPEED GROUPS (MPH)

| | 0.0-0.5 | | 0.6-3.5 | | 3.6-7.5 | | 7.6-12.5 | | 12.6-18.5 | | 18.6-24.5 | | GE 24.6 | | SUM PERCENT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIRECTION | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | | |
| N | 0 | 0.0 | 20 | 0.2 | 34 | 0.4 | 41 | 0.5 | 9 | 0.1 | 0 | 0.0 | 0 | 0.0 | 104 | 1.2 |
| NNE | 0 | 0.0 | 30 | 0.3 | 20 | 0.2 | 38 | 0.4 | 7 | 0.1 | 0 | 0.0 | 0 | 0.0 | 95 | 1.1 |
| NE | 0 | 0.0 | 21 | 0.2 | 42 | 0.5 | 16 | 0.2 | 3 | 0.0 | 0 | 0.0 | 0 | 0.0 | 82 | 0.9 |
| ENE | 0 | 0.0 | 28 | 0.3 | 48 | 0.5 | 12 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 88 | 1.0 |
| E | 0 | 0.0 | 20 | 0.2 | 38 | 0.4 | 22 | 0.3 | 4 | 0.0 | 0 | 0.0 | 0 | 0.0 | 84 | 1.0 |
| ESE | 0 | 0.0 | 17 | 0.2 | 21 | 0.2 | 21 | 0.2 | 8 | 0.1 | 0 | 0.0 | 0 | 0.0 | 67 | 0.8 |
| SE | 0 | 0.0 | 15 | 0.2 | 24 | 0.3 | 16 | 0.2 | 6 | 0.1 | 3 | 0.0 | 0 | 0.0 | 64 | 0.7 |
| SSE | 0 | 0.0 | 14 | 0.2 | 25 | 0.3 | 34 | 0.4 | 4 | 0.0 | 1 | 0.0 | 0 | 0.0 | 78 | 0.9 |
| S | 0 | 0.0 | 10 | 0.1 | 55 | 0.6 | 103 | 1.2 | 28 | 0.3 | 3 | 0.0 | 0 | 0.0 | 199 | 2.3 |
| SSW | 0 | 0.0 | 11 | 0.1 | 74 | 0.8 | 98 | 1.1 | 37 | 0.4 | 4 | 0.0 | 2 | 0.0 | 226 | 2.6 |
| SW | 0 | 0.0 | 15 | 0.2 | 94 | 1.1 | 78 | 0.9 | 11 | 0.1 | 2 | 0.0 | 0 | 0.0 | 200 | 2.3 |
| WSW | 0 | 0.0 | 19 | 0.2 | 69 | 0.8 | 60 | 0.7 | 13 | 0.1 | 3 | 0.0 | 0 | 0.0 | 164 | 1.9 |
| W | 0 | 0.0 | 20 | 0.2 | 95 | 1.1 | 89 | 1.0 | 33 | 0.4 | 2 | 0.0 | 1 | 0.0 | 240 | 2.7 |
| WNW | 0 | 0.0 | 27 | 0.3 | 128 | 1.5 | 191 | 2.2 | 43 | 0.5 | 2 | 0.0 | 2 | 0.0 | 393 | 4.5 |
| NW | 0 | 0.0 | 15 | 0.2 | 80 | 0.9 | 112 | 1.3 | 27 | 0.3 | 2 | 0.0 | 0 | 0.0 | 236 | 2.7 |
| NNW | 0 | 0.0 | 11 | 0.1 | 55 | 0.6 | 50 | 0.6 | 12 | 0.1 | 1 | 0.0 | 0 | 0.0 | 129 | 1.5 |
| | 0 | 0.0 | 293 | 3.3 | 902 | 10.3 | 981 | 11.2 | 245 | 2.8 | 23 | 0.3 | 5 | 0.1 | 2449 | 28.0 |

MEAN WIND SPEED: 8.0
MISSING: 0

LIMERICK MET DATA 1/01-12/01

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED
BY ATMOSPHERIC STABILITY CLASS
WIND: LEVEL 2
DELTA T: (266-26FT)

LAPSE RATE: 1.6 TO 4.0 DEG C/100M
CLASS F

WIND SPEED GROUPS (MPH)

| | 0.0-0.5 | | 0.6-3.5 | | 3.6-7.5 | | 7.6-12.5 | | 12.6-18.5 | | 18.6-24.5 | | GE 24.6 | | SUM PERCENT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIRECTION | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | | |
| N | 0 | 0.0 | 9 | 0.1 | 19 | 0.2 | 7 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 35 | 0.4 |
| NNE | 0 | 0.0 | 5 | 0.1 | 10 | 0.1 | 9 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 24 | 0.3 |
| NE | 0 | 0.0 | 14 | 0.2 | 13 | 0.1 | 3 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 30 | 0.3 |
| ENE | 0 | 0.0 | 8 | 0.1 | 6 | 0.1 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 16 | 0.2 |
| E | 0 | 0.0 | 12 | 0.1 | 4 | 0.0 | 6 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 22 | 0.3 |
| ESE | 0 | 0.0 | 8 | 0.1 | 9 | 0.1 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 18 | 0.2 |
| SE | 0 | 0.0 | 11 | 0.1 | 5 | 0.1 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 17 | 0.2 |
| SSE | 0 | 0.0 | 7 | 0.1 | 16 | 0.2 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 24 | 0.3 |
| S | 0 | 0.0 | 8 | 0.1 | 14 | 0.2 | 5 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 27 | 0.3 |
| SSW | 0 | 0.0 | 11 | 0.1 | 34 | 0.4 | 27 | 0.3 | 2 | 0.0 | 1 | 0.0 | 0 | 0.0 | 75 | 0.9 |
| SW | 0 | 0.0 | 11 | 0.1 | 28 | 0.3 | 13 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 52 | 0.6 |
| WSW | 0 | 0.0 | 13 | 0.1 | 37 | 0.4 | 7 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 57 | 0.7 |
| W | 0 | 0.0 | 26 | 0.3 | 51 | 0.6 | 19 | 0.2 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 98 | 1.1 |
| WNW | 0 | 0.0 | 23 | 0.3 | 82 | 0.9 | 72 | 0.8 | 7 | 0.1 | 0 | 0.0 | 0 | 0.0 | 184 | 2.1 |
| NW | 0 | 0.0 | 17 | 0.2 | 47 | 0.5 | 27 | 0.3 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 92 | 1.1 |
| NNW | 0 | 0.0 | 17 | 0.2 | 19 | 0.2 | 7 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 43 | 0.5 |
| | 0 | 0.0 | 200 | 2.3 | 394 | 4.5 | 207 | 2.4 | 12 | 0.1 | 1 | 0.0 | 0 | 0.0 | 814 | 9.3 |

MEAN WIND SPEED: 5.8
MISSING: 0

LIMERICK MET DATA 1/01-12/01

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED
BY ATMOSPHERIC STABILITY CLASS
WIND: LEVEL 2
DELTA T: (266-26FT)

LAPSE RATE: GT 4.0 DEG C/100M
CLASS G

WIND SPEED GROUPS (MPH)

| | 0.0-0.5 | | 0.6-3.5 | | 3.6-7.5 | | 7.6-12.5 | | 12.6-18.5 | | 18.6-24.5 | | GE 24.6 | | SUM | PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIRECTION | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | | |
| N | 0 | 0.0 | 15 | 0.2 | 7 | 0.1 | 4 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 26 | 0.3 |
| NNE | 0 | 0.0 | 10 | 0.1 | 4 | 0.0 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 16 | 0.2 |
| NE | 0 | 0.0 | 7 | 0.1 | 3 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 10 | 0.1 |
| ENE | 0 | 0.0 | 8 | 0.1 | 3 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 11 | 0.1 |
| E | 0 | 0.0 | 5 | 0.1 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 7 | 0.1 |
| ESE | 0 | 0.0 | 6 | 0.1 | 4 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 10 | 0.1 |
| SE | 0 | 0.0 | 9 | 0.1 | 3 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 12 | 0.1 |
| SSE | 0 | 0.0 | 8 | 0.1 | 4 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 12 | 0.1 |
| S | 0 | 0.0 | 15 | 0.2 | 12 | 0.1 | 5 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 32 | 0.4 |
| SSW | 0 | 0.0 | 13 | 0.1 | 19 | 0.2 | 4 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 36 | 0.4 |
| SW | 0 | 0.0 | 15 | 0.2 | 27 | 0.3 | 4 | 0.0 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 47 | 0.5 |
| WSW | 0 | 0.0 | 26 | 0.3 | 18 | 0.2 | 4 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 48 | 0.5 |
| W | 0 | 0.0 | 20 | 0.2 | 66 | 0.8 | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 88 | 1.0 |
| WNW | 0 | 0.0 | 31 | 0.4 | 111 | 1.3 | 72 | 0.8 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 214 | 2.4 |
| NW | 0 | 0.0 | 24 | 0.3 | 56 | 0.6 | 18 | 0.2 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 98 | 1.1 |
| NNW | 0 | 0.0 | 14 | 0.2 | 15 | 0.2 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 30 | 0.3 |
| | 0 | 0.0 | 226 | 2.6 | 354 | 4.0 | 116 | 1.3 | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 697 | 8.0 |

MEAN WIND SPEED: 4.9
MISSING: 0

LIMERICK MET DATA 1/01-12/01

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED
BY ATMOSPHERIC STABILITY CLASS
WIND: LEVEL 2
DELTA T: (266-26FT)

ALL STABILITY CLASSES

WIND SPEED GROUPS (MPH)

| | 0.0-0.5 | | 0.6-3.5 | | 3.6-7.5 | | 7.6-12.5 | | 12.6-18.5 | | 18.6-24.5 | | GE 24.6 | | SUM | PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIRECTION | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | | |
| N | 0 | 0.0 | 71 | 0.8 | 132 | 1.5 | 137 | 1.6 | 54 | 0.6 | 1 | 0.0 | 0 | 0.0 | 395 | 4.5 |
| NNE | 0 | 0.0 | 74 | 0.8 | 112 | 1.3 | 111 | 1.3 | 24 | 0.3 | 0 | 0.0 | 0 | 0.0 | 321 | 3.7 |
| NE | 0 | 0.0 | 73 | 0.8 | 137 | 1.6 | 49 | 0.6 | 5 | 0.1 | 1 | 0.0 | 1 | 0.0 | 266 | 3.0 |
| ENE | 0 | 0.0 | 79 | 0.9 | 166 | 1.9 | 103 | 1.2 | 10 | 0.1 | 6 | 0.1 | 1 | 0.0 | 365 | 4.2 |
| E | 0 | 0.0 | 52 | 0.6 | 94 | 1.1 | 153 | 1.7 | 72 | 0.8 | 2 | 0.0 | 0 | 0.0 | 373 | 4.3 |
| ESE | 0 | 0.0 | 45 | 0.5 | 69 | 0.8 | 85 | 1.0 | 40 | 0.5 | 0 | 0.0 | 0 | 0.0 | 239 | 2.7 |
| SE | 0 | 0.0 | 52 | 0.6 | 72 | 0.8 | 69 | 0.8 | 34 | 0.4 | 7 | 0.1 | 0 | 0.0 | 234 | 2.7 |
| SSE | 0 | 0.0 | 45 | 0.5 | 83 | 0.9 | 115 | 1.3 | 31 | 0.4 | 5 | 0.1 | 0 | 0.0 | 279 | 3.2 |
| S | 0 | 0.0 | 52 | 0.6 | 139 | 1.6 | 257 | 2.9 | 53 | 0.6 | 5 | 0.1 | 0 | 0.0 | 506 | 5.8 |
| SSW | 0 | 0.0 | 48 | 0.5 | 215 | 2.5 | 276 | 3.2 | 102 | 1.2 | 7 | 0.1 | 2 | 0.0 | 650 | 7.4 |
| SW | 0 | 0.0 | 66 | 0.8 | 245 | 2.8 | 223 | 2.5 | 37 | 0.4 | 3 | 0.0 | 0 | 0.0 | 574 | 6.6 |
| WSW | 0 | 0.0 | 78 | 0.9 | 214 | 2.4 | 161 | 1.8 | 45 | 0.5 | 13 | 0.1 | 3 | 0.0 | 514 | 5.9 |
| W | 0 | 0.0 | 91 | 1.0 | 314 | 3.6 | 273 | 3.1 | 165 | 1.9 | 50 | 0.6 | 9 | 0.1 | 902 | 10.3 |
| WNW | 0 | 0.0 | 99 | 1.1 | 443 | 5.1 | 535 | 6.1 | 294 | 3.4 | 108 | 1.2 | 33 | 0.4 | 1512 | 17.3 |
| NW | 0 | 0.0 | 69 | 0.8 | 260 | 3.0 | 326 | 3.7 | 282 | 3.2 | 116 | 1.3 | 31 | 0.4 | 1084 | 12.4 |
| NNW | 0 | 0.0 | 67 | 0.8 | 148 | 1.7 | 172 | 2.0 | 112 | 1.3 | 36 | 0.4 | 3 | 0.0 | 538 | 6.1 |
| | 0 | 0.0 | 1061 | 12.1 | 2843 | 32.5 | 3045 | 34.8 | 1360 | 15.5 | 360 | 4.1 | 83 | 0.9 | 8752 | 100.0 |

MISSING HOURS: 8

MEAN WIND SPEED: 8.9

LIMERICK MET DATA 1/01-12/01

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED
BY ATMOSPHERIC STABILITY CLASS
WIND: LEVEL 2
DELTA T: (266-26FT)

DIRECTION VS SPEED ONLY

WIND SPEED GROUPS (MPH)

| | 0.0-0.5 | | 0.6-3.5 | | 3.6-7.5 | | 7.6-12.5 | | 12.6-18.5 | | 18.6-24.5 | | GE 24.6 | | SUM | PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIRECTION | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | SUM | PERCENT | | |
| N | 0 | 0.0 | 71 | 0.8 | 132 | 1.5 | 137 | 1.6 | 54 | 0.6 | 1 | 0.0 | 0 | 0.0 | 395 | 4.5 |
| NNE | 0 | 0.0 | 74 | 0.8 | 112 | 1.3 | 111 | 1.3 | 24 | 0.3 | 0 | 0.0 | 0 | 0.0 | 321 | 3.7 |
| NE | 0 | 0.0 | 73 | 0.8 | 137 | 1.6 | 49 | 0.6 | 5 | 0.1 | 1 | 0.0 | 1 | 0.0 | 266 | 3.0 |
| ENE | 0 | 0.0 | 79 | 0.9 | 166 | 1.9 | 103 | 1.2 | 10 | 0.1 | 6 | 0.1 | 1 | 0.0 | 365 | 4.2 |
| E | 0 | 0.0 | 52 | 0.6 | 94 | 1.1 | 153 | 1.7 | 72 | 0.8 | 2 | 0.0 | 0 | 0.0 | 373 | 4.3 |
| ESE | 0 | 0.0 | 45 | 0.5 | 69 | 0.8 | 85 | 1.0 | 40 | 0.5 | 0 | 0.0 | 0 | 0.0 | 239 | 2.7 |
| SE | 0 | 0.0 | 52 | 0.6 | 72 | 0.8 | 69 | 0.8 | 34 | 0.4 | 7 | 0.1 | 0 | 0.0 | 234 | 2.7 |
| SSE | 0 | 0.0 | 45 | 0.5 | 83 | 0.9 | 115 | 1.3 | 31 | 0.4 | 5 | 0.1 | 0 | 0.0 | 279 | 3.2 |
| S | 0 | 0.0 | 52 | 0.6 | 139 | 1.6 | 257 | 2.9 | 53 | 0.6 | 5 | 0.1 | 0 | 0.0 | 506 | 5.8 |
| SSW | 0 | 0.0 | 48 | 0.5 | 215 | 2.5 | 276 | 3.2 | 102 | 1.2 | 7 | 0.1 | 2 | 0.0 | 650 | 7.4 |
| SW | 0 | 0.0 | 66 | 0.8 | 245 | 2.8 | 223 | 2.5 | 37 | 0.4 | 3 | 0.0 | 0 | 0.0 | 574 | 6.6 |
| WSW | 0 | 0.0 | 78 | 0.9 | 214 | 2.4 | 161 | 1.8 | 45 | 0.5 | 13 | 0.1 | 3 | 0.0 | 514 | 5.9 |
| W | 0 | 0.0 | 91 | 1.0 | 314 | 3.6 | 273 | 3.1 | 165 | 1.9 | 50 | 0.6 | 9 | 0.1 | 902 | 10.3 |
| WNW | 0 | 0.0 | 99 | 1.1 | 443 | 5.1 | 535 | 6.1 | 294 | 3.4 | 108 | 1.2 | 33 | 0.4 | 1512 | 17.3 |
| NW | 0 | 0.0 | 69 | 0.8 | 260 | 3.0 | 326 | 3.7 | 282 | 3.2 | 116 | 1.3 | 31 | 0.4 | 1084 | 12.4 |
| NNW | 0 | 0.0 | 67 | 0.8 | 148 | 1.7 | 172 | 2.0 | 112 | 1.3 | 36 | 0.4 | 3 | 0.0 | 538 | 6.1 |
| | 0 | 0.0 | 1061 | 12.1 | 2843 | 32.5 | 3045 | 34.8 | 1360 | 15.5 | 360 | 4.1 | 83 | 0.9 | 8752 | 100.0 |

MISSING HOURS: 8

MEAN WIND SPEED: 8.9

LIMERICK GENERATING STATION
DATA RECOVERY SUMMARY

LEVEL 2 - TOWER 1 175' OR TOWER 2 304'

| PARAMETER | COUNT | PERCENT |
|---|---|---|
| PRIMARY SPEED GOOD HOURS | 7973 | 91.02% |
| BACKUP SPEED GOOD HOURS | 8501 | 97.04% |
| BACKUP SPEED HOURS USED | 779 | 8.89% |
| TOTAL AVAILABLE SPEED HOURS | 8752 | 99.91% |
| | | |
| PRIMARY DIRECTION GOOD HOURS | 7973 | 91.02% |
| BACKUP DIRECTION GOOD HOURS | 8501 | 97.04% |
| BACKUP DIRECTION HOURS USED | 779 | 8.89% |
| TOTAL AVAILABLE DIRECTION HOURS | 8752 | 99.91% |
| | | |
| PRIMARY (266-26') DELTA TEMP HOURS | 8091 | 92.36% |
| BACKUP (300-26') DELTA TEMP HOURS | 8473 | 96.72% |
| BACKUP DELTA TEMP HOURS USED | 661 | 7.55% |
| TOTAL AVAILABLE DELTA TEMP HOURS | 8752 | 99.91% |
| | | |
| LEVEL 2 JOINT DATA RECOVERY: | 8752 | 99.91% |

Exelon Nuclear

# PROCESS CONTROL PROGRAM FOR RADIOACTIVE WASTES

## 1. PURPOSE

1.1. The purpose of the Process Control Program (PCP) is to:

1.1.1. Establish the process and boundary conditions for the preparation of specific procedures for processing, sampling, analysis, packaging, storage, and shipment of solid radwaste in accordance with local, state, and federal requirements. **(CM-1)**

1.1.2. Establish parameters which will provide reasonable assurance that all Low Level Radioactive Wastes (LLRW), processed by the in-plant waste process systems on-site OR by on-site vendor supplied waste processing systems, meet the acceptance criteria to a Licensed Burial Facility, as required by 10CFR Part 20, 10CFR Part 61, 10CFR Part 71, 49CFR Parts 171-172, "Technical Position on Waste Form (Revision 1)" [1/91], "Low-Level Waste Licensing Branch Technical Position on Radioactive Waste Classification" [5/83], and the Station Technical Specifications, as applicable.

1.1.3. Provide reasonable assurance that waste placed in "on-site storage" meets the requirements as addressed within the Safety Analysis Reports for the low level radwaste storage facilities for dry and/or processed wet waste.

## 2. TERMS AND DEFINITIONS

2.1. **Process Control Program (PCP):** The program which contains the current formulas, sampling, analysis, tests, and determinations to be made to ensure that processing and packaging of solid radioactive waste based on demonstrated processing of actual or simulated wet solid wastes will be accomplished in such a way as to assure the waste meets the stabilization criteria specified in 10CFR Parts 20, 61 and 71, state regulations, and burial site requirements.

2.2. **Solidification:** Liquid waste processed to either an unstable or stable form per 10CFR61 requirements. Waste solidified does not have to meet the 300-year free standing monolith criteria. Approved formulas, samples and tests do not have to meet NRC approval for wastes solidified in a container meeting stability (e.g. High Integrity Container).

2.3. **Stabilization:** Liquid waste processed to a "stable state" per 10CFR61 Requirements. Established formulas, samples, and tests shall be approved by the NRC in order to meet solidification "stabilization" criteria. This processing method is currently not available, because the NRC recognizes that waste packed in a High Integrity Container meets the 300-year stabilization criteria. In the event that this processing method becomes an acceptable method, then the NRC shall approve the stabilization formulas, samples, tests, etc.

2.4. **Solidification Media:** An approved media (e.g. Barnwell - vinyl ester styrene, cement, bitumen) when waste containing greater than 5-year half lives is solidified in a container when the activity is greater than 1 micro curie/cc. Waste solidified in a HIC is approved by the commission meeting the 10CFR61 stabilization criteria, including 1% free standing liquids by volume when the waste is packaged to a "stable" form and $\leq$ 0.5% when waste is packaged to an "unstable" form. The formulas, sampling, analysis, and test do not require NRC approval, because the HIC meets the stability criteria.

2.4.1. Solidification to an unstable or stable state are performed by vendors, when applicable. Liquid waste solidified to meet stabilization criteria (10CFR61 and 01-91 Branch Technical Requirements) must have documentation available that shows that the process is approved by the NRC or disposal facility.

2.5. **Dewatering:** The removal of liquids from liquid waste streams to produce a waste form that meets the requirements of 10CFR Part 61 and applicable burial site criteria, $\leq$0.5% by volume when the waste is packaged to an "unstable" state, or $\leq$1% by volume when the waste is packaged to a "stable" form.

2.6. **High Integrity Container (HIC):** A disposable container that is approved to the container's Certificate of Compliance 10CFR Part 61 Requirements for meeting stability. The use of HIC's is an alternative to solidification or encapsulation in a steel container to meet burial stability. HIC's are used to package dewatered liquid wastes, (e.g. filter cartridges, filter media, resin, sludges, etc), or dry active waste.

2.7. **Encapsulation:** The process of placing a component (e.g. cartridge filters or mechanical components) into a special purpose disposable container and then completely surrounding the waste material with an approved stabilization media, such as cement.

2.8. **Liquid Waste Processing Systems:** In-plant or vendor supplied processing systems consisting of equipment utilized for evaporation, filtration, demineralization, dewatering, solidification, or reverse osmosis (RO) for the treatment of liquid wastes (such as Floor Drains, Chemical Drains and Equipment Drain inputs).

2.9. **Incineration, RVR, and/or Glass Vitrification of Liquid or Solid:** Dry or wet waste processed via incineration and/or thermal processing where by the volume reduced by thermal means meets 10CFR61 requirements.

2.10. **Compaction:** When dry wastes such as paper, wood, plastic, cardboard, incinerator ash, and etc. are volume reduced through the use of a compactor.

2.11. **Waste Streams:** Consist of but are not limited to

- Filter media (powdered, bead resin and fiber),
- Filter cartridges,
- Pre-coat body feed material,
- Contaminated charcoal,
- Fuel pool activated hardware,
- Fuel Pool Crud

- Sump and tank sludges,
- High activity filter cartridges,
- Concentrated liquids,
- Contaminated waste oil,
- Dried sewage or wastewater plant waste,
- Dry Active Waste (DAW): Waste such as filters, air filters, low activity cartridge filters, paper, wood, glass, plastic, cardboard, hoses, cloth, and metals, etc, which have become contaminated as a consequence of normal operating, housekeeping and maintenance activities.
- Other radioactive waste generated from cleanup of inadvertent contamination.

## 3. RESPONSIBILITIES

3.1. Implementation of this Process Control Program (PCP) is described in procedures at each station.

## 4. MAIN BODY

4.1. Process Control Program Requirements

4.1.1. A change to this PCP (Radioactive Waste Treatment Systems) may be made provided that the change is reported as part of the annual radioactive effluent release report, Regulatory Guide 1.21, and is approved by the Plant Operations Review Committee (PORC).

4.1.2. Changes become effective upon acceptance per station requirements.

4.1.3. Records of reviews performed shall be retained for the duration of the unit operating license. This documentation shall contain:

1. Sufficient information to support the change together with the appropriate analyses or evaluations justifying the change, and

2. A determination which documents that the change will maintain the overall conformance of waste products to Federal (10CFR61 and the Branch Technical Position), State, or other applicable requirements, including applicable burial site criteria.

4.1.4. A solidification media, approved by the burial site, **MAY BE REQUIRED when** liquid radwaste is solidified to a stable/unstable state.

4.1.5. **When** processing liquid radwaste to meet solidification stability using a vendor supplied solidification system:

1. **If** the vendor has its own Quality Assurance (QA) Program, **then** the vendor **SHALL ADHERE** to its own QA Program and **SHALL HAVE SUBMITTED** its process system topical report to the NRC or agreement state.

2. **If** the vendor **DOES NOT HAVE** its own Quality Assurance Program, **then** the vendor **SHALL ADHERE** to an approved Quality Assurance Topical Report standard belonging to the Station or to another vendor.

4.1.6. The vendor processing system(s) is/are controlled per the following:

1. A commercial vendor supplied processing system(s) **MAY BE USED** for the processing of LLRW streams.

2. All vendors used to process liquid LLRW at the sites **MUST MEET** applicable QA Topical Report Augmented Quality Requirements and **SHALL BE APPROVED** by station radwaste management.

4.1.7. Vendor processing system(s) operated at the site **WILL BE OPERATED and CONTROLLED** in accordance with vendor approved procedures or station procedures based upon vendor approved documents.

4.1.8. All waste streams processed for burial or long term on-site storage **SHALL MEET** the waste classification and characteristics specified in 10CFR Part 61.55, Part 61.56, the 5-83 Branch Technical Position for waste classification, and the applicable burial site acceptance criteria (for any burial site operating at the time the waste was processed).

4.2. General Waste Processing Requirements

4.2.1. On-site resin processing involves tank mixing and settling, transferring to the station or vendor processing system via resin water slurry or vacuuming into approved waste containers, and, when applicable, dewatering for burial.

4.2.2. Vendor resin beds **MAY BE USED** for decontamination of plant systems, such as, Spent Fuel Pool, RWCU (reactor water cleanup), and SDC (Shut Down Cooling). These resins **ARE then PROCESSED** via the station or vendor processing system.

4.2.3. Various drains and sump discharges **WILL BE COLLECTED** in tanks or suitable containers for processing treatment. Water from these tanks **MAY BE SENT** through a filter, demineralizer, concentrator or vendor supplied processing systems.

4.2.4. Process waste (e.g. filter media, sludges, resin, etc) **WILL BE** periodically **DISCHARGED** to the station or vendor processing system for onsite waste treatment **or PACKAGED** in containers for shipment to offsite vendor for volume reduction processing.

4.2.5. Process water (e.g. chemical, floor, equipment drain, etc.) **MAY BE SENT** to either the site waste process systems or vendor waste processing systems for further filtration, demineralization for plant re-use, or discharge.

4.2.6. All dewatering and solidification/stabilization **WILL BE PERFORMED** by either utility site personnel or by on-site vendors **or WILL BE PACKAGED and SHIPPED** to an off-site vendor low-level radwaste processing facility.

4.2.7. Dry Active Waste (DAW) **WILL BE HANDLED and PROCESSED** per the following:

1. DAW **WILL BE COLLECTED and SURVEYED and MAY BE SORTED** for compactable and non-compactable wastes.

2. DAW **MAY BE PACKAGED** in containers to facilitate on-site pre-compaction and/or off-site super-compaction, incineration, or offsite volume reduction processes.

3. DAW items **MAY BE SURVEYED** for release onsite or offsite when applicable.

4. Contaminated filter cartridges **WILL BE PLACED** into a HIC **or WILL BE ENCAPSULATED** in an in-situ liner for disposal **or SHIPPED** to an offsite waste processor in drums, boxes or steel liners per the vendor site criteria for processing and disposal.

4.2.8. Filtering devices using pre-coat media **MAY BE USED** for the removal of suspended solids from liquid waste streams. The pre-coat material or cartridges from these devices **MAY BE** routinely **REMOVED** from the filter vessel and discharged to a Filter Sludge Tank or Liner/HIC. Periodically, the filter sludge **MAY BE DISCHARGED** to the vendor processing system for waste treatment onsite **or PACKAGED** in containers for shipment to offsite vendor for volume reduction processing.

4.2.9. Activated hardware stored in the Spent Fuel Pools **WILL BE PROCESSED** periodically using remote handling equipment **and MAY then BE PUT** into a container for shipment or storage

4.2.10. High Integrity Containers (HIC):

1. Vendors who supply HIC's to the station **MUST PROVIDE** a copy of the HIC Certificate of Compliance, which details specific limitations on use of the HIC.

2. Vendors who supply HIC's to the station **MUST PROVIDE** a handling procedure, which establishes guidelines for the utilization of the HIC. These guidelines serve to protect the integrity of the HIC and ensure the HIC is handled in accordance with the requirements of the Certificate of Compliance.

4.2.11. Lubricants and oils contaminated as a consequence of normal operating and maintenance activities **MAY BE PROCESSED** on-site (by incineration, for oils meeting 10CFR20.2004 and applicable state requirements, or by an approved vendor process) **or SHIPPED** offsite (for incineration or other acceptable processing method).

4.2.12. Former in-plant systems GE or Stock Drum Transfer Cart and Drum Storage Areas **MAY BE USED** for higher dose DAW storage at Clinton, Quad Cities, Braidwood and Byron.

4.2.13 Certain waste, including flowable solids from holding pond, oily waste separator, cooling tower basin and emergency spray pond, may be disposed of onsite under the provisions of 0CFR20.2002 permit. Specific requirements associated with the disposal shall be incorporated into station implementing procedures. **(CM-2)**

4.3. Burial Site Requirements

4.3.1. Waste sent directly to burial **WILL COMPLY** with the applicable parts of 49CFR, 10CFR61, and 10CFR71, and the acceptance criteria for the applicable burial site.

4.3.2. Wastes containing freestanding liquids **SHALL BE CONTROLLED** within limits defined in the applicable burial site criteria. The amount (or maximum level) of freestanding liquid in any container of processed wet waste **SHALL BE DETERMINED** through techniques defined in station or vendor procedures.

4.3.3. Waste **WILL NOT BE** capable of detonation or explosive decomposition/reaction.

4.3.4. Non-gaseous waste **WILL BE CONTROLLED** such that no waste container contains, or is capable of generating, toxic gases, vapors or fumes harmful to people.

4.3.5. Waste **WILL BE** non-flammable.

4.3.6. Waste containing hazardous, biological, pathogenic, or infectious material **WILL BE TREATED** using vendor process/policy to reduce the potential hazard from non-radiological materials.

4.4. Shipping and Inspection Requirements

4.4.1. All shipping/storage containers **WILL BE INSPECTED**, as required by station procedures, for compliance with applicable requirements (Department Of Transportation (DOT), Nuclear Regulatory Commission (NRC), station, on-site storage, and/or burial site requirements) prior to use.

4.4.2. Containers of solidified liquid waste **WILL BE INSPECTED** for solidification quality and/or dewatering requirements per the burial site, offsite vendor acceptance, or station acceptance criteria, as applicable.

4.4.3. Shipments sent to an off site processor **WILL BE INSPECTED** to ensure that the applicable processor's waste acceptance criteria are being met.

4.5. Inspection and Corrective Action

4.5.1. Inspection results that indicate non-compliance with applicable NRC, State, vendor, or site requirements **WILL BE IDENTIFIED and TRACKED** through the Corrective Action Program.

4.5.2. Administrative controls for preventing unsatisfactory waste forms from being released for shipment are described in applicable station procedures. **If** the provisions of the Process Control Program are not satisfied, **then SUSPEND** shipments of defectively packaged radioactive waste from the site. **(CM-1)**

4.5.3. **If** freestanding water or solidification not meeting program requirements is observed, **then** samples of the particular series of batches **WILL BE TAKEN** to determine the cause. Additional samples **WILL BE TAKEN**, as warranted, to ensure that no freestanding water is present and solidification requirements are maintained.

4.6. Procedure and Process Reviews

4.6.1. The Exelon Nuclear Process Control Program and changes to it (other than editorial changes) **SHALL BE APPROVED** in accordance with the Quality Assurance Program and the Technical Specifications or Technical Reference Manual (TRMs) or Operation Requirements Manual (ORM), as applicable, for the respective station.

4.6.2. The station or vendor's implementing processing procedures for the purpose of this Process Control Program **SHALL BE REVIEWED and APPROVED** in accordance with the plant specific Technical Specifications (either CTS or ITS, as applicable). These include the following, when applicable:

1. procedures for set-up and operation of dewatering equipment (e.g., set-up and operation of RDS 1000 Unit).

2. solidification procedures affecting waste stabilization for waste processed in a steel container. (This processing method is not currently in use due to waste loading and volume reduction.)

3. High Integrity Container handling procedure.

4. operating waste sampling equipment for solidification and dewatering processes.

4.6.3. All other vendor waste processing procedures **SHALL BE** technically **REVIEWED**, as appropriate.

4.6.4. Station processes, including procedures related to waste manifests, shipment inspections, and container activity determination, **ARE CONTROLLED** by each station.

1. Site waste processing **IS CONTROLLED** by site operating procedures.

2. Liquid processed by vendor equipment **WILL BE DONE** in accordance with vendor procedures.

4.7. Waste Types, Point of Generation, and Processing Method

Methods of processing and individual vendors **MAY CHANGE** due to changing financial and regulatory options. The table below is a representative sample. It is not intended be all encompassing.

| Waste Stream | POINTS OF GENERATION | AVAILABLE WASTE PROCESSING METHODS |
|---|---|---|
| Bead Resin | Systems - Fuel Pool, Condensate, Reactor Water Cleanup, Blowdown, Equipment Drain, Chemical and Volume Control Systems, Floor Drain, Maximum Recycle, Blowdown, Boric Acid Recycling System, Vendor Supplied Processing Systems, and Portable Demin System | Dewatering, solidification to an unstable/stable state<br>Thermal Processing<br>Free Release to a Land Fill |
| Powdered Resin | Systems - (Condensate System, Floor Drain/Equipment Drain filtration, Fuel Pool) | Dewatering, solidification to an unstable/stable state<br>Thermal Processing |
| Concentrated Waste | Waste generated from Site Evaporators resulting typically from the Floor Drain and Equipment Drain Systems | Solidification to an unstable/stable state<br>Thermal Processing |
| Sludge | Sedimentation resulting from various sumps, condensers, tanks, cooling tower, emergency spray pond, holding pond, and oily waste separators.. | Dewatering, solidification to an unstable/stable state<br>Thermal Processing<br>Evaporation on-site or at an offsite processor<br>On-site disposal per 10CFR20.2002 permit |

| Waste Stream | POINTS OF GENERATION | AVAILABLE WASTE PROCESSING METHODS |
|---|---|---|
| Filter cartridges | Systems - Floor/Equipment Drains, Fuel Pool; cartridge filters are typically generated from clean up activities within the fuel pool, torus, etc. | Dewatering, solidification to an unstable/stable state<br>Processed by a vendor for volume reduction |
| Dry Active Waste | Paper, wood, plastic, rubber, glass, metal, and etc. resulting from daily plant activities. | Decon/Sorting for Free Release,<br>Compaction/Super-compaction<br>Thermal Processing by Incineration or glass vitrification<br>Sorting for Free Release<br>Metal melting to an ingot |
| Contaminated Oil | Oil contaminated with radioactive materials from any in-plant system. | Solidification unstable state<br>Thermal Processing by Incineration<br>Free Release for recycling |
| Drying Bed Sludge | Sewage Treatment and Waste Water Treatment Facilities | Free release to a landfill or burial |
| Metals | See DAW | See DAW |
| Irradiated Hardware | Fuel Pool, Reactor Components | Volume Reduction for packaging efficiencies |

5. **DOCUMENTATION** - None

6. **REFERENCES**

6.1. Technical Specifications:

6.1.1. The details contained in Current Tech Specs (CTS) or Improved Technical Specifications (ITS), as applicable, in regard to the Process Control Program (PCP), are to be relocated to the UFSAR. Some facilities such as Clinton have elected to relocate these details into the Operational Requirements Manual (ORM). The PCP implements the requirements of 10 CFR 20, 10CFR 61, and 10CFR 71. Compliance with these regulations is required by the Facility Operating Licenses. Relocation of the description of the PCP from the CTS or ITS does not affect the safe operation of the facility. Therefore, the relocation details are not required to be in the CTS or the ITS to provide adequate protection of the public health and safety. Changes to the UFSAR and ORM are controlled by the provisions of 10CFR 50.59.

6.2. Source Documents:

6.2.1. Code Of Federal Regulations: 10 CFR Part 20, Part 61, Part 71, 49 CFR Parts 171-172

6.2.2. Low Level Waste Licensing Branch Technical Position On Radioactive Waste Classification, May 1983

6.2.3. Technical Position on Waste Form (Revision 1), January 1991

6.2.4. Branch Technical Position on Concentration Averaging and Encapsulation, January 1995

6.2.5. Regulatory Guide 1.21

6.2.6. I.E. Circular 80.18, 10CFR 50.59 Safety Evaluation for Changes to Radioactive Waste Treatment Systems

6.2.7. Quality Assurance Program

6.3. Station Commitments:

6.3.1. Peach Bottom

CM-1, T03819, Letter from G.A. Hunger, Jr., dated Sept. 29,94, transmitting TSCR 93-16 (Improved Technical Specifications).

6.3.2. Limerick

CM-2, 10CFR20.2002 permit granted to Limerick via letter dated July 10, 1976.

7. **ATTACHMENTS** - None