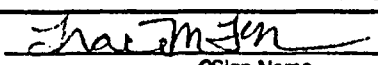
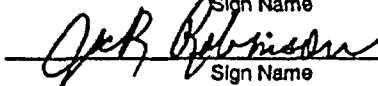
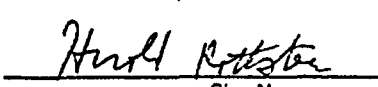
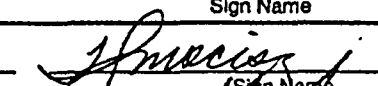



**ADDITIONAL ATTACHMENTS TO**

**10-10-05 Letter: Supplement to Request for LAR Application of AST**

Attachment 001 AST – LM-0641 Rev 0 X-Q.

Analysis No. LM-0641		Revision 0		Last Page No. 14	
EC/ECR No. 04-00003		Revision 0			
Title: Calculation of Alternative Source Term (AST) Onsite and Offsite X/Q Values					
Station(s)	Limerick Generating Station	Component(s)			
Unit No.:	1 and 2				
Discipline	SEAO				
Description Code/	Dispersion				
Keyword					
Safety Class	Safety-related				
System Code	912				
Structure	NA				
<b>CONTROLLED DOCUMENT REFERENCES</b>					
Document No.	From/To	Document No.	From/To		
UFSAR	From/To				
Dwg No. M-121	From				
Dwg No. M-123	From				
Dwg No. M-136	From				
Is this Design Analysis Safeguards? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Does this Design Analysis Contain Unverified Assumptions? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> AT/AR# Is a Supplemental Review Required? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes, complete Attachment 3					
Preparer	Traci Thomas			11/25/03	
	Print Name	Sign Name		Date	
Reviewer	Jack Robinson			11/25/03	
	Print Name	Sign Name		Date	
Method of Review	<input checked="" type="checkbox"/> Detailed Review	<input type="checkbox"/> Alternate Calculations		<input type="checkbox"/> Testing	
Review Notes:					
Approver	Harold Rothstein			11/25/03	
	Print Name	Sign Name		Date	
(For External Analyses Only)					
Exelon Reviewer	T. J. MISCIB			2/25/04	
	Print Name	Sign Name		Date	
Approver	Wayne Lewis			8/24/04	
	Print Name	Sign Name		Date	
Description of Revision (list affected pages for partials):					

THIS DESIGN ANALYSIS SUPERCEDES:

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- D. Drawing: Excerpt from UFSAR Fig 6.4-2 [Page 1]
- E. Drawing: Excerpt from UFSAR Fig. 2.4-1 [Page 1]
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- G. Joint Frequency Distribution Tables [Pages 1-4]
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- I. PAVAN Input and Output [Pages 1-124]
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- K. PAVAN Computer Disclosure Sheet [Page 1]

## 1.0 PURPOSE/OBJECTIVE

This calculation, LM-0641, presents the atmospheric relative concentration (X/Q) values for Alternative Source Term (AST) accident evaluations for the Limerick Generating Station (hereinafter, the Station). The purpose of this calculation is to determine the Control Room, Exclusion Area Boundary (EAB), and the outer boundary of the Low Population Zone (LPZ) relative concentration values (X/Q, in  $\text{sec}/\text{m}^3$ ) resulting from certain postulated accidental radiological releases. The values resulting from this calculation will serve as input to the calculation of the radiological doses for use of the Alternative Source Terms (AST) per Regulatory Guide 1.183 (Reference 1).

The X/Q values resulting at the Control Room Intake are calculated using the NRC-sponsored computer code ARCON96 (Reference 2), consistent with the procedures in Regulatory Guide 1.194 (Reference 4). This analysis is presented in Section 2.

The X/Q values resulting at the EAB and LPZ are calculated using the NRC-sponsored computer code PAVAN (Reference 3), consistent with the procedures in Regulatory Guide 1.145 (Reference 5). This analysis is presented in Section 3.

Meteorological data utilized for this calculation were selected from the historical record of the Station meteorological monitoring tower network. Monitoring records dating back to 1972 and extending through 2002 for Tower 1 (primary tower) and Tower 2 (backup tower) were provided by Exelon (Reference 6). It was desired that this calculation be based upon the continuous 5-year period that constitutes the highest Tower 1 data recovery (See Attachment A for data recovery rates). The period 1996-2000 was selected.

## 2.0 ARCON96 MODELING ANALYSIS OF CONTROL ROOM X/Q

ARCON96 is a commercial software package designated by Washington Group International (WGI) as NU-830, an "active" program applicable to nuclear safety related analyses as well as non-safety related studies and evaluations. Its use is principally control room habitability assessments. The NU-830 code has been verified for 0-2 hour, 2-8 hour, and 8-24 hour centerline and sector X/Q averages and the 95% maximum X/Q. This verification is in accordance with Revision 4 of the Washington Group International Nuclear Engineering Standard for Computer Software Control, NEP-09. Revision 0 of NU-830 was verified for ground-level and zero exit velocity uncapped vents, and Revision 1 was verified for zero exit velocity stack releases.

### 2.1 Methodology and Acceptance Criteria

#### ARCON96 Program Description [excerpted from NUREG/CR-6331 Rev. 1]

ARCON96 is a straight line Gaussian dispersion model used in control room habitability assessments for estimating dispersion in the vicinity of buildings to calculate relative concentrations at control room air intakes that would be exceeded no more than five percent of the time. The basic diffusion model implemented in the ARCON96 code is a straight-line

Gaussian model that assumes the release rate is constant for the entire period of release. This assumption is made to permit evaluation of potential effects of accidental releases without having to specify a complete release sequence. Ambient atmospheric conditions measured in accordance with Regulatory Guide 1.23 are input to ARCON96 by way of a sequential hour-by-hour meteorological database of jointly measured wind speed, wind direction, and Pasquill stability class, as derived from the vertical temperature difference recorded at a representative location and elevation (i.e., tower level).

ARCON96 permits evaluation of ground-level, vent, and elevated releases. Building wake effects are considered in the evaluation of relative concentrations from ground-level releases. The proportion of the mixture is determined by the ratio between the effluent vertical velocity and the release-height wind speed using the procedure included in the NRC XOQDOQ code (Reference 7). An elevated release, defined as a stack more than 2.5 times the height of structures in the immediate vicinity, is treated in the usual manner with correction for stack downwash and differences in terrain elevation between the stack and the control room intake. With an assumed zero (0) vertical exit velocity, vents are treated as ground-level releases. Otherwise, a vent release is treated as a mixed ground-level and elevated release.

Diffusion coefficients used in ARCON96 have three components. The first component is the diffusion coefficient used in other NRC models, for example XOQDOQ, and PAVAN. The other two components are corrections to account for enhanced dispersion under low wind speed conditions and in building wakes. Derivations of the low wind speed and building wake corrections are described by Ramsdell and Fosmire (Reference 8).

Parameter values for the correction factors are based on analysis of diffusion data collected in various building wake diffusion experiments. The experiments were conducted under a wide range of meteorological conditions. However, a large number of experiments were conducted during low wind speeds, when wake effects are minimal. The wake correction model included in ARCON96 treats diffusion under these conditions much better than previous models. Thus, the diffusion coefficients in ARCON96 account for both low-wind speed meander and wake effects.

ARCON96 calculates relative concentrations using hourly meteorological data. It then combines the hourly averages to estimate concentrations for periods ranging in duration from 2 hours to 30 days. Wind direction is considered as the averages are formed. As a result, the averages account for persistence in both diffusion conditions and wind direction. Cumulative frequency distributions are prepared from the average relative concentrations. Relative concentrations that are exceeded no more than five percent of the time (95<sup>th</sup> percentile relative concentrations) are determined from the cumulative frequency distributions for each averaging period. Finally, the relative concentrations for five standard averaging periods used in control room habitability assessments are calculated from the 95<sup>th</sup> percentile relative concentrations.

## **2.2 Design Input**

### **2.2.1 Source Configuration**

The North and South Stacks are executed by ARCON96 as a vent release. As depicted in Attachment B, both stacks have a height of 416 ft msl (200 ft above grade). The stacks are located between Reactor Buildings 1 and 2 with the North Stack situated on the north face of

the buildings and the South Stack on the south face of the buildings as seen in Attachment C (designated as Normal Release Point 2, "HVAC VENTS FOR REACTOR ENCLOSURES"). These stacks are less than 2.5 times the 194.75 ft high Reactor Buildings (i.e., the highest adjacent building), and therefore, per Regulatory Guide 1.145, they are modeled as a 'vent' release.

Both the North and South Stacks are conservatively assumed to have a zero (0) flow, for which ARCON96 requires that the exit velocity and stack diameter each be assigned an input value of zero (0). Per Regulatory Guide 1.194, Table A-2, the actual building vertical cross-sectional area perpendicular to the wind direction must be utilized; therefore, the Reactor Buildings' combined vertical cross-sectional area of 5851 m<sup>2</sup> (calculated as height = 59.4 m, and w = 98.5 m, based on References 9, 10 and 11), was input into ARCON96 to account for wake effects.

### 2.2.2 Receptors

The model ARCON96 was executed for X/Q at the Control Room Intake (highlighted orange in Attachment D), which is centered on the north face of the Control Building at a height of 124 ft above grade.

The direction, relative to true north (assumed 0°) of a straight line extending from the Control Room Intake towards the stack source location, is also an input parameter required by ARCON96. Attachment D depicts the two (2) separate intake-to-stack direction scenarios analyzed in this calculation. They are as follows:

	Direction (degrees)	Distance (m)
	<u>Intake to Stack</u>	<u>Intake to Stack</u>
• North Stack (highlighted blue)	180	16.5
• South Stack (highlighted green)	180	64.8

### 2.2.3 Meteorological Data

As described in Section 1.0, the Station's meteorological database for the five-year period, 1996-2000, as supplied by Exelon, was applied in the ARCON96 modeling analysis. Data measured at two (one primary and one backup) meteorological towers were used.

Meteorological Tower 1 is the primary tower and is located approximately 0.6 miles north-northwest of the North and South Stacks, whereas Tower 2 is the backup tower and is located west at approximately 0.4 miles from the North and South Stacks. See Attachments B and E for drawings depicting the height and locations of these meteorological towers.

Tower 2 data were used only for substitution of any missing Tower 1 data as follows:

**Limerick Meteorological Tower Instrument Levels**  
(elevation above subject tower grade)

	<u>Tower 1 (primary)</u>	<u>Tower 2 (backup)</u>
Wind Speed:		
Elevation 1	30 ft	159 ft
Elevation 2	175 ft	304 ft
Wind Direction:		
Elevation 1:	30 ft	159 ft
Elevation 2:	175 ft	304 ft

Meteorological Evaluation Services Co., Inc. (MES) illustrated that the Tower 2 delta temperature data are sufficiently representative to be substituted for the Tower 1 delta temperature data; however, since the Tower 1 and Tower 2 delta temperature height intervals differ from each other somewhat, and also since for all years shown, the primary Tower 1 has data recovery rates well above the NRC's 90 percent requirements, it was deemed unnecessary to make such substitutions.

Hereinafter, the Tower 1 ARCON96 meteorological input database with applicable Tower 2 values substituted for missing Tower 1 values as indicated above will be identified as the "Tower 1 Modeling Database".

Attachment F, Sheets 1 and 2 include the five-year wind rose diagrams based on the lower and upper level data in the Tower 1 Modeling Database used for the ARCON96 analysis scenarios shown below in Table 2-1.

The designation of 'calm' is made to all wind speed observations 0.5 mph or less. The higher of the starting speeds of the Climatronics® wind vane and anemometer equipment on each of the towers (i.e. 0.5 mph) was used as the threshold for calm winds, per Regulatory Guide 1.145, Section 1.1.

Attachment G contains the lower and upper level joint wind direction, wind speed, and stability class distribution tables, based on the five-year lower and upper level Tower 1 Modeling Database, as used for the ARCON96 modeling analysis. (These data are provided both in the format of number of observations and percent occurrence frequency.)

#### 2.2.4 ARCON96 Run Scenarios

Control Room Intake X/Q values were calculated by ARCON96 for various source/receptor scenarios. These two scenarios were analyzed using the five-year hourly meteorological joint wind and stability database, as identified below in Table 2-1.

TABLE 2-1

ARCON96 RELEASE SCENARIO	METEOROLOGICAL DATABASE SCENARIOS		
	Wind Speed and Direction		Stability Class (Delta Temperature)
	Primary	Secondary*	
1: North Stack	Tower 1: 175 ft	Tower 1: 30 ft	Tower 1: 171 - 26'
2: South Stack	Tower 1: 175 ft	Tower 1: 30 ft	Tower 1: 171 - 26'

\* Secondary data used only for those hours when primary data are missing.

The upper level of the Tower 1 Modeling database is the obvious most representative monitoring location of choice for wind data representing the North and South Stack release points.

The North and South Stacks are not tall enough to avoid building-induced downwash; therefore, with zero (0) exit velocity having been assumed, ARCON96 treats their releases as a 'ground-level' type.

### 2.3 Calculations

The X/Q values resulting from the ARCON96 modeling analysis of each release and meteorological database scenario for the required time intervals are presented in Table 2-2 as follows:

TABLE 2-2

#### ARCON96 X/Q (sec/m<sup>3</sup>) RESULTS

RELEASE / INTAKE & METEOROLOGICAL SCENARIO	0-2 hour	2-8 hour	8-24 hour	1-4 day	4-30 day
1. North Stack to Control Room Intake: • Wind: Tower 1 175' Stability: Tower 1 171 - 26'	6.88E-03	5.17E-03	2.04E-03	1.29E-03	9.63E-04
2. South Stack To Control Room Intake: • Wind: Tower 1 175' Stability: Tower 1 171 - 26'	1.26E-03	9.64E-04	3.80E-04	2.39E-04	1.80E-04



### 3.0 PAVAN MODELING ANALYSES OF CONTROL ROOM, EAB AND LPZ X/Q

The model PAVAN is a commercial software package designated by WGI as MC-131, an "active" program applicable to nuclear safety related analyses as well as non-safety related studies and evaluations. The PAVAN code Revision 1 verification was performed for the 0-2 hour, 0-8 hour, 8-24, 1-4 day, and 4-30 day 0.5-percentile, and annual average direction-specific X/Q values, and the overall site 95-percentile maximum X/Q for each of the 0-2 hour, 0-8 hour, 8-24 hour, 1-4 day, and 4-30 day time-averaging periods. This verification was performed with WGI (formerly Raytheon Engineers & Constructors, Inc.) corporate standards, and is consistent with Computer Software Control, NEP-09. Revision 1 of MC-131 was verified for ground-level (i.e., non-elevated) releases, as well as elevated releases, with zero (0) vertical exit velocity assumed.

#### 3.1 Methodology and Acceptance Criteria

The computer code PAVAN is a straight line Gaussian dispersion model utilized to estimate relative ground-level air concentrations (X/Q) for potential accidental releases of radioactive material from nuclear facilities. Such assessment is required by 10 CFR 100 and 10 CFR 50. The program implements the NRC guidance provided in Regulatory Guide 1.145. The technical basis for the program is presented by Snell and Jubach (Reference 12). Utilizing joint frequency of occurrence distributions of wind direction, wind speed and Pasquill atmospheric stability class, PAVAN calculates X/Q values as a function of direction for various time-averaging periods at the EAB and the outer boundary of the LPZ. Calculations are made from assumed ground-level (i.e., non-elevated) releases (such as vents and building penetrations), which are less than 2.5 times the height of adjacent solid structures, and from elevated releases (i.e., stacks). Three (3) procedures are utilized for calculating X/Q: a direction-dependent approach, a direction-independent approach, and an overall site X/Q approach.

The PAVAN model contains certain model options for executing the program. Table 3-1 below summarizes the options invoked for the EAB and LPZ X/Q calculations.

**TABLE 3-1**

Option No.	Description	Option Invoked?
1	Calculate $\sigma_y$ and $\sigma_z$ based on desert diffusion.	No
2	X/Q values include evaluation for no building wake.	No
3	ENVLOP calculations printed which describe upper envelope curve.	No
4	Print points used in upper envelope curve and calculation.	Yes
5	Null	—
6	Joint frequency distribution in % frequency format.	No
7	Print X/Q calculation details	Yes
8	Distribute calm winds observations into first wind speed category.	Yes
9	Use site-specific terrain adjustment factors for the annual average calculations.	Yes*
10	Assume a default terrain adjustment factor for the average annual calculations. Option 10 is applied, which together with application of Option 9 means that site specific terrain factors will be used.	Yes

\* A uniform value of 1.0 is used.

## 3.2 Design Input

### 3.2.1 Source Configuration

#### 3.2.1.1 Releases for Control Room Intake X/Q Evaluation

The North and South Stacks are the assumed release points. Because these stacks do not qualify as 'elevated' releases as defined by Regulatory Guide 1.145, in accordance with Regulatory Guide 1.194 methodology no PAVAN modeling (i.e., only ARCON96 modeling) is appropriate for the Control Room assessment.

#### 3.2.1.2 Releases for EAB and LPZ X/Q Evaluation

As previously stated, the North and South Stacks have a physical height of 200 ft and are located to the south of the Control Room Intake. These stacks do not qualify as elevated releases per Regulatory Guide 1.145. Therefore, the stacks were executed by PAVAN as 'ground' type releases requiring that each of these stack heights be assigned an input value of 10 m. The Reactor Building height of 59.4 m and smallest calculated Reactor Building vertical cross-sectional area of 2426 m<sup>2</sup> was used for each of the scenarios.

### 3.2.2 Receptors

For the North and South Stack to the EAB and LPZ scenarios, PAVAN was executed in ground release mode with stack-to-intake horizontal distances of 731 m for the EAB and 2043 m for the LPZ (Reference 13).

### 3.2.3 Meteorological Data

As described in Section 1.0, Limerick meteorological data from the five-year period, 1996-2000, as supplied by Exelon for two meteorological towers (one primary and one backup), was used in the PAVAN analysis.

The format of PAVAN meteorological input consists of a joint wind direction (based on sixteen 22.5 degree sectors), wind speed (7 intervals), and stability class (7 classes) occurrence frequency distribution.

Each such meteorological joint frequency distribution for input to PAVAN was prepared by using the WGI pre-qualified program ARCONtoPAVANMETrev1 (Program Number NU-840) to transform the data to a joint wind-stability occurrence frequency distribution. The seven wind speed categories were defined according to Regulatory Guide 1.23 (Reference 14) with the first category identified as "calm". The higher of the starting speeds of the Climatronics® wind vane and anemometer equipment on each of the towers (i.e. 0.50 mph) was used as the threshold for calm winds, per Regulatory Guide 1.145, Section 1.1. A midpoint was also assumed between each of the Regulatory Guide 1.23 wind speed categories, Nos. 2-6, as to be inclusive of all monitored wind speeds. The Regulatory Guide 1.23 wind speed categories have, therefore, been refined in Table 3-3 as follows:

**TABLE 3-3****DEFINED WIND SPEED CATEGORY RANGES FOR PAVAN MODELING**

Category No.	Regulatory Guide 1.23 Speed Interval (mph)	PAVAN-Assumed Speed Interval (mph)
1 (Calm)	0 to < 1	0 to <0.50
2	1 to 3	>=0.50 to <3.5
3	4 to 7	>=3.5 to <7.5
4	8 to 12	>=7.5 to <12.5
5	13 to 18	>=12.5 to <18.5
6	19 to 24	>=18.5 to <24
7	>24	>=24

Attachment F, page 1 includes the five-year wind rose diagram for the lower level Tower 1 Modeling Database.

The same delta temperature stability class database utilized for the ARCON96 analysis described above in Section 2.2.3 was also adopted for the PAVAN analysis.

Attachment G, pages 1 and 2, provide the joint lower level wind-stability class occurrence frequency distribution table based on the five-year Tower 1 Modeling Database.

### 3.2.4 PAVAN Run Scenarios

Stack release scenarios were identified for the purpose of applying the PAVAN model using the selected representative meteorological wind and stability class databases to predict the X/Q values that result at the EAB and LPZ. They are shown in Table 3-4 as follows:

**TABLE 3-4**

<b>PAVAN X/Q SCENARIOS</b>		
<b>RELEASE/RECEPTOR SCENARIO</b>	<b>METEOROLOGICAL DATABASE SCENARIOS</b>	
	<b>(Tower ID: Measurement Height above Tower Grade)</b>	
	<b>Wind Speed and Direction</b>	<b>Stability Class (Delta Temperature)</b>
<b>EAB (731 m):</b>		
• North and South Stack	Tower 1: 30'	Tower 1: 171 – 26'
<b>LPZ (2043 m):</b>		
• North and South Stack	Tower 2: 30'	Tower 2: 171 – 26'

The Tower 1 Modeling Database as described above in Section 2.2.3 is representative for deriving all required meteorological input for the PAVAN modeling of the North and South Stack release X/Q for each subject receptor.

The EAB and LPZ are located at distances of 731 m and 2403 m, respectively. It should be noted that the lower (30 ft) level wind speeds contained in the Tower 1 Modeling Database were used instead of the upper (175 ft) winds, even though it might be otherwise expected that the 175 ft level winds would better represent the 200 ft North and South stack tops. This is because PAVAN requires that any non-elevated release be assumed as a 'ground level' release, which accordingly requires that whatever the release elevation may actually be, it is reassigned a value of 10 meters above station grade. Thus, using actual 10-meter monitored data (i.e., data from the 30 ft level on Tower 1) is considered to be superior to using data from another level (i.e., 175 feet) that PAVAN would subsequently adjust (but imprecisely so, by power law extrapolation) down to 10 meters.

### 3.3 Calculations

The X/Q values for the EAB and LPZ calculated by the PAVAN modeling analysis of each release scenario are presented below in Table 3-6 for each time interval required by NRC Regulatory Guide 1.145.

**TABLE 3-6**

**PAVAN X/Q (sec/m<sup>3</sup>) Results**

**North And South Stacks to EAB and LPZ**

RELEASE LOCATION	X/Q PARAMETER (sec/m <sup>3</sup> )	0-2 hour	0-8 hour	8-24 hour	1-4 day	4-30 day
<b>EAB (731 m)</b>						
North and South Stacks*	Direction-Specific Max	<b>3.18E-04 (ESE)</b>	<b>1.76E-04 (ESE)</b>	<b>1.31E-04 (ESE)</b>	<b>6.89E-05 (ESE)</b>	<b>2.74E-05 (ESE)</b>
	Site Limit	<b>2.79E-04</b>	<b>1.58E-04</b>	<b>1.19E-04</b>	<b>6.39E-05</b>	<b>2.63E-05</b>
<b>LPZ (2043 m)</b>						
North and South Stacks*	Direction-Specific Max	<b>1.15E-04 (ESE)</b>	<b>5.79E-05 (ESE)</b>	<b>4.10E-05 (ESE)</b>	<b>1.95E-05 (ESE)</b>	<b>6.68E-06 (ESE)</b>
	Site Limit	<b>1.01E-04</b>	<b>5.18E-05</b>	<b>3.71E-05</b>	<b>1.81E-05</b>	<b>6.41E-06</b>

\* The same PAVAN results apply to the North and South Stacks individually.

\*\*The higher of the direction specific and the site limit values are indicated in bold.

#### 4.0 SUMMARY AND CONCLUSIONS

The ARCON96 and PAVAN X/Q modeling calculation results are summarized below for the Control Room, EAB and LPZ for the regulated time-averaging periods. Control Room intake results are calculated using the ARCON96 model and the EAB and LPZ results have been calculated using the PAVAN model. All input and output files for ARCON96 and PAVAN are provided in Attachments H and I, respectively.

**TABLE 4-1**  
**X/Q RESULTS SUMMARY**  
(sec/m<sup>3</sup>)

RECEPTOR	RELEASE POINT	0-2 hour	2-8 hour*	8-24 hour	1-4 day	4-30 day
Control Room Intake	North Stack	6.88E-03	5.17E-03	2.04E-03	1.29E-03	9.63E-04
	South Stack	1.26E-03	9.64E-04	3.80E-04	2.39E-04	1.80E-04
EAB (731 m)	North and South Stacks**	3.18E-04 (ESE)	1.76E-04 (ESE)	1.31E-04 (ESE)	6.89E-05 (ESE)	2.74E-05 (ESE)
LPZ (2,043 m)	North and South Stacks**	1.15E-04 (ESE)	5.79E-05 (ESE)	4.10E-05 (ESE)	1.95E-05 (ESE)	6.68E-06 (ESE)

\* PAVAN result representing 0-8 hour time period.

\*\* The same PAVAN results apply to the North and South Stacks individually.

Attachments J and K provide WGI Computer Disclosure Sheets associated with the ARCON96 and PAVAN analyses, respectively.

## 5.0 REFERENCES

- 1) *Regulatory Guide 1.183, "Alternative Radiological Source Terms For Evaluating Design Basis Accidents At Nuclear Power Reactors"*; U.S. Nuclear Regulatory Commission; July 2000.
- 2) *Atmospheric Relative Concentrations in Building Wakes*; NUREG/CR-6331, PNNL-10521, Rev. 1; prepared by J. V. Ramsdell, Jr., C. A. Simmons, Pacific Northwest National Laboratory; prepared for U.S. Nuclear Regulatory Commission; May 1997 (Errata, July 1997).
- 3) *Atmospheric Dispersion Code System for Evaluating Accidental Radioactivity Releases from Nuclear Power Stations*; PAVAN, Version 2; Oak Ridge National Laboratory; U.S. Nuclear Regulatory Commission; December 1997.
- 4) *Regulatory Guide 1.194; Atmospheric Relative Concentrations for Control Room Radiological Habitability Assessments at Nuclear Power Plants*; U.S. Nuclear Regulatory Commission; June 2003.
- 5) *Regulatory Guide 1.145; Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants (Revision 1)*; U.S. Nuclear Regulatory Commission; November 1982.
- 6) Limerick 1972-2002 Meteorological Tower data; provided on behalf of Exelon by Pat Brennen of MES under cover letter "LGS Meteorological Data, 1972-2002", March 24, 2003.
- 7) *XOQDOQ: Computer Program for the Meteorological Evaluation of Routine Releases at Nuclear Power Stations*; NUREG/CR-2919; J. F. Sagendorf, J. T. Goll, and W. F. Sandusky, U.S. Nuclear Regulatory Commission; Washington, D.C; 1982.
- 8) *Atmospheric Dispersion Estimates in the Vicinity of Buildings*; J. V. Ramsdell and C. J. Fosmire, Pacific Northwest Laboratory; 1995.
- 9) Limerick Generating Station Units 1 & 2 Drawing No. M-123, Rev. 7; Equipment Location Reactor Building Unit 1, Section A-A.
- 10) Limerick Generating Station Units 1 & 2 Drawing No. M-121, Rev. 17; Equipment Location Reactor Enclosure Unit 1, Plan at Elev. 313 Feet.
- 11) Limerick Generating Station Units 1 & 2 Drawing No. M-136, Rev. 9; Equipment Location Reactor Enclosure Unit 2, Plan at Elev. 313 Feet.
- 12) *Technical Basis for Regulatory Guide 1.145, Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants*; NUREG/CR-2260; W. G. Snell and R. W. Jubach, U.S. Nuclear Regulatory Commission, Washington, D.C; 1981
- 13) Limerick UFSAR, Table 2.3.4-4; *LGS Accident X/Q Values*.
- 14) *Regulatory Guide 1.23 (Safety Guide 23), Onsite Meteorological Programs*; U. S. Nuclear Regulatory Commission; USNRC Office of Standards Development; Washington, D.C.; 1972.

## 6.0 OWNER'S ACCEPTANCE REVIEW CHECKLIST FOR EXTERNAL DESIGN ANALYSIS

DESIGN ANALYSIS NO. LM-0641 REV: 0

	Yes	No	N/A
1. Do assumptions have sufficient rationale?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Are assumptions compatible with the way the plant is operated and with the licensing basis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Do the design inputs have sufficient rationale?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Are design inputs correct and reasonable?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Are design inputs compatible with the way the plant is operated and with the licensing basis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Are Engineering Judgments clearly documented and justified?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Are Engineering Judgments compatible with the way the plant is operated and with the licensing basis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Do the results and conclusions satisfy the purpose and objective of the design analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Are the results and conclusions compatible with the way the plant is operated and with the licensing basis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Does the design analysis include the applicable design basis documentation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Have any limitations on the use of the results been identified and transmitted to the appropriate organizations?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Are there any unverified assumptions?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
13. Do all unverified assumptions have a tracking and closure mechanism in place?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

EXELON REVIEWER:

T. J. Mscisz / J. Garcia DATE 2/2/04  
Print/ Sign

# Attachment A

## Limerick Generating Station Meteorological Data Recovery Rates (%)

	Tower 1					Tower 2				
	30' Wind Direction	30' Wind Speed	175' Wind Direction	175' Wind Speed	171'-26' Delta Temp	30' Wind Direction	30' Wind Speed	159' Wind Direction	159' Wind Speed	155'-26' Delta Temp
1996	97.65	98.61	98.99	95.58	100.00	70.87	60.43	71.37	84.90	100.00
1997	97.28	97.05	98.13	98.23	100.00	87.67	89.14	91.27	92.00	100.00
1998	89.39	97.82	91.20	94.39	94.05	98.62	96.58	98.12	91.77	95.15
1999	97.47	97.47	86.93	98.55	97.34	95.32	95.32	93.69	95.32	92.97
2000	98.32	98.28	97.29	97.29	97.52	89.65	95.47	92.94	95.69	95.21
2001	91.02	90.83	91.02	91.02	92.36	97.04	97.04	97.04	96.67	96.68
2002	94.89	94.55	94.92	94.92	92.79	93.00	93.00	93.00	93.00	80.07

Tower 1 (missing values substituted with applicable Tower 2 values)					
	30' Wind Direction	30' Wind Speed	175' Wind Direction	175' Wind Speed	171'-26' Delta Temp**
1996	98.58	99.25	100.00	100.00	NA
1997	98.87	99.08	100.00	100.00	NA
1998	99.94	99.95	100.00	100.00	NA
1999	99.49	99.98	100.00	100.00	NA
2000	99.97	99.95	100.00	100.00	NA
2001	99.29	99.91	100.00	100.00	NA
2002	99.97	99.97	99.97	99.97	NA

\*Shading indicates a data recovery rate less than 90%

\*\*Meteorological Evaluation Services Co., Inc. (MES) illustrated that the Tower 2 delta temperature data are sufficiently representative to be substituted for the Tower 1 delta temperature data; however, since the Tower 1 and Tower 2 delta temperature height intervals differ from each other somewhat, and also since for all years shown, the primary Tower 1 has data recovery rates well above the NRC's 90 percent requirements, it was deemed unnecessary to make such substitutions.



# ATTACHMENT B

## LIMERICK GENERATING STATION RELATIVE ELEVATIONS OF METEOROLOGICAL SENSORS AND RELEASE POINTS

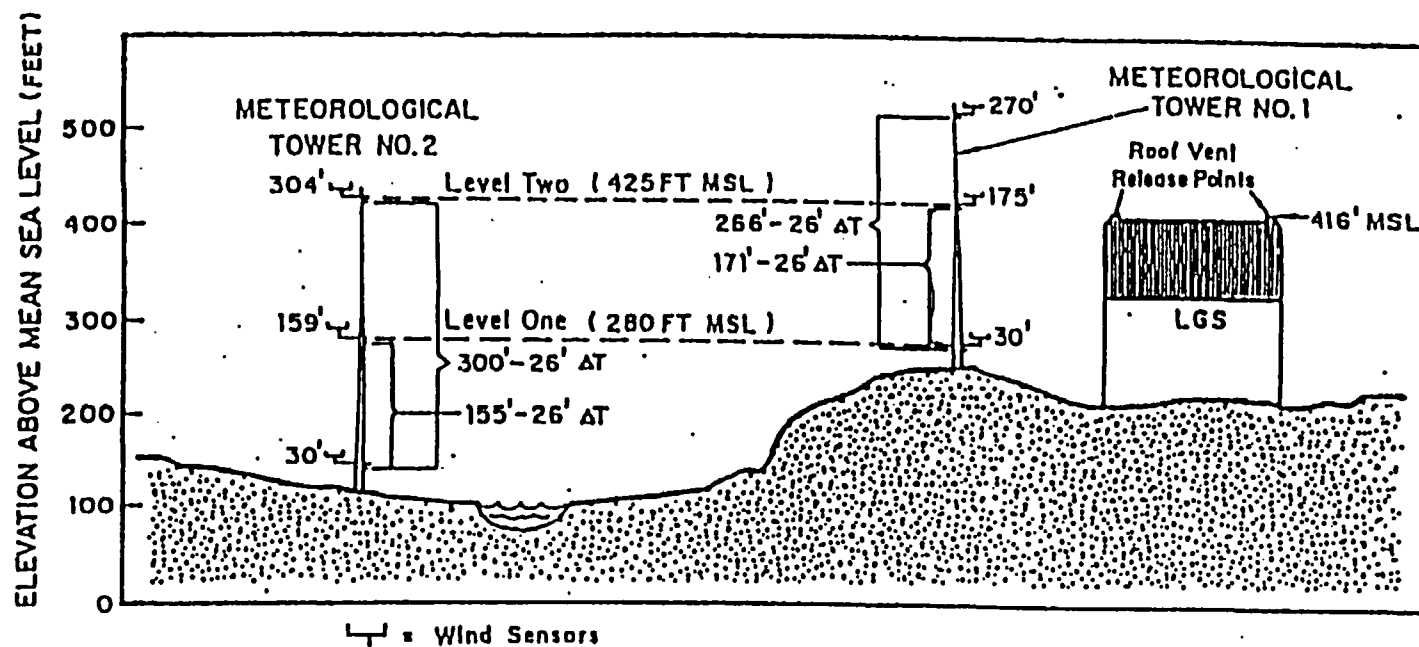


Figure 2

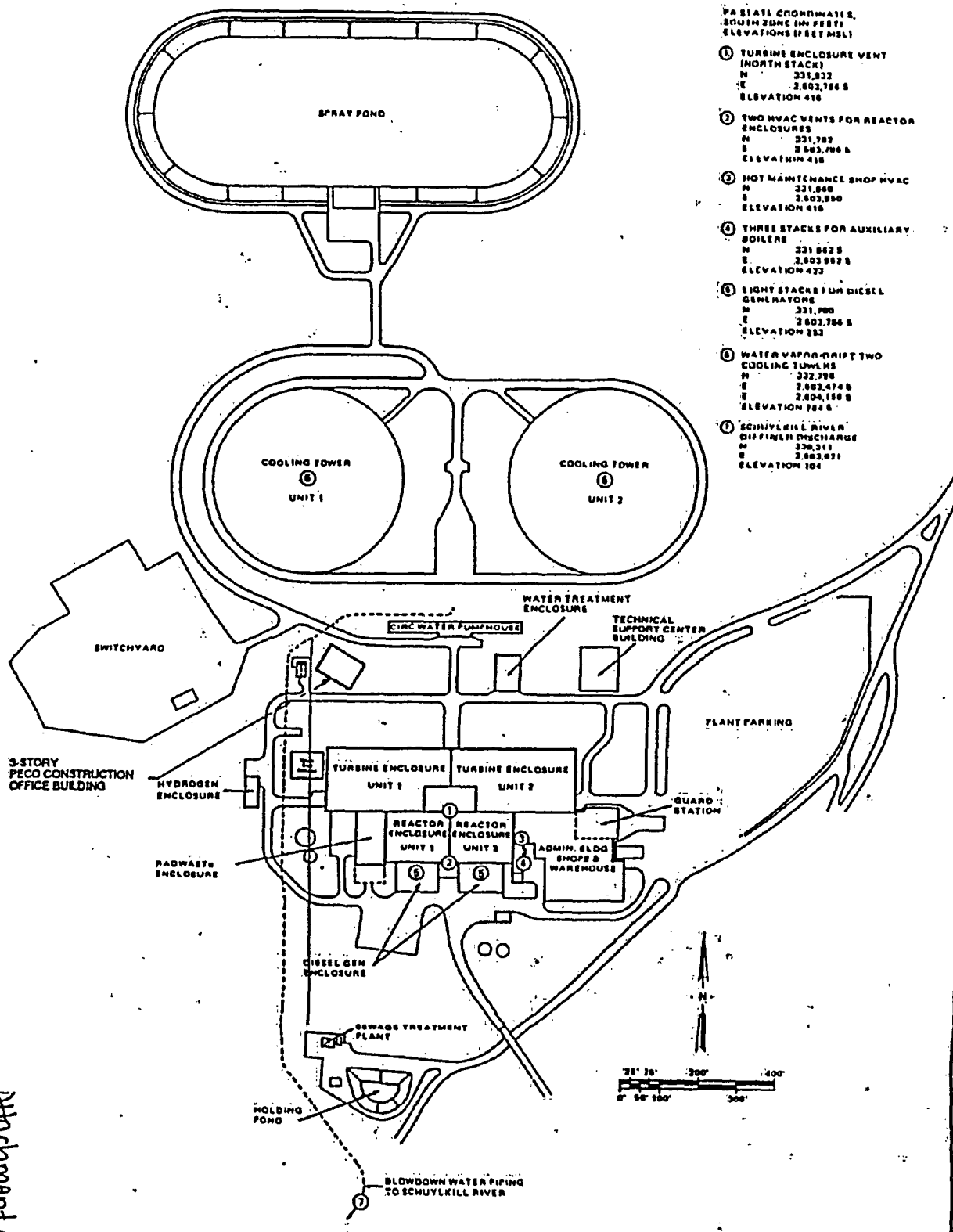
# ATTACHMENT C

(Fig 2.1-4 from UFSAR)

## NORMAL RELEASE POINTS

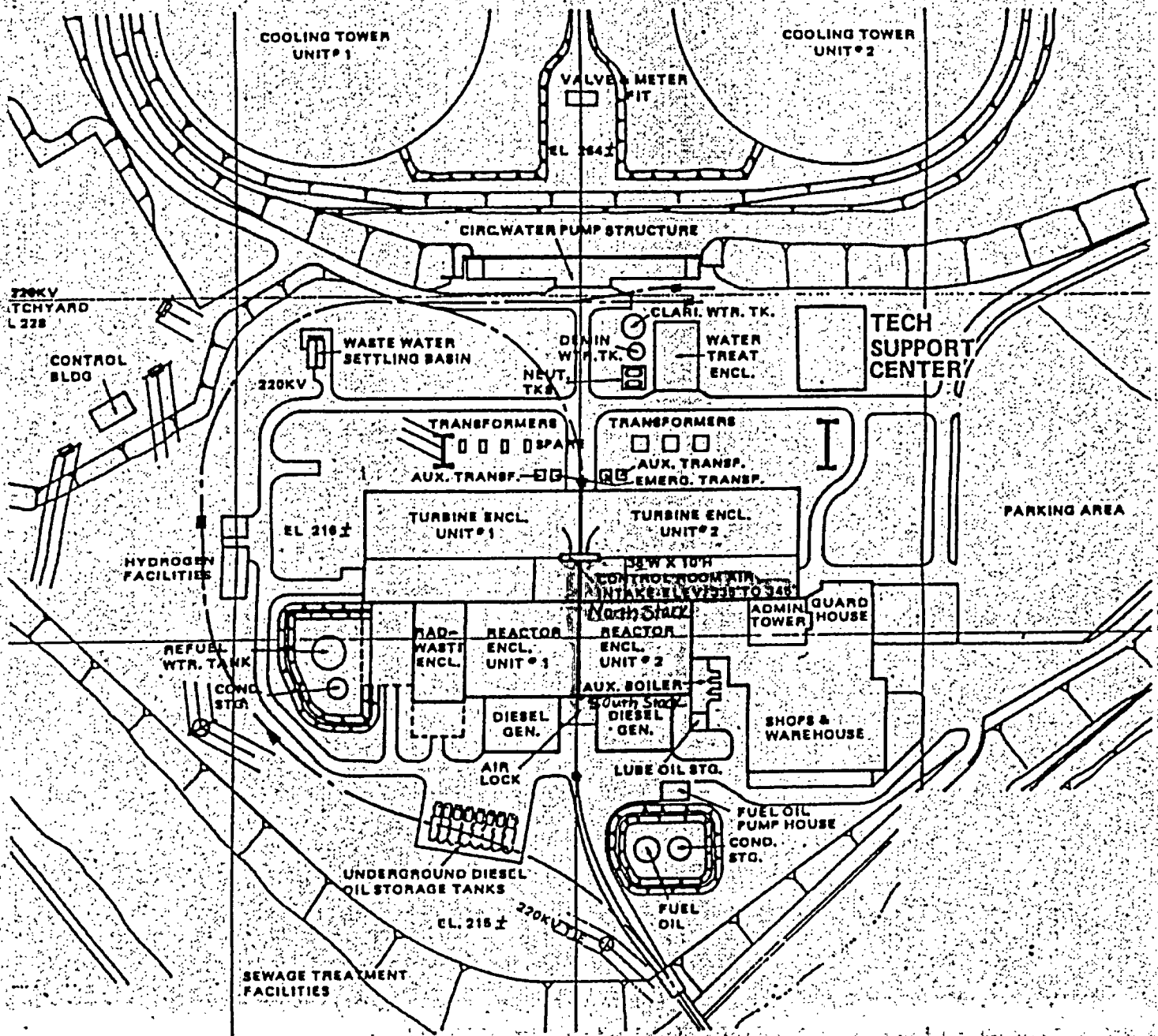
PA STATE COORDINATE S.  
SOUTH ZONE (IN FEET)  
ELEVATIONS (FEET MSL)

- ① TURBINE ENCLOSURE VENT (NORTH STACK)  
N 331,832  
E 2,603,786 S  
ELEVATION 416
- ② TWO HVAC VENTS FOR REACTOR ENCLOSURES  
N 331,782  
E 2,603,786 S  
ELEVATION 416
- ③ HOT MAINTENANCE SHOP HVAC  
N 331,840  
E 2,603,850  
ELEVATION 416
- ④ THREE STACKS FOR AUXILIARY BOILERS  
N 331,862 S  
E 2,603,882 S  
ELEVATION 432
- ⑤ EIGHT STACKS FOR DIESEL GENERATORS  
N 331,700  
E 2,603,786 S  
ELEVATION 352
- ⑥ WATER VAPOR-DRIFT TWO COOLING TOWERS  
N 332,798  
E 2,603,474 S  
E 2,604,188 S  
ELEVATION 784 S
- ⑦ SCHUYLKILL RIVER DIFFUSEL DISCHARGE  
N 336,311  
E 2,603,037  
ELEVATION 104



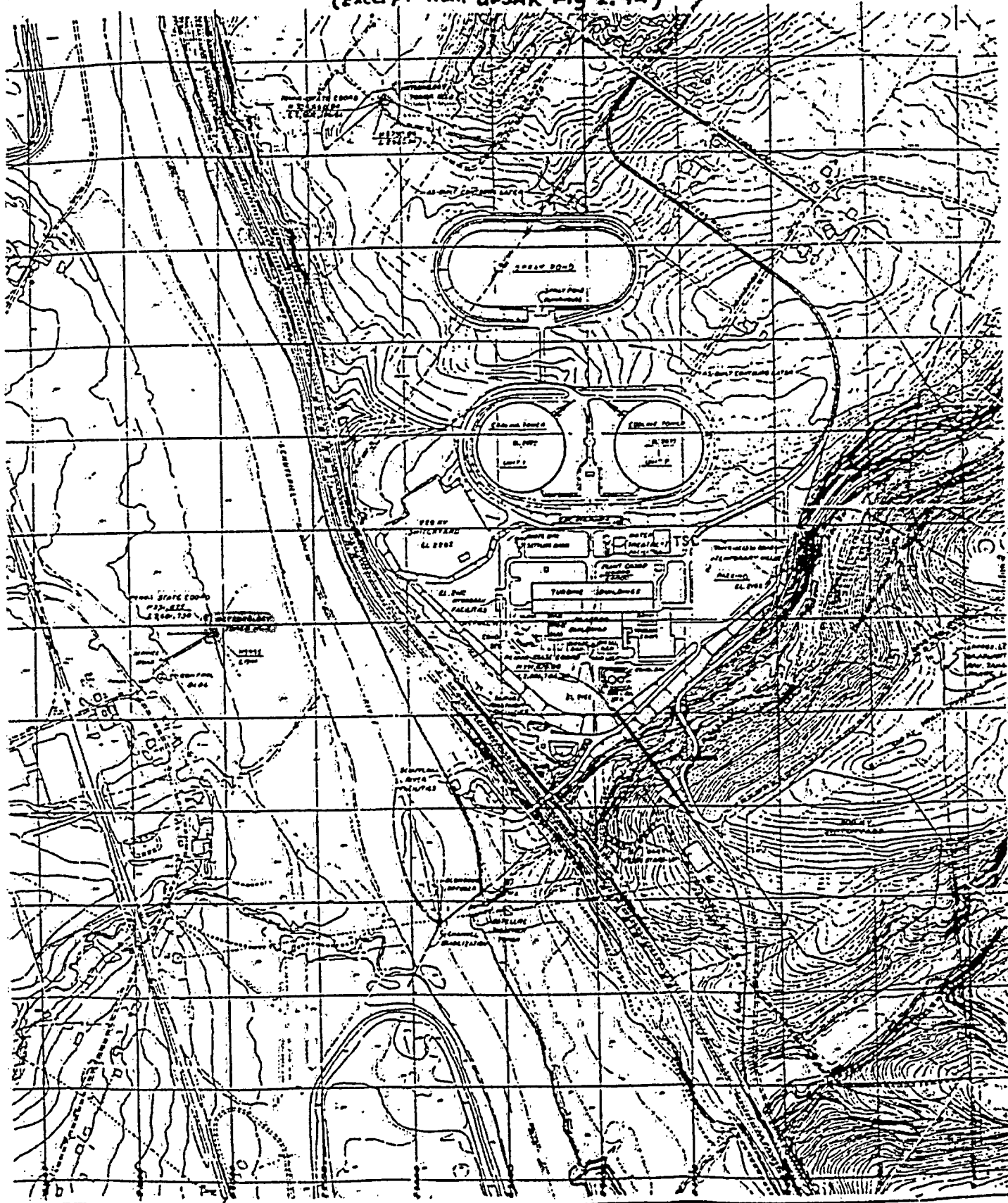
# ATTACHMENT D

(Excerpt of UFSAR Fig 6.4-2)



# ATTACHMENT E

(Excerpt from UFSAR Fig 2.4-1)



# Attachment F

LGS 1996-2000 30 ft

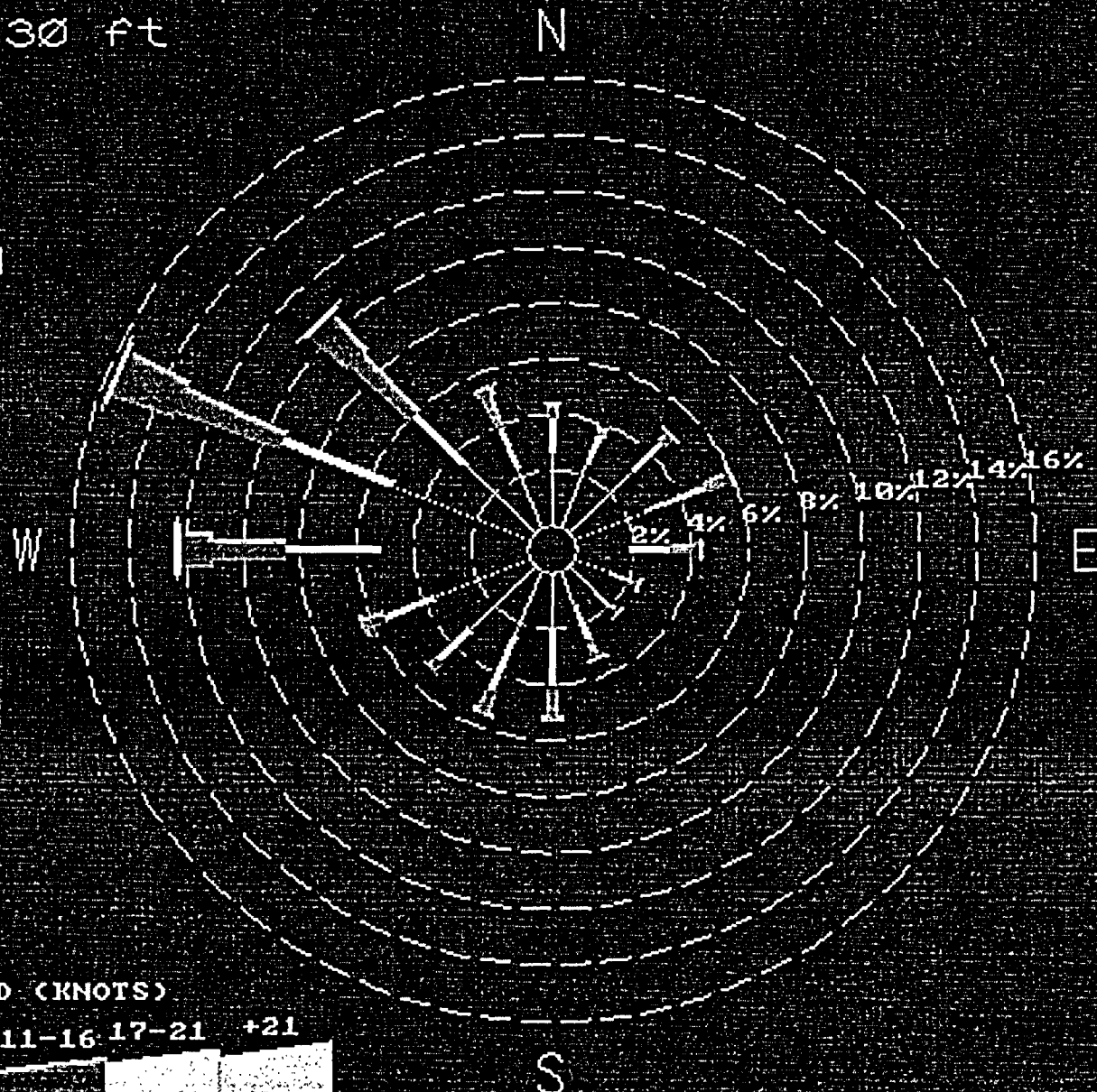
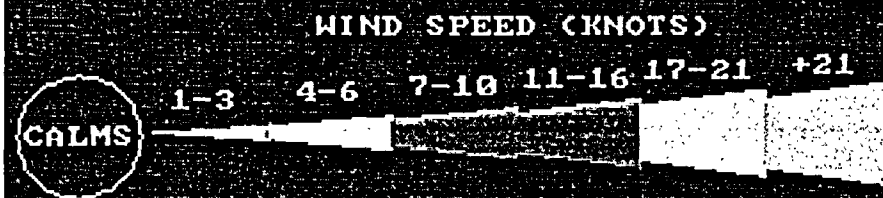
January 1

December 31

Midnight-11 PM

NOTE: Frequencies  
indicate direction  
from which the  
wind is blowing.

CALM WINDS 1.34%



LGS 1996-2000 175 ft

January 1

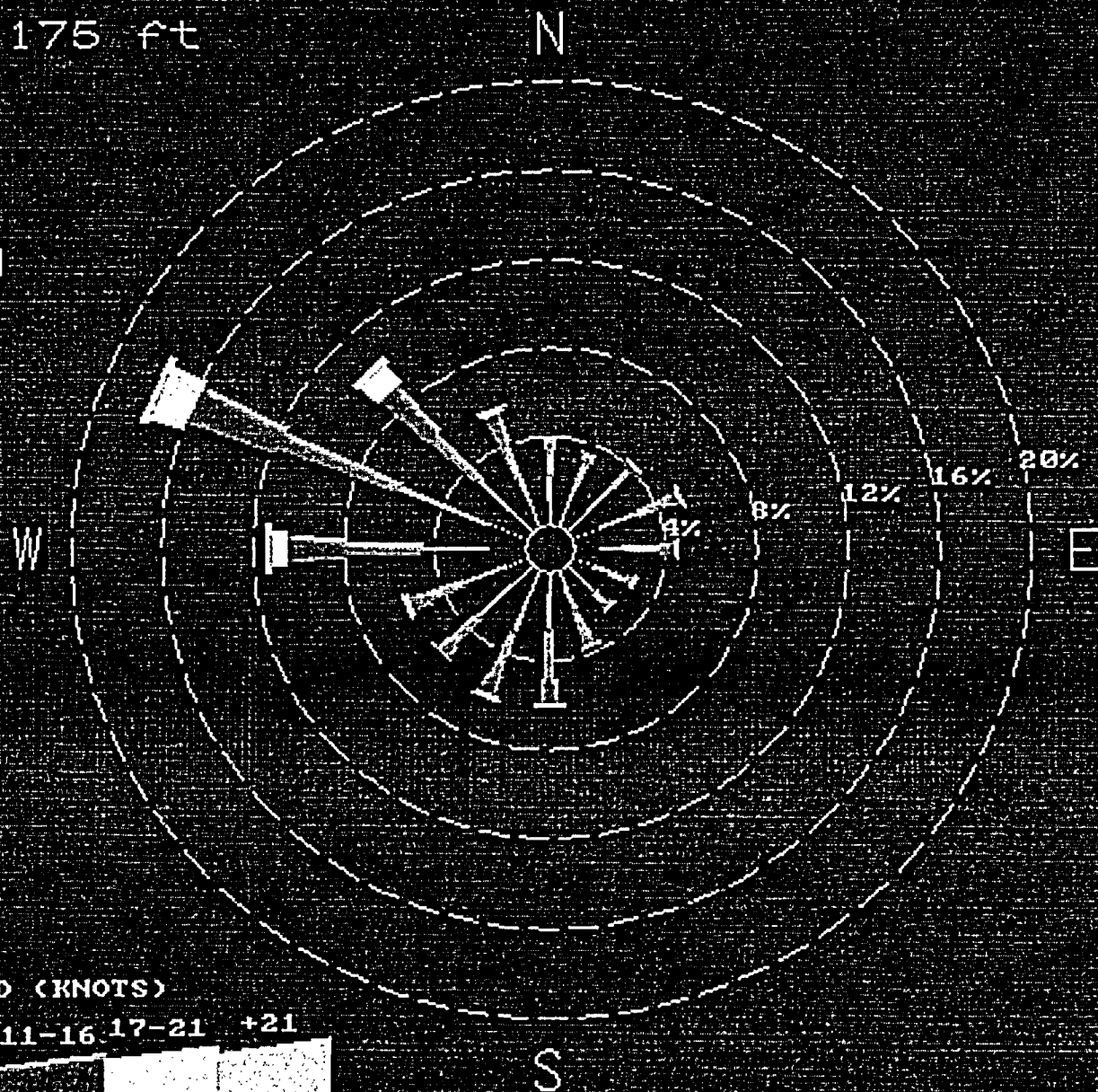
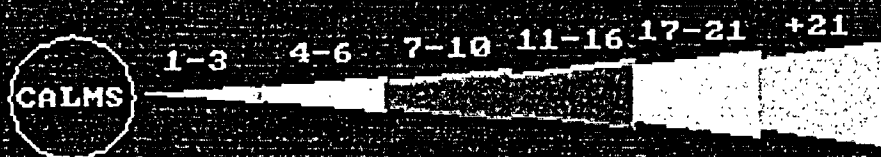
December 31

Midnight-11 PM

NOTE: Frequencies  
indicate direction  
from which the  
wind is blowing.

CALM WINDS 0.13%

WIND SPEED (KNOTS)



# Attachment G

## Limerick Generating Station

Joint Frequency Distribution (number of observations)

1996-2000

Tower 1

30' wind

171'-26' Delta T

		Wind Direction Category																	Total
Wind Speed Category <sup>(1)</sup>		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Calm	Total
1 (A)	1 (Calm)																		0
	2	5	5	7	1	1	1	1	0	0	0	3	14	23	7	8	6	0	62
	3	85	54	34	16	4	10	8	7	42	94	177	212	214	189	80	56	1282	
	4	27	13	4	9	6	9	8	10	71	124	69	125	165	253	190	60	1143	
	5	0	0	0	4	8	0	0	0	7	16	6	11	67	139	59	17	334	
	6	0	0	0	0	0	0	0	0	2	1	0	0	5	12	8	4	32	
	7	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
	Subtotal	117	72	45	30	19	20	17	17	17	122	235	255	362	475	600	345	143	2874
2 (B)	1 (Calm)																	0	
	2	7	4	8	6	4	2	1	0	3	2	10	12	22	12	5	0	66	
	3	50	32	27	29	19	16	6	17	37	76	73	82	93	108	68	40	773	
	4	25	11	10	17	24	14	3	6	29	54	20	38	94	124	133	44	646	
	5	1	2	0	1	5	2	0	0	6	4	0	2	36	85	50	21	215	
	6	0	0	0	0	1	0	0	0	0	1	0	0	7	4	5	4	21	
	7	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	
	Subtotal	83	49	45	53	52	34	10	23	78	137	103	134	256	333	261	109	1757	
3 (C)	1 (Calm)																	0	
	2	6	7	13	11	6	4	5	8	8	13	22	26	26	21	11	10	197	
	3	52	43	34	60	49	16	34	23	47	82	84	93	124	132	81	35	909	
	4	24	9	11	37	47	13	4	9	36	59	23	37	88	168	176	55	790	
	5	1	0	0	3	1	1	1	3	12	3	2	1	39	131	124	22	344	
	6	0	0	0	0	0	0	0	0	0	1	0	0	8	12	30	3	55	
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	
	Subtotal	83	59	58	111	103	34	44	43	104	158	131	157	263	485	423	125	2343	
4 (D)	1 (Calm)																	0	
	2	204	207	303	243	177	130	119	96	123	146	156	194	195	210	193	154	2850	
	3	379	288	508	601	480	280	226	326	443	416	288	315	502	668	582	345	6847	
	4	200	116	146	331	362	115	61	171	293	175	53	87	516	1008	820	419	4873	
	5	22	2	18	29	82	8	8	18	32	37	5	17	226	526	559	128	1717	
	6	0	0	0	2	1	1	0	1	0	1	0	0	24	39	114	12	195	
	7	0	0	0	0	1	0	0	0	0	0	0	0	1	1	5	0	8	
	Subtotal	885	613	875	1400	1103	534	414	612	691	775	602	613	1464	2452	2273	1058	16490	
5 (E)	1 (Calm)																	0	
	2	235	238	265	259	185	146	112	142	193	285	377	402	461	464	352	236	4352	
	3	202	183	190	317	234	137	206	250	487	416	295	280	560	646	514	256	6373	
	4	44	24	10	31	88	53	31	67	104	88	30	25	133	265	223	83	1299	
	5	5	1	2	3	12	9	13	31	8	6	5	3	20	56	54	12	240	
	6	0	0	0	0	0	0	0	3	5	1	0	0	1	1	5	0	21	
	7	0	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	3	
	Subtotal	486	444	487	611	519	345	367	495	763	763	707	711	1175	1638	1148	587	11219	
6 (F)	1 (Calm)																	0	
	2	170	185	179	174	123	91	64	66	73	126	215	294	445	450	353	199	3207	
	3	16	36	21	32	38	25	11	19	47	116	71	37	110	192	97	22	890	
	4	0	1	0	0	0	1	1	0	2	0	3	0	0	7	0	1	16	
	5	1	0	0	0	0	1	1	0	0	0	0	0	0	2	10	0	15	
	6	2	3	0	0	0	0	0	0	0	0	0	0	0	0	2	2	9	
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
	Subtotal	188	225	200	206	161	118	77	86	122	242	288	331	655	651	462	224	4138	
7 (G)	1 (Calm)																	0	
	2	266	208	240	150	115	53	43	39	72	65	133	164	423	512	351	320	3154	
	3	4	6	2	17	16	7	12	12	16	13	17	24	65	91	27	9	336	
	4	0	0	0	1	6	1	1	7	10	6	4	2	22	14	4	3	81	
	5	0	0	0	0	0	0	0	0	1	2	0	0	3	12	0	0	18	
	6	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Subtotal	270	214	242	168	137	61	64	56	99	88	154	186	613	630	382	332	3593	
Total		2033	1870	2032	2585	2084	1148	885	1334	2208	2478	2141	2498	4723	6767	6294	2578	2	42374

Notes:

Category	Wind Speed (mph)
1 (Calm)	<0.5
2	>=0.5 to <3.5
3	>=3.5 to <7.5
4	>=7.5 to <12.5
5	>=12.5 to <18.5
6	>=18.5 to <24
7	>=24

**Limerick Generating Station**  
**Joint Frequency Distribution (Percent Occurrence Frequency)**  
1996-2000  
Tower 1  
30' wind  
171'-26' Delta T

		Wind Direction Category																Total
Wind Speed Category <sup>1)</sup>		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16 Calm	
1 (A)	1 (Calm)																0.00	0.00
	2	0.01	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.05	0.02	0.02	0.01	0.19
	3	0.20	0.13	0.08	0.04	0.01	0.02	0.02	0.02	0.10	0.22	0.42	0.50	0.50	0.44	0.19	0.13	3.01
	4	0.06	0.03	0.01	0.02	0.01	0.02	0.02	0.02	0.17	0.29	0.16	0.29	0.39	0.59	0.45	0.14	2.69
	5	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.00	0.02	0.04	0.01	0.03	0.16	0.33	0.14	0.04	0.79
	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.02	0.01	0.08
	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	0.28	0.17	0.11	0.07	0.04	0.05	0.04	0.04	0.29	0.65	0.60	0.85	1.12	1.41	0.81	0.34	6.76
2 (B)	1 (Calm)																0.00	0.00
	2	0.02	0.01	0.02	0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.02	0.03	0.05	0.03	0.01	0.00	0.23
	3	0.12	0.08	0.06	0.07	0.04	0.04	0.01	0.04	0.09	0.18	0.17	0.19	0.22	0.25	0.16	0.09	1.62
	4	0.06	0.03	0.02	0.04	0.06	0.03	0.01	0.01	0.07	0.13	0.05	0.09	0.22	0.29	0.31	0.10	1.52
	5	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.08	0.20	0.12	0.05	0.51
	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.01	0.01	0.05
	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01
	Subtotal	0.20	0.12	0.11	0.12	0.12	0.08	0.02	0.05	0.18	0.32	0.24	0.32	0.60	0.78	0.61	0.26	4.13
3 (C)	1 (Calm)																0.00	0.00
	2	0.01	0.02	0.03	0.03	0.01	0.01	0.01	0.02	0.02	0.03	0.05	0.06	0.06	0.05	0.03	0.02	0.46
	3	0.12	0.10	0.08	0.14	0.12	0.04	0.08	0.05	0.11	0.19	0.20	0.22	0.29	0.31	0.19	0.08	2.33
	4	0.06	0.02	0.03	0.09	0.11	0.03	0.01	0.02	0.08	0.14	0.05	0.09	0.21	0.40	0.41	0.13	1.87
	5	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.03	0.01	0.00	0.00	0.09	0.31	0.29	0.05	0.81
	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.03	0.07	0.01	0.13
	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	0.20	0.14	0.14	0.28	0.24	0.08	0.10	0.10	0.24	0.37	0.31	0.37	0.67	1.08	0.99	0.29	5.60
4 (D)	1 (Calm)																0.00	0.00
	2	0.48	0.49	0.71	0.57	0.42	0.31	0.28	0.23	0.29	0.34	0.37	0.46	0.46	0.49	0.45	0.36	6.70
	3	0.89	0.68	1.19	1.88	1.13	0.66	0.53	0.77	1.04	0.98	0.68	0.74	1.18	1.57	1.37	0.81	18.10
	4	0.47	0.27	0.34	0.78	0.85	0.27	0.14	0.40	0.69	0.41	0.12	0.20	1.21	2.37	1.93	0.99	11.46
	5	0.05	0.00	0.04	0.07	0.19	0.02	0.02	0.04	0.08	0.09	0.01	0.04	0.53	1.24	1.31	0.30	4.04
	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.09	0.27	0.03	0.46
	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.02
	Subtotal	1.89	1.44	2.29	3.31	2.59	1.28	0.97	1.44	2.10	1.82	1.18	1.44	3.44	5.77	6.35	2.49	36.78
5 (E)	1 (Calm)																0.00	0.00
	2	0.55	0.56	0.62	0.61	0.44	0.34	0.26	0.33	0.45	0.67	0.89	0.95	1.08	1.09	0.83	0.55	10.23
	3	0.48	0.43	0.45	0.75	0.55	0.32	0.48	0.59	1.15	0.98	0.69	0.66	1.32	1.99	1.21	0.60	12.64
	4	0.10	0.06	0.02	0.07	0.21	0.12	0.07	0.16	0.24	0.21	0.07	0.06	0.31	0.62	0.52	0.20	3.05
	5	0.01	0.00	0.00	0.01	0.03	0.02	0.03	0.07	0.02	0.01	0.01	0.01	0.05	0.13	0.13	0.03	0.56
	6	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.05
	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	Subtotal	1.14	1.05	1.10	1.44	1.22	0.81	0.86	1.16	1.85	1.87	1.88	1.87	2.78	3.85	2.70	1.38	26.55
6 (F)	1 (Calm)																0.00	0.00
	2	0.40	0.44	0.42	0.41	0.29	0.21	0.15	0.16	0.17	0.30	0.51	0.69	1.05	1.06	0.83	0.47	7.54
	3	0.04	0.08	0.05	0.08	0.09	0.06	0.03	0.04	0.11	0.27	0.17	0.09	0.26	0.45	0.23	0.05	2.09
	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.00	0.00	0.04
	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.04
	6	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	0.44	0.53	0.47	0.48	0.38	0.28	0.18	0.20	0.29	0.57	0.68	0.78	1.31	1.53	1.09	0.63	9.73
7 (G)	1 (Calm)																0.00	0.00
	2	0.63	0.49	0.56	0.35	0.27	0.12	0.10	0.09	0.17	0.15	0.31	0.39	0.99	1.20	0.83	0.75	7.42
	3	0.01	0.01	0.00	0.04	0.04	0.02	0.03	0.03	0.04	0.03	0.04	0.06	0.15	0.21	0.06	0.02	0.79
	4	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.02	0.01	0.01	0.00	0.05	0.03	0.01	0.01	0.19
	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.00	0.00	0.04
	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	0.63	0.50	0.57	0.40	0.32	0.14	0.13	0.14	0.23	0.20	0.36	0.45	1.21	1.48	0.90	0.78	8.45
Total		4.78	3.95	4.78	6.08	4.92	2.89	2.32	3.14	6.19	6.71	5.83	5.87	11.11	15.61	12.45	6.94	108.00

Notes:

1) Wind Speed Categories defined as follows:

Category	Wind Speed (mph)
1 (Calm)	<0.5
2	>=0.5 to <3.5
3	>=3.5 to <7.5
4	>=7.5 to <12.5
5	>=12.5 to <18.5
6	>=18.5 to <24
7	>=24



**Limerick Generating Station**  
**Joint Frequency Distribution (number of observations)**  
1996-2000  
Tower 1  
175' wind  
171'-26' Delta T

	Wind Speed Category <sup>1)</sup>	Wind Direction Category																	Total
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Calm	
1 (A)	1 (Calm)																		0
	2	1	4	2	1	0	0	3	2	1	1	1	4	9	8	9	3		49
	3	49	37	18	12	4	4	9	4	15	28	65	68	91	69	49	32		554
	4	57	40	9	9	2	9	14	14	66	126	145	140	186	198	121	56		1182
	5	9	6	2	5	4	6	0	3	28	77	44	102	134	178	157	58		811
	6	1	0	0	1	1	0	0	0	3	17	9	20	41	82	45	21		251
	7	1	0	0	0	0	0	0	0	2	6	1	0	15	23	5	8		60
	Subtotal	118	87	31	28	11	19	28	23	113	234	283	334	478	548	388	178	0	2917
2 (B)	1 (Calm)																		0
	2	2	2	6	2	1	2	1	0	1	2	2	4	9	4	4	2		44
	3	20	26	22	14	14	14	2	7	27	26	32	34	47	41	36	24		306
	4	46	23	17	17	22	15	14	9	22	72	57	53	74	120	82	40		683
	5	16	4	4	5	9	9	4	2	20	38	16	37	68	87	78	45		452
	6	1	0	0	0	0	0	0	0	2	3	4	8	23	53	49	13		156
	7	0	0	0	0	0	0	0	0	0	0	0	1	11	23	5	2		45
	Subtotal	85	55	48	38	48	40	21	18	72	144	111	137	232	338	254	126	0	1788
3 (C)	1 (Calm)																		0
	2	6	5	3	5	4	2	4	1	8	9	7	9	15	17	6	4		105
	3	27	32	27	24	35	17	15	25	28	43	49	42	64	76	39	25		568
	4	42	27	23	36	45	29	18	14	51	77	48	56	77	122	101	42		808
	5	13	4	3	14	17	5	1	5	22	39	21	32	80	139	130	46		571
	6	1	0	0	0	0	0	0	0	7	5	3	8	28	82	79	21		245
	7	0	0	0	0	0	0	0	0	2	2	0	2	7	39	36	3		91
	Subtotal	89	68	58	78	101	83	38	48	118	175	128	149	271	485	391	141	0	2388
4 (D)	1 (Calm)																		0
	2	85	96	124	122	97	79	94	63	60	69	84	66	91	92	82	61		1365
	3	221	232	360	538	324	223	191	191	260	282	224	133	219	343	234	186		4181
	4	301	251	320	501	459	232	172	269	452	302	185	180	363	707	543	384		5621
	5	154	90	76	135	184	94	46	99	225	134	67	90	332	901	618	379		3624
	6	23	8	16	6	52	13	2	11	34	41	8	31	130	483	375	97		1330
	7	0	0	1	3	4	0	0	1	3	13	6	9	66	145	141	24		416
	Subtotal	784	677	897	1385	1128	641	585	634	1034	841	574	509	1281	2671	1983	1131	0	18317
5 (E)	1 (Calm)																		0
	2	73	63	95	97	78	74	68	54	54	54	59	55	57	99	83	67		1130
	3	155	146	170	262	156	106	140	188	247	339	352	282	343	488	244	183		3901
	4	173	152	138	137	244	112	97	209	394	410	292	249	391	907	481	288		4674
	5	58	33	8	11	53	66	32	38	118	127	49	53	143	326	215	92		1422
	6	4	0	2	2	4	6	11	20	16	13	15	10	25	62	25	12		227
	7	0	0	0	1	0	0	1	14	4	4	2	2	5	13	9	1		56
	Subtotal	483	394	413	818	835	584	348	823	833	947	789	631	844	1885	1697	643	0	11310
6 (F)	1 (Calm)																		0
	2	47	33	46	30	60	42	52	34	42	28	45	40	56	59	59	48		721
	3	80	58	64	56	54	45	45	62	83	112	137	171	243	437	201	100		1948
	4	28	39	22	7	32	25	11	10	39	120	118	97	156	459	133	55		1381
	5	3	7	1	1	5	5	3	1	6	11	18	3	7	22	16	2		111
	6	0	0	0	0	0	0	2	0	0	0	1	0	0	2	5	2		12
	7	2	5	0	0	0	0	0	1	0	0	0	0	0	0	4	2		14
	Subtotal	160	142	133	94	151	117	113	108	176	271	319	311	482	978	418	209	0	4157
7 (G)	1 (Calm)																		0
	2	38	47	49	55	50	48	54	33	42	36	51	76	86	84	91	57		897
	3	46	46	37	35	55	51	34	41	58	95	137	145	254	498	243	90		1866
	4	12	19	6	6	15	17	6	8	24	26	40	28	57	326	110	34		734
	5	1	0	0	0	0	0	3	0	11	10	6	2	16	45	5	3		105
	6	0	0	0	0	0	0	0	0	0	0	0	0	2	12	0	0		17
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0		1
	Subtotal	97	112	92	98	128	119	94	85	135	176	234	251	415	966	449	184	0	3618
Total		1798	1535	1871	2150	2884	1333	1148	1437	2476	2882	2400	2342	4821	7902	4948	2812	0	42874

Notes:

Category	Wind Speed (mph)
1 (Calm)	<0.5
2	>=0.5 to <3.5
3	>=3.5 to <7.5
4	>=7.5 to <12.5
5	>=12.5 to <18.5
6	>=18.5 to <24
7	>=24

## 171'-26' Delta T

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## Attachment H

### North Stack to Control Room

#### ARCON96 Input

```
5
C:\MYDOCU~1\TRACI\LIMERICK\T196_A.MET
C:\MYDOCU~1\TRACI\LIMERICK\T197_A.MET
C:\MYDOCU~1\TRACI\LIMERICK\T198_A.MET
C:\MYDOCU~1\TRACI\LIMERICK\T199_A.MET
C:\MYDOCU~1\TRACI\LIMERICK\T100_A.MET
  9.14
 53.30
  2
  2
 61.00
5851.00
  0.00
  0.00
  0.00
180  90
 16.50
 37.80
  0.00
NtoCR2F.out
NtoCR2F.cfd
.1
  0.22
  4.00
  1  2  4  8 12 24 96 168 360 720
  1  2  4  8 11 22 87 152 324 648
  0.00      0.00
```

# ARCON96 Output

X/Q CUMULATIVE FREQUENCY DISTRIBUTIONS											
XOQ	1	2	4	8	XOQ	12	24	96	168	360	720
Abv. Lim.	0.	0.	0.	0.	Abv. Lim.	0.	0.	0.	0.	0.	0.
9.120E-03	83.	31.	14.	2.	9.120E-03	0.	0.	0.	0.	0.	0.
8.318E-03	325.	174.	71.	13.	8.318E-03	0.	0.	0.	0.	0.	0.
7.586E-03	553.	429.	248.	108.	7.586E-03	0.	0.	0.	0.	0.	0.
6.918E-03	2077.	1451.	930.	409.	6.918E-03	30.	0.	0.	0.	0.	0.
6.310E-03	3033.	2474.	1831.	1043.	6.310E-03	105.	0.	0.	0.	0.	0.
5.754E-03	4552.	3692.	2802.	1873.	5.754E-03	398.	0.	0.	0.	0.	0.
5.248E-03	5315.	4365.	3592.	2642.	5.248E-03	1004.	11.	0.	0.	0.	0.
4.786E-03	5816.	4840.	4269.	3364.	4.786E-03	1717.	87.	0.	0.	0.	0.
4.365E-03	6315.	5296.	4893.	4125.	4.365E-03	2526.	308.	0.	0.	0.	0.
3.981E-03	6716.	5725.	5444.	4819.	3.981E-03	3311.	703.	0.	0.	0.	0.
3.631E-03	7015.	6294.	6039.	5477.	3.631E-03	4097.	1175.	1.	0.	0.	0.
3.311E-03	7245.	6802.	6610.	6165.	3.311E-03	4852.	1875.	44.	0.	0.	0.
3.020E-03	7427.	7401.	7155.	6811.	3.020E-03	5569.	2702.	66.	0.	0.	0.
2.754E-03	7567.	7867.	7592.	7355.	2.754E-03	6334.	3635.	88.	40.	0.	0.
2.512E-03	7716.	8191.	7962.	7996.	2.512E-03	7022.	4567.	159.	84.	0.	0.
2.291E-03	7843.	8527.	8274.	8525.	2.291E-03	7719.	5516.	373.	110.	0.	0.
2.089E-03	7951.	8848.	8604.	9020.	2.089E-03	8356.	6520.	755.	226.	0.	0.
1.905E-03	8069.	9097.	8888.	9548.	1.905E-03	8993.	7431.	1422.	383.	88.	0.
1.738E-03	8168.	9333.	9485.	10060.	1.738E-03	9594.	8342.	2275.	660.	156.	0.
1.585E-03	8262.	9524.	9851.	10497.	1.585E-03	10161.	9236.	3565.	1363.	222.	0.
1.445E-03	8348.	9669.	10408.	11039.	1.445E-03	10731.	10169.	4969.	2577.	469.	8.
1.318E-03	8412.	9786.	10759.	11422.	1.318E-03	11202.	11025.	6567.	3950.	919.	143.
1.202E-03	8458.	9904.	11040.	11709.	1.202E-03	11721.	11886.	8257.	5923.	2102.	448.
1.096E-03	8505.	9977.	11324.	11976.	1.096E-03	12205.	12692.	10008.	7859.	3952.	1490.
1.000E-03	8521.	10044.	11583.	12222.	1.000E-03	12692.	13458.	11821.	10188.	6860.	3441.
9.120E-04	8541.	10087.	11793.	12686.	9.120E-04	13125.	14133.	14053.	12620.	9461.	6410.
8.318E-04	8554.	10117.	11955.	13067.	8.318E-04	13554.	14818.	16039.	14964.	12371.	10638.
7.586E-04	8565.	10148.	12062.	13539.	7.586E-04	13899.	15526.	17800.	17283.	16271.	16006.
6.918E-04	8567.	10173.	12151.	13937.	6.918E-04	14236.	16160.	19125.	19210.	19909.	20523.
6.310E-04	8574.	10187.	12247.	14218.	6.310E-04	14555.	16728.	20824.	21190.	23160.	24981.
5.754E-04	8577.	10199.	12309.	14472.	5.754E-04	15048.	17341.	22297.	23369.	25911.	28666.
5.248E-04	8583.	10208.	12349.	14772.	5.248E-04	15401.	17889.	23859.	25582.	28013.	31854.
4.786E-04	8583.	10212.	12389.	14978.	4.786E-04	15821.	18369.	25137.	27398.	29591.	33470.
4.365E-04	8584.	10215.	12425.	15159.	4.365E-04	16173.	18829.	26427.	28751.	31394.	34945.
3.981E-04	8584.	10215.	12438.	15289.	3.981E-04	16436.	19292.	27759.	30055.	33025.	36255.
3.631E-04	8584.	10215.	12454.	15386.	3.631E-04	16711.	19636.	28938.	31173.	34079.	37606.
3.311E-04	8584.	10215.	12465.	15483.	3.311E-04	16969.	20039.	29915.	32468.	35312.	38661.
3.020E-04	8584.	10215.	12475.	15548.	3.020E-04	17302.	20616.	30742.	33475.	36301.	39315.
2.754E-04	8584.	10215.	12483.	15598.	2.754E-04	17528.	20983.	31601.	34285.	37105.	39606.
2.512E-04	8584.	10216.	12487.	15630.	2.512E-04	17689.	21364.	32187.	35035.	37737.	39858.
2.291E-04	8584.	10216.	12489.	15652.	2.291E-04	17865.	21689.	32700.	35901.	38149.	40002.
2.089E-04	8584.	10216.	12491.	15680.	2.089E-04	18060.	21965.	33213.	36584.	38425.	40153.
1.905E-04	8584.	10216.	12491.	15691.	1.905E-04	18184.	22240.	33640.	37079.	38706.	40153.
1.738E-04	8584.	10216.	12491.	15696.	1.738E-04	18267.	22555.	34152.	37557.	38989.	40153.
1.585E-04	8584.	10216.	12491.	15712.	1.585E-04	18313.	22874.	34523.	37962.	39167.	40153.

1.445E-04	8584.	10216.	12491.	15719.	1.445E-04	18363.	23143.	35055.	38208.	39510.	40153.
1.318E-04	8584.	10216.	12492.	15725.	1.318E-04	18412.	23404.	35285.	38449.	39642.	40153.
1.202E-04	8584.	10216.	12492.	15729.	1.202E-04	18438.	23595.	35651.	38646.	39691.	40153.
1.096E-04	8584.	10216.	12492.	15730.	1.096E-04	18458.	23850.	36089.	38716.	39757.	40153.
1.000E-04	8584.	10216.	12492.	15731.	1.000E-04	18473.	24040.	36318.	38935.	39810.	40153.
9.120E-05	8584.	10216.	12492.	15731.	9.120E-05	18484.	24164.	36431.	38966.	39854.	40153.
8.318E-05	8584.	10216.	12492.	15731.	8.318E-05	18492.	24287.	36613.	39180.	39857.	40153.
7.586E-05	8584.	10216.	12492.	15731.	7.586E-05	18494.	24347.	36825.	39210.	39862.	40153.
6.918E-05	8584.	10216.	12492.	15731.	6.918E-05	18503.	24452.	37022.	39399.	39872.	40153.
6.310E-05	8584.	10216.	12492.	15731.	6.310E-05	18507.	24482.	37191.	39728.	39872.	40153.
5.754E-05	8584.	10216.	12492.	15731.	5.754E-05	18512.	24511.	37388.	39764.	39872.	40153.
5.248E-05	8584.	10216.	12492.	15731.	5.248E-05	18514.	24517.	37470.	39796.	39872.	40153.
4.786E-05	8584.	10216.	12492.	15731.	4.786E-05	18514.	24529.	37523.	39819.	39872.	40153.
4.365E-05	8584.	10216.	12492.	15731.	4.365E-05	18514.	24557.	37691.	40014.	39872.	40153.
3.981E-05	8584.	10216.	12492.	15731.	3.981E-05	18514.	24558.	37805.	40086.	39872.	40153.
3.631E-05	8584.	10216.	12492.	15731.	3.631E-05	18514.	24561.	37914.	40178.	39872.	40153.
3.311E-05	8584.	10216.	12492.	15731.	3.311E-05	18514.	24572.	38067.	40300.	39872.	40153.
3.020E-05	8584.	10216.	12492.	15731.	3.020E-05	18514.	24575.	38105.	40353.	39872.	40153.
2.754E-05	8584.	10216.	12492.	15731.	2.754E-05	18514.	24579.	38144.	40364.	39872.	40153.
2.512E-05	8584.	10216.	12492.	15731.	2.512E-05	18514.	24579.	38349.	40495.	39872.	40153.
2.291E-05	8584.	10216.	12492.	15731.	2.291E-05	18514.	24579.	38426.	40522.	39872.	40153.
2.089E-05	8584.	10216.	12492.	15731.	2.089E-05	18514.	24579.	38534.	40524.	39872.	40153.
1.905E-05	8584.	10216.	12492.	15731.	1.905E-05	18514.	24579.	38590.	40546.	39872.	40153.
1.738E-05	8584.	10216.	12492.	15731.	1.738E-05	18514.	24579.	38672.	40548.	39872.	40153.
1.585E-05	8584.	10216.	12492.	15731.	1.585E-05	18514.	24579.	38672.	40548.	39872.	40153.
1.445E-05	8584.	10216.	12492.	15731.	1.445E-05	18514.	24579.	38689.	40637.	39872.	40153.
1.318E-05	8584.	10216.	12492.	15731.	1.318E-05	18514.	24579.	38693.	40689.	39872.	40153.
1.202E-05	8584.	10216.	12492.	15731.	1.202E-05	18514.	24579.	38701.	40759.	39872.	40153.
1.096E-05	8584.	10216.	12492.	15731.	1.096E-05	18514.	24579.	38702.	40760.	39872.	40153.
1.000E-05	8584.	10216.	12492.	15731.	1.000E-05	18514.	24579.	38702.	40768.	39872.	40153.
9.120E-06	8584.	10216.	12492.	15731.	9.120E-06	18514.	24579.	38703.	40768.	39872.	40153.
8.318E-06	8584.	10216.	12492.	15731.	8.318E-06	18514.	24579.	38709.	40772.	39872.	40153.
7.586E-06	8584.	10216.	12492.	15731.	7.586E-06	18514.	24579.	38709.	40780.	39872.	40153.
6.918E-06	8584.	10216.	12492.	15731.	6.918E-06	18514.	24579.	38709.	40780.	39872.	40153.
6.310E-06	8584.	10216.	12492.	15731.	6.310E-06	18514.	24579.	38709.	40780.	39872.	40153.
5.754E-06	8584.	10216.	12492.	15731.	5.754E-06	18514.	24579.	38709.	40780.	39872.	40153.
5.248E-06	8584.	10216.	12492.	15731.	5.248E-06	18514.	24579.	38709.	40781.	39872.	40153.
4.786E-06	8584.	10216.	12492.	15731.	4.786E-06	18514.	24579.	38709.	40781.	39872.	40153.
4.365E-06	8584.	10216.	12492.	15731.	4.365E-06	18514.	24579.	38709.	40781.	39872.	40153.
3.981E-06	8584.	10216.	12492.	15731.	3.981E-06	18514.	24579.	38709.	40781.	39872.	40153.
3.631E-06	8584.	10216.	12492.	15731.	3.631E-06	18514.	24579.	38709.	40781.	39872.	40153.
3.311E-06	8584.	10216.	12492.	15731.	3.311E-06	18514.	24579.	38709.	40781.	39872.	40153.
3.020E-06	8584.	10216.	12492.	15731.	3.020E-06	18514.	24579.	38709.	40781.	39872.	40153.
2.754E-06	8584.	10216.	12492.	15731.	2.754E-06	18514.	24579.	38709.	40781.	39872.	40153.
2.512E-06	8584.	10216.	12492.	15731.	2.512E-06	18514.	24579.	38709.	40781.	39872.	40153.
2.291E-06	8584.	10216.	12492.	15731.	2.291E-06	18514.	24579.	38709.	40781.	39872.	40153.
2.089E-06	8584.	10216.	12492.	15731.	2.089E-06	18514.	24579.	38709.	40781.	39872.	40153.
1.905E-06	8584.	10216.	12492.	15731.	1.905E-06	18514.	24579.	38709.	40781.	39872.	40153.
1.738E-06	8584.	10216.	12492.	15731.	1.738E-06	18514.	24579.	38709.	40781.	39872.	40153.
1.585E-06	8584.	10216.	12492.	15731.	1.585E-06	18514.	24579.	38709.	40781.	39872.	40153.
1.445E-06	8584.	10216.	12492.	15731.	1.445E-06	18514.	24579.	38709.	40781.	39872.	40153.
1.318E-06	8584.	10216.	12492.	15731.	1.318E-06	18514.	24579.	38709.	40781.	39872.	40153.
1.202E-06	8584.	10216.	12492.	15731.	1.202E-06	18514.	24579.	38709.	40781.	39872.	40153.

1.096E-06	8584.	10216.	12492.	15731.	1.096E-06	18514.	24579.	38709.	40781.	39872.	40153.
1.000E-06	8584.	10216.	12492.	15731.	1.000E-06	18514.	24579.	38709.	40781.	39872.	40153.
Belw. Lim.	0.	0.	0.	0.	Belw. Lim.	0.	0.	0.	0.	0.	0.

Program Title: ARCON96.

Developed For: U.S. Nuclear Regulatory Commission  
Office of Nuclear Reactor Regulation  
Division of Reactor Program Management

Date: June 25, 1997 11:00 a.m.

NRC Contacts: J. Y. Lee Phone: (301) 415 1080  
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Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 5/18/2003 at 14:33:54

\*\*\*\*\* ARCON INPUT \*\*\*\*\*

Number of Meteorological Data Files = 5  
Meteorological Data File Names  
C:\MYDOCU~1\TRACI\LIMERICK\T196\_A.MET  
C:\MYDOCU~1\TRACI\LIMERICK\T197\_A.MET  
C:\MYDOCU~1\TRACI\LIMERICK\T198\_A.MET  
C:\MYDOCU~1\TRACI\LIMERICK\T199\_A.MET  
C:\MYDOCU~1\TRACI\LIMERICK\T100\_A.MET

Height of lower wind instrument (m) = 9.1  
Height of upper wind instrument (m) = 53.3  
Wind speeds entered as miles per hour

Vent release  
Release height (m) = 61.0  
Building Area (m^2) = 5851.0  
Effluent vertical velocity (m/s) = .00  
Vent or stack flow (m^3/s) = .00  
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 180  
Wind direction sector width (deg) = 90

Wind direction window (deg) = 135 - 225  
 Distance to intake (m) = 16.5  
 Intake height (m) = 37.8  
 Terrain elevation difference (m) = .0

Output file names

NtoCR2F.out  
 NtoCR2F.cfd

Minimum Wind Speed (m/s) = .2  
 Surface roughness length (m) = .10  
 Sector averaging constant = 4.0

Initial value of sigma y = .00  
 Initial value of sigma z = .00

Expanded output for code testing not selected

Total number of hours of data processed = 43849  
 Hours of missing data = 1153  
 Hours direction in window = 8582  
 Hours elevated plume w/ dir. in window = 0  
 Hours of calm winds = 2  
 Hours direction not in window or calm = 34112

DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL

AVER. PER.	1	2	4	8	12	24	96	168	360	720
UPPER LIM.	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02
LOW LIM.	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06
ABOVE RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
IN RANGE	8584.	10216.	12492.	15731.	18514.	24579.	38709.	40781.	39872.	40153.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34112.	32421.	30027.	26552.	24050.	17897.	3187.	468.	0.	0.
TOTAL X/Qs	42696.	42637.	42519.	42283.	42564.	42476.	41896.	41249.	39872.	40153.
% NON ZERO	20.10	23.96	29.38	37.20	43.50	57.87	92.39	98.87	100.00	100.00

95th PERCENTILE X/Q VALUES

6.88E-03	6.51E-03	6.14E-03	5.60E-03	4.57E-03	3.22E-03	1.77E-03	1.50E-03	1.21E-03	1.07E-03
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95% X/Q for standard averaging intervals

0 to 2 hours	6.88E-03
2 to 8 hours	5.17E-03
8 to 24 hours	2.04E-03
1 to 4 days	1.29E-03
4 to 30 days	9.63E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	9.46E-03	4.48E-04
SECTOR-AVERAGE	5.93E-03	2.81E-04

NORMAL PROGRAM COMPLETION



## South Stack to Control Room

### ARCON96 Input

```
5
T196_a.met
T197_a.met
T198_a.met
T199_a.met
T100_a.met
  9.14
  53.30
    2
    2
    61.00
  5851.00
    0.00
    0.00
    0.00
  180  90
    64.80
    37.80
    0.00
StoCR2F.out
StoCR2F.cfd
  .1
    0.22
    4.00
    1   2   4   8  12  24  96 168 360 720
    1   2   4   8  11  22  87 152 324 648
    0.00      0.00
n
```

# ARCON96 Output

## X/Q CUMULATIVE FREQUENCY DISTRIBUTIONS

XOQ	1	2	4	8	XOQ	12	24	96	168	360	720
Abv. Lim.	0.	0.	0.	0.	Abv. Lim.	0.	0.	0.	0.	0.	0.
9.120E-03	0.	0.	0.	0.	9.120E-03	0.	0.	0.	0.	0.	0.
8.318E-03	0.	0.	0.	0.	8.318E-03	0.	0.	0.	0.	0.	0.
7.586E-03	0.	0.	0.	0.	7.586E-03	0.	0.	0.	0.	0.	0.
6.918E-03	0.	0.	0.	0.	6.918E-03	0.	0.	0.	0.	0.	0.
6.310E-03	0.	0.	0.	0.	6.310E-03	0.	0.	0.	0.	0.	0.
5.754E-03	0.	0.	0.	0.	5.754E-03	0.	0.	0.	0.	0.	0.
5.248E-03	0.	0.	0.	0.	5.248E-03	0.	0.	0.	0.	0.	0.
4.786E-03	0.	0.	0.	0.	4.786E-03	0.	0.	0.	0.	0.	0.
4.365E-03	0.	0.	0.	0.	4.365E-03	0.	0.	0.	0.	0.	0.
3.981E-03	0.	0.	0.	0.	3.981E-03	0.	0.	0.	0.	0.	0.
3.631E-03	0.	0.	0.	0.	3.631E-03	0.	0.	0.	0.	0.	0.
3.311E-03	0.	0.	0.	0.	3.311E-03	0.	0.	0.	0.	0.	0.
3.020E-03	0.	0.	0.	0.	3.020E-03	0.	0.	0.	0.	0.	0.
2.754E-03	0.	0.	0.	0.	2.754E-03	0.	0.	0.	0.	0.	0.
2.512E-03	0.	0.	0.	0.	2.512E-03	0.	0.	0.	0.	0.	0.
2.291E-03	0.	0.	0.	0.	2.291E-03	0.	0.	0.	0.	0.	0.
2.089E-03	0.	0.	0.	0.	2.089E-03	0.	0.	0.	0.	0.	0.
1.905E-03	0.	0.	0.	0.	1.905E-03	0.	0.	0.	0.	0.	0.
1.738E-03	0.	0.	0.	0.	1.738E-03	0.	0.	0.	0.	0.	0.
1.585E-03	123.	68.	28.	5.	1.585E-03	0.	0.	0.	0.	0.	0.
1.445E-03	452.	300.	144.	56.	1.445E-03	0.	0.	0.	0.	0.	0.
1.318E-03	1666.	1100.	597.	234.	1.318E-03	2.	0.	0.	0.	0.	0.
1.202E-03	2532.	2197.	1514.	814.	1.202E-03	65.	0.	0.	0.	0.	0.
1.096E-03	4307.	3497.	2581.	1628.	1.096E-03	272.	0.	0.	0.	0.	0.
1.000E-03	5177.	4207.	3362.	2416.	1.000E-03	768.	5.	0.	0.	0.	0.
9.120E-04	5741.	4779.	4131.	3146.	9.120E-04	1500.	53.	0.	0.	0.	0.
8.318E-04	6261.	5211.	4774.	3923.	8.318E-04	2299.	237.	0.	0.	0.	0.
7.586E-04	6705.	5648.	5302.	4648.	7.586E-04	3087.	590.	0.	0.	0.	0.
6.918E-04	7003.	5992.	5851.	5307.	6.918E-04	3882.	1020.	0.	0.	0.	0.
6.310E-04	7236.	6698.	6471.	5995.	6.310E-04	4631.	1661.	39.	0.	0.	0.
5.754E-04	7438.	7254.	7027.	6662.	5.754E-04	5400.	2464.	58.	0.	0.	0.
5.248E-04	7603.	7791.	7533.	7228.	5.248E-04	6142.	3364.	82.	21.	0.	0.
4.786E-04	7725.	8144.	7932.	7858.	4.786E-04	6859.	4319.	128.	81.	0.	0.
4.365E-04	7845.	8479.	8236.	8408.	4.365E-04	7546.	5269.	278.	101.	0.	0.
3.981E-04	7955.	8834.	8519.	8935.	3.981E-04	8193.	6260.	639.	199.	0.	0.
3.631E-04	8073.	9129.	8855.	9446.	3.631E-04	8841.	7179.	1241.	311.	13.	0.
3.311E-04	8177.	9368.	9368.	9950.	3.311E-04	9439.	8117.	2025.	563.	151.	0.
3.020E-04	8267.	9553.	9789.	10415.	3.020E-04	10043.	9014.	3174.	1093.	209.	0.
2.754E-04	8348.	9719.	10374.	10950.	2.754E-04	10604.	9914.	4600.	2192.	371.	0.
2.512E-04	8416.	9829.	10732.	11363.	2.512E-04	11068.	10788.	6132.	3542.	737.	93.
2.291E-04	8463.	9931.	11000.	11698.	2.291E-04	11576.	11644.	7816.	5271.	1699.	307.
2.089E-04	8504.	10001.	11299.	11951.	2.089E-04	12086.	12484.	9530.	7375.	3365.	1189.
1.905E-04	8522.	10056.	11610.	12201.	1.905E-04	12632.	13254.	11285.	9549.	6069.	2841.
1.738E-04	8539.	10099.	11816.	12467.	1.738E-04	13074.	13940.	13598.	11940.	8711.	5264.
1.585E-04	8555.	10125.	11968.	13020.	1.585E-04	13481.	14652.	15407.	14255.	11498.	9419.

1.445E-04	8565.	10149.	12098.	13445.	1.445E-04	13841.	15362.	17440.	16670.	15357.	14773.
1.318E-04	8567.	10175.	12208.	13862.	1.318E-04	14159.	16022.	18782.	18646.	18773.	19496.
1.202E-04	8574.	10187.	12281.	14194.	1.202E-04	14489.	16612.	20351.	20788.	22065.	23788.
1.096E-04	8577.	10199.	12339.	14471.	1.096E-04	14990.	17202.	21963.	22854.	25426.	27679.
1.000E-04	8582.	10208.	12383.	14749.	1.000E-04	15331.	17789.	23455.	25199.	27575.	31236.
9.120E-05	8583.	10212.	12420.	15015.	9.120E-05	15774.	18266.	24879.	26862.	29067.	32994.
8.318E-05	8584.	10214.	12433.	15184.	8.318E-05	16113.	18757.	26177.	28445.	30950.	34722.
7.586E-05	8584.	10215.	12446.	15324.	7.586E-05	16409.	19222.	27515.	29731.	32603.	35991.
6.918E-05	8584.	10215.	12453.	15437.	6.918E-05	16677.	19564.	28493.	30908.	33897.	37267.
6.310E-05	8584.	10215.	12468.	15528.	6.310E-05	16985.	19976.	29634.	31934.	34937.	38412.
5.754E-05	8584.	10215.	12473.	15605.	5.754E-05	17296.	20425.	30513.	33251.	36136.	39193.
5.248E-05	8584.	10215.	12482.	15627.	5.248E-05	17515.	20930.	31480.	34068.	36911.	39557.
4.786E-05	8584.	10216.	12487.	15666.	4.786E-05	17719.	21319.	32060.	34814.	37632.	39819.
4.365E-05	8584.	10216.	12489.	15682.	4.365E-05	17909.	21650.	32587.	35780.	38113.	39954.
3.981E-05	8584.	10216.	12491.	15685.	3.981E-05	18093.	21912.	33123.	36398.	38357.	40153.
3.631E-05	8584.	10216.	12491.	15691.	3.631E-05	18208.	22160.	33544.	37000.	38568.	40153.
3.311E-05	8584.	10216.	12491.	15696.	3.311E-05	18288.	22540.	34107.	37407.	38907.	40153.
3.020E-05	8584.	10216.	12491.	15712.	3.020E-05	18351.	22831.	34413.	37936.	39157.	40153.
2.754E-05	8584.	10216.	12491.	15719.	2.754E-05	18397.	23106.	34980.	38152.	39506.	40153.
2.512E-05	8584.	10216.	12492.	15725.	2.512E-05	18423.	23411.	35202.	38441.	39615.	40153.
2.291E-05	8584.	10216.	12492.	15729.	2.291E-05	18448.	23643.	35531.	38583.	39688.	40153.
2.089E-05	8584.	10216.	12492.	15730.	2.089E-05	18472.	23869.	36047.	38683.	39756.	40153.
1.905E-05	8584.	10216.	12492.	15731.	1.905E-05	18484.	24081.	36259.	38927.	39785.	40153.
1.738E-05	8584.	10216.	12492.	15731.	1.738E-05	18488.	24217.	36356.	38960.	39815.	40153.
1.585E-05	8584.	10216.	12492.	15731.	1.585E-05	18492.	24311.	36591.	39173.	39857.	40153.
1.445E-05	8584.	10216.	12492.	15731.	1.445E-05	18494.	24421.	36793.	39199.	39862.	40153.
1.318E-05	8584.	10216.	12492.	15731.	1.318E-05	18507.	24460.	37025.	39291.	39872.	40153.
1.202E-05	8584.	10216.	12492.	15731.	1.202E-05	18507.	24498.	37203.	39733.	39872.	40153.
1.096E-05	8584.	10216.	12492.	15731.	1.096E-05	18514.	24507.	37377.	39758.	39872.	40153.
1.000E-05	8584.	10216.	12492.	15731.	1.000E-05	18514.	24544.	37463.	39795.	39872.	40153.
9.120E-06	8584.	10216.	12492.	15731.	9.120E-06	18514.	24556.	37511.	39950.	39872.	40153.
8.318E-06	8584.	10216.	12492.	15731.	8.318E-06	18514.	24557.	37671.	40012.	39872.	40153.
7.586E-06	8584.	10216.	12492.	15731.	7.586E-06	18514.	24558.	37754.	40091.	39872.	40153.
6.918E-06	8584.	10216.	12492.	15731.	6.918E-06	18514.	24560.	37896.	40178.	39872.	40153.
6.310E-06	8584.	10216.	12492.	15731.	6.310E-06	18514.	24572.	38067.	40299.	39872.	40153.
5.754E-06	8584.	10216.	12492.	15731.	5.754E-06	18514.	24575.	38113.	40324.	39872.	40153.
5.248E-06	8584.	10216.	12492.	15731.	5.248E-06	18514.	24579.	38179.	40364.	39872.	40153.
4.786E-06	8584.	10216.	12492.	15731.	4.786E-06	18514.	24579.	38363.	40495.	39872.	40153.
4.365E-06	8584.	10216.	12492.	15731.	4.365E-06	18514.	24579.	38537.	40522.	39872.	40153.
3.981E-06	8584.	10216.	12492.	15731.	3.981E-06	18514.	24579.	38547.	40528.	39872.	40153.
3.631E-06	8584.	10216.	12492.	15731.	3.631E-06	18514.	24579.	38675.	40546.	39872.	40153.
3.311E-06	8584.	10216.	12492.	15731.	3.311E-06	18514.	24579.	38676.	40548.	39872.	40153.
3.020E-06	8584.	10216.	12492.	15731.	3.020E-06	18514.	24579.	38689.	40549.	39872.	40153.
2.754E-06	8584.	10216.	12492.	15731.	2.754E-06	18514.	24579.	38691.	40639.	39872.	40153.
2.512E-06	8584.	10216.	12492.	15731.	2.512E-06	18514.	24579.	38693.	40767.	39872.	40153.
2.291E-06	8584.	10216.	12492.	15731.	2.291E-06	18514.	24579.	38701.	40771.	39872.	40153.
2.089E-06	8584.	10216.	12492.	15731.	2.089E-06	18514.	24579.	38702.	40779.	39872.	40153.
1.905E-06	8584.	10216.	12492.	15731.	1.905E-06	18514.	24579.	38702.	40779.	39872.	40153.
1.738E-06	8584.	10216.	12492.	15731.	1.738E-06	18514.	24579.	38703.	40780.	39872.	40153.
1.585E-06	8584.	10216.	12492.	15731.	1.585E-06	18514.	24579.	38709.	40780.	39872.	40153.
1.445E-06	8584.	10216.	12492.	15731.	1.445E-06	18514.	24579.	38709.	40780.	39872.	40153.
1.318E-06	8584.	10216.	12492.	15731.	1.318E-06	18514.	24579.	38709.	40780.	39872.	40153.
1.202E-06	8584.	10216.	12492.	15731.	1.202E-06	18514.	24579.	38709.	40780.	39872.	40153.

1.096E-06	8584.	10216.	12492.	15731.	1.096E-06	18514.	24579.	38709.	40780.	39872.	40153.
1.000E-06	8584.	10216.	12492.	15731.	1.000E-06	18514.	24579.	38709.	40781.	39872.	40153.
Belw. Lim.	0.	0.	0.	0.	Belw. Lim.	0.	0.	0.	0.	0.	0.

Program Title: ARCON96.

Developed For: U.S. Nuclear Regulatory Commission  
Office of Nuclear Reactor Regulation  
Division of Reactor Program Management

Date: June 25, 1997 11:00 a.m.

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Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 5/18/2003 at 14:34:31

\*\*\*\*\* ARCON INPUT \*\*\*\*\*

Number of Meteorological Data Files = 5  
Meteorological Data File Names

T196\_a.met  
T197\_a.met  
T198\_a.met  
T199\_a.met  
T100\_a.met

Height of lower wind instrument (m) = 9.1  
Height of upper wind instrument (m) = 53.3  
Wind speeds entered as miles per hour

Vent release  
Release height (m) = 61.0  
Building Area (m<sup>2</sup>) = 5851.0  
Effluent vertical velocity (m/s) = .00  
Vent or stack flow (m<sup>3</sup>/s) = .00  
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 180  
Wind direction sector width (deg) = 90  
Wind direction window (deg) = 135 - 225

Distance to intake (m) = 64.8  
 Intake height (m) = 37.8  
 Terrain elevation difference (m) = .0

Output file names

StoCR2F.out  
 StoCR2F.cfd

Minimum Wind Speed (m/s) = .2  
 Surface roughness length (m) = .10  
 Sector averaging constant = 4.0

Initial value of sigma y = .00  
 Initial value of sigma z = .00

Expanded output for code testing not selected

Total number of hours of data processed = 43849  
 Hours of missing data = 1153  
 Hours direction in window = 8582  
 Hours elevated plume w/ dir. in window = 0  
 Hours of calm winds = 2  
 Hours direction not in window or calm = 34112

DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL

AVER. PER.	1	2	4	8	12	24	96	168	360	720
UPPER LIM.	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02
LOW LIM.	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06
ABOVE RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
IN RANGE	8584.	10216.	12492.	15731.	18514.	24579.	38709.	40781.	39872.	40153.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34112.	32421.	30027.	26552.	24050.	17897.	3187.	468.	0.	0.
TOTAL X/Qs	42696.	42637.	42519.	42283.	42564.	42476.	41896.	41249.	39872.	40153.
% NON ZERO	20.10	23.96	29.38	37.20	43.50	57.87	92.39	98.87	100.00	100.00

95th PERCENTILE X/Q VALUES

1.26E-03	1.21E-03	1.14E-03	1.04E-03	8.49E-04	5.99E-04	3.29E-04	2.79E-04	2.26E-04	2.00E-04
----------	----------	----------	----------	----------	----------	----------	----------	----------	----------

95% X/Q for standard averaging intervals

0 to 2 hours	1.26E-03
2 to 8 hours	9.64E-04
8 to 24 hours	3.80E-04
1 to 4 days	2.39E-04
4 to 30 days	1.80E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	1.70E-03	8.47E-05
SECTOR-AVERAGE	1.06E-03	5.31E-05

NORMAL PROGRAM COMPLETION

# Attachment I

## PAVAN Input

### North and South Stack to the EAB and LPZ

1 1111  
 Limerick Ground Release  
 9.14 meters 52.3-7.9 meters

Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

```

7 0
5851. 59.4 10.0 9.14
0 0 0 0 1 0 1
5. 5. 7. 1. 1. 1. 1. 0. 0. 0. 3. 14. 23. 7. 8. 6.
85. 54. 34. 16. 4. 10. 8. 7. 42. 94. 177. 212. 214. 189. 80. 56.
27. 13. 4. 9. 6. 9. 8. 10. 71. 124. 69. 125. 165. 253. 190. 60.
0. 0. 0. 4. 8. 0. 0. 0. 7. 16. 6. 11. 67. 139. 59. 17.
0. 0. 0. 0. 0. 0. 0. 0. 2. 1. 0. 0. 5. 12. 8. 4.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 1. 0. 0. 0.
7. 4. 8. 6. 4. 2. 1. 0. 3. 2. 10. 12. 22. 12. 5. 0.
50. 32. 27. 29. 19. 16. 6. 17. 37. 76. 73. 82. 93. 108. 68. 40.
25. 11. 10. 17. 24. 14. 3. 6. 29. 54. 20. 38. 94. 124. 133. 44.
1. 2. 0. 1. 5. 2. 0. 0. 6. 4. 0. 2. 36. 85. 50. 21.
0. 0. 0. 0. 0. 0. 0. 0. 0. 1. 0. 0. 7. 4. 5. 4.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 4. 0. 0. 0.
6. 7. 13. 11. 6. 4. 5. 8. 8. 13. 22. 26. 26. 21. 11. 10.
52. 43. 34. 60. 49. 16. 34. 23. 47. 82. 84. 93. 124. 132. 81. 35.
24. 9. 11. 37. 47. 13. 4. 9. 36. 59. 23. 37. 88. 168. 176. 55.
1. 0. 0. 3. 1. 1. 1. 3. 12. 3. 2. 1. 39. 131. 124. 22.
0. 0. 0. 0. 0. 0. 0. 0. 1. 1. 0. 0. 8. 12. 30. 3.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 1. 1. 0.
204. 207. 303. 243. 177. 130. 119. 96. 123. 146. 156. 194. 195. 210. 193. 154.
379. 288. 508. 801. 480. 280. 226. 326. 443. 416. 288. 315. 502. 668. 582. 345.
200. 116. 146. 331. 362. 115. 61. 171. 293. 175. 53. 87. 516. 1008. 820. 419.
22. 2. 18. 29. 82. 8. 8. 18. 32. 37. 5. 17. 226. 526. 559. 128.
0. 0. 0. 2. 1. 1. 0. 1. 0. 1. 0. 0. 24. 39. 114. 12.
0. 0. 0. 0. 1. 0. 0. 0. 0. 0. 0. 0. 1. 1. 5. 0.
235. 238. 265. 259. 185. 146. 112. 142. 193. 285. 377. 402. 461. 464. 352. 236.
202. 183. 190. 317. 234. 137. 206. 250. 487. 416. 295. 280. 560. 846. 514. 256.
44. 24. 10. 31. 88. 53. 31. 67. 104. 88. 30. 25. 133. 265. 223. 83.
5. 1. 2. 3. 12. 9. 13. 31. 8. 6. 5. 3. 20. 56. 54. 12.
0. 0. 0. 0. 0. 0. 3. 5. 1. 0. 0. 1. 1. 5. 5. 0.
0. 0. 0. 1. 0. 0. 2. 0. 0. 0. 0. 0. 0. 0. 0. 0.
170. 185. 179. 174. 123. 91. 64. 66. 73. 126. 215. 294. 445. 450. 353. 199.
16. 36. 21. 32. 38. 25. 11. 19. 47. 116. 71. 37. 110. 192. 97. 22.
0. 1. 0. 0. 0. 1. 1. 0. 2. 0. 3. 0. 0. 7. 0. 1.
1. 0. 0. 0. 0. 1. 1. 0. 0. 0. 0. 0. 0. 2. 10. 0.
2. 3. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 2. 2.
0. 0. 0. 0. 0. 0. 0. 1. 0. 0. 0. 0. 0. 0. 0. 0.
266. 208. 240. 150. 115. 53. 43. 39. 72. 65. 133. 164. 423. 512. 351. 320.
  
```

4.	6.	2.	17.	16.	7.	12.	12.	16.	13.	17.	24.	65.	91.	27.	9.
0.	0.	0.	1.	6.	1.	1.	7.	10.	6.	4.	2.	22.	14.	4.	3.
0.	0.	0.	0.	0.	0.	0.	0.	1.	2.	0.	0.	3.	12.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
101.	0.50	3.50	7.50	12.5	18.5	24.0	55.0								
0731.	0731.	0731.	0731.	0731.	0731.	0731.	0731.	0731.	0731.	0731.	0731.	0731.	0731.	0731.	0731.
2043.	2043.	2043.	2043.	2043.	2043.	2043.	2043.	2043.	2043.	2043.	2043.	2043.	2043.	2043.	2043.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.



# PAVAN Output

Copyright (c) 1990 Ergo Computing, Inc. for Lahey

USNRC COMPUTER CODE-PAVAN, VERSION 2.0

RUN DATE: 04/30/03

## PRINTOUT OF INPUT CARDS

```
1      00010 01111 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 2      Limerick
Ground Release
3      9.14 meters          52.3-7.9 meters
4
5      Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2      6          7 42524      0
7      0.500 5851.000      59.400      10.000      9.140
8      0.000 0.000 0.000 0.000 1.000 0.000 1.000
9      5.000 5.000 7.000 1.000 1.000 1.000 1.000 0.000 0.000 0.000 3.000 14.000 23.000 7.000 8.000 6.000
9      85.000 54.000 34.000 16.000 4.000 10.000 8.000 7.000 42.000 94.000177.000212.000214.000189.000 80.000 56.000
9      27.000 13.000 4.000 9.000 6.000 9.000 8.000 10.000 71.000124.000 69.000125.000165.000253.000190.000 60.000
9      0.000 0.000 0.000 4.000 8.000 0.000 0.000 0.000 7.000 16.000 6.000 11.000 67.000139.000 59.000 17.000
9      0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 2.000 1.000 0.000 0.000 5.000 12.000 8.000 4.000
9      0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000
9      7.000 4.000 8.000 6.000 4.000 2.000 1.000 0.000 3.000 2.000 10.000 12.000 22.000 12.000 5.000 0.000
9      50.000 32.000 27.000 29.000 19.000 16.000 6.000 17.000 37.000 76.000 73.000 82.000 93.000108.000 68.000 40.000
9      25.000 11.000 10.000 17.000 24.000 14.000 3.000 6.000 29.000 54.000 20.000 38.000 94.000124.000133.000 44.000
9      1.000 2.000 0.000 1.000 5.000 2.000 0.000 0.000 6.000 4.000 0.000 2.000 36.000 85.000 50.000 21.000
9      0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 7.000 4.000 5.000 4.000
9      0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 4.000 0.000 0.000 0.000
9      6.000 7.000 13.000 11.000 6.000 4.000 5.000 8.000 8.000 13.000 22.000 26.000 26.000 21.000 11.000 10.000
9      52.000 43.000 34.000 60.000 49.000 16.000 34.000 23.000 47.000 82.000 84.000 93.000124.000132.000 81.000 35.000
9      24.000 9.000 11.000 37.000 47.000 13.000 4.000 9.000 36.000 59.000 23.000 37.000 88.000168.000176.000 55.000
9      1.000 0.000 0.000 3.000 1.000 1.000 1.000 3.000 12.000 3.000 2.000 1.000 39.000131.000124.000 22.000
9      0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 1.000 0.000 0.000 8.000 12.000 30.000 3.000
9      0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 1.000 0.000
9      204.000207.000303.000243.000177.000130.000119.000 96.000123.000146.000156.000194.000195.000210.000193.000154.000
9      379.000288.000508.000801.000480.000280.000226.000326.000443.000416.000288.000315.000502.000668.000582.000345.000
9      200.000116.000146.000331.000362.000115.000 61.000171.000293.000175.000 53.000 87.000516.000*****820.000419.000
9      22.000 2.000 18.000 29.000 82.000 8.000 8.000 18.000 32.000 37.000 5.000 17.000226.000526.000559.000128.000
9      0.000 0.000 0.000 2.000 1.000 1.000 0.000 1.000 0.000 1.000 0.000 0.000 24.000 39.000114.000 12.000
9      0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 1.000 5.000 0.000
9      235.000238.000265.000259.000185.000146.000112.000142.000193.000285.000377.000402.000461.000464.000352.000236.000
9      202.000183.000190.000317.000234.000137.000206.000250.000487.000416.000295.000280.000560.000846.000514.000256.000
9      44.000 24.000 10.000 31.000 88.000 53.000 31.000 67.000104.000 88.000 30.000 25.000133.000265.000223.000 83.000
9      5.000 1.000 2.000 3.000 12.000 9.000 13.000 31.000 8.000 6.000 5.000 3.000 20.000 56.000 54.000 12.000
9      0.000 0.000 0.000 0.000 0.000 0.000 3.000 5.000 1.000 0.000 0.000 1.000 1.000 5.000 5.000 0.000
9      0.000 0.000 0.000 1.000 0.000 0.000 2.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000
9      170.000185.000179.000174.000123.000 91.000 64.000 66.000 73.000126.000215.000294.000445.000450.000353.000199.000
9      16.000 36.000 21.000 32.000 38.000 25.000 11.000 19.000 47.000116.000 71.000 37.000110.000192.000 97.000 22.000
9      0.000 1.000 0.000 0.000 0.000 0.000 1.000 1.000 0.000 2.000 0.000 3.000 0.000 0.000 7.000 0.000 1.000
9      1.000 0.000 0.000 0.000 0.000 1.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 2.000 10.000 0.000
9      2.000 3.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 2.000 2.000
9      0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000
9      266.000208.000240.000150.000115.000 53.000 43.000 39.000 72.000 65.000133.000164.000423.000512.000351.000320.000
9      4.000 6.000 2.000 17.000 16.000 7.000 12.000 12.000 16.000 13.000 17.000 24.000 65.000 91.000 27.000 9.000
9      0.000 0.000 0.000 1.000 6.000 1.000 1.000 7.000 10.000 6.000 4.000 2.000 22.000 14.000 4.000 3.000
9      0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 2.000 0.000 0.000 3.000 12.000 0.000 0.000
9      0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.000 0.000 0.000 0.000
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9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10	101.	0.500	3.500	
7.500	12.500	18.500	24.000	55.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11	731.	731.	731.	731.	731.	731.	731.	731.	731.
731.	731.	731.	731.	731.	731.	731.	731.	11	2043.	2043.	2043.	2043.	2043.	2043.	2043.	2043.	2043.	2043.	2043.	2043.	2043.	2043.	2043.
2043.	2043.	12	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
12	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION

## ATMOSPHERIC STABILITY CLASS A

WIND SPEED (M/S)

TOWER RELEASE	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
0.22 0.23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.56 1.60	0.012	0.012	0.016	0.002	0.002	0.002	0.002	0.000	0.000	0.000	0.007	0.033	0.054	0.016	0.019	0.014	0.193
3.35 3.43	0.200	0.127	0.080	0.038	0.009	0.024	0.019	0.016	0.099	0.221	0.416	0.499	0.503	0.444	0.188	0.132	3.015
5.59 5.72	0.063	0.031	0.009	0.021	0.014	0.021	0.019	0.024	0.167	0.292	0.162	0.294	0.388	0.595	0.447	0.141	2.688
8.27 8.46	0.000	0.000	0.000	0.009	0.019	0.000	0.000	0.000	0.016	0.038	0.014	0.026	0.158	0.327	0.139	0.040	0.785
10.73 10.97	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.002	0.000	0.000	0.012	0.028	0.019	0.009	0.075
24.59 25.15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.002
TOTAL	0.28	0.17	0.11	0.07	0.04	0.05	0.04	0.04	0.29	0.55	0.60	0.85	1.12	1.41	0.81	0.34	6.76

## JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION

## ATMOSPHERIC STABILITY CLASS B

WIND SPEED (M/S)

TOWER RELEASE	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
0.22 0.23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.56 1.60	0.016	0.009	0.019	0.014	0.009	0.005	0.002	0.000	0.007	0.005	0.024	0.028	0.052	0.028	0.012	0.000	0.230
3.35 3.43	0.118	0.075	0.063	0.068	0.045	0.038	0.014	0.040	0.087	0.179	0.172	0.193	0.219	0.254	0.160	0.094	1.818
5.59 5.72	0.059	0.026	0.024	0.040	0.056	0.033	0.007	0.014	0.068	0.127	0.047	0.089	0.221	0.292	0.313	0.103	1.519
8.27 8.46	0.002	0.005	0.000	0.002	0.012	0.005	0.000	0.000	0.014	0.009	0.000	0.005	0.085	0.200	0.118	0.049	0.506
10.73 10.97	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.016	0.009	0.012	0.009	0.049
24.59 25.15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.000	0.000	0.000	0.009
TOTAL	0.20	0.12	0.11	0.12	0.12	0.08	0.02	0.05	0.18	0.32	0.24	0.32	0.60	0.78	0.61	0.26	4.13

## JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION

## ATMOSPHERIC STABILITY CLASS C

WIND SPEED (M/S)

TOWER RELEASE	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
0.22 0.23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.56 1.60	0.014	0.016	0.031	0.026	0.014	0.009	0.012	0.019	0.019	0.031	0.052	0.061	0.061	0.049	0.026	0.024	0.463
3.35 3.43	0.122	0.101	0.080	0.141	0.115	0.038	0.080	0.054	0.111	0.193	0.198	0.219	0.292	0.310	0.190	0.082	2.326
5.59 5.72	0.056	0.021	0.026	0.087	0.111	0.031	0.009	0.021	0.085	0.139	0.054	0.087	0.207	0.395	0.414	0.129	1.872
8.27 8.46	0.002	0.000	0.000	0.007	0.002	0.002	0.002	0.007	0.028	0.007	0.005	0.002	0.092	0.308	0.292	0.052	0.809
10.73 10.97	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.002	0.000	0.000	0.019	0.028	0.071	0.007	0.129
24.59 25.15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.002	0.000	0.005
TOTAL	0.20	0.14	0.14	0.26	0.24	0.08	0.10	0.10	0.24	0.37	0.31	0.37	0.67	1.09	0.99	0.29	5.60

## JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION

## ATMOSPHERIC STABILITY CLASS D

WIND SPEED (M/S)

TOWER RELEASE	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
0.22 0.23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.56 1.60	0.480	0.487	0.713	0.571	0.416	0.306	0.280	0.226	0.289	0.343	0.367	0.456	0.459	0.494	0.454	0.362	6.702
3.35 3.43	0.891	0.677	1.195	1.884	1.129	0.658	0.531	0.767	1.042	0.978	0.677	0.741	1.181	1.571	1.369	0.811	16.101
5.59 5.72	0.470	0.273	0.343	0.778	0.851	0.270	0.143	0.402	0.689	0.412	0.125	0.205	1.213	2.370	1.928	0.985	11.459
8.27 8.46	0.052	0.005	0.042	0.068	0.193	0.019	0.019	0.042	0.075	0.087	0.012	0.040	0.531	1.237	1.315	0.301	4.038
10.73 10.97	0.000	0.000	0.000	0.005	0.002	0.002	0.000	0.002	0.000	0.002	0.000	0.000	0.056	0.092	0.268	0.028	0.459
24.59 25.15	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.002	0.012	0.000	0.019
TOTAL	1.89	1.44	2.29	3.31	2.59	1.26	0.97	1.44	2.10	1.82	1.18	1.44	3.44	5.77	5.35	2.49	38.78

## JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION

## ATMOSPHERIC STABILITY CLASS E

WIND SPEED (M/S)

TOWER RELEASE	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
0.22 0.23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
1.56 1.64	0.553	0.560	0.623	0.609	0.435	0.343	0.263	0.334	0.454	0.670	0.887	0.945	1.084	1.091	0.828	0.555	10.234
3.35 3.51	0.475	0.430	0.447	0.745	0.550	0.322	0.484	0.588	1.145	0.978	0.694	0.658	1.317	1.989	1.209	0.602	12.635
5.59 5.84	0.103	0.056	0.024	0.073	0.207	0.125	0.073	0.158	0.245	0.207	0.071	0.059	0.313	0.623	0.524	0.195	3.055
8.27 8.65	0.012	0.002	0.005	0.007	0.028	0.021	0.031	0.073	0.019	0.014	0.012	0.007	0.047	0.132	0.127	0.028	0.564
10.73 11.22	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.012	0.002	0.000	0.000	0.002	0.002	0.012	0.012	0.000	0.049
24.59 25.72	0.000	0.000	0.000	0.002	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007
TOTAL	1.14	1.05	1.10	1.44	1.22	0.81	0.86	1.16	1.86	1.87	1.66	1.67	2.76	3.85	2.70	1.38	26.55

## JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION

## ATMOSPHERIC STABILITY CLASS F

WIND SPEED (M/S)

TOWER RELEASE	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
0.22 0.23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.56 1.64	0.400	0.435	0.421	0.409	0.289	0.214	0.151	0.155	0.172	0.296	0.506	0.691	1.046	1.058	0.830	0.468	7.542
3.35 3.51	0.038	0.085	0.049	0.075	0.089	0.059	0.026	0.045	0.111	0.273	0.167	0.087	0.259	0.452	0.228	0.052	2.093
5.59 5.84	0.000	0.002	0.000	0.000	0.000	0.002	0.002	0.000	0.005	0.000	0.007	0.000	0.000	0.016	0.000	0.002	0.038
8.27 8.65	0.002	0.000	0.000	0.000	0.000	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.024	0.000	0.035
10.73 11.22	0.005	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.005	0.021
24.59 25.72	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
TOTAL	0.44	0.53	0.47	0.48	0.38	0.28	0.18	0.20	0.29	0.57	0.68	0.78	1.31	1.53	1.09	0.53	9.73

## JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION

## ATMOSPHERIC STABILITY CLASS G

WIND SPEED (M/S)

TOWER RELEASE	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
0.22 0.23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
1.56 1.64	0.626	0.489	0.564	0.353	0.270	0.125	0.101	0.092	0.169	0.153	0.313	0.386	0.995	1.204	0.825	0.753	7.417
3.35 3.51	0.009	0.014	0.005	0.040	0.038	0.016	0.028	0.028	0.038	0.031	0.040	0.056	0.153	0.214	0.063	0.021	0.795
5.59 5.84	0.000	0.000	0.000	0.002	0.014	0.002	0.002	0.016	0.024	0.014	0.009	0.005	0.052	0.033	0.009	0.007	0.190
8.27 8.65	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.005	0.000	0.000	0.007	0.028	0.000	0.000	0.042
10.73 11.22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.002
24.59 25.72	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	0.64	0.50	0.57	0.40	0.32	0.14	0.13	0.14	0.23	0.20	0.36	0.45	1.21	1.48	0.90	0.78	8.45

WIND MEASURED AT 9.1 METERS.

WIND SPEED CORRECTED TO THE RELEASE HEIGHT OF 10.0 METERS.

## OVERALL WIND DIRECTION FREQUENCY

WIND DIRECTION:	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
FREQUENCY:	4.8	3.9	4.8	6.1	4.9	2.7	2.3	3.1	5.2	5.7	5.0	5.9	11.1	15.9	12.4	6.1

## OVERALL WIND SPEED FREQUENCY AS MEASURED ON THE TOWER:

MAX.WIND SPEED (M/S):	0.224	1.565	3.353	5.588	8.270	10.729	24.587
WIND SPEED FREQUENCY:	0.00	32.78	38.78	20.82	6.78	0.79	0.04

## BUILDING AND RELEASE CHARACTERISTICS:

RELEASE HEIGHT: 10.00 METERS

MIXING VOLUME COEFFICIENT: 0.50

BUILDING CROSS-SECTIONAL AREA: 5851.00 SQUARE METERS

## BOUNDARY DISTANCES (METERS) FROM THE SOURCE FOR EACH DOWNWIND SECTOR:

DOWNWIND SECTOR	S	SSW	SW	WSW	W	WNW	NW	NNW	N	NNE	NE	ENE	E	ESE	SE	SSE
-----------------	---	-----	----	-----	---	-----	----	-----	---	-----	----	-----	---	-----	----	-----

BOUNDARY 1        731.   731.   731.   731.   731.   731.   731.   731.   731.   731.   731.   731.   731.   731.   731.   731.  
BOUNDARY 2        2043. 2043. 2043. 2043. 2043. 2043. 2043. 2043. 2043. 2043. 2043. 2043. 2043. 2043. 2043. 2043.  
THE CONVERSION FACTOR APPLIED TO THE WIND SPEED CLASSES IS    0.447

USNRC COMPUTER CODE-PAVAN, VERSION 2.0

RUN DATE: 04/30/03

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

WINDSPEEDS ADJUSTED TO 10.0 METERS.

PERCENT OF THE TIME A GIVEN WINDSPEED IS LOWER:

WINDSPEED (METER/SEC)	CUMULATIVE FREQUENCY (PERCENT)
0.23	0.00
0.23	0.00
1.60	7.59
1.64	32.79
3.43	56.05
3.51	71.57
5.72	89.11
5.84	92.39
8.46	98.53
8.65	99.17
10.97	99.88
11.22	99.96
25.15	99.99
25.72	100.00

WINDSPEED (INTERPOLATED) (METER/SEC)	CUMULATIVE FREQUENCY (PERCENT)
0.23	0.00
1.63	32.79
3.46	71.57
5.74	92.39
8.48	99.17
11.00	99.96
25.27	100.00

LOG-NORMAL INTERPOLATION PERCENTILES

WINDSPEED (METER/SEC)	CUMULATIVE FREQUENCY (PERCENT)
0.57	1.00
0.73	3.00
0.83	5.00
1.02	10.00
1.17	15.00
1.30	20.00
1.43	25.00
1.56	30.00
1.70	35.00
1.88	40.00
2.06	45.00
2.27	50.00

2.49	55.00
2.74	60.00
3.02	65.00
3.35	70.00
3.68	75.00
4.06	80.00
4.67	85.00
5.25	90.00

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE S SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC AT 10.0 METERS	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN METERS	HT METERS	EFF METERS	PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	CHI/Q VALUES (SEC/CUBIC METER)	BLDG WAKE CA=2926.SQ.METERS	USED
A	1.6	0.25	731.	0.	0.	0.	141.1	248.3	141.1	5.677E-06	5.530E-06	5.530E-06	
A	3.4	4.18	731.	0.	0.	0.	141.1	248.3	141.1	2.649E-06	2.581E-06	2.581E-06	
A	5.7	1.33	731.	0.	0.	0.	141.1	248.3	141.1	1.589E-06	1.548E-06	1.548E-06	
B	1.6	0.34	731.	0.	0.	0.	106.1	77.9	106.1	2.406E-05	2.162E-05	2.162E-05	
B	3.4	2.46	731.	0.	0.	0.	106.1	77.9	106.1	1.123E-05	1.009E-05	1.009E-05	
B	5.7	1.23	731.	0.	0.	0.	106.1	77.9	106.1	6.736E-06	6.055E-06	6.055E-06	
B	8.5	0.05	731.	0.	0.	0.	106.1	77.9	106.1	4.552E-06	4.091E-06	4.091E-06	
C	1.6	0.30	731.	0.	0.	0.	80.6	45.9	80.6	5.373E-05	4.293E-05	4.293E-05	
C	3.4	2.56	731.	0.	0.	0.	80.6	45.9	80.6	2.507E-05	2.003E-05	2.003E-05	
C	5.7	1.18	731.	0.	0.	0.	80.6	45.9	80.6	1.504E-05	1.202E-05	1.202E-05	
C	8.5	0.05	731.	0.	0.	0.	80.6	45.9	80.6	1.017E-05	8.122E-06	8.122E-06	
D	1.6	10.03	731.	0.	0.	0.	56.8	24.8	113.5	7.076E-05	8.512E-05	7.076E-05	
D	3.4	18.64	731.	0.	0.	0.	56.8	24.8	80.8	4.640E-05	3.972E-05	3.972E-05	
D	5.7	9.84	731.	0.	0.	0.	56.8	24.8	58.5	3.843E-05	2.383E-05	2.383E-05	
D	8.5	1.08	731.	0.	0.	0.	56.8	24.8	56.8	2.677E-05	1.610E-05	1.610E-05	
E	0.2	0.00	731.	0.	0.	0.	40.4	17.2	121.1	6.556E-04	8.386E-04	6.556E-04	
E	1.6	11.56	731.	0.	0.	0.	40.4	17.2	121.1	9.366E-05	1.198E-04	9.366E-05	
E	3.5	9.94	731.	0.	0.	0.	40.4	17.2	69.1	7.664E-05	5.591E-05	5.591E-05	
E	5.8	2.16	731.	0.	0.	0.	40.4	17.2	41.4	7.664E-05	3.355E-05	3.355E-05	
E	8.7	0.25	731.	0.	0.	0.	40.4	17.2	40.4	5.316E-05	2.267E-05	2.267E-05	
F	1.6	8.36	731.	0.	0.	0.	27.9	11.0	111.4	1.591E-04	2.122E-04	1.591E-04	
F	3.5	0.79	731.	0.	0.	0.	27.9	11.0	54.9	1.508E-04	9.900E-05	9.900E-05	
F	8.7	0.05	731.	0.	0.	0.	27.9	11.0	27.9	1.204E-04	4.014E-05	4.014E-05	
F	11.2	0.10	731.	0.	0.	0.	27.9	11.0	27.9	9.283E-05	3.094E-05	3.094E-05	
G	0.2	0.00	731.	0.	0.	0.	19.2	7.0	115.4	1.682E-03	3.364E-03	1.682E-03	
G	1.6	13.08	731.	0.	0.	0.	19.2	7.0	115.4	2.403E-04	4.806E-04	2.403E-04	
G	3.5	0.20	731.	0.	0.	0.	19.2	7.0	46.2	2.803E-04	2.243E-04	2.243E-04	



PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## SITE EXCLUSION BOUNDARY CALCULATIONS:

S SECTOR BOUNDARY DISTANCE = 731.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED  
AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

1.682E-03	6.556E-04	2.403E-04	2.243E-04	1.591E-04	9.900E-05	9.366E-05	7.076E-05	5.591E-05	4.293E-05
0.004	0.007	13.090	13.287	21.648	22.435	33.994	44.027	53.963	54.258
0.00020	0.00033	0.62585	0.63526	1.03504	1.07266	1.62529	2.10502	2.58004	2.59415
4.014E-05	3.972E-05	3.355E-05	3.094E-05	2.383E-05	2.267E-05	2.162E-05	2.003E-05	1.610E-05	1.202E-05
54.307	72.948	75.112	75.211	85.048	85.294	85.638	88.196	89.278	90.458
2.59651	3.48777	3.59124	3.59594	4.06626	4.07802	4.09448	4.21677	4.26850	4.32494
1.009E-05	8.122E-06	6.055E-06	5.530E-06	4.091E-06	2.581E-06	1.548E-06			
92.917	92.967	94.196	94.442	94.491	98.672	100.000			
4.44252	4.44487	4.50366	4.51542	4.51777	4.71766	4.78116			

## X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE  
ORDERED X/Q-FREQUENCY VALUES, AND AS  
PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q	WITH RESPECT TO	WHEN THE WIND BLOWS
SEC/CUBIC METER	THE TOTAL TIME	INTO THIS SECTOR ONLY

HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 3)=	1.034
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 4)=	3.485
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 5)=	4.063
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 6)=	4.213

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
1	1	-6.38764	-10.63112	-0.91990
1	2	-8.33355	-13.93542	-2.24286
1	3	-8.74579	-15.16882	-2.77592
1	4	-10.13357	-23.28307	-7.24929
1	5	-10.64440	-28.46706	-10.22272
1	6	-10.81804	NUMXQ(K)= 6	
		5.043E-04	0.048	1.000
		3.752E-04	0.143	3.000
		3.238E-04	0.239	5.000

2.620E-04	0.478	10.000
2.155E-04	0.717	15.000
1.701E-04	0.956	20.000
1.367E-04	1.195	25.000
1.123E-04	1.434	30.000
9.470E-05	1.673	35.000
8.146E-05	1.912	40.000
7.115E-05	2.152	45.000
6.290E-05	2.391	50.000
5.617E-05	2.630	55.000
5.057E-05	2.869	60.000
4.585E-05	3.108	65.000
4.183E-05	3.347	70.000
3.626E-05	3.586	75.000
2.927E-05	3.825	80.000
2.388E-05	4.064	85.000
2.583E-04	0.5	10.46

ANNUAL AVERAGE = 3.83E-06

K= 1 FIVEXQ(K)= 2.583E-04 FIVEPR(K)=10.458

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE SSW SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	EFF PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
									MEANDER	BLDG WAKE	USED
AT 10.0 METERS									CA=2926.SQ.METERS		
A	1.6	0.30	731.	0.	0.	141.1	248.3	141.1	5.677E-06	5.530E-06	5.530E-06
A	3.4	3.22	731.	0.	0.	141.1	248.3	141.1	2.649E-06	2.581E-06	2.581E-06
A	5.7	0.77	731.	0.	0.	141.1	248.3	141.1	1.589E-06	1.548E-06	1.548E-06
B	1.6	0.24	731.	0.	0.	106.1	77.9	106.1	2.406E-05	2.162E-05	2.162E-05
B	3.4	1.91	731.	0.	0.	106.1	77.9	106.1	1.123E-05	1.009E-05	1.009E-05
B	5.7	0.66	731.	0.	0.	106.1	77.9	106.1	6.736E-06	6.055E-06	6.055E-06
B	8.5	0.12	731.	0.	0.	106.1	77.9	106.1	4.552E-06	4.091E-06	4.091E-06
C	1.6	0.42	731.	0.	0.	80.6	45.9	80.6	5.373E-05	4.293E-05	4.293E-05
C	3.4	2.56	731.	0.	0.	80.6	45.9	80.6	2.507E-05	2.003E-05	2.003E-05
C	5.7	0.54	731.	0.	0.	80.6	45.9	80.6	1.504E-05	1.202E-05	1.202E-05
D	1.6	12.34	731.	0.	0.	56.8	24.8	113.5	7.076E-05	8.512E-05	7.076E-05
D	3.4	17.16	731.	0.	0.	56.8	24.8	80.8	4.640E-05	3.972E-05	3.972E-05
D	5.7	6.91	731.	0.	0.	56.8	24.8	58.5	3.843E-05	2.383E-05	2.383E-05
D	8.5	0.12	731.	0.	0.	56.8	24.8	56.8	2.677E-05	1.610E-05	1.610E-05
E	0.2	0.00	731.	0.	0.	40.4	17.2	121.1	6.556E-04	8.386E-04	6.556E-04
E	1.6	14.18	731.	0.	0.	40.4	17.2	121.1	9.366E-05	1.198E-04	9.366E-05
E	3.5	10.91	731.	0.	0.	40.4	17.2	69.1	7.664E-05	5.591E-05	5.591E-05
E	5.8	1.43	731.	0.	0.	40.4	17.2	41.4	7.664E-05	3.355E-05	3.355E-05
E	8.7	0.06	731.	0.	0.	40.4	17.2	40.4	5.316E-05	2.267E-05	2.267E-05
F	1.6	11.02	731.	0.	0.	27.9	11.0	111.4	1.591E-04	2.122E-04	1.591E-04
F	3.5	2.15	731.	0.	0.	27.9	11.0	54.9	1.508E-04	9.900E-05	9.900E-05
F	5.8	0.06	731.	0.	0.	27.9	11.0	28.8	1.724E-04	5.940E-05	5.940E-05
F	11.2	0.18	731.	0.	0.	27.9	11.0	27.9	9.283E-05	3.094E-05	3.094E-05
G	0.2	0.00	731.	0.	0.	19.2	7.0	115.4	1.682E-03	3.364E-03	1.682E-03
G	1.6	12.39	731.	0.	0.	19.2	7.0	115.4	2.403E-04	4.806E-04	2.403E-04
G	3.5	0.36	731.	0.	0.	19.2	7.0	46.2	2.803E-04	2.243E-04	2.243E-04

USNRC COMPUTER CODE-PAVAN, VERSION 2.0

RUN DATE: 04/30/03

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

#### SITE EXCLUSION BOUNDARY CALCULATIONS:

SSW SECTOR BOUNDARY DISTANCE = 731.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

1.682E-03	6.556E-04	2.403E-04	2.243E-04	1.591E-04	9.900E-05	9.366E-05	7.076E-05	5.940E-05	5.591E-05
0.004	0.007	12.402	12.760	23.784	25.929	40.112	52.447	52.506	63.411
0.00016	0.00028	0.48942	0.50353	0.93858	1.02324	1.58292	2.06970	2.07206	2.50240
4.293E-05	3.972E-05	3.355E-05	3.094E-05	2.383E-05	2.267E-05	2.162E-05	2.003E-05	1.610E-05	1.202E-05
63.829	80.991	82.421	82.600	89.512	89.572	89.810	92.372	92.492	93.028
2.51886	3.19613	3.25257	3.25962	3.53241	3.53476	3.54417	3.64529	3.64999	3.67115
1.009E-05	6.055E-06	5.530E-06	4.091E-06	2.581E-06	1.548E-06				
94.935	95.590	95.888	96.007	99.225	100.000				
3.74640	3.77227	3.78403	3.78873	3.91572	3.94629				

#### X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE  
ORDERED X/Q-FREQUENCY VALUES, AND AS  
PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q WITH RESPECT TO WHEN THE WIND BLOWS  
SEC/CUBIC METER THE TOTAL TIME INTO THIS SECTOR ONLY

HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 3)=	0.937
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 4)=	2.068
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 5)=	2.500
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 6)=	3.193
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 7)=	3.529
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 8)=	3.642

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
2	1	-6.38764	-10.75038	-0.93544
2	2	-8.33355	-12.90179	-1.76815
2	3	-8.74579	-14.88163	-2.61047
2	4	-9.55627	-15.56025	-2.94313
2	5	-9.79177	-16.06161	-3.19892
2	6	-10.13357	-31.17130	-11.35251
2	7	-10.64440	-32.57639	-12.12961

2	8	-10.81804	NUMXQ(K) = 8	
4.953E-04		0.039		1.000
3.683E-04		0.118		3.000
3.179E-04		0.197		5.000
2.574E-04		0.395		10.000
2.137E-04		0.592		15.000
1.781E-04		0.789		20.000
1.516E-04		0.987		25.000
1.266E-04		1.184		30.000
1.083E-04		1.381		35.000
9.435E-05		1.579		40.000
8.337E-05		1.776		45.000
7.450E-05		1.973		50.000
6.675E-05		2.170		55.000
5.992E-05		2.368		60.000
5.404E-05		2.565		65.000
4.878E-05		2.762		70.000
4.429E-05		2.960		75.000
4.043E-05		3.157		80.000
3.107E-05		3.354		85.000
2.313E-05		3.552		90.000
2.372E-04		0.5		12.67

ANNUAL AVERAGE = 3.44E-06

K= 2 FIVEXQ(K) = 2.372E-04 FIVEPR(K) = 12.670

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE SW SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC AT 10.0 METERS	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	HT EFF METERS	PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
										MEANDER	BLDG WAKE CA=2926.SQ.METERS	USED
A	1.6	0.34	731.	0.	0.	0.	141.1	248.3	141.1	5.677E-06	5.530E-06	5.530E-06
A	3.4	1.67	731.	0.	0.	0.	141.1	248.3	141.1	2.649E-06	2.581E-06	2.581E-06
A	5.7	0.20	731.	0.	0.	0.	141.1	248.3	141.1	1.589E-06	1.548E-06	1.548E-06
B	1.6	0.39	731.	0.	0.	0.	106.1	77.9	106.1	2.406E-05	2.162E-05	2.162E-05
B	3.4	1.33	731.	0.	0.	0.	106.1	77.9	106.1	1.123E-05	1.009E-05	1.009E-05
B	5.7	0.49	731.	0.	0.	0.	106.1	77.9	106.1	6.736E-06	6.055E-06	6.055E-06
C	1.6	0.64	731.	0.	0.	0.	80.6	45.9	80.6	5.373E-05	4.293E-05	4.293E-05
C	3.4	1.67	731.	0.	0.	0.	80.6	45.9	80.6	2.507E-05	2.003E-05	2.003E-05
C	5.7	0.54	731.	0.	0.	0.	80.6	45.9	80.6	1.504E-05	1.202E-05	1.202E-05
D	1.6	14.91	731.	0.	0.	0.	56.8	24.8	113.5	7.076E-05	8.512E-05	7.076E-05
D	3.4	25.00	731.	0.	0.	0.	56.8	24.8	80.8	4.640E-05	3.972E-05	3.972E-05
D	5.7	7.18	731.	0.	0.	0.	56.8	24.8	58.5	3.843E-05	2.383E-05	2.383E-05
D	8.5	0.89	731.	0.	0.	0.	56.8	24.8	56.8	2.677E-05	1.610E-05	1.610E-05
E	0.2	0.00	731.	0.	0.	0.	40.4	17.2	121.1	6.556E-04	8.386E-04	6.556E-04
E	1.6	13.04	731.	0.	0.	0.	40.4	17.2	121.1	9.366E-05	1.198E-04	9.366E-05
E	3.5	9.35	731.	0.	0.	0.	40.4	17.2	69.1	7.664E-05	5.591E-05	5.591E-05
E	5.8	0.49	731.	0.	0.	0.	40.4	17.2	41.4	7.664E-05	3.355E-05	3.355E-05
E	8.7	0.10	731.	0.	0.	0.	40.4	17.2	40.4	5.316E-05	2.267E-05	2.267E-05
F	1.6	8.81	731.	0.	0.	0.	27.9	11.0	111.4	1.591E-04	2.122E-04	1.591E-04
F	3.5	1.03	731.	0.	0.	0.	27.9	11.0	54.9	1.508E-04	9.900E-05	9.900E-05
G	0.2	0.00	731.	0.	0.	0.	19.2	7.0	115.4	1.682E-03	3.364E-03	1.682E-03
G	1.6	11.81	731.	0.	0.	0.	19.2	7.0	115.4	2.403E-04	4.806E-04	2.403E-04
G	3.5	0.10	731.	0.	0.	0.	19.2	7.0	46.2	2.803E-04	2.243E-04	2.243E-04

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## SITE EXCLUSION BOUNDARY CALCULATIONS:

SW SECTOR BOUNDARY DISTANCE = 731.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

1.682E-03	6.556E-04	2.403E-04	2.243E-04	1.591E-04	9.900E-05	9.366E-05	7.076E-05	5.591E-05	4.293E-05
0.004	0.007	11.817	11.915	20.724	21.757	34.798	49.708	59.058	59.698
0.00018	0.00032	0.56471	0.56941	0.99035	1.03974	1.66291	2.37545	2.82226	2.85283
3.972E-05	3.355E-05	2.383E-05	2.267E-05	2.162E-05	2.003E-05	1.610E-05	1.202E-05	1.009E-05	6.055E-06
84.696	85.188	92.373	92.471	92.865	94.538	95.424	95.965	97.294	97.786
4.04745	4.07096	4.41430	4.41900	4.43782	4.51777	4.56010	4.58597	4.64946	4.67298
5.530E-06	2.581E-06	1.548E-06							
98.130	99.803	100.000							
4.68944	4.76939	4.77880							

## X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE ORDERED X/Q-FREQUENCY VALUES, AND AS PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q	WITH RESPECT TO	WHEN THE WIND BLOWS
SEC/CUBIC METER	THE TOTAL TIME	INTO THIS SECTOR ONLY

HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 3)=	0.989
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 4)=	2.373
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 5)=	4.044
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 6)=	4.411
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 7)=	4.514

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
3	1	-6.38764	-10.68101	-0.92643
3	2	-8.33355	-13.46772	-2.02621
3	3	-8.74579	-14.16931	-2.32727
3	4	-9.55627	-14.39332	-2.44028
3	5	-10.13357	-32.03783	-12.54830
3	6	-10.64440	-37.58858	-15.80409
3	7	-10.81804	NUMXQ(K)= 7	
		4.903E-04	0.048	1.000

3.640E-04	0.143	3.000
3.138E-04	0.239	5.000
2.536E-04	0.478	10.000
2.024E-04	0.717	15.000
1.635E-04	0.956	20.000
1.348E-04	1.195	25.000
1.143E-04	1.434	30.000
9.913E-05	1.673	35.000
8.737E-05	1.912	40.000
7.800E-05	2.150	45.000
7.033E-05	2.389	50.000
6.366E-05	2.628	55.000
5.805E-05	2.867	60.000
5.327E-05	3.106	65.000
4.914E-05	3.345	70.000
4.553E-05	3.584	75.000
4.237E-05	3.823	80.000
3.890E-05	4.062	85.000
2.780E-05	4.301	90.000
2.499E-04	0.5	10.46

ANNUAL AVERAGE = 4.02E-06

K= 3 FIVEXQ(K)= 2.499E-04 FIVEPR(K)=10.463



PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE WSW SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	EFF PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
									MEANDER	BLDG WAKE	USED
AT 10.0 METERS									CA=2926.SQ.METERS		
A	1.6	0.04	731.	0.	0.	141.1	248.3	141.1	5.677E-06	5.530E-06	5.530E-06
A	3.4	0.62	731.	0.	0.	141.1	248.3	141.1	2.649E-06	2.581E-06	2.581E-06
A	5.7	0.35	731.	0.	0.	141.1	248.3	141.1	1.589E-06	1.548E-06	1.548E-06
A	8.5	0.15	731.	0.	0.	141.1	248.3	141.1	1.074E-06	1.046E-06	1.046E-06
B	1.6	0.23	731.	0.	0.	106.1	77.9	106.1	2.406E-05	2.162E-05	2.162E-05
B	3.4	1.12	731.	0.	0.	106.1	77.9	106.1	1.123E-05	1.009E-05	1.009E-05
B	5.7	0.66	731.	0.	0.	106.1	77.9	106.1	6.736E-06	6.055E-06	6.055E-06
B	8.5	0.04	731.	0.	0.	106.1	77.9	106.1	4.552E-06	4.091E-06	4.091E-06
C	1.6	0.43	731.	0.	0.	80.6	45.9	80.6	5.373E-05	4.293E-05	4.293E-05
C	3.4	2.32	731.	0.	0.	80.6	45.9	80.6	2.507E-05	2.003E-05	2.003E-05
C	5.7	1.43	731.	0.	0.	80.6	45.9	80.6	1.504E-05	1.202E-05	1.202E-05
C	8.5	0.12	731.	0.	0.	80.6	45.9	80.6	1.017E-05	8.122E-06	8.122E-06
D	1.6	9.40	731.	0.	0.	56.8	24.8	113.5	7.076E-05	8.512E-05	7.076E-05
D	3.4	30.99	731.	0.	0.	56.8	24.8	80.8	4.640E-05	3.972E-05	3.972E-05
D	5.7	12.80	731.	0.	0.	56.8	24.8	58.5	3.843E-05	2.383E-05	2.383E-05
D	8.5	1.12	731.	0.	0.	56.8	24.8	56.8	2.677E-05	1.610E-05	1.610E-05
D	11.0	0.08	731.	0.	0.	56.8	24.8	56.8	2.064E-05	1.241E-05	1.241E-05
E	0.2	0.00	731.	0.	0.	40.4	17.2	121.1	6.556E-04	8.386E-04	6.556E-04
E	1.6	10.02	731.	0.	0.	40.4	17.2	121.1	9.366E-05	1.198E-04	9.366E-05
E	3.5	12.26	731.	0.	0.	40.4	17.2	69.1	7.664E-05	5.591E-05	5.591E-05
E	5.8	1.20	731.	0.	0.	40.4	17.2	41.4	7.664E-05	3.355E-05	3.355E-05
E	8.7	0.12	731.	0.	0.	40.4	17.2	40.4	5.316E-05	2.267E-05	2.267E-05
E	25.7	0.04	731.	0.	0.	40.4	17.2	40.4	1.788E-05	7.624E-06	7.624E-06
F	1.6	6.73	731.	0.	0.	27.9	11.0	111.4	1.591E-04	2.122E-04	1.591E-04
F	3.5	1.24	731.	0.	0.	27.9	11.0	54.9	1.508E-04	9.900E-05	9.900E-05
G	0.2	0.00	731.	0.	0.	19.2	7.0	115.4	1.682E-03	3.364E-03	1.682E-03
G	1.6	5.80	731.	0.	0.	19.2	7.0	115.4	2.403E-04	4.806E-04	2.403E-04
G	3.5	0.66	731.	0.	0.	19.2	7.0	46.2	2.803E-04	2.243E-04	2.243E-04
G	5.8	0.04	731.	0.	0.	19.2	7.0	20.1	3.869E-04	1.346E-04	1.346E-04

USNRC COMPUTER CODE-PAVAN, VERSION 2.0

RUN DATE: 04/30/03

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

# SITE EXCLUSION BOUNDARY CALCULATIONS:

WSW SECTOR BOUNDARY DISTANCE = 731.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED  
AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

1.682E-03	6.556E-04	2.403E-04	2.243E-04	1.591E-04	1.346E-04	9.900E-05	9.366E-05	7.076E-05	5.591E-05
0.002	0.004	5.807	6.464	13.195	13.234	14.472	24.491	33.891	46.153
0.00011	0.00025	0.35299	0.39297	0.80215	0.80450	0.87976	1.48882	2.06027	2.80573
4.293E-05	3.972E-05	3.355E-05	2.383E-05	2.267E-05	2.162E-05	2.003E-05	1.610E-05	1.241E-05	1.202E-05
46.579	77.564	78.763	91.567	91.683	91.915	94.236	95.358	95.435	96.867
2.83159	4.71524	4.78814	5.56652	5.57358	5.58769	5.72878	5.79698	5.80168	5.88869
1.009E-05	8.122E-06	7.624E-06	6.055E-06	5.530E-06	4.091E-06	2.581E-06	1.548E-06	1.046E-06	
97.988	98.105	98.143	98.801	98.840	98.878	99.497	99.845	100.000	
5.95689	5.96394	5.96630	6.00627	6.00862	6.01098	6.04860	6.06977	6.07917	

## X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE  
ORDERED X/Q-FREQUENCY VALUES, AND AS  
PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q	WITH RESPECT TO	WHEN THE WIND BLOWS
SEC/CUBIC METER	THE TOTAL TIME	INTO THIS SECTOR ONLY

HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 3)=	0.801
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 4)=	4.712
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 5)=	5.563
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 6)=	5.725
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 7)=	5.953

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
4	1	-6.38764	-10.90845	-0.95565
4	2	-8.33355	-12.21691	-1.44128
4	3	-8.74579	-13.29384	-1.88844
4	4	-10.13357	-20.70018	-6.31415
4	5	-10.64440	-29.99416	-12.14995
4	6	-10.81804	-66.15426	-35.06090
4	7	-11.50388	NUMXQ(K)= 7	
		4.030E-04	0.061	1.000

2.946E-04	0.182	3.000
2.520E-04	0.304	5.000
1.837E-04	0.608	10.000
1.456E-04	0.912	15.000
1.186E-04	1.216	20.000
1.006E-04	1.520	25.000
8.756E-05	1.824	30.000
7.766E-05	2.128	35.000
6.983E-05	2.432	40.000
6.346E-05	2.736	45.000
5.817E-05	3.040	50.000
5.368E-05	3.344	55.000
4.983E-05	3.648	60.000
4.649E-05	3.951	65.000
4.355E-05	4.255	70.000
4.095E-05	4.559	75.000
3.616E-05	4.863	80.000
3.003E-05	5.167	85.000
2.516E-05	5.471	90.000

2.027E-04	0.5	8.22
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ANNUAL AVERAGE = 3.83E-06

K= 4 FIVEXQ(K)= 2.027E-04 FIVEPR(K)= 8.225

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE W SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	EFF PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
									MEANDER	BLDG WAKE	USED
AT 10.0 METERS											
CA=2926.SQ.METERS											
A	1.6	0.05	731.	0.	0.	141.1	248.3	141.1	5.677E-06	5.530E-06	5.530E-06
A	3.4	0.19	731.	0.	0.	141.1	248.3	141.1	2.649E-06	2.581E-06	2.581E-06
A	5.7	0.29	731.	0.	0.	141.1	248.3	141.1	1.589E-06	1.548E-06	1.548E-06
A	8.5	0.38	731.	0.	0.	141.1	248.3	141.1	1.074E-06	1.046E-06	1.046E-06
B	1.6	0.19	731.	0.	0.	106.1	77.9	106.1	2.406E-05	2.162E-05	2.162E-05
B	3.4	0.91	731.	0.	0.	106.1	77.9	106.1	1.123E-05	1.009E-05	1.009E-05
B	5.7	1.15	731.	0.	0.	106.1	77.9	106.1	6.736E-06	6.055E-06	6.055E-06
B	8.5	0.24	731.	0.	0.	106.1	77.9	106.1	4.552E-06	4.091E-06	4.091E-06
C	1.6	0.29	731.	0.	0.	80.6	45.9	80.6	5.373E-05	4.293E-05	4.293E-05
C	3.4	2.34	731.	0.	0.	80.6	45.9	80.6	2.507E-05	2.003E-05	2.003E-05
C	5.7	2.24	731.	0.	0.	80.6	45.9	80.6	1.504E-05	1.202E-05	1.202E-05
C	8.5	0.05	731.	0.	0.	80.6	45.9	80.6	1.017E-05	8.122E-06	8.122E-06
D	1.6	8.45	731.	0.	0.	56.8	24.8	113.5	7.076E-05	8.512E-05	7.076E-05
D	3.4	22.92	731.	0.	0.	56.8	24.8	80.8	4.640E-05	3.972E-05	3.972E-05
D	5.7	17.29	731.	0.	0.	56.8	24.8	58.5	3.843E-05	2.383E-05	2.383E-05
D	8.5	3.92	731.	0.	0.	56.8	24.8	56.8	2.677E-05	1.610E-05	1.610E-05
D	11.0	0.05	731.	0.	0.	56.8	24.8	56.8	2.064E-05	1.241E-05	1.241E-05
D	25.1	0.05	731.	0.	0.	56.8	24.8	56.8	9.005E-06	5.417E-06	5.417E-06
E	0.2	0.00	731.	0.	0.	40.4	17.2	121.1	6.556E-04	8.386E-04	6.556E-04
E	1.6	8.83	731.	0.	0.	40.4	17.2	121.1	9.366E-05	1.198E-04	9.366E-05
E	3.5	11.17	731.	0.	0.	40.4	17.2	69.1	7.664E-05	5.591E-05	5.591E-05
E	5.8	4.20	731.	0.	0.	40.4	17.2	41.4	7.664E-05	3.355E-05	3.355E-05
E	8.7	0.57	731.	0.	0.	40.4	17.2	40.4	5.316E-05	2.267E-05	2.267E-05
F	1.6	5.87	731.	0.	0.	27.9	11.0	111.4	1.591E-04	2.122E-04	1.591E-04
F	3.5	1.81	731.	0.	0.	27.9	11.0	54.9	1.508E-04	9.900E-05	9.900E-05
G	0.2	0.00	731.	0.	0.	19.2	7.0	115.4	1.682E-03	3.364E-03	1.682E-03
G	1.6	5.49	731.	0.	0.	19.2	7.0	115.4	2.403E-04	4.806E-04	2.403E-04
G	3.5	0.76	731.	0.	0.	19.2	7.0	46.2	2.803E-04	2.243E-04	2.243E-04
G	5.8	0.29	731.	0.	0.	19.2	7.0	20.1	3.869E-04	1.346E-04	1.346E-04

USNRC COMPUTER CODE-PAVAN, VERSION 2.0

RUN DATE: 04/30/03

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

#### SITE EXCLUSION BOUNDARY CALCULATIONS:

W SECTOR BOUNDARY DISTANCE = 731.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

1.682E-03	6.556E-04	2.403E-04	2.243E-04	1.591E-04	1.346E-04	9.900E-05	9.366E-05	7.076E-05	5.591E-05
0.002	0.004	5.495	6.260	12.133	12.420	14.234	23.069	31.521	42.696
0.00009	0.00019	0.27062	0.30825	0.59750	0.61161	0.70097	1.13601	1.55225	2.10253
4.293E-05	3.972E-05	3.355E-05	2.383E-05	2.267E-05	2.162E-05	2.003E-05	1.610E-05	1.241E-05	1.202E-05
42.982	65.904	70.106	87.393	87.966	88.157	90.497	94.413	94.461	96.705
2.11664	3.24541	3.45235	4.30364	4.33186	4.34126	4.45649	4.64932	4.65168	4.76220
1.009E-05	8.122E-06	6.055E-06	5.530E-06	5.417E-06	4.091E-06	2.581E-06	1.548E-06	1.046E-06	
97.612	97.660	98.806	98.854	98.902	99.140	99.331	99.618	100.000	
4.80688	4.80923	4.86567	4.86802	4.87038	4.88213	4.89154	4.90565	4.92446	

#### X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE ORDERED X/Q-FREQUENCY VALUES, AND AS PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q WITH RESPECT TO WHEN THE WIND BLOWS  
SEC/CUBIC METER THE TOTAL TIME INTO THIS SECTOR ONLY

HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 3)=	0.597
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 4)=	3.242
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 5)=	4.300
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 6)=	4.453
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 7)=	4.646

K I XQSAVE(K,I) XQINT(K,I) XQSLOP(K,I)

5 1 -6.38764 -11.03675 -0.97176

5 2 -8.33355 -12.61678 -1.53975

5 3 -8.74579 -13.97083 -2.07834

5 4 -10.13357 -17.42025 -3.94663

5 5 -10.64440 -28.72604 -10.53176

5 6 -10.81804 -29.23738 -10.83247

5 7 -11.03644 NUMXQ(K)= 7

3.957E-04 0.049 1.000

2.893E-04	0.148	3.000
2.476E-04	0.246	5.000
1.765E-04	0.492	10.000
1.360E-04	0.739	15.000
1.091E-04	0.985	20.000
9.149E-05	1.231	25.000
7.891E-05	1.477	30.000
6.943E-05	1.724	35.000
6.199E-05	1.970	40.000
5.599E-05	2.216	45.000
5.104E-05	2.462	50.000
4.687E-05	2.708	55.000
4.331E-05	2.955	60.000
4.024E-05	3.201	65.000
3.569E-05	3.447	70.000
3.154E-05	3.693	75.000
2.805E-05	3.940	80.000
2.509E-05	4.186	85.000
2.059E-05	4.432	90.000

1.751E-04	0.5	10.15
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ANNUAL AVERAGE = 2.87E-06

K= 5 FIVEXQ(K)= 1.751E-04 FIVEPR(K)=10.153

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE WNW SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC AT 10.0 METERS	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	HT EFF METERS	PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
										MEANDER	BLDG WAKE	USED
										CA=2926.SQ.METERS		
A	1.6	0.09	731.	0.	0.	0.	141.1	248.3	141.1	5.677E-06	5.530E-06	5.530E-06
A	3.4	0.87	731.	0.	0.	0.	141.1	248.3	141.1	2.649E-06	2.581E-06	2.581E-06
A	5.7	0.79	731.	0.	0.	0.	141.1	248.3	141.1	1.589E-06	1.548E-06	1.548E-06
B	1.6	0.17	731.	0.	0.	0.	106.1	77.9	106.1	2.406E-05	2.162E-05	2.162E-05
B	3.4	1.40	731.	0.	0.	0.	106.1	77.9	106.1	1.123E-05	1.009E-05	1.009E-05
B	5.7	1.22	731.	0.	0.	0.	106.1	77.9	106.1	6.736E-06	6.055E-06	6.055E-06
B	8.5	0.17	731.	0.	0.	0.	106.1	77.9	106.1	4.552E-06	4.091E-06	4.091E-06
C	1.6	0.35	731.	0.	0.	0.	80.6	45.9	80.6	5.373E-05	4.293E-05	4.293E-05
C	3.4	1.40	731.	0.	0.	0.	80.6	45.9	80.6	2.507E-05	2.003E-05	2.003E-05
C	5.7	1.13	731.	0.	0.	0.	80.6	45.9	80.6	1.504E-05	1.202E-05	1.202E-05
C	8.5	0.09	731.	0.	0.	0.	80.6	45.9	80.6	1.017E-05	8.122E-06	8.122E-06
D	1.6	11.34	731.	0.	0.	0.	56.8	24.8	113.5	7.076E-05	8.512E-05	7.076E-05
D	3.4	24.43	731.	0.	0.	0.	56.8	24.8	80.8	4.640E-05	3.972E-05	3.972E-05
D	5.7	10.03	731.	0.	0.	0.	56.8	24.8	58.5	3.843E-05	2.383E-05	2.383E-05
D	8.5	0.70	731.	0.	0.	0.	56.8	24.8	56.8	2.677E-05	1.610E-05	1.610E-05
D	11.0	0.09	731.	0.	0.	0.	56.8	24.8	56.8	2.064E-05	1.241E-05	1.241E-05
E	0.2	0.00	731.	0.	0.	0.	40.4	17.2	121.1	6.556E-04	8.386E-04	6.556E-04
E	1.6	12.74	731.	0.	0.	0.	40.4	17.2	121.1	9.366E-05	1.198E-04	9.366E-05
E	3.5	11.95	731.	0.	0.	0.	40.4	17.2	69.1	7.664E-05	5.591E-05	5.591E-05
E	5.8	4.62	731.	0.	0.	0.	40.4	17.2	41.4	7.664E-05	3.355E-05	3.355E-05
E	8.7	0.79	731.	0.	0.	0.	40.4	17.2	40.4	5.316E-05	2.267E-05	2.267E-05
F	1.6	7.94	731.	0.	0.	0.	27.9	11.0	111.4	1.591E-04	2.122E-04	1.591E-04
F	3.5	2.18	731.	0.	0.	0.	27.9	11.0	54.9	1.508E-04	9.900E-05	9.900E-05
F	5.8	0.09	731.	0.	0.	0.	27.9	11.0	28.8	1.724E-04	5.940E-05	5.940E-05
F	8.7	0.09	731.	0.	0.	0.	27.9	11.0	27.9	1.204E-04	4.014E-05	4.014E-05
G	0.2	0.00	731.	0.	0.	0.	19.2	7.0	115.4	1.682E-03	3.364E-03	1.682E-03
G	1.6	4.62	731.	0.	0.	0.	19.2	7.0	115.4	2.403E-04	4.806E-04	2.403E-04
G	3.5	0.61	731.	0.	0.	0.	19.2	7.0	46.2	2.803E-04	2.243E-04	2.243E-04
G	5.8	0.09	731.	0.	0.	0.	19.2	7.0	20.1	3.869E-04	1.346E-04	1.346E-04

USNRC COMPUTER CODE-PAVAN, VERSION 2.0

RUN DATE: 04/30/03

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

# SITE EXCLUSION BOUNDARY CALCULATIONS:

WNW SECTOR BOUNDARY DISTANCE = 731.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

1.682E-03	6.556E-04	2.403E-04	2.243E-04	1.591E-04	1.346E-04	9.900E-05	9.366E-05	7.076E-05	5.940E-05
0.001	0.004	4.629	5.240	13.180	13.267	15.449	28.188	39.531	39.619
0.00004	0.00012	0.12475	0.14122	0.35521	0.35756	0.41635	0.75969	1.06540	1.06775
5.591E-05	4.293E-05	4.014E-05	3.972E-05	3.355E-05	2.383E-05	2.267E-05	2.162E-05	2.003E-05	1.610E-05
51.573	51.922	52.009	76.441	81.065	91.100	91.885	92.060	93.456	94.154
1.38992	1.39933	1.40168	2.06013	2.18477	2.45520	2.47637	2.48107	2.51870	2.53751
1.241E-05	1.202E-05	1.009E-05	8.122E-06	6.055E-06	5.530E-06	4.091E-06	2.581E-06	1.548E-06	
94.241	95.375	96.772	96.859	98.080	98.168	98.342	99.215	100.000	
2.53986	2.57043	2.60806	2.61041	2.64333	2.64568	2.65039	2.67390	2.69507	

## X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE ORDERED X/Q-FREQUENCY VALUES, AND AS PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q WITH RESPECT TO WHEN THE WIND BLOWS  
SEC/CUBIC METER THE TOTAL TIME INTO THIS SECTOR ONLY

HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 2)=	0.125
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 3)=	0.355
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 4)=	0.759
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 5)=	2.058
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 6)=	2.182
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 7)=	2.453

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
6	1	-6.38764	-11.40936	-1.01705
6	2	-8.33355	-12.08941	-1.24192
6	3	-8.74579	-14.14801	-2.00654
6	4	-9.27582	-14.66836	-2.22084
6	5	-10.13357	-24.22875	-6.90289
6	6	-10.30259	-24.28429	-6.93042
6	7	-10.64440	NUMXQ(K)= 7	



3.746E-04	0.027	1.000
2.740E-04	0.081	3.000
2.334E-04	0.135	5.000
1.781E-04	0.270	10.000
1.459E-04	0.404	15.000
1.196E-04	0.539	20.000
1.021E-04	0.674	25.000
8.906E-05	0.809	30.000
7.850E-05	0.943	35.000
7.022E-05	1.078	40.000
6.355E-05	1.213	45.000
5.804E-05	1.348	50.000
5.341E-05	1.482	55.000
4.946E-05	1.617	60.000
4.604E-05	1.752	65.000
4.306E-05	1.887	70.000
4.042E-05	2.021	75.000
3.485E-05	2.156	80.000
2.922E-05	2.291	85.000
2.470E-05	2.426	90.000
1.261E-04	0.5	18.55

ANNUAL AVERAGE = 1.75E-06

K= 6 FIVEXQ(K)= 1.261E-04 FIVEPR(K)=18.552

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE NW SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC AT 10.0 METERS	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN METERS	HT EFF METERS	PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
										MEANDER	BLDG WAKE	USED
										CA=2926.SQ.METERS		
A	1.6	0.10	731.	0.	0.	141.1	248.3	141.1	5.677E-06	5.530E-06	5.530E-06	
A	3.4	0.81	731.	0.	0.	141.1	248.3	141.1	2.649E-06	2.581E-06	2.581E-06	
A	5.7	0.81	731.	0.	0.	141.1	248.3	141.1	1.589E-06	1.548E-06	1.548E-06	
B	1.6	0.10	731.	0.	0.	106.1	77.9	106.1	2.406E-05	2.162E-05	2.162E-05	
B	3.4	0.61	731.	0.	0.	106.1	77.9	106.1	1.123E-05	1.009E-05	1.009E-05	
B	5.7	0.30	731.	0.	0.	106.1	77.9	106.1	6.736E-06	6.055E-06	6.055E-06	
C	1.6	0.51	731.	0.	0.	80.6	45.9	80.6	5.373E-05	4.293E-05	4.293E-05	
C	3.4	3.45	731.	0.	0.	80.6	45.9	80.6	2.507E-05	2.003E-05	2.003E-05	
C	5.7	0.41	731.	0.	0.	80.6	45.9	80.6	1.504E-05	1.202E-05	1.202E-05	
C	8.5	0.10	731.	0.	0.	80.6	45.9	80.6	1.017E-05	8.122E-06	8.122E-06	
D	1.6	12.08	731.	0.	0.	56.8	24.8	113.5	7.076E-05	8.512E-05	7.076E-05	
D	3.4	22.94	731.	0.	0.	56.8	24.8	80.8	4.640E-05	3.972E-05	3.972E-05	
D	5.7	6.19	731.	0.	0.	56.8	24.8	58.5	3.843E-05	2.383E-05	2.383E-05	
D	8.5	0.81	731.	0.	0.	56.8	24.8	56.8	2.677E-05	1.610E-05	1.610E-05	
E	0.2	0.00	731.	0.	0.	40.4	17.2	121.1	6.556E-04	8.386E-04	6.556E-04	
E	1.6	11.37	731.	0.	0.	40.4	17.2	121.1	9.366E-05	1.198E-04	9.366E-05	
E	3.5	20.91	731.	0.	0.	40.4	17.2	69.1	7.664E-05	5.591E-05	5.591E-05	
E	5.8	3.15	731.	0.	0.	40.4	17.2	41.4	7.664E-05	3.355E-05	3.355E-05	
E	8.7	1.32	731.	0.	0.	40.4	17.2	40.4	5.316E-05	2.267E-05	2.267E-05	
E	11.2	0.30	731.	0.	0.	40.4	17.2	40.4	4.098E-05	1.747E-05	1.747E-05	
E	25.7	0.20	731.	0.	0.	40.4	17.2	40.4	1.788E-05	7.624E-06	7.624E-06	
F	1.6	6.50	731.	0.	0.	27.9	11.0	111.4	1.591E-04	2.122E-04	1.591E-04	
F	3.5	1.12	731.	0.	0.	27.9	11.0	54.9	1.508E-04	9.900E-05	9.900E-05	
F	5.8	0.10	731.	0.	0.	27.9	11.0	28.8	1.724E-04	5.940E-05	5.940E-05	
F	8.7	0.10	731.	0.	0.	27.9	11.0	27.9	1.204E-04	4.014E-05	4.014E-05	
G	0.2	0.00	731.	0.	0.	19.2	7.0	115.4	1.682E-03	3.364E-03	1.682E-03	
G	1.6	4.37	731.	0.	0.	19.2	7.0	115.4	2.403E-04	4.806E-04	2.403E-04	
G	3.5	1.22	731.	0.	0.	19.2	7.0	46.2	2.803E-04	2.243E-04	2.243E-04	
G	5.8	0.10	731.	0.	0.	19.2	7.0	20.1	3.869E-04	1.346E-04	1.346E-04	

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## SITE EXCLUSION BOUNDARY CALCULATIONS:

NW SECTOR BOUNDARY DISTANCE = 731.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

1.682E-03	6.556E-04	2.403E-04	2.243E-04	1.591E-04	1.346E-04	9.900E-05	9.366E-05	7.076E-05	5.940E-05
0.001	0.004	4.369	5.588	12.085	12.186	13.303	24.673	36.754	36.855
0.00003	0.00009	0.10121	0.12943	0.27993	0.28229	0.30815	0.57153	0.85138	0.85373
5.591E-05	4.293E-05	4.014E-05	3.972E-05	3.355E-05	2.383E-05	2.267E-05	2.162E-05	2.003E-05	1.747E-05
57.768	58.276	58.377	81.321	84.468	90.660	91.980	92.082	95.533	95.838
1.33816	1.34992	1.35227	1.88373	1.95663	2.10008	2.13065	2.13301	2.21296	2.22002
1.610E-05	1.202E-05	1.009E-05	8.122E-06	7.624E-06	6.055E-06	5.530E-06	2.581E-06	1.548E-06	
96.650	97.056	97.665	97.767	97.970	98.274	98.376	99.188	100.000	
2.23883	2.24823	2.26234	2.26470	2.26940	2.27645	2.27881	2.29762	2.31643	

## X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE  
ORDERED X/Q-FREQUENCY VALUES, AND AS  
PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q WITH RESPECT TO WHEN THE WIND BLOWS  
SEC/CUBIC METER THE TOTAL TIME INTO THIS SECTOR ONLY

HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 2)= 0.129  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 3)= 0.280  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 4)= 1.337  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 5)= 1.882  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 6)= 2.211  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 7)= 2.236

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
7	1	-6.38764	-11.49231	-1.02541
7	2	-8.40264	-12.66946	-1.41609
7	3	-8.74579	-13.96417	-1.88337
7	4	-9.79177	-15.33608	-2.50263
7	5	-10.13357	-31.44885	-10.25356
7	6	-10.81804	-100.85500	-44.74857
7	7	-11.03644	NUMXQ(K)= 7	

3.700E-04	0.023	1.000
2.708E-04	0.069	3.000
2.321E-04	0.116	5.000
1.735E-04	0.232	10.000
1.392E-04	0.347	15.000
1.159E-04	0.463	20.000
1.002E-04	0.579	25.000
8.868E-05	0.695	30.000
7.982E-05	0.811	35.000
7.276E-05	0.927	40.000
6.696E-05	1.042	45.000
6.210E-05	1.158	50.000
5.796E-05	1.274	55.000
5.387E-05	1.390	60.000
4.979E-05	1.506	65.000
4.624E-05	1.622	70.000
4.314E-05	1.737	75.000
4.039E-05	1.853	80.000
3.297E-05	1.969	85.000
2.587E-05	2.085	90.000
1.103E-04	0.5	21.58

ANNUAL AVERAGE = 1.47E-06

K= 7 FIVEXQ(K)= 1.103E-04 FIVEPR(K)=21.585

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE NNW SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC AT 10.0 METERS	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	HT EFF METERS	PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
										MEANDER	BLDG WAKE	USED
										CA=2926.SQ.METERS		
A	3.4	0.52	731.	0.	0.	141.1	248.3	141.1	2.649E-06	2.581E-06	2.581E-06	
A	5.7	0.75	731.	0.	0.	141.1	248.3	141.1	1.589E-06	1.548E-06	1.548E-06	
B	3.4	1.27	731.	0.	0.	106.1	77.9	106.1	1.123E-05	1.009E-05	1.009E-05	
B	5.7	0.45	731.	0.	0.	106.1	77.9	106.1	6.736E-06	6.055E-06	6.055E-06	
C	1.6	0.60	731.	0.	0.	80.6	45.9	80.6	5.373E-05	4.293E-05	4.293E-05	
C	3.4	1.72	731.	0.	0.	80.6	45.9	80.6	2.507E-05	2.003E-05	2.003E-05	
C	5.7	0.67	731.	0.	0.	80.6	45.9	80.6	1.504E-05	1.202E-05	1.202E-05	
C	8.5	0.22	731.	0.	0.	80.6	45.9	80.6	1.017E-05	8.122E-06	8.122E-06	
D	1.6	7.20	731.	0.	0.	56.8	24.8	113.5	7.076E-05	8.512E-05	7.076E-05	
D	3.4	24.44	731.	0.	0.	56.8	24.8	80.8	4.640E-05	3.972E-05	3.972E-05	
D	5.7	12.82	731.	0.	0.	56.8	24.8	58.5	3.843E-05	2.383E-05	2.383E-05	
D	8.5	1.35	731.	0.	0.	56.8	24.8	56.8	2.677E-05	1.610E-05	1.610E-05	
D	11.0	0.07	731.	0.	0.	56.8	24.8	56.8	2.064E-05	1.241E-05	1.241E-05	
E	0.2	0.00	731.	0.	0.	40.4	17.2	121.1	6.556E-04	8.386E-04	6.556E-04	
E	1.6	10.64	731.	0.	0.	40.4	17.2	121.1	9.366E-05	1.198E-04	9.366E-05	
E	3.5	18.74	731.	0.	0.	40.4	17.2	69.1	7.664E-05	5.591E-05	5.591E-05	
E	5.8	5.02	731.	0.	0.	40.4	17.2	41.4	7.664E-05	3.355E-05	3.355E-05	
E	8.7	2.32	731.	0.	0.	40.4	17.2	40.4	5.316E-05	2.267E-05	2.267E-05	
E	11.2	0.37	731.	0.	0.	40.4	17.2	40.4	4.098E-05	1.747E-05	1.747E-05	
F	1.6	4.95	731.	0.	0.	27.9	11.0	111.4	1.591E-04	2.122E-04	1.591E-04	
F	3.5	1.42	731.	0.	0.	27.9	11.0	54.9	1.508E-04	9.900E-05	9.900E-05	
F	25.7	0.07	731.	0.	0.	27.9	11.0	27.9	4.051E-05	1.350E-05	1.350E-05	
G	0.2	0.00	731.	0.	0.	19.2	7.0	115.4	1.682E-03	3.364E-03	1.682E-03	
G	1.6	2.92	731.	0.	0.	19.2	7.0	115.4	2.403E-04	4.806E-04	2.403E-04	
G	3.5	0.90	731.	0.	0.	19.2	7.0	46.2	2.803E-04	2.243E-04	2.243E-04	
G	5.8	0.52	731.	0.	0.	19.2	7.0	20.1	3.869E-04	1.346E-04	1.346E-04	

USNRC COMPUTER CODE-PAVAN, VERSION 2.0

RUN DATE: 04/30/03

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

#### SITE EXCLUSION BOUNDARY CALCULATIONS:

NNW SECTOR BOUNDARY DISTANCE = 731.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

1.682E-03	6.556E-04	2.403E-04	2.243E-04	1.591E-04	1.346E-04	9.900E-05	9.366E-05	7.076E-05	5.591E-05
0.001	0.003	2.927	3.826	8.774	9.298	10.723	21.367	28.563	47.303
0.00003	0.00011	0.09182	0.12004	0.27524	0.29171	0.33639	0.67032	0.89607	1.48397
4.293E-05	3.972E-05	3.355E-05	2.383E-05	2.267E-05	2.003E-05	1.747E-05	1.610E-05	1.350E-05	1.241E-05
47.903	72.340	77.362	90.180	92.504	94.228	94.603	95.952	96.027	96.102
1.50279	2.26941	2.42697	2.82910	2.90200	2.95608	2.96784	3.01017	3.01252	3.01487
1.202E-05	1.009E-05	8.122E-06	6.055E-06	2.581E-06	1.548E-06				
96.777	98.051	98.276	98.726	99.250	100.000				
3.03604	3.07602	3.08307	3.09718	3.11364	3.13716				

#### X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE  
ORDERED X/Q-FREQUENCY VALUES, AND AS  
PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q WITH RESPECT TO WHEN THE WIND BLOWS  
SEC/CUBIC METER THE TOTAL TIME INTO THIS SECTOR ONLY

HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 2)=	0.120
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 3)=	0.275
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 4)=	1.482
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 5)=	2.267
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 6)=	2.899
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 7)=	2.953

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
8	1	-6.38764	-11.52190	-1.02746
8	2	-8.40264	-12.41542	-1.32178
8	3	-8.74579	-13.57370	-1.73899
8	4	-9.79177	-14.08090	-1.97221
8	5	-10.13357	-20.76193	-5.31026
8	6	-10.69464	-39.54101	-15.21579
8	7	-10.81804	NUMXQ(K)=	7

3.327E-04	0.031	1.000
2.416E-04	0.094	3.000
2.013E-04	0.157	5.000
1.477E-04	0.314	10.000
1.165E-04	0.471	15.000
9.787E-05	0.627	20.000
8.513E-05	0.784	25.000
7.575E-05	0.941	30.000
6.849E-05	1.098	35.000
6.266E-05	1.255	40.000
5.786E-05	1.412	45.000
5.353E-05	1.569	50.000
4.964E-05	1.725	55.000
4.630E-05	1.882	60.000
4.338E-05	2.039	65.000
4.082E-05	2.196	70.000
3.663E-05	2.353	75.000
3.166E-05	2.510	80.000
2.756E-05	2.667	85.000
2.416E-05	2.823	90.000
1.124E-04	0.5	15.94

ANNUAL AVERAGE = 1.68E-06

K= 8 FIVEXQ(K)= 1.124E-04 FIVEPR(K)=15.938

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE N SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC AT 10.0 METERS	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN METERS	HT EFF METERS	PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
										MEANDER	BLDG WAKE	USED
										CA=2926.SQ.METERS		
A	3.4	1.90	731.	0.	0.	0.	141.1	248.3	141.1	2.649E-06	2.581E-06	2.581E-06
A	5.7	3.22	731.	0.	0.	0.	141.1	248.3	141.1	1.589E-06	1.548E-06	1.548E-06
A	8.5	0.32	731.	0.	0.	0.	141.1	248.3	141.1	1.074E-06	1.046E-06	1.046E-06
A	11.0	0.09	731.	0.	0.	0.	141.1	248.3	141.1	8.278E-07	8.064E-07	8.064E-07
B	1.6	0.14	731.	0.	0.	0.	106.1	77.9	106.1	2.406E-05	2.162E-05	2.162E-05
B	3.4	1.68	731.	0.	0.	0.	106.1	77.9	106.1	1.123E-05	1.009E-05	1.009E-05
B	5.7	1.31	731.	0.	0.	0.	106.1	77.9	106.1	6.736E-06	6.055E-06	6.055E-06
B	8.5	0.27	731.	0.	0.	0.	106.1	77.9	106.1	4.552E-06	4.091E-06	4.091E-06
C	1.6	0.36	731.	0.	0.	0.	80.6	45.9	80.6	5.373E-05	4.293E-05	4.293E-05
C	3.4	2.13	731.	0.	0.	0.	80.6	45.9	80.6	2.507E-05	2.003E-05	2.003E-05
C	5.7	1.63	731.	0.	0.	0.	80.6	45.9	80.6	1.504E-05	1.202E-05	1.202E-05
C	8.5	0.54	731.	0.	0.	0.	80.6	45.9	80.6	1.017E-05	8.122E-06	8.122E-06
C	11.0	0.05	731.	0.	0.	0.	80.6	45.9	80.6	7.836E-06	6.261E-06	6.261E-06
D	1.6	5.58	731.	0.	0.	0.	56.8	24.8	113.5	7.076E-05	8.512E-05	7.076E-05
D	3.4	20.08	731.	0.	0.	0.	56.8	24.8	80.8	4.640E-05	3.972E-05	3.972E-05
D	5.7	13.28	731.	0.	0.	0.	56.8	24.8	58.5	3.843E-05	2.383E-05	2.383E-05
D	8.5	1.45	731.	0.	0.	0.	56.8	24.8	56.8	2.677E-05	1.610E-05	1.610E-05
E	0.2	0.00	731.	0.	0.	0.	40.4	17.2	121.1	6.556E-04	8.386E-04	6.556E-04
E	1.6	8.75	731.	0.	0.	0.	40.4	17.2	121.1	9.366E-05	1.198E-04	9.366E-05
E	3.5	22.08	731.	0.	0.	0.	40.4	17.2	69.1	7.664E-05	5.591E-05	5.591E-05
E	5.8	4.71	731.	0.	0.	0.	40.4	17.2	41.4	7.664E-05	3.355E-05	3.355E-05
E	8.7	0.36	731.	0.	0.	0.	40.4	17.2	40.4	5.316E-05	2.267E-05	2.267E-05
E	11.2	0.05	731.	0.	0.	0.	40.4	17.2	40.4	4.098E-05	1.747E-05	1.747E-05
F	1.6	3.31	731.	0.	0.	0.	27.9	11.0	111.4	1.591E-04	2.122E-04	1.591E-04
F	3.5	2.13	731.	0.	0.	0.	27.9	11.0	54.9	1.508E-04	9.900E-05	9.900E-05
F	5.8	0.09	731.	0.	0.	0.	27.9	11.0	28.8	1.724E-04	5.940E-05	5.940E-05
G	0.2	0.00	731.	0.	0.	0.	19.2	7.0	115.4	1.682E-03	3.364E-03	1.682E-03
G	1.6	3.26	731.	0.	0.	0.	19.2	7.0	115.4	2.403E-04	4.806E-04	2.403E-04
G	3.5	0.73	731.	0.	0.	0.	19.2	7.0	46.2	2.803E-04	2.243E-04	2.243E-04
G	5.8	0.45	731.	0.	0.	0.	19.2	7.0	20.1	3.869E-04	1.346E-04	1.346E-04
G	8.7	0.05	731.	0.	0.	0.	19.2	7.0	19.2	2.728E-04	9.092E-05	9.092E-05



USNRC COMPUTER CODE-PAVAN, VERSION 2.0

RUN DATE: 04/30/03

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

#### SITE EXCLUSION BOUNDARY CALCULATIONS:

N SECTOR BOUNDARY DISTANCE = 731.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

1.682E-03	6.556E-04	2.403E-04	2.243E-04	1.591E-04	1.346E-04	9.900E-05	9.366E-05	9.092E-05	7.076E-05
0.001	0.003	3.267	3.992	7.301	7.754	9.885	18.633	18.679	24.254
0.00005	0.00016	0.16947	0.20710	0.37877	0.40228	0.51281	0.96667	0.96902	1.25827

5.940E-05	5.591E-05	4.293E-05	3.972E-05	3.355E-05	2.383E-05	2.267E-05	2.162E-05	2.003E-05	1.747E-05
24.345	46.420	46.783	66.864	71.578	84.860	85.223	85.359	87.489	87.534
1.26297	2.40821	2.42702	3.46879	3.71336	4.40238	4.42119	4.42825	4.53877	4.54112

1.610E-05	1.202E-05	1.009E-05	8.122E-06	6.261E-06	6.055E-06	4.091E-06	2.581E-06	1.548E-06	1.046E-06
88.985	90.617	92.294	92.838	92.883	94.198	94.470	96.374	99.592	99.909
4.61637	4.70103	4.78804	4.81626	4.81861	4.88681	4.90092	4.99969	5.16665	5.18311

8.064E-07  
100.000  
5.18782

#### X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE  
ORDERED X/Q-FREQUENCY VALUES, AND AS  
PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q WITH RESPECT TO WHEN THE WIND BLOWS  
SEC/CUBIC METER THE TOTAL TIME INTO THIS SECTOR ONLY

HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 3)= 0.207  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 4)= 2.406  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 5)= 3.466  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 6)= 4.399  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 7)= 4.535

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
9	1	-6.38764	-11.26211	-0.99939
9	2	-8.33355	-11.55459	-1.09920
9	3	-8.40264	-12.87255	-1.55882
9	4	-9.79177	-14.01439	-2.13658

9	5	-10.13357	-18.55282	-4.63520
9	6	-10.64440	-31.11704	-11.99921
9	7	-10.81804	NUMXQ(K)= 7	
		3.410E-04	0.052	1.000
		2.467E-04	0.156	3.000
		2.005E-04	0.259	5.000
		1.396E-04	0.519	10.000
		1.115E-04	0.778	15.000
		9.448E-05	1.038	20.000
		8.271E-05	1.297	25.000
		7.397E-05	1.556	30.000
		6.715E-05	1.816	35.000
		6.164E-05	2.075	40.000
		5.707E-05	2.335	45.000
		5.224E-05	2.594	50.000
		4.782E-05	2.853	55.000
		4.406E-05	3.113	60.000
		4.082E-05	3.372	65.000
		3.607E-05	3.631	70.000
		3.115E-05	3.891	75.000
		2.710E-05	4.150	80.000
		2.361E-05	4.410	85.000
		1.424E-04	0.5	9.64

ANNUAL AVERAGE = 2.53E-06

K= 9 FIVEXQ(K)= 1.424E-04 FIVEPR(K)= 9.638

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE NNE SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	EFF PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
									MEANDER	BLDG WAKE	USED
AT 10.0 METERS											
CA=2926.SQ.METERS											
A	3.4	3.87	731.	0.	0.	141.1	248.3	141.1	2.649E-06	2.581E-06	2.581E-06
A	5.7	5.11	731.	0.	0.	141.1	248.3	141.1	1.589E-06	1.548E-06	1.548E-06
A	8.5	0.66	731.	0.	0.	141.1	248.3	141.1	1.074E-06	1.046E-06	1.046E-06
A	11.0	0.04	731.	0.	0.	141.1	248.3	141.1	8.278E-07	8.064E-07	8.064E-07
B	1.6	0.08	731.	0.	0.	106.1	77.9	106.1	2.406E-05	2.162E-05	2.162E-05
B	3.4	3.13	731.	0.	0.	106.1	77.9	106.1	1.123E-05	1.009E-05	1.009E-05
B	5.7	2.22	731.	0.	0.	106.1	77.9	106.1	6.736E-06	6.055E-06	6.055E-06
B	8.5	0.16	731.	0.	0.	106.1	77.9	106.1	4.552E-06	4.091E-06	4.091E-06
B	11.0	0.04	731.	0.	0.	106.1	77.9	106.1	3.509E-06	3.153E-06	3.153E-06
C	1.6	0.54	731.	0.	0.	80.6	45.9	80.6	5.373E-05	4.293E-05	4.293E-05
C	3.4	3.38	731.	0.	0.	80.6	45.9	80.6	2.507E-05	2.003E-05	2.003E-05
C	5.7	2.43	731.	0.	0.	80.6	45.9	80.6	1.504E-05	1.202E-05	1.202E-05
C	8.5	0.12	731.	0.	0.	80.6	45.9	80.6	1.017E-05	8.122E-06	8.122E-06
C	11.0	0.04	731.	0.	0.	80.6	45.9	80.6	7.836E-06	6.261E-06	6.261E-06
D	1.6	6.01	731.	0.	0.	56.8	24.8	113.5	7.076E-05	8.512E-05	7.076E-05
D	3.4	17.13	731.	0.	0.	56.8	24.8	80.8	4.640E-05	3.972E-05	3.972E-05
D	5.7	7.21	731.	0.	0.	56.8	24.8	58.5	3.843E-05	2.383E-05	2.383E-05
D	8.5	1.52	731.	0.	0.	56.8	24.8	56.8	2.677E-05	1.610E-05	1.610E-05
D	11.0	0.04	731.	0.	0.	56.8	24.8	56.8	2.064E-05	1.241E-05	1.241E-05
E	0.2	0.00	731.	0.	0.	40.4	17.2	121.1	6.556E-04	8.386E-04	6.556E-04
E	1.6	11.74	731.	0.	0.	40.4	17.2	121.1	9.366E-05	1.198E-04	9.366E-05
E	3.5	17.13	731.	0.	0.	40.4	17.2	69.1	7.664E-05	5.591E-05	5.591E-05
E	5.8	3.62	731.	0.	0.	40.4	17.2	41.4	7.664E-05	3.355E-05	3.355E-05
E	8.7	0.25	731.	0.	0.	40.4	17.2	40.4	5.316E-05	2.267E-05	2.267E-05
F	1.6	5.19	731.	0.	0.	27.9	11.0	111.4	1.591E-04	2.122E-04	1.591E-04
F	3.5	4.78	731.	0.	0.	27.9	11.0	54.9	1.508E-04	9.900E-05	9.900E-05
G	0.2	0.00	731.	0.	0.	19.2	7.0	115.4	1.682E-03	3.364E-03	1.682E-03
G	1.6	2.68	731.	0.	0.	19.2	7.0	115.4	2.403E-04	4.806E-04	2.403E-04
G	3.5	0.54	731.	0.	0.	19.2	7.0	46.2	2.803E-04	2.243E-04	2.243E-04
G	5.8	0.25	731.	0.	0.	19.2	7.0	20.1	3.869E-04	1.346E-04	1.346E-04
G	8.7	0.08	731.	0.	0.	19.2	7.0	19.2	2.728E-04	9.092E-05	9.092E-05

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## SITE EXCLUSION BOUNDARY CALCULATIONS:

NNE SECTOR BOUNDARY DISTANCE = 731.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

1.682E-03	6.556E-04	2.403E-04	2.243E-04	1.591E-04	1.346E-04	9.900E-05	9.366E-05	9.092E-05	7.076E-05
0.001	0.004	2.681	3.216	8.405	8.652	13.430	25.167	25.250	31.263
0.00005	0.00020	0.15306	0.18363	0.47993	0.49404	0.76683	1.43704	1.44174	1.78508

5.591E-05	4.293E-05	3.972E-05	3.355E-05	2.383E-05	2.267E-05	2.162E-05	2.003E-05	1.610E-05	1.241E-05
48.396	48.931	66.064	69.688	76.895	77.142	77.225	80.602	82.126	82.167
2.76335	2.79392	3.77219	3.97913	4.39066	4.40477	4.40948	4.60231	4.68932	4.69167

1.202E-05	1.009E-05	8.122E-06	6.261E-06	6.055E-06	4.091E-06	3.153E-06	2.581E-06	1.548E-06	1.046E-06
84.597	87.727	87.850	87.892	90.116	90.280	90.322	94.193	99.300	99.959
4.83042	5.00914	5.01619	5.01854	5.14553	5.15494	5.15729	5.37834	5.66994	5.70757

8.064E-07
100.000
5.70992

## X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE  
ORDERED X/Q-FREQUENCY VALUES, AND AS  
PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q	WITH RESPECT TO	WHEN THE WIND BLOWS
SEC/CUBIC METER	THE TOTAL TIME	INTO THIS SECTOR ONLY

HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 2)=	0.153
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 3)=	0.479
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 4)=	1.435
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 5)=	2.761
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 6)=	3.769
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 7)=	3.976
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 8)=	4.387
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 9)=	4.599
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE(10)=	5.005

K I XQSAVE(K,I) XQINT(K,I) XQSLOP(K,I)

10	1	-6.38764	-11.31099	-1.00526
10	2	-8.33355	-11.62036	-1.10971
10	3	-8.74579	-12.15349	-1.31553
10	4	-9.27582	-13.45172	-1.90901
10	5	-9.79177	-14.50480	-2.45829
10	6	-10.13357	-22.32577	-6.85666
10	7	-10.30259	-23.30989	-7.41789
10	8	-10.64440	-23.90795	-7.76816
10	9	-10.81804	-39.18070	-16.83171
10	10	-11.50388	NUMXQ(K) = 10	
		3.221E-04	0.057	1.000
		2.312E-04	0.171	3.000
		1.930E-04	0.285	5.000
		1.470E-04	0.571	10.000
		1.214E-04	0.856	15.000
		1.053E-04	1.142	20.000
		9.399E-05	1.427	25.000
		8.194E-05	1.713	30.000
		7.267E-05	1.998	35.000
		6.533E-05	2.284	40.000
		5.937E-05	2.569	45.000
		5.399E-05	2.855	50.000
		4.869E-05	3.140	55.000
		4.424E-05	3.426	60.000
		4.046E-05	3.711	65.000
		3.303E-05	3.997	70.000
		2.601E-05	4.282	75.000
		2.060E-05	4.568	80.000
		1.305E-05	4.853	85.000
		1.562E-04	0.5	8.76
ANNUAL AVERAGE = 2.95E-06				
K= 10 FIVEXQ(K) = 1.562E-04 FIVEPR(K) = 8.757				

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE NE SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC AT 10.0 METERS	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN METERS	HT EFF METERS	PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
										MEANDER	BLDG WAKE	USED
										CA=2926.SQ.METERS		
A	1.6	0.14	731.	0.	0.	0.	141.1	248.3	141.1	5.677E-06	5.530E-06	5.530E-06
A	3.4	8.27	731.	0.	0.	0.	141.1	248.3	141.1	2.649E-06	2.581E-06	2.581E-06
A	5.7	3.22	731.	0.	0.	0.	141.1	248.3	141.1	1.589E-06	1.548E-06	1.548E-06
A	8.5	0.28	731.	0.	0.	0.	141.1	248.3	141.1	1.074E-06	1.046E-06	1.046E-06
B	1.6	0.47	731.	0.	0.	0.	106.1	77.9	106.1	2.406E-05	2.162E-05	2.162E-05
B	3.4	3.41	731.	0.	0.	0.	106.1	77.9	106.1	1.123E-05	1.009E-05	1.009E-05
B	5.7	0.93	731.	0.	0.	0.	106.1	77.9	106.1	6.736E-06	6.055E-06	6.055E-06
C	1.6	1.03	731.	0.	0.	0.	80.6	45.9	80.6	5.373E-05	4.293E-05	4.293E-05
C	3.4	3.92	731.	0.	0.	0.	80.6	45.9	80.6	2.507E-05	2.003E-05	2.003E-05
C	5.7	1.07	731.	0.	0.	0.	80.6	45.9	80.6	1.504E-05	1.202E-05	1.202E-05
C	8.5	0.09	731.	0.	0.	0.	80.6	45.9	80.6	1.017E-05	8.122E-06	8.122E-06
D	1.6	7.29	731.	0.	0.	0.	56.8	24.8	113.5	7.076E-05	8.512E-05	7.076E-05
D	3.4	13.45	731.	0.	0.	0.	56.8	24.8	80.8	4.640E-05	3.972E-05	3.972E-05
D	5.7	2.48	731.	0.	0.	0.	56.8	24.8	58.5	3.843E-05	2.383E-05	2.383E-05
D	8.5	0.23	731.	0.	0.	0.	56.8	24.8	56.8	2.677E-05	1.610E-05	1.610E-05
E	0.2	0.00	731.	0.	0.	0.	40.4	17.2	121.1	6.556E-04	8.386E-04	6.556E-04
E	1.6	17.61	731.	0.	0.	0.	40.4	17.2	121.1	9.366E-05	1.198E-04	9.366E-05
E	3.5	13.78	731.	0.	0.	0.	40.4	17.2	69.1	7.664E-05	5.591E-05	5.591E-05
E	5.8	1.40	731.	0.	0.	0.	40.4	17.2	41.4	7.664E-05	3.355E-05	3.355E-05
E	8.7	0.23	731.	0.	0.	0.	40.4	17.2	40.4	5.316E-05	2.267E-05	2.267E-05
F	1.6	10.04	731.	0.	0.	0.	27.9	11.0	111.4	1.591E-04	2.122E-04	1.591E-04
F	3.5	3.32	731.	0.	0.	0.	27.9	11.0	54.9	1.508E-04	9.900E-05	9.900E-05
F	5.8	0.14	731.	0.	0.	0.	27.9	11.0	28.8	1.724E-04	5.940E-05	5.940E-05
G	0.2	0.00	731.	0.	0.	0.	19.2	7.0	115.4	1.682E-03	3.364E-03	1.682E-03
G	1.6	6.21	731.	0.	0.	0.	19.2	7.0	115.4	2.403E-04	4.806E-04	2.403E-04
G	3.5	0.79	731.	0.	0.	0.	19.2	7.0	46.2	2.803E-04	2.243E-04	2.243E-04
G	5.8	0.19	731.	0.	0.	0.	19.2	7.0	20.1	3.869E-04	1.346E-04	1.346E-04

RUN DATE: 04/30/03

PLANT NAME: Limerick

## METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

**DELTA-T HEIGHTS: 52.3-7.9 meters**

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

**SITE EXCLUSION BOUNDARY CALCULATIONS:**

NE SECTOR BOUNDARY DISTANCE = 731.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/O. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

1.682E-03	6.556E-04	2.403E-04	2.243E-04	1.591E-04	1.346E-04	9.900E-05	9.366E-05	7.076E-05	5.940E-05
0.002	0.006	6.218	7.012	17.053	17.240	20.556	38.163	45.449	45.589
0.00010	0.00030	0.31307	0.35304	0.85864	0.86805	1.03501	1.92157	2.28842	2.29548

5.591E-05	4.293E-05	3.972E-05	3.355E-05	2.383E-05	2.267E-05	2.162E-05	2.003E-05	1.610E-05	1.202E-05
59.367	60.395	73.846	75.247	77.722	77.956	78.423	82.346	82.579	83.653
2.98920	3.04094	3.71820	3.78875	3.91339	3.92515	3.94866	4.14620	4.15795	4.21204

1.009E-05	8.122E-06	6.055E-06	5.530E-06	2.581E-06	1.548E-06	1.046E-06
87.063	87.156	88.090	88.230	96.497	99.720	100.000
4.38371	4.38841	4.43545	4.44250	4.85874	5.02100	5.03511

**X/O PERCENTILES**

(BASED ON THE UPPER ENVELOPE OF THE ORDERED X/Q-FREQUENCY VALUES, AND AS PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/O IS EQUALED OR EXCEEDED

CHI/Q SEC/CUBIC METER	WITH RESPECT TO THE TOTAL TIME	WHEN THE WIND BLOWS INTO THIS SECTOR ONLY
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
12	12	12
13	13	13
14	14	14
15	15	15
16	16	16
17	17	17
18	18	18
19	19	19
20	20	20
21	21	21
22	22	22
23	23	23
24	24	24
25	25	25
26	26	26
27	27	27
28	28	28
29	29	29
30	30	30
31	31	31
32	32	32
33	33	33
34	34	34
35	35	35
36	36	36
37	37	37
38	38	38
39	39	39
40	40	40
41	41	41
42	42	42
43	43	43
44	44	44
45	45	45
46	46	46
47	47	47
48	48	48
49	49	49
50	50	50
51	51	51
52	52	52
53	53	53
54	54	54
55	55	55
56	56	56
57	57	57
58	58	58
59	59	59
60	60	60
61	61	61
62	62	62
63	63	63
64	64	64
65	65	65
66	66	66
67	67	67
68	68	68
69	69	69
70	70	70
71	71	71
72	72	72
73	73	73
74	74	74
75	75	75
76	76	76
77	77	77
78	78	78
79	79	79
80	80	80
81	81	81
82	82	82
83	83	83
84	84	84
85	85	85
86	86	86
87	87	87
88	88	88
89	89	89
90	90	90
91	91	91
92	92	92
93	93	93
94	94	94
95	95	95
96	96	96
97	97	97
98	98	98
99	99	99
100	100	100

HANDCHECK	GRAPH:	SLOPE	LT	-1.0	FOR	LOW	PERCENTAGES.	XSAVE ( 3) =	0.858
HANDCHECK	GRAPH:	SLOPE	LT	-1.0	FOR	LOW	PERCENTAGES.	XSAVE ( 4) =	1.920
HANDCHECK	GRAPH:	SLOPE	LT	-1.0	FOR	LOW	PERCENTAGES.	XSAVE ( 5) =	2.986
HANDCHECK	GRAPH:	SLOPE	LT	-1.0	FOR	LOW	PERCENTAGES.	XSAVE ( 6) =	3.715
HANDCHECK	GRAPH:	SLOPE	LT	-1.0	FOR	LOW	PERCENTAGES.	XSAVE ( 7) =	4.143
HANDCHECK	GRAPH:	SLOPE	LT	-1.0	FOR	LOW	PERCENTAGES.	XSAVE ( 8) =	4.380

K	I	XQSAVE(K, I)	XQINT(K, I)	XQSLOP(K, I)
11	1	-6.38764	-10.96636	-0.96294
11	2	-8.33355	-11.54724	-1.17539
11	3	-8.74579	-12.78497	-1.69470
11	4	-9.27582	-14.96276	-2.74643
11	5	-9.79177	-16.35622	-3.48653
11	6	-10.13357	-34.36553	-13.57711
11	7	-10.81804	-56.25573	-26.19864

11	8	-11.50388	NUMXQ(K) = 8	
		4.100E-04	0.050	1.000
		3.004E-04	0.151	3.000
		2.573E-04	0.252	5.000
		1.990E-04	0.504	10.000
		1.681E-04	0.755	15.000
		1.439E-04	1.007	20.000
		1.246E-04	1.259	25.000
		1.104E-04	1.511	30.000
		9.944E-05	1.762	35.000
		8.881E-05	2.014	40.000
		7.760E-05	2.266	45.000
		6.862E-05	2.518	50.000
		6.129E-05	2.769	55.000
		5.501E-05	3.021	60.000
		4.859E-05	3.273	65.000
		4.325E-05	3.525	70.000
		3.607E-05	3.776	75.000
		2.406E-05	4.028	80.000
		1.357E-05	4.280	85.000
		1.996E-04	0.5	9.93

ANNUAL AVERAGE = 3.58E-06

K= 11 FIVEXQ(K) = 1.996E-04 FIVEPR(K) = 9.930



PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE ENE SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	EFF PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
									MEANDER	BLDG WAKE	USED
AT 10.0 METERS									CA=2926.SQ.METERS		
A	1.6	0.56	731.	0.	0.	141.1	248.3	141.1	5.677E-06	5.530E-06	5.530E-06
A	3.4	8.49	731.	0.	0.	141.1	248.3	141.1	2.649E-06	2.581E-06	2.581E-06
A	5.7	5.00	731.	0.	0.	141.1	248.3	141.1	1.589E-06	1.548E-06	1.548E-06
A	8.5	0.44	731.	0.	0.	141.1	248.3	141.1	1.074E-06	1.046E-06	1.046E-06
B	1.6	0.48	731.	0.	0.	106.1	77.9	106.1	2.406E-05	2.162E-05	2.162E-05
B	3.4	3.28	731.	0.	0.	106.1	77.9	106.1	1.123E-05	1.009E-05	1.009E-05
B	5.7	1.52	731.	0.	0.	106.1	77.9	106.1	6.736E-06	6.055E-06	6.055E-06
B	8.5	0.08	731.	0.	0.	106.1	77.9	106.1	4.552E-06	4.091E-06	4.091E-06
C	1.6	1.04	731.	0.	0.	80.6	45.9	80.6	5.373E-05	4.293E-05	4.293E-05
C	3.4	3.72	731.	0.	0.	80.6	45.9	80.6	2.507E-05	2.003E-05	2.003E-05
C	5.7	1.48	731.	0.	0.	80.6	45.9	80.6	1.504E-05	1.202E-05	1.202E-05
C	8.5	0.04	731.	0.	0.	80.6	45.9	80.6	1.017E-05	8.122E-06	8.122E-06
D	1.6	7.77	731.	0.	0.	56.8	24.8	113.5	7.076E-05	8.512E-05	7.076E-05
D	3.4	12.61	731.	0.	0.	56.8	24.8	80.8	4.640E-05	3.972E-05	3.972E-05
D	5.7	3.48	731.	0.	0.	56.8	24.8	58.5	3.843E-05	2.383E-05	2.383E-05
D	8.5	0.68	731.	0.	0.	56.8	24.8	56.8	2.677E-05	1.610E-05	1.610E-05
E	0.2	0.00	731.	0.	0.	40.4	17.2	121.1	6.556E-04	8.386E-04	6.556E-04
E	1.6	16.09	731.	0.	0.	40.4	17.2	121.1	9.366E-05	1.198E-04	9.366E-05
E	3.5	11.21	731.	0.	0.	40.4	17.2	69.1	7.664E-05	5.591E-05	5.591E-05
E	5.8	1.00	731.	0.	0.	40.4	17.2	41.4	7.664E-05	3.355E-05	3.355E-05
E	8.7	0.12	731.	0.	0.	40.4	17.2	40.4	5.316E-05	2.267E-05	2.267E-05
E	11.2	0.04	731.	0.	0.	40.4	17.2	40.4	4.098E-05	1.747E-05	1.747E-05
F	1.6	11.77	731.	0.	0.	27.9	11.0	111.4	1.591E-04	2.122E-04	1.591E-04
F	3.5	1.48	731.	0.	0.	27.9	11.0	54.9	1.508E-04	9.900E-05	9.900E-05
G	0.2	0.00	731.	0.	0.	19.2	7.0	115.4	1.682E-03	3.364E-03	1.682E-03
G	1.6	6.56	731.	0.	0.	19.2	7.0	115.4	2.403E-04	4.806E-04	2.403E-04
G	3.5	0.96	731.	0.	0.	19.2	7.0	46.2	2.803E-04	2.243E-04	2.243E-04
G	5.8	0.08	731.	0.	0.	19.2	7.0	20.1	3.869E-04	1.346E-04	1.346E-04

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## SITE EXCLUSION BOUNDARY CALCULATIONS:

ENE SECTOR BOUNDARY DISTANCE = 731.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

1.682E-03	6.556E-04	2.403E-04	2.243E-04	1.591E-04	1.346E-04	9.900E-05	9.366E-05	7.076E-05	5.591E-05
0.002	0.006	6.571	7.531	19.300	19.380	20.861	36.953	44.719	55.927
0.00012	0.00034	0.38600	0.44244	1.13382	1.13852	1.22553	2.17088	2.62709	3.28554
4.293E-05	3.972E-05	3.355E-05	2.383E-05	2.267E-05	2.162E-05	2.003E-05	1.747E-05	1.610E-05	1.202E-05
56.968	69.577	70.578	74.061	74.181	74.661	78.384	78.424	79.104	80.586
3.34668	4.08744	4.14623	4.35082	4.35788	4.38610	4.60480	4.60715	4.64713	4.73414
1.009E-05	8.122E-06	6.055E-06	5.530E-06	4.091E-06	2.581E-06	1.548E-06	1.046E-06		
83.868	83.908	85.429	85.990	86.070	94.556	99.560	100.000		
4.92697	4.92932	5.01868	5.05160	5.05631	5.55485	5.84880	5.87467		

## X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE  
ORDERED X/Q-FREQUENCY VALUES, AND AS  
PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q WITH RESPECT TO WHEN THE WIND BLOWS  
SEC/CUBIC METER THE TOTAL TIME INTO THIS SECTOR ONLY

HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 3)= 1.133  
 HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 4)= 2.169  
 HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 5)= 3.283  
 HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 6)= 4.084  
 HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 7)= 4.601  
 HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 8)= 4.923

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
12	1	-6.38764	-10.86520	-0.95015
12	2	-8.33355	-11.18523	-1.07026
12	3	-8.74579	-13.40700	-2.04503
12	4	-9.27582	-15.08868	-2.87750
12	5	-9.79177	-16.09718	-3.42536
12	6	-10.13357	-31.33722	-12.17890
12	7	-10.81804	-46.39631	-21.11702

12	8	-11.50388	NUMXQ(K) = 8	
4.173E-04			0.059	1.000
3.058E-04			0.176	3.000
2.619E-04			0.294	5.000
2.059E-04			0.587	10.000
1.761E-04			0.881	15.000
1.548E-04			1.175	20.000
1.296E-04			1.469	25.000
1.116E-04			1.762	30.000
9.810E-05			2.056	35.000
8.509E-05			2.350	40.000
7.361E-05			2.644	45.000
6.451E-05			2.937	50.000
5.713E-05			3.231	55.000
5.016E-05			3.525	60.000
4.425E-05			3.819	65.000
3.838E-05			4.112	70.000
2.586E-05			4.406	75.000
1.631E-05			4.700	80.000
2.187E-04			0.5	8.51

ANNUAL AVERAGE = 4.20E-06

K= 12 FIVEXQ(K)= 2.187E-04 FIVEPR(K)= 8.511

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE E SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC AT 10.0 METERS	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN METERS	HT EFF METERS	PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
										MEANDER	BLDG WAKE	USED
										CA=2926.SQ.METERS		
A	1.6	0.49	731.	0.	0.	0.	141.1	248.3	141.1	5.677E-06	5.530E-06	5.530E-06
A	3.4	4.53	731.	0.	0.	0.	141.1	248.3	141.1	2.649E-06	2.581E-06	2.581E-06
A	5.7	3.49	731.	0.	0.	0.	141.1	248.3	141.1	1.589E-06	1.548E-06	1.548E-06
A	8.5	1.42	731.	0.	0.	0.	141.1	248.3	141.1	1.074E-06	1.046E-06	1.046E-06
A	11.0	0.11	731.	0.	0.	0.	141.1	248.3	141.1	8.278E-07	8.064E-07	8.064E-07
A	25.1	0.02	731.	0.	0.	0.	141.1	248.3	141.1	3.612E-07	3.519E-07	3.519E-07
B	1.6	0.47	731.	0.	0.	0.	106.1	77.9	106.1	2.406E-05	2.162E-05	2.162E-05
B	3.4	1.97	731.	0.	0.	0.	106.1	77.9	106.1	1.123E-05	1.009E-05	1.009E-05
B	5.7	1.99	731.	0.	0.	0.	106.1	77.9	106.1	6.736E-06	6.055E-06	6.055E-06
B	8.5	0.76	731.	0.	0.	0.	106.1	77.9	106.1	4.552E-06	4.091E-06	4.091E-06
B	11.0	0.15	731.	0.	0.	0.	106.1	77.9	106.1	3.509E-06	3.153E-06	3.153E-06
B	25.1	0.08	731.	0.	0.	0.	106.1	77.9	106.1	1.531E-06	1.376E-06	1.376E-06
C	1.6	0.55	731.	0.	0.	0.	80.6	45.9	80.6	5.373E-05	4.293E-05	4.293E-05
C	3.4	2.63	731.	0.	0.	0.	80.6	45.9	80.6	2.507E-05	2.003E-05	2.003E-05
C	5.7	1.86	731.	0.	0.	0.	80.6	45.9	80.6	1.504E-05	1.202E-05	1.202E-05
C	8.5	0.83	731.	0.	0.	0.	80.6	45.9	80.6	1.017E-05	8.122E-06	8.122E-06
C	11.0	0.17	731.	0.	0.	0.	80.6	45.9	80.6	7.836E-06	6.261E-06	6.261E-06
D	1.6	4.13	731.	0.	0.	0.	56.8	24.8	113.5	7.076E-05	8.512E-05	7.076E-05
D	3.4	10.63	731.	0.	0.	0.	56.8	24.8	80.8	4.640E-05	3.972E-05	3.972E-05
D	5.7	10.92	731.	0.	0.	0.	56.8	24.8	58.5	3.843E-05	2.383E-05	2.383E-05
D	8.5	4.78	731.	0.	0.	0.	56.8	24.8	56.8	2.677E-05	1.610E-05	1.610E-05
D	11.0	0.51	731.	0.	0.	0.	56.8	24.8	56.8	2.064E-05	1.241E-05	1.241E-05
D	25.1	0.02	731.	0.	0.	0.	56.8	24.8	56.8	9.005E-06	5.417E-06	5.417E-06
E	0.2	0.00	731.	0.	0.	0.	40.4	17.2	121.1	6.556E-04	8.386E-04	6.556E-04
E	1.6	9.76	731.	0.	0.	0.	40.4	17.2	121.1	9.366E-05	1.198E-04	9.366E-05
E	3.5	11.86	731.	0.	0.	0.	40.4	17.2	69.1	7.664E-05	5.591E-05	5.591E-05
E	5.8	2.82	731.	0.	0.	0.	40.4	17.2	41.4	7.664E-05	3.355E-05	3.355E-05
E	8.7	0.42	731.	0.	0.	0.	40.4	17.2	40.4	5.316E-05	2.267E-05	2.267E-05
E	11.2	0.02	731.	0.	0.	0.	40.4	17.2	40.4	4.098E-05	1.747E-05	1.747E-05
F	1.6	9.42	731.	0.	0.	0.	27.9	11.0	111.4	1.591E-04	2.122E-04	1.591E-04
F	3.5	2.33	731.	0.	0.	0.	27.9	11.0	54.9	1.508E-04	9.900E-05	9.900E-05
G	0.2	0.00	731.	0.	0.	0.	19.2	7.0	115.4	1.682E-03	3.364E-03	1.682E-03
G	1.6	8.96	731.	0.	0.	0.	19.2	7.0	115.4	2.403E-04	4.806E-04	2.403E-04
G	3.5	1.38	731.	0.	0.	0.	19.2	7.0	46.2	2.803E-04	2.243E-04	2.243E-04
G	5.8	0.47	731.	0.	0.	0.	19.2	7.0	20.1	3.869E-04	1.346E-04	1.346E-04
G	8.7	0.06	731.	0.	0.	0.	19.2	7.0	19.2	2.728E-04	9.092E-05	9.092E-05

USNRC COMPUTER CODE-PAVAN, VERSION 2.0

RUN DATE: 04/30/03

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

#### SITE EXCLUSION BOUNDARY CALCULATIONS:

E SECTOR BOUNDARY DISTANCE = 731.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

1.682E-03	6.556E-04	2.403E-04	2.243E-04	1.591E-04	1.346E-04	9.900E-05	9.366E-05	9.092E-05	7.076E-05
0.003	0.005	8.961	10.337	19.758	20.224	22.553	32.313	32.377	36.505
0.00032	0.00056	0.99530	1.14815	2.19462	2.24636	2.50503	3.58913	3.59618	4.05475
5.591E-05	4.293E-05	3.972E-05	3.355E-05	2.383E-05	2.267E-05	2.162E-05	2.003E-05	1.747E-05	1.610E-05
48.362	48.912	59.540	62.356	73.281	73.704	74.170	76.796	76.817	81.602
5.37165	5.43279	6.61330	6.92607	8.13950	8.18653	8.23827	8.52987	8.53222	9.06368
1.241E-05	1.202E-05	1.009E-05	8.122E-06	6.261E-06	6.055E-06	5.530E-06	5.417E-06	4.091E-06	3.153E-06
82.110	83.973	85.942	86.768	86.937	88.927	89.414	89.435	90.197	90.346
9.12012	9.32706	9.54576	9.63748	9.65629	9.87734	9.93143	9.93378	10.01844	10.03490
2.581E-06	1.548E-06	1.376E-06	1.046E-06	8.064E-07	3.519E-07				
94.876	98.370	98.454	99.873	99.979	100.000				
10.53814	10.92616	10.93556	11.09312	11.10488	11.10723				

#### X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE ORDERED X/Q-FREQUENCY VALUES, AND AS PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q WITH RESPECT TO WHEN THE WIND BLOWS  
SEC/CUBIC METER THE TOTAL TIME INTO THIS SECTOR ONLY

HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 3)=	1.147
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 4)=	2.192
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 5)=	3.586
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 6)=	5.368
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 7)=	6.609
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 8)=	8.136
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 9)=	9.060
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE(10)=	9.542

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
13	1	-6.38764	-10.40528	-0.88971

13	2	-8.33355	-11.30942	-1.27799
13	3	-8.40264	-11.41687	-1.32523
13	4	-8.74579	-13.72257	-2.46919
13	5	-9.27582	-14.14791	-2.70537
13	6	-9.79177	-15.05056	-3.26596
13	7	-10.13357	-17.15492	-4.66372
13	8	-10.64440	-19.92995	-6.65157
13	9	-11.03644	-32.59905	-16.12694
13	10	-11.50388	NUMXQ(K)= 10	
	4.604E-04		0.111	1.000
	3.385E-04		0.333	3.000
	2.900E-04		0.555	5.000
	2.279E-04		1.111	10.000
	1.849E-04		1.666	15.000
	1.571E-04		2.221	20.000
	1.242E-04		2.777	25.000
	1.018E-04		3.332	30.000
	8.483E-05		3.888	35.000
	7.164E-05		4.443	40.000
	6.150E-05		4.998	45.000
	5.298E-05		5.554	50.000
	4.534E-05		6.109	55.000
	3.900E-05		6.664	60.000
	3.211E-05		7.220	65.000
	2.674E-05		7.775	70.000
	2.192E-05		8.330	75.000
	1.732E-05		8.886	80.000
	1.115E-05		9.441	85.000
	2.996E-04		0.5	4.50

ANNUAL AVERAGE = 7.36E-06

K= 13 FIVEXQ(K)= 2.996E-04 FIVEPR(K)= 4.502

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE ESE SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	EFF PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
									MEANDER	BLDG WAKE	USED
AT 10.0 METERS									CA=2926.SQ.METERS		
A	1.6	0.10	731.	0.	0.	141.1	248.3	141.1	5.677E-06	5.530E-06	5.530E-06
A	3.4	2.79	731.	0.	0.	141.1	248.3	141.1	2.649E-06	2.581E-06	2.581E-06
A	5.7	3.74	731.	0.	0.	141.1	248.3	141.1	1.589E-06	1.548E-06	1.548E-06
A	8.5	2.05	731.	0.	0.	141.1	248.3	141.1	1.074E-06	1.046E-06	1.046E-06
A	11.0	0.18	731.	0.	0.	141.1	248.3	141.1	8.278E-07	8.064E-07	8.064E-07
B	1.6	0.18	731.	0.	0.	106.1	77.9	106.1	2.406E-05	2.162E-05	2.162E-05
B	3.4	1.60	731.	0.	0.	106.1	77.9	106.1	1.123E-05	1.009E-05	1.009E-05
B	5.7	1.83	731.	0.	0.	106.1	77.9	106.1	6.736E-06	6.055E-06	6.055E-06
B	8.5	1.26	731.	0.	0.	106.1	77.9	106.1	4.552E-06	4.091E-06	4.091E-06
B	11.0	0.06	731.	0.	0.	106.1	77.9	106.1	3.509E-06	3.153E-06	3.153E-06
C	1.6	0.31	731.	0.	0.	80.6	45.9	80.6	5.373E-05	4.293E-05	4.293E-05
C	3.4	1.95	731.	0.	0.	80.6	45.9	80.6	2.507E-05	2.003E-05	2.003E-05
C	5.7	2.48	731.	0.	0.	80.6	45.9	80.6	1.504E-05	1.202E-05	1.202E-05
C	8.5	1.94	731.	0.	0.	80.6	45.9	80.6	1.017E-05	8.122E-06	8.122E-06
C	11.0	0.18	731.	0.	0.	80.6	45.9	80.6	7.836E-06	6.261E-06	6.261E-06
C	25.1	0.01	731.	0.	0.	80.6	45.9	80.6	3.419E-06	2.732E-06	2.732E-06
D	1.6	3.10	731.	0.	0.	56.8	24.8	113.5	7.076E-05	8.512E-05	7.076E-05
D	3.4	9.87	731.	0.	0.	56.8	24.8	80.8	4.640E-05	3.972E-05	3.972E-05
D	5.7	14.90	731.	0.	0.	56.8	24.8	58.5	3.843E-05	2.383E-05	2.383E-05
D	8.5	7.77	731.	0.	0.	56.8	24.8	56.8	2.677E-05	1.610E-05	1.610E-05
D	11.0	0.58	731.	0.	0.	56.8	24.8	56.8	2.064E-05	1.241E-05	1.241E-05
D	25.1	0.01	731.	0.	0.	56.8	24.8	56.8	9.005E-06	5.417E-06	5.417E-06
E	0.2	0.00	731.	0.	0.	40.4	17.2	121.1	6.556E-04	8.386E-04	6.556E-04
E	1.6	6.86	731.	0.	0.	40.4	17.2	121.1	9.366E-05	1.198E-04	9.366E-05
E	3.5	12.50	731.	0.	0.	40.4	17.2	69.1	7.664E-05	5.591E-05	5.591E-05
E	5.8	3.92	731.	0.	0.	40.4	17.2	41.4	7.664E-05	3.355E-05	3.355E-05
E	8.7	0.83	731.	0.	0.	40.4	17.2	40.4	5.316E-05	2.267E-05	2.267E-05
E	11.2	0.07	731.	0.	0.	40.4	17.2	40.4	4.098E-05	1.747E-05	1.747E-05
F	1.6	6.65	731.	0.	0.	27.9	11.0	111.4	1.591E-04	2.122E-04	1.591E-04
F	3.5	2.84	731.	0.	0.	27.9	11.0	54.9	1.508E-04	9.900E-05	9.900E-05
F	5.8	0.10	731.	0.	0.	27.9	11.0	28.8	1.724E-04	5.940E-05	5.940E-05
F	8.7	0.03	731.	0.	0.	27.9	11.0	27.9	1.204E-04	4.014E-05	4.014E-05
G	0.2	0.00	731.	0.	0.	19.2	7.0	115.4	1.682E-03	3.364E-03	1.682E-03
G	1.6	7.57	731.	0.	0.	19.2	7.0	115.4	2.403E-04	4.806E-04	2.403E-04
G	3.5	1.34	731.	0.	0.	19.2	7.0	46.2	2.803E-04	2.243E-04	2.243E-04
G	5.8	0.21	731.	0.	0.	19.2	7.0	20.1	3.869E-04	1.346E-04	1.346E-04
G	8.7	0.18	731.	0.	0.	19.2	7.0	19.2	2.728E-04	9.092E-05	9.092E-05
G	11.2	0.01	731.	0.	0.	19.2	7.0	19.2	2.103E-04	7.009E-05	7.009E-05

USNRC COMPUTER CODE-PAVAN, VERSION 2.0

RUN DATE: 04/30/03

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

#### SITE EXCLUSION BOUNDARY CALCULATIONS:

ESE SECTOR BOUNDARY DISTANCE = 731.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

1.682E-03	6.556E-04	2.403E-04	2.243E-04	1.591E-04	1.346E-04	9.900E-05	9.366E-05	9.092E-05	7.076E-05
0.002	0.004	7.570	8.915	15.564	15.771	18.608	25.465	25.642	28.745
0.00038	0.00063	1.20466	1.41866	2.47688	2.50980	2.96131	4.05246	4.08068	4.57452
7.009E-05	5.940E-05	5.591E-05	4.293E-05	4.014E-05	3.972E-05	3.355E-05	2.383E-05	2.267E-05	2.162E-05
28.760	28.863	41.365	41.675	41.705	51.576	55.492	70.387	71.214	71.392
4.57687	4.59333	6.58280	6.63218	6.63689	8.20776	8.83094	11.20137	11.33306	11.36128
2.003E-05	1.747E-05	1.610E-05	1.241E-05	1.202E-05	1.009E-05	8.122E-06	6.261E-06	6.055E-06	5.530E-06
73.342	73.416	81.189	81.765	84.248	85.844	87.779	87.957	89.789	89.893
11.67169	11.68345	12.92039	13.01211	13.40718	13.66115	13.96921	13.99743	14.28903	14.30549
5.417E-06	4.091E-06	3.153E-06	2.732E-06	2.581E-06	1.548E-06	1.046E-06	8.064E-07		
89.907	91.163	91.222	91.237	94.030	97.769	99.823	100.000		
14.30785	14.50773	14.51714	14.51949	14.96395	15.55890	15.88578	15.91400		

#### X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE ORDERED X/Q-FREQUENCY VALUES, AND AS PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q WITH RESPECT TO WHEN THE WIND BLOWS  
SEC/CUBIC METER THE TOTAL TIME INTO THIS SECTOR ONLY

HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 3)= 1.417  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 4)= 2.474  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 5)= 6.579  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 6)= 11.199  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 7)= 12.919  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 8)= 13.406

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
14	1	-6.38764	-10.31198	-0.87693
14	2	-8.33355	-10.78641	-1.08722
14	3	-8.40264	-11.70011	-1.50396



14	4	-8.74579	-13.24713	-2.29149
14	5	-9.79177	-14.19656	-2.92113
14	6	-10.64440	-16.20146	-4.56986
14	7	-11.03644	-25.51216	-12.80772
14	8	-11.32887	NUMXQ(K) = 8	
	4.416E-04	0.159		1.000
	3.227E-04	0.477		3.000
	2.754E-04	0.796		5.000
	2.094E-04	1.591		10.000
	1.629E-04	2.387		15.000
	1.239E-04	3.183		20.000
	9.817E-05	3.979		25.000
	8.060E-05	4.774		30.000
	6.784E-05	5.570		35.000
	5.816E-05	6.366		40.000
	4.920E-05	7.161		45.000
	4.179E-05	7.957		50.000
	3.591E-05	8.753		55.000
	3.117E-05	9.548		60.000
	2.729E-05	10.344		65.000
	2.406E-05	11.140		70.000
	2.006E-05	11.936		75.000
	1.678E-05	12.731		80.000
	3.182E-04	0.5		3.14
ANNUAL AVERAGE = 8.88E-06				
K= 14	FIVEXQ(K) = 3.182E-04		FIVEPR(K) = 3.142	

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE SE SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC AT 10.0 METERS	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN METERS	HT EFF METERS	PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
										MEANDER	BLDG WAKE	USED
										CA=2926.SQ.METERS		
A	1.6	0.15	731.	0.	0.	0.	141.1	248.3	141.1	5.677E-06	5.530E-06	5.530E-06
A	3.4	1.51	731.	0.	0.	0.	141.1	248.3	141.1	2.649E-06	2.581E-06	2.581E-06
A	5.7	3.59	731.	0.	0.	0.	141.1	248.3	141.1	1.589E-06	1.548E-06	1.548E-06
A	8.5	1.11	731.	0.	0.	0.	141.1	248.3	141.1	1.074E-06	1.046E-06	1.046E-06
A	11.0	0.15	731.	0.	0.	0.	141.1	248.3	141.1	8.278E-07	8.064E-07	8.064E-07
B	1.6	0.09	731.	0.	0.	0.	106.1	77.9	106.1	2.406E-05	2.162E-05	2.162E-05
B	3.4	1.28	731.	0.	0.	0.	106.1	77.9	106.1	1.123E-05	1.009E-05	1.009E-05
B	5.7	2.51	731.	0.	0.	0.	106.1	77.9	106.1	6.736E-06	6.055E-06	6.055E-06
B	8.5	0.94	731.	0.	0.	0.	106.1	77.9	106.1	4.552E-06	4.091E-06	4.091E-06
B	11.0	0.09	731.	0.	0.	0.	106.1	77.9	106.1	3.509E-06	3.153E-06	3.153E-06
C	1.6	0.21	731.	0.	0.	0.	80.6	45.9	80.6	5.373E-05	4.293E-05	4.293E-05
C	3.4	1.53	731.	0.	0.	0.	80.6	45.9	80.6	2.507E-05	2.003E-05	2.003E-05
C	5.7	3.32	731.	0.	0.	0.	80.6	45.9	80.6	1.504E-05	1.202E-05	1.202E-05
C	8.5	2.34	731.	0.	0.	0.	80.6	45.9	80.6	1.017E-05	8.122E-06	8.122E-06
C	11.0	0.57	731.	0.	0.	0.	80.6	45.9	80.6	7.836E-06	6.261E-06	6.261E-06
C	25.1	0.02	731.	0.	0.	0.	80.6	45.9	80.6	3.419E-06	2.732E-06	2.732E-06
D	1.6	3.65	731.	0.	0.	0.	56.8	24.8	113.5	7.076E-05	8.512E-05	7.076E-05
D	3.4	10.99	731.	0.	0.	0.	56.8	24.8	80.8	4.640E-05	3.972E-05	3.972E-05
D	5.7	15.49	731.	0.	0.	0.	56.8	24.8	58.5	3.843E-05	2.383E-05	2.383E-05
D	8.5	10.56	731.	0.	0.	0.	56.8	24.8	56.8	2.677E-05	1.610E-05	1.610E-05
D	11.0	2.15	731.	0.	0.	0.	56.8	24.8	56.8	2.064E-05	1.241E-05	1.241E-05
D	25.1	0.09	731.	0.	0.	0.	56.8	24.8	56.8	9.005E-06	5.417E-06	5.417E-06
E	0.2	0.00	731.	0.	0.	0.	40.4	17.2	121.1	6.556E-04	8.386E-04	6.556E-04
E	1.6	6.65	731.	0.	0.	0.	40.4	17.2	121.1	9.366E-05	1.198E-04	9.366E-05
E	3.5	9.71	731.	0.	0.	0.	40.4	17.2	69.1	7.664E-05	5.591E-05	5.591E-05
E	5.8	4.21	731.	0.	0.	0.	40.4	17.2	41.4	7.664E-05	3.355E-05	3.355E-05
E	8.7	1.02	731.	0.	0.	0.	40.4	17.2	40.4	5.316E-05	2.267E-05	2.267E-05
E	11.2	0.09	731.	0.	0.	0.	40.4	17.2	40.4	4.098E-05	1.747E-05	1.747E-05
F	1.6	6.67	731.	0.	0.	0.	27.9	11.0	111.4	1.591E-04	2.122E-04	1.591E-04
F	3.5	1.83	731.	0.	0.	0.	27.9	11.0	54.9	1.508E-04	9.900E-05	9.900E-05
F	8.7	0.19	731.	0.	0.	0.	27.9	11.0	27.9	1.204E-04	4.014E-05	4.014E-05
F	11.2	0.04	731.	0.	0.	0.	27.9	11.0	27.9	9.283E-05	3.094E-05	3.094E-05
G	0.2	0.00	731.	0.	0.	0.	19.2	7.0	115.4	1.682E-03	3.364E-03	1.682E-03
G	1.6	6.63	731.	0.	0.	0.	19.2	7.0	115.4	2.403E-04	4.806E-04	2.403E-04
G	3.5	0.51	731.	0.	0.	0.	19.2	7.0	46.2	2.803E-04	2.243E-04	2.243E-04
G	5.8	0.08	731.	0.	0.	0.	19.2	7.0	20.1	3.869E-04	1.346E-04	1.346E-04

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## SITE EXCLUSION BOUNDARY CALCULATIONS:

SE SECTOR BOUNDARY DISTANCE = 731.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

1.682E-03	6.556E-04	2.403E-04	2.243E-04	1.591E-04	1.346E-04	9.900E-05	9.366E-05	7.076E-05	5.591E-05
0.002	0.004	6.634	7.144	13.811	13.887	15.719	22.368	26.013	35.722
0.00026	0.00045	0.82587	0.88936	1.71948	1.72889	1.95699	2.78476	3.23862	4.44735
4.293E-05	4.014E-05	3.972E-05	3.355E-05	3.094E-05	2.383E-05	2.267E-05	2.162E-05	2.003E-05	1.747E-05
35.930	36.119	47.112	51.324	51.362	66.850	67.870	67.965	69.495	69.589
4.47322	4.49674	5.86538	6.38979	6.39449	8.32281	8.44980	8.46156	8.65204	8.66380
1.610E-05	1.241E-05	1.202E-05	1.009E-05	8.122E-06	6.261E-06	6.055E-06	5.530E-06	5.417E-06	4.091E-06
80.148	82.301	85.626	86.910	89.252	89.819	92.331	92.482	92.577	93.521
9.97835	10.24643	10.66031	10.82022	11.11182	11.18237	11.49514	11.51395	11.52571	11.64329
3.153E-06	2.732E-06	2.581E-06	1.548E-06	1.046E-06	8.064E-07				
93.616	93.635	95.146	98.734	99.849	100.000				
11.65505	11.65740	11.84553	12.29233	12.43108	12.44989				

## X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE  
ORDERED X/Q-FREQUENCY VALUES, AND AS  
PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q WITH RESPECT TO WHEN THE WIND BLOWS  
SEC/CUBIC METER THE TOTAL TIME INTO THIS SECTOR ONLY

HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 3)= 1.718  
 HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 4)= 4.444  
 HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 5)= 5.862  
 HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 6)= 8.319  
 HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 7)= 9.975  
 HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 8)= 10.658

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
15	1	-6.38764	-10.49626	-0.90199
15	2	-8.33355	-11.84122	-1.46293
15	3	-8.74579	-14.08444	-2.52309

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15 4      -9.79177 -14.10418 -2.53470
15 5      -10.13357 -14.51627 -2.79776
15 6      -10.64440 -16.01861 -3.88333
15 7      -11.03644 -20.90559 -7.69246
15 8      -11.32887      NUMXQ(K) = 8
      4.231E-04      0.124      1.000
      3.088E-04      0.373      3.000
      2.634E-04      0.622      5.000
      1.918E-04      1.245     10.000
      1.462E-04      1.867     15.000
      1.079E-04      2.490     20.000
      8.448E-05      3.112     25.000
      6.865E-05      3.735     30.000
      5.729E-05      4.357     35.000
      4.873E-05      4.980     40.000
      4.210E-05      5.602     45.000
      3.652E-05      6.225     50.000
      3.185E-05      6.847     55.000
      2.803E-05      7.470     60.000
      2.487E-05      8.092     65.000
      2.161E-05      8.715     70.000
      1.863E-05      9.337     75.000
      1.617E-05      9.960     80.000
      1.242E-05     10.582     85.000

      2.823E-04      0.5      4.02

ANNUAL AVERAGE = 6.50E-06

K= 15      FIVEXQ(K) = 2.823E-04      FIVEPR(K) = 4.016

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PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE SSE SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC AT 10.0 METERS	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN METERS	HT EFF METERS	PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
										MEANDER	BLDG WAKE	USED
										CA=2926.SQ.METERS		
A	1.6	0.23	731.	0.	0.	0.	141.1	248.3	141.1	5.677E-06	5.530E-06	5.530E-06
A	3.4	2.17	731.	0.	0.	0.	141.1	248.3	141.1	2.649E-06	2.581E-06	2.581E-06
A	5.7	2.33	731.	0.	0.	0.	141.1	248.3	141.1	1.589E-06	1.548E-06	1.548E-06
A	8.5	0.66	731.	0.	0.	0.	141.1	248.3	141.1	1.074E-06	1.046E-06	1.046E-06
A	11.0	0.16	731.	0.	0.	0.	141.1	248.3	141.1	8.278E-07	8.064E-07	8.064E-07
B	3.4	1.55	731.	0.	0.	0.	106.1	77.9	106.1	1.123E-05	1.009E-05	1.009E-05
B	5.7	1.71	731.	0.	0.	0.	106.1	77.9	106.1	6.736E-06	6.055E-06	6.055E-06
B	8.5	0.81	731.	0.	0.	0.	106.1	77.9	106.1	4.552E-06	4.091E-06	4.091E-06
B	11.0	0.16	731.	0.	0.	0.	106.1	77.9	106.1	3.509E-06	3.153E-06	3.153E-06
C	1.6	0.39	731.	0.	0.	0.	80.6	45.9	80.6	5.373E-05	4.293E-05	4.293E-05
C	3.4	1.36	731.	0.	0.	0.	80.6	45.9	80.6	2.507E-05	2.003E-05	2.003E-05
C	5.7	2.13	731.	0.	0.	0.	80.6	45.9	80.6	1.504E-05	1.202E-05	1.202E-05
C	8.5	0.85	731.	0.	0.	0.	80.6	45.9	80.6	1.017E-05	8.122E-06	8.122E-06
C	11.0	0.12	731.	0.	0.	0.	80.6	45.9	80.6	7.836E-06	6.261E-06	6.261E-06
D	1.6	5.97	731.	0.	0.	0.	56.8	24.8	113.5	7.076E-05	8.512E-05	7.076E-05
D	3.4	13.38	731.	0.	0.	0.	56.8	24.8	80.8	4.640E-05	3.972E-05	3.972E-05
D	5.7	16.25	731.	0.	0.	0.	56.8	24.8	58.5	3.843E-05	2.383E-05	2.383E-05
D	8.5	4.96	731.	0.	0.	0.	56.8	24.8	56.8	2.677E-05	1.610E-05	1.610E-05
D	11.0	0.47	731.	0.	0.	0.	56.8	24.8	56.8	2.064E-05	1.241E-05	1.241E-05
E	0.2	0.00	731.	0.	0.	0.	40.4	17.2	121.1	6.556E-04	8.386E-04	6.556E-04
E	1.6	9.15	731.	0.	0.	0.	40.4	17.2	121.1	9.366E-05	1.198E-04	9.366E-05
E	3.5	9.93	731.	0.	0.	0.	40.4	17.2	69.1	7.664E-05	5.591E-05	5.591E-05
E	5.8	3.22	731.	0.	0.	0.	40.4	17.2	41.4	7.664E-05	3.355E-05	3.355E-05
E	8.7	0.47	731.	0.	0.	0.	40.4	17.2	40.4	5.316E-05	2.267E-05	2.267E-05
F	1.6	7.72	731.	0.	0.	0.	27.9	11.0	111.4	1.591E-04	2.122E-04	1.591E-04
F	3.5	0.85	731.	0.	0.	0.	27.9	11.0	54.9	1.508E-04	9.900E-05	9.900E-05
F	5.8	0.04	731.	0.	0.	0.	27.9	11.0	28.8	1.724E-04	5.940E-05	5.940E-05
F	11.2	0.08	731.	0.	0.	0.	27.9	11.0	27.9	9.283E-05	3.094E-05	3.094E-05
G	0.2	0.00	731.	0.	0.	0.	19.2	7.0	115.4	1.682E-03	3.364E-03	1.682E-03
G	1.6	12.41	731.	0.	0.	0.	19.2	7.0	115.4	2.403E-04	4.806E-04	2.403E-04
G	3.5	0.35	731.	0.	0.	0.	19.2	7.0	46.2	2.803E-04	2.243E-04	2.243E-04
G	5.8	0.12	731.	0.	0.	0.	19.2	7.0	20.1	3.869E-04	1.346E-04	1.346E-04

USNRC COMPUTER CODE-PAVAN, VERSION 2.0

RUN DATE: 04/30/03

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

#### SITE EXCLUSION BOUNDARY CALCULATIONS:

SSE SECTOR BOUNDARY DISTANCE = 731.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

1.682E-03	6.556E-04	2.403E-04	2.243E-04	1.591E-04	1.346E-04	9.900E-05	9.366E-05	7.076E-05	5.940E-05
0.004	0.006	12.418	12.767	20.486	20.602	21.455	30.609	36.583	36.621
0.00024	0.00037	0.75288	0.77405	1.24202	1.24907	1.30081	1.85579	2.21794	2.22029
5.591E-05	4.293E-05	3.972E-05	3.355E-05	3.094E-05	2.383E-05	2.267E-05	2.003E-05	1.610E-05	1.241E-05
46.551	46.939	60.320	63.540	63.617	79.869	80.335	81.692	86.657	87.123
2.82230	2.84582	3.65712	3.85231	3.85701	4.84234	4.87056	4.95286	5.25387	5.28209
1.202E-05	1.009E-05	8.122E-06	6.261E-06	6.055E-06	5.530E-06	4.091E-06	3.153E-06	2.581E-06	1.548E-06
89.256	90.807	91.661	91.777	93.484	93.716	94.531	94.686	96.858	99.186
5.41143	5.50549	5.55723	5.56428	5.66775	5.68186	5.73125	5.74065	5.87235	6.01344
1.046E-06	8.064E-07								
99.845	100.000								
6.05342	6.06283								

#### X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE ORDERED X/Q-FREQUENCY VALUES, AND AS PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q WITH RESPECT TO WHEN THE WIND BLOWS  
SEC/CUBIC METER THE TOTAL TIME INTO THIS SECTOR ONLY

HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 3)=	1.241
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 4)=	3.654
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 5)=	4.839
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 6)=	5.250
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 7)=	5.408

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
16	1	-6.38764	-10.54131	-0.90802
16	2	-8.33355	-13.69082	-2.20335
16	3	-8.74579	-15.63691	-3.07047
16	4	-10.13357	-17.08862	-3.88042

16	5	-10.64440	-27.07330	-9.89276
16	6	-11.03644	-43.68282	-20.13878
16	7	-11.32887	NUMXQ(K)= 7	
		4.990E-04	0.061	1.000
		3.706E-04	0.182	3.000
		3.194E-04	0.303	5.000
		2.578E-04	0.606	10.000
		2.063E-04	0.909	15.000
		1.624E-04	1.213	20.000
		1.253E-04	1.516	25.000
		1.000E-04	1.819	30.000
		8.231E-05	2.122	35.000
		6.925E-05	2.425	40.000
		5.928E-05	2.728	45.000
		5.145E-05	3.031	50.000
		4.517E-05	3.335	55.000
		4.002E-05	3.638	60.000
		3.477E-05	3.941	65.000
		3.040E-05	4.244	70.000
		2.679E-05	4.547	75.000
		2.365E-05	4.850	80.000
		1.768E-05	5.153	85.000
		2.741E-04	0.5	8.25
ANNUAL AVERAGE = 4.34E-06				
K= 16	FIVEXQ(K)= 2.741E-04		FIVEPR(K)= 8.247	

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE ALL SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN METERS	HT EFF METERS	PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
										MEANDER	BLDG WAKE	USED
AT 10.0 METERS										CA=2926.SQ.METERS		
A	1.6	0.19	731.	0.	0.	0.	141.1	248.3	141.1	5.677E-06	5.530E-06	5.530E-06
A	3.4	3.01	731.	0.	0.	0.	141.1	248.3	141.1	2.649E-06	2.581E-06	2.581E-06
A	5.7	2.69	731.	0.	0.	0.	141.1	248.3	141.1	1.589E-06	1.548E-06	1.548E-06
A	8.5	0.79	731.	0.	0.	0.	141.1	248.3	141.1	1.074E-06	1.046E-06	1.046E-06
A	11.0	0.08	731.	0.	0.	0.	141.1	248.3	141.1	8.278E-07	8.064E-07	8.064E-07
A	25.1	0.00	731.	0.	0.	0.	141.1	248.3	141.1	3.612E-07	3.519E-07	3.519E-07
B	1.6	0.23	731.	0.	0.	0.	106.1	77.9	106.1	2.406E-05	2.162E-05	2.162E-05
B	3.4	1.82	731.	0.	0.	0.	106.1	77.9	106.1	1.123E-05	1.009E-05	1.009E-05
B	5.7	1.52	731.	0.	0.	0.	106.1	77.9	106.1	6.736E-06	6.055E-06	6.055E-06
B	8.5	0.51	731.	0.	0.	0.	106.1	77.9	106.1	4.552E-06	4.091E-06	4.091E-06
B	11.0	0.05	731.	0.	0.	0.	106.1	77.9	106.1	3.509E-06	3.153E-06	3.153E-06
B	25.1	0.01	731.	0.	0.	0.	106.1	77.9	106.1	1.531E-06	1.376E-06	1.376E-06
C	1.6	0.46	731.	0.	0.	0.	80.6	45.9	80.6	5.373E-05	4.293E-05	4.293E-05
C	3.4	2.33	731.	0.	0.	0.	80.6	45.9	80.6	2.507E-05	2.003E-05	2.003E-05
C	5.7	1.87	731.	0.	0.	0.	80.6	45.9	80.6	1.504E-05	1.202E-05	1.202E-05
C	8.5	0.81	731.	0.	0.	0.	80.6	45.9	80.6	1.017E-05	8.122E-06	8.122E-06
C	11.0	0.13	731.	0.	0.	0.	80.6	45.9	80.6	7.836E-06	6.261E-06	6.261E-06
C	25.1	0.00	731.	0.	0.	0.	80.6	45.9	80.6	3.419E-06	2.732E-06	2.732E-06
D	1.6	6.70	731.	0.	0.	0.	56.8	24.8	56.8	1.415E-04	8.512E-05	8.512E-05
D	3.4	16.10	731.	0.	0.	0.	56.8	24.8	56.8	6.604E-05	3.972E-05	3.972E-05
D	5.7	11.46	731.	0.	0.	0.	56.8	24.8	56.8	3.962E-05	2.383E-05	2.383E-05
D	8.5	4.04	731.	0.	0.	0.	56.8	24.8	56.8	2.677E-05	1.610E-05	1.610E-05
D	11.0	0.46	731.	0.	0.	0.	56.8	24.8	56.8	2.064E-05	1.241E-05	1.241E-05
D	25.1	0.02	731.	0.	0.	0.	56.8	24.8	56.8	9.005E-06	5.417E-06	5.417E-06
E	0.2	0.00	731.	0.	0.	0.	40.4	17.2	40.4	1.967E-03	8.386E-04	8.386E-04
E	1.6	10.23	731.	0.	0.	0.	40.4	17.2	40.4	2.810E-04	1.198E-04	1.198E-04
E	3.5	12.64	731.	0.	0.	0.	40.4	17.2	40.4	1.311E-04	5.591E-05	5.591E-05
E	5.8	3.05	731.	0.	0.	0.	40.4	17.2	40.4	7.868E-05	3.355E-05	3.355E-05
E	8.7	0.56	731.	0.	0.	0.	40.4	17.2	40.4	5.316E-05	2.267E-05	2.267E-05
E	11.2	0.05	731.	0.	0.	0.	40.4	17.2	40.4	4.098E-05	1.747E-05	1.747E-05
E	25.7	0.01	731.	0.	0.	0.	40.4	17.2	40.4	1.788E-05	7.624E-06	7.624E-06
F	1.6	7.54	731.	0.	0.	0.	27.9	11.0	27.9	6.365E-04	2.122E-04	2.122E-04
F	3.5	2.09	731.	0.	0.	0.	27.9	11.0	27.9	2.970E-04	9.900E-05	9.900E-05
F	5.8	0.04	731.	0.	0.	0.	27.9	11.0	27.9	1.782E-04	5.940E-05	5.940E-05
F	8.7	0.04	731.	0.	0.	0.	27.9	11.0	27.9	1.204E-04	4.014E-05	4.014E-05
F	11.2	0.02	731.	0.	0.	0.	27.9	11.0	27.9	9.283E-05	3.094E-05	3.094E-05
F	25.7	0.00	731.	0.	0.	0.	27.9	11.0	27.9	4.051E-05	1.350E-05	1.350E-05
G	0.2	0.00	731.	0.	0.	0.	19.2	7.0	19.2	1.009E-02	3.364E-03	3.364E-03
G	1.6	7.42	731.	0.	0.	0.	19.2	7.0	19.2	1.442E-03	4.806E-04	4.806E-04



G	3.5	0.79	731.	0.	0.	19.2	7.0	19.2	6.729E-04	2.243E-04	2.243E-04
G	5.8	0.19	731.	0.	0.	19.2	7.0	19.2	4.037E-04	1.346E-04	1.346E-04
G	8.7	0.04	731.	0.	0.	19.2	7.0	19.2	2.728E-04	9.092E-05	9.092E-05
G	11.2	0.00	731.	0.	0.	19.2	7.0	19.2	2.103E-04	7.009E-05	7.009E-05

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## SITE EXCLUSION BOUNDARY CALCULATIONS:

DIRECTION-INDEPENDENT (S.R.P 2.3.4) MODEL.

MINIMUM BOUNDARY DISTANCE = 731.0 METERS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

3.364E-03	8.386E-04	4.806E-04	2.243E-04	2.122E-04	1.346E-04	1.198E-04	9.900E-05	9.092E-05	8.512E-05
0.002	0.005	7.422	8.217	15.758	15.949	26.183	28.276	28.318	35.020
0.00235	0.00470	7.42169	8.21654	15.75816	15.94864	26.18286	28.27580	28.31813	35.02023
7.009E-05	5.940E-05	5.591E-05	4.293E-05	4.014E-05	3.972E-05	3.355E-05	3.094E-05	2.383E-05	2.267E-05
35.023	35.060	47.695	48.159	48.194	64.295	67.350	67.371	78.831	79.395
35.02258	35.06020	47.69542	48.15869	48.19396	64.29546	67.35020	67.37137	78.83078	79.39516
2.162E-05	2.003E-05	1.747E-05	1.610E-05	1.350E-05	1.241E-05	1.202E-05	1.009E-05	8.122E-06	7.624E-06
79.626	81.951	82.001	86.038	86.041	86.499	88.371	90.189	90.998	91.005
79.62563	81.95137	82.00076	86.03848	86.04082	86.49939	88.37128	90.18907	90.99802	91.00508
6.261E-06	6.055E-06	5.530E-06	5.417E-06	4.091E-06	3.153E-06	2.732E-06	2.581E-06	1.548E-06	1.376E-06
91.134	92.654	92.846	92.865	93.371	93.420	93.425	96.440	99.128	99.137
91.13442	92.65356	92.84640	92.86521	93.37081	93.42020	93.42490	96.43967	99.12756	99.13697
1.046E-06	8.064E-07	3.519E-07							
99.922	99.998	100.000							
99.92241	99.99766	100.00000							

## X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE  
ORDERED X/Q-FREQUENCY VALUES, AND AS  
PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q	WITH RESPECT TO	WHEN THE WIND BLOWS
SEC/CUBIC METER	THE TOTAL TIME	INTO THIS SECTOR ONLY

9.238E-04	1.000	1.000
6.639E-04	3.000	3.000
5.573E-04	5.000	5.000
3.680E-04	10.000	10.000
2.466E-04	15.000	15.000
1.794E-04	20.000	20.000
1.366E-04	25.000	25.000
1.069E-04	30.000	30.000
8.520E-05	35.000	35.000

ERROR IN NORMAL TRANSFORMATION FOR A( 43)= 100.00000

7.448E-05	40.000	40.000
6.543E-05	45.000	45.000
5.761E-05	50.000	50.000
5.072E-05	55.000	55.000
4.455E-05	60.000	60.000
3.885E-05	65.000	65.000
3.299E-05	70.000	70.000
2.765E-05	75.000	75.000
2.251E-05	80.000	80.000
1.716E-05	85.000	85.000
1.318E-05	90.000	90.000

5.573E-04	5.0	5.00
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K= 17      FIVEXQ(K)= 5.573E-04      FIVEPR(K)= 5.000

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## SITE EXCLUSION BOUNDARY CALCULATIONS:

## FIVE PERCENT OVERALL SITE LIMIT

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

1.682E-03	6.556E-04	2.403E-04	2.243E-04	1.591E-04	1.346E-04	9.900E-05	9.366E-05	9.092E-05	7.076E-05
0.002	0.005	7.422	8.217	15.758	15.949	18.042	28.276	28.318	35.020
0.00235	0.00470	7.42169	8.21654	15.75816	15.94864	18.04157	28.27580	28.31813	35.02022
7.009E-05	5.940E-05	5.591E-05	4.293E-05	4.014E-05	3.972E-05	3.355E-05	3.094E-05	2.383E-05	2.267E-05
35.023	35.060	47.695	48.159	48.194	64.295	67.350	67.371	78.831	79.395
35.02257	35.06019	47.69540	48.15867	48.19394	64.29543	67.35016	67.37132	78.83073	79.39511
2.162E-05	2.003E-05	1.747E-05	1.610E-05	1.350E-05	1.241E-05	1.202E-05	1.009E-05	8.122E-06	7.624E-06
79.626	81.951	82.001	86.038	86.041	86.499	88.371	90.189	90.998	91.005
79.62556	81.95131	82.00069	86.03841	86.04076	86.49931	88.37122	90.18902	90.99797	91.00502
6.261E-06	6.055E-06	5.530E-06	5.417E-06	4.091E-06	3.153E-06	2.732E-06	2.581E-06	1.548E-06	1.376E-06
91.134	92.654	92.846	92.865	93.371	93.420	93.425	96.440	99.127	99.137
91.13436	92.65352	92.84634	92.86515	93.37074	93.42012	93.42482	96.43960	99.12749	99.13689
1.046E-06	8.064E-07	3.519E-07							
99.922	99.998	100.000							
99.92234	99.99759	99.99994							

## X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE  
ORDERED X/Q-FREQUENCY VALUES, AND AS  
PLOTTED ON A LOG-NORMAL GRAPH.)

## PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q WITH RESPECT TO WHEN THE WIND BLOWS  
SEC/CUBIC METER THE TOTAL TIME INTO THIS SECTOR ONLY

K	I	XQSAVE(K, I)	XQINT(K, I)	XQSLOP(K, I)
18	1	-6.38764	-9.40517	-0.74142
18	2	-8.33355	-9.68485	-0.93492
18	3	-8.74579	-9.85546	-1.10478
18	4	-9.79177	-9.83829	-0.80696
18	5	-10.13357	-9.70331	-1.17583
18	6	-10.64440	-9.53061	-1.39161
18	7	-11.03644	-9.95004	-1.00400
18	8	-14.03067	NUMXQ(K)= 8	

4.620E-04

1.000

1.000

3.320E-04	3.000	3.000
2.787E-04	5.000	5.000
2.062E-04	10.000	10.000
1.640E-04	15.000	15.000
1.329E-04	20.000	20.000
1.105E-04	25.000	25.000
9.359E-05	30.000	30.000
8.026E-05	35.000	35.000
6.937E-05	40.000	40.000
6.025E-05	45.000	45.000
5.337E-05	50.000	50.000
4.823E-05	55.000	55.000
4.352E-05	60.000	60.000
3.885E-05	65.000	65.000
3.299E-05	70.000	70.000
2.765E-05	75.000	75.000
2.251E-05	80.000	80.000
1.716E-05	85.000	85.000
1.318E-05	90.000	90.000

2.787E-04	5.0	5.00
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K= 18      FIVEXQ(K) = 2.787E-04      FIVEPR(K) = 5.000

K	HIGHPR	PR	GRNDVT (K)
1	-2.80284	0.25328	4.78115
2	-1.82403	3.40741	3.94629
3	-2.83692	0.22776	4.77880
4	-2.98817	0.14033	6.07917
5	-3.07069	0.10679	4.92446
6	-3.30029	0.04830	2.69507
7	-3.35427	0.03979	2.31643
8	-3.37638	0.03673	3.13716
9	-3.21127	0.06608	5.18782
10	-3.24114	0.05953	5.70992
11	-3.02571	0.12403	5.03511
12	-2.95995	0.15385	5.87467
13	-2.64411	0.40953	11.10723
14	-2.57624	0.49942	15.91400
15	-2.70897	0.33747	12.44989
16	-2.74061	0.30663	6.06283

K	HOURS (K)	TOTHR
1	22.18715	22.18715
2	298.48880	320.67600
3	19.95136	340.62730
4	12.29319	352.92050
5	9.35512	362.27570
6	4.23087	366.50650
7	3.48578	369.99230
8	3.21741	373.20970
9	5.78893	378.99870
10	5.21510	384.21370
11	10.86514	395.07890
12	13.47739	408.55630
13	35.87497	444.43120
14	43.74879	488.18000
15	29.56233	517.74240
16	26.86080	544.60310

K	FIVEXQ	SVANN	SLTIME	TIMINT	I	TIME	XQT
1	2.583E-04	3.833E-06	-0.5022	-7.9132	1	8.0	-8.95738
					2	16.0	-9.30544
					3	72.0	-10.06072
					4	624.0	-11.14511
2	2.372E-04	3.440E-06	-0.5049	-7.9966	1	8.0	-9.04652
					2	16.0	-9.39648
					3	72.0	-10.15587
					4	624.0	-11.24616
3	2.499E-04	4.024E-06	-0.4924	-7.9530	1	8.0	-8.97693
					2	16.0	-9.31824
					3	72.0	-10.05887
					4	624.0	-11.12222
4	2.027E-04	3.833E-06	-0.4732	-8.1758	1	8.0	-9.15987
					2	16.0	-9.48788
					3	72.0	-10.19965
					4	624.0	-11.22157
5	1.751E-04	2.867E-06	-0.4904	-8.3101	1	8.0	-9.32987
					2	16.0	-9.66980
					3	72.0	-10.40741
					4	624.0	-11.46645
6	1.261E-04	1.750E-06	-0.5101	-8.6251	1	8.0	-9.68582
					2	16.0	-10.03939
					3	72.0	-10.80661
					4	624.0	-11.90814
7	1.103E-04	1.470E-06	-0.5150	-8.7552	1	8.0	-9.82609
					2	16.0	-10.18305
					3	72.0	-10.95763
					4	624.0	-12.06972
8	1.124E-04	1.684E-06	-0.5010	-8.7464	1	8.0	-9.78818
					2	16.0	-10.13545
					3	72.0	-10.88899
					4	624.0	-11.97089
9	1.424E-04	2.531E-06	-0.4807	-8.5235	1	8.0	-9.52299
					2	16.0	-9.85615
					3	72.0	-10.57910
					4	624.0	-11.61708
10	1.562E-04	2.950E-06	-0.4734	-8.4363	1	8.0	-9.42064
					2	16.0	-9.74877
					3	72.0	-10.46078
					4	624.0	-11.48306
11	1.996E-04	3.576E-06	-0.4797	-8.1867	1	8.0	-9.18413
					2	16.0	-9.51662
					3	72.0	-10.23810
					4	624.0	-11.27397
12	2.187E-04	4.203E-06	-0.4713	-8.1013	1	8.0	-9.08131

					2	16.0	-9.40798
					3	72.0	-10.11682
					4	624.0	-11.13454
13	2.996E-04	7.358E-06	-0.4420	-7.8068			
					1	8.0	-8.72598
					2	16.0	-9.03238
					3	72.0	-9.69725
					4	624.0	-10.65183
14	3.182E-04	8.878E-06	-0.4268	-7.7569			
					1	8.0	-8.64453
					2	16.0	-8.94040
					3	72.0	-9.58241
					4	624.0	-10.50418
15	2.823E-04	6.503E-06	-0.4497	-7.8608			
					1	8.0	-8.79594
					2	16.0	-9.10766
					3	72.0	-9.78405
					4	624.0	-10.75518
16	2.741E-04	4.342E-06	-0.4943	-7.8594			
					1	8.0	-8.88736
					2	16.0	-9.23002
					3	72.0	-9.97356
					4	624.0	-11.04110
17	5.573E-04	8.878E-06	-0.4937	-7.1501			
					1	8.0	-8.17672
					2	16.0	-8.51892
					3	72.0	-9.26147
					4	624.0	-10.32758
18	2.787E-04	8.878E-06	-0.4110	-7.9005			
					1	8.0	-8.75519
					2	16.0	-9.04010
					3	72.0	-9.65833
					4	624.0	-10.54595

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER)

VERSUS

HOURS PER YEAR MAX

AVERAGING TIME

0-2 HR X/Q IS

DOWNWIND DISTANCE								EXCEEDED	DOWNWIND
SECTOR (METERS)		0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	IN SECTOR	SECTOR
S 731.		2.58E-04	1.29E-04	9.09E-05	4.27E-05	1.44E-05	3.83E-06	22.2	S
SSW 731.		2.37E-04	1.18E-04	8.30E-05	3.88E-05	1.31E-05	3.44E-06	298.5	SSW
SW 731.		2.50E-04	1.26E-04	8.98E-05	4.28E-05	1.48E-05	4.02E-06	20.0	SW
WSW 731.		2.03E-04	1.05E-04	7.58E-05	3.72E-05	1.34E-05	3.83E-06	12.3	WSW
W 731.		1.75E-04	8.87E-05	6.32E-05	3.02E-05	1.05E-05	2.87E-06	9.4	W
WNW 731.		1.26E-04	6.22E-05	4.36E-05	2.03E-05	6.74E-06	1.75E-06	4.2	WNW
NW 731.		1.10E-04	5.40E-05	3.78E-05	1.74E-05	5.73E-06	1.47E-06	3.5	NW
NNW 731.		1.12E-04	5.61E-05	3.96E-05	1.87E-05	6.33E-06	1.68E-06	3.2	NNW
N 731.		1.42E-04	7.32E-05	5.24E-05	2.54E-05	9.01E-06	2.53E-06	5.8	N
NNE 731.		1.56E-04	8.10E-05	5.84E-05	2.86E-05	1.03E-05	2.95E-06	5.2	NNE
NE 731.		2.00E-04	1.03E-04	7.36E-05	3.58E-05	1.27E-05	3.58E-06	10.9	NE
ENE 731.		2.19E-04	1.14E-04	8.21E-05	4.04E-05	1.46E-05	4.20E-06	13.5	ENE
E 731.		3.00E-04	1.62E-04	1.19E-04	6.15E-05	2.37E-05	7.36E-06	35.9	E
ESE 731.		3.18E-04	1.76E-04	1.31E-04	6.89E-05	2.74E-05	8.88E-06	43.7	ESE
SE 731.		2.82E-04	1.51E-04	1.11E-04	5.63E-05	2.13E-05	6.50E-06	29.6	SE
SSE 731.		2.74E-04	1.38E-04	9.81E-05	4.66E-05	1.60E-05	4.34E-06	26.9	SSE
MAX X/Q		3.18E-04					TOTAL HOURS AROUND SITE:	544.6	
SRP 2.3.4 731.		5.57E-04	2.81E-04	2.00E-04	9.50E-05	3.27E-05	8.88E-06		
SITE LIMIT		2.79E-04	1.58E-04	1.19E-04	6.39E-05	2.63E-05	8.88E-06		

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

\*\*\*NOTE\*\*: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.  
 CHECK THE REASONABLENESS OF THE ENVELOPES  
 COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY  
 FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.



PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE S SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	HT EFF METERS	PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
										MEANDER	BLDG WAKE	USED
										CA=2926.SQ.METERS		
AT 10.0 METERS												
A	1.6	0.25	2043.	0.	0.	0.	357.1	1000.0	357.1	5.571E-07	5.556E-07	5.556E-07
A	3.4	4.18	2043.	0.	0.	0.	357.1	1000.0	357.1	2.600E-07	2.593E-07	2.593E-07
A	5.7	1.33	2043.	0.	0.	0.	357.1	1000.0	357.1	1.560E-07	1.556E-07	1.556E-07
B	1.6	0.34	2043.	0.	0.	0.	268.5	239.2	268.5	3.097E-06	3.053E-06	3.053E-06
B	3.4	2.46	2043.	0.	0.	0.	268.5	239.2	268.5	1.445E-06	1.425E-06	1.425E-06
B	5.7	1.23	2043.	0.	0.	0.	268.5	239.2	268.5	8.673E-07	8.549E-07	8.549E-07
B	8.5	0.05	2043.	0.	0.	0.	268.5	239.2	268.5	5.860E-07	5.776E-07	5.776E-07
C	1.6	0.30	2043.	0.	0.	0.	203.9	117.1	203.9	8.327E-06	8.015E-06	8.015E-06
C	3.4	2.56	2043.	0.	0.	0.	203.9	117.1	203.9	3.886E-06	3.740E-06	3.740E-06
C	5.7	1.18	2043.	0.	0.	0.	203.9	117.1	203.9	2.332E-06	2.244E-06	2.244E-06
C	8.5	0.05	2043.	0.	0.	0.	203.9	117.1	203.9	1.575E-06	1.516E-06	1.516E-06
D	1.6	10.03	2043.	0.	0.	0.	143.6	51.3	205.2	1.889E-05	2.396E-05	1.889E-05
D	3.4	18.64	2043.	0.	0.	0.	143.6	51.3	169.6	1.066E-05	1.118E-05	1.066E-05
D	5.7	9.84	2043.	0.	0.	0.	143.6	51.3	145.5	7.456E-06	6.708E-06	6.708E-06
D	8.5	1.08	2043.	0.	0.	0.	143.6	51.3	143.6	5.105E-06	4.533E-06	4.533E-06
E	0.2	0.00	2043.	0.	0.	0.	102.1	34.8	189.7	2.062E-04	3.035E-04	2.062E-04
E	1.6	11.56	2043.	0.	0.	0.	102.1	34.8	189.7	2.946E-05	4.336E-05	2.946E-05
E	3.5	9.94	2043.	0.	0.	0.	102.1	34.8	133.2	1.957E-05	2.024E-05	1.957E-05
E	5.8	2.16	2043.	0.	0.	0.	102.1	34.8	103.3	1.515E-05	1.214E-05	1.214E-05
E	8.7	0.25	2043.	0.	0.	0.	102.1	34.8	102.1	1.035E-05	8.204E-06	8.204E-06
F	1.6	8.36	2043.	0.	0.	0.	70.5	22.6	161.1	5.347E-05	7.711E-05	5.347E-05
F	3.5	0.79	2043.	0.	0.	0.	70.5	22.6	99.8	4.030E-05	3.599E-05	3.599E-05
F	8.7	0.05	2043.	0.	0.	0.	70.5	22.6	70.5	2.313E-05	1.459E-05	1.459E-05
F	11.2	0.10	2043.	0.	0.	0.	70.5	22.6	70.5	1.783E-05	1.125E-05	1.125E-05
G	0.2	0.00	2043.	0.	0.	0.	48.6	14.6	152.9	6.080E-04	8.284E-04	6.080E-04
G	1.6	13.08	2043.	0.	0.	0.	48.6	14.6	152.9	8.686E-05	1.183E-04	8.686E-05
G	3.5	0.20	2043.	0.	0.	0.	48.6	14.6	77.9	7.962E-05	5.523E-05	5.523E-05

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## LOW POPULATION ZONE CALCULATIONS:

S SECTOR BOUNDARY DISTANCE = 2043.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

6.080E-04	2.062E-04	8.686E-05	5.523E-05	5.347E-05	3.599E-05	2.946E-05	1.957E-05	1.889E-05	1.459E-05
0.004	0.007	13.090	13.287	21.648	22.435	33.994	43.929	53.963	54.012
0.00020	0.00033	0.62585	0.63526	1.03504	1.07266	1.62529	2.10032	2.58004	2.58240
1.214E-05	1.125E-05	1.066E-05	8.204E-06	8.015E-06	6.708E-06	4.533E-06	3.740E-06	3.053E-06	2.244E-06
56.176	56.274	74.916	75.162	75.457	85.294	86.376	88.933	89.278	90.458
2.68587	2.69057	3.58183	3.59359	3.60770	4.07802	4.12976	4.25204	4.26850	4.32494
1.516E-06	1.425E-06	8.549E-07	5.776E-07	5.556E-07	2.593E-07	1.556E-07			
90.507	92.967	94.196	94.245	94.491	98.672	100.000			
4.32729	4.44487	4.50366	4.50602	4.51778	4.71766	4.78116			

## X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE ORDERED X/Q-FREQUENCY VALUES, AND AS PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q	WITH RESPECT TO	WHEN THE WIND BLOWS
SEC/CUBIC METER	THE TOTAL TIME	INTO THIS SECTOR ONLY

HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 3)=	1.034
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 4)=	2.577
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 5)=	3.579
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 6)=	4.075
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 7)=	4.249

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
1	1	-7.40531	-11.64880	-0.91990
1	2	-9.35122	-15.94494	-2.63998
1	3	-9.83646	-16.39814	-2.83584
1	4	-10.87710	-18.55540	-3.94391
1	5	-11.44918	-25.41537	-7.75114
1	6	-11.91217	-63.96977	-29.88225
1	7	-12.49637	NUMXQ(K)= 7	
		1.823E-04	0.048	1.000

1.356E-04	0.143	3.000
1.170E-04	0.239	5.000
9.471E-05	0.478	10.000
7.639E-05	0.717	15.000
5.783E-05	0.956	20.000
4.578E-05	1.195	25.000
3.744E-05	1.434	30.000
3.146E-05	1.673	35.000
2.698E-05	1.912	40.000
2.349E-05	2.152	45.000
2.071E-05	2.391	50.000
1.828E-05	2.630	55.000
1.575E-05	2.869	60.000
1.371E-05	3.108	65.000
1.203E-05	3.347	70.000
1.062E-05	3.586	75.000
8.443E-06	3.825	80.000
6.792E-06	4.064	85.000
9.337E-05	0.5	10.46

ANNUAL AVERAGE = 7.73E-07

K= 1 FIVEXQ(K)= 9.337E-05 FIVEPR(K)=10.458

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE SSW SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC AT 10.0 METERS	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	HT EFF METERS	PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
										MEANDER	BLDG WAKE	USED
										CA=2926.SQ.METERS		
A	1.6	0.30	2043.	0.	0.	0.	357.1	1000.0	357.1	5.571E-07	5.556E-07	5.556E-07
A	3.4	3.22	2043.	0.	0.	0.	357.1	1000.0	357.1	2.600E-07	2.593E-07	2.593E-07
A	5.7	0.77	2043.	0.	0.	0.	357.1	1000.0	357.1	1.560E-07	1.556E-07	1.556E-07
B	1.6	0.24	2043.	0.	0.	0.	268.5	239.2	268.5	3.097E-06	3.053E-06	3.053E-06
B	3.4	1.91	2043.	0.	0.	0.	268.5	239.2	268.5	1.445E-06	1.425E-06	1.425E-06
B	5.7	0.66	2043.	0.	0.	0.	268.5	239.2	268.5	8.673E-07	8.549E-07	8.549E-07
B	8.5	0.12	2043.	0.	0.	0.	268.5	239.2	268.5	5.860E-07	5.776E-07	5.776E-07
C	1.6	0.42	2043.	0.	0.	0.	203.9	117.1	203.9	8.327E-06	8.015E-06	8.015E-06
C	3.4	2.56	2043.	0.	0.	0.	203.9	117.1	203.9	3.886E-06	3.740E-06	3.740E-06
C	5.7	0.54	2043.	0.	0.	0.	203.9	117.1	203.9	2.332E-06	2.244E-06	2.244E-06
D	1.6	12.34	2043.	0.	0.	0.	143.6	51.3	205.2	1.889E-05	2.396E-05	1.889E-05
D	3.4	17.16	2043.	0.	0.	0.	143.6	51.3	169.6	1.066E-05	1.118E-05	1.066E-05
D	5.7	6.91	2043.	0.	0.	0.	143.6	51.3	145.5	7.456E-06	6.708E-06	6.708E-06
D	8.5	0.12	2043.	0.	0.	0.	143.6	51.3	143.6	5.105E-06	4.533E-06	4.533E-06
E	0.2	0.00	2043.	0.	0.	0.	102.1	34.8	189.7	2.062E-04	3.035E-04	2.062E-04
E	1.6	14.18	2043.	0.	0.	0.	102.1	34.8	189.7	2.946E-05	4.336E-05	2.946E-05
E	3.5	10.91	2043.	0.	0.	0.	102.1	34.8	133.2	1.957E-05	2.024E-05	1.957E-05
E	5.8	1.43	2043.	0.	0.	0.	102.1	34.8	103.3	1.515E-05	1.214E-05	1.214E-05
E	8.7	0.06	2043.	0.	0.	0.	102.1	34.8	102.1	1.035E-05	8.204E-06	8.204E-06
F	1.6	11.02	2043.	0.	0.	0.	70.5	22.6	161.1	5.347E-05	7.711E-05	5.347E-05
F	3.5	2.15	2043.	0.	0.	0.	70.5	22.6	99.8	4.030E-05	3.599E-05	3.599E-05
F	5.8	0.06	2043.	0.	0.	0.	70.5	22.6	71.5	3.374E-05	2.159E-05	2.159E-05
F	11.2	0.18	2043.	0.	0.	0.	70.5	22.6	70.5	1.783E-05	1.125E-05	1.125E-05
G	0.2	0.00	2043.	0.	0.	0.	48.6	14.6	152.9	6.080E-04	8.284E-04	6.080E-04
G	1.6	12.39	2043.	0.	0.	0.	48.6	14.6	152.9	8.686E-05	1.183E-04	8.686E-05
G	3.5	0.36	2043.	0.	0.	0.	48.6	14.6	77.9	7.962E-05	5.523E-05	5.523E-05

USNRC COMPUTER CODE-PAVAN, VERSION 2.0

RUN DATE: 04/30/03

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

#### LOW POPULATION ZONE CALCULATIONS:

SSW SECTOR BOUNDARY DISTANCE = 2043.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

6.080E-04	2.062E-04	8.686E-05	5.523E-05	5.347E-05	3.599E-05	2.946E-05	2.159E-05	1.957E-05	1.889E-05
0.004	0.007	12.402	12.760	23.784	25.929	40.112	40.171	51.076	63.411
0.00016	0.00028	0.48942	0.50353	0.93858	1.02324	1.58292	1.58527	2.01562	2.50240
1.214E-05	1.125E-05	1.066E-05	8.204E-06	8.015E-06	6.708E-06	4.533E-06	3.740E-06	3.053E-06	2.244E-06
64.842	65.020	82.182	82.242	82.659	89.572	89.691	92.253	92.492	93.028
2.55884	2.56589	3.24316	3.24551	3.26197	3.53476	3.53946	3.64058	3.64999	3.67115
1.425E-06	8.549E-07	5.776E-07	5.556E-07	2.593E-07	1.556E-07				
94.935	95.590	95.710	96.007	99.225	100.000				
3.74640	3.77227	3.77698	3.78873	3.91572	3.94629				

#### X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE  
ORDERED X/Q-FREQUENCY VALUES, AND AS  
PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q	WITH RESPECT TO	WHEN THE WIND BLOWS
SEC/CUBIC METER	THE TOTAL TIME	INTO THIS SECTOR ONLY

HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 3)=	0.937
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 4)=	2.500
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 5)=	3.240
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 6)=	3.532
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 7)=	3.637

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
2	1	-7.40531	-11.76805	-0.93544
2	2	-9.35122	-14.72830	-2.08122
2	3	-9.83646	-16.10040	-2.66497
2	4	-10.87710	-20.76732	-5.04607
2	5	-11.44918	-33.49724	-11.93973
2	6	-11.91217	-90.58685	-43.51872
2	7	-12.49637	NUMXQ(K)= 7	
		1.790E-04	0.039	1.000

1.331E-04	0.118	3.000
1.149E-04	0.197	5.000
9.303E-05	0.395	10.000
7.566E-05	0.592	15.000
6.106E-05	0.789	20.000
5.088E-05	0.987	25.000
4.232E-05	1.184	30.000
3.609E-05	1.381	35.000
3.136E-05	1.579	40.000
2.764E-05	1.776	45.000
2.464E-05	1.973	50.000
2.217E-05	2.170	55.000
2.011E-05	2.368	60.000
1.790E-05	2.565	65.000
1.523E-05	2.762	70.000
1.308E-05	2.960	75.000
1.132E-05	3.157	80.000
8.899E-06	3.354	85.000
6.105E-06	3.552	90.000
8.553E-05	0.5	12.67

ANNUAL AVERAGE = 7.03E-07

K= 2 FIVEXQ(K)= 8.553E-05 FIVEPR(K)=12.670

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE SW SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC AT 10.0 METERS	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	HT EFF METERS	PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
										MEANDER	BLDG WAKE	USED
										CA=2926.SQ.METERS		
A	1.6	0.34	2043.	0.	0.	0.	357.1	1000.0	357.1	5.571E-07	5.556E-07	5.556E-07
A	3.4	1.67	2043.	0.	0.	0.	357.1	1000.0	357.1	2.600E-07	2.593E-07	2.593E-07
A	5.7	0.20	2043.	0.	0.	0.	357.1	1000.0	357.1	1.560E-07	1.556E-07	1.556E-07
B	1.6	0.39	2043.	0.	0.	0.	268.5	239.2	268.5	3.097E-06	3.053E-06	3.053E-06
B	3.4	1.33	2043.	0.	0.	0.	268.5	239.2	268.5	1.445E-06	1.425E-06	1.425E-06
B	5.7	0.49	2043.	0.	0.	0.	268.5	239.2	268.5	8.673E-07	8.549E-07	8.549E-07
C	1.6	0.64	2043.	0.	0.	0.	203.9	117.1	203.9	8.327E-06	8.015E-06	8.015E-06
C	3.4	1.67	2043.	0.	0.	0.	203.9	117.1	203.9	3.886E-06	3.740E-06	3.740E-06
C	5.7	0.54	2043.	0.	0.	0.	203.9	117.1	203.9	2.332E-06	2.244E-06	2.244E-06
D	1.6	14.91	2043.	0.	0.	0.	143.6	51.3	205.2	1.889E-05	2.396E-05	1.889E-05
D	3.4	25.00	2043.	0.	0.	0.	143.6	51.3	169.6	1.066E-05	1.118E-05	1.066E-05
D	5.7	7.18	2043.	0.	0.	0.	143.6	51.3	145.5	7.456E-06	6.708E-06	6.708E-06
D	8.5	0.89	2043.	0.	0.	0.	143.6	51.3	143.6	5.105E-06	4.533E-06	4.533E-06
E	0.2	0.00	2043.	0.	0.	0.	102.1	34.8	189.7	2.062E-04	3.035E-04	2.062E-04
E	1.6	13.04	2043.	0.	0.	0.	102.1	34.8	189.7	2.946E-05	4.336E-05	2.946E-05
E	3.5	9.35	2043.	0.	0.	0.	102.1	34.8	133.2	1.957E-05	2.024E-05	1.957E-05
E	5.8	0.49	2043.	0.	0.	0.	102.1	34.8	103.3	1.515E-05	1.214E-05	1.214E-05
E	8.7	0.10	2043.	0.	0.	0.	102.1	34.8	102.1	1.035E-05	8.204E-06	8.204E-06
F	1.6	8.81	2043.	0.	0.	0.	70.5	22.6	161.1	5.347E-05	7.711E-05	5.347E-05
F	3.5	1.03	2043.	0.	0.	0.	70.5	22.6	99.8	4.030E-05	3.599E-05	3.599E-05
G	0.2	0.00	2043.	0.	0.	0.	48.6	14.6	152.9	6.080E-04	8.284E-04	6.080E-04
G	1.6	11.81	2043.	0.	0.	0.	48.6	14.6	152.9	8.686E-05	1.183E-04	8.686E-05
G	3.5	0.10	2043.	0.	0.	0.	48.6	14.6	77.9	7.962E-05	5.523E-05	5.523E-05

USNRC COMPUTER CODE-PAVAN, VERSION 2.0

RUN DATE: 04/30/03

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

#### LOW POPULATION ZONE CALCULATIONS:

SW SECTOR BOUNDARY DISTANCE = 2043.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

6.080E-04	2.062E-04	8.686E-05	5.523E-05	5.347E-05	3.599E-05	2.946E-05	1.957E-05	1.889E-05	1.214E-05
0.004	0.007	11.817	11.915	20.724	21.757	34.798	44.147	59.058	59.550
0.00018	0.00032	0.56471	0.56941	0.99035	1.03974	1.66291	2.10972	2.82226	2.84577
1.066E-05	8.204E-06	8.015E-06	6.708E-06	4.533E-06	3.740E-06	3.053E-06	2.244E-06	1.425E-06	8.549E-07
84.548	84.647	85.286	92.471	93.357	95.030	95.424	95.965	97.294	97.786
4.04039	4.04510	4.07567	4.41900	4.46133	4.54129	4.56010	4.58597	4.64946	4.67298
5.556E-07	2.593E-07	1.556E-07							
98.130	99.803	100.000							
4.68944	4.76939	4.77880							

#### X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE ORDERED X/Q-FREQUENCY VALUES, AND AS PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q WITH RESPECT TO WHEN THE WIND BLOWS  
SEC/CUBIC METER THE TOTAL TIME INTO THIS SECTOR ONLY

HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 3)= 0.989  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 4)= 2.820  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 5)= 4.037  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 6)= 4.415  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 7)= 4.538

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
3	1	-7.40531	-11.69869	-0.92643
3	2	-9.35122	-15.39444	-2.38497
3	3	-9.83646	-15.57757	-2.46355
3	4	-10.87710	-17.63166	-3.54011
3	5	-11.44918	-30.68999	-11.01737
3	6	-11.91217	-88.78957	-45.10571
3	7	-12.49637	NUMXQ(K)= 7	
		1.772E-04	0.048	1.000



1.315E-04	0.143	3.000
1.134E-04	0.239	5.000
9.165E-05	0.478	10.000
7.097E-05	0.717	15.000
5.519E-05	0.956	20.000
4.487E-05	1.195	25.000
3.768E-05	1.434	30.000
3.240E-05	1.673	35.000
2.834E-05	1.912	40.000
2.514E-05	2.150	45.000
2.253E-05	2.389	50.000
2.038E-05	2.628	55.000
1.843E-05	2.867	60.000
1.627E-05	3.106	65.000
1.447E-05	3.345	70.000
1.296E-05	3.584	75.000
1.167E-05	3.823	80.000
1.037E-05	4.062	85.000
7.723E-06	4.301	90.000
9.034E-05	0.5	10.46

ANNUAL AVERAGE = 8.24E-07

K= 3 FIVEXQ(K)= 9.034E-05 FIVEPR(K)=10.463

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE WSW SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC AT 10.0 METERS	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN METERS	HT EFF METERS	PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
										MEANDER	BLDG WAKE	USED
										CA=2926.SQ.METERS		
A	1.6	0.04	2043.	0.	0.	0.	357.1	1000.0	357.1	5.571E-07	5.556E-07	5.556E-07
A	3.4	0.62	2043.	0.	0.	0.	357.1	1000.0	357.1	2.600E-07	2.593E-07	2.593E-07
A	5.7	0.35	2043.	0.	0.	0.	357.1	1000.0	357.1	1.560E-07	1.556E-07	1.556E-07
A	8.5	0.15	2043.	0.	0.	0.	357.1	1000.0	357.1	1.054E-07	1.051E-07	1.051E-07
B	1.6	0.23	2043.	0.	0.	0.	268.5	239.2	268.5	3.097E-06	3.053E-06	3.053E-06
B	3.4	1.12	2043.	0.	0.	0.	268.5	239.2	268.5	1.445E-06	1.425E-06	1.425E-06
B	5.7	0.66	2043.	0.	0.	0.	268.5	239.2	268.5	8.673E-07	8.549E-07	8.549E-07
B	8.5	0.04	2043.	0.	0.	0.	268.5	239.2	268.5	5.860E-07	5.776E-07	5.776E-07
C	1.6	0.43	2043.	0.	0.	0.	203.9	117.1	203.9	8.327E-06	8.015E-06	8.015E-06
C	3.4	2.32	2043.	0.	0.	0.	203.9	117.1	203.9	3.886E-06	3.740E-06	3.740E-06
C	5.7	1.43	2043.	0.	0.	0.	203.9	117.1	203.9	2.332E-06	2.244E-06	2.244E-06
C	8.5	0.12	2043.	0.	0.	0.	203.9	117.1	203.9	1.575E-06	1.516E-06	1.516E-06
D	1.6	9.40	2043.	0.	0.	0.	143.6	51.3	205.2	1.889E-05	2.396E-05	1.889E-05
D	3.4	30.99	2043.	0.	0.	0.	143.6	51.3	169.6	1.066E-05	1.118E-05	1.066E-05
D	5.7	12.80	2043.	0.	0.	0.	143.6	51.3	145.5	7.456E-06	6.708E-06	6.708E-06
D	8.5	1.12	2043.	0.	0.	0.	143.6	51.3	143.6	5.105E-06	4.533E-06	4.533E-06
D	11.0	0.08	2043.	0.	0.	0.	143.6	51.3	143.6	3.935E-06	3.494E-06	3.494E-06
E	0.2	0.00	2043.	0.	0.	0.	102.1	34.8	189.7	2.062E-04	3.035E-04	2.062E-04
E	1.6	10.02	2043.	0.	0.	0.	102.1	34.8	189.7	2.946E-05	4.336E-05	2.946E-05
E	3.5	12.26	2043.	0.	0.	0.	102.1	34.8	133.2	1.957E-05	2.024E-05	1.957E-05
E	5.8	1.20	2043.	0.	0.	0.	102.1	34.8	103.3	1.515E-05	1.214E-05	1.214E-05
E	8.7	0.12	2043.	0.	0.	0.	102.1	34.8	102.1	1.035E-05	8.204E-06	8.204E-06
E	25.7	0.04	2043.	0.	0.	0.	102.1	34.8	102.1	3.482E-06	2.759E-06	2.759E-06
F	1.6	6.73	2043.	0.	0.	0.	70.5	22.6	161.1	5.347E-05	7.711E-05	5.347E-05
F	3.5	1.24	2043.	0.	0.	0.	70.5	22.6	99.8	4.030E-05	3.599E-05	3.599E-05
G	0.2	0.00	2043.	0.	0.	0.	48.6	14.6	152.9	6.080E-04	8.284E-04	6.080E-04
G	1.6	5.80	2043.	0.	0.	0.	48.6	14.6	152.9	8.686E-05	1.183E-04	8.686E-05
G	3.5	0.66	2043.	0.	0.	0.	48.6	14.6	77.9	7.962E-05	5.523E-05	5.523E-05
G	5.8	0.04	2043.	0.	0.	0.	48.6	14.6	49.6	7.506E-05	3.314E-05	3.314E-05

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## LOW POPULATION ZONE CALCULATIONS:

WSW SECTOR BOUNDARY DISTANCE = 2043.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

6.080E-04	2.062E-04	8.686E-05	5.523E-05	5.347E-05	3.599E-05	3.314E-05	2.946E-05	1.957E-05	1.889E-05
0.002	0.004	5.807	6.464	13.195	14.433	14.472	24.491	36.753	46.153
0.00011	0.00025	0.35299	0.39297	0.80215	0.87740	0.87976	1.48882	2.23428	2.80573
1.214E-05	1.066E-05	8.204E-06	8.015E-06	6.708E-06	4.533E-06	3.740E-06	3.494E-06	3.053E-06	2.759E-06
47.352	78.337	78.453	78.879	91.683	92.805	95.126	95.203	95.435	95.474
2.87863	4.76227	4.76932	4.79519	5.57358	5.64177	5.78287	5.78757	5.80168	5.80403
2.244E-06	1.516E-06	1.425E-06	8.549E-07	5.776E-07	5.556E-07	2.593E-07	1.556E-07	1.051E-07	
96.905	97.021	98.143	98.801	98.840	98.878	99.497	99.845	100.000	
5.89104	5.89810	5.96629	6.00627	6.00862	6.01098	6.04860	6.06977	6.07917	

## X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE  
ORDERED X/Q-FREQUENCY VALUES, AND AS  
PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q WITH RESPECT TO WHEN THE WIND BLOWS  
SEC/CUBIC METER THE TOTAL TIME INTO THIS SECTOR ONLY

HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 3)= 0.801  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 4)= 2.803  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 5)= 4.759  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 6)= 5.570  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 7)= 5.779

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
4	1	-7.40531	-11.92613	-0.95565
4	2	-9.35122	-13.92216	-1.69646
4	3	-9.83646	-14.87114	-2.09050
4	4	-10.87710	-15.39645	-2.36545
4	5	-11.44918	-21.51330	-6.03104
4	6	-11.91217	-62.57862	-31.82662
4	7	-12.49637	NUMX(K)= 7	
		1.457E-04	0.061	1.000

1.065E-04	0.182	3.000
9.106E-05	0.304	5.000
6.331E-05	0.608	10.000
4.845E-05	0.912	15.000
3.860E-05	1.216	20.000
3.217E-05	1.520	25.000
2.760E-05	1.824	30.000
2.417E-05	2.128	35.000
2.148E-05	2.432	40.000
1.933E-05	2.736	45.000
1.738E-05	3.040	50.000
1.572E-05	3.344	55.000
1.432E-05	3.648	60.000
1.313E-05	3.951	65.000
1.209E-05	4.255	70.000
1.120E-05	4.559	75.000
1.003E-05	4.863	80.000
8.398E-06	5.167	85.000
7.090E-06	5.471	90.000
7.108E-05	0.5	8.22

ANNUAL AVERAGE = 8.07E-07

K= 4 FIVEXQ(K)= 7.108E-05 FIVEPR(K)= 8.225

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE W SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC AT 10.0 METERS	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN METERS	HT EFF METERS	PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
										MEANDER	BLDG WAKE	USED
										CA=2926.SQ.METERS		
A	1.6	0.05	2043.	0.	0.	0.	357.1	1000.0	357.1	5.571E-07	5.556E-07	5.556E-07
A	3.4	0.19	2043.	0.	0.	0.	357.1	1000.0	357.1	2.600E-07	2.593E-07	2.593E-07
A	5.7	0.29	2043.	0.	0.	0.	357.1	1000.0	357.1	1.560E-07	1.556E-07	1.556E-07
A	8.5	0.38	2043.	0.	0.	0.	357.1	1000.0	357.1	1.054E-07	1.051E-07	1.051E-07
B	1.6	0.19	2043.	0.	0.	0.	268.5	239.2	268.5	3.097E-06	3.053E-06	3.053E-06
B	3.4	0.91	2043.	0.	0.	0.	268.5	239.2	268.5	1.445E-06	1.425E-06	1.425E-06
B	5.7	1.15	2043.	0.	0.	0.	268.5	239.2	268.5	8.673E-07	8.549E-07	8.549E-07
B	8.5	0.24	2043.	0.	0.	0.	268.5	239.2	268.5	5.860E-07	5.776E-07	5.776E-07
C	1.6	0.29	2043.	0.	0.	0.	203.9	117.1	203.9	8.327E-06	8.015E-06	8.015E-06
C	3.4	2.34	2043.	0.	0.	0.	203.9	117.1	203.9	3.886E-06	3.740E-06	3.740E-06
C	5.7	2.24	2043.	0.	0.	0.	203.9	117.1	203.9	2.332E-06	2.244E-06	2.244E-06
C	8.5	0.05	2043.	0.	0.	0.	203.9	117.1	203.9	1.575E-06	1.516E-06	1.516E-06
D	1.6	8.45	2043.	0.	0.	0.	143.6	51.3	205.2	1.889E-05	2.396E-05	1.889E-05
D	3.4	22.92	2043.	0.	0.	0.	143.6	51.3	169.6	1.066E-05	1.118E-05	1.066E-05
D	5.7	17.29	2043.	0.	0.	0.	143.6	51.3	145.5	7.456E-06	6.708E-06	6.708E-06
D	8.5	3.92	2043.	0.	0.	0.	143.6	51.3	143.6	5.105E-06	4.533E-06	4.533E-06
D	11.0	0.05	2043.	0.	0.	0.	143.6	51.3	143.6	3.935E-06	3.494E-06	3.494E-06
D	25.1	0.05	2043.	0.	0.	0.	143.6	51.3	143.6	1.717E-06	1.525E-06	1.525E-06
E	0.2	0.00	2043.	0.	0.	0.	102.1	34.8	189.7	2.062E-04	3.035E-04	2.062E-04
E	1.6	8.83	2043.	0.	0.	0.	102.1	34.8	189.7	2.946E-05	4.336E-05	2.946E-05
E	3.5	11.17	2043.	0.	0.	0.	102.1	34.8	133.2	1.957E-05	2.024E-05	1.957E-05
E	5.8	4.20	2043.	0.	0.	0.	102.1	34.8	103.3	1.515E-05	1.214E-05	1.214E-05
E	8.7	0.57	2043.	0.	0.	0.	102.1	34.8	102.1	1.035E-05	8.204E-06	8.204E-06
F	1.6	5.87	2043.	0.	0.	0.	70.5	22.6	161.1	5.347E-05	7.711E-05	5.347E-05
F	3.5	1.81	2043.	0.	0.	0.	70.5	22.6	99.8	4.030E-05	3.599E-05	3.599E-05
G	0.2	0.00	2043.	0.	0.	0.	48.6	14.6	152.9	6.080E-04	8.284E-04	6.080E-04
G	1.6	5.49	2043.	0.	0.	0.	48.6	14.6	152.9	8.686E-05	1.183E-04	8.686E-05
G	3.5	0.76	2043.	0.	0.	0.	48.6	14.6	77.9	7.962E-05	5.523E-05	5.523E-05
G	5.8	0.29	2043.	0.	0.	0.	48.6	14.6	49.6	7.506E-05	3.314E-05	3.314E-05

USNRC COMPUTER CODE-PAVAN, VERSION 2.0

RUN DATE: 04/30/03

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

#### LOW POPULATION ZONE CALCULATIONS:

W SECTOR BOUNDARY DISTANCE = 2043.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

6.080E-04	2.062E-04	8.686E-05	5.523E-05	5.347E-05	3.599E-05	3.314E-05	2.946E-05	1.957E-05	1.889E-05
0.002	0.004	5.495	6.260	12.133	13.948	14.234	23.069	34.243	42.696
0.00009	0.00019	0.27062	0.30825	0.59750	0.68686	0.70097	1.13601	1.68629	2.10253
1.214E-05	1.066E-05	8.204E-06	8.015E-06	6.708E-06	4.533E-06	3.740E-06	3.494E-06	3.053E-06	2.244E-06
46.898	69.820	70.393	70.679	87.966	91.882	94.222	94.270	94.461	96.705
2.30947	3.43824	3.46646	3.48057	4.33186	4.52469	4.63992	4.64227	4.65168	4.76220
1.525E-06	1.516E-06	1.425E-06	8.549E-07	5.776E-07	5.556E-07	2.593E-07	1.556E-07	1.051E-07	
96.753	96.800	97.708	98.854	99.093	99.140	99.331	99.618	100.000	
4.76455	4.76691	4.81159	4.86802	4.87978	4.88213	4.89154	4.90565	4.92446	

#### X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE ORDERED X/Q-FREQUENCY VALUES, AND AS PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q WITH RESPECT TO WHEN THE WIND BLOWS  
SEC/CUBIC METER THE TOTAL TIME INTO THIS SECTOR ONLY

HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE ( 3)= 0.597  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE ( 4)= 2.100  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE ( 5)= 3.435  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE ( 6)= 4.328  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE ( 7)= 4.636

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
5	1	-7.40531	-12.05442	-0.97176
5	2	-9.35122	-14.39282	-1.81237
5	3	-9.83646	-15.28032	-2.16539
5	4	-10.87710	-16.33633	-2.68470
5	5	-11.44918	-19.35717	-4.34417
5	6	-11.91217	-42.62115	-17.91875
5	7	-12.49637	NUMXQ(K)= 7	
		1.430E-04	0.049	1.000

1.046E-04	0.148	3.000
8.947E-05	0.246	5.000
6.042E-05	0.492	10.000
4.538E-05	0.739	15.000
3.609E-05	0.985	20.000
3.004E-05	1.231	25.000
2.575E-05	1.477	30.000
2.253E-05	1.724	35.000
2.002E-05	1.970	40.000
1.780E-05	2.216	45.000
1.580E-05	2.462	50.000
1.415E-05	2.708	55.000
1.278E-05	2.955	60.000
1.162E-05	3.201	65.000
1.060E-05	3.447	70.000
9.254E-06	3.693	75.000
8.133E-06	3.940	80.000
7.195E-06	4.186	85.000
5.528E-06	4.432	90.000
5.985E-05	0.5	10.15

ANNUAL AVERAGE = 6.03E-07

K= 5 FIVEXQ(K)= 5.985E-05 FIVEPR(K)=10.153

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE WNW SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	HT EFF METERS	PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
										MEANDER	BLDG WAKE	USED
AT 10.0 METERS										CA=2926.SQ.METERS		
A	1.6	0.09	2043.	0.	0.	0.	357.1	1000.0	357.1	5.571E-07	5.556E-07	5.556E-07
A	3.4	0.87	2043.	0.	0.	0.	357.1	1000.0	357.1	2.600E-07	2.593E-07	2.593E-07
A	5.7	0.79	2043.	0.	0.	0.	357.1	1000.0	357.1	1.560E-07	1.556E-07	1.556E-07
B	1.6	0.17	2043.	0.	0.	0.	268.5	239.2	268.5	3.097E-06	3.053E-06	3.053E-06
B	3.4	1.40	2043.	0.	0.	0.	268.5	239.2	268.5	1.445E-06	1.425E-06	1.425E-06
B	5.7	1.22	2043.	0.	0.	0.	268.5	239.2	268.5	8.673E-07	8.549E-07	8.549E-07
B	8.5	0.17	2043.	0.	0.	0.	268.5	239.2	268.5	5.860E-07	5.776E-07	5.776E-07
C	1.6	0.35	2043.	0.	0.	0.	203.9	117.1	203.9	8.327E-06	8.015E-06	8.015E-06
C	3.4	1.40	2043.	0.	0.	0.	203.9	117.1	203.9	3.886E-06	3.740E-06	3.740E-06
C	5.7	1.13	2043.	0.	0.	0.	203.9	117.1	203.9	2.332E-06	2.244E-06	2.244E-06
C	8.5	0.09	2043.	0.	0.	0.	203.9	117.1	203.9	1.575E-06	1.516E-06	1.516E-06
D	1.6	11.34	2043.	0.	0.	0.	143.6	51.3	205.2	1.889E-05	2.396E-05	1.889E-05
D	3.4	24.43	2043.	0.	0.	0.	143.6	51.3	169.6	1.066E-05	1.118E-05	1.066E-05
D	5.7	10.03	2043.	0.	0.	0.	143.6	51.3	145.5	7.456E-06	6.708E-06	6.708E-06
D	8.5	0.70	2043.	0.	0.	0.	143.6	51.3	143.6	5.105E-06	4.533E-06	4.533E-06
D	11.0	0.09	2043.	0.	0.	0.	143.6	51.3	143.6	3.935E-06	3.494E-06	3.494E-06
E	0.2	0.00	2043.	0.	0.	0.	102.1	34.8	189.7	2.062E-04	3.035E-04	2.062E-04
E	1.6	12.74	2043.	0.	0.	0.	102.1	34.8	189.7	2.946E-05	4.336E-05	2.946E-05
E	3.5	11.95	2043.	0.	0.	0.	102.1	34.8	133.2	1.957E-05	2.024E-05	1.957E-05
E	5.8	4.62	2043.	0.	0.	0.	102.1	34.8	103.3	1.515E-05	1.214E-05	1.214E-05
E	8.7	0.79	2043.	0.	0.	0.	102.1	34.8	102.1	1.035E-05	8.204E-06	8.204E-06
F	1.6	7.94	2043.	0.	0.	0.	70.5	22.6	161.1	5.347E-05	7.711E-05	5.347E-05
F	3.5	2.18	2043.	0.	0.	0.	70.5	22.6	99.8	4.030E-05	3.599E-05	3.599E-05
F	5.8	0.09	2043.	0.	0.	0.	70.5	22.6	71.5	3.374E-05	2.159E-05	2.159E-05
F	8.7	0.09	2043.	0.	0.	0.	70.5	22.6	70.5	2.313E-05	1.459E-05	1.459E-05
G	0.2	0.00	2043.	0.	0.	0.	48.6	14.6	152.9	6.080E-04	8.284E-04	6.080E-04
G	1.6	4.62	2043.	0.	0.	0.	48.6	14.6	152.9	8.686E-05	1.183E-04	8.686E-05
G	3.5	0.61	2043.	0.	0.	0.	48.6	14.6	77.9	7.962E-05	5.523E-05	5.523E-05
G	5.8	0.09	2043.	0.	0.	0.	48.6	14.6	49.6	7.506E-05	3.314E-05	3.314E-05



PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## LOW POPULATION ZONE CALCULATIONS:

WNW SECTOR BOUNDARY DISTANCE = 2043.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

6.080E-04	2.062E-04	8.686E-05	5.523E-05	5.347E-05	3.599E-05	3.314E-05	2.946E-05	2.159E-05	1.957E-05
0.001	0.004	4.629	5.240	13.180	15.361	15.449	28.188	28.275	40.230
0.00004	0.00012	0.12475	0.14122	0.35521	0.41400	0.41635	0.75969	0.76204	1.08421
1.889E-05	1.459E-05	1.214E-05	1.066E-05	8.204E-06	8.015E-06	6.708E-06	4.533E-06	3.740E-06	3.494E-06
51.573	51.660	56.285	80.716	81.502	81.851	91.885	92.583	93.979	94.067
1.38992	1.39227	1.51691	2.17536	2.19653	2.20593	2.47637	2.49518	2.53281	2.53516
3.053E-06	2.244E-06	1.516E-06	1.425E-06	8.549E-07	5.776E-07	5.556E-07	2.593E-07	1.556E-07	
94.241	95.375	95.463	96.859	98.080	98.255	98.342	99.215	100.000	
2.53986	2.57043	2.57278	2.61041	2.64333	2.64804	2.65039	2.67390	2.69507	

## X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE ORDERED X/Q-FREQUENCY VALUES, AND AS PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q	WITH RESPECT TO	WHEN THE WIND BLOWS
SEC/CUBIC METER	THE TOTAL TIME	INTO THIS SECTOR ONLY

HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 2)=	0.125
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 3)=	0.355
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 4)=	1.388
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 5)=	2.173
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 6)=	2.474
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 7)=	2.530

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
6	1	-7.40531	-12.42703	-1.01705
6	2	-9.35122	-13.77208	-1.46180
6	3	-9.83646	-15.53401	-2.11624
6	4	-10.87710	-17.82015	-3.15513
6	5	-11.44918	-28.51271	-8.45045
6	6	-11.91217	-130.91840	-60.57977
6	7	-12.49637	NUMXQ(K)=	7

1.354E-04	0.027	1.000
9.902E-05	0.081	3.000
8.394E-05	0.135	5.000
6.106E-05	0.270	10.000
4.877E-05	0.404	15.000
3.958E-05	0.539	20.000
3.350E-05	0.674	25.000
2.914E-05	0.809	30.000
2.583E-05	0.943	35.000
2.323E-05	1.078	40.000
2.112E-05	1.213	45.000
1.938E-05	1.348	50.000
1.744E-05	1.482	55.000
1.563E-05	1.617	60.000
1.412E-05	1.752	65.000
1.284E-05	1.887	70.000
1.174E-05	2.021	75.000
1.078E-05	2.156	80.000
8.871E-06	2.291	85.000
7.229E-06	2.426	90.000
4.182E-05	0.5	18.55

ANNUAL AVERAGE = 3.75E-07

K= 6 FIVEXQ(K)= 4.182E-05 FIVEPR(K)=18.552

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE NW SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	HT EFF METERS	PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
										MEANDER	BLDG WAKE	USED
										CA=2926.SQ.METERS		
AT 10.0 METERS												
A	1.6	0.10	2043.	0.	0.	0.	357.1	1000.0	357.1	5.571E-07	5.556E-07	5.556E-07
A	3.4	0.81	2043.	0.	0.	0.	357.1	1000.0	357.1	2.600E-07	2.593E-07	2.593E-07
A	5.7	0.81	2043.	0.	0.	0.	357.1	1000.0	357.1	1.560E-07	1.556E-07	1.556E-07
B	1.6	0.10	2043.	0.	0.	0.	268.5	239.2	268.5	3.097E-06	3.053E-06	3.053E-06
B	3.4	0.61	2043.	0.	0.	0.	268.5	239.2	268.5	1.445E-06	1.425E-06	1.425E-06
B	5.7	0.30	2043.	0.	0.	0.	268.5	239.2	268.5	8.673E-07	8.549E-07	8.549E-07
C	1.6	0.51	2043.	0.	0.	0.	203.9	117.1	203.9	8.327E-06	8.015E-06	8.015E-06
C	3.4	3.45	2043.	0.	0.	0.	203.9	117.1	203.9	3.886E-06	3.740E-06	3.740E-06
C	5.7	0.41	2043.	0.	0.	0.	203.9	117.1	203.9	2.332E-06	2.244E-06	2.244E-06
C	8.5	0.10	2043.	0.	0.	0.	203.9	117.1	203.9	1.575E-06	1.516E-06	1.516E-06
D	1.6	12.08	2043.	0.	0.	0.	143.6	51.3	205.2	1.889E-05	2.396E-05	1.889E-05
D	3.4	22.94	2043.	0.	0.	0.	143.6	51.3	169.6	1.066E-05	1.118E-05	1.066E-05
D	5.7	6.19	2043.	0.	0.	0.	143.6	51.3	145.5	7.456E-06	6.708E-06	6.708E-06
D	8.5	0.81	2043.	0.	0.	0.	143.6	51.3	143.6	5.105E-06	4.533E-06	4.533E-06
E	0.2	0.00	2043.	0.	0.	0.	102.1	34.8	189.7	2.062E-04	3.035E-04	2.062E-04
E	1.6	11.37	2043.	0.	0.	0.	102.1	34.8	189.7	2.946E-05	4.336E-05	2.946E-05
E	3.5	20.91	2043.	0.	0.	0.	102.1	34.8	133.2	1.957E-05	2.024E-05	1.957E-05
E	5.8	3.15	2043.	0.	0.	0.	102.1	34.8	103.3	1.515E-05	1.214E-05	1.214E-05
E	8.7	1.32	2043.	0.	0.	0.	102.1	34.8	102.1	1.035E-05	8.204E-06	8.204E-06
E	11.2	0.30	2043.	0.	0.	0.	102.1	34.8	102.1	7.981E-06	6.324E-06	6.324E-06
E	25.7	0.20	2043.	0.	0.	0.	102.1	34.8	102.1	3.482E-06	2.759E-06	2.759E-06
F	1.6	6.50	2043.	0.	0.	0.	70.5	22.6	161.1	5.347E-05	7.711E-05	5.347E-05
F	3.5	1.12	2043.	0.	0.	0.	70.5	22.6	99.8	4.030E-05	3.599E-05	3.599E-05
F	5.8	0.10	2043.	0.	0.	0.	70.5	22.6	71.5	3.374E-05	2.159E-05	2.159E-05
F	8.7	0.10	2043.	0.	0.	0.	70.5	22.6	70.5	2.313E-05	1.459E-05	1.459E-05
G	0.2	0.00	2043.	0.	0.	0.	48.6	14.6	152.9	6.080E-04	8.284E-04	6.080E-04
G	1.6	4.37	2043.	0.	0.	0.	48.6	14.6	152.9	8.686E-05	1.183E-04	8.686E-05
G	3.5	1.22	2043.	0.	0.	0.	48.6	14.6	77.9	7.962E-05	5.523E-05	5.523E-05
G	5.8	0.10	2043.	0.	0.	0.	48.6	14.6	49.6	7.506E-05	3.314E-05	3.314E-05

USNRC COMPUTER CODE-PAVAN, VERSION 2.0

RUN DATE: 04/30/03

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

#### LOW POPULATION ZONE CALCULATIONS:

NW SECTOR BOUNDARY DISTANCE = 2043.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

6.080E-04	2.062E-04	8.686E-05	5.523E-05	5.347E-05	3.599E-05	3.314E-05	2.946E-05	2.159E-05	1.957E-05
0.001	0.004	4.369	5.588	12.085	13.201	13.303	24.673	24.775	45.687
0.00003	0.00009	0.10121	0.12943	0.27993	0.30580	0.30815	0.57153	0.57389	1.05832
1.889E-05	1.459E-05	1.214E-05	1.066E-05	8.204E-06	8.015E-06	6.708E-06	6.324E-06	4.533E-06	3.740E-06
57.768	57.870	61.017	83.960	85.280	85.787	91.980	92.285	93.097	96.548
1.33816	1.34051	1.41341	1.94488	1.97545	1.98721	2.13065	2.13771	2.15652	2.23648
3.053E-06	2.759E-06	2.244E-06	1.516E-06	1.425E-06	8.549E-07	5.556E-07	2.593E-07	1.556E-07	
96.650	96.853	97.259	97.361	97.970	98.274	98.376	99.188	100.000	
2.23883	2.24353	2.25294	2.25529	2.26940	2.27645	2.27881	2.29762	2.31643	

#### X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE  
ORDERED X/Q-FREQUENCY VALUES, AND AS  
PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q WITH RESPECT TO WHEN THE WIND BLOWS  
SEC/CUBIC METER THE TOTAL TIME INTO THIS SECTOR ONLY

HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 2)= 0.101  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 3)= 0.280  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 4)= 1.337  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 5)= 1.943  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 6)= 2.128  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 7)= 2.234

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
7	1	-7.40531	-12.52744	-1.02892
7	2	-9.35122	-14.08882	-1.53472
7	3	-9.83646	-15.02822	-1.87376
7	4	-10.87710	-19.34399	-3.82184
7	5	-11.44918	-36.75828	-12.25201
7	6	-11.91217	-70.28531	-28.78473
7	7	-12.49637	NUMXQ(K)= 7	

1.330E-04	0.023	1.000
9.727E-05	0.069	3.000
8.165E-05	0.116	5.000
5.872E-05	0.232	10.000
4.680E-05	0.347	15.000
3.901E-05	0.463	20.000
3.374E-05	0.579	25.000
2.988E-05	0.695	30.000
2.692E-05	0.811	35.000
2.454E-05	0.927	40.000
2.260E-05	1.042	45.000
2.097E-05	1.158	50.000
1.957E-05	1.274	55.000
1.785E-05	1.390	60.000
1.582E-05	1.506	65.000
1.413E-05	1.622	70.000
1.271E-05	1.737	75.000
1.150E-05	1.853	80.000
1.002E-05	1.969	85.000
7.496E-06	2.085	90.000
3.713E-05	0.5	21.58

ANNUAL AVERAGE = 3.17E-07

K= 7 FIVEXQ(K)= 3.713E-05 FIVEPR(K)=21.585

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE NNW SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC AT 10.0 METERS	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN METERS	HT EFF METERS	PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
										MEANDER	BLDG WAKE	USED
										CA=2926.SQ.METERS		
A	3.4	0.52	2043.	0.	0.	0.	357.1	1000.0	357.1	2.600E-07	2.593E-07	2.593E-07
A	5.7	0.75	2043.	0.	0.	0.	357.1	1000.0	357.1	1.560E-07	1.556E-07	1.556E-07
B	3.4	1.27	2043.	0.	0.	0.	268.5	239.2	268.5	1.445E-06	1.425E-06	1.425E-06
B	5.7	0.45	2043.	0.	0.	0.	268.5	239.2	268.5	8.673E-07	8.549E-07	8.549E-07
C	1.6	0.60	2043.	0.	0.	0.	203.9	117.1	203.9	8.327E-06	8.015E-06	8.015E-06
C	3.4	1.72	2043.	0.	0.	0.	203.9	117.1	203.9	3.886E-06	3.740E-06	3.740E-06
C	5.7	0.67	2043.	0.	0.	0.	203.9	117.1	203.9	2.332E-06	2.244E-06	2.244E-06
C	8.5	0.22	2043.	0.	0.	0.	203.9	117.1	203.9	1.575E-06	1.516E-06	1.516E-06
D	1.6	7.20	2043.	0.	0.	0.	143.6	51.3	205.2	1.889E-05	2.396E-05	1.889E-05
D	3.4	24.44	2043.	0.	0.	0.	143.6	51.3	169.6	1.066E-05	1.118E-05	1.066E-05
D	5.7	12.82	2043.	0.	0.	0.	143.6	51.3	145.5	7.456E-06	6.708E-06	6.708E-06
D	8.5	1.35	2043.	0.	0.	0.	143.6	51.3	143.6	5.105E-06	4.533E-06	4.533E-06
D	11.0	0.07	2043.	0.	0.	0.	143.6	51.3	143.6	3.935E-06	3.494E-06	3.494E-06
E	0.2	0.00	2043.	0.	0.	0.	102.1	34.8	189.7	2.062E-04	3.035E-04	2.062E-04
E	1.6	10.64	2043.	0.	0.	0.	102.1	34.8	189.7	2.946E-05	4.336E-05	2.946E-05
E	3.5	18.74	2043.	0.	0.	0.	102.1	34.8	133.2	1.957E-05	2.024E-05	1.957E-05
E	5.8	5.02	2043.	0.	0.	0.	102.1	34.8	103.3	1.515E-05	1.214E-05	1.214E-05
E	8.7	2.32	2043.	0.	0.	0.	102.1	34.8	102.1	1.035E-05	8.204E-06	8.204E-06
E	11.2	0.37	2043.	0.	0.	0.	102.1	34.8	102.1	7.981E-06	6.324E-06	6.324E-06
F	1.6	4.95	2043.	0.	0.	0.	70.5	22.6	161.1	5.347E-05	7.711E-05	5.347E-05
F	3.5	1.42	2043.	0.	0.	0.	70.5	22.6	99.8	4.030E-05	3.599E-05	3.599E-05
F	25.7	0.07	2043.	0.	0.	0.	70.5	22.6	70.5	7.779E-06	4.907E-06	4.907E-06
G	0.2	0.00	2043.	0.	0.	0.	48.6	14.6	152.9	6.080E-04	8.284E-04	6.080E-04
G	1.6	2.92	2043.	0.	0.	0.	48.6	14.6	152.9	8.686E-05	1.183E-04	8.686E-05
G	3.5	0.90	2043.	0.	0.	0.	48.6	14.6	77.9	7.962E-05	5.523E-05	5.523E-05
G	5.8	0.52	2043.	0.	0.	0.	48.6	14.6	49.6	7.506E-05	3.314E-05	3.314E-05

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## LOW POPULATION ZONE CALCULATIONS:

NNW SECTOR BOUNDARY DISTANCE = 2043.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

6.080E-04	2.062E-04	8.686E-05	5.523E-05	5.347E-05	3.599E-05	3.314E-05	2.946E-05	1.957E-05	1.889E-05
0.001	0.003	2.927	3.826	8.774	10.198	10.723	21.367	40.107	47.303
0.00003	0.00011	0.09182	0.12004	0.27524	0.31993	0.33639	0.67032	1.25822	1.48397
1.214E-05	1.066E-05	8.204E-06	8.015E-06	6.708E-06	6.324E-06	4.907E-06	4.533E-06	3.740E-06	3.494E-06
52.325	76.762	79.086	79.686	92.504	92.879	92.954	94.303	96.027	96.102
1.64153	2.40816	2.48106	2.49987	2.90200	2.91375	2.91611	2.95844	3.01252	3.01487
2.244E-06	1.516E-06	1.425E-06	8.549E-07	2.593E-07	1.556E-07				
96.777	97.002	98.276	98.726	99.250	100.000				
3.03604	3.04309	3.08307	3.09718	3.11364	3.13716				

## X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE  
ORDERED X/Q-FREQUENCY VALUES, AND AS  
PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q	WITH RESPECT TO	WHEN THE WIND BLOWS
SEC/CUBIC METER	THE TOTAL TIME	INTO THIS SECTOR ONLY

HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 2)=	0.092
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 3)=	0.275
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 4)=	1.482
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 5)=	2.406
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 6)=	2.899
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 7)=	2.911

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
8	1	-7.40531	-12.57410	-1.03437
8	2	-9.35122	-13.80439	-1.42923
8	3	-9.83646	-14.63974	-1.73012
8	4	-10.87710	-17.14719	-2.88309
8	5	-11.44918	-22.81040	-5.74856
8	6	-11.91217	-75.00739	-33.28127
8	7	-11.97121	NUMXQ(K)= 7	

1.189E-04	0.031	1.000
8.596E-05	0.094	3.000
6.896E-05	0.157	5.000
4.965E-05	0.314	10.000
3.922E-05	0.471	15.000
3.296E-05	0.627	20.000
2.870E-05	0.784	25.000
2.555E-05	0.941	30.000
2.311E-05	1.098	35.000
2.115E-05	1.255	40.000
1.954E-05	1.412	45.000
1.772E-05	1.569	50.000
1.587E-05	1.725	55.000
1.433E-05	1.882	60.000
1.303E-05	2.039	65.000
1.192E-05	2.196	70.000
1.097E-05	2.353	75.000
9.631E-06	2.510	80.000
8.290E-06	2.667	85.000
7.188E-06	2.823	90.000
3.783E-05	0.5	15.94

ANNUAL AVERAGE = 3.68E-07

K= 8 FIVEXQ(K)= 3.783E-05 FIVEPR(K)=15.938



PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE N SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	EFF PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
									MEANDER	BLDG WAKE	USED
AT 10.0 METERS									CA=2926.SQ.METERS		
A	3.4	1.90	2043.	0.	0.	357.1	1000.0	357.1	2.600E-07	2.593E-07	2.593E-07
A	5.7	3.22	2043.	0.	0.	357.1	1000.0	357.1	1.560E-07	1.556E-07	1.556E-07
A	8.5	0.32	2043.	0.	0.	357.1	1000.0	357.1	1.054E-07	1.051E-07	1.051E-07
A	11.0	0.09	2043.	0.	0.	357.1	1000.0	357.1	8.124E-08	8.103E-08	8.103E-08
B	1.6	0.14	2043.	0.	0.	268.5	239.2	268.5	3.097E-06	3.053E-06	3.053E-06
B	3.4	1.68	2043.	0.	0.	268.5	239.2	268.5	1.445E-06	1.425E-06	1.425E-06
B	5.7	1.31	2043.	0.	0.	268.5	239.2	268.5	8.673E-07	8.549E-07	8.549E-07
B	8.5	0.27	2043.	0.	0.	268.5	239.2	268.5	5.860E-07	5.776E-07	5.776E-07
C	1.6	0.36	2043.	0.	0.	203.9	117.1	203.9	8.327E-06	8.015E-06	8.015E-06
C	3.4	2.13	2043.	0.	0.	203.9	117.1	203.9	3.886E-06	3.740E-06	3.740E-06
C	5.7	1.63	2043.	0.	0.	203.9	117.1	203.9	2.332E-06	2.244E-06	2.244E-06
C	8.5	0.54	2043.	0.	0.	203.9	117.1	203.9	1.575E-06	1.516E-06	1.516E-06
C	11.0	0.05	2043.	0.	0.	203.9	117.1	203.9	1.214E-06	1.169E-06	1.169E-06
D	1.6	5.58	2043.	0.	0.	143.6	51.3	205.2	1.889E-05	2.396E-05	1.889E-05
D	3.4	20.08	2043.	0.	0.	143.6	51.3	169.6	1.066E-05	1.118E-05	1.066E-05
D	5.7	13.28	2043.	0.	0.	143.6	51.3	145.5	7.456E-06	6.708E-06	6.708E-06
D	8.5	1.45	2043.	0.	0.	143.6	51.3	143.6	5.105E-06	4.533E-06	4.533E-06
E	0.2	0.00	2043.	0.	0.	102.1	34.8	189.7	2.062E-04	3.035E-04	2.062E-04
E	1.6	8.75	2043.	0.	0.	102.1	34.8	189.7	2.946E-05	4.336E-05	2.946E-05
E	3.5	22.08	2043.	0.	0.	102.1	34.8	133.2	1.957E-05	2.024E-05	1.957E-05
E	5.8	4.71	2043.	0.	0.	102.1	34.8	103.3	1.515E-05	1.214E-05	1.214E-05
E	8.7	0.36	2043.	0.	0.	102.1	34.8	102.1	1.035E-05	8.204E-06	8.204E-06
E	11.2	0.05	2043.	0.	0.	102.1	34.8	102.1	7.981E-06	6.324E-06	6.324E-06
F	1.6	3.31	2043.	0.	0.	70.5	22.6	161.1	5.347E-05	7.711E-05	5.347E-05
F	3.5	2.13	2043.	0.	0.	70.5	22.6	99.8	4.030E-05	3.599E-05	3.599E-05
F	5.8	0.09	2043.	0.	0.	70.5	22.6	71.5	3.374E-05	2.159E-05	2.159E-05
G	0.2	0.00	2043.	0.	0.	48.6	14.6	152.9	6.080E-04	8.284E-04	6.080E-04
G	1.6	3.26	2043.	0.	0.	48.6	14.6	152.9	8.686E-05	1.183E-04	8.686E-05
G	3.5	0.73	2043.	0.	0.	48.6	14.6	77.9	7.962E-05	5.523E-05	5.523E-05
G	5.8	0.45	2043.	0.	0.	48.6	14.6	49.6	7.506E-05	3.314E-05	3.314E-05
G	8.7	0.05	2043.	0.	0.	48.6	14.6	48.6	5.167E-05	2.239E-05	2.239E-05

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## LOW POPULATION ZONE CALCULATIONS:

N SECTOR BOUNDARY DISTANCE = 2043.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

6.080E-04	2.062E-04	8.686E-05	5.523E-05	5.347E-05	3.599E-05	3.314E-05	2.946E-05	2.239E-05	2.159E-05
0.001	0.003	3.267	3.992	7.301	9.432	9.885	18.633	18.679	18.769
0.00005	0.00016	0.16947	0.20710	0.37877	0.48929	0.51281	0.96667	0.96902	0.97373

1.957E-05	1.889E-05	1.214E-05	1.066E-05	8.204E-06	8.015E-06	6.708E-06	6.324E-06	4.533E-06	3.740E-06
40.845	46.420	51.135	71.216	71.578	71.941	85.223	85.268	86.718	88.849
2.11896	2.40821	2.65278	3.69454	3.71336	3.73217	4.42119	4.42354	4.49879	4.60932

3.053E-06	2.244E-06	1.516E-06	1.425E-06	1.169E-06	8.549E-07	5.776E-07	2.593E-07	1.556E-07	1.051E-07
88.985	90.617	91.161	92.838	92.883	94.198	94.470	96.374	99.592	99.909
4.61637	4.70103	4.72925	4.81626	4.81861	4.88681	4.90092	4.99969	5.16665	5.18311

8.103E-08

100.000

5.18782

## X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE  
ORDERED X/Q-FREQUENCY VALUES, AND AS  
PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q WITH RESPECT TO WHEN THE WIND BLOWS  
SEC/CUBIC METER THE TOTAL TIME INTO THIS SECTOR ONLY

HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 3)= 2.406  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 4)= 3.691  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 5)= 4.418  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 6)= 4.606

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
9	1	-7.40531	-12.27978	-0.99939
9	2	-9.35122	-14.03819	-1.59946
9	3	-10.87710	-16.87001	-3.03232
9	4	-11.44918	-21.35693	-5.54221
9	5	-11.91217	-62.18789	-29.50196

9	6	-12.49637	NUMXQ(K) =	6	
1.232E-04			0.052		1.000
8.918E-05			0.156		3.000
7.001E-05			0.259		5.000
4.830E-05			0.519		10.000
3.836E-05			0.778		15.000
3.235E-05			1.038		20.000
2.823E-05			1.297		25.000
2.517E-05			1.556		30.000
2.279E-05			1.816		35.000
2.087E-05			2.075		40.000
1.929E-05			2.335		45.000
1.715E-05			2.594		50.000
1.513E-05			2.853		55.000
1.347E-05			3.113		60.000
1.209E-05			3.372		65.000
1.092E-05			3.631		70.000
9.341E-06			3.891		75.000
7.911E-06			4.150		80.000
6.754E-06			4.410		85.000
4.930E-05			0.5		9.64

ANNUAL AVERAGE = 5.49E-07

K= 9 FIVEXQ(K) = 4.930E-05 FIVEPR(K) = 9.638

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE NNE SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC AT 10.0 METERS	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN METERS	HT METERS	EFF METERS	PLUME METERS	HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
												MEANDER	BLDG WAKE CA=2926.SQ.METERS	USED
A	3.4	3.87	2043.	0.	0.	0.	357.1	1000.0	357.1	2.600E-07	2.593E-07	2.593E-07		
A	5.7	5.11	2043.	0.	0.	0.	357.1	1000.0	357.1	1.560E-07	1.556E-07	1.556E-07		
A	8.5	0.66	2043.	0.	0.	0.	357.1	1000.0	357.1	1.054E-07	1.051E-07	1.051E-07		
A	11.0	0.04	2043.	0.	0.	0.	357.1	1000.0	357.1	8.124E-08	8.103E-08	8.103E-08		
B	1.6	0.08	2043.	0.	0.	0.	268.5	239.2	268.5	3.097E-06	3.053E-06	3.053E-06		
B	3.4	3.13	2043.	0.	0.	0.	268.5	239.2	268.5	1.445E-06	1.425E-06	1.425E-06		
B	5.7	2.22	2043.	0.	0.	0.	268.5	239.2	268.5	8.673E-07	8.549E-07	8.549E-07		
B	8.5	0.16	2043.	0.	0.	0.	268.5	239.2	268.5	5.860E-07	5.776E-07	5.776E-07		
B	11.0	0.04	2043.	0.	0.	0.	268.5	239.2	268.5	4.517E-07	4.452E-07	4.452E-07		
C	1.6	0.54	2043.	0.	0.	0.	203.9	117.1	203.9	8.327E-06	8.015E-06	8.015E-06		
C	3.4	3.38	2043.	0.	0.	0.	203.9	117.1	203.9	3.886E-06	3.740E-06	3.740E-06		
C	5.7	2.43	2043.	0.	0.	0.	203.9	117.1	203.9	2.332E-06	2.244E-06	2.244E-06		
C	8.5	0.12	2043.	0.	0.	0.	203.9	117.1	203.9	1.575E-06	1.516E-06	1.516E-06		
C	11.0	0.04	2043.	0.	0.	0.	203.9	117.1	203.9	1.214E-06	1.169E-06	1.169E-06		
D	1.6	6.01	2043.	0.	0.	0.	143.6	51.3	205.2	1.889E-05	2.396E-05	1.889E-05		
D	3.4	17.13	2043.	0.	0.	0.	143.6	51.3	169.6	1.066E-05	1.118E-05	1.066E-05		
D	5.7	7.21	2043.	0.	0.	0.	143.6	51.3	145.5	7.456E-06	6.708E-06	6.708E-06		
D	8.5	1.52	2043.	0.	0.	0.	143.6	51.3	143.6	5.105E-06	4.533E-06	4.533E-06		
D	11.0	0.04	2043.	0.	0.	0.	143.6	51.3	143.6	3.935E-06	3.494E-06	3.494E-06		
E	0.2	0.00	2043.	0.	0.	0.	102.1	34.8	189.7	2.062E-04	3.035E-04	2.062E-04		
E	1.6	11.74	2043.	0.	0.	0.	102.1	34.8	189.7	2.946E-05	4.336E-05	2.946E-05		
E	3.5	17.13	2043.	0.	0.	0.	102.1	34.8	133.2	1.957E-05	2.024E-05	1.957E-05		
E	5.8	3.62	2043.	0.	0.	0.	102.1	34.8	103.3	1.515E-05	1.214E-05	1.214E-05		
E	8.7	0.25	2043.	0.	0.	0.	102.1	34.8	102.1	1.035E-05	8.204E-06	8.204E-06		
F	1.6	5.19	2043.	0.	0.	0.	70.5	22.6	161.1	5.347E-05	7.711E-05	5.347E-05		
F	3.5	4.78	2043.	0.	0.	0.	70.5	22.6	99.8	4.030E-05	3.599E-05	3.599E-05		
G	0.2	0.00	2043.	0.	0.	0.	48.6	14.6	152.9	6.080E-04	8.284E-04	6.080E-04		
G	1.6	2.68	2043.	0.	0.	0.	48.6	14.6	152.9	8.686E-05	1.183E-04	8.686E-05		
G	3.5	0.54	2043.	0.	0.	0.	48.6	14.6	77.9	7.962E-05	5.523E-05	5.523E-05		
G	5.8	0.25	2043.	0.	0.	0.	48.6	14.6	49.6	7.506E-05	3.314E-05	3.314E-05		
G	8.7	0.08	2043.	0.	0.	0.	48.6	14.6	48.6	5.167E-05	2.239E-05	2.239E-05		

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## LOW POPULATION ZONE CALCULATIONS:

NNE SECTOR BOUNDARY DISTANCE = 2043.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

6.080E-04	2.062E-04	8.686E-05	5.523E-05	5.347E-05	3.599E-05	3.314E-05	2.946E-05	2.239E-05	1.957E-05
0.001	0.004	2.681	3.216	8.405	13.183	13.430	25.167	25.250	42.383
0.00005	0.00020	0.15306	0.18363	0.47993	0.75272	0.76683	1.43704	1.44174	2.42001
1.889E-05	1.214E-05	1.066E-05	8.204E-06	8.015E-06	6.708E-06	4.533E-06	3.740E-06	3.494E-06	3.053E-06
48.396	52.020	69.153	69.400	69.935	77.142	78.666	82.043	82.085	82.167
2.76335	2.97029	3.94856	3.96267	3.99324	4.40477	4.49178	4.68462	4.68697	4.69167
2.244E-06	1.516E-06	1.425E-06	1.169E-06	8.549E-07	5.776E-07	4.452E-07	2.593E-07	1.556E-07	1.051E-07
84.597	84.720	87.850	87.892	90.116	90.280	90.322	94.193	99.300	99.959
4.83042	4.83747	5.01619	5.01854	5.14553	5.15494	5.15729	5.37834	5.66994	5.70757
8.103E-08									
100.000									
5.70992									

## X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE  
ORDERED X/Q-FREQUENCY VALUES, AND AS  
PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q	WITH RESPECT TO	WHEN THE WIND BLOWS
SEC/CUBIC METER	THE TOTAL TIME	INTO THIS SECTOR ONLY

HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 2)=	0.153
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 3)=	0.479
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 4)=	1.435
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 5)=	2.761
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 6)=	3.945
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 7)=	4.401
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 8)=	4.681

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
10	1	-7.40531	-12.32866	-1.00526
10	2	-9.35122	-13.21999	-1.30620

10	3	-9.83646	-13.66871	-1.47942
10	4	-10.43252	-14.03078	-1.64495
10	5	-10.87710	-17.72700	-3.57287
10	6	-11.44918	-27.34744	-9.04812
10	7	-11.91217	-45.91876	-19.93459
10	8	-12.49637	NUMXQ(K)= 8	
		1.164E-04	0.057	1.000
		8.300E-05	0.171	3.000
		6.711E-05	0.285	5.000
		4.890E-05	0.571	10.000
		3.942E-05	0.856	15.000
		3.361E-05	1.142	20.000
		2.957E-05	1.427	25.000
		2.625E-05	1.713	30.000
		2.367E-05	1.998	35.000
		2.160E-05	2.284	40.000
		1.989E-05	2.569	45.000
		1.795E-05	2.855	50.000
		1.545E-05	3.140	55.000
		1.344E-05	3.426	60.000
		1.180E-05	3.711	65.000
		1.013E-05	3.997	70.000
		7.565E-06	4.282	75.000
		4.755E-06	4.568	80.000
		5.236E-05	0.5	8.76
ANNUAL AVERAGE = 6.39E-07				
K=	10	FIVEXQ(K)= 5.236E-05	FIVEPR(K)= 8.757	

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE NE SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	HT EFF METERS	PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
										MEANDER	BLDG WAKE	USED
										CA=2926.SQ.METERS		
AT 10.0 METERS												
A	1.6	0.14	2043.	0.	0.	0.	357.1	1000.0	357.1	5.571E-07	5.556E-07	5.556E-07
A	3.4	8.27	2043.	0.	0.	0.	357.1	1000.0	357.1	2.600E-07	2.593E-07	2.593E-07
A	5.7	3.22	2043.	0.	0.	0.	357.1	1000.0	357.1	1.560E-07	1.556E-07	1.556E-07
A	8.5	0.28	2043.	0.	0.	0.	357.1	1000.0	357.1	1.054E-07	1.051E-07	1.051E-07
B	1.6	0.47	2043.	0.	0.	0.	268.5	239.2	268.5	3.097E-06	3.053E-06	3.053E-06
B	3.4	3.41	2043.	0.	0.	0.	268.5	239.2	268.5	1.445E-06	1.425E-06	1.425E-06
B	5.7	0.93	2043.	0.	0.	0.	268.5	239.2	268.5	8.673E-07	8.549E-07	8.549E-07
C	1.6	1.03	2043.	0.	0.	0.	203.9	117.1	203.9	8.327E-06	8.015E-06	8.015E-06
C	3.4	3.92	2043.	0.	0.	0.	203.9	117.1	203.9	3.886E-06	3.740E-06	3.740E-06
C	5.7	1.07	2043.	0.	0.	0.	203.9	117.1	203.9	2.332E-06	2.244E-06	2.244E-06
C	8.5	0.09	2043.	0.	0.	0.	203.9	117.1	203.9	1.575E-06	1.516E-06	1.516E-06
D	1.6	7.29	2043.	0.	0.	0.	143.6	51.3	205.2	1.889E-05	2.396E-05	1.889E-05
D	3.4	13.45	2043.	0.	0.	0.	143.6	51.3	169.6	1.066E-05	1.118E-05	1.066E-05
D	5.7	2.48	2043.	0.	0.	0.	143.6	51.3	145.5	7.456E-06	6.708E-06	6.708E-06
D	8.5	0.23	2043.	0.	0.	0.	143.6	51.3	143.6	5.105E-06	4.533E-06	4.533E-06
E	0.2	0.00	2043.	0.	0.	0.	102.1	34.8	189.7	2.062E-04	3.035E-04	2.062E-04
E	1.6	17.61	2043.	0.	0.	0.	102.1	34.8	189.7	2.946E-05	4.336E-05	2.946E-05
E	3.5	13.78	2043.	0.	0.	0.	102.1	34.8	133.2	1.957E-05	2.024E-05	1.957E-05
E	5.8	1.40	2043.	0.	0.	0.	102.1	34.8	103.3	1.515E-05	1.214E-05	1.214E-05
E	8.7	0.23	2043.	0.	0.	0.	102.1	34.8	102.1	1.035E-05	8.204E-06	8.204E-06
F	1.6	10.04	2043.	0.	0.	0.	70.5	22.6	161.1	5.347E-05	7.711E-05	5.347E-05
F	3.5	3.32	2043.	0.	0.	0.	70.5	22.6	99.8	4.030E-05	3.599E-05	3.599E-05
F	5.8	0.14	2043.	0.	0.	0.	70.5	22.6	71.5	3.374E-05	2.159E-05	2.159E-05
G	0.2	0.00	2043.	0.	0.	0.	48.6	14.6	152.9	6.080E-04	8.284E-04	6.080E-04
G	1.6	6.21	2043.	0.	0.	0.	48.6	14.6	152.9	8.686E-05	1.183E-04	8.686E-05
G	3.5	0.79	2043.	0.	0.	0.	48.6	14.6	77.9	7.962E-05	5.523E-05	5.523E-05
G	5.8	0.19	2043.	0.	0.	0.	48.6	14.6	49.6	7.506E-05	3.314E-05	3.314E-05

USNRC COMPUTER CODE-PAVAN, VERSION 2.0

RUN DATE: 04/30/03

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

#### LOW POPULATION ZONE CALCULATIONS:

NE SECTOR BOUNDARY DISTANCE = 2043.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

6.080E-04	2.062E-04	8.686E-05	5.523E-05	5.347E-05	3.599E-05	3.314E-05	2.946E-05	2.159E-05	1.957E-05
0.002	0.006	6.218	7.012	17.053	20.369	20.556	38.163	38.304	52.081
0.00010	0.00030	0.31307	0.35304	0.85864	1.02561	1.03501	1.92157	1.92863	2.62235
1.889E-05	1.214E-05	1.066E-05	8.204E-06	8.015E-06	6.708E-06	4.533E-06	3.740E-06	3.053E-06	2.244E-06
59.367	60.768	74.219	74.453	75.480	77.956	78.189	82.112	82.579	83.653
2.98920	3.05975	3.73702	3.74877	3.80051	3.92515	3.93690	4.13444	4.15795	4.21204
1.516E-06	1.425E-06	8.549E-07	5.556E-07	2.593E-07	1.556E-07	1.051E-07			
83.747	87.156	88.090	88.230	96.497	99.720	100.000			
4.21675	4.38841	4.43545	4.44250	4.85874	5.02100	5.03511			

#### X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE  
ORDERED X/Q-FREQUENCY VALUES, AND AS  
PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q WITH RESPECT TO WHEN THE WIND BLOWS  
SEC/CUBIC METER THE TOTAL TIME INTO THIS SECTOR ONLY

HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 3)=	0.858
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 4)=	1.920
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 5)=	2.986
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 6)=	3.734
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 7)=	3.922
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 8)=	4.131

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
11	1	-7.40531	-11.98404	-0.96294
11	2	-9.35122	-13.13392	-1.38350
11	3	-9.83646	-14.37887	-1.90584
11	4	-10.43252	-15.33280	-2.36653
11	5	-10.87710	-21.61079	-5.70091
11	6	-11.44918	-47.93169	-20.46758
11	7	-11.91217	-54.47933	-24.18819



11	8	-12.49637	NUMXQ(K) = 8	
	1.482E-04		0.050	1.000
	1.086E-04		0.151	3.000
	9.300E-05		0.252	5.000
	6.958E-05		0.504	10.000
	5.705E-05		0.755	15.000
	4.776E-05		1.007	20.000
	4.061E-05		1.259	25.000
	3.545E-05		1.511	30.000
	3.151E-05		1.762	35.000
	2.814E-05		2.014	40.000
	2.505E-05		2.266	45.000
	2.253E-05		2.518	50.000
	2.044E-05		2.769	55.000
	1.839E-05		3.021	60.000
	1.501E-05		3.273	65.000
	1.241E-05		3.525	70.000
	9.660E-06		3.776	75.000
	5.017E-06		4.028	80.000
	6.981E-05		0.5	9.93

ANNUAL AVERAGE = 7.57E-07

K= 11 FIVEXQ(K) = 6.981E-05 FIVEPR(K) = 9.930

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE ENE SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	HT EFF METERS	PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
										MEANDER	BLDG WAKE	USED
AT 10.0 METERS										CA=2926.SQ.METERS		
A	1.6	0.56	2043.	0.	0.	0.	357.1	1000.0	357.1	5.571E-07	5.556E-07	5.556E-07
A	3.4	8.49	2043.	0.	0.	0.	357.1	1000.0	357.1	2.600E-07	2.593E-07	2.593E-07
A	5.7	5.00	2043.	0.	0.	0.	357.1	1000.0	357.1	1.560E-07	1.556E-07	1.556E-07
A	8.5	0.44	2043.	0.	0.	0.	357.1	1000.0	357.1	1.054E-07	1.051E-07	1.051E-07
B	1.6	0.48	2043.	0.	0.	0.	268.5	239.2	268.5	3.097E-06	3.053E-06	3.053E-06
B	3.4	3.28	2043.	0.	0.	0.	268.5	239.2	268.5	1.445E-06	1.425E-06	1.425E-06
B	5.7	1.52	2043.	0.	0.	0.	268.5	239.2	268.5	8.673E-07	8.549E-07	8.549E-07
B	8.5	0.08	2043.	0.	0.	0.	268.5	239.2	268.5	5.860E-07	5.776E-07	5.776E-07
C	1.6	1.04	2043.	0.	0.	0.	203.9	117.1	203.9	8.327E-06	8.015E-06	8.015E-06
C	3.4	3.72	2043.	0.	0.	0.	203.9	117.1	203.9	3.886E-06	3.740E-06	3.740E-06
C	5.7	1.48	2043.	0.	0.	0.	203.9	117.1	203.9	2.332E-06	2.244E-06	2.244E-06
C	8.5	0.04	2043.	0.	0.	0.	203.9	117.1	203.9	1.575E-06	1.516E-06	1.516E-06
D	1.6	7.77	2043.	0.	0.	0.	143.6	51.3	205.2	1.889E-05	2.396E-05	1.889E-05
D	3.4	12.61	2043.	0.	0.	0.	143.6	51.3	169.6	1.066E-05	1.118E-05	1.066E-05
D	5.7	3.48	2043.	0.	0.	0.	143.6	51.3	145.5	7.456E-06	6.708E-06	6.708E-06
D	8.5	0.68	2043.	0.	0.	0.	143.6	51.3	143.6	5.105E-06	4.533E-06	4.533E-06
E	0.2	0.00	2043.	0.	0.	0.	102.1	34.8	189.7	2.062E-04	3.035E-04	2.062E-04
E	1.6	16.09	2043.	0.	0.	0.	102.1	34.8	189.7	2.946E-05	4.336E-05	2.946E-05
E	3.5	11.21	2043.	0.	0.	0.	102.1	34.8	133.2	1.957E-05	2.024E-05	1.957E-05
E	5.8	1.00	2043.	0.	0.	0.	102.1	34.8	103.3	1.515E-05	1.214E-05	1.214E-05
E	8.7	0.12	2043.	0.	0.	0.	102.1	34.8	102.1	1.035E-05	8.204E-06	8.204E-06
E	11.2	0.04	2043.	0.	0.	0.	102.1	34.8	102.1	7.981E-06	6.324E-06	6.324E-06
F	1.6	11.77	2043.	0.	0.	0.	70.5	22.6	161.1	5.347E-05	7.711E-05	5.347E-05
F	3.5	1.48	2043.	0.	0.	0.	70.5	22.6	99.8	4.030E-05	3.599E-05	3.599E-05
G	0.2	0.00	2043.	0.	0.	0.	48.6	14.6	152.9	6.080E-04	8.284E-04	6.080E-04
G	1.6	6.56	2043.	0.	0.	0.	48.6	14.6	152.9	8.686E-05	1.183E-04	8.686E-05
G	3.5	0.96	2043.	0.	0.	0.	48.6	14.6	77.9	7.962E-05	5.523E-05	5.523E-05
G	5.8	0.08	2043.	0.	0.	0.	48.6	14.6	49.6	7.506E-05	3.314E-05	3.314E-05

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## LOW POPULATION ZONE CALCULATIONS:

ENE SECTOR BOUNDARY DISTANCE = 2043.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

6.080E-04	2.062E-04	8.686E-05	5.523E-05	5.347E-05	3.599E-05	3.314E-05	2.946E-05	1.957E-05	1.889E-05
0.002	0.006	6.571	7.531	19.300	20.781	20.861	36.953	48.162	55.927
0.00012	0.00034	0.38600	0.44244	1.13382	1.22083	1.22553	2.17088	2.82933	3.28554
1.214E-05	1.066E-05	8.204E-06	8.015E-06	6.708E-06	6.324E-06	4.533E-06	3.740E-06	3.053E-06	2.244E-06
56.928	69.537	69.657	70.698	74.181	74.221	74.901	78.624	79.104	80.586
3.34433	4.08509	4.09215	4.15329	4.35788	4.36023	4.40021	4.61891	4.64713	4.73414
1.516E-06	1.425E-06	8.549E-07	5.776E-07	5.556E-07	2.593E-07	1.556E-07	1.051E-07		
80.626	83.908	85.429	85.509	86.070	94.556	99.560	100.000		
4.73649	4.92932	5.01868	5.02339	5.05631	5.55485	5.84880	5.87467		

## X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE  
ORDERED X/Q-FREQUENCY VALUES, AND AS  
PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q	WITH RESPECT TO	WHEN THE WIND BLOWS
SEC/CUBIC METER	THE TOTAL TIME	INTO THIS SECTOR ONLY

HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 3)=	1.133
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 4)=	2.169
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 5)=	3.283
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 6)=	4.082
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 7)=	4.354
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 8)=	4.615

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
12	1	-7.40531	-11.88287	-0.95015
12	2	-9.35122	-12.70781	-1.25976
12	3	-9.83646	-15.07840	-2.29982
12	4	-10.43252	-15.44131	-2.47947
12	5	-10.87710	-21.45888	-5.74846
12	6	-11.44918	-38.04042	-15.27106
12	7	-11.91217	-48.11391	-21.15866

12	8	-12.49637	NUMXQ(K) = 8	
	1.508E-04		0.059	1.000
	1.105E-04		0.176	3.000
	9.467E-05		0.294	5.000
	7.241E-05		0.587	10.000
	6.023E-05		0.881	15.000
	5.182E-05		1.175	20.000
	4.244E-05		1.469	25.000
	3.589E-05		1.762	30.000
	3.103E-05		2.056	35.000
	2.712E-05		2.350	40.000
	2.394E-05		2.644	45.000
	2.136E-05		2.937	50.000
	1.924E-05		3.231	55.000
	1.574E-05		3.525	60.000
	1.276E-05		3.819	65.000
	1.017E-05		4.112	70.000
	6.011E-06		4.406	75.000
	7.772E-05		0.5	8.51

ANNUAL AVERAGE = 8.80E-07

K= 12 FIVEXQ(K) = 7.772E-05 FIVEPR(K) = 8.511

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE E SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC AT 10.0 METERS	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN METERS	HT EFF METERS	PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
										MEANDER	BLDG WAKE	USED
										CA=2926.SQ.METERS		
A	1.6	0.49	2043.	0.	0.	0.	357.1	1000.0	357.1	5.571E-07	5.556E-07	5.556E-07
A	3.4	4.53	2043.	0.	0.	0.	357.1	1000.0	357.1	2.600E-07	2.593E-07	2.593E-07
A	5.7	3.49	2043.	0.	0.	0.	357.1	1000.0	357.1	1.560E-07	1.556E-07	1.556E-07
A	8.5	1.42	2043.	0.	0.	0.	357.1	1000.0	357.1	1.054E-07	1.051E-07	1.051E-07
A	11.0	0.11	2043.	0.	0.	0.	357.1	1000.0	357.1	8.124E-08	8.103E-08	8.103E-08
A	25.1	0.02	2043.	0.	0.	0.	357.1	1000.0	357.1	3.545E-08	3.536E-08	3.536E-08
B	1.6	0.47	2043.	0.	0.	0.	268.5	239.2	268.5	3.097E-06	3.053E-06	3.053E-06
B	3.4	1.97	2043.	0.	0.	0.	268.5	239.2	268.5	1.445E-06	1.425E-06	1.425E-06
B	5.7	1.99	2043.	0.	0.	0.	268.5	239.2	268.5	8.673E-07	8.549E-07	8.549E-07
B	8.5	0.76	2043.	0.	0.	0.	268.5	239.2	268.5	5.860E-07	5.776E-07	5.776E-07
B	11.0	0.15	2043.	0.	0.	0.	268.5	239.2	268.5	4.517E-07	4.452E-07	4.452E-07
B	25.1	0.08	2043.	0.	0.	0.	268.5	239.2	268.5	1.971E-07	1.943E-07	1.943E-07
C	1.6	0.55	2043.	0.	0.	0.	203.9	117.1	203.9	8.327E-06	8.015E-06	8.015E-06
C	3.4	2.63	2043.	0.	0.	0.	203.9	117.1	203.9	3.886E-06	3.740E-06	3.740E-06
C	5.7	1.86	2043.	0.	0.	0.	203.9	117.1	203.9	2.332E-06	2.244E-06	2.244E-06
C	8.5	0.83	2043.	0.	0.	0.	203.9	117.1	203.9	1.575E-06	1.516E-06	1.516E-06
C	11.0	0.17	2043.	0.	0.	0.	203.9	117.1	203.9	1.214E-06	1.169E-06	1.169E-06
D	1.6	4.13	2043.	0.	0.	0.	143.6	51.3	205.2	1.889E-05	2.396E-05	1.889E-05
D	3.4	10.63	2043.	0.	0.	0.	143.6	51.3	169.6	1.066E-05	1.118E-05	1.066E-05
D	5.7	10.92	2043.	0.	0.	0.	143.6	51.3	145.5	7.456E-06	6.708E-06	6.708E-06
D	8.5	4.78	2043.	0.	0.	0.	143.6	51.3	143.6	5.105E-06	4.533E-06	4.533E-06
D	11.0	0.51	2043.	0.	0.	0.	143.6	51.3	143.6	3.935E-06	3.494E-06	3.494E-06
D	25.1	0.02	2043.	0.	0.	0.	143.6	51.3	143.6	1.717E-06	1.525E-06	1.525E-06
E	0.2	0.00	2043.	0.	0.	0.	102.1	34.8	189.7	2.062E-04	3.035E-04	2.062E-04
E	1.6	9.76	2043.	0.	0.	0.	102.1	34.8	189.7	2.946E-05	4.336E-05	2.946E-05
E	3.5	11.86	2043.	0.	0.	0.	102.1	34.8	133.2	1.957E-05	2.024E-05	1.957E-05
E	5.8	2.82	2043.	0.	0.	0.	102.1	34.8	103.3	1.515E-05	1.214E-05	1.214E-05
E	8.7	0.42	2043.	0.	0.	0.	102.1	34.8	102.1	1.035E-05	8.204E-06	8.204E-06
E	11.2	0.02	2043.	0.	0.	0.	102.1	34.8	102.1	7.981E-06	6.324E-06	6.324E-06
F	1.6	9.42	2043.	0.	0.	0.	70.5	22.6	161.1	5.347E-05	7.711E-05	5.347E-05
F	3.5	2.33	2043.	0.	0.	0.	70.5	22.6	99.8	4.030E-05	3.599E-05	3.599E-05
G	0.2	0.00	2043.	0.	0.	0.	48.6	14.6	152.9	6.080E-04	8.284E-04	6.080E-04
G	1.6	8.96	2043.	0.	0.	0.	48.6	14.6	152.9	8.686E-05	1.183E-04	8.686E-05
G	3.5	1.38	2043.	0.	0.	0.	48.6	14.6	77.9	7.962E-05	5.523E-05	5.523E-05
G	5.8	0.47	2043.	0.	0.	0.	48.6	14.6	49.6	7.506E-05	3.314E-05	3.314E-05
G	8.7	0.06	2043.	0.	0.	0.	48.6	14.6	48.6	5.167E-05	2.239E-05	2.239E-05

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## LOW POPULATION ZONE CALCULATIONS:

E SECTOR BOUNDARY DISTANCE = 2043.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

6.080E-04	2.062E-04	8.686E-05	5.523E-05	5.347E-05	3.599E-05	3.314E-05	2.946E-05	2.239E-05	1.957E-05
0.003	0.005	8.961	10.337	19.758	22.087	22.553	32.313	32.377	44.233
0.00032	0.00056	0.99530	1.14815	2.19462	2.45330	2.50503	3.58913	3.59618	4.91308
1.889E-05	1.214E-05	1.066E-05	8.204E-06	8.015E-06	6.708E-06	6.324E-06	4.533E-06	3.740E-06	3.494E-06
48.362	51.178	61.806	62.229	62.780	73.704	73.726	78.511	81.136	81.644
5.37165	5.68441	6.86492	6.91196	6.97310	8.18653	8.18888	8.72035	9.01194	9.06838
3.053E-06	2.244E-06	1.525E-06	1.516E-06	1.425E-06	1.169E-06	8.549E-07	5.776E-07	5.556E-07	4.452E-07
82.110	83.973	83.994	84.820	86.789	86.958	88.948	89.710	90.197	90.346
9.12012	9.32706	9.32941	9.42113	9.63983	9.65864	9.87969	9.96435	10.01844	10.03490
2.593E-07	1.943E-07	1.556E-07	1.051E-07	8.103E-08	3.536E-08				
94.876	94.961	98.454	99.873	99.979	100.000				
10.53814	10.54755	10.93556	11.09312	11.10488	11.10723				

## X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE  
ORDERED X/Q-FREQUENCY VALUES, AND AS  
PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q WITH RESPECT TO WHEN THE WIND BLOWS  
SEC/CUBIC METER THE TOTAL TIME INTO THIS SECTOR ONLY

HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 3)= 2.192  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 4)= 5.368  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 5)= 6.861  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 6)= 8.183  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 7)= 9.008  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 8)= 9.065

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
13	1	-7.40531	-11.42295	-0.88971
13	2	-9.35122	-12.96111	-1.55027
13	3	-9.83646	-15.01067	-2.56714

13	4	-10.87710	-18.30784	-4.61484
13	5	-11.44918	-18.82119	-4.96025
13	6	-11.91217	-27.36904	-11.09707
13	7	-12.49637	-38.83990	-19.65592
13	8	-12.56450	NUMXQ(K)= 8	
		1.664E-04	0.111	1.000
		1.223E-04	0.333	3.000
		1.048E-04	0.555	5.000
		8.146E-05	1.111	10.000
		6.371E-05	1.666	15.000
		5.277E-05	2.221	20.000
		4.131E-05	2.777	25.000
		3.359E-05	3.332	30.000
		2.805E-05	3.888	35.000
		2.390E-05	4.443	40.000
		2.067E-05	4.998	45.000
		1.750E-05	5.554	50.000
		1.404E-05	6.109	55.000
		1.144E-05	6.664	60.000
		9.354E-06	7.220	65.000
		7.698E-06	7.775	70.000
		6.040E-06	8.330	75.000
		4.079E-06	8.886	80.000
		1.083E-04	0.5	4.50
ANNUAL AVERAGE = 1.49E-06				
K=	13	FIVEXQ(K)= 1.083E-04		FIVEPR(K)= 4.502

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE ESE SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	EFF PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
									MEANDER	BLDG WAKE	USED
AT 10.0 METERS									CA=2926.SQ.METERS		
A	1.6	0.10	2043.	0.	0.	357.1	1000.0	357.1	5.571E-07	5.556E-07	5.556E-07
A	3.4	2.79	2043.	0.	0.	357.1	1000.0	357.1	2.600E-07	2.593E-07	2.593E-07
A	5.7	3.74	2043.	0.	0.	357.1	1000.0	357.1	1.560E-07	1.556E-07	1.556E-07
A	8.5	2.05	2043.	0.	0.	357.1	1000.0	357.1	1.054E-07	1.051E-07	1.051E-07
A	11.0	0.18	2043.	0.	0.	357.1	1000.0	357.1	8.124E-08	8.103E-08	8.103E-08
B	1.6	0.18	2043.	0.	0.	268.5	239.2	268.5	3.097E-06	3.053E-06	3.053E-06
B	3.4	1.60	2043.	0.	0.	268.5	239.2	268.5	1.445E-06	1.425E-06	1.425E-06
B	5.7	1.83	2043.	0.	0.	268.5	239.2	268.5	8.673E-07	8.549E-07	8.549E-07
B	8.5	1.26	2043.	0.	0.	268.5	239.2	268.5	5.860E-07	5.776E-07	5.776E-07
B	11.0	0.06	2043.	0.	0.	268.5	239.2	268.5	4.517E-07	4.452E-07	4.452E-07
C	1.6	0.31	2043.	0.	0.	203.9	117.1	203.9	8.327E-06	8.015E-06	8.015E-06
C	3.4	1.95	2043.	0.	0.	203.9	117.1	203.9	3.886E-06	3.740E-06	3.740E-06
C	5.7	2.48	2043.	0.	0.	203.9	117.1	203.9	2.332E-06	2.244E-06	2.244E-06
C	8.5	1.94	2043.	0.	0.	203.9	117.1	203.9	1.575E-06	1.516E-06	1.516E-06
C	11.0	0.18	2043.	0.	0.	203.9	117.1	203.9	1.214E-06	1.169E-06	1.169E-06
C	25.1	0.01	2043.	0.	0.	203.9	117.1	203.9	5.299E-07	5.100E-07	5.100E-07
D	1.6	3.10	2043.	0.	0.	143.6	51.3	205.2	1.889E-05	2.396E-05	1.889E-05
D	3.4	9.87	2043.	0.	0.	143.6	51.3	169.6	1.066E-05	1.118E-05	1.066E-05
D	5.7	14.90	2043.	0.	0.	143.6	51.3	145.5	7.456E-06	6.708E-06	6.708E-06
D	8.5	7.77	2043.	0.	0.	143.6	51.3	143.6	5.105E-06	4.533E-06	4.533E-06
D	11.0	0.58	2043.	0.	0.	143.6	51.3	143.6	3.935E-06	3.494E-06	3.494E-06
D	25.1	0.01	2043.	0.	0.	143.6	51.3	143.6	1.717E-06	1.525E-06	1.525E-06
E	0.2	0.00	2043.	0.	0.	102.1	34.8	189.7	2.062E-04	3.035E-04	2.062E-04
E	1.6	6.86	2043.	0.	0.	102.1	34.8	189.7	2.946E-05	4.336E-05	2.946E-05
E	3.5	12.50	2043.	0.	0.	102.1	34.8	133.2	1.957E-05	2.024E-05	1.957E-05
E	5.8	3.92	2043.	0.	0.	102.1	34.8	103.3	1.515E-05	1.214E-05	1.214E-05
E	8.7	0.83	2043.	0.	0.	102.1	34.8	102.1	1.035E-05	8.204E-06	8.204E-06
E	11.2	0.07	2043.	0.	0.	102.1	34.8	102.1	7.981E-06	6.324E-06	6.324E-06
F	1.6	6.65	2043.	0.	0.	70.5	22.6	161.1	5.347E-05	7.711E-05	5.347E-05
F	3.5	2.84	2043.	0.	0.	70.5	22.6	99.8	4.030E-05	3.599E-05	3.599E-05
F	5.8	0.10	2043.	0.	0.	70.5	22.6	71.5	3.374E-05	2.159E-05	2.159E-05
F	8.7	0.03	2043.	0.	0.	70.5	22.6	70.5	2.313E-05	1.459E-05	1.459E-05
G	0.2	0.00	2043.	0.	0.	48.6	14.6	152.9	6.080E-04	8.284E-04	6.080E-04
G	1.6	7.57	2043.	0.	0.	48.6	14.6	152.9	8.686E-05	1.183E-04	8.686E-05
G	3.5	1.34	2043.	0.	0.	48.6	14.6	77.9	7.962E-05	5.523E-05	5.523E-05
G	5.8	0.21	2043.	0.	0.	48.6	14.6	49.6	7.506E-05	3.314E-05	3.314E-05
G	8.7	0.18	2043.	0.	0.	48.6	14.6	48.6	5.167E-05	2.239E-05	2.239E-05
G	11.2	0.01	2043.	0.	0.	48.6	14.6	48.6	3.983E-05	1.726E-05	1.726E-05



PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## LOW POPULATION ZONE CALCULATIONS:

ESE SECTOR BOUNDARY DISTANCE = 2043.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

6.080E-04	2.062E-04	8.686E-05	5.523E-05	5.347E-05	3.599E-05	3.314E-05	2.946E-05	2.239E-05	2.159E-05
0.002	0.004	7.570	8.915	15.564	18.401	18.608	25.465	25.642	25.746
0.00038	0.00063	1.20466	1.41866	2.47688	2.92839	2.96131	4.05246	4.08068	4.09714
1.957E-05	1.889E-05	1.726E-05	1.459E-05	1.214E-05	1.066E-05	8.204E-06	8.015E-06	6.708E-06	6.324E-06
38.247	41.350	41.365	41.394	45.310	55.181	56.009	56.319	71.214	71.288
6.08661	6.58045	6.58280	6.58750	7.21068	8.78156	8.91325	8.96263	11.33306	11.34481
4.533E-06	3.740E-06	3.494E-06	3.053E-06	2.244E-06	1.525E-06	1.516E-06	1.425E-06	1.169E-06	8.549E-07
79.061	81.012	81.588	81.765	84.248	84.262	86.198	87.794	87.971	89.804
12.58176	12.89217	12.98389	13.01211	13.40718	13.40953	13.71759	13.97157	13.99978	14.29138
5.776E-07	5.556E-07	5.100E-07	4.452E-07	2.593E-07	1.556E-07	1.051E-07	8.103E-08		
91.060	91.163	91.178	91.237	94.030	97.769	99.823	100.000		
14.49127	14.50773	14.51009	14.51949	14.96395	15.55890	15.88578	15.91400		

## X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE  
ORDERED X/Q-FREQUENCY VALUES, AND AS  
PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q	WITH RESPECT TO	WHEN THE WIND BLOWS
SEC/CUBIC METER	THE TOTAL TIME	INTO THIS SECTOR ONLY

HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 3)=	2.474
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 4)=	6.577
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 5)=	11.331
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 6)=	12.580
HANDCHECK GRAPH:	SLOPE LT -1.0 FOR LOW PERCENTAGES.	XSAVE( 7)=	12.891

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
14	1	-7.40531	-11.32966	-0.87693
14	2	-9.35122	-13.10395	-1.66338
14	3	-9.83646	-14.31664	-2.28072
14	4	-10.87710	-16.09855	-3.46229

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14 5      -11.91217 -19.47693 -6.25635
14 6      -12.30422 -27.09479 -12.90097
14 7      -12.49637      NUMXQ(K) = 7
      1.596E-04      0.159      1.000
      1.166E-04      0.477      3.000
      9.953E-05      0.796      5.000
      7.245E-05      1.591     10.000
      5.488E-05      2.387     15.000
      4.166E-05      3.183     20.000
      3.306E-05      3.979     25.000
      2.717E-05      4.774     30.000
      2.288E-05      5.570     35.000
      1.963E-05      6.366     40.000
      1.622E-05      7.161     45.000
      1.337E-05      7.957     50.000
      1.117E-05      8.753     55.000
      9.444E-06      9.548     60.000
      8.065E-06     10.344     65.000
      6.948E-06     11.140     70.000
      5.532E-06     11.936     75.000
      4.130E-06     12.731     80.000

      1.150E-04      0.5      3.14

ANNUAL AVERAGE = 1.80E-06

K= 14      FIVEXQ(K) = 1.150E-04      FIVEPR(K) = 3.142

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PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE SE SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	HT EFF METERS	PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
										MEANDER	BLDG WAKE	USED
AT 10.0 METERS										CA=2926.SQ.METERS		
A	1.6	0.15	2043.	0.	0.	0.	357.1	1000.0	357.1	5.571E-07	5.556E-07	5.556E-07
A	3.4	1.51	2043.	0.	0.	0.	357.1	1000.0	357.1	2.600E-07	2.593E-07	2.593E-07
A	5.7	3.59	2043.	0.	0.	0.	357.1	1000.0	357.1	1.560E-07	1.556E-07	1.556E-07
A	8.5	1.11	2043.	0.	0.	0.	357.1	1000.0	357.1	1.054E-07	1.051E-07	1.051E-07
A	11.0	0.15	2043.	0.	0.	0.	357.1	1000.0	357.1	8.124E-08	8.103E-08	8.103E-08
B	1.6	0.09	2043.	0.	0.	0.	268.5	239.2	268.5	3.097E-06	3.053E-06	3.053E-06
B	3.4	1.28	2043.	0.	0.	0.	268.5	239.2	268.5	1.445E-06	1.425E-06	1.425E-06
B	5.7	2.51	2043.	0.	0.	0.	268.5	239.2	268.5	8.673E-07	8.549E-07	8.549E-07
B	8.5	0.94	2043.	0.	0.	0.	268.5	239.2	268.5	5.860E-07	5.776E-07	5.776E-07
B	11.0	0.09	2043.	0.	0.	0.	268.5	239.2	268.5	4.517E-07	4.452E-07	4.452E-07
C	1.6	0.21	2043.	0.	0.	0.	203.9	117.1	203.9	8.327E-06	8.015E-06	8.015E-06
C	3.4	1.53	2043.	0.	0.	0.	203.9	117.1	203.9	3.886E-06	3.740E-06	3.740E-06
C	5.7	3.32	2043.	0.	0.	0.	203.9	117.1	203.9	2.332E-06	2.244E-06	2.244E-06
C	8.5	2.34	2043.	0.	0.	0.	203.9	117.1	203.9	1.575E-06	1.516E-06	1.516E-06
C	11.0	0.57	2043.	0.	0.	0.	203.9	117.1	203.9	1.214E-06	1.169E-06	1.169E-06
C	25.1	0.02	2043.	0.	0.	0.	203.9	117.1	203.9	5.299E-07	5.100E-07	5.100E-07
D	1.6	3.65	2043.	0.	0.	0.	143.6	51.3	205.2	1.889E-05	2.396E-05	1.889E-05
D	3.4	10.99	2043.	0.	0.	0.	143.6	51.3	169.6	1.066E-05	1.118E-05	1.066E-05
D	5.7	15.49	2043.	0.	0.	0.	143.6	51.3	145.5	7.456E-06	6.708E-06	6.708E-06
D	8.5	10.56	2043.	0.	0.	0.	143.6	51.3	143.6	5.105E-06	4.533E-06	4.533E-06
D	11.0	2.15	2043.	0.	0.	0.	143.6	51.3	143.6	3.935E-06	3.494E-06	3.494E-06
D	25.1	0.09	2043.	0.	0.	0.	143.6	51.3	143.6	1.717E-06	1.525E-06	1.525E-06
E	0.2	0.00	2043.	0.	0.	0.	102.1	34.8	189.7	2.062E-04	3.035E-04	2.062E-04
E	1.6	6.65	2043.	0.	0.	0.	102.1	34.8	189.7	2.946E-05	4.336E-05	2.946E-05
E	3.5	9.71	2043.	0.	0.	0.	102.1	34.8	133.2	1.957E-05	2.024E-05	1.957E-05
E	5.8	4.21	2043.	0.	0.	0.	102.1	34.8	103.3	1.515E-05	1.214E-05	1.214E-05
E	8.7	1.02	2043.	0.	0.	0.	102.1	34.8	102.1	1.035E-05	8.204E-06	8.204E-06
E	11.2	0.09	2043.	0.	0.	0.	102.1	34.8	102.1	7.981E-06	6.324E-06	6.324E-06
F	1.6	6.67	2043.	0.	0.	0.	70.5	22.6	161.1	5.347E-05	7.711E-05	5.347E-05
F	3.5	1.83	2043.	0.	0.	0.	70.5	22.6	99.8	4.030E-05	3.599E-05	3.599E-05
F	8.7	0.19	2043.	0.	0.	0.	70.5	22.6	70.5	2.313E-05	1.459E-05	1.459E-05
F	11.2	0.04	2043.	0.	0.	0.	70.5	22.6	70.5	1.783E-05	1.125E-05	1.125E-05
G	0.2	0.00	2043.	0.	0.	0.	48.6	14.6	152.9	6.080E-04	8.284E-04	6.080E-04
G	1.6	6.63	2043.	0.	0.	0.	48.6	14.6	152.9	8.686E-05	1.183E-04	8.686E-05
G	3.5	0.51	2043.	0.	0.	0.	48.6	14.6	77.9	7.962E-05	5.523E-05	5.523E-05
G	5.8	0.08	2043.	0.	0.	0.	48.6	14.6	49.6	7.506E-05	3.314E-05	3.314E-05

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## LOW POPULATION ZONE CALCULATIONS:

SE SECTOR BOUNDARY DISTANCE = 2043.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

6.080E-04	2.062E-04	8.686E-05	5.523E-05	5.347E-05	3.599E-05	3.314E-05	2.946E-05	1.957E-05	1.889E-05
0.002	0.004	6.634	7.144	13.811	15.643	15.719	22.368	32.077	35.722
0.00026	0.00045	0.82587	0.88936	1.71948	1.94759	1.95699	2.78476	3.99349	4.44735
1.459E-05	1.214E-05	1.125E-05	1.066E-05	8.204E-06	8.015E-06	6.708E-06	6.324E-06	4.533E-06	3.740E-06
35.911	40.123	40.161	51.154	52.174	52.382	67.870	67.965	78.524	80.054
4.47087	4.99528	4.99998	6.36862	6.49561	6.52147	8.44980	8.46156	9.77611	9.96659
3.494E-06	3.053E-06	2.244E-06	1.525E-06	1.516E-06	1.425E-06	1.169E-06	8.549E-07	5.776E-07	5.556E-07
82.207	82.301	85.626	85.720	88.062	89.347	89.913	92.426	93.370	93.521
10.23467	10.24643	10.66031	10.67207	10.96367	11.12358	11.19413	11.50689	11.62447	11.64329
5.100E-07	4.452E-07	2.593E-07	1.556E-07	1.051E-07	8.103E-08				
93.540	93.635	95.146	98.734	99.849	100.000				
11.64564	11.65740	11.84553	12.29233	12.43108	12.44989				

## X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE  
ORDERED X/Q-FREQUENCY VALUES, AND AS  
PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q WITH RESPECT TO WHEN THE WIND BLOWS  
SEC/CUBIC METER THE TOTAL TIME INTO THIS SECTOR ONLY

HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 3)= 1.718  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 4)= 4.444  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 5)= 8.446  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 6)= 9.773  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 7)= 10.232

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
15	1	-7.40531	-11.51394	-0.90199
15	2	-9.35122	-13.47995	-1.72195
15	3	-9.83646	-15.14787	-2.51022
15	4	-10.87710	-16.28429	-3.17817

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15 5      -11.91217 -18.56462 -4.83578
15 6      -12.30422 -25.19530 -9.95758
15 7      -12.56450      NUMXQ(K)= 7
      1.529E-04      0.124      1.000
      1.116E-04      0.373      3.000
      9.522E-05      0.622      5.000
      6.659E-05      1.245     10.000
      4.915E-05      1.867     15.000
      3.634E-05      2.490     20.000
      2.847E-05      3.112     25.000
      2.316E-05      3.735     30.000
      1.935E-05      4.357     35.000
      1.590E-05      4.980     40.000
      1.323E-05      5.602     45.000
      1.118E-05      6.225     50.000
      9.572E-06      6.847     55.000
      8.281E-06      7.470     60.000
      7.227E-06      8.092     65.000
      6.181E-06      8.715     70.000
      5.136E-06      9.337     75.000
      4.079E-06      9.960     80.000

      1.020E-04      0.5      4.02

ANNUAL AVERAGE = 1.33E-06

K= 15      FIVEXQ(K)= 1.020E-04      FIVEPR(K)= 4.016

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PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE SSE SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC AT 10.0 METERS	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	HT EFF METERS	PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
										MEANDER	BLDG WAKE	USED
										CA=2926.SQ.METERS		
A	1.6	0.23	2043.	0.	0.	0.	357.1	1000.0	357.1	5.571E-07	5.556E-07	5.556E-07
A	3.4	2.17	2043.	0.	0.	0.	357.1	1000.0	357.1	2.600E-07	2.593E-07	2.593E-07
A	5.7	2.33	2043.	0.	0.	0.	357.1	1000.0	357.1	1.560E-07	1.556E-07	1.556E-07
A	8.5	0.66	2043.	0.	0.	0.	357.1	1000.0	357.1	1.054E-07	1.051E-07	1.051E-07
A	11.0	0.16	2043.	0.	0.	0.	357.1	1000.0	357.1	8.124E-08	8.103E-08	8.103E-08
B	3.4	1.55	2043.	0.	0.	0.	268.5	239.2	268.5	1.445E-06	1.425E-06	1.425E-06
B	5.7	1.71	2043.	0.	0.	0.	268.5	239.2	268.5	8.673E-07	8.549E-07	8.549E-07
B	8.5	0.81	2043.	0.	0.	0.	268.5	239.2	268.5	5.860E-07	5.776E-07	5.776E-07
B	11.0	0.16	2043.	0.	0.	0.	268.5	239.2	268.5	4.517E-07	4.452E-07	4.452E-07
C	1.6	0.39	2043.	0.	0.	0.	203.9	117.1	203.9	8.327E-06	8.015E-06	8.015E-06
C	3.4	1.36	2043.	0.	0.	0.	203.9	117.1	203.9	3.886E-06	3.740E-06	3.740E-06
C	5.7	2.13	2043.	0.	0.	0.	203.9	117.1	203.9	2.332E-06	2.244E-06	2.244E-06
C	8.5	0.85	2043.	0.	0.	0.	203.9	117.1	203.9	1.575E-06	1.516E-06	1.516E-06
C	11.0	0.12	2043.	0.	0.	0.	203.9	117.1	203.9	1.214E-06	1.169E-06	1.169E-06
D	1.6	5.97	2043.	0.	0.	0.	143.6	51.3	205.2	1.889E-05	2.396E-05	1.889E-05
D	3.4	13.38	2043.	0.	0.	0.	143.6	51.3	169.6	1.066E-05	1.118E-05	1.066E-05
D	5.7	16.25	2043.	0.	0.	0.	143.6	51.3	145.5	7.456E-06	6.708E-06	6.708E-06
D	8.5	4.96	2043.	0.	0.	0.	143.6	51.3	143.6	5.105E-06	4.533E-06	4.533E-06
D	11.0	0.47	2043.	0.	0.	0.	143.6	51.3	143.6	3.935E-06	3.494E-06	3.494E-06
E	0.2	0.00	2043.	0.	0.	0.	102.1	34.8	189.7	2.062E-04	3.035E-04	2.062E-04
E	1.6	9.15	2043.	0.	0.	0.	102.1	34.8	189.7	2.946E-05	4.336E-05	2.946E-05
E	3.5	9.93	2043.	0.	0.	0.	102.1	34.8	133.2	1.957E-05	2.024E-05	1.957E-05
E	5.8	3.22	2043.	0.	0.	0.	102.1	34.8	103.3	1.515E-05	1.214E-05	1.214E-05
E	8.7	0.47	2043.	0.	0.	0.	102.1	34.8	102.1	1.035E-05	8.204E-06	8.204E-06
F	1.6	7.72	2043.	0.	0.	0.	70.5	22.6	161.1	5.347E-05	7.711E-05	5.347E-05
F	3.5	0.85	2043.	0.	0.	0.	70.5	22.6	99.8	4.030E-05	3.599E-05	3.599E-05
F	5.8	0.04	2043.	0.	0.	0.	70.5	22.6	71.5	3.374E-05	2.159E-05	2.159E-05
F	11.2	0.08	2043.	0.	0.	0.	70.5	22.6	70.5	1.783E-05	1.125E-05	1.125E-05
G	0.2	0.00	2043.	0.	0.	0.	48.6	14.6	152.9	6.080E-04	8.284E-04	6.080E-04
G	1.6	12.41	2043.	0.	0.	0.	48.6	14.6	152.9	8.686E-05	1.183E-04	8.686E-05
G	3.5	0.35	2043.	0.	0.	0.	48.6	14.6	77.9	7.962E-05	5.523E-05	5.523E-05
G	5.8	0.12	2043.	0.	0.	0.	48.6	14.6	49.6	7.506E-05	3.314E-05	3.314E-05

USNRC COMPUTER CODE-PAVAN, VERSION 2.0

RUN DATE: 04/30/03

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

# LOW POPULATION ZONE CALCULATIONS:

SSE SECTOR BOUNDARY DISTANCE = 2043.0 METERS

LATERAL PLUME MEANDER/BUILDING WAKE CREDIT ALLOWED

AS A FUNCTION OF DOWNWIND DISTANCE.

MEANDER CREDIT IS FOR WINDSPEEDS LESS THAN 6 MPS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

6.080E-04	2.062E-04	8.686E-05	5.523E-05	5.347E-05	3.599E-05	3.314E-05	2.946E-05	2.159E-05	1.957E-05
0.004	0.006	12.418	12.767	20.486	21.339	21.455	30.609	30.648	40.578
0.00024	0.00037	0.75288	0.77405	1.24202	1.29375	1.30081	1.85579	1.85814	2.46015
1.889E-05	1.214E-05	1.125E-05	1.066E-05	8.204E-06	8.015E-06	6.708E-06	4.533E-06	3.740E-06	3.494E-06
46.551	49.770	49.848	63.230	63.695	64.083	80.335	85.300	86.657	87.123
2.82230	3.01749	3.02219	3.83350	3.86172	3.88523	4.87056	5.17156	5.25387	5.28209
2.244E-06	1.516E-06	1.425E-06	1.169E-06	8.549E-07	5.776E-07	5.556E-07	4.452E-07	2.593E-07	1.556E-07
89.256	90.109	91.661	91.777	93.484	94.298	94.531	94.686	96.858	99.186
5.41143	5.46316	5.55723	5.56428	5.66775	5.71714	5.73125	5.74065	5.87235	6.01344
1.051E-07	8.103E-08								
99.845	100.000								
6.05342	6.06283								

## X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE ORDERED X/Q-FREQUENCY VALUES, AND AS PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q WITH RESPECT TO WHEN THE WIND BLOWS  
SEC/CUBIC METER THE TOTAL TIME INTO THIS SECTOR ONLY

HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 3)= 1.241  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 4)= 2.820  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 5)= 4.867  
HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 6)= 5.168

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
16	1	-7.40531	-11.55899	-0.90802
16	2	-9.35122	-15.65703	-2.59347
16	3	-9.83646	-16.78085	-3.09421
16	4	-10.87710	-18.77360	-4.13863
16	5	-11.91217	-34.24426	-13.47011

16	6	-12.30422	NUMXQ(K) =	6	
		1.804E-04		0.061	1.000
		1.339E-04		0.182	3.000
		1.154E-04		0.303	5.000
		9.319E-05		0.606	10.000
		7.259E-05		0.909	15.000
		5.476E-05		1.213	20.000
		4.201E-05		1.516	25.000
		3.349E-05		1.819	30.000
		2.752E-05		2.122	35.000
		2.312E-05		2.425	40.000
		1.977E-05		2.728	45.000
		1.659E-05		3.031	50.000
		1.391E-05		3.335	55.000
		1.182E-05		3.638	60.000
		1.015E-05		3.941	65.000
		8.798E-06		4.244	70.000
		7.687E-06		4.547	75.000
		6.764E-06		4.850	80.000
		4.639E-06		5.153	85.000
		9.907E-05		0.5	8.25

ANNUAL AVERAGE = 8.69E-07

K= 16 FIVEXQ(K)= 9.907E-05 FIVEPR(K)= 8.247



PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## PARAMETER VALUES FOR THE CHI/Q CALCULATIONS FOR THE ALL SECTOR.

STABILITY CLASS	WINDSPEED METER/SEC	FREQUENCY PERCENT	DISTANCE METERS	TERRAIN HT METERS	HT EFF METERS	PLUME HT METERS	SIGMA-Y METERS	SIGMA-Z METERS	MEANDER-SY METERS	** CHI/Q VALUES (SEC/CUBIC METER)		
										MEANDER	BLDG WAKE	USED
AT 10.0 METERS										CA=2926.SQ.METERS		
A	1.6	0.19	2043.	0.	0.	0.	357.1	1000.0	357.1	5.571E-07	5.556E-07	5.556E-07
A	3.4	3.01	2043.	0.	0.	0.	357.1	1000.0	357.1	2.600E-07	2.593E-07	2.593E-07
A	5.7	2.69	2043.	0.	0.	0.	357.1	1000.0	357.1	1.560E-07	1.556E-07	1.556E-07
A	8.5	0.79	2043.	0.	0.	0.	357.1	1000.0	357.1	1.054E-07	1.051E-07	1.051E-07
A	11.0	0.08	2043.	0.	0.	0.	357.1	1000.0	357.1	8.124E-08	8.103E-08	8.103E-08
A	25.1	0.00	2043.	0.	0.	0.	357.1	1000.0	357.1	3.545E-08	3.536E-08	3.536E-08
B	1.6	0.23	2043.	0.	0.	0.	268.5	239.2	268.5	3.097E-06	3.053E-06	3.053E-06
B	3.4	1.82	2043.	0.	0.	0.	268.5	239.2	268.5	1.445E-06	1.425E-06	1.425E-06
B	5.7	1.52	2043.	0.	0.	0.	268.5	239.2	268.5	8.673E-07	8.549E-07	8.549E-07
B	8.5	0.51	2043.	0.	0.	0.	268.5	239.2	268.5	5.860E-07	5.776E-07	5.776E-07
B	11.0	0.05	2043.	0.	0.	0.	268.5	239.2	268.5	4.517E-07	4.452E-07	4.452E-07
B	25.1	0.01	2043.	0.	0.	0.	268.5	239.2	268.5	1.971E-07	1.943E-07	1.943E-07
C	1.6	0.46	2043.	0.	0.	0.	203.9	117.1	203.9	8.327E-06	8.015E-06	8.015E-06
C	3.4	2.33	2043.	0.	0.	0.	203.9	117.1	203.9	3.886E-06	3.740E-06	3.740E-06
C	5.7	1.87	2043.	0.	0.	0.	203.9	117.1	203.9	2.332E-06	2.244E-06	2.244E-06
C	8.5	0.81	2043.	0.	0.	0.	203.9	117.1	203.9	1.575E-06	1.516E-06	1.516E-06
C	11.0	0.13	2043.	0.	0.	0.	203.9	117.1	203.9	1.214E-06	1.169E-06	1.169E-06
C	25.1	0.00	2043.	0.	0.	0.	203.9	117.1	203.9	5.299E-07	5.100E-07	5.100E-07
D	1.6	6.70	2043.	0.	0.	0.	143.6	51.3	143.6	2.698E-05	2.396E-05	2.396E-05
D	3.4	16.10	2043.	0.	0.	0.	143.6	51.3	143.6	1.259E-05	1.118E-05	1.118E-05
D	5.7	11.46	2043.	0.	0.	0.	143.6	51.3	143.6	7.556E-06	6.708E-06	6.708E-06
D	8.5	4.04	2043.	0.	0.	0.	143.6	51.3	143.6	5.105E-06	4.533E-06	4.533E-06
D	11.0	0.46	2043.	0.	0.	0.	143.6	51.3	143.6	3.935E-06	3.494E-06	3.494E-06
D	25.1	0.02	2043.	0.	0.	0.	143.6	51.3	143.6	1.717E-06	1.525E-06	1.525E-06
E	0.2	0.00	2043.	0.	0.	0.	102.1	34.8	102.1	3.831E-04	3.035E-04	3.035E-04
E	1.6	10.23	2043.	0.	0.	0.	102.1	34.8	102.1	5.472E-05	4.336E-05	4.336E-05
E	3.5	12.64	2043.	0.	0.	0.	102.1	34.8	102.1	2.554E-05	2.024E-05	2.024E-05
E	5.8	3.05	2043.	0.	0.	0.	102.1	34.8	102.1	1.532E-05	1.214E-05	1.214E-05
E	8.7	0.56	2043.	0.	0.	0.	102.1	34.8	102.1	1.035E-05	8.204E-06	8.204E-06
E	11.2	0.05	2043.	0.	0.	0.	102.1	34.8	102.1	7.981E-06	6.324E-06	6.324E-06
E	25.7	0.01	2043.	0.	0.	0.	102.1	34.8	102.1	3.482E-06	2.759E-06	2.759E-06
F	1.6	7.54	2043.	0.	0.	0.	70.5	22.6	70.5	1.222E-04	7.711E-05	7.711E-05
F	3.5	2.09	2043.	0.	0.	0.	70.5	22.6	70.5	5.705E-05	3.599E-05	3.599E-05
F	5.8	0.04	2043.	0.	0.	0.	70.5	22.6	70.5	3.423E-05	2.159E-05	2.159E-05
F	8.7	0.04	2043.	0.	0.	0.	70.5	22.6	70.5	2.313E-05	1.459E-05	1.459E-05
F	11.2	0.02	2043.	0.	0.	0.	70.5	22.6	70.5	1.783E-05	1.125E-05	1.125E-05
F	25.7	0.00	2043.	0.	0.	0.	70.5	22.6	70.5	7.779E-06	4.907E-06	4.907E-06
G	0.2	0.00	2043.	0.	0.	0.	48.6	14.6	48.6	1.912E-03	8.284E-04	8.284E-04
G	1.6	7.42	2043.	0.	0.	0.	48.6	14.6	48.6	2.731E-04	1.183E-04	1.183E-04

G	3.5	0.79	2043.	0.	0.	48.6	14.6	48.6	1.274E-04	5.523E-05	5.523E-05
G	5.8	0.19	2043.	0.	0.	48.6	14.6	48.6	7.647E-05	3.314E-05	3.314E-05
G	8.7	0.04	2043.	0.	0.	48.6	14.6	48.6	5.167E-05	2.239E-05	2.239E-05
G	11.2	0.00	2043.	0.	0.	48.6	14.6	48.6	3.983E-05	1.726E-05	1.726E-05

USNRC COMPUTER CODE-PAVAN, VERSION 2.0

RUN DATE: 04/30/03

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

#### LOW POPULATION ZONE CALCULATIONS:

DIRECTION-INDEPENDENT (S.R.P 2.3.4) MODEL.

MINIMUM BOUNDARY DISTANCE = 2043.0 METERS.

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

8.284E-04	3.035E-04	1.183E-04	7.711E-05	5.523E-05	4.336E-05	3.599E-05	3.314E-05	2.396E-05	2.239E-05
0.002	0.005	7.422	14.963	15.758	25.992	28.085	28.276	34.978	35.020
0.00235	0.00470	7.42169	14.96332	15.75816	25.99238	28.08532	28.27580	34.97790	35.02023
2.159E-05	2.024E-05	1.726E-05	1.459E-05	1.214E-05	1.125E-05	1.118E-05	8.204E-06	8.015E-06	6.708E-06
35.058	47.693	47.695	47.731	50.785	50.807	66.908	67.472	67.936	79.395
35.05785	47.69307	47.69542	47.73069	50.78544	50.80660	66.90810	67.47248	67.93575	79.39516
6.324E-06	4.907E-06	4.533E-06	3.740E-06	3.494E-06	3.053E-06	2.759E-06	2.244E-06	1.525E-06	1.516E-06
79.445	79.447	83.485	85.810	86.269	86.499	86.506	88.378	88.397	89.206
79.44454	79.44689	83.48461	85.81036	86.26892	86.49938	86.50644	88.37833	88.39714	89.20609
1.425E-06	1.169E-06	8.549E-07	5.776E-07	5.556E-07	5.100E-07	4.452E-07	2.593E-07	1.943E-07	1.556E-07
91.024	91.153	92.672	93.178	93.371	93.376	93.425	96.440	96.449	99.137
91.02389	91.15323	92.67237	93.17797	93.37080	93.37550	93.42489	96.43966	96.44907	99.13696
1.051E-07	8.103E-08	3.536E-08							
99.922	99.998	100.000							
99.92240	99.99765	100.00000							

#### X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE ORDERED X/Q-FREQUENCY VALUES, AND AS PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q	WITH RESPECT TO	WHEN THE WIND BLOWS
SEC/CUBIC METER	THE TOTAL TIME	INTO THIS SECTOR ONLY

HANDCHECK GRAPH: SLOPE LT -1.0 FOR LOW PERCENTAGES. XSAVE( 3)= 14.963

2.275E-04	1.000	1.000
1.635E-04	3.000	3.000
1.373E-04	5.000	5.000
9.964E-05	10.000	10.000
7.695E-05	15.000	15.000
5.897E-05	20.000	20.000
4.694E-05	25.000	25.000
3.824E-05	30.000	30.000
3.162E-05	35.000	35.000
2.641E-05	40.000	40.000

2.219E-05	45.000	45.000
1.888E-05	50.000	50.000
1.625E-05	55.000	55.000
1.394E-05	60.000	60.000
1.190E-05	65.000	65.000
9.955E-06	70.000	70.000
8.148E-06	75.000	75.000
6.383E-06	80.000	80.000
4.061E-06	85.000	85.000
2.860E-06	90.000	90.000
1.373E-04	5.0	5.00

K= 17      FIVEXQ(K)= 1.373E-04      FIVEPR(K)= 5.000

PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

## LOW POPULATION ZONE CALCULATIONS:

## FIVE PERCENT OVERALL SITE LIMIT

BUILDING WAKE CREDIT ALLOWED: C= 0.5 A= 5851. D= 59.4

CORRECTION FACTORS USED IN THE ANNUAL AVERAGE CALCULATIONS.

BELOW ARE PRINTED THE ORDERED VALUES OF CHI/Q AND THE FREQUENCY WITH WHICH THAT VALUE IS REACHED OR EXCEEDED.

THE TOP NUMBER IS THE CHI/Q. THE MIDDLE NUMBER IS THE FREQUENCY NORMALIZED TO THIS SECTOR.

THE THIRD NUMBER IS THE FREQUENCY WITH RESPECT TO ALL TIME.

6.080E-04	2.062E-04	8.686E-05	5.523E-05	5.347E-05	3.599E-05	3.314E-05	2.946E-05	2.239E-05	2.159E-05
0.002	0.005	7.422	8.217	15.758	17.851	18.042	28.276	28.318	28.356
0.00235	0.00470	7.42169	8.21654	15.75816	17.85110	18.04158	28.27580	28.31813	28.35576
1.957E-05	1.889E-05	1.726E-05	1.459E-05	1.214E-05	1.125E-05	1.066E-05	8.204E-06	8.015E-06	6.708E-06
40.991	47.693	47.695	47.731	50.785	50.807	66.908	67.472	67.936	79.395
40.99098	47.69307	47.69542	47.73069	50.78544	50.80660	66.90810	67.47248	67.93575	79.39516
6.324E-06	4.907E-06	4.533E-06	3.740E-06	3.494E-06	3.053E-06	2.759E-06	2.244E-06	1.525E-06	1.516E-06
79.445	79.447	83.485	85.810	86.269	86.499	86.506	88.378	88.397	89.206
79.44453	79.44688	83.48460	85.81035	86.26891	86.49936	86.50641	88.37831	88.39712	89.20607
1.425E-06	1.169E-06	8.549E-07	5.776E-07	5.556E-07	5.100E-07	4.452E-07	2.593E-07	1.943E-07	1.556E-07
91.024	91.153	92.672	93.178	93.371	93.375	93.425	96.440	96.449	99.137
91.02387	91.15321	92.67237	93.17796	93.37078	93.37548	93.42487	96.43964	96.44905	99.13694
1.051E-07	8.103E-08	3.536E-08							
99.922	99.998	100.000							
99.92239	99.99763	99.99998							

## X/Q PERCENTILES

(BASED ON THE UPPER ENVELOPE OF THE  
ORDERED X/Q-FREQUENCY VALUES, AND AS  
PLOTTED ON A LOG-NORMAL GRAPH.)

PERCENT OF TIME CHI/Q IS EQUALED OR EXCEEDED

CHI/Q WITH RESPECT TO WHEN THE WIND BLOWS  
SEC/CUBIC METER THE TOTAL TIME INTO THIS SECTOR ONLY

K	I	XQSAVE(K,I)	XQINT(K,I)	XQSLOP(K,I)
18	1	-7.40531	-10.42285	-0.74143
18	2	-9.35122	-10.94055	-1.09961
18	3	-10.87710	-10.94384	-1.15654
18	4	-11.44918	-10.92109	-1.20860
18	5	-11.91217	-10.00993	-2.31974
18	6	-12.49637	-11.12567	-1.27881
18	7	-16.32844	NUMXQ(K)= 7	
		1.670E-04	1.000	1.000
		1.200E-04	3.000	3.000

1.007E-04	5.000	5.000
7.256E-05	10.000	10.000
5.540E-05	15.000	15.000
4.471E-05	20.000	20.000
3.720E-05	25.000	25.000
3.154E-05	30.000	30.000
2.706E-05	35.000	35.000
2.341E-05	40.000	40.000
2.034E-05	45.000	45.000
1.767E-05	50.000	50.000
1.528E-05	55.000	55.000
1.319E-05	60.000	60.000
1.132E-05	65.000	65.000
9.594E-06	70.000	70.000
8.001E-06	75.000	75.000
6.383E-06	80.000	80.000
4.061E-06	85.000	85.000
2.860E-06	90.000	90.000

1.007E-04	5.0	5.00
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K= 18      FIVEXQ(K)= 1.007E-04      FIVEPR(K)= 5.000

K	HIGHPR	PR	GRNDVT (K)
1	-2.80284	0.25328	4.78115
2	-1.82403	3.40740	3.94629
3	-2.83693	0.22776	4.77880
4	-2.98817	0.14033	6.07917
5	-3.07069	0.10679	4.92446
6	-3.30029	0.04830	2.69507
7	-3.35981	0.03901	2.31643
8	-3.38720	0.03531	3.13716
9	-3.21127	0.06608	5.18782
10	-3.24114	0.05953	5.70992
11	-3.02571	0.12403	5.03511
12	-2.95995	0.15385	5.87467
13	-2.64411	0.40953	11.10723
14	-2.57624	0.49942	15.91400
15	-2.70897	0.33746	12.44989
16	-2.74061	0.30663	6.06283

K	HOURS (K)	TOTHR
1	22.18715	22.18715
2	298.48830	320.67550
3	19.95136	340.62680
4	12.29319	352.92000
5	9.35460	362.27460
6	4.23087	366.50550
7	3.41686	369.92240
8	3.09314	373.01550
9	5.78893	378.80440
10	5.21510	384.01950
11	10.86514	394.88470
12	13.47739	408.36210
13	35.87497	444.23700
14	43.74879	487.98580
15	29.56181	517.54760
16	26.86080	544.40840

K	FIVEXQ	SVANN	SLTIME	TIMINT	I	TIME	XQT
1	9.337E-05	7.728E-07	-0.5718	-8.8826	1	8.0	-10.07156
					2	16.0	-10.46789
					3	72.0	-11.32788
					4	624.0	-12.56261
2	8.553E-05	7.031E-07	-0.5726	-8.9697	1	8.0	-10.16037
					2	16.0	-10.55725
					3	72.0	-11.41846
					4	624.0	-12.65495
3	9.034E-05	8.241E-07	-0.5602	-8.9237	1	8.0	-10.08852
					2	16.0	-10.47680
					3	72.0	-11.31932
					4	624.0	-12.52898
4	7.108E-05	8.075E-07	-0.5340	-9.1815	1	8.0	-10.29196
					2	16.0	-10.66211
					3	72.0	-11.46530
					4	624.0	-12.61849
5	5.985E-05	6.028E-07	-0.5484	-9.3436	1	8.0	-10.48390
					2	16.0	-10.86399
					3	72.0	-11.68875
					4	624.0	-12.87290
6	4.182E-05	3.751E-07	-0.5622	-9.6924	1	8.0	-10.86145
					2	16.0	-11.25113
					3	72.0	-12.09671
					4	624.0	-13.31076
7	3.713E-05	3.167E-07	-0.5682	-9.8071	1	8.0	-10.98864
					2	16.0	-11.38248
					3	72.0	-12.23707
					4	624.0	-13.46406
8	3.783E-05	3.676E-07	-0.5526	-9.7995	1	8.0	-10.94863
					2	16.0	-11.33168
					3	72.0	-12.16287
					4	624.0	-13.35624
9	4.930E-05	5.486E-07	-0.5365	-9.5458	1	8.0	-10.66130
					2	16.0	-11.03315
					3	72.0	-11.84003
					4	624.0	-12.99852
10	5.236E-05	6.395E-07	-0.5254	-9.4932	1	8.0	-10.58568
					2	16.0	-10.94984
					3	72.0	-11.74004
					4	624.0	-12.87457
11	6.981E-05	7.566E-07	-0.5396	-9.1957	1	8.0	-10.31777
					2	16.0	-10.69180
					3	72.0	-11.50344
					4	624.0	-12.66874
12	7.772E-05	8.802E-07	-0.5344	-9.0920	1	8.0	-10.20317
					2	16.0	-10.57357

					3	72.0	-11.37731
					4	624.0	-12.53129
13	1.083E-04	1.494E-06	-0.5108	-8.7768			
					1	8.0	-9.83903
					2	16.0	-10.19312
					3	72.0	-10.96146
					4	624.0	-12.06461
14	1.150E-04	1.804E-06	-0.4955	-8.7270			
					1	8.0	-9.75742
					2	16.0	-10.10090
					3	72.0	-10.84622
					4	624.0	-11.91631
15	1.020E-04	1.331E-06	-0.5175	-8.8315			
					1	8.0	-9.90766
					2	16.0	-10.26640
					3	72.0	-11.04482
					4	624.0	-12.16245
16	9.907E-05	8.693E-07	-0.5648	-8.8282			
					1	8.0	-10.00271
					2	16.0	-10.39420
					3	72.0	-11.24370
					4	624.0	-12.46339
17	1.373E-04	1.804E-06	-0.5166	-8.5356			
					1	8.0	-9.60987
					2	16.0	-9.96797
					3	72.0	-10.74499
					4	624.0	-11.86061
18	1.007E-04	1.804E-06	-0.4797	-8.8705			
					1	8.0	-9.86808
					2	16.0	-10.20060
					3	72.0	-10.92214
					4	624.0	-11.95809



PLANT NAME: Limerick

METEOROLOGICAL INSTRUMENTATION

DATA PERIOD:

WIND SENSORS HEIGHT: 9.14 meters

TYPE OF RELEASE: Ground Release

DELTA-T HEIGHTS: 52.3-7.9 meters

SOURCE OF DATA:

COMMENTS: Limerick NtoEL T1 1996-2000 met, 30 ft wind, 171-26 ft Delta T, Building Area 2

PROGRAM: PAVAN, 10/76, 8/79 REVISION, IMPLEMENTATION OF REGULATORY GUIDE 1.145

DOWNWIND DISTANCE SECTOR (METERS)		RELATIVE CONCENTRATION (X/Q) VALUES (SEC/CUBIC METER) VERSUS AVERAGING TIME						HOURS PER YEAR MAX 0-2 HR X/Q IS EXCEEDED		DOWNWIND SECTOR
		0-2 HOURS	0-8 HOURS	8-24 HOURS	1-4 DAYS	4-30 DAYS	ANNUAL AVERAGE	IN SECTOR		
S	2043.	9.34E-05	4.23E-05	2.84E-05	1.20E-05	3.50E-06	7.73E-07	22.2		S
SSW	2043.	8.55E-05	3.87E-05	2.60E-05	1.10E-05	3.19E-06	7.03E-07	298.5		SSW
SW	2043.	9.03E-05	4.16E-05	2.82E-05	1.21E-05	3.62E-06	8.24E-07	20.0		SW
WSW	2043.	7.11E-05	3.39E-05	2.34E-05	1.05E-05	3.31E-06	8.07E-07	12.3		WSW
W	2043.	5.98E-05	2.80E-05	1.91E-05	8.39E-06	2.57E-06	6.03E-07	9.4		W
WNW	2043.	4.18E-05	1.92E-05	1.30E-05	5.58E-06	1.66E-06	3.75E-07	4.2		WNW
NW	2043.	3.71E-05	1.69E-05	1.14E-05	4.85E-06	1.42E-06	3.17E-07	3.4		NW
NNW	2043.	3.78E-05	1.76E-05	1.20E-05	5.22E-06	1.58E-06	3.68E-07	3.1		NNW
N	2043.	4.93E-05	2.34E-05	1.62E-05	7.21E-06	2.26E-06	5.49E-07	5.8		N
NNE	2043.	5.24E-05	2.53E-05	1.76E-05	7.97E-06	2.56E-06	6.39E-07	5.2		NNE
NE	2043.	6.98E-05	3.30E-05	2.27E-05	1.01E-05	3.15E-06	7.57E-07	10.9		NE
ENE	2043.	7.77E-05	3.71E-05	2.56E-05	1.15E-05	3.61E-06	8.80E-07	13.5		ENE
E	2043.	1.08E-04	5.33E-05	3.74E-05	1.74E-05	5.76E-06	1.49E-06	35.9		E
ESE	2043.	1.15E-04	5.79E-05	4.10E-05	1.95E-05	6.68E-06	1.80E-06	43.7		ESE
SE	2043.	1.02E-04	4.98E-05	3.48E-05	1.60E-05	5.22E-06	1.33E-06	29.6		SE
SSE	2043.	9.91E-05	4.53E-05	3.06E-05	1.31E-05	3.87E-06	8.69E-07	26.9		SSE
MAX X/Q		1.15E-04				TOTAL HOURS AROUND SITE:		544.4		
SRP 2.3.4	2043.	1.37E-04	6.71E-05	4.69E-05	2.16E-05	7.06E-06	1.80E-06			
SITE LIMIT		1.01E-04	5.18E-05	3.71E-05	1.81E-05	6.41E-06	1.80E-06			

THE FIVE-PERCENT-FOR-THE-ENTIRE-SITE X/Q IS LIMITING.

\*\*\*NOTE\*\*: VALUES ON THIS PAGE ARE APPROXIMATIONS ONLY.  
CHECK THE REASONABLENESS OF THE ENVELOPES  
COMPUTED FOR THE 0-2 HOUR VALUES. FOR ANY  
FAULTY ENVELOPES, ADJUST THE ABOVE VALUES.

PRINTOUT OF INPUT CARDS

1 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000

**Computer Disclosure Sheet**Discipline NuclearClient:: Exelon Corporation  
Project: Limerick Generating StationDate: November 2003  
Job No. 26760-NCS0018.CALCProgram(s) used  
ARCON96Rev No.  
1Rev. Date  
5/1997Calculation No.: LM-0641, Rev. 0  
Status ☐ Prelim.  
☒ Final  
☐ VoidWGI Prequalification ☒ Yes  
☐ No

Run No. 1

Description: ARCON96 X/Q analysis consistent with procedures in Draft Regulatory Guide 1111  
for Control Room habitability assessments.

Analysis Description: ARCON96 calculations of X/Q are performed for vent releases to the Control Room Intake. Centerline X/Q values, sector X/Q values and 95% max X/Q values are computed for 0-2 hours, 2-8 hours and 8-24 hours, 1-4 day, and 4-30 days.

The attached computer output has been reviewed, the input data checked,  
And the results approved for release. Input criteria for this analysis were established.

By:

On:

Run by: T.Thomas

Checked by: J. Robinson

Approved by: J. Robinson

Remarks: WGI Form for Computer Software Control

# Computer Disclosure Sheet

**Discipline Nuclear**

**Client::** Exelon Corporation  
**Project:** Limerick Generating Station

Date: November 2003  
Job No. 26760-NCS0018.CALC

Program(s) used  
PAVAN

Rev No.  
2

Rev. Date  
12/1997

Calculation No.: LM-0641, Rev. 0  
 Status    ☐ Prelim.  
           ☒ Final  
           ☐ Void

WGI Prequalification ☒ Yes  
☐ No

Run No. 1

**Description:** PAVAN X/Q analysis of Regulatory Guide 1.145 accidental release.

**Analysis Description:** PAVAN calculations of X/Q are performed for the EAB and outer LPZ distances. Maximum 0-2 hour, 0-8 hour, and 8 – 24 hour, 1-4 day and 4-30 day X/Q values are computed for each direction sector; and the 5th percentile overall site X/Q is also calculated. The higher value is selected.

The attached computer output has been reviewed, the input data checked, And the results approved for release. Input criteria for this analysis were established.

By:

On:

Run by: T.Thomas

Checked by: J. Robinson

Approved by: J. Robinson

Remarks: WGI Form for Computer Software Control