Progress Energy

Serial: NPD-NRC-2008-175
July 29, 2009

10CFR52.79

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

LEVY NUCLEAR POWER PLANT, UNITS 1 AND 2
DOCKET NOS. 52-029 AND 52-030
SUPPLEMENT 1 TO RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 015 RELATED TO HEALTH PHYSICS

References:
1. Letter from Brian C. Anderson (NRC) to Garry Miller (PEF), dated March 3, 2009, "Request for Additional Information Letter No. 015 Related to SRP Section 11.3 for the Levy County Nuclear Plant, Units 1 and 2 Combined License Application"

2. Letter from Garry D. Miller (PEF) to U. S. Nuclear Regulatory Commission, dated April 1, 2009, "Response to Request for Additional Information Letter No. 015 Related to Health Physics", Serial: NPD-NRC-2009-060

Ladies and Gentlemen:

Progress Energy Florida, Inc. (PEF) hereby submits a revised response to the Nuclear Regulatory Commission's (NRC) request for additional information provided in the referenced letter.

A revised response to the NRC request is addressed in the enclosure. The enclosure also identifies changes that will be made in a future revision of the Levy Nuclear Power Plant Units 1 and 2 application.

If you have any further questions, or need additional information, please contact Bob Kitchen at (919) 546-6992, or me at (919) 546-6107.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on July 29, 2009.

Sincerely,

Garry D. Miller
General Manager
Nuclear Plant Development

Enclosure/Attachment

cc : U.S. NRC Region II, Regional Administrator
Mr. Brian C. Anderson, U.S. NRC Project Manager

Progress Energy Carolinas, Inc.
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NRO

Levy Nuclear Power Plant Units 1 and 2
Supplement 1 to Response to NRC Request for Additional Information Letter No. 015 Related to SRP Section 11.3 for the Combined License Application, dated March 3, 2009

NRC RAI #	Progress Energy RAI #	Progress Energy Response
11.03-1	L-0519	Revised response enclosed – see following pages

Attachment	Associated NRC RAI #	Pages Included
Annotated FSAR Table 11.3-201 and sector average X/Q values	L-0519	5

NRC Letter No.: LEVY-RAI-LTR-015

NRC Letter Date: March 3, 2009

NRC Review of Final Safety Analysis Report

NRC RAI #: 11.03-1

Text of NRC RAI:

Please provide detailed information to enable the staff to validate and verify the estimated doses in FSAR section 11.3.3.4 with respect to the dose objectives of Appendix I to 10 CFR Part 50 and the dose limits in 10 CFR 20.1301(e); please revise the FSAR to include this information, or justify its exclusion. The information should include the following:

- a complete description of how the applicant derived all the values listed in Table 11.3-201, including all assumptions made
- citations to any reference material used (for documents not publicly available please provide a copy for staff's use)
- detailed breakdown of individual doses by pathway and organ
- detailed breakdown of population doses by pathway and organ

PGN RAI ID #: L-0519

PGN Response to NRC RAI:

This revised response is provided to update the calculated doses based on the accumulation of two years of meteorological data for the Levy site.

Regulatory Guide 1.206, Revision 0, and Standard Review Plan 11.3, Revision 3, require the parameters used to determine estimated doses from the gaseous effluent system to be provided in the FSAR, but neither requires the FSAR to provide a detailed basis for each parameter. In lieu of providing this detail in the FSAR, the requested material is provided in Attachment 1 which includes Annotated Table 11.3-201 and sector average X/Q tables. These tables are not part of the FSAR and not included in the revision to the COLA.

FSAR Table 11.3-201 is revised as shown below to provide additional GASPAR II input parameters.

FSAR Table 11.3-206 is revised to include the individual dose rates due to gaseous releases by pathway and organ and new FSAR Table 11.3-208 is added to provide the annual population doses by pathway and organ.

Associated LNP COL Application Revisions:

The following changes will be made to the LNP FSAR in a future revision:

1. Revise the third sentence in the last paragraph of FSAR Section 11.3.3.4.1 from:

   Table 11.3-206 contains total organ dose rates based on age group.

   To read:

   Table 11.3-206 provides individual dose rates by pathway and organ.

2. Add the following sentence to the beginning FSAR Section 11.3.3.4.2:

   Table 11.3-208 presents a listing of the estimated annual population doses by pathway and organ.

3. Revise FSAR Table 11.3-201 as shown below.
4. Replace FSAR Table11.3-206 with the revised table shown below.
5. Add new FSAR Table 11.3-208 as shown below.

Table 11.3-201
GASPAR II Input for Dose Rates

	Input Parameter	Value
LNP COL 11.3-1	Number of Source Terms	1
LNP COL 11.5-3	Distance from site to NE Corner of the United States (mi.)	1680
	Source Term	DCD Table 11.3-3
	Population Data	Table 11.3-202
	Fraction of the year leafy vegetables are grown	0.92
	Fraction of the year milk cows are on pasture	0.92[(a)]
	Fraction of max individual's vegetable intake from own garden	1.0
	Humidity over growing season (g/m^3)	8.0
	Average temperature, T, over growing season	0[(b)]
	Fraction of the year goats are on pasture	1.0
	Fraction of goat feed intake from pasture while on pasture	1.0
	Fraction of the year beef cattle are on pasture	0.92
	Fraction of beef-cattle feed intake from pasture while on pasture	1.0
	Total Production Rate for the 50-mile area	
	-Vegetables (kg/yr)	Table 11.3-203
	-Milk (L/yr)	Table 11.3-204
	-Meat (kg/yr)	Table 11.3-205
	Meteorological data	Sector average X/Q
	Special Location Data	Section 2.3.5

a) There are no milk cows identified within 5 mi. of LNP.
b) With humidity specified in units of g/m^3 temperature is not needed. GASPAR default value = 0.

LNP COL 11.5-3

Table 11.3-206

Individual Dose Rates

Dose (mrem/yr)[a]										
Pathway		**Total Body**	**GI-Tract**	**Bone**	**Liver**	**Kidney**	**Thyroid**	**Lung**	**Skin**	**Location**
Plume		9.85E-01	9.85E-01	9.85E-01	9.85E-01	9.85E-01	9.85E-01	1.08	6.32	EAB[b]
Ground		1.14E-01	1.14E-01	1.14E-01	1.14E-01	1.14E-01	1.14E-01	1.14E-01	1.33E-01	EAB
Cow Milk	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No Milk Cow in 5 mi
	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Goat Milk	ADULT	2.53E-02	2.36E-02	7.70E-02	2.60E-02	2.48E-02	1.55E-01	2.37E-02	2.34E-02	Nearest Goat Milk[c]
	TEEN	4.04E-02	3.88E-02	1.41E-01	4.30E-02	4.10E-02	2.46E-01	3.90E-02	3.85E-02	
	CHILD	8.67E-02	8.50E-02	3.47E-01	9.24E-02	8.89E-02	4.97E-01	8.55E-02	8.48E-02	
	INFANT	1.70E-01	1.67E-01	6.73E-01	1.82E-01	1.74E-01	1.17E+00	1.68E-01	1.67E-01	
Vegetables	ADULT	5.30E-01	5.32E-01	2.08E+00	5.30E-01	5.26E-01	1.43E+00	5.19E-01	5.18E-01	Nearest Garden[d]
	TEEN	8.04E-01	8.06E-01	3.40E+00	8.10E-01	8.03E-01	1.98E+00	7.93E-01	7.91E-01	
	CHILD	1.80E+00	1.80E+00	8.16E+00	1.82E+00	1.80E+00	4.05E+00	1.79E+00	1.78E+00	
Inhalation	ADULT	5.98E-02	6.05E-02	8.63E-03	6.11E-02	6.20E-02	5.21E-01	7.64E-02	5.82E-02	Nearest Residence[e]
	TEEN	6.05E-02	6.10E-02	1.04E-02	6.26E-02	6.39E-02	6.49E-01	8.61E-02	5.87E-02	
	CHILD	5.36E-02	5.29E-02	1.27E-02	5.57E-02	5.68E-02	7.53E-01	7.46E-02	5.18E-02	
	INFANT	3.09E-02	3.02E-02	6.37E-03	3.32E-02	3.30E-02	6.73E-01	4.57E-02	2.98E-02	
Meat	ADULT	1.28E-02	1.36E-02	5.64E-02	1.28E-02	1.28E-02	1.80E-02	1.27E-02	1.27E-02	Nearest Meat Cow[f]
	TEEN	1.04E-02	1.09E-02	4.76E-02	1.05E-02	1.04E-02	1.42E-02	1.04E-02	1.04E-02	
	CHILD	1.89E-02	1.91E-02	8.74E-02	1.90E-02	1.89E-02	2.46E-02	1.89E-02	1.89E-02	
Total w/o plume	ADULT	7.42E-01	7.44E-01	2.34E+00	7.44E-01	7.40E-01	2.24E+00	7.46E-01	7.45E-01	
	TEEN	1.03E+00	1.03E+00	3.71E+00	1.04E+00	1.03E+00	3.00E+00	1.04E+00	1.03E+00	
	CHILD	2.07E+00	2.07E+00	8.72E+00	2.10E+00	2.08E+00	5.44E+00	2.08E+00	2.07E+00	
	INFANT	3.15E-01	3.11E-01	7.93E-01	3.29E-01	3.21E-01	1.96E+00	3.28E-01	3.30E-01	
	Max	2.07E+00	2.07E+00	8.72E+00	2.10E+00	2.08E+00	5.44E+00	2.08E+00	2.07E+00	
Total with plume	ADULT	1.73E+00	1.73E+00	3.32E+00	1.73E+00	1.72E+00	3.22E+00	1.83E+00	7.07E+00	
	TEEN	2.01E+00	2.02E+00	4.70E+00	2.03E+00	2.02E+00	3.99E+00	2.12E+00	7.35E+00	
	CHILD	3.06E+00	3.06E+00	9.71E+00	3.09E+00	3.06E+00	6.42E+00	3.16E+00	8.39E+00	
	INFANT	1.30E+00	1.30E+00	1.78E+00	1.31E+00	1.31E+00	2.94E+00	1.41E+00	6.65E+00	
	Max	3.06E+00	3.06E+00	9.71E+00	3.09E+00	3.06E+00	6.42E+00	3.16E+00	8.39E+00	

a) 10 CFR 50 Appendix I: Total Body Dose Limit = 5 mrem/yr, Skin Dose = 15 mrem/yr and Dose to Any Organ = 15 mrem/yr

b) EAB	0.83 mi WSW
c) Nearest Goat Milk	2.4 mi NNW
d)Nearest Garden	1.7 mi WSW
e)Nearest Residence	1.7 mi WSW
f) Nearest Meat Cow	2.8 mi SSW

LNP COL 11.5-3

Table 11.3-208

Population Doses from Gaseous Effluents

	Dose (person-rem/year)							
Pathway	Total Body	GI-Tract	Bone	Liver	Kidney	Thyroid	Lung	Skin
Plume	1.02E+00	1.02E+00	1.02E+00	1.02E+00	1.02E+00	1.02E+00	1.22E+00	1.24E+01
Ground	9.87E-02	9.87E-02	9.87E-02	9.87E-02	9.87E-02	9.87E-02	9.87E-02	1.16E-01
Inhalation	3.69E-01	3.71E-01	6.01E-02	3.75E-01	3.76E-01	2.58E+00	4.95E-01	3.60E-01
Vegetable Ingestion	3.10E+00	3.09E+00	1.28E+01	3.10E+00	3.08E+00	3.11E+00	3.07E+00	3.07E+00
Cow Milk Ingestion	2.77E-01	2.75E-01	1.16E+00	2.78E-01	2.77E-01	5.41E-01	2.75E-01	2.75E-01
Meat Ingestion	8.78E-01	8.91E-01	3.95E+00	8.78E-01	8.77E-01	9.79E-01	8.75E-01	8.75E-01
Total	5.74E+00	5.75E+00	1.91E+01	5.75E+00	5.73E+00	8.33E+00	6.04E+00	1.71E+01

Attachments/Enclosures:

Attachment 1 Annotated FSAR Table 11.3-201 and sector average X/Q values.

Attachment 1

Annotated Table 11.3-201 and Section Average X/Q Tables

Annotated Table 11.3-201
GASPAR II Input for Dose Rates

Input Parameter	Value	Basis
Number of Source Terms	1	One set of values used per DCD Table 11.3-3
Distance from site to NE Corner of the United States (mi.)	1680	Approximate value in miles Note 1
Source Term	DCD Table 11.3-3	AP1000 DCD
Population Data (2020)	Table 11.3-202	Note 2
Fraction of the year leafy vegetables are grown	0.92	Per Reference 1, page 2.10: 11 months or 0.92 per yr
Fraction of the year milk cows are on pasture	0.92	Per Reference 1, page 2.10: 11 months or 0.92 per yr
Fraction of max individual's vegetable intake from own garden	1.0	Conservative assumption
Humidity over growing season (g/m^3)	8.0	Per Reference 1, page 2.8 in g/m^3 (Absolute Humidity)
Average temperature, T, over growing season	0	Humidity specified in units of g/m^3. Temperature not needed.
Fraction of the year goats are on pasture	1.0	Per Ref. 1, page 2.8: Add 1 month to value for cows or 11 + 1 = 12 months or 1.0 per yr.
Fraction of goat feed intake from pasture while on pasture	1.0	Conservative assumption
Fraction of the year beef cattle are on pasture	0.92	Same as Cow above
Fraction of beef-cattle feed intake from pasture while on pasture	1.0	Conservative assumption
Total Production Rate for the 50-mile area		
-Vegetables (kg/yr)	Table 11.3-203	Note 3
-Milk (L/yr)	Table 11.3-204	Note 3
-Meat (kg/yr)	Table 11.3-205	Note 3
Meteorological data	Sector average	Note 4 and attached sector average X/Q tabulation.
Special Location Data	Section 2.3.5	Note 5

Reference 1: NUREG/CR-4635, GASPAR II Technical Reference and User Guide, March 1987

Notes:

1 Approximate distance in miles from site to NE Corner of the USA. This parameter is used by GASPAR to calculate the NEPA population doses and does not affect the doses calculated to demonstrate compliance with Appendix I of 10 CFR Part 50 or 10 CFR Part 20.

2 Population data provided in Table 11.3-202 is Census data projected out to five years from the time of the licensing action is anticipated in accordance with guidance in NUREG-1555. Projections were estimated using Florida population growth rates. The population used for this calculation is for year 2020 to conservatively bound the 5-year criteria. The population distribution for each of the 221/2-degree radial sectors centered on the 16 cardinal compass directions for radial distances of 1, 2, 3, 4, 5, 10, 20, 30, 40, and 50 miles were calculated assuming uniform distribution within the radial sectors.

3 Agricultural Statistics were calculated from County level statistics in the same format as population data. If a County was bisected by a sector, thus parts of the same County fell in 2 or more sectors, agricultural production statistics were proportioned by percent of the County area. Since agricultural data was only available at the County level, production was assumed to be fairly uniform across the County area. Sources of Information utilized include United States Department of Agriculture, Florida Department of Agriculture and Consumer Services and ArcGIS (Geographical Information System).

4. GASPAR II requires inputs for the 16 compass sectors to be Sector Averages at the downwind distances. NUREG/CR-2919 "XOQDOQ Computer Program for the Meteorological Evaluation of Routine Effluent Releases at Nuclear Power Stations" describes the method for computing sector averages given the dispersion factors at various annual distances. Tabulation of sector averages meteorological values is attached.

5. FSAR Section 2.3.5 provides values and describes the bases for determining long term X/Q and relative deposition (D/Q) factors using the XOQ/DOQ computer code for various site locations.

Average Annual X/Q Sector Averages

	1.0	2.0	3.0	4.0	5.0	10.0	20.0	30.0	40.0	50.0
N	2.20E-06	7.84E-07	3.89E-07	2.48E-07	1.77E-07	9.24E-08	3.79E-08	1.97E-08	1.29E-08	9.46E-09
NNE	9.90E-07	3.52E-07	1.64E-07	1.00E-07	6.99E-08	3.47E-08	1.32E-08	6.50E-09	4.12E-09	2.94E-09
NE	2.16E-06	7.59E-07	3.75E-07	2.38E-07	1.71E-07	8.87E-08	3.64E-08	1.89E-08	1.24E-08	9.08E-09
ENE	1.77E-06	6.13E-07	2.90E-07	1.79E-07	1.26E-07	6.36E-08	2.50E-08	1.26E-08	8.13E-09	5.88E-09
E	2.53E-06	9.03E-07	4.39E-07	2.76E-07	1.96E-07	1.01E-07	4.05E-08	2.08E-08	1.35E-08	9.86E-09
ESE	3.99E-06	1.43E-06	7.15E-07	4.58E-07	3.29E-07	1.73E-07	7.15E-08	3.74E-08	2.46E-08	1.81E-08
SE	7.72E-06	2.72E-06	1.41E-06	9.14E-07	6.65E-07	3.55E-07	1.51E-07	8.04E-08	5.35E-08	3.96E-08
SSE	4.32E-06	1.53E-06	7.83E-07	5.07E-07	3.68E-07	1.96E-07	8.27E-08	4.39E-08	2.92E-08	2.16E-08
S	7.29E-06	2.56E-06	1.31E-06	8.50E-07	6.16E-07	3.28E-07	1.38E-07	7.35E-08	4.88E-08	3.60E-08
SSW	5.26E-06	1.88E-06	9.29E-07	5.90E-07	4.21E-07	2.19E-07	8.91E-08	4.61E-08	3.01E-08	2.20E-08
SW	1.09E-05	3.89E-06	1.96E-06	1.26E-06	9.07E-07	4.77E-07	1.98E-07	1.04E-07	6.86E-08	5.04E-08
WSW	2.55E-05	9.07E-06	4.67E-06	3.03E-06	2.20E-06	1.17E-06	4.96E-07	2.64E-07	1.75E-07	1.29E-07
W	2.16E-05	7.64E-06	3.95E-06	2.57E-06	1.87E-06	9.98E-07	4.24E-07	2.26E-07	1.50E-07	1.11E-07
WNW	9.17E-06	3.25E-06	1.67E-06	1.08E-06	7.86E-07	4.18E-07	1.77E-07	9.41E-08	6.25E-08	4.62E-08
NW	2.90E-06	1.04E-06	5.12E-07	3.24E-07	2.31E-07	1.20E-07	4.85E-08	2.50E-08	1.63E-08	1.19E-08
NNW	3.14E-06	1.12E-06	5.65E-07	3.63E-07	2.61E-07	1.37E-07	5.70E-08	2.99E-08	1.97E-08	1.45E-08

2.26 Day Decay X/Q Sector Averages

	1.0	2.0	3.0	4.0	5.0	10.0	20.0	30.0	40.0	50.0
N	2.17E-06	7.60E-07	3.69E-07	2.30E-07	1.61E-07	7.87E-08	2.75E-08	1.15E-08	6.12E-09	3.68E-09
NNE	9.80E-07	3.44E-07	1.58E-07	9.50E-08	6.51E-08	3.09E-08	1.06E-08	4.47E-09	2.47E-09	1.56E-09
NE	2.13E-06	7.36E-07	3.56E-07	2.21E-07	1.55E-07	7.56E-08	2.64E-08	1.10E-08	5.88E-09	3.54E-09
ENE	1.75E-06	6.00E-07	2.78E-07	1.69E-07	1.17E-07	5.62E-08	1.96E-08	8.39E-09	4.66E-09	2.95E-09
E	2.50E-06	8.78E-07	4.17E-07	2.57E-07	1.79E-07	8.66E-08	3.01E-08	1.26E-08	6.79E-09	4.15E-09
ESE	3.92E-06	1.38E-06	6.75E-07	4.22E-07	2.96E-07	1.45E-07	5.05E-08	2.08E-08	1.09E-08	6.44E-09
SE	7.58E-06	2.62E-06	1.32E-06	8.37E-07	5.93E-07	2.95E-07	1.04E-07	4.31E-08	2.24E-08	1.31E-08
SSE	4.25E-06	1.47E-06	7.37E-07	4.66E-07	3.30E-07	1.64E-07	5.81E-08	2.43E-08	1.28E-08	7.59E-09
S	7.17E-06	2.47E-06	1.24E-06	7.81E-07	5.53E-07	2.74E-07	9.70E-08	4.04E-08	2.12E-08	1.25E-08
SSW	5.19E-06	1.83E-06	8.83E-07	5.48E-07	3.83E-07	1.87E-07	6.53E-08	2.74E-08	1.47E-08	8.88E-09
SW	1.08E-05	3.77E-06	1.85E-06	1.16E-06	8.18E-07	4.02E-07	1.41E-07	5.89E-08	3.11E-08	1.85E-08
WSW	2.51E-05	8.76E-06	4.39E-06	2.78E-06	1.97E-06	9.80E-07	3.48E-07	1.45E-07	7.62E-08	4.50E-08
W	2.12E-05	7.38E-06	3.71E-06	2.36E-06	1.67E-06	8.32E-07	2.96E-07	1.23E-07	6.48E-08	3.82E-08
WNW	9.02E-06	3.13E-06	1.57E-06	9.93E-07	7.03E-07	3.49E-07	1.24E-07	5.14E-08	2.69E-08	1.58E-08
NW	2.86E-06	1.01E-06	4.85E-07	3.00E-07	2.10E-07	1.02E-07	3.54E-08	1.47E-08	7.83E-09	4.71E-09
NNW	3.09E-06	1.08E-06	5.33E-07	3.34E-07	2.35E-07	1.15E-07	4.03E-08	1.67E-08	8.75E-09	5.16E-09

X/Q Depleted and 8 Day Decay Sector Averages

	1.0	2.0	3.0	4.0	5.0	10.0	20.0	30.0	40.0	50.0
N	1.97E-06	6.63E-07	3.11E-07	1.89E-07	1.31E-07	6.27E-08	2.17E-08	9.35E-09	5.23E-09	3.31E-09
NNE	8.86E-07	2.99E-07	1.32E-07	7.72E-08	5.18E-08	2.39E-08	7.80E-09	3.23E-09	1.78E-09	1.12E-09
NE	1.93E-06	6.42E-07	3.00E-07	1.82E-07	1.25E-07	6.02E-08	2.08E-08	8.97E-09	5.02E-09	3.18E-09
ENE	1.58E-06	5.20E-07	2.33E-07	1.38E-07	9.33E-08	4.36E-08	1.46E-08	6.20E-09	3.46E-09	2.20E-09
E	2.27E-06	7.64E-07	3.51E-07	2.11E-07	1.44E-07	6.85E-08	2.34E-08	9.97E-09	5.56E-09	3.52E-09
ESE	3.57E-06	1.20E-06	5.71E-07	3.49E-07	2.42E-07	1.17E-07	4.07E-08	1.75E-08	9.81E-09	6.21E-09
SE	6.90E-06	2.30E-06	1.12E-06	6.96E-07	4.87E-07	2.39E-07	8.53E-08	3.73E-08	2.10E-08	1.34E-08
SSE	3.86E-06	1.29E-06	6.24E-07	3.87E-07	2.70E-07	1.32E-07	4.70E-08	2.06E-08	1.16E-08	7.38E-09
S	6.52E-06	2.16E-06	1.05E-06	6.48E-07	4.52E-07	2.21E-07	7.85E-08	3.43E-08	1.93E-08	1.23E-08
SSW	4.71E-06	1.59E-06	7.44E-07	4.51E-07	3.10E-07	1.48E-07	5.12E-08	2.20E-08	1.23E-08	7.78E-09
SW	9.77E-06	3.29E-06	1.57E-06	9.61E-07	6.66E-07	3.22E-07	1.13E-07	4.89E-08	2.74E-08	1.74E-08
WSW	2.28E-05	7.66E-06	3.72E-06	2.31E-06	1.61E-06	7.91E-07	2.82E-07	1.23E-07	6.94E-08	4.42E-08
W	1.93E-05	6.45E-06	3.15E-06	1.96E-06	1.37E-06	6.73E-07	2.40E-07	1.05E-07	5.94E-08	3.78E-08
WNW	8.20E-06	2.74E-06	1.33E-06	8.25E-07	5.76E-07	2.82E-07	1.00E-07	4.39E-08	2.47E-08	1.57E-08
NW	2.59E-06	8.80E-07	4.09E-07	2.48E-07	1.70E-07	8.11E-08	2.79E-08	1.19E-08	6.62E-09	4.18E-09
NNW	2.80E-06	9.47E-07	4.51E-07	2.77E-07	1.92E-07	9.27E-08	3.25E-08	1.40E-08	7.85E-09	4.98E-09

D/Q Sector Averages

	1.0	2.0	3.0	4.0	5.0	10.0	20.0	30.0	40.0	50.0
N	2.93E-09	8.89E-10	3.54E-10	1.93E-10	1.23E-10	5.27E-11	1.64E-11	6.48E-12	3.46E-12	2.14E-12
NNE	2.67E-09	8.10E-10	3.22E-10	1.76E-10	1.12E-10	4.81E-11	1.49E-11	5.91E-12	3.16E-12	1.95E-12
NE	4.05E-09	1.23E-09	4.89E-10	2.67E-10	1.70E-10	7.29E-11	2.26E-11	8.96E-12	4.78E-12	2.96E-12
ENE	6.61E-09	2.00E-09	7.98E-10	4.36E-10	2.77E-10	1.19E-10	3.69E-11	1.46E-11	7.81E-12	4.83E-12
E	6.42E-09	1.95E-09	7.75E-10	4.24E-10	2.69E-10	1.16E-10	3.59E-11	1.42E-11	7.59E-12	4.70E-12
ESE	3.29E-09	9.97E-10	3.97E-10	2.17E-10	1.38E-10	5.92E-11	1.84E-11	7.27E-12	3.89E-12	2.40E-12
SE	4.41E-09	1.34E-09	5.32E-10	2.91E-10	1.85E-10	7.94E-11	2.46E-11	9.76E-12	5.21E-12	3.22E-12
SSE	3.73E-09	1.13E-09	4.50E-10	2.46E-10	1.56E-10	6.72E-11	2.08E-11	8.25E-12	4.41E-12	2.73E-12
S	6.17E-09	1.87E-09	7.45E-10	4.07E-10	2.59E-10	1.11E-10	3.45E-11	1.37E-11	7.29E-12	4.51E-12
SSW	7.56E-09	2.29E-09	9.12E-10	4.98E-10	3.17E-10	1.36E-10	4.22E-11	1.67E-11	8.93E-12	5.53E-12
SW	1.17E-08	3.56E-09	1.42E-09	7.74E-10	4.92E-10	2.11E-10	6.56E-11	2.60E-11	1.39E-11	8.59E-12
WSW	1.81E-08	5.48E-09	2.18E-09	1.19E-09	7.57E-10	3.25E-10	1.01E-10	4.00E-11	2.14E-11	1.32E-11
W	1.64E-08	4.97E-09	1.98E-09	1.08E-09	6.87E-10	2.95E-10	9.15E-11	3.63E-11	1.94E-11	1.20E-11
WNW	6.67E-09	2.02E-09	8.06E-10	4.40E-10	2.80E-10	1.20E-10	3.73E-11	1.48E-11	7.89E-12	4.88E-12
NW	3.08E-09	9.34E-10	3.72E-10	2.03E-10	1.29E-10	5.55E-11	1.72E-11	6.81E-12	3.64E-12	2.25E-12
NNW	2.62E-09	7.94E-10	3.16E-10	1.73E-10	1.10E-10	4.71E-11	1.46E-11	5.79E-12	3.09E-12	1.91E-12