Mark D. Mitchell
Vice President - Generation Construction
Dominion Generation

An operating segment of
Dominion Resources, Inc.
5000 Dominion Boulevard, Glen Allen, VA 23060

dom.com

October 17, 2014

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

Serial No. NA3-14-039R
Docket No. 52-017
COL/BCB

DOMINION VIRGINIA POWER
NORTH ANNA UNIT 3 COMBINED LICENSE APPLICATION
SRP 02.03.05: RESPONSE TO RAI LETTER 133

On September 9, 2014, the NRC requested additional information to support the review of certain portions of the North Anna Unit 3 Combined License Application (COLA), which consisted of one question. The response to the following Request for Additional Information (RAI) Question is provided in Enclosure 1:

- RAI 7660, Question 02.03.05-5 Modeling of Radwaste Building Vent Stack Releases

As a result of the changes described in the response to this RAI, the XOQ/DOQ and GASPAR II computer code data files were updated. The updated computer code data files are provided on compact discs (CD) in Enclosures 2 and 3. The computer code files are submitted in the native formats required by the software in which they may be used to support the staff's analysis. Therefore, the files on the enclosed CDs are not considered documents as defined in Section 2 of the NRC's "Guidance for Electronic Submissions to the NRC," Revision 6.1, dated May 27, 2011.

This information will be incorporated into a future submission of the NA3 COLA, as described in Enclosure 1.

Please contact Regina Borsh at (804) 273-2247 (regina.borsh@dom.com) if you have questions.

Very truly yours,

Mark D Mitchell

Mark D. Mitchell

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NRO

Enclosures:

1. Response to NRC RAI Letter No. 133, RAI 7660, Question 02.03.05-5
2. CD-ROM Containing XOQDOQ Code Input and Output Files
3. CD-ROM Containing GASPAR II Code Input and Output Files

Commitments made by this letter:

This information will be incorporated into a future submission of the NA3 COLA, as described in Enclosure 1.

COMMONWEALTH OF VIRGINIA

COUNTY OF HENRICO

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Mark D. Mitchell, who is Vice President–Generation Construction of Virginia Electric and Power Company (Dominion Virginia Power). He has affirmed before me that he is duly authorized to execute and file the foregoing document on behalf of the Company, and that the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 17 day of OCTOBER, 2014
My registration number is 253183 and my
Commission expires: SEPTEMBER 30, 2016

Kathy W Prokopiw
Notary Public

KATHY W. PROKOPIW NOTARY PUBLIC MY COMMISSION NUMBER 253183 COMMONWEALTH OF VIRGINIA

cc with all Enclosures:

C. P. Patel, NRC

cc without Enclosures 2 and 3:

U. S. Nuclear Regulatory Commission, Region II
T. S. Dozier, NRC
G. J. Kolcum, NRC
D. Paylor, VDEQ
W. T. Lough, SCC
P. W. Smith, DTE
M. K. Brandon, DTE
R. J. Bell, NEI

ENCLOSURE 1

Response to NRC RAI Letter No. 133

RAI 7660, Question 02.03.05-5

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

North Anna Unit 3

Dominion

Docket No. 52-017

RAI NO.: 7660 (RAI LETTER NO. 133)

SRP SECTION: 02.03.05 – LONG-TERM ATMOSPHERIC DISPERSION ESTIMATES FOR ROUTINE RELEASES

DATE OF RAI ISSUE: 9/09/2014

QUESTION NO.: 02.03.05-5

The annual average atmospheric dispersion and deposition factors are used in the calculation of offsite concentrations and dose consequences of postulated routine airborne radioactive releases to demonstrate compliance with 10 CFR Part 20 and Appendix I to 10 CFR Part 50. Regulatory Guide 1.111, Revision 1, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors," presents criteria for characterizing atmospheric dispersion and deposition conditions for evaluating the consequences of routine releases. Regulatory Guide 1.111 provides source configuration criteria for determining when effluent release points can be considered elevated releases, ground-level releases, or part-time elevated/part-time ground-level (i.e., mixed-mode) releases.

The ESBWR DCD, Revision 10, provides a set of long-term χ/Q and D/Q values for each of the three stacks (Radwaste Building stack, Reactor Building/Fuel Building stack and Turbine Building Stack). For the ESBWR analysis, both ground-level and mixed-mode releases were considered. As stated in Subsection 2.3.5.3 of the Final Safety Evaluation Report for the ESBWR standard design (ML110030027), a ground-level release was considered for releases from the Radwaste Building, while mixed-mode releases were considered for releases from the Reactor Building/Fuel Building stack and the Turbine Building stack based on the criteria set forth in RG 1.111.

Similarly, Subsection 2.3.5.1 of the Fermi 3 FSAR (ML14055A083), which also references the ESBWR standard design, states that a ground-level release was considered for releases from the Radwaste Building and mixed-mode releases were considered for releases from the Reactor Building/Fuel Building stack and the Turbine Building stack.

North Anna 3 COL FSAR Section 2.3.5, "Long-Term (Routine) Diffusion Estimates," describes the input data and assumptions that are used in the XOQDOQ model for routine releases. The North Anna 3 FSAR states that the vent stacks on the Reactor Building/Fuel Building, Turbine Building, and Radwaste Building are all modeled as mixed-mode releases. The North Anna COL FSAR also states that the Radwaste Building stack is close enough to the Turbine Building that the stack will experience building downwash effects from the Turbine Building. According to Tier 2, Table 2B-1 of the ESBWR DCD, the Radwaste Building stack height is 18.15 meters above grade whereas the Turbine Building height is 52.0 meters above grade.

RG 1.111 states that for effluents released from points less than the height of adjacent solid structures, ground-level release should be assumed. Ground-level releases under these circumstances account for the initial mixing of the effluent plume within the building wake.

Considering the source configuration criteria set forth in RG 1.111 and the modeling methodology used in the ESBWR DCD, please either update the FSAR to include a justification for modeling the Radwaste building vent stack as a mixed-mode release or update the FSAR to implement the ground-level source configuration guidance provided in RG 1.111 for Radwaste building vent stack releases.

Dominion Response

After further consideration of the source configuration criteria set forth in RG 1.111, Dominion will change the type of release assumed for modeling routine releases from the Radwaste Building ventilation stack from mixed-mode to a ground-level release. Estimates of long-term atmospheric dispersion from routine releases will be updated, and associated dose calculations, which use the estimated χ/Q and D/Q from the Radwaste Building vent stack as inputs, will be revised to implement the updated values. The COLA will be revised to reflect updated values for long-term χ/Q and D/Q from the Radwaste Building vent stack releases, along with the associated doses. The resulting doses remain within the appropriate acceptance criteria. Affected COLA sections and tables are summarized below.

Proposed COLA Revision

FSAR Sections 2.3.5.1, 11.3.1, 12.2.2.2.2, and 12.2.2.4.4 and FSAR Tables 1.8-202, 2.0-201, 2.3-16R, 2.3-208, 2.3-209, 2.3-210, 2.3-211, 2.3-212, 2.3-213, 2.3-214, 2.3-215, 12.2-17R, 12.2-18bR, 12.2-201, 12.2-203, 12.2-204 will be revised as indicated in the attached markup.

ER Sections 2.7.6 and 5.4.2.2 and ER Tables 2.7-2, 2.7-4, 2.7-5, 2.7-6, 2.7-7, 2.7-8, 2.7-9, 2.7-10, 2.7-11, 2.7-12, 3.0-1, 3.0-2, 5.4-4, 5.4-5, 5.4-6, 5.4-7, 5.4-8, and 10.4-2 will also be revised as indicated in the attached markup.

Part 7, including Variances 2.0-1 and 12.2-4, will also be revised as indicated in the attached markup.

Markup of North Anna COLA

The attached markup represents Dominion's good faith effort to show how the COLA will be revised in a future COLA submittal in response to the subject RAI. However, the same COLA content may be impacted by revisions to the DCD, responses to other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be somewhat different than as presented herein.

NAPS SUP 1.8-4

Table 1.8-202 Variances from the ESP and ESPA SSAR

Number	Subject	FSAR Location
NAPS ESP VAR 2.0-1	~~Long-Term Deposition Value (D/Q) Estimate~~ Long-Term Dispersion Estimates (χ/Q and D/Q)	Section 2.3.5 Table 2.0-201 Table 2.3-16R
NAPS ESP VAR 2.0-2	Hydraulic Conductivity	Section 2.4.12.1.2 Table 2.0-201
NAPS ESP VAR 2.0-3	Hydraulic Gradient	Section 2.4.12.1.2, Table 2.0-201
NAPS ESP VAR 2.0-4	Vibratory Ground Motion	Section 2.0, Section 2.5 Section 2.5.1 Section 2.5.2 Section 2.5.3
NAPS ESP VAR 2.0-5	Distribution Coefficients (K_d)	Table 2.0-201
NAPS ESP VAR 2.0-6	DBA Source Term Parameters and Doses	Table 2.0-201
NAPS ESP VAR 2.0-7a-b	Coordinates and Abandoned Mat Foundations	Table 2.0-201
NAPS ESP VAR 2.3-1	Tornado Site Characteristics	Table 2.0-201 Section 2.3.1.3.2
NAPS ESP VAR 2.4-1	Void Ratio, Porosity, and Seepage Velocity	Section 2.4.12.1.2
NAPS ESP VAR 2.4-2	NAPS Water Supply Well Information	Table 2.4-17R
NAPS ESP VAR 2.4-3	Well Reference Point Elevation	Table 2.4-15R
NAPS ESP VAR 2.4-4	Lake Level Increase	Section 2.4.1.3 Section 2.4.3 Section 2.4.3.3 Section 2.4.8 Section 2.4.11.1 Section 2.4.11.4 Table 2.4-1R Table 2.4-6R Figure 2.4-14R
NAPS ESP VAR 2.4-5	Lake Anna Probable Maximum Flood (PMF) Level Increase	Section 2.4.3 Section 2.4.3.4 Section 2.4.3.5 Section 2.4.10 Figure 2.4-11R

NAPS SUP 1.8-4

Table 1.8-202 Variances from the ESP and ESPA SSAR

Number	Subject	FSAR Location
NAPS ESP VAR 2.5-1	Stability of Slopes	Section 2.5.5
NAPS ESP VAR 2.5-2	[Deleted}	
NAPS ESP VAR 12.2-1	Gaseous Pathway Doses	Section 12.2.2.2.6 Table 12.2-18bR
NAPS ESP VAR 12.2-2	[Deleted]	
NAPS ESP VAR 12.2-3	Annual Liquid Effluent Releases	Section 12.2.2.4.6 Table 12.2-19bR
NAPS ESP VAR 12.2-4	Existing Units' ~~and Site Total~~ Doses	Section 12.2.2.2.4 Section 12.2.2.4.4 Table 12.2-203
NAPS ESP VAR 12.2-5	Annual Gaseous Effluent Releases	Section 12.2.2.2.5 Table 12.2-17R

Table 2.0-201 Evaluation of Site/Design Parameters and Characteristics

	Subject [20]	DCD Site Parameter Value [1][20]	Site Characteristic	Evaluation
NAPS COL 2.0-1-A	**Part 1 – Evaluation of DCD Site Parameters**			
	[Long Term Dispersion Estimates [12]			
NAPS COL 12.2-2-A	*χ/Q:*		**ESP**	The ESP site characteristic values for long term (routine release) atmospheric dispersion estimates are defined based on type of sensitive receptor (MEI) and decay time. Each of these values is compared with the appropriate DCD site parameter values, χ/Q or D/Q, below. Each ESP site characteristic value that is equal to or less than a DCD site parameter value results in a lower estimated dose for the same source term, and conversely, a higher χ/Q or D/Q results in a higher estimated dose. As shown below, every ESP site characteristic value does not fall within (some are greater than) the DCD site parameter value. As also shown below, every Unit 3 site characteristic value falls within (is smaller than) the DCD site parameter value. Per Note (12), offsite doses due to radioactive airborne effluents are calculated using site-specific χ/Q and D/Q values to demonstrate compliance with the regulatory dose limits. Because the ESP site characteristic values are defined based on ground level releases from the ESP plant parameter envelope boundary, which is shown in Figure 2.0-205, there is a single χ/Q and D/Q value for each type of sensitive receptor (MEI) and decay time, rather than values for releases from each ventilation stack. Each ESP site characteristic χ/Q value is compared with all three DCD site parameter χ/Q values, which correspond to a value for each of the three buildings with a ventilation stack. Each ESP site characteristic D/Q value is similarly compared with all three DCD site parameter D/Q values. The Unit 3 site characteristic values are determined using mixed mode releases for the Reactor Building and Turbine Building, and using a ground-level release for the Radwaste Building. These are modeled based on the distances to each sensitive receptor (MEI) from the ESP plant parameter envelope boundary, which is shown in Figure 2.0-205, and the ventilation stack parameters from DCD Appendix 2B. The Unit 3 ~~mixed mode release~~ results are compared below to the DCD site parameter values for each of the three buildings with a ventilation stack.
	Reactor/Fuel Building Ventilation Stack (RB-VS)	*1.5E-07 s/m³*	The ESP site characteristic values for long term (routine release) atmospheric dispersion estimates are based on the maximally exposed individual (MEI) for each pathway.	
	Turbine Building Ventilation Stack (TB-VS)	*1.2E-07 s/m³*		
	Radwaste Building Ventilation Stack (RW-VS)	*5.0E-06 s/m³*	**Unit 3** The Unit 3 site characteristic values assume conservatively, that each sensitive receptor (meat animal, vegetable garden, residence) is at the location of the closest receptor.	
	D/Q:			
	RB-VS	*4.8E-09 m⁻²*		
	TB-VS	*3.5E-09 m⁻²*		
	RW-VS	*1.9E-08 m⁻²*		
	χ/Q:		**ESP**	The ESP site characteristic value for this long term dispersion estimate is defined as the maximum annual average EAB undepleted/no decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual. The ESP site characteristic value does not fall within (is greater than) two of the DCD site parameter values.
	RB-VS	*1.5E-07 s/m³*	3.7×10^{-6} s/m³, annual average, undepleted/no decay, EAB, east-southeast, 1.4 km (0.88 mi)	
	TB-VS	*1.2E-07 s/m³*		
	RW-VS	*5.0E-06 s/m³]**	**Unit 3** RB-VS 7.1×10^{-8} s/m³ North-northeast 0.88 mi TB-VS 5.2×10^{-8} s/m³ North-northeast 0.88 mi RW-VS ~~8.1×10^{-7} s/m³ North-northeast 0.88 mi~~ 3.3×10^{-6} s/m³ East-southeast 0.88 mi	The Unit 3 site characteristic values for this long term dispersion estimate are provided in Table 2.3-16R. The Unit 3 site characteristic value for releases from each building falls within (is smaller than) the DCD site parameter value. See Section 12.2 for the site-specific concentration and dose analysis inputs and results. The Unit 3 site characteristic values fall within (are smaller than) the ESP site characteristic value.

* Text sections and table that are bracketed and italicized with an asterisk following the brackets are designated as Tier 2*. Prior NRC approval is required to change. See DCD Appendix 1D.

Table 2.0-201 Evaluation of Site/Design Parameters and Characteristics

	Subject[20]	DCD Site Parameter Value[1][20]	Site Characteristic	Evaluation
NAPS COL 2.0-1-A	**Part 1 – Evaluation of DCD Site Parameters**			
	[Long Term Dispersion Estimates[12] (continued)			
	χ/Q: *RB-VS* *TB-VS* *RW-VS*	*1.5E-07 s/m³* *1.2E-07 s/m³* *5.0E-06 s/m³*	**ESP** 3.7×10^{-6} s/m³, annual average, undepleted/2.26-day decay, EAB, east-southeast, 1.4 km (0.88 mi)	The ESP site characteristic value for this long term dispersion estimate is defined as the maximum annual average EAB undepleted/2.26-day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual. The ESP site characteristic value does not fall within (is greater than) two of the DCD site parameter values.
			Unit 3 RB-VS 7.1×10^{-8} s/m³ North-northeast 0.88 mi TB-VS 5.2×10^{-8} s/m³ North-northeast 0.88 mi RW-VS ~~8.1×10^{-7} s/m³~~ ~~North-northeast 0.88 mi~~ 3.3×10^{-6} s/m³ East-southeast 0.88 mi	The Unit 3 site characteristic values for this long term dispersion estimate are provided in Table 2.3-16R. The Unit 3 site characteristic value for releases from each building falls within (is smaller than) the DCD site parameter value. See Section 12.2 for the site-specific concentration and dose analysis inputs and results. The Unit 3 site characteristic values fall within (are smaller than) the ESP site characteristic value.
	χ/Q: *RB-VS* *TB-VS* *RW-VS*	*1.5E-07 s/m³* *1.2E-07 s/m³* *5.0E-06 s/m³]**	**ESP** 3.3×10^{-6} s/m³, annual average, depleted/8.00-day decay, EAB, east-southeast, 1.4 km (0.88 mi)	The ESP site characteristic value for this long term dispersion estimate is defined as the maximum annual average EAB depleted/8.00-day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual. The ESP site characteristic value does not fall within (is greater than) two of the DCD site parameter values.
			Unit 3 RB-VS 6.9×10^{-8} s/m³ North-northeast 0.88 mi TB-VS 5.0×10^{-8} s/m³ North-northeast 0.88 mi RW-VS ~~8.0×10^{-7} s/m³~~ ~~North-northeast 0.88 mi~~ 2.9×10^{-6} s/m³ East-southeast 0.88 mi	The Unit 3 site characteristic values for this long term dispersion estimate are provided in Table 2.3-16R. The Unit 3 site characteristic value for releases from each building falls within (is smaller than) the DCD site parameter value. See Section 12.2 for the site-specific concentration and dose analysis inputs and results. The Unit 3 site characteristic values fall within (are smaller than) the ESP site characteristic value.

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Table 2.0-201 Evaluation of Site/Design Parameters and Characteristics

	Subject[20]	DCD Site Parameter Value[1][20]	Site Characteristic	Evaluation
NAPS COL 2.0-1-A	**Part 1 – Evaluation of DCD Site Parameters**			
	[Long Term Dispersion Estimates[12] (continued)			
	D/Q: *RB-VS* *TB-VS* *RW-VS*	 *4.8E-09 m^{-2}* *3.5E-09 m^{-2}* *1.9E-08 m^{-2}*	**ESP** 1.2×10^{-8} $1/m^2$, annual average, D/Q value, EAB, South 0.62 mi	The ESP site characteristic value for this long term dispersion estimate is defined as the maximum annual average EAB D/Q value for use in determining gaseous pathway doses to the maximally exposed individual. The ESP site characteristic value does not fall within (is greater than) two of the DCD site parameter values.
			Unit 3 RB-VS 1.7×10^{-9} $1/m^2$ South 0.62 mi South-southeast 0.73 mi TB-VS 1.6×10^{-9} $1/m^2$ North-northeast 0.88 mi South-southeast 0.73 mi RW-VS ~~6.5×10^{-9} $1/m^2$~~ 1.1×10^{-8} $1/m^2$ South 0.62 mi	The Unit 3 site characteristic values for this long term dispersion estimate are provided in Table 2.3-16R. The Unit 3 site characteristic value for releases from each building falls within (is smaller than) the DCD site parameter value. See Section 12.2 for the site-specific concentration and dose analysis inputs and results. The Unit 3 site characteristic values fall within (are smaller than) the ESP site characteristic value.
	χ/Q: *RB-VS* *TB-VS* *RW-VS*	 *1.5E-07 s/m^3* *1.2E-07 s/m^3* *5.0E-06 s/m^3]**	**ESP** 2.4×10^{-6} s/m^3, annual average, undepleted/no decay, nearest resident, north-northeast, 1.5 km (0.96 mi)	The ESP site characteristic value for this long term dispersion estimate is defined as the maximum annual average resident undepleted/no decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual. The ESP site characteristic value does not fall within (is greater than) two of the DCD site parameter values.
NAPS ESP VAR 2.0-1			**Unit 3** RB-VS 6.8×10^{-8} s/m^3 North-northeast 0.74 mi TB-VS 5.5×10^{-8} s/m^3 North-northeast 0.74 mi RW-VS ~~8.3×10^{-7} s/m^3~~ ~~North-northeast 0.74 mi~~ 4.2×10^{-6} s/m^3 East-southeast 0.74 mi	The Unit 3 site characteristic values for this long term dispersion estimate are provided in Table 2.3-16R. The Unit 3 site characteristic values fall within (are smaller than) the DCD site parameter values. See Section 12.2 for the site-specific concentration and dose analysis inputs and results. The Unit 3 site characteristic ~~values fall within (are smaller than)~~ value for the RW-VS does not fall within (is greater than) the ESP site characteristic value.

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Table 2.0-201 Evaluation of Site/Design Parameters and Characteristics

	Subject[20]	DCD Site Parameter Value[1][20]	Site Characteristic	Evaluation
NAPS COL 2.0-1-A	**Part 1 – Evaluation of DCD Site Parameters**			
	[Long Term Dispersion Estimates[12] (continued)			
	χ/Q: *RB-VS* *TB-VS* *RW-VS*	 *1.5E-07 s/m³* *1.2E-07 s/m³* *5.0E-06 s/m³*	**ESP** 2.4×10^{-6} s/m³, annual average, undepleted/2.26-day decay, nearest resident, north-northeast, 1.5 km (0.96 mi)	The ESP site characteristic value for this long term dispersion estimate is defined as the maximum annual average resident undepleted/2.26 day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual. The ESP site characteristic value does not fall within (is greater than) two of the DCD site parameter values.
NAPS ESP VAR 2.0-1			**Unit 3** RB-VS 6.8×10^{-8} s/m³ North-northeast 0.74 mi TB-VS 5.5×10^{-8} s/m³ North-northeast 0.74 mi RW-VS ~~8.3×10^{-7} s/m³~~ ~~North-northeast 0.74 mi~~ 4.2×10^{-6} s/m³ East-southeast 0.74 mi	The Unit 3 site characteristic values for this long term dispersion estimate are provided in Table 2.3-16R. The Unit 3 site characteristic values fall within (are smaller than) the DCD site parameter values. See Section 12.2 for the site-specific concentration and dose analysis inputs and results. The Unit 3 site characteristic ~~values fall within (are smaller than)~~ value for the RW-VS does not fall within (is greater than) the ESP site characteristic value.
	χ/Q: *RB-VS* *TB-VS* *RW-VS*	 *1.5E-07 s/m³* *1.2E-07 s/m³* *5.0E-06 s/m³]**	**ESP** 2.1×10^{-6} s/m³, annual average, depleted/8.00-day decay, nearest resident, north-northeast, 1.5 km (0.96 mi)	The ESP site characteristic value for this long term dispersion estimate is defined as the maximum annual average resident depleted/8.00-day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual. The ESP site characteristic value does not fall within (is greater than) two of the DCD site parameter values.
NAPS ESP VAR 2.0-1			**Unit 3** RB-VS 6.6×10^{-8} s/m³ North-northeast 0.74 mi TB-VS 5.3×10^{-8} s/m³ North-northeast 0.74 mi RW-VS ~~8.2×10^{-7} s/m³~~ ~~North-northeast 0.74 mi~~ 3.8×10^{-8} s/m³ East-southeast 0.74 mi	The Unit 3 site characteristic values for this long term dispersion estimate are provided in Table 2.3-16R. The Unit 3 site characteristic values fall within (are smaller than) the DCD site parameter values. See Section 12.2 for the site-specific concentration and dose analysis inputs and results. The Unit 3 site characteristic ~~values fall within (are smaller than)~~ value for the RW-VS does not fall within (is greater than) the ESP site characteristic value.

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Table 2.0-201 Evaluation of Site/Design Parameters and Characteristics

	Subject[20]	DCD Site Parameter Value[1][20]	Site Characteristic	Evaluation
NAPS COL 2.0-1-A	**Part 1 – Evaluation of DCD Site Parameters**			
	[Long Term Dispersion Estimates[12] (continued)			
	D/Q: *RB-VS* *TB-VS* *RW-VS*	 *4.8E-09 m^{-2}* *3.5E-09 m^{-2}* *1.9E-08 m^{-2}*	**ESP** 7.2×10^{-9} 1/m^2, annual average, nearest resident, north-northeast, 1.5 km (0.96 mi)	The ESP site characteristic value for this long term dispersion estimate is defined as the maximum annual average resident D/Q value for use in determining gaseous pathway doses to the maximally exposed individual. The ESP site characteristic value does not fall within (is greater than) two of the DCD site parameter values.
NAPS ESP VAR 2.0-1			**Unit 3** RB-VS 1.8×10^{-9} 1/m^2 North-northeast 0.74 mi Southeast 0.74 mi TB-VS 1.8×10^{-9} 1/m^2 North-northeast 0.74 mi RW-VS ~~4.4×10^{-9} 1/m^2~~ ~~South 0.74 mi~~ 1.1×10^{-8} 1/m^2 North-northeast 0.74 mi	The Unit 3 site characteristic values for this long term dispersion estimate are provided in Table 2.3-16R. The Unit 3 site characteristic values fall within (are smaller than) the DCD site parameter values. See Section 12.2 for the site-specific concentration and dose analysis inputs and results. The Unit 3 site characteristic ~~values fall within (are smaller than)~~ value for the RW-VS does not fall within (is greater than) the ESP site characteristic value.
	χ/Q: *RB-VS* *TB-VS* *RW-VS*	 *1.5E-07 s/m^3* *1.2E-07 s/m^3* *5.0E-06 s/m^3]**	**ESP** 1.4×10^{-6} s/m^3, annual average, undepleted/ no decay, nearest meat animal, southeast, 2.2 km (1.37 mi)	The ESP site characteristic value for this long term dispersion estimate is defined as the maximum annual average meat animal undepleted/no decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual. The ESP site characteristic value does not fall within (is greater than) two of the DCD site parameter values.
NAPS ESP VAR 2.0-1			**Unit 3** RB-VS 6.8×10^{-8} s/m^3 North-northeast 0.74 mi TB-VS 5.5×10^{-8} s/m^3 North-northeast 0.74 mi RW-VS ~~8.3×10^{-7} s/m^3~~ ~~North-northeast 0.74 mi~~ 4.2×10^{-8} s/m^3 East-southeast 0.74 mi	The Unit 3 site characteristic values for this long term dispersion estimate are provided in Table 2.3-16R. The Unit 3 site characteristic values fall within (are smaller than) the DCD site parameter values. See Section 12.2 for the site-specific concentration and dose analysis inputs and results. The Unit 3 site characteristic ~~values fall within (are smaller than)~~ value for the RW-VS does not fall within (is greater than) the ESP site characteristic value.

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Table 2.0-201 Evaluation of Site/Design Parameters and Characteristics

	Subject [20]	DCD Site Parameter Value [1][20]	Site Characteristic	Evaluation
NAPS COL 2.0-1-A	**Part 1 – Evaluation of DCD Site Parameters**			
	[Long Term Dispersion Estimates [12] (continued)			
	χ/Q: *RB-VS* *TB-VS* *RW-VS*	*1.5E-07 s/m³* *1.2E-07 s/m³* *5.0E-06 s/m³*	**ESP** 1.4×10^{-6} s/m³, annual average, undepleted/2.26-day decay, nearest meat animal, southeast, 2.2 km (1.37 mi)	The ESP site characteristic value for this long term dispersion estimate is defined as the maximum annual average meat animal undepleted/2.26-day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual. This ESP site characteristic value is 1.4×10^{-6} s/m³ and does not fall within (is greater than) two of the DCD site parameter values.
NAPS ESP VAR 2.0-1			**Unit 3** RB-VS 6.8×10^{-8} s/m³ North-northeast 0.74 mi TB-VS 5.5×10^{-8} s/m³ North-northeast 0.74 mi RW-VS ~~8.3×10^{-7} s/m³~~ ~~North-northeast 0.74 mi~~ 4.2×10^{-6} s/m³ East-southeast 0.74 mi	The Unit 3 site characteristic values for this long term dispersion estimate are provided in Table 2.3-16R. The Unit 3 site characteristic values fall within (are smaller than) the DCD site parameter values. See Section 12.2 for the site-specific concentration and dose analysis inputs and results. The Unit 3 site characteristic ~~values fall within (are smaller than)~~ value for the RW-VS does not fall within (is greater than) the ESP site characteristic value.
	χ/Q: *RB-VS* *TB-VS* *RW-VS*	*1.5E-07 s/m³* *1.2E-07 s/m³* *5.0E-06 s/m³]**	**ESP** 1.2×10^{-6} s/m³, annual average, depleted/8.00-day decay, nearest meat animal, southeast, 2.2 km (1.37 mi)	The ESP site characteristic value for this long term dispersion estimate is defined as the maximum annual average meat animal depleted/8.00-day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual. The ESP site characteristic value does not fall within (is greater than) two of the DCD site parameter values.
NAPS ESP VAR 2.0-1			**Unit 3** RB-VS 6.6×10^{-8} s/m³ North-northeast 0.74 mi TB-VS 5.3×10^{-8} s/m³ North-northeast 0.74 mi RW-VS ~~8.2×10^{-7} s/m³~~ ~~North-northeast 0.74 mi~~ 3.8×10^{-6} s/m³ East-southeast 0.74 mi	The Unit 3 site characteristic values for this long term dispersion estimate are provided in Table 2.3-16R. The Unit 3 site characteristic values fall within (are smaller than) the DCD site parameter values. See Section 12.2 for the site-specific concentration and dose analysis inputs and results. The Unit 3 site characteristic ~~values fall within (are smaller than)~~ value for the RW-VS does not fall within (is greater than) the ESP site characteristic value.

* Text sections and table that are bracketed and italicized with an asterisk following the brackets are designated as Tier 2*. Prior NRC approval is required to change. See DCD Appendix 1D.

Table 2.0-201 Evaluation of Site/Design Parameters and Characteristics

	Subject[20]	DCD Site Parameter Value[1][20]	Site Characteristic	Evaluation
NAPS COL 2.0-1-A	**Part 1 – Evaluation of DCD Site Parameters**			
	[Long Term Dispersion Estimates[12] (continued)			
	D/Q: *RB-VS* *TB-VS* *RW-VS*	 *4.8E-09 m^{-2}* *3.5E-09 m^{-2}* *1.9E-08 m^{-2}*	**ESP** 3.1×10^{-9} 1/m^2, annual average, nearest meat animal, southeast, 2.2 km (1.37 mi)	The ESP site characteristic value for this long term dispersion estimate is defined as the maximum annual average meat animal D/Q value for use in determining gaseous pathway doses to the maximally exposed individual. The ESP site characteristic value falls within (is smaller than) the DCD site parameter values.
NAPS ESP VAR 2.0-1			**Unit 3** RB-VS 1.8×10^{-9} 1/m^2 North-northeast 0.74 mi Southeast 0.74 mi TB-VS 1.8×10^{-9} 1/m^2 North-northeast 0.74 mi RW-VS ~~4.4×10^{-9} 1/m^2~~ ~~South 0.74 mi~~ 1.1×10^{-8} 1/m^2 North-northeast 0.74 mi	The Unit 3 site characteristic values for this long term dispersion estimate are provided in Table 2.3-16R. The Unit 3 site characteristic values fall within (are smaller than) the DCD site parameter values. See Section 12.2 for the site-specific concentration and dose analysis inputs and results. The Unit 3 site characteristic value for the RW-VS does not fall within (is greater than) the ESP site characteristic value.
	χ/Q: *RB-VS* *TB-VS* *RW-VS*	 *1.5E-07 s/m^3* *1.2E-07 s/m^3* *5.0E-06 s/m^3]**	**ESP** 2.0×10^{-6} s/m^3, annual average, undepleted/no decay, nearest vegetable garden, northeast, 1.5 km (0.94 mi)	The ESP site characteristic value for this long term dispersion estimate is defined as the maximum annual average vegetable garden undepleted/no decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual. The ESP site characteristic value does not fall within (is greater than) two of the DCD site parameter values.
NAPS ESP VAR 2.0-1			**Unit 3** RB-VS 6.8×10^{-8} s/m^3 North-northeast 0.74 mi TB-VS 5.5×10^{-8} s/m^3 North-northeast 0.74 mi RW-VS ~~8.3×10^{-7} s/m^3~~ ~~North-northeast 0.74 mi~~ 4.2×10^{-6} s/m^3 East-southeast 0.74 mi	The Unit 3 site characteristic values for this long term dispersion estimate are provided in Table 2.3-16R. The Unit 3 site characteristic values fall within (are smaller than) the DCD site parameter values. See Section 12.2 for the site-specific concentration and dose analysis inputs and results. The Unit 3 site characteristic ~~values fall within (are smaller than)~~ value for the RW-VS does not fall within (is greater than) the ESP site characteristic value.

* Text sections and table that are bracketed and italicized with an asterisk following the brackets are designated as Tier 2*. Prior NRC approval is required to change. See DCD Appendix 1D.

Table 2.0-201 Evaluation of Site/Design Parameters and Characteristics

	Subject [20]	DCD Site Parameter Value [1][20]	Site Characteristic	Evaluation
NAPS COL 2.0-1-A	**Part 1 – Evaluation of DCD Site Parameters**			
	[Long Term Dispersion Estimates [12] (continued)			
	χ/Q: *RB-VS* *TB-VS* *RW-VS*	 *1.5E-07 s/m³* *1.2E-07 s/m³* *5.0E-06 s/m³*	**ESP** 2.0×10^{-6} s/m³, annual average, undepleted/2.26-day decay, nearest vegetable garden, northeast, 1.5 km (0.94 mi)	The ESP site characteristic value for this long term dispersion estimate is defined as the maximum annual average vegetable garden undepleted 2.26-day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual. The ESP site characteristic value does not fall within (is greater than) two of the DCD site parameter values.
NAPS ESP VAR 2.0-1			**Unit 3** RB-VS 6.8×10^{-8} s/m³ North-northeast 0.74 mi TB-VS 5.5×10^{-8} s/m³ North-northeast 0.74 mi RW-VS ~~8.3×10^{-7} s/m³~~ ~~North-northeast 0.74 mi~~ 4.2×10^{-6} s/m³ East-southeast 0.74 mi	The Unit 3 site characteristic values for this long term dispersion estimate are provided in Table 2.3-16R. The Unit 3 site characteristic values fall within (are smaller than) the DCD site parameter values. See Section 12.2 for the site-specific concentration and dose analysis inputs and results. The Unit 3 site characteristic ~~values fall within (are smaller than)~~ value for the RW-VS does not fall within (is greater than) the ESP site characteristic value.
	χ/Q: *RB-VS* *TB-VS* *RW-VS*	 *1.5E-07 s/m³* *1.2E-07 s/m³* *5.0E-06 s/m³]**	**ESP** 1.8×10^{-6} s/m³, annual average, depleted/8.00-day decay, nearest vegetable garden, northeast, 1.5 km (0.94 mi)	The ESP site characteristic value for this long term dispersion estimate is defined as the maximum annual average vegetable garden depleted/8.00-day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual. The ESP site characteristic value does not fall within (is greater than) two of the DCD site parameter values.
NAPS ESP VAR 2.0-1			**Unit 3** RB-VS 6.6×10^{-8} s/m³ North-northeast 0.74 mi TB-VS 5.3×10^{-8} s/m³ North-northeast 0.74 mi RW-VS ~~8.2×10^{-7} s/m³~~ ~~North-northeast 0.74 mi~~ 3.8×10^{-6} s/m³ East-southeast 0.74 mi	The Unit 3 site characteristic values for this long term dispersion estimate are provided in Table 2.3-16R. The Unit 3 site characteristic values fall within (are smaller than) the DCD site parameter values. See Section 12.2 for the site-specific concentration and dose analysis inputs and results. The Unit 3 site characteristic ~~values fall within (are smaller than)~~ value for the RW-VS does not fall within (is greater than) the ESP site characteristic value.

* Text sections and table that are bracketed and italicized with an asterisk following the brackets are designated as Tier 2*. Prior NRC approval is required to change. See DCD Appendix 1D.

Table 2.0-201 Evaluation of Site/Design Parameters and Characteristics

	Subject[20]	DCD Site Parameter Value[1][20]	Site Characteristic	Evaluation
NAPS COL 2.0-1-A	**Part 1 – Evaluation of DCD Site Parameters**			
	[Long Term Dispersion Estimates[12] (continued)			
	D/Q:		**ESP**	The ESP site characteristic value for this long term dispersion estimate is defined as the maximum annual average vegetable garden D/Q value for use in determining gaseous pathway doses to the maximally exposed individual. The ESP site characteristic value does not fall within (is greater than) two of the DCD site parameter values.
	RB-VS	*4.8E-09 m^{-2}*	6.0×10^{-9} 1/m^2, annual average, nearest vegetable garden, northeast, 1.5 km (0.94 mi)	
	TB-VS	*3.5E-09 m^{-2}*		
	RW-VS	*1.9E-08 m^{-2}*		
NAPS ESP VAR 2.0-1			**Unit 3** RB-VS 1.8×10^{-9} 1/m^2 North-northeast 0.74 mi Southeast 0.74 mi TB-VS 1.8×10^{-9} 1/m^2 North-northeast 0.74 mi RW-VS ~~4.4×10^{-9} 1/m^2~~ ~~South 0.74 mi~~ 1.1×10^{-8} 1/m^2 North-northeast 0.74 mi	The Unit 3 site characteristic values for this long term dispersion estimate are provided in Table 2.3-16R. The Unit 3 site characteristic values fall within (are smaller than) the DCD site parameter values. See Section 12.2 for the site-specific concentration and dose analysis inputs and results. The Unit 3 site characteristic ~~values fall within (are smaller than)~~ value for the RW-VS does not fall within (is greater than) the ESP site characteristic value.
	χ/Q:		**ESP and Unit 3**	The ESP and Unit 3 site characteristic values for each of these long term χ/Q dispersion coefficients is "No value provided." The milk exposure pathway was not considered because there are no reported cows or goats used for milk production in the near vicinity of the site, within 5 miles. Each ESP and Unit 3 site characteristic value falls within (is smaller than) the DCD site parameter values. See Section 12.2 for the site-specific concentration and dose analysis inputs and results. The Unit 3 site characteristic values fall within (are the same as) the ESP site characteristic value.
	RB-VS	*1.5E-07 s/m^3*	No value provided for annual average, nearest cow-milk, undepleted/no decay χ/Q value; annual average undepleted/2.26-day decay χ/Q value; and annual average depleted/8.00-day decay	
	TB-VS	*1.2E-07 s/m^3*		
	RW-VS	*5.0E-06 s/m^3*		
	D/Q:		**ESP and Unit 3**	The ESP and Unit 3 site characteristic values for this long term D/Q dispersion estimate is "No value provided." The milk exposure pathway was not considered because there are no reported cows or goats used for milk production in the near vicinity of the site, within 5 miles. The ESP and Unit 3 site characteristic values fall within (are the smaller than) the DCD site parameter values. See Section 12.2 for the site-specific concentration and dose analysis inputs and results. The Unit 3 site characteristic value falls within (is the same as) the ESP site characteristic value.
	RB-VS	*4.8E-09 m^{-2}*	No value provided for annual average, nearest cow-milk	
	TB-VS	*3.5E-09 m^{-2}*		
	RW-VS	*1.9E-08 m^{-2}]**		

* Text sections and table that are bracketed and italicized with an asterisk following the brackets are designated as Tier 2*. Prior NRC approval is required to change. See DCD Appendix 1D.

2.3.5.1 Basis

The third through sixth paragraphs of this SSAR section are supplemented as follows with information to address the receptors near the Unit 3 site.

NAPS ESP COL 2.3-3

The following input data and assumptions were used in the XOQDOQ modeling of routine releases from the vent stacks of the Reactor Building (RB-VS), Turbine Building (TB-VS), and Radwaste Building (RW-VS); and from the CIRC cooling tower:

- Meteorological Data: Three-year combined (1996–1998) onsite joint frequency distribution of wind speed, wind direction, and atmospheric stability.
- Type of Release: Mixed mode (RB-VS~~,~~ and TB-VS~~, and RW-VS~~) and ground level (RW-VS and CIRC cooling tower).
- Wind Sensor Height: 10 m (33 ft).
- Vertical Temperature Difference from instruments at: 10 m (33 ft) and 48.4 m (158.9 ft).
- Number of Wind Speed Categories: 7.
- Release Height: 52.77 m (173.09 ft) for RB-VS, 71.3 m (234.0 ft) for TB-VS, ~~18.15 m (59.59 ft)~~ 0.0 m (0.0 ft) for RW-VS, 0.0 m (0.0 ft) for CIRC cooling tower.
- Building Height: 46.1 m (151.2 ft) effective height of TB for RB-VS, ~~and~~ TB-VS, and RW-VS releases, ~~12.15 m (39.89 ft) for RW-VS release,~~ and 0.0 m (0.0 ft) for CIRC Cooling Tower.
- Minimum Turbine Building Cross-Sectional Area: 3098 m^2 (33,347 ft^2).
- Stack Average Velocity: 17.78 m/s (58.33 ft/s) for RB-VS~~,~~ and TB-VS~~, and RW-VS~~.
- Stack Inside Diameter: 2.40 m (7.9 ft) for RB-VS, 1.95 m (6.4 ft) for TB-VS, ~~1.34 m (4.4 ft)~~ 0.0 m (0.0 ft) for RW-VS, 0.0 m (0.0 ft) for CIRC cooling tower.
- The distance for each sensitive receptor in each direction was assumed to occur at the distance for the nearest residence for releases from the RB, TB, and RW vent stacks. The distances from the CIRC cooling tower to potential receptors at the EAB are provided in Table 2.3-226.

~~Two sets of χ/Q and D/Q values were calculated. One analysis was performed for releases from the RB, TB, and RW vent stacks using distances from the plant facility boundary in Figure 2.0-205 to the EAB. These releases were based on the release heights and exit velocities for each building's vent stack as provided in DCD Table 2B-1. An additional analysis was performed for ground level releases from the CIRC cooling tower.~~

For releases from the RB-VS, TB-VS, and RW-VS, χ/Q and D/Q calculations at the EAB were computed using distances from the plant facility boundary (Figure 2.0-205) to the EAB in each sector. For releases from the CIRC cooling tower, which lies outside the plant facility boundary, χ/Q and D/Q calculations at the EAB were computed using distances from the CIRC cooling tower to the EAB in each sector.

For the RB-VS, TB-VS, and RW-VS dispersion analyses, the Turbine Building was used to determine the minimum building cross-sectional area for evaluating building downwash effects. The height of this building is approximately 52 m (170.6 ft) and as the tallest building within the plant facility boundary, this building creates the largest wake. Because the Turbine Building is close enough to each of the three stacks, each will experience wake effects (dispersion) due to the Turbine Building. Also, because the Turbine Building is taller than the other buildings within the plant facility boundary, the building-induced turbulence for the Turbine Building effectively envelops the wakes from the other lower height structures. Therefore, only the Turbine Building wake was considered and was based on the Turbine Building cross-sectional area. A width of 67.2 m (220.5 ft) at the base of the building and a minimum building cross-sectional area of 3098 m^2 (33,347 ft^2) were used to determine χ/Q and D/Q estimates. This minimum Turbine Building area was divided by the width at the base to obtain the effective height, which accounts for the irregular shape of the top of the Turbine Building. An effective Turbine Building height of 46.1 m (151.2 ft) was used for modeling the releases from ~~both~~ the RB-VS, ~~and~~ TB-VS, and RW-VS. For Unit 3, the χ/Q and D/Q values were found to depend on building height but not cross-sectional area. ~~Because building height is a more sensitive input than the cross-sectional area, and there is a large difference in the heights of the Turbine Building and the Radwaste Building, the Radwaste Building height of 12.15 m (39.89 ft) was used to ensure conservative results.~~

The annual Radiological Environmental Monitoring Program (Reference 2.3-201) was reviewed to determine if the distances of any of the nearest receptors modeled for the SSAR have changed. The results are documented in Table 2.3-15R based on a subsequent review and plotting of receptor locations using GIS technology. This process provided improved distance accuracy for these receptors. The results show the closest receptor to be a residence in the NW direction at a distance of 1.28 km (4207 ft). The evaluation assumed conservatively, that each receptor (meat animal, vegetable garden, residence) is at the distance to the closest receptor and that the closest receptor is the residence in the NW direction at the previously determined distance of 1.20 km (3930 ft or 0.74 mi). Therefore, for the purposes of the atmospheric dispersion analysis and the subsequent dose evaluations, one of each type of receptor was assumed to be at 1.20 km (3930 ft or 0.74 mi) in each compass direction. The maximum annual average χ/Q value calculated for releases from the plant facility boundary (i.e., from the RB-VS, TB-VS, and RW-VS) for the nearest residence, vegetable garden, and meat animal, all assumed at 1.20 km (3930 ft or 0.74 mi), is ~~8.30E-7~~ 4.2×10^{-6} sec/m^3 in the ~~NNE~~ ESE direction.

The maximum D/Q for releases from the plant facility boundary for these receptors is ~~4.4E-9 m^{-2}~~ 1.1×10^{-8} in the ~~S~~ NNE direction. The maximum annual χ/Q (no decay, undepleted) at the EAB is ~~8.1×10^{-7}~~ 3.3×10^{-6} sec/m^3; at a distance of 1.42 km (0.88 mile) to the ~~NNE~~ ESE of the plant facility boundary from Table 2.3-16R. The maximum D/Q for releases from the plant facility boundary for the EAB is ~~5.5E-9 m^{-2}~~ 1.1×10^{-8} in the S direction.

NAPS ESP VAR 2.0-1a

The results are summarized in Table 2.3-16R which presents the maximum calculated χ/Qs and D/Qs for sensitive receptors. The values at various distances from the site are addressed in the tables described below.

Add the following at the end of this SSAR section to address annual average χ/Q and D/Q estimates.

NAPS COL 2.0-11-A

Long-term (annual average) χ/Q and D/Q estimates generated by the XOQDOQ model are also presented for each directional sector at twenty-two specific distances, as well as for ten distance segments. Table 2.3-208 presents the no decay and undepleted χ/Q estimates for the RB, TB, and RW vent stack releases at various downwind distances

NAPS ESP COL 2.3-3
NAPS ESP VAR 2.0-1

Table 2.3-16R XOQDOQ Predicted Maximum χ/Q and D/Q Values at Specific Points of Interest

Type of Location	Structure	Release Type	Direction from Site (True North)	Distance (miles)	χ/Q (No Decay, Undepleted)	χ/Q (2.26 Day Decay, Undepleted)	χ/Q (8 Day Decay, Depleted)	D/Q
Residence	RB	Mixed	NNE	0.74	6.8E-08	6.8E-08	6.6E-08	1.8E-09 [b]
EAB	RB	Mixed	NNE	0.88	7.1E-08	~~7.1E08~~ 7.1E-08	6.9E-08	1.7E-09 [a]
Meat Animal	RB	Mixed	NNE	0.74	6.8E-08	6.8E-08	6.6E-08	1.8E-09 [b]
Veg. Garden	RB	Mixed	NNE	0.74	6.8E-08	6.8E-08	6.6E-08	1.8E-09 [b]
Residence	TB	Mixed	NNE	0.74	5.5E-08	5.5E-08	5.3E-08	1.8E-09
EAB	TB	Mixed	NNE	0.88	5.2E-08	5.2E-08	5.0E-08	1.6E-09 [c]
Meat Animal	TB	Mixed	NNE	0.74	5.5E-08	5.5E-08	5.3E-08	1.8E-09
Veg. Garden	TB	Mixed	NNE	0.74	5.5E-08	5.5E-08	5.3E-08	1.8E-09
Residence	RW	~~Mixed~~ Ground	~~NNE~~ ESE	0.74	~~8.3E-07~~ 4.2E-06	~~8.3E-07~~ 4.2E-06	~~8.2E-07~~ 3.8E-06	~~4.4E-09~~ [e] 1.1E-08 [e]
EAB	RW	~~Mixed~~ Ground	~~NNE~~ ESE	0.88	~~8.1E-07~~ 3.3E-06	~~8.1E-07~~ 3.3E-06	~~8.0E-07~~ 2.9E-06	~~5.5E-09~~ [d] 1.1E-08 [d]
Meat Animal	RW	~~Mixed~~ Ground	~~NNE~~ ESE	0.74	~~8.3E-07~~ 4.2E-06	~~8.3E-07~~ 4.2E-06	~~8.2E-07~~ 3.8E-06	~~4.4E-09~~ [e] 1.1E-08 [e]
Veg. Garden	RW	~~Mixed~~ Ground	~~NNE~~ ESE	0.74	~~8.3E-07~~ 4.2E-06	~~8.3E-07~~ 4.2E-06	~~8.2E-07~~ 3.8E-06	~~4.4E-09~~ [e] 1.1E-08 [e]
Residence	CIRC CT	Ground	ESE	0.74	6.3E-06	6.2E-06	5.6E-06	1.1E-08 [g]
EAB	CIRC CT	Ground	W	0.34	6.4E-06	6.4E-06	6.0E-06	2.1E-08 [f]
Meat Animal	CIRC CT	Ground	ESE	0.74	6.3E-06	6.2E-06	5.6E-06	1.1E-08 [g]

NAPS ESP COL 2.3-3
NAPS ESP VAR 2.0-1

Table 2.3-16R XOQDOQ Predicted Maximum χ/Q and D/Q Values at Specific Points of Interest

Type of Location	Structure	Release Type	Direction from Site (True North)	Distance (miles)	χ/Q (No Decay, Undepleted)	χ/Q (2.26 Day Decay, Undepleted)	χ/Q (8 Day Decay, Depleted)	D/Q
Veg. Garden	CIRC CT	Ground	ESE	0.74	6.3E-06	6.2E-06	5.6E-06	1.1E-08 [g]

NAPS ESP COL 2.3-3
NAPS ESP VAR 2.0-1

Table 2.3-16R XOQDOQ Predicted Maximum χ/Q and D/Q Values at Specific Points of Interest

Notes:
χ/Q – sec/m^3
D/Q – $1/m^2$
RB – Reactor Building
TB – Turbine Building
RW – Radwaste Building
CIRC CT – CIRC Cooling Tower
a - Direction South and South-Southeast at distances of 0.62 and 0.73 mi, respectively, for maximum D/Q for EAB.
b - Direction North-Northeast and Southeast at distances of 0.74 mi for maximum D/Q for Residence, Meat Animal and Veg. Garden.
c - Direction North-Northeast and South-Southeast at distances of 0.88 and 0.73 mi, respectively, for maximum D/Q for EAB.
d – Direction South at distance of 0.62 mi for maximum D/Q for EAB.
e - Direction ~~South~~ North-Northeast at distance of 0.74 mi for maximum D/Q for Residence, Meat Animal and Veg. Garden.
f - Direction South at distance of 0.43 mi for maximum D/Q for EAB.
g - Direction North-Northeast at distance of 0.74 mi for maximum D/Q for Residence, Meat Animal and Veg. Garden.

Table 2.3-17R [Deleted]

NAPS COL 2.0-11-A

Table 2.3-208 Long-Term χ/Q (sec/m^3) for Routine Releases at Distances Between 0.25 to 50 Miles, No Decay, Undepleted

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT RB - MIXED MODE RELEASE - NO PURGE RELEASES
NO DECAY, UNDEPLETED

0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	0.250	0.500	0.750	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500
S	1.215E-07	6.850E-08	6.533E-08	7.487E-08	8.482E-08	8.163E-08	7.439E-08	6.675E-08	5.975E-08	5.363E-08	4.836E-08
SSW	5.450E-08	3.120E-08	3.230E-08	4.172E-08	5.403E-08	5.532E-08	5.227E-08	4.804E-08	4.377E-08	3.981E-08	3.628E-08
SW	4.108E-08	2.332E-08	2.410E-08	3.227E-08	4.374E-08	4.576E-08	4.381E-08	4.064E-08	3.728E-08	3.411E-08	3.122E-08
WSW	3.446E-08	2.254E-08	2.357E-08	2.932E-08	3.737E-08	3.866E-08	3.708E-08	3.459E-08	3.193E-08	2.937E-08	2.703E-08
W	4.658E-08	2.971E-08	2.844E-08	3.446E-08	4.328E-08	4.447E-08	4.252E-08	3.961E-08	3.656E-08	3.366E-08	3.100E-08
WNW	4.676E-08	3.794E-08	3.545E-08	3.894E-08	4.490E-08	4.478E-08	4.207E-08	3.868E-08	3.533E-08	3.224E-08	2.949E-08
NW	2.899E-08	2.013E-08	1.912E-08	2.602E-08	3.864E-08	4.243E-08	4.170E-08	3.930E-08	3.643E-08	3.358E-08	3.093E-08
NNW	3.068E-08	1.997E-08	1.382E-08	1.696E-08	2.674E-08	3.105E-08	3.171E-08	3.072E-08	2.908E-08	2.724E-08	2.542E-08
N	8.469E-08	4.920E-08	3.659E-08	4.590E-08	7.175E-08	8.282E-08	8.430E-08	8.149E-08	7.702E-08	7.208E-08	6.720E-08
NNE	1.495E-07	8.914E-08	6.988E-08	7.852E-08	1.039E-07	1.125E-07	1.110E-07	1.054E-07	9.853E-08	9.149E-08	8.481E-08
NE	1.070E-07	5.723E-08	4.874E-08	5.915E-08	8.211E-08	8.991E-08	8.903E-08	8.467E-08	7.917E-08	7.353E-08	6.817E-08
ENE	7.397E-08	3.692E-08	2.785E-08	3.128E-08	4.206E-08	4.634E-08	4.640E-08	4.461E-08	4.213E-08	3.948E-08	3.688E-08
E	8.171E-08	3.661E-08	2.533E-08	3.063E-08	4.870E-08	5.852E-08	6.186E-08	6.179E-08	6.007E-08	5.760E-08	5.485E-08
ESE	1.130E-07	5.568E-08	4.030E-08	4.415E-08	6.015E-08	6.798E-08	6.973E-08	6.847E-08	6.586E-08	6.273E-08	5.948E-08
SE	1.522E-07	8.406E-08	5.817E-08	5.493E-08	5.937E-08	5.990E-08	5.768E-08	5.439E-08	5.084E-08	4.738E-08	4.416E-08
SSE	1.199E-07	7.853E-08	6.419E-08	6.486E-08	6.805E-08	6.486E-08	5.942E-08	5.379E-08	4.862E-08	4.404E-08	4.005E-08

0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	5.000	7.500	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	50.000
S	4.383E-08	2.875E-08	2.063E-08	1.253E-08	8.675E-09	6.485E-09	5.099E-09	4.155E-09	3.477E-09	2.970E-09	2.579E-09
SSW	3.316E-08	2.233E-08	1.624E-08	1.000E-08	6.972E-09	5.232E-09	4.125E-09	3.367E-09	2.822E-09	2.413E-09	2.097E-09
SW	2.865E-08	1.954E-08	1.432E-08	8.907E-09	6.247E-09	4.710E-09	3.726E-09	3.051E-09	2.563E-09	2.196E-09	1.912E-09
WSW	2.492E-08	1.730E-08	1.281E-08	8.065E-09	5.702E-09	4.323E-09	3.434E-09	2.822E-09	2.378E-09	2.043E-09	1.782E-09
W	2.862E-08	2.000E-08	1.491E-08	9.498E-09	6.780E-09	5.182E-09	4.145E-09	3.426E-09	2.902E-09	2.505E-09	2.195E-09
WNW	2.707E-08	1.862E-08	1.378E-08	8.734E-09	6.239E-09	4.774E-09	3.823E-09	3.164E-09	2.682E-09	2.318E-09	2.033E-09
NW	2.853E-08	1.985E-08	1.477E-08	9.404E-09	6.722E-09	5.144E-09	4.121E-09	3.409E-09	2.890E-09	2.497E-09	2.189E-09
NNW	2.370E-08	1.706E-08	1.293E-08	8.397E-09	6.059E-09	4.665E-09	3.752E-09	3.114E-09	2.646E-09	2.289E-09	2.010E-09
N	6.261E-08	4.498E-08	3.404E-08	2.206E-08	1.590E-08	1.223E-08	9.824E-09	8.145E-09	6.913E-09	5.977E-09	5.244E-09
NNE	7.870E-08	5.597E-08	4.222E-08	2.732E-08	1.970E-08	1.516E-08	1.219E-08	1.012E-08	8.598E-09	7.440E-09	6.533E-09
NE	6.325E-08	4.493E-08	3.387E-08	2.189E-08	1.578E-08	1.214E-08	9.763E-09	8.102E-09	6.884E-09	5.958E-09	5.232E-09
ENE	3.446E-08	2.515E-08	1.931E-08	1.280E-08	9.376E-09	7.306E-09	5.933E-09	4.965E-09	4.248E-09	3.698E-09	3.265E-09
E	5.207E-08	4.012E-08	3.186E-08	2.202E-08	1.657E-08	1.317E-08	1.086E-08	9.196E-09	7.949E-09	6.982E-09	6.211E-09
ESE	5.632E-08	4.337E-08	3.468E-08	2.442E-08	1.871E-08	1.511E-08	1.263E-08	1.083E-08	9.467E-09	8.399E-09	7.540E-09
SE	4.125E-08	3.040E-08	2.370E-08	1.623E-08	1.225E-08	9.805E-09	8.151E-09	6.963E-09	6.069E-09	5.374E-09	4.817E-09
SSE	3.660E-08	2.486E-08	1.831E-08	1.157E-08	8.267E-09	6.338E-09	5.090E-09	4.224E-09	3.593E-09	3.114E-09	2.739E-09

0VENT AND BUILDING PARAMETERS:

RELEASE HEIGHT	(METERS)	52.77	REP. WIND HEIGHT	(METERS)	10.0
DIAMETER	(METERS)	2.40	BUILDING HEIGHT	(METERS)	46.1
EXIT VELOCITY	(METERS)	17.78	BLDG.MIN.CRS.SEC.AREA	(SQ.METERS)	3098.0
			HEAT EMISSION RATE	(CAL/SEC)	0.0

0AT THE RELEASE HEIGHT: / AT THE MEASURED WIND HEIGHT (10.0 METERS):

VENT RELEASE MODE	WIND SPEED (METERS/SEC)	/	VENT RELEASE MODE	WIND SPEED (METERS/SEC) STABLE CONDITIONS	WIND SPEED (METERS/SEC) UNSTABLE/NEUTRAL CONDITIONS
ELEVATED	LESS THAN 3.556	/	ELEVATED	LESS THAN 3.556	LESS THAN 3.556
MIXED	BETWEEN 3.556 AND 17.780	/	MIXED	BETWEEN 3.556 AND 17.780	BETWEEN 3.556 AND 17.780
GROUND LEVEL	ABOVE 17.780	/	GROUND LEVEL	ABOVE 17.780	ABOVE 17.780

Note: Directions are True North.

NAPS COL 2.0-11-A

Table 2.3-208 Long-Term χ/Q (sec/m^3) for Routine Releases at Distances Between 0.25 to 50 Miles, No Decay, Undepleted

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT TB - MIXED MODE RELEASE - NO PURGE RELEASES
NO DECAY, UNDEPLETED

0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	0.250	0.500	0.750	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500
S	1.147E-07	5.912E-08	4.785E-08	5.254E-08	6.329E-08	6.493E-08	6.190E-08	5.730E-08	5.244E-08	4.784E-08	4.366E-08
SSW	5.197E-08	2.729E-08	2.301E-08	2.804E-08	3.902E-08	4.298E-08	4.271E-08	4.064E-08	3.793E-08	3.511E-08	3.241E-08
SW	3.866E-08	2.069E-08	1.738E-08	2.166E-08	3.127E-08	3.515E-08	3.541E-08	3.402E-08	3.200E-08	2.980E-08	2.765E-08
WSW	3.221E-08	1.974E-08	1.770E-08	2.053E-08	2.708E-08	2.984E-08	3.005E-08	2.900E-08	2.742E-08	2.567E-08	2.393E-08
W	4.366E-08	2.686E-08	2.209E-08	2.471E-08	3.166E-08	3.437E-08	3.432E-08	3.299E-08	3.113E-08	2.912E-08	2.714E-08
WNW	4.287E-08	3.378E-08	2.939E-08	2.983E-08	3.313E-08	3.400E-08	3.304E-08	3.124E-08	2.916E-08	2.707E-08	2.508E-08
NW	2.612E-08	1.808E-08	1.485E-08	1.724E-08	2.515E-08	2.947E-08	3.062E-08	3.006E-08	2.873E-08	2.710E-08	2.541E-08
NNW	2.768E-08	1.883E-08	1.150E-08	1.104E-08	1.605E-08	2.010E-08	2.199E-08	2.242E-08	2.203E-08	2.123E-08	2.025E-08
N	7.522E-08	4.563E-08	2.991E-08	2.954E-08	4.271E-08	5.325E-08	5.813E-08	5.918E-08	5.811E-08	5.597E-08	5.335E-08
NNE	1.330E-07	8.002E-08	5.611E-08	5.368E-08	6.653E-08	7.601E-08	7.916E-08	7.836E-08	7.555E-08	7.187E-08	6.789E-08
NE	9.706E-08	5.066E-08	3.734E-08	3.839E-08	5.136E-08	6.011E-08	6.316E-08	6.278E-08	6.065E-08	5.775E-08	5.459E-08
ENE	6.623E-08	3.337E-08	2.189E-08	2.066E-08	2.601E-08	3.028E-08	3.202E-08	3.209E-08	3.127E-08	3.002E-08	2.859E-08
E	7.219E-08	3.341E-08	2.009E-08	1.895E-08	2.721E-08	3.485E-08	3.916E-08	4.096E-08	4.122E-08	4.060E-08	3.951E-08
ESE	1.009E-07	5.030E-08	3.241E-08	2.978E-08	3.669E-08	4.301E-08	4.613E-08	4.694E-08	4.640E-08	4.515E-08	4.354E-08
SE	1.348E-07	7.571E-08	4.873E-08	4.191E-08	4.236E-08	4.353E-08	4.323E-08	4.185E-08	3.992E-08	3.779E-08	3.563E-08
SSE	1.092E-07	6.871E-08	5.128E-08	4.905E-08	5.158E-08	5.106E-08	4.843E-08	4.502E-08	4.149E-08	3.815E-08	3.508E-08

0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	5.000	7.500	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	50.000
S	3.995E-08	2.689E-08	1.951E-08	1.196E-08	8.316E-09	6.229E-09	4.903E-09	3.997E-09	3.346E-09	2.859E-09	2.482E-09
SSW	2.993E-08	2.072E-08	1.526E-08	9.498E-09	6.653E-09	5.007E-09	3.954E-09	3.231E-09	2.710E-09	2.319E-09	2.016E-09
SW	2.563E-08	1.800E-08	1.336E-08	8.405E-09	5.927E-09	4.483E-09	3.553E-09	2.913E-09	2.450E-09	2.101E-09	1.830E-09
WSW	2.229E-08	1.590E-08	1.191E-08	7.578E-09	5.384E-09	4.093E-09	3.258E-09	2.680E-09	2.260E-09	1.943E-09	1.697E-09
W	2.528E-08	1.812E-08	1.366E-08	8.782E-09	6.297E-09	4.825E-09	3.866E-09	3.199E-09	2.712E-09	2.342E-09	2.054E-09
WNW	2.328E-08	1.654E-08	1.244E-08	8.012E-09	5.772E-09	4.440E-09	3.569E-09	2.961E-09	2.515E-09	2.177E-09	1.912E-09
NW	2.378E-08	1.728E-08	1.313E-08	8.545E-09	6.177E-09	4.761E-09	3.832E-09	3.181E-09	2.704E-09	2.341E-09	2.056E-09
NNW	1.922E-08	1.457E-08	1.134E-08	7.563E-09	5.537E-09	4.303E-09	3.483E-09	2.904E-09	2.477E-09	2.150E-09	1.893E-09
N	5.061E-08	3.835E-08	2.983E-08	1.989E-08	1.456E-08	1.131E-08	9.148E-09	7.625E-09	6.499E-09	5.638E-09	4.961E-09
NNE	6.398E-08	4.769E-08	3.687E-08	2.450E-08	1.793E-08	1.393E-08	1.128E-08	9.413E-09	8.031E-09	6.974E-09	6.141E-09
NE	5.145E-08	3.831E-08	2.958E-08	1.962E-08	1.434E-08	1.113E-08	9.008E-09	7.512E-09	6.407E-09	5.562E-09	4.897E-09
ENE	2.713E-08	2.078E-08	1.637E-08	1.115E-08	8.300E-09	6.534E-09	5.346E-09	4.498E-09	3.866E-09	3.378E-09	2.992E-09
E	3.818E-08	3.112E-08	2.549E-08	1.825E-08	1.401E-08	1.128E-08	9.389E-09	8.010E-09	6.965E-09	6.146E-09	5.490E-09
ESE	4.180E-08	3.354E-08	2.737E-08	1.966E-08	1.522E-08	1.237E-08	1.039E-08	8.942E-09	7.839E-09	6.972E-09	6.273E-09
SE	3.358E-08	2.532E-08	1.988E-08	1.363E-08	1.028E-08	8.212E-09	6.817E-09	5.816E-09	5.066E-09	4.483E-09	4.017E-09
SSE	3.235E-08	2.250E-08	1.672E-08	1.064E-08	7.612E-09	5.835E-09	4.683E-09	3.884E-09	3.300E-09	2.858E-09	2.512E-09

0VENT AND BUILDING PARAMETERS:

RELEASE HEIGHT	(METERS)	71.30	REP. WIND HEIGHT	(METERS)	10.0
DIAMETER	(METERS)	1.95	BUILDING HEIGHT	(METERS)	46.1
EXIT VELOCITY	(METERS)	17.78	BLDG.MIN.CRS.SEC.AREA	(SQ.METERS)	3098.0
			HEAT EMISSION RATE	(CAL/SEC)	0.0

0AT THE RELEASE HEIGHT: / AT THE MEASURED WIND HEIGHT (10.0 METERS):

VENT RELEASE MODE	WIND SPEED (METERS/SEC)	/	VENT RELEASE MODE	WIND SPEED (METERS/SEC) STABLE CONDITIONS	WIND SPEED (METERS/SEC) UNSTABLE/NEUTRAL CONDITIONS
ELEVATED	LESS THAN 3.556	/	ELEVATED	LESS THAN 3.556	LESS THAN 3.556
MIXED	BETWEEN 3.556 AND 17.780	/	MIXED	BETWEEN 3.556 AND 17.780	BETWEEN 3.556 AND 17.780
GROUND LEVEL	ABOVE 17.780	/	GROUND LEVEL	ABOVE 17.780	ABOVE 17.780

Note: Directions are True North.

NAPS COL 2.0-11-A

Table 2.3-208 Long-Term χ/Q (sec/m^3) for Routine Releases at Distances Between 0.25 to 50 Miles, No Decay, Undepleted

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 7/ 8/2013
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT ONE - GROUND LEVEL RELEASE - NO PURGE RELEASES
NO DECAY, UNDEPLETED
0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	0.250	0.500	0.750	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500
S	8.557E-06	3.035E-06	1.618E-06	1.035E-06	5.561E-07	3.586E-07	2.555E-07	1.939E-07	1.538E-07	1.258E-07	1.055E-07
SSW	6.692E-06	2.387E-06	1.281E-06	8.219E-07	4.431E-07	2.864E-07	2.044E-07	1.553E-07	1.233E-07	1.010E-07	8.472E-08
SW	5.993E-06	2.128E-06	1.143E-06	7.348E-07	3.972E-07	2.571E-07	1.838E-07	1.399E-07	1.111E-07	9.113E-08	7.654E-08
WSW	5.628E-06	1.979E-06	1.062E-06	6.824E-07	3.695E-07	2.396E-07	1.715E-07	1.307E-07	1.039E-07	8.530E-08	7.169E-08
W	7.005E-06	2.408E-06	1.286E-06	8.272E-07	4.513E-07	2.943E-07	2.117E-07	1.619E-07	1.292E-07	1.063E-07	8.961E-08
WNW	6.098E-06	2.086E-06	1.117E-06	7.181E-07	3.907E-07	2.544E-07	1.828E-07	1.397E-07	1.115E-07	9.173E-08	7.729E-08
NW	6.083E-06	2.108E-06	1.143E-06	7.395E-07	4.052E-07	2.651E-07	1.912E-07	1.465E-07	1.172E-07	9.661E-08	8.154E-08
NNW	5.158E-06	1.787E-06	9.783E-07	6.369E-07	3.503E-07	2.297E-07	1.659E-07	1.274E-07	1.019E-07	8.414E-08	7.108E-08
N	1.311E-05	4.572E-06	2.516E-06	1.640E-06	8.999E-07	5.891E-07	4.249E-07	3.257E-07	2.605E-07	2.148E-07	1.813E-07
NNE	1.674E-05	5.775E-06	3.165E-06	2.064E-06	1.134E-06	7.425E-07	5.358E-07	4.109E-07	3.287E-07	2.711E-07	2.289E-07
NE	1.366E-05	4.720E-06	2.583E-06	1.683E-06	9.262E-07	6.076E-07	4.390E-07	3.370E-07	2.698E-07	2.227E-07	1.881E-07
ENE	8.564E-06	2.868E-06	1.566E-06	1.025E-06	5.709E-07	3.777E-07	2.747E-07	2.120E-07	1.705E-07	1.412E-07	1.197E-07
E	1.674E-05	5.376E-06	2.919E-06	1.921E-06	1.089E-06	7.297E-07	5.356E-07	4.165E-07	3.371E-07	2.808E-07	2.391E-07
ESE	2.574E-05	8.002E-06	4.182E-06	2.707E-06	1.560E-06	1.059E-06	7.848E-07	6.153E-07	5.012E-07	4.200E-07	3.595E-07
SE	1.829E-05	5.731E-06	2.952E-06	1.888E-06	1.080E-06	7.295E-07	5.392E-07	4.218E-07	3.430E-07	2.870E-07	2.453E-07
SSE	9.435E-06	3.165E-06	1.663E-06	1.062E-06	5.835E-07	3.829E-07	2.767E-07	2.126E-07	1.703E-07	1.406E-07	1.189E-07

0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	5.000	7.500	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	50.000
S	9.015E-08	4.946E-08	3.242E-08	1.799E-08	1.191E-08	8.665E-09	6.692E-09	5.384E-09	4.462E-09	3.783E-09	3.265E-09
SSW	7.245E-08	3.984E-08	2.616E-08	1.453E-08	9.620E-09	6.999E-09	5.404E-09	4.346E-09	3.601E-09	3.053E-09	2.634E-09
SW	6.551E-08	3.614E-08	2.379E-08	1.327E-08	8.809E-09	6.424E-09	4.969E-09	4.003E-09	3.321E-09	2.819E-09	2.435E-09
WSW	6.141E-08	3.400E-08	2.243E-08	1.256E-08	8.366E-09	6.116E-09	4.741E-09	3.827E-09	3.180E-09	2.703E-09	2.338E-09
W	7.695E-08	4.302E-08	2.860E-08	1.619E-08	1.087E-08	7.997E-09	6.232E-09	5.053E-09	4.217E-09	3.596E-09	3.121E-09
WNW	6.637E-08	3.714E-08	2.470E-08	1.401E-08	9.435E-09	6.957E-09	5.432E-09	4.410E-09	3.685E-09	3.146E-09	2.733E-09
NW	7.011E-08	3.938E-08	2.626E-08	1.493E-08	1.005E-08	7.411E-09	5.785E-09	4.695E-09	3.922E-09	3.347E-09	2.906E-09
NNW	6.116E-08	3.445E-08	2.302E-08	1.311E-08	8.831E-09	6.512E-09	5.083E-09	4.126E-09	3.445E-09	2.940E-09	2.553E-09
N	1.559E-07	8.755E-08	5.837E-08	3.315E-08	2.228E-08	1.640E-08	1.278E-08	1.036E-08	8.642E-09	7.367E-09	6.390E-09
NNE	1.969E-07	1.107E-07	7.388E-08	4.201E-08	2.827E-08	2.083E-08	1.625E-08	1.318E-08	1.100E-08	9.388E-09	8.147E-09
NE	1.618E-07	9.115E-08	6.089E-08	3.468E-08	2.336E-08	1.722E-08	1.344E-08	1.091E-08	9.112E-09	7.777E-09	6.751E-09
ENE	1.033E-07	5.889E-08	3.967E-08	2.286E-08	1.552E-08	1.152E-08	9.035E-09	7.365E-09	6.174E-09	5.287E-09	4.603E-09
E	2.072E-07	1.199E-07	8.167E-08	4.776E-08	3.276E-08	2.450E-08	1.934E-08	1.585E-08	1.335E-08	1.148E-08	1.003E-08
ESE	3.130E-07	1.843E-07	1.270E-07	7.556E-08	5.246E-08	3.960E-08	3.150E-08	2.599E-08	2.201E-08	1.902E-08	1.669E-08
SE	2.134E-07	1.253E-07	8.621E-08	5.120E-08	3.553E-08	2.681E-08	2.133E-08	1.760E-08	1.491E-08	1.288E-08	1.131E-08
SSE	1.024E-07	5.791E-08	3.884E-08	2.228E-08	1.512E-08	1.122E-08	8.804E-09	7.181E-09	6.023E-09	5.162E-09	4.498E-09

0VENT AND BUILDING PARAMETERS:

RELEASE HEIGHT	(METERS)	0.00	REF. WIND HEIGHT	(METERS)	10.0
DIAMETER	(METERS)	0.00	BUILDING HEIGHT	(METERS)	46.1
EXIT VELOCITY	(METERS)	0.00	BLDG.MIN.CRS.SEC.AREA	(SQ.METERS)	3098.0
			HEAT EMISSION RATE	(CAL/SEC)	0.0

0ALL GROUND LEVEL RELEASES.

Note: Directions are True North. The results on this page are applicable to releases from the RW-VS.

NAPS COL 2.0-11-A

Table 2.3-209 Long-Term χ/Q (sec/m^3) for Routine Releases Along Various Distance Segments, No Decay, Undepleted

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT RB - MIXED MODE RELEASE - NO PURGE RELEASES
NO DECAY, UNDEPLETED
0CHI/Q (SEC/METER CUBED) FOR EACH SEGMENT

	SEGMENT BOUNDARIES IN MILES FROM THE SITE									
DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	7.027E-08	8.119E-08	7.326E-08	5.942E-08	4.824E-08	2.849E-08	1.261E-08	6.515E-09	4.166E-09	2.975E-09
SSW	3.625E-08	5.187E-08	5.139E-08	4.348E-08	3.617E-08	2.203E-08	1.004E-08	5.253E-09	3.376E-09	2.417E-09
SW	2.756E-08	4.209E-08	4.306E-08	3.703E-08	3.112E-08	1.925E-08	8.929E-09	4.726E-09	3.058E-09	2.200E-09
WSW	2.590E-08	3.616E-08	3.651E-08	3.171E-08	2.694E-08	1.700E-08	8.069E-09	4.335E-09	2.828E-09	2.045E-09
W	3.140E-08	4.185E-08	4.188E-08	3.633E-08	3.090E-08	1.965E-08	9.493E-09	5.193E-09	3.432E-09	2.508E-09
WNW	3.756E-08	4.352E-08	4.144E-08	3.511E-08	2.941E-08	1.835E-08	8.746E-09	4.784E-09	3.169E-09	2.320E-09
NW	2.241E-08	3.752E-08	4.093E-08	3.616E-08	3.083E-08	1.952E-08	9.404E-09	5.155E-09	3.415E-09	2.499E-09
NNW	1.658E-08	2.648E-08	3.114E-08	2.885E-08	2.532E-08	1.670E-08	8.366E-09	4.672E-09	3.118E-09	2.291E-09
N	4.353E-08	7.093E-08	8.278E-08	7.642E-08	6.694E-08	4.404E-08	2.199E-08	1.225E-08	8.155E-09	5.983E-09
NNE	7.800E-08	1.021E-07	1.092E-07	9.783E-08	8.453E-08	5.491E-08	2.724E-08	1.518E-08	1.013E-08	7.447E-09
NE	5.525E-08	8.047E-08	8.752E-08	7.859E-08	6.794E-08	4.409E-08	2.184E-08	1.216E-08	8.112E-09	5.963E-09
ENE	3.139E-08	4.157E-08	4.567E-08	4.183E-08	3.676E-08	2.462E-08	1.272E-08	7.309E-09	4.968E-09	3.701E-09
E	3.019E-08	4.905E-08	6.094E-08	5.962E-08	5.463E-08	3.910E-08	2.179E-08	1.315E-08	9.195E-09	6.983E-09
ESE	4.543E-08	6.008E-08	6.876E-08	6.541E-08	5.927E-08	4.239E-08	2.417E-08	1.508E-08	1.083E-08	8.397E-09
SE	6.248E-08	5.862E-08	5.695E-08	5.053E-08	4.404E-08	2.983E-08	1.612E-08	9.797E-09	6.962E-09	5.374E-09
SSE	6.768E-08	6.592E-08	5.862E-08	4.835E-08	3.995E-08	2.456E-08	1.160E-08	6.353E-09	4.231E-09	3.117E-09

0AVERAGE EFFECTIVE STACK HEIGHT IN METERS FOR EACH SEGMENT

DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	1.039E+02	1.039E+02	1.039E+02	1.039E+02	1.039E+02	1.039E+02	1.039E+02	1.039E+02	1.039E+02	1.039E+02
SSW	1.091E+02	1.091E+02	1.091E+02	1.091E+02	1.091E+02	1.091E+02	1.091E+02	1.091E+02	1.091E+02	1.091E+02
SW	1.111E+02	1.111E+02	1.111E+02	1.111E+02	1.111E+02	1.111E+02	1.111E+02	1.111E+02	1.111E+02	1.111E+02
WSW	1.144E+02	1.144E+02	1.144E+02	1.144E+02	1.144E+02	1.144E+02	1.144E+02	1.144E+02	1.144E+02	1.144E+02
W	1.138E+02	1.139E+02	1.139E+02	1.139E+02	1.139E+02	1.139E+02	1.139E+02	1.139E+02	1.139E+02	1.139E+02
WNW	1.100E+02	1.100E+02	1.100E+02	1.100E+02	1.100E+02	1.100E+02	1.100E+02	1.100E+02	1.100E+02	1.100E+02
NW	1.061E+02	1.061E+02	1.061E+02	1.061E+02	1.061E+02	1.061E+02	1.061E+02	1.061E+02	1.061E+02	1.061E+02
NNW	1.090E+02	1.090E+02	1.090E+02	1.090E+02	1.090E+02	1.090E+02	1.090E+02	1.090E+02	1.090E+02	1.090E+02
N	1.069E+02	1.069E+02	1.069E+02	1.069E+02	1.069E+02	1.069E+02	1.069E+02	1.069E+02	1.069E+02	1.069E+02
NNE	1.023E+02	1.023E+02	1.023E+02	1.023E+02	1.023E+02	1.023E+02	1.023E+02	1.023E+02	1.023E+02	1.023E+02
NE	1.005E+02	1.005E+02	1.005E+02	1.005E+02	1.005E+02	1.005E+02	1.005E+02	1.005E+02	1.005E+02	1.005E+02
ENE	9.853E+01	9.854E+01	9.854E+01	9.854E+01	9.854E+01	9.854E+01	9.854E+01	9.854E+01	9.854E+01	9.854E+01
E	9.598E+01	9.599E+01	9.599E+01	9.599E+01	9.599E+01	9.599E+01	9.599E+01	9.599E+01	9.599E+01	9.599E+01
ESE	9.461E+01	9.461E+01	9.461E+01	9.461E+01	9.461E+01	9.461E+01	9.461E+01	9.461E+01	9.461E+01	9.461E+01
SE	1.016E+02	1.016E+02	1.016E+02	1.016E+02	1.016E+02	1.016E+02	1.016E+02	1.016E+02	1.016E+02	1.016E+02
SSE	1.050E+02	1.050E+02	1.050E+02	1.050E+02	1.050E+02	1.050E+02	1.050E+02	1.050E+02	1.050E+02	1.050E+02

Note: Directions are True North.

NAPS COL 2.0-11-A

Table 2.3-209 Long-Term χ/Q (sec/m^3) for Routine Releases Along Various Distance Segments, No Decay, Undepleted

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT TB - MIXED MODE RELEASE - NO PURGE RELEASES
NO DECAY, UNDEPLETED
0CHI/Q (SEC/METER CUBED) FOR EACH SEGMENT

	SEGMENT BOUNDARIES IN MILES FROM THE SITE									
DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	5.244E-08	6.163E-08	6.087E-08	5.207E-08	4.352E-08	2.651E-08	1.202E-08	6.255E-09	4.008E-09	2.864E-09
SSW	2.619E-08	3.834E-08	4.196E-08	3.763E-08	3.229E-08	2.034E-08	9.513E-09	5.025E-09	3.239E-09	2.322E-09
SW	2.002E-08	3.086E-08	3.479E-08	3.174E-08	2.754E-08	1.763E-08	8.405E-09	4.496E-09	2.920E-09	2.104E-09
WSW	1.941E-08	2.685E-08	2.957E-08	2.721E-08	2.384E-08	1.555E-08	7.566E-09	4.103E-09	2.686E-09	1.946E-09
W	2.431E-08	3.132E-08	3.380E-08	3.089E-08	2.704E-08	1.773E-08	8.760E-09	4.834E-09	3.204E-09	2.345E-09
WNW	3.056E-08	3.279E-08	3.258E-08	2.896E-08	2.500E-08	1.621E-08	8.000E-09	4.447E-09	2.965E-09	2.179E-09
NW	1.663E-08	2.532E-08	3.009E-08	2.849E-08	2.531E-08	1.688E-08	8.512E-09	4.767E-09	3.185E-09	2.343E-09
NNW	1.292E-08	1.673E-08	2.166E-08	2.184E-08	2.016E-08	1.417E-08	7.502E-09	4.304E-09	2.907E-09	2.152E-09
N	3.324E-08	4.447E-08	5.725E-08	5.760E-08	5.311E-08	3.729E-08	1.973E-08	1.131E-08	7.631E-09	5.643E-09
NNE	6.034E-08	6.788E-08	7.800E-08	7.495E-08	6.762E-08	4.650E-08	2.433E-08	1.394E-08	9.420E-09	6.979E-09
NE	4.076E-08	5.237E-08	6.220E-08	6.015E-08	5.436E-08	3.735E-08	1.949E-08	1.114E-08	7.519E-09	5.566E-09
ENE	2.389E-08	2.672E-08	3.159E-08	3.103E-08	2.847E-08	2.023E-08	1.104E-08	6.530E-09	4.500E-09	3.380E-09
E	2.254E-08	2.877E-08	3.873E-08	4.091E-08	3.934E-08	3.019E-08	1.798E-08	1.125E-08	8.006E-09	6.146E-09
ESE	3.522E-08	3.796E-08	4.562E-08	4.608E-08	4.337E-08	3.263E-08	1.940E-08	1.234E-08	8.935E-09	6.970E-09
SE	5.170E-08	4.278E-08	4.276E-08	3.966E-08	3.551E-08	2.474E-08	1.353E-08	8.206E-09	5.816E-09	4.483E-09
SSE	5.416E-08	5.079E-08	4.777E-08	4.123E-08	3.498E-08	2.212E-08	1.065E-08	5.848E-09	3.890E-09	2.861E-09

0AVERAGE EFFECTIVE STACK HEIGHT IN METERS FOR EACH SEGMENT

DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	1.130E+02	1.131E+02	1.131E+02	1.131E+02	1.131E+02	1.131E+02	1.131E+02	1.131E+02	1.131E+02	1.131E+02
SSW	1.174E+02	1.174E+02	1.174E+02	1.174E+02	1.174E+02	1.174E+02	1.174E+02	1.174E+02	1.174E+02	1.174E+02
SW	1.190E+02	1.190E+02	1.190E+02	1.190E+02	1.190E+02	1.190E+02	1.190E+02	1.190E+02	1.190E+02	1.190E+02
WSW	1.217E+02	1.217E+02	1.217E+02	1.217E+02	1.217E+02	1.217E+02	1.217E+02	1.217E+02	1.217E+02	1.217E+02
W	1.214E+02	1.214E+02	1.214E+02	1.214E+02	1.214E+02	1.214E+02	1.214E+02	1.214E+02	1.214E+02	1.214E+02
WNW	1.184E+02	1.184E+02	1.184E+02	1.184E+02	1.184E+02	1.184E+02	1.184E+02	1.184E+02	1.184E+02	1.184E+02
NW	1.155E+02	1.155E+02	1.155E+02	1.155E+02	1.155E+02	1.155E+02	1.155E+02	1.155E+02	1.155E+02	1.155E+02
NNW	1.180E+02	1.180E+02	1.180E+02	1.180E+02	1.180E+02	1.180E+02	1.180E+02	1.180E+02	1.180E+02	1.180E+02
N	1.163E+02	1.163E+02	1.163E+02	1.163E+02	1.163E+02	1.163E+02	1.163E+02	1.163E+02	1.163E+02	1.163E+02
NNE	1.124E+02	1.124E+02	1.124E+02	1.124E+02	1.124E+02	1.124E+02	1.124E+02	1.124E+02	1.124E+02	1.124E+02
NE	1.110E+02	1.110E+02	1.110E+02	1.110E+02	1.110E+02	1.110E+02	1.110E+02	1.110E+02	1.110E+02	1.110E+02
ENE	1.094E+02	1.094E+02	1.094E+02	1.094E+02	1.094E+02	1.094E+02	1.094E+02	1.094E+02	1.094E+02	1.094E+02
E	1.077E+02	1.077E+02	1.077E+02	1.077E+02	1.077E+02	1.077E+02	1.077E+02	1.077E+02	1.077E+02	1.077E+02
ESE	1.065E+02	1.065E+02	1.065E+02	1.065E+02	1.065E+02	1.065E+02	1.065E+02	1.065E+02	1.065E+02	1.065E+02
SE	1.118E+02	1.118E+02	1.118E+02	1.118E+02	1.118E+02	1.118E+02	1.118E+02	1.118E+02	1.118E+02	1.118E+02
SSE	1.141E+02	1.141E+02	1.141E+02	1.141E+02	1.141E+02	1.141E+02	1.141E+02	1.141E+02	1.141E+02	1.141E+02

Note: Directions are True North.

NAPS COL 2.0-11-A

Table 2.3-209 Long-Term χ/Q (sec/m^3) for Routine Releases Along Various Distance Segments, No Decay, Undepleted

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 7/ 8/2013
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT ONE - GROUND LEVEL RELEASE - NO PURGE RELEASES
NO DECAY, UNDEPLETED
0CHI/Q (SEC/METER CUBED) FOR EACH SEGMENT

	SEGMENT BOUNDARIES IN MILES FROM THE SITE									
DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	1.674E-06	5.747E-07	2.584E-07	1.546E-07	1.058E-07	5.093E-08	1.850E-08	8.741E-09	5.406E-09	3.792E-09
SSW	1.323E-06	4.576E-07	2.066E-07	1.239E-07	8.500E-08	4.101E-08	1.493E-08	7.060E-09	4.365E-09	3.060E-09
SW	1.181E-06	4.100E-07	1.858E-07	1.117E-07	7.678E-08	3.718E-08	1.363E-08	6.478E-09	4.019E-09	2.825E-09
WSW	1.097E-06	3.813E-07	1.733E-07	1.045E-07	7.191E-08	3.495E-08	1.289E-08	6.166E-09	3.842E-09	2.709E-09
W	1.331E-06	4.651E-07	2.138E-07	1.298E-07	8.988E-08	4.415E-08	1.658E-08	8.057E-09	5.071E-09	3.604E-09
WNW	1.155E-06	4.029E-07	1.847E-07	1.120E-07	7.752E-08	3.811E-08	1.435E-08	7.008E-09	4.426E-09	3.153E-09
NW	1.178E-06	4.172E-07	1.930E-07	1.177E-07	8.177E-08	4.038E-08	1.528E-08	7.465E-09	4.712E-09	3.354E-09
NNW	1.006E-06	3.604E-07	1.675E-07	1.024E-07	7.127E-08	3.530E-08	1.341E-08	6.558E-09	4.140E-09	2.946E-09
N	2.583E-06	9.262E-07	4.290E-07	2.617E-07	1.818E-07	8.977E-08	3.392E-08	1.652E-08	1.040E-08	7.383E-09
NNE	3.256E-06	1.166E-06	5.410E-07	3.303E-07	2.296E-07	1.135E-07	4.299E-08	2.098E-08	1.323E-08	9.407E-09
NE	2.658E-06	9.528E-07	4.432E-07	2.710E-07	1.886E-07	9.341E-08	3.547E-08	1.735E-08	1.095E-08	7.793E-09
ENE	1.615E-06	5.860E-07	2.771E-07	1.712E-07	1.200E-07	6.023E-08	2.333E-08	1.159E-08	7.389E-09	5.296E-09
E	3.022E-06	1.114E-06	5.397E-07	3.383E-07	2.397E-07	1.223E-07	4.863E-08	2.464E-08	1.590E-08	1.149E-08
ESE	4.375E-06	1.592E-06	7.900E-07	5.029E-07	3.602E-07	1.874E-07	7.673E-08	3.979E-08	2.605E-08	1.904E-08
SE	3.097E-06	1.104E-06	5.430E-07	3.442E-07	2.458E-07	1.275E-07	5.201E-08	2.694E-08	1.764E-08	1.290E-08
SSE	1.730E-06	6.008E-07	2.794E-07	1.711E-07	1.192E-07	5.931E-08	2.278E-08	1.129E-08	7.204E-09	5.171E-09

Note: Directions are True North. The results on this page are applicable to releases from the RW-VS.

NAPS COL 2.0-11-A

Table 2.3-210 Long-Term χ/Q (sec/m^3) for Routine Releases at Distances Between 0.25 to 50 Miles, 2.260 Day Decay, Undepleted

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT RB - MIXED MODE RELEASE - NO PURGE RELEASES
2.260 DAY DECAY, UNDEPLETED

0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	0.250	0.500	0.750	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500
S	1.215E-07	6.844E-08	6.524E-08	7.472E-08	8.453E-08	8.122E-08	7.390E-08	6.619E-08	5.915E-08	5.299E-08	4.769E-08
SSW	5.448E-08	3.117E-08	3.226E-08	4.163E-08	5.383E-08	5.501E-08	5.188E-08	4.759E-08	4.327E-08	3.928E-08	3.571E-08
SW	4.106E-08	2.330E-08	2.407E-08	3.220E-08	4.356E-08	4.548E-08	4.345E-08	4.022E-08	3.682E-08	3.361E-08	3.070E-08
WSW	3.445E-08	2.252E-08	2.353E-08	2.925E-08	3.721E-08	3.842E-08	3.677E-08	3.422E-08	3.151E-08	2.892E-08	2.655E-08
W	4.656E-08	2.967E-08	2.839E-08	3.437E-08	4.309E-08	4.418E-08	4.215E-08	3.919E-08	3.609E-08	3.314E-08	3.045E-08
WNW	4.674E-08	3.789E-08	3.538E-08	3.883E-08	4.469E-08	4.447E-08	4.169E-08	3.825E-08	3.485E-08	3.173E-08	2.895E-08
NW	2.897E-08	2.010E-08	1.908E-08	2.594E-08	3.845E-08	4.213E-08	4.131E-08	3.884E-08	3.593E-08	3.304E-08	3.036E-08
NNW	3.066E-08	1.994E-08	1.379E-08	1.690E-08	2.658E-08	3.078E-08	3.134E-08	3.028E-08	2.859E-08	2.671E-08	2.485E-08
N	8.464E-08	4.913E-08	3.651E-08	4.575E-08	7.132E-08	8.212E-08	8.336E-08	8.037E-08	7.576E-08	7.071E-08	6.574E-08
NNE	1.494E-07	8.904E-08	6.976E-08	7.831E-08	1.034E-07	1.117E-07	1.099E-07	1.041E-07	9.707E-08	8.990E-08	8.312E-08
NE	1.070E-07	5.717E-08	4.866E-08	5.900E-08	8.171E-08	8.926E-08	8.817E-08	8.365E-08	7.802E-08	7.229E-08	6.685E-08
ENE	7.393E-08	3.688E-08	2.780E-08	3.120E-08	4.185E-08	4.598E-08	4.592E-08	4.403E-08	4.147E-08	3.875E-08	3.611E-08
E	8.167E-08	3.657E-08	2.528E-08	3.054E-08	4.840E-08	5.798E-08	6.112E-08	6.087E-08	5.900E-08	5.641E-08	5.356E-08
ESE	1.130E-07	5.562E-08	4.024E-08	4.404E-08	5.982E-08	6.741E-08	6.895E-08	6.751E-08	6.475E-08	6.149E-08	5.814E-08
SE	1.522E-07	8.396E-08	5.807E-08	5.479E-08	5.909E-08	5.946E-08	5.710E-08	5.370E-08	5.006E-08	4.653E-08	4.324E-08
SSE	1.199E-07	7.844E-08	6.409E-08	6.472E-08	6.778E-08	6.447E-08	5.895E-08	5.325E-08	4.802E-08	4.340E-08	3.937E-08

0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	5.000	7.500	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	50.000
S	4.314E-08	2.803E-08	1.991E-08	1.185E-08	8.047E-09	5.896E-09	4.543E-09	3.627E-09	2.975E-09	2.490E-09	2.119E-09
SSW	3.258E-08	2.170E-08	1.561E-08	9.408E-09	6.415E-09	4.709E-09	3.631E-09	2.900E-09	2.377E-09	1.988E-09	1.690E-09
SW	2.810E-08	1.896E-08	1.373E-08	8.344E-09	5.717E-09	4.210E-09	3.253E-09	2.601E-09	2.135E-09	1.787E-09	1.520E-09
WSW	2.442E-08	1.674E-08	1.225E-08	7.522E-09	5.187E-09	3.835E-09	2.972E-09	2.381E-09	1.957E-09	1.640E-09	1.396E-09
W	2.804E-08	1.936E-08	1.426E-08	8.857E-09	6.165E-09	4.594E-09	3.583E-09	2.888E-09	2.384E-09	2.007E-09	1.715E-09
WNW	2.652E-08	1.802E-08	1.318E-08	8.154E-09	5.684E-09	4.244E-09	3.317E-09	2.679E-09	2.217E-09	1.869E-09	1.600E-09
NW	2.794E-08	1.921E-08	1.412E-08	8.781E-09	6.127E-09	4.577E-09	3.579E-09	2.891E-09	2.392E-09	2.018E-09	1.727E-09
NNW	2.311E-08	1.641E-08	1.227E-08	7.750E-09	5.441E-09	4.076E-09	3.190E-09	2.576E-09	2.130E-09	1.794E-09	1.533E-09
N	6.108E-08	4.329E-08	3.233E-08	2.039E-08	1.430E-08	1.070E-08	8.372E-09	6.757E-09	5.584E-09	4.701E-09	4.017E-09
NNE	7.693E-08	5.401E-08	4.022E-08	2.535E-08	1.781E-08	1.336E-08	1.047E-08	8.466E-09	7.011E-09	5.913E-09	5.062E-09
NE	6.187E-08	4.340E-08	3.230E-08	2.036E-08	1.430E-08	1.073E-08	8.414E-09	6.808E-09	5.642E-09	4.762E-09	4.079E-09
ENE	3.364E-08	2.422E-08	1.834E-08	1.182E-08	8.422E-09	6.382E-09	5.042E-09	4.103E-09	3.415E-09	2.893E-09	2.485E-09
E	5.070E-08	3.849E-08	3.012E-08	2.022E-08	1.477E-08	1.140E-08	9.126E-09	7.507E-09	6.303E-09	5.377E-09	4.648E-09
ESE	5.489E-08	4.166E-08	3.283E-08	2.244E-08	1.669E-08	1.308E-08	1.062E-08	8.837E-09	7.498E-09	6.457E-09	5.628E-09
SE	4.028E-08	2.927E-08	2.250E-08	1.497E-08	1.098E-08	8.532E-09	6.888E-09	5.714E-09	4.837E-09	4.159E-09	3.621E-09
SSE	3.591E-08	2.411E-08	1.754E-08	1.082E-08	7.546E-09	5.644E-09	4.422E-09	3.580E-09	2.970E-09	2.510E-09	2.154E-09

0VENT AND BUILDING PARAMETERS:

RELEASE HEIGHT	(METERS)	52.77	REF. WIND HEIGHT	(METERS)	10.0
DIAMETER	(METERS)	2.40	BUILDING HEIGHT	(METERS)	46.1
EXIT VELOCITY	(METERS)	17.78	BLDG.MIN.CRS.SEC.AREA	(SQ.METERS)	3098.0
			HEAT EMISSION RATE	(CAL/SEC)	0.0

0AT THE RELEASE HEIGHT: / AT THE MEASURED WIND HEIGHT (10.0 METERS):

VENT RELEASE MODE	WIND SPEED (METERS/SEC)	/	VENT RELEASE MODE	WIND SPEED (METERS/SEC) STABLE CONDITIONS	WIND SPEED (METERS/SEC) UNSTABLE/NEUTRAL CONDITIONS
ELEVATED	LESS THAN 3.556	/	ELEVATED	LESS THAN 3.556	LESS THAN 3.556
MIXED	BETWEEN 3.556 AND 17.780	/	MIXED	BETWEEN 3.556 AND 17.780	BETWEEN 3.556 AND 17.780
GROUND LEVEL	ABOVE 17.780	/	GROUND LEVEL	ABOVE 17.780	ABOVE 17.780

Note: Directions are True North.

NAPS COL 2.0-11-A

Table 2.3-210 Long-Term χ/Q (sec/m^3) for Routine Releases at Distances Between 0.25 to 50 Miles, 2.260 Day Decay, Undepleted

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT TB - MIXED MODE RELEASE - NO PURGE RELEASES
2.260 DAY DECAY, UNDEPLETED

0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	0.250	0.500	0.750	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500
S	1.147E-07	5.906E-08	4.779E-08	5.244E-08	6.308E-08	6.462E-08	6.150E-08	5.682E-08	5.191E-08	4.727E-08	4.306E-08
SSW	5.195E-08	2.726E-08	2.297E-08	2.798E-08	3.888E-08	4.275E-08	4.240E-08	4.026E-08	3.750E-08	3.464E-08	3.192E-08
SW	3.865E-08	2.067E-08	1.735E-08	2.161E-08	3.114E-08	3.495E-08	3.513E-08	3.368E-08	3.161E-08	2.937E-08	2.719E-08
WSW	3.220E-08	1.972E-08	1.767E-08	2.048E-08	2.697E-08	2.966E-08	2.980E-08	2.870E-08	2.707E-08	2.529E-08	2.351E-08
W	4.364E-08	2.683E-08	2.204E-08	2.464E-08	3.153E-08	3.415E-08	3.404E-08	3.264E-08	3.073E-08	2.867E-08	2.666E-08
WNW	4.285E-08	3.373E-08	2.932E-08	2.974E-08	3.298E-08	3.378E-08	3.276E-08	3.090E-08	2.878E-08	2.665E-08	2.464E-08
NW	2.610E-08	1.806E-08	1.482E-08	1.719E-08	2.503E-08	2.927E-08	3.034E-08	2.972E-08	2.834E-08	2.668E-08	2.496E-08
NNW	2.766E-08	1.880E-08	1.147E-08	1.100E-08	1.596E-08	1.993E-08	2.175E-08	2.211E-08	2.167E-08	2.083E-08	1.981E-08
N	7.517E-08	4.557E-08	2.985E-08	2.945E-08	4.247E-08	5.282E-08	5.750E-08	5.839E-08	5.718E-08	5.492E-08	5.221E-08
NNE	1.329E-07	7.992E-08	5.602E-08	5.354E-08	6.623E-08	7.548E-08	7.841E-08	7.743E-08	7.447E-08	7.065E-08	6.658E-08
NE	9.702E-08	5.061E-08	3.728E-08	3.830E-08	5.114E-08	5.971E-08	6.258E-08	6.205E-08	5.980E-08	5.680E-08	5.356E-08
ENE	6.620E-08	3.333E-08	2.186E-08	2.061E-08	2.589E-08	3.006E-08	3.171E-08	3.170E-08	3.080E-08	2.949E-08	2.801E-08
E	7.216E-08	3.338E-08	2.006E-08	1.890E-08	2.706E-08	3.455E-08	3.871E-08	4.037E-08	4.051E-08	3.979E-08	3.860E-08
ESE	1.009E-07	5.025E-08	3.236E-08	2.971E-08	3.651E-08	4.268E-08	4.564E-08	4.631E-08	4.566E-08	4.429E-08	4.259E-08
SE	1.348E-07	7.561E-08	4.865E-08	4.181E-08	4.218E-08	4.324E-08	4.282E-08	4.135E-08	3.934E-08	3.713E-08	3.492E-08
SSE	1.092E-07	6.862E-08	5.119E-08	4.894E-08	5.138E-08	5.077E-08	4.806E-08	4.458E-08	4.100E-08	3.761E-08	3.451E-08

0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	5.000	7.500	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	50.000
S	3.932E-08	2.622E-08	1.884E-08	1.132E-08	7.721E-09	5.670E-09	4.375E-09	3.497E-09	2.870E-09	2.404E-09	2.047E-09
SSW	2.941E-08	2.015E-08	1.467E-08	8.940E-09	6.127E-09	4.512E-09	3.486E-09	2.787E-09	2.287E-09	1.915E-09	1.629E-09
SW	2.516E-08	1.746E-08	1.282E-08	7.880E-09	5.430E-09	4.012E-09	3.108E-09	2.489E-09	2.045E-09	1.714E-09	1.459E-09
WSW	2.185E-08	1.539E-08	1.139E-08	7.074E-09	4.904E-09	3.637E-09	2.824E-09	2.267E-09	1.865E-09	1.564E-09	1.333E-09
W	2.478E-08	1.755E-08	1.307E-08	8.198E-09	5.735E-09	4.286E-09	3.350E-09	2.704E-09	2.235E-09	1.883E-09	1.610E-09
WNW	2.282E-08	1.602E-08	1.190E-08	7.488E-09	5.266E-09	3.954E-09	3.103E-09	2.513E-09	2.084E-09	1.761E-09	1.510E-09
NW	2.330E-08	1.673E-08	1.257E-08	7.987E-09	5.638E-09	4.242E-09	3.334E-09	2.703E-09	2.244E-09	1.897E-09	1.627E-09
NNW	1.875E-08	1.403E-08	1.076E-08	6.986E-09	4.976E-09	3.763E-09	2.964E-09	2.406E-09	1.997E-09	1.687E-09	1.446E-09
N	4.939E-08	3.693E-08	2.834E-08	1.839E-08	1.310E-08	9.908E-09	7.805E-09	6.334E-09	5.257E-09	4.442E-09	3.806E-09
NNE	6.258E-08	4.606E-08	3.515E-08	2.276E-08	1.623E-08	1.229E-08	9.702E-09	7.890E-09	6.562E-09	5.555E-09	4.769E-09
NE	5.035E-08	3.703E-08	2.824E-08	1.826E-08	1.301E-08	9.851E-09	7.775E-09	6.324E-09	5.261E-09	4.455E-09	3.827E-09
ENE	2.651E-08	2.002E-08	1.556E-08	1.032E-08	7.469E-09	5.720E-09	4.553E-09	3.727E-09	3.117E-09	2.650E-09	2.284E-09
E	3.719E-08	2.988E-08	2.413E-08	1.677E-08	1.251E-08	9.778E-09	7.905E-09	6.552E-09	5.534E-09	4.745E-09	4.118E-09
ESE	4.077E-08	3.225E-08	2.594E-08	1.810E-08	1.361E-08	1.074E-08	8.760E-09	7.322E-09	6.234E-09	5.384E-09	4.705E-09
SE	3.282E-08	2.441E-08	1.890E-08	1.260E-08	9.240E-09	7.173E-09	5.787E-09	4.798E-09	4.061E-09	3.493E-09	3.042E-09
SSE	3.175E-08	2.183E-08	1.604E-08	9.965E-09	6.964E-09	5.212E-09	4.084E-09	3.306E-09	2.742E-09	2.318E-09	1.989E-09

0VENT AND BUILDING PARAMETERS:

RELEASE HEIGHT	(METERS)	71.30	REP. WIND HEIGHT	(METERS)	10.0
DIAMETER	(METERS)	1.95	BUILDING HEIGHT	(METERS)	46.1
EXIT VELOCITY	(METERS)	17.78	BLDG.MIN.CRS.SEC.AREA	(SQ.METERS)	3098.0
			HEAT EMISSION RATE	(CAL/SEC)	0.0

0AT THE RELEASE HEIGHT:

VENT RELEASE MODE	WIND SPEED (METERS/SEC)	
ELEVATED	LESS THAN	3.556
MIXED	BETWEEN	3.556 AND 17.780
GROUND LEVEL	ABOVE	17.780

AT THE MEASURED WIND HEIGHT (10.0 METERS):

VENT RELEASE MODE	WIND SPEED (METERS/SEC) STABLE CONDITIONS			WIND SPEED (METERS/SEC) UNSTABLE/NEUTRAL CONDITIONS		
ELEVATED	LESS THAN	3.556		LESS THAN	3.556	
MIXED	BETWEEN	3.556 AND	17.780	BETWEEN	3.556 AND	17.780
GROUND LEVEL	ABOVE	17.780		ABOVE	17.780	

Note: Directions are True North.

NAPS COL 2.0-11-A

Table 2.3-210 Long-Term χ/Q (sec/m^3) for Routine Releases at Distances Between 0.25 to 50 Miles, 2.260 Day Decay, Undepleted

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 7/ 8/2013
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT ONE - GROUND LEVEL RELEASE - NO PURGE RELEASES
2.260 DAY DECAY, UNDEPLETED

0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	0.250	0.500	0.750	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500
S	8.548E-06	3.029E-06	1.613E-06	1.031E-06	5.527E-07	3.556E-07	2.528E-07	1.915E-07	1.515E-07	1.237E-07	1.035E-07
SSW	6.685E-06	2.381E-06	1.276E-06	8.183E-07	4.402E-07	2.838E-07	2.021E-07	1.532E-07	1.213E-07	9.914E-08	8.299E-08
SW	5.986E-06	2.123E-06	1.139E-06	7.314E-07	3.944E-07	2.547E-07	1.816E-07	1.379E-07	1.093E-07	8.938E-08	7.488E-08
WSW	5.620E-06	1.974E-06	1.058E-06	6.790E-07	3.667E-07	2.372E-07	1.693E-07	1.287E-07	1.021E-07	8.355E-08	7.004E-08
W	6.996E-06	2.402E-06	1.281E-06	8.230E-07	4.478E-07	2.913E-07	2.089E-07	1.593E-07	1.268E-07	1.041E-07	8.749E-08
WNW	6.090E-06	2.081E-06	1.112E-06	7.145E-07	3.878E-07	2.519E-07	1.805E-07	1.376E-07	1.095E-07	8.986E-08	7.552E-08
NW	6.075E-06	2.103E-06	1.138E-06	7.358E-07	4.022E-07	2.625E-07	1.888E-07	1.443E-07	1.151E-07	9.466E-08	7.969E-08
NNW	5.151E-06	1.782E-06	9.742E-07	6.333E-07	3.473E-07	2.271E-07	1.636E-07	1.252E-07	9.994E-08	8.224E-08	6.928E-08
N	1.309E-05	4.559E-06	2.505E-06	1.631E-06	8.925E-07	5.826E-07	4.190E-07	3.203E-07	2.554E-07	2.100E-07	1.768E-07
NNE	1.672E-05	5.760E-06	3.153E-06	2.053E-06	1.125E-06	7.347E-07	5.287E-07	4.044E-07	3.226E-07	2.654E-07	2.234E-07
NE	1.364E-05	4.708E-06	2.573E-06	1.674E-06	9.190E-07	6.013E-07	4.333E-07	3.317E-07	2.649E-07	2.180E-07	1.837E-07
ENE	8.552E-06	2.860E-06	1.559E-06	1.019E-06	5.660E-07	3.734E-07	2.707E-07	2.083E-07	1.670E-07	1.380E-07	1.166E-07
E	1.671E-05	5.360E-06	2.906E-06	1.909E-06	1.079E-06	7.206E-07	5.273E-07	4.088E-07	3.298E-07	2.739E-07	2.325E-07
ESE	2.570E-05	7.976E-06	4.162E-06	2.690E-06	1.545E-06	1.045E-06	7.722E-07	6.033E-07	4.899E-07	4.091E-07	3.491E-07
SE	1.826E-05	5.713E-06	2.938E-06	1.876E-06	1.069E-06	7.203E-07	5.306E-07	4.137E-07	3.353E-07	2.796E-07	2.383E-07
SSE	9.423E-06	3.157E-06	1.657E-06	1.057E-06	5.790E-07	3.789E-07	2.731E-07	2.092E-07	1.671E-07	1.376E-07	1.160E-07

0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	5.000	7.500	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	50.000
S	8.824E-08	4.788E-08	3.104E-08	1.684E-08	1.090E-08	7.753E-09	5.854E-09	4.605E-09	3.732E-09	3.094E-09	2.612E-09
SSW	7.080E-08	3.847E-08	2.496E-08	1.354E-08	8.750E-09	6.215E-09	4.685E-09	3.680E-09	2.977E-09	2.464E-09	2.077E-09
SW	6.393E-08	3.483E-08	2.264E-08	1.231E-08	7.970E-09	5.666E-09	4.274E-09	3.357E-09	2.716E-09	2.248E-09	1.894E-09
WSW	5.983E-08	3.268E-08	2.128E-08	1.160E-08	7.521E-09	5.353E-09	4.040E-09	3.175E-09	2.569E-09	2.127E-09	1.792E-09
W	7.492E-08	4.132E-08	2.709E-08	1.492E-08	9.740E-09	6.971E-09	5.285E-09	4.169E-09	3.385E-09	2.809E-09	2.373E-09
WNW	6.468E-08	3.572E-08	2.345E-08	1.295E-08	8.492E-09	6.099E-09	4.638E-09	3.669E-09	2.986E-09	2.485E-09	2.103E-09
NW	6.834E-08	3.789E-08	2.494E-08	1.382E-08	9.062E-09	6.510E-09	4.952E-09	3.917E-09	3.189E-09	2.653E-09	2.246E-09
NNW	5.944E-08	3.300E-08	2.174E-08	1.203E-08	7.877E-09	5.646E-09	4.284E-09	3.381E-09	2.746E-09	2.280E-09	1.925E-09
N	1.516E-07	8.395E-08	5.519E-08	3.047E-08	1.992E-08	1.426E-08	1.081E-08	8.529E-09	6.923E-09	5.744E-09	4.849E-09
NNE	1.916E-07	1.063E-07	6.999E-08	3.874E-08	2.537E-08	1.820E-08	1.382E-08	1.092E-08	8.878E-09	7.377E-09	6.237E-09
NE	1.576E-07	8.759E-08	5.773E-08	3.201E-08	2.100E-08	1.508E-08	1.146E-08	9.064E-09	7.375E-09	6.134E-09	5.190E-09
ENE	1.004E-07	5.635E-08	3.741E-08	2.093E-08	1.380E-08	9.941E-09	7.575E-09	5.999E-09	4.886E-09	4.065E-09	3.440E-09
E	2.009E-07	1.144E-07	7.670E-08	4.347E-08	2.891E-08	2.096E-08	1.605E-08	1.276E-08	1.042E-08	8.692E-09	7.371E-09
ESE	3.029E-07	1.754E-07	1.189E-07	6.846E-08	4.600E-08	3.362E-08	2.590E-08	2.069E-08	1.698E-08	1.421E-08	1.209E-08
SE	2.065E-07	1.193E-07	8.072E-08	4.639E-08	3.115E-08	2.276E-08	1.753E-08	1.400E-08	1.149E-08	9.618E-09	8.181E-09
SSE	9.963E-08	5.557E-08	3.674E-08	2.049E-08	1.351E-08	9.741E-09	7.431E-09	5.893E-09	4.806E-09	4.005E-09	3.394E-09

0VENT AND BUILDING PARAMETERS:

RELEASE HEIGHT	(METERS)	0.00	REF. WIND HEIGHT	(METERS)	10.0
DIAMETER	(METERS)	0.00	BUILDING HEIGHT	(METERS)	46.1
EXIT VELOCITY	(METERS)	0.00	BLDG.MIN.CRS.SEC.AREA	(SQ.METERS)	3098.0
			HEAT EMISSION RATE	(CAL/SEC)	0.0

0ALL GROUND LEVEL RELEASES.

Note: Directions are True North. The results on this page are applicable to releases from the RW-VS.

NAPS COL 2.0-11-A

Table 2.3-211 Long-Term χ/Q (sec/m^3) for Routine Releases Along Various Distance Segments, 2.260 Day Decay, Undepleted

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT RB - MIXED MODE RELEASE - NO PURGE RELEASES
2.260 DAY DECAY, UNDEPLETED
0CHI/Q (SEC/METER CUBED) FOR EACH SEGMENT

	SEGMENT BOUNDARIES IN MILES FROM THE SITE									
DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	7.017E-08	8.088E-08	7.277E-08	5.882E-08	4.758E-08	2.778E-08	1.195E-08	5.928E-09	3.640E-09	2.496E-09
SSW	3.618E-08	5.164E-08	5.100E-08	4.298E-08	3.561E-08	2.141E-08	9.457E-09	4.733E-09	2.909E-09	1.993E-09
SW	2.751E-08	4.189E-08	4.270E-08	3.657E-08	3.060E-08	1.867E-08	8.374E-09	4.229E-09	2.610E-09	1.791E-09
WSW	2.585E-08	3.598E-08	3.619E-08	3.130E-08	2.646E-08	1.645E-08	7.534E-09	3.850E-09	2.388E-09	1.643E-09
W	3.133E-08	4.164E-08	4.151E-08	3.585E-08	3.035E-08	1.902E-08	8.861E-09	4.609E-09	2.895E-09	2.010E-09
WNW	3.747E-08	4.329E-08	4.105E-08	3.463E-08	2.888E-08	1.776E-08	8.173E-09	4.258E-09	2.685E-09	1.873E-09
NW	2.236E-08	3.730E-08	4.054E-08	3.566E-08	3.026E-08	1.889E-08	8.789E-09	4.591E-09	2.898E-09	2.021E-09
NNW	1.654E-08	2.629E-08	3.077E-08	2.836E-08	2.476E-08	1.606E-08	7.728E-09	4.085E-09	2.581E-09	1.797E-09
N	4.342E-08	7.044E-08	8.183E-08	7.515E-08	6.549E-08	4.237E-08	2.034E-08	1.073E-08	6.772E-09	4.709E-09
NNE	7.784E-08	1.015E-07	1.081E-07	9.636E-08	8.284E-08	5.298E-08	2.530E-08	1.339E-08	8.484E-09	5.923E-09
NE	5.515E-08	8.002E-08	8.665E-08	7.744E-08	6.662E-08	4.257E-08	2.032E-08	1.076E-08	6.822E-09	4.770E-09
ENE	3.133E-08	4.132E-08	4.518E-08	4.116E-08	3.598E-08	2.370E-08	1.176E-08	6.390E-09	4.109E-09	2.897E-09
E	3.013E-08	4.869E-08	6.018E-08	5.855E-08	5.335E-08	3.748E-08	2.000E-08	1.139E-08	7.511E-09	5.381E-09
ESE	4.534E-08	5.969E-08	6.796E-08	6.429E-08	5.793E-08	4.068E-08	2.220E-08	1.306E-08	8.835E-09	6.458E-09
SE	6.237E-08	5.830E-08	5.637E-08	4.975E-08	4.312E-08	2.871E-08	1.487E-08	8.527E-09	5.716E-09	4.161E-09
SSE	6.756E-08	6.563E-08	5.814E-08	4.775E-08	3.928E-08	2.381E-08	1.086E-08	5.662E-09	3.588E-09	2.515E-09

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT TB - MIXED MODE RELEASE - NO PURGE RELEASES
2.260 DAY DECAY, UNDEPLETED
0CHI/Q (SEC/METER CUBED) FOR EACH SEGMENT

	SEGMENT BOUNDARIES IN MILES FROM THE SITE									
DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	5.236E-08	6.140E-08	6.046E-08	5.155E-08	4.292E-08	2.585E-08	1.139E-08	5.699E-09	3.509E-09	2.410E-09
SSW	2.615E-08	3.818E-08	4.164E-08	3.720E-08	3.180E-08	1.977E-08	8.964E-09	4.532E-09	2.796E-09	1.919E-09
SW	1.998E-08	3.072E-08	3.450E-08	3.135E-08	2.708E-08	1.711E-08	7.888E-09	4.028E-09	2.497E-09	1.718E-09
WSW	1.937E-08	2.672E-08	2.932E-08	2.685E-08	2.342E-08	1.505E-08	7.069E-09	3.650E-09	2.273E-09	1.568E-09
W	2.426E-08	3.116E-08	3.351E-08	3.049E-08	2.656E-08	1.716E-08	8.185E-09	4.298E-09	2.710E-09	1.886E-09
WNW	3.049E-08	3.262E-08	3.229E-08	2.857E-08	2.456E-08	1.570E-08	7.482E-09	3.964E-09	2.518E-09	1.764E-09
NW	1.659E-08	2.517E-08	2.981E-08	2.810E-08	2.485E-08	1.634E-08	7.960E-09	4.251E-09	2.708E-09	1.900E-09
NNW	1.289E-08	1.662E-08	2.141E-08	2.148E-08	1.972E-08	1.362E-08	6.932E-09	3.767E-09	2.409E-09	1.690E-09
N	3.317E-08	4.418E-08	5.661E-08	5.666E-08	5.197E-08	3.588E-08	1.825E-08	9.919E-09	6.344E-09	4.448E-09
NNE	6.023E-08	6.752E-08	7.724E-08	7.386E-08	6.630E-08	4.488E-08	2.261E-08	1.231E-08	7.902E-09	5.562E-09
NE	4.070E-08	5.209E-08	6.160E-08	5.930E-08	5.333E-08	3.608E-08	1.814E-08	9.863E-09	6.333E-09	4.461E-09
ENE	2.386E-08	2.657E-08	3.126E-08	3.056E-08	2.789E-08	1.948E-08	1.022E-08	5.719E-09	3.731E-09	2.653E-09
E	2.250E-08	2.858E-08	3.826E-08	4.020E-08	3.843E-08	2.895E-08	1.651E-08	9.756E-09	6.551E-09	4.746E-09
ESE	3.516E-08	3.774E-08	4.512E-08	4.532E-08	4.242E-08	3.134E-08	1.785E-08	1.071E-08	7.318E-09	5.385E-09
SE	5.160E-08	4.257E-08	4.234E-08	3.907E-08	3.480E-08	2.383E-08	1.251E-08	7.170E-09	4.800E-09	3.494E-09
SSE	5.406E-08	5.056E-08	4.739E-08	4.073E-08	3.440E-08	2.146E-08	9.981E-09	5.228E-09	3.313E-09	2.322E-09

Note: Directions are True North.

NAPS COL 2.0-11-A

Table 2.3-211 Long-Term χ/Q (sec/m^3) for Routine Releases Along Various Distance Segments, 2.260 Day Decay, Undepleted

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 7/ 8/2013
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT ONE - GROUND LEVEL RELEASE - NO PURGE RELEASES
2.260 DAY DECAY, UNDEPLETED
0CHI/Q (SEC/METER CUBED) FOR EACH SEGMENT

	SEGMENT BOUNDARIES IN MILES FROM THE SITE									
DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	1.669E-06	5.713E-07	2.557E-07	1.523E-07	1.038E-07	4.936E-08	1.735E-08	7.832E-09	4.629E-09	3.104E-09
SSW	1.318E-06	4.547E-07	2.043E-07	1.220E-07	8.326E-08	3.965E-08	1.395E-08	6.279E-09	3.699E-09	2.473E-09
SW	1.177E-06	4.072E-07	1.836E-07	1.099E-07	7.512E-08	3.588E-08	1.268E-08	5.723E-09	3.375E-09	2.256E-09
WSW	1.093E-06	3.785E-07	1.712E-07	1.026E-07	7.026E-08	3.365E-08	1.194E-08	5.406E-09	3.191E-09	2.134E-09
W	1.326E-06	4.616E-07	2.110E-07	1.275E-07	8.776E-08	4.246E-08	1.532E-08	7.035E-09	4.189E-09	2.818E-09
WNW	1.151E-06	4.000E-07	1.824E-07	1.100E-07	7.576E-08	3.670E-08	1.330E-08	6.152E-09	3.686E-09	2.492E-09
NW	1.174E-06	4.143E-07	1.907E-07	1.157E-07	7.992E-08	3.890E-08	1.418E-08	6.567E-09	3.935E-09	2.661E-09
NNW	1.002E-06	3.574E-07	1.652E-07	1.004E-07	6.947E-08	3.387E-08	1.234E-08	5.696E-09	3.397E-09	2.286E-09
N	2.573E-06	9.189E-07	4.231E-07	2.567E-07	1.773E-07	8.619E-08	3.127E-08	1.439E-08	8.570E-09	5.762E-09
NNE	3.243E-06	1.158E-06	5.339E-07	3.242E-07	2.241E-07	1.091E-07	3.974E-08	1.836E-08	1.097E-08	7.399E-09
NE	2.648E-06	9.457E-07	4.375E-07	2.661E-07	1.842E-07	8.988E-08	3.283E-08	1.521E-08	9.106E-09	6.152E-09
ENE	1.608E-06	5.811E-07	2.731E-07	1.678E-07	1.169E-07	5.771E-08	2.142E-08	1.002E-08	6.025E-09	4.077E-09
E	3.008E-06	1.104E-06	5.315E-07	3.310E-07	2.330E-07	1.169E-07	4.438E-08	2.111E-08	1.281E-08	8.715E-09
ESE	4.355E-06	1.577E-06	7.774E-07	4.915E-07	3.497E-07	1.786E-07	6.969E-08	3.383E-08	2.076E-08	1.424E-08
SE	3.083E-06	1.094E-06	5.344E-07	3.365E-07	2.388E-07	1.215E-07	4.725E-08	2.290E-08	1.405E-08	9.640E-09
SSE	1.724E-06	5.963E-07	2.757E-07	1.679E-07	1.164E-07	5.699E-08	2.100E-08	9.822E-09	5.918E-09	4.016E-09

Note: Directions are True North. The results on this page are applicable to releases from the RW-VS.

NAPS COL 2.0-11-A

Table 2.3-212 Long-Term χ/Q (sec/m^3) for Routine Releases at Distances Between 0.25 to 50 Miles, 8.000 Day Decay, Depleted

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT RB - MIXED MODE RELEASE - NO PURGE RELEASES
8.000 DAY DECAY, DEPLETED
0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	0.250	0.500	0.750	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500
S	1.169E-07	6.545E-08	6.291E-08	7.283E-08	8.268E-08	7.920E-08	7.173E-08	6.394E-08	5.687E-08	5.072E-08	4.545E-08
SSW	5.238E-08	2.982E-08	3.120E-08	4.080E-08	5.294E-08	5.395E-08	5.066E-08	4.627E-08	4.190E-08	3.788E-08	3.432E-08
SW	3.959E-08	2.234E-08	2.331E-08	3.159E-08	4.291E-08	4.468E-08	4.253E-08	3.922E-08	3.578E-08	3.254E-08	2.962E-08
WSW	3.339E-08	2.178E-08	2.287E-08	2.867E-08	3.659E-08	3.771E-08	3.598E-08	3.337E-08	3.064E-08	2.804E-08	2.566E-08
W	4.527E-08	2.876E-08	2.756E-08	3.364E-08	4.231E-08	4.331E-08	4.121E-08	3.820E-08	3.507E-08	3.212E-08	2.944E-08
WNW	4.579E-08	3.709E-08	3.445E-08	3.789E-08	4.373E-08	4.352E-08	4.076E-08	3.734E-08	3.397E-08	3.089E-08	2.815E-08
NW	2.863E-08	1.976E-08	1.866E-08	2.553E-08	3.800E-08	4.165E-08	4.081E-08	3.833E-08	3.542E-08	3.255E-08	2.988E-08
NNW	3.052E-08	1.970E-08	1.349E-08	1.662E-08	2.634E-08	3.058E-08	3.118E-08	3.014E-08	2.846E-08	2.660E-08	2.476E-08
N	8.413E-08	4.846E-08	3.569E-08	4.497E-08	7.066E-08	8.158E-08	8.291E-08	7.999E-08	7.544E-08	7.044E-08	6.552E-08
NNE	1.470E-07	8.704E-08	6.779E-08	7.656E-08	1.019E-07	1.103E-07	1.087E-07	1.030E-07	9.602E-08	8.894E-08	8.225E-08
NE	1.043E-07	5.532E-08	4.706E-08	5.765E-08	8.057E-08	8.823E-08	8.722E-08	8.275E-08	7.718E-08	7.150E-08	6.613E-08
ENE	7.254E-08	3.586E-08	2.692E-08	3.048E-08	4.127E-08	4.549E-08	4.551E-08	4.368E-08	4.116E-08	3.849E-08	3.589E-08
E	8.066E-08	3.577E-08	2.455E-08	2.993E-08	4.796E-08	5.771E-08	6.099E-08	6.087E-08	5.910E-08	5.659E-08	5.382E-08
ESE	1.108E-07	5.409E-08	3.891E-08	4.291E-08	5.893E-08	6.672E-08	6.843E-08	6.712E-08	6.449E-08	6.134E-08	5.808E-08
SE	1.496E-07	8.197E-08	5.625E-08	5.319E-08	5.771E-08	5.823E-08	5.599E-08	5.268E-08	4.912E-08	4.566E-08	4.245E-08
SSE	1.164E-07	7.604E-08	6.198E-08	6.287E-08	6.605E-08	6.277E-08	5.726E-08	5.159E-08	4.639E-08	4.183E-08	3.786E-08

0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	5.000	7.500	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	50.000
S	4.095E-08	2.620E-08	1.841E-08	1.081E-08	7.278E-09	5.311E-09	4.087E-09	3.265E-09	2.682E-09	2.259E-09	1.926E-09
SSW	3.119E-08	2.052E-08	1.463E-08	8.732E-09	5.932E-09	4.354E-09	3.365E-09	2.698E-09	2.223E-09	1.877E-09	1.603E-09
SW	2.704E-08	1.805E-08	1.299E-08	7.841E-09	5.368E-09	3.963E-09	3.077E-09	2.477E-09	2.047E-09	1.733E-09	1.484E-09
WSW	2.354E-08	1.599E-08	1.163E-08	7.113E-09	4.910E-09	3.646E-09	2.843E-09	2.296E-09	1.904E-09	1.615E-09	1.387E-09
W	2.705E-08	1.853E-08	1.359E-08	8.425E-09	5.883E-09	4.411E-09	3.469E-09	2.822E-09	2.355E-09	2.008E-09	1.733E-09
WNW	2.575E-08	1.744E-08	1.274E-08	7.897E-09	5.533E-09	4.162E-09	3.281E-09	2.676E-09	2.237E-09	1.909E-09	1.650E-09
NW	2.748E-08	1.888E-08	1.390E-08	8.694E-09	6.119E-09	4.619E-09	3.654E-09	2.987E-09	2.503E-09	2.141E-09	1.855E-09
NNW	2.303E-08	1.640E-08	1.232E-08	7.868E-09	5.597E-09	4.253E-09	3.379E-09	2.772E-09	2.328E-09	1.994E-09	1.731E-09
N	6.091E-08	4.330E-08	3.248E-08	2.073E-08	1.473E-08	1.118E-08	8.879E-09	7.278E-09	6.109E-09	5.228E-09	4.535E-09
NNE	7.613E-08	5.356E-08	4.003E-08	2.549E-08	1.812E-08	1.377E-08	1.094E-08	8.976E-09	7.541E-09	6.459E-09	5.607E-09
NE	6.120E-08	4.301E-08	3.212E-08	2.044E-08	1.453E-08	1.104E-08	8.777E-09	7.205E-09	6.055E-09	5.190E-09	4.507E-09
ENE	3.347E-08	2.420E-08	1.843E-08	1.205E-08	8.718E-09	6.715E-09	5.394E-09	4.466E-09	3.781E-09	3.260E-09	2.847E-09
E	5.102E-08	3.905E-08	3.082E-08	2.107E-08	1.570E-08	1.234E-08	1.008E-08	8.455E-09	7.237E-09	6.296E-09	5.546E-09
ESE	5.492E-08	4.201E-08	3.340E-08	2.326E-08	1.764E-08	1.410E-08	1.167E-08	9.917E-09	8.583E-09	7.543E-09	6.705E-09
SE	3.955E-08	2.881E-08	2.225E-08	1.500E-08	1.118E-08	8.833E-09	7.260E-09	6.133E-09	5.288E-09	4.635E-09	4.109E-09
SSE	3.445E-08	2.295E-08	1.663E-08	1.024E-08	7.161E-09	5.388E-09	4.254E-09	3.476E-09	2.912E-09	2.492E-09	2.160E-09

0VENT AND BUILDING PARAMETERS:

RELEASE HEIGHT	(METERS)	52.77	REP. WIND HEIGHT	(METERS)	10.0
DIAMETER	(METERS)	2.40	BUILDING HEIGHT	(METERS)	46.1
EXIT VELOCITY	(METERS)	17.78	BLDG.MIN.CRS.SEC.AREA	(SQ.METERS)	3098.0
			HEAT EMISSION RATE	(CAL/SEC)	0.0

0AT THE RELEASE HEIGHT: / AT THE MEASURED WIND HEIGHT (10.0 METERS):

VENT RELEASE MODE	WIND SPEED (METERS/SEC)		VENT RELEASE MODE	WIND SPEED (METERS/SEC) STABLE CONDITIONS		WIND SPEED (METERS/SEC) UNSTABLE/NEUTRAL CONDITIONS	
ELEVATED	LESS THAN	3.556	ELEVATED	LESS THAN	3.556	LESS THAN	3.556
MIXED	BETWEEN	3.556 AND 17.780	MIXED	BETWEEN	3.556 AND 17.780	BETWEEN	3.556 AND 17.780
GROUND LEVEL	ABOVE	17.780	GROUND LEVEL	ABOVE	17.780	ABOVE	17.780

Note: Directions are True North.

NAPS COL 2.0-11-A

Table 2.3-212 Long-Term χ/Q (sec/m^3) for Routine Releases at Distances Between 0.25 to 50 Miles, 8.000 Day Decay, Depleted

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT TB - MIXED MODE RELEASE - NO PURGE RELEASES
8.000 DAY DECAY, DEPLETED

0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	0.250	0.500	0.750	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500
S	1.101E-07	5.617E-08	4.555E-08	5.062E-08	6.141E-08	6.281E-08	5.953E-08	5.475E-08	4.978E-08	4.512E-08	4.092E-08
SSW	4.985E-08	2.592E-08	2.194E-08	2.715E-08	3.807E-08	4.179E-08	4.128E-08	3.902E-08	3.619E-08	3.329E-08	3.055E-08
SW	3.718E-08	1.972E-08	1.661E-08	2.101E-08	3.053E-08	3.420E-08	3.426E-08	3.272E-08	3.059E-08	2.832E-08	2.612E-08
WSW	3.114E-08	1.900E-08	1.703E-08	1.990E-08	2.638E-08	2.900E-08	2.905E-08	2.788E-08	2.621E-08	2.440E-08	2.262E-08
W	4.234E-08	2.592E-08	2.124E-08	2.392E-08	3.078E-08	3.333E-08	3.313E-08	3.167E-08	2.972E-08	2.765E-08	2.564E-08
WNW	4.190E-08	3.296E-08	2.843E-08	2.882E-08	3.204E-08	3.284E-08	3.183E-08	2.999E-08	2.788E-08	2.579E-08	2.381E-08
NW	2.576E-08	1.773E-08	1.442E-08	1.677E-08	2.457E-08	2.877E-08	2.981E-08	2.918E-08	2.779E-08	2.614E-08	2.443E-08
NNW	2.752E-08	1.857E-08	1.118E-08	1.072E-08	1.568E-08	1.968E-08	2.151E-08	2.189E-08	2.146E-08	2.063E-08	1.963E-08
N	7.467E-08	4.492E-08	2.905E-08	2.866E-08	4.172E-08	5.214E-08	5.688E-08	5.781E-08	5.665E-08	5.444E-08	5.177E-08
NNE	1.305E-07	7.802E-08	5.413E-08	5.183E-08	6.470E-08	7.406E-08	7.707E-08	7.614E-08	7.325E-08	6.950E-08	6.549E-08
NE	9.437E-08	4.883E-08	3.575E-08	3.698E-08	5.000E-08	5.864E-08	6.155E-08	6.105E-08	5.883E-08	5.588E-08	5.268E-08
ENE	6.483E-08	3.235E-08	2.101E-08	1.989E-08	2.530E-08	2.953E-08	3.122E-08	3.125E-08	3.039E-08	2.912E-08	2.767E-08
E	7.116E-08	3.261E-08	1.936E-08	1.828E-08	2.654E-08	3.415E-08	3.840E-08	4.015E-08	4.037E-08	3.972E-08	3.859E-08
ESE	9.879E-08	4.878E-08	3.109E-08	2.861E-08	3.559E-08	4.190E-08	4.498E-08	4.575E-08	4.519E-08	4.391E-08	4.229E-08
SE	1.322E-07	7.376E-08	4.693E-08	4.029E-08	4.085E-08	4.203E-08	4.170E-08	4.029E-08	3.833E-08	3.618E-08	3.402E-08
SSE	1.058E-07	6.637E-08	4.921E-08	4.719E-08	4.978E-08	4.920E-08	4.648E-08	4.300E-08	3.944E-08	3.608E-08	3.302E-08

0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	5.000	7.500	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	50.000
S	3.721E-08	2.442E-08	1.734E-08	1.027E-08	6.938E-09	5.070E-09	3.903E-09	3.119E-09	2.563E-09	2.159E-09	1.840E-09
SSW	2.805E-08	1.895E-08	1.368E-08	8.246E-09	5.626E-09	4.139E-09	3.203E-09	2.571E-09	2.119E-09	1.790E-09	1.530E-09
SW	2.409E-08	1.653E-08	1.205E-08	7.354E-09	5.059E-09	3.746E-09	2.913E-09	2.348E-09	1.942E-09	1.645E-09	1.410E-09
WSW	2.095E-08	1.461E-08	1.075E-08	6.638E-09	4.602E-09	3.426E-09	2.675E-09	2.163E-09	1.795E-09	1.524E-09	1.308E-09
W	2.377E-08	1.668E-08	1.235E-08	7.727E-09	5.415E-09	4.068E-09	3.203E-09	2.608E-09	2.177E-09	1.858E-09	1.604E-09
WNW	2.202E-08	1.539E-08	1.142E-08	7.193E-09	5.082E-09	3.841E-09	3.039E-09	2.484E-09	2.081E-09	1.779E-09	1.540E-09
NW	2.279E-08	1.634E-08	1.229E-08	7.856E-09	5.592E-09	4.251E-09	3.378E-09	2.772E-09	2.329E-09	1.997E-09	1.734E-09
NNW	1.858E-08	1.394E-08	1.074E-08	7.053E-09	5.091E-09	3.905E-09	3.123E-09	2.574E-09	2.171E-09	1.865E-09	1.623E-09
N	4.900E-08	3.675E-08	2.833E-08	1.860E-08	1.343E-08	1.030E-08	8.235E-09	6.786E-09	5.721E-09	4.914E-09	4.276E-09
NNE	6.156E-08	4.540E-08	3.477E-08	2.274E-08	1.641E-08	1.259E-08	1.007E-08	8.310E-09	7.013E-09	6.030E-09	5.251E-09
NE	4.952E-08	3.648E-08	2.791E-08	1.822E-08	1.313E-08	1.007E-08	8.059E-09	6.647E-09	5.611E-09	4.826E-09	4.204E-09
ENE	2.621E-08	1.989E-08	1.554E-08	1.045E-08	7.679E-09	5.976E-09	4.837E-09	4.028E-09	3.426E-09	2.966E-09	2.599E-09
E	3.724E-08	3.017E-08	2.457E-08	1.740E-08	1.322E-08	1.054E-08	8.686E-09	7.341E-09	6.323E-09	5.529E-09	4.892E-09
ESE	4.054E-08	3.231E-08	2.621E-08	1.862E-08	1.427E-08	1.148E-08	9.552E-09	8.144E-09	7.072E-09	6.234E-09	5.555E-09
SE	3.198E-08	2.381E-08	1.850E-08	1.248E-08	9.274E-09	7.312E-09	5.997E-09	5.058E-09	4.357E-09	3.817E-09	3.382E-09
SSE	3.030E-08	2.066E-08	1.510E-08	9.344E-09	6.535E-09	4.910E-09	3.871E-09	3.158E-09	2.642E-09	2.259E-09	1.955E-09

0VENT AND BUILDING PARAMETERS:

RELEASE HEIGHT	(METERS)	71.30	REP. WIND HEIGHT	(METERS)	10.0
DIAMETER	(METERS)	1.95	BUILDING HEIGHT	(METERS)	46.1
EXIT VELOCITY	(METERS)	17.78	BLDG.MIN.CRS.SEC.AREA	(SQ.METERS)	3098.0
			HEAT EMISSION RATE	(CAL/SEC)	0.0

0AT THE RELEASE HEIGHT: / AT THE MEASURED WIND HEIGHT (10.0 METERS):

VENT RELEASE MODE	WIND SPEED (METERS/SEC)	/	VENT RELEASE MODE	WIND SPEED (METERS/SEC) STABLE CONDITIONS	WIND SPEED (METERS/SEC) UNSTABLE/NEUTRAL CONDITIONS
ELEVATED	LESS THAN 3.556	/	ELEVATED	LESS THAN 3.556	LESS THAN 3.556
MIXED	BETWEEN 3.556 AND 17.780	/	MIXED	BETWEEN 3.556 AND 17.780	BETWEEN 3.556 AND 17.780
GROUND LEVEL	ABOVE 17.780	/	GROUND LEVEL	ABOVE 17.780	ABOVE 17.780

Note: Directions are True North.

NAPS COL 2.0-11-A

Table 2.3-212 Long-Term χ/Q (sec/m^3) for Routine Releases at Distances Between 0.25 to 50 Miles, 8.000 Day Decay, Depleted

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 7/ 8/2013
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT ONE - GROUND LEVEL RELEASE - NO PURGE RELEASES
8.000 DAY DECAY, DEPLETED
0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	0.250	0.500	0.750	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500
S	8.096E-06	2.770E-06	1.441E-06	9.047E-07	4.714E-07	2.962E-07	2.064E-07	1.535E-07	1.195E-07	9.613E-08	7.933E-08
SSW	6.331E-06	2.178E-06	1.140E-06	7.185E-07	3.756E-07	2.365E-07	1.650E-07	1.229E-07	9.576E-08	7.711E-08	6.368E-08
SW	5.670E-06	1.942E-06	1.018E-06	6.424E-07	3.366E-07	2.124E-07	1.484E-07	1.107E-07	8.631E-08	6.958E-08	5.751E-08
WSW	5.324E-06	1.806E-06	9.450E-07	5.965E-07	3.132E-07	1.979E-07	1.384E-07	1.033E-07	8.069E-08	6.509E-08	5.385E-08
W	6.627E-06	2.197E-06	1.145E-06	7.231E-07	3.824E-07	2.430E-07	1.708E-07	1.280E-07	1.003E-07	8.114E-08	6.730E-08
WNW	5.769E-06	1.903E-06	9.940E-07	6.277E-07	3.311E-07	2.101E-07	1.475E-07	1.105E-07	8.654E-08	7.001E-08	5.806E-08
NW	5.755E-06	1.924E-06	1.017E-06	6.464E-07	3.434E-07	2.189E-07	1.543E-07	1.159E-07	9.097E-08	7.373E-08	6.125E-08
NNW	4.880E-06	1.630E-06	8.708E-07	5.566E-07	2.968E-07	1.896E-07	1.339E-07	1.007E-07	7.910E-08	6.417E-08	5.335E-08
N	1.240E-05	4.172E-06	2.239E-06	1.433E-06	7.625E-07	4.863E-07	3.428E-07	2.575E-07	2.021E-07	1.638E-07	1.361E-07
NNE	1.584E-05	5.270E-06	2.817E-06	1.804E-06	9.605E-07	6.130E-07	4.324E-07	3.249E-07	2.551E-07	2.069E-07	1.719E-07
NE	1.292E-05	4.307E-06	2.299E-06	1.471E-06	7.849E-07	5.017E-07	3.543E-07	2.665E-07	2.094E-07	1.699E-07	1.413E-07
ENE	8.102E-06	2.617E-06	1.394E-06	8.958E-07	4.837E-07	3.118E-07	2.216E-07	1.676E-07	1.323E-07	1.077E-07	8.985E-08
E	1.583E-05	4.905E-06	2.598E-06	1.679E-06	9.225E-07	6.021E-07	4.320E-07	3.291E-07	2.614E-07	2.140E-07	1.794E-07
ESE	2.435E-05	7.301E-06	3.722E-06	2.365E-06	1.321E-06	8.734E-07	6.328E-07	4.860E-07	3.886E-07	3.200E-07	2.695E-07
SE	1.730E-05	5.229E-06	2.627E-06	1.650E-06	9.144E-07	6.019E-07	4.348E-07	3.332E-07	2.659E-07	2.187E-07	1.840E-07
SSE	8.926E-06	2.888E-06	1.481E-06	9.287E-07	4.945E-07	3.161E-07	2.233E-07	1.681E-07	1.322E-07	1.073E-07	8.926E-08

0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	5.000	7.500	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	50.000
S	6.679E-08	3.455E-08	2.151E-08	1.098E-08	6.780E-09	4.644E-09	3.396E-09	2.598E-09	2.054E-09	1.666E-09	1.378E-09
SSW	5.366E-08	2.781E-08	1.734E-08	8.857E-09	5.468E-09	3.743E-09	2.735E-09	2.091E-09	1.653E-09	1.340E-09	1.108E-09
SW	4.849E-08	2.521E-08	1.576E-08	8.078E-09	4.999E-09	3.429E-09	2.509E-09	1.921E-09	1.520E-09	1.233E-09	1.020E-09
WSW	4.544E-08	2.370E-08	1.485E-08	7.637E-09	4.739E-09	3.257E-09	2.388E-09	1.831E-09	1.450E-09	1.177E-09	9.751E-10
W	5.693E-08	2.998E-08	1.892E-08	9.834E-09	6.151E-09	4.254E-09	3.135E-09	2.413E-09	1.919E-09	1.563E-09	1.298E-09
WNW	4.911E-08	2.589E-08	1.635E-08	8.520E-09	5.346E-09	3.707E-09	2.737E-09	2.111E-09	1.681E-09	1.372E-09	1.141E-09
NW	5.188E-08	2.746E-08	1.739E-08	9.081E-09	5.699E-09	3.951E-09	2.917E-09	2.250E-09	1.791E-09	1.461E-09	1.215E-09
NNW	4.522E-08	2.399E-08	1.521E-08	7.956E-09	4.992E-09	3.459E-09	2.552E-09	1.967E-09	1.565E-09	1.276E-09	1.060E-09
N	1.153E-07	6.099E-08	3.860E-08	2.012E-08	1.260E-08	8.718E-09	6.425E-09	4.946E-09	3.931E-09	3.202E-09	2.659E-09
NNE	1.456E-07	7.716E-08	4.888E-08	2.553E-08	1.601E-08	1.109E-08	8.181E-09	6.305E-09	5.015E-09	4.088E-09	3.397E-09
NE	1.197E-07	6.354E-08	4.029E-08	2.108E-08	1.323E-08	9.173E-09	6.772E-09	5.222E-09	4.157E-09	3.390E-09	2.818E-09
ENE	7.639E-08	4.100E-08	2.621E-08	1.386E-08	8.764E-09	6.109E-09	4.530E-09	3.505E-09	2.798E-09	2.288E-09	1.906E-09
E	1.531E-07	8.343E-08	5.390E-08	2.891E-08	1.846E-08	1.296E-08	9.668E-09	7.517E-09	6.026E-09	4.944E-09	4.132E-09
ESE	2.311E-07	1.281E-07	8.375E-08	4.568E-08	2.950E-08	2.090E-08	1.570E-08	1.228E-08	9.898E-09	8.158E-09	6.845E-09
SE	1.576E-07	8.710E-08	5.684E-08	3.095E-08	1.998E-08	1.415E-08	1.063E-08	8.316E-09	6.701E-09	5.524E-09	4.636E-09
SSE	7.572E-08	4.035E-08	2.568E-08	1.353E-08	8.548E-09	5.960E-09	4.421E-09	3.423E-09	2.735E-09	2.238E-09	1.867E-09

0VENT AND BUILDING PARAMETERS:

RELEASE HEIGHT	(METERS)	0.00	REP. WIND HEIGHT	(METERS)	10.0
DIAMETER	(METERS)	0.00	BUILDING HEIGHT	(METERS)	46.1
EXIT VELOCITY	(METERS)	0.00	BLDG.MIN.CRS.SEC.AREA	(SQ.METERS)	3098.0
			HEAT EMISSION RATE	(CAL/SEC)	0.0

0ALL GROUND LEVEL RELEASES.

Note: Directions are True North. The results on this page are applicable to releases from the RW-VS.

SOF-207

NAPS COL 2.0-11-A

Table 2.3-213 Long-Term χ/Q (sec/m^3) for Routine Releases Along Various Distance Segments, 8.000 Day Decay, Depleted

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT RB - MIXED MODE RELEASE - NO PURGE RELEASES
8.000 DAY DECAY, DEPLETED
0CHI/Q (SEC/METER CUBED) FOR EACH SEGMENT

	SEGMENT BOUNDARIES IN MILES FROM THE SITE									
DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	6.788E-08	7.894E-08	7.061E-08	5.655E-08	4.535E-08	2.602E-08	1.093E-08	5.346E-09	3.278E-09	2.261E-09
SSW	3.516E-08	5.069E-08	4.978E-08	4.162E-08	3.421E-08	2.027E-08	8.799E-09	4.379E-09	2.708E-09	1.878E-09
SW	2.678E-08	4.118E-08	4.178E-08	3.553E-08	2.953E-08	1.780E-08	7.886E-09	3.983E-09	2.485E-09	1.734E-09
WSW	2.521E-08	3.533E-08	3.540E-08	3.043E-08	2.558E-08	1.573E-08	7.138E-09	3.662E-09	2.303E-09	1.616E-09
W	3.053E-08	4.083E-08	4.056E-08	3.484E-08	2.935E-08	1.823E-08	8.443E-09	4.427E-09	2.829E-09	2.009E-09
WNW	3.656E-08	4.234E-08	4.013E-08	3.376E-08	2.808E-08	1.720E-08	7.922E-09	4.175E-09	2.681E-09	1.910E-09
NW	2.196E-08	3.685E-08	4.004E-08	3.516E-08	2.979E-08	1.858E-08	8.707E-09	4.633E-09	2.993E-09	2.143E-09
NNW	1.626E-08	2.607E-08	3.060E-08	2.823E-08	2.466E-08	1.606E-08	7.847E-09	4.262E-09	2.776E-09	1.995E-09
N	4.265E-08	6.981E-08	8.139E-08	7.484E-08	6.527E-08	4.241E-08	2.067E-08	1.121E-08	7.290E-09	5.232E-09
NNE	7.597E-08	1.000E-07	1.069E-07	9.532E-08	8.197E-08	5.256E-08	2.544E-08	1.380E-08	8.991E-09	6.464E-09
NE	5.360E-08	7.888E-08	8.570E-08	7.661E-08	6.590E-08	4.221E-08	2.041E-08	1.107E-08	7.216E-09	5.193E-09
ENE	3.049E-08	4.075E-08	4.477E-08	4.086E-08	3.576E-08	2.370E-08	1.199E-08	6.721E-09	4.470E-09	3.262E-09
E	2.944E-08	4.829E-08	6.007E-08	5.865E-08	5.360E-08	3.806E-08	2.085E-08	1.233E-08	8.455E-09	6.297E-09
ESE	4.406E-08	5.883E-08	6.745E-08	6.404E-08	5.787E-08	4.105E-08	2.301E-08	1.407E-08	9.911E-09	7.541E-09
SE	6.060E-08	5.694E-08	5.526E-08	4.882E-08	4.233E-08	2.828E-08	1.491E-08	8.828E-09	6.133E-09	4.633E-09
SSE	6.550E-08	6.388E-08	5.646E-08	4.614E-08	3.777E-08	2.270E-08	1.029E-08	5.407E-09	3.483E-09	2.493E-09

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT TB - MIXED MODE RELEASE - NO PURGE RELEASES
8.000 DAY DECAY, DEPLETED
0CHI/Q (SEC/METER CUBED) FOR EACH SEGMENT

	SEGMENT BOUNDARIES IN MILES FROM THE SITE									
DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	5.017E-08	5.964E-08	5.849E-08	4.942E-08	4.079E-08	2.412E-08	1.036E-08	5.101E-09	3.131E-09	2.160E-09
SSW	2.514E-08	3.730E-08	4.052E-08	3.590E-08	3.044E-08	1.863E-08	8.289E-09	4.161E-09	2.579E-09	1.791E-09
SW	1.925E-08	3.005E-08	3.363E-08	3.033E-08	2.602E-08	1.622E-08	7.377E-09	3.763E-09	2.355E-09	1.646E-09
WSW	1.874E-08	2.611E-08	2.857E-08	2.600E-08	2.253E-08	1.431E-08	6.647E-09	3.439E-09	2.169E-09	1.524E-09
W	2.347E-08	3.039E-08	3.260E-08	2.949E-08	2.554E-08	1.633E-08	7.728E-09	4.082E-09	2.614E-09	1.859E-09
WNW	2.961E-08	3.168E-08	3.136E-08	2.769E-08	2.373E-08	1.510E-08	7.194E-09	3.851E-09	2.489E-09	1.780E-09
NW	1.620E-08	2.470E-08	2.928E-08	2.756E-08	2.433E-08	1.597E-08	7.835E-09	4.259E-09	2.777E-09	1.998E-09
NNW	1.262E-08	1.635E-08	2.117E-08	2.127E-08	1.954E-08	1.355E-08	7.001E-09	3.908E-09	2.577E-09	1.866E-09
N	3.240E-08	4.345E-08	5.599E-08	5.614E-08	5.153E-08	3.573E-08	1.846E-08	1.031E-08	6.794E-09	4.917E-09
NNE	5.842E-08	6.600E-08	7.590E-08	7.265E-08	6.522E-08	4.427E-08	2.260E-08	1.260E-08	8.320E-09	6.032E-09
NE	3.920E-08	5.095E-08	6.057E-08	5.834E-08	5.246E-08	3.557E-08	1.811E-08	1.008E-08	6.656E-09	4.828E-09
ENE	2.303E-08	2.598E-08	3.078E-08	3.015E-08	2.756E-08	1.936E-08	1.035E-08	5.975E-09	4.030E-09	2.967E-09
E	2.182E-08	2.809E-08	3.797E-08	4.006E-08	3.843E-08	2.925E-08	1.713E-08	1.051E-08	7.337E-09	5.528E-09
ESE	3.392E-08	3.684E-08	4.447E-08	4.486E-08	4.212E-08	3.143E-08	1.837E-08	1.145E-08	8.138E-09	6.231E-09
SE	4.994E-08	4.125E-08	4.122E-08	3.807E-08	3.390E-08	2.327E-08	1.239E-08	7.309E-09	5.059E-09	3.816E-09
SSE	5.213E-08	4.895E-08	4.581E-08	3.918E-08	3.292E-08	2.033E-08	9.374E-09	4.928E-09	3.165E-09	2.260E-09

Note: Directions are True North.

NAPS COL 2.0-11-A

Table 2.3-213 Long-Term χ/Q (sec/m^3) for Routine Releases Along Various Distance Segments, 8.000 Day Decay, Depleted

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 7/ 8/2013
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT ONE - GROUND LEVEL RELEASE - NO PURGE RELEASES
8.000 DAY DECAY, DEPLETED
0CHI/Q (SEC/METER CUBED) FOR EACH SEGMENT

	SEGMENT BOUNDARIES IN MILES FROM THE SITE									
DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	1.498E-06	4.898E-07	2.092E-07	1.203E-07	7.966E-08	3.592E-08	1.145E-08	4.714E-09	2.619E-09	1.675E-09
SSW	1.183E-06	3.900E-07	1.672E-07	9.641E-08	6.395E-08	2.890E-08	9.236E-09	3.800E-09	2.108E-09	1.346E-09
SW	1.056E-06	3.493E-07	1.504E-07	8.689E-08	5.775E-08	2.619E-08	8.417E-09	3.480E-09	1.936E-09	1.239E-09
WSW	9.814E-07	3.249E-07	1.402E-07	8.122E-08	5.407E-08	2.460E-08	7.952E-09	3.305E-09	1.845E-09	1.183E-09
W	1.191E-06	3.962E-07	1.729E-07	1.009E-07	6.756E-08	3.105E-08	1.022E-08	4.312E-09	2.431E-09	1.570E-09
WNW	1.033E-06	3.432E-07	1.494E-07	8.709E-08	5.829E-08	2.681E-08	8.850E-09	3.756E-09	2.126E-09	1.378E-09
NW	1.054E-06	3.554E-07	1.562E-07	9.153E-08	6.148E-08	2.841E-08	9.424E-09	4.004E-09	2.266E-09	1.468E-09
NNW	8.999E-07	3.069E-07	1.354E-07	7.958E-08	5.355E-08	2.481E-08	8.251E-09	3.505E-09	1.981E-09	1.282E-09
N	2.310E-06	7.888E-07	3.469E-07	2.034E-07	1.366E-07	6.310E-08	2.088E-08	8.836E-09	4.982E-09	3.217E-09
NNE	2.912E-06	9.935E-07	4.376E-07	2.567E-07	1.725E-07	7.981E-08	2.649E-08	1.124E-08	6.350E-09	4.107E-09
NE	2.377E-06	8.115E-07	3.585E-07	2.107E-07	1.418E-07	6.570E-08	2.186E-08	9.295E-09	5.259E-09	3.406E-09
ENE	1.444E-06	4.989E-07	2.240E-07	1.330E-07	9.016E-08	4.229E-08	1.434E-08	6.185E-09	3.529E-09	2.298E-09
E	2.702E-06	9.482E-07	4.362E-07	2.627E-07	1.799E-07	8.579E-08	2.982E-08	1.311E-08	7.563E-09	4.964E-09
ESE	3.914E-06	1.354E-06	6.382E-07	3.903E-07	2.703E-07	1.313E-07	4.695E-08	2.112E-08	1.235E-08	8.187E-09
SE	2.771E-06	9.390E-07	4.387E-07	2.671E-07	1.845E-07	8.932E-08	3.183E-08	1.430E-08	8.362E-09	5.544E-09
SSE	1.548E-06	5.117E-07	2.260E-07	1.329E-07	8.959E-08	4.169E-08	1.402E-08	6.035E-09	3.446E-09	2.248E-09

Note: Directions are True North. The results on this page are applicable to releases from the RW-VS.

NAPS COL 2.0-11-A

Table 2.3-214 Long-Term D/Q (1/m^2) for Routine Releases at Distances Between 0.25 to 50 Miles

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT RB - MIXED MODE RELEASE - NO PURGE RELEASES

********** RELATIVE DEPOSITION PER UNIT AREA (M**-2) AT FIXED POINTS BY DOWNWIND SECTORS **********

DIRECTION FROM SITE	DISTANCES IN MILES 0.25	0.50	0.75	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50
S	3.039E-09	1.897E-09	1.544E-09	1.381E-09	9.561E-10	7.176E-10	5.564E-10	4.416E-10	3.568E-10	2.926E-10	2.429E-10
SSW	1.184E-09	8.178E-10	7.730E-10	7.624E-10	5.636E-10	4.356E-10	3.431E-10	2.746E-10	2.229E-10	1.832E-10	1.522E-10
SW	9.372E-10	6.500E-10	6.118E-10	6.036E-10	4.461E-10	3.453E-10	2.723E-10	2.182E-10	1.772E-10	1.457E-10	1.211E-10
WSW	9.115E-10	6.612E-10	5.927E-10	5.590E-10	3.989E-10	3.047E-10	2.386E-10	1.905E-10	1.545E-10	1.269E-10	1.055E-10
W	1.177E-09	8.409E-10	7.241E-10	6.617E-10	4.609E-10	3.485E-10	2.715E-10	2.161E-10	1.749E-10	1.436E-10	1.194E-10
WNW	1.599E-09	1.131E-09	8.545E-10	6.923E-10	4.326E-10	3.125E-10	2.376E-10	1.867E-10	1.501E-10	1.229E-10	1.022E-10
NW	8.198E-10	6.218E-10	5.076E-10	4.401E-10	2.918E-10	2.171E-10	1.677E-10	1.330E-10	1.075E-10	8.820E-11	7.334E-11
NNW	6.798E-10	5.102E-10	3.870E-10	3.116E-10	1.924E-10	1.386E-10	1.052E-10	8.265E-11	6.647E-11	5.445E-11	4.527E-11
N	1.856E-09	1.373E-09	1.030E-09	8.202E-10	5.015E-10	3.593E-10	2.720E-10	2.132E-10	1.713E-10	1.403E-10	1.166E-10
NNE	3.560E-09	2.438E-09	1.794E-09	1.422E-09	8.718E-10	6.231E-10	4.708E-10	3.686E-10	2.959E-10	2.420E-10	2.011E-10
NE	2.590E-09	1.685E-09	1.262E-09	1.031E-09	6.560E-10	4.753E-10	3.617E-10	2.843E-10	2.285E-10	1.870E-10	1.553E-10
ENE	1.563E-09	1.011E-09	7.263E-10	5.695E-10	3.472E-10	2.473E-10	1.865E-10	1.459E-10	1.170E-10	9.566E-11	7.944E-11
E	1.739E-09	1.149E-09	7.962E-10	5.938E-10	3.412E-10	2.359E-10	1.748E-10	1.354E-10	1.080E-10	8.816E-11	7.321E-11
ESE	2.690E-09	1.708E-09	1.179E-09	8.812E-10	5.117E-10	3.535E-10	2.616E-10	2.023E-10	1.612E-10	1.314E-10	1.090E-10
SE	4.132E-09	2.588E-09	1.758E-09	1.306E-09	7.562E-10	5.218E-10	3.859E-10	2.984E-10	2.378E-10	1.938E-10	1.608E-10
SSE	3.761E-09	2.348E-09	1.690E-09	1.343E-09	8.385E-10	5.999E-10	4.530E-10	3.544E-10	2.841E-10	2.322E-10	1.926E-10

0DIRECTION FROM SITE	DISTANCES IN MILES 5.00	7.50	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00
S	2.039E-10	1.064E-10	6.729E-11	3.511E-11	2.201E-11	1.548E-11	1.157E-11	9.015E-12	7.245E-12	5.959E-12	4.994E-12
SSW	1.278E-10	6.671E-11	4.218E-11	2.193E-11	1.370E-11	9.571E-12	7.116E-12	5.523E-12	4.426E-12	3.634E-12	3.043E-12
SW	1.016E-10	5.310E-11	3.361E-11	1.750E-11	1.094E-11	7.653E-12	5.695E-12	4.423E-12	3.545E-12	2.911E-12	2.438E-12
WSW	8.857E-11	4.636E-11	2.938E-11	1.535E-11	9.618E-12	6.771E-12	5.058E-12	3.937E-12	3.159E-12	2.594E-12	2.171E-12
W	1.003E-10	5.251E-11	3.329E-11	1.742E-11	1.094E-11	7.730E-12	5.793E-12	4.522E-12	3.637E-12	2.993E-12	2.509E-12
WNW	8.597E-11	4.526E-11	2.887E-11	1.531E-11	9.709E-12	7.023E-12	5.352E-12	4.228E-12	3.432E-12	2.843E-12	2.396E-12
NW	6.167E-11	3.245E-11	2.066E-11	1.090E-11	6.881E-12	4.927E-12	3.728E-12	2.930E-12	2.369E-12	1.957E-12	1.646E-12
NNW	3.812E-11	2.013E-11	1.286E-11	6.844E-12	4.350E-12	3.164E-12	2.421E-12	1.918E-12	1.560E-12	1.295E-12	1.093E-12
N	9.823E-11	5.187E-11	3.316E-11	1.766E-11	1.124E-11	8.190E-12	6.273E-12	4.977E-12	4.052E-12	3.365E-12	2.842E-12
NNE	1.692E-10	8.908E-11	5.684E-11	3.019E-11	1.918E-11	1.392E-11	1.064E-11	8.438E-12	6.872E-12	5.710E-12	4.829E-12
NE	1.305E-10	6.840E-11	4.348E-11	2.293E-11	1.450E-11	1.042E-11	7.920E-12	6.264E-12	5.102E-12	4.245E-12	3.601E-12
ENE	6.685E-11	3.515E-11	2.244E-11	1.192E-11	7.574E-12	5.497E-12	4.206E-12	3.338E-12	2.722E-12	2.266E-12	1.919E-12
E	6.169E-11	3.256E-11	2.086E-11	1.118E-11	7.159E-12	5.289E-12	4.105E-12	3.301E-12	2.724E-12	2.290E-12	1.961E-12
ESE	9.178E-11	4.820E-11	3.076E-11	1.639E-11	1.046E-11	7.674E-12	5.925E-12	4.742E-12	3.899E-12	3.268E-12	2.790E-12
SE	1.353E-10	7.108E-11	4.539E-11	2.423E-11	1.547E-11	1.132E-11	8.704E-12	6.921E-12	5.648E-12	4.696E-12	3.968E-12
SSE	1.619E-10	8.467E-11	5.379E-11	2.837E-11	1.795E-11	1.288E-11	9.768E-12	7.686E-12	6.221E-12	5.141E-12	4.321E-12

Note: Directions are True North.

NAPS COL 2.0-11-A

Table 2.3-214 Long-Term D/Q (1/m^2) for Routine Releases at Distances Between 0.25 to 50 Miles

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT TB - MIXED MODE RELEASE - NO PURGE RELEASES

********** RELATIVE DEPOSITION PER UNIT AREA (M**-2) AT FIXED POINTS BY DOWNWIND SECTORS **********

DIRECTION FROM SITE	DISTANCES IN MILES 0.25	0.50	0.75	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50
S	2.773E-09	1.735E-09	1.452E-09	1.325E-09	9.255E-10	7.018E-10	5.477E-10	4.364E-10	3.534E-10	2.901E-10	2.411E-10
SSW	1.144E-09	7.743E-10	7.406E-10	7.410E-10	5.524E-10	4.299E-10	3.400E-10	2.728E-10	2.218E-10	1.824E-10	1.516E-10
SW	9.066E-10	6.276E-10	5.977E-10	5.947E-10	4.413E-10	3.429E-10	2.710E-10	2.174E-10	1.767E-10	1.453E-10	1.208E-10
WSW	8.970E-10	6.425E-10	5.782E-10	5.494E-10	3.938E-10	3.022E-10	2.373E-10	1.897E-10	1.539E-10	1.265E-10	1.052E-10
W	1.159E-09	8.155E-10	7.041E-10	6.484E-10	4.539E-10	3.450E-10	2.696E-10	2.150E-10	1.742E-10	1.431E-10	1.190E-10
WNW	1.572E-09	1.114E-09	8.449E-10	6.864E-10	4.294E-10	3.108E-10	2.367E-10	1.861E-10	1.498E-10	1.227E-10	1.020E-10
NW	8.198E-10	6.218E-10	5.076E-10	4.401E-10	2.918E-10	2.171E-10	1.677E-10	1.330E-10	1.075E-10	8.820E-11	7.334E-11
NNW	6.798E-10	5.102E-10	3.870E-10	3.116E-10	1.924E-10	1.386E-10	1.052E-10	8.265E-11	6.647E-11	5.445E-11	4.527E-11
N	1.855E-09	1.372E-09	1.029E-09	8.195E-10	5.011E-10	3.591E-10	2.719E-10	2.132E-10	1.713E-10	1.403E-10	1.166E-10
NNE	3.456E-09	2.381E-09	1.765E-09	1.405E-09	8.619E-10	6.180E-10	4.679E-10	3.669E-10	2.947E-10	2.412E-10	2.005E-10
NE	2.440E-09	1.597E-09	1.214E-09	1.002E-09	6.398E-10	4.670E-10	3.571E-10	2.815E-10	2.267E-10	1.857E-10	1.543E-10
ENE	1.486E-09	9.816E-10	7.164E-10	5.649E-10	3.441E-10	2.457E-10	1.855E-10	1.453E-10	1.166E-10	9.536E-11	7.923E-11
E	1.675E-09	1.123E-09	7.869E-10	5.892E-10	3.383E-10	2.344E-10	1.739E-10	1.348E-10	1.077E-10	8.789E-11	7.301E-11
ESE	2.520E-09	1.613E-09	1.129E-09	8.516E-10	4.951E-10	3.449E-10	2.568E-10	1.994E-10	1.593E-10	1.301E-10	1.080E-10
SE	3.739E-09	2.416E-09	1.688E-09	1.269E-09	7.340E-10	5.100E-10	3.792E-10	2.942E-10	2.350E-10	1.918E-10	1.593E-10
SSE	3.371E-09	2.148E-09	1.593E-09	1.288E-09	8.067E-10	5.833E-10	4.437E-10	3.487E-10	2.804E-10	2.295E-10	1.906E-10

0DIRECTION FROM SITE	DISTANCES IN MILES 5.00	7.50	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00
S	2.024E-10	1.060E-10	6.722E-11	3.516E-11	2.204E-11	1.553E-11	1.161E-11	9.033E-12	7.244E-12	5.946E-12	4.971E-12
SSW	1.272E-10	6.655E-11	4.214E-11	2.195E-11	1.371E-11	9.580E-12	7.115E-12	5.513E-12	4.408E-12	3.611E-12	3.014E-12
SW	1.014E-10	5.304E-11	3.360E-11	1.751E-11	1.094E-11	7.656E-12	5.691E-12	4.413E-12	3.530E-12	2.892E-12	2.415E-12
WSW	8.834E-11	4.629E-11	2.936E-11	1.536E-11	9.625E-12	6.777E-12	5.061E-12	3.938E-12	3.158E-12	2.592E-12	2.167E-12
W	9.994E-11	5.240E-11	3.327E-11	1.743E-11	1.094E-11	7.735E-12	5.792E-12	4.515E-12	3.625E-12	2.978E-12	2.492E-12
WNW	8.581E-11	4.522E-11	2.886E-11	1.532E-11	9.710E-12	7.022E-12	5.343E-12	4.212E-12	3.409E-12	2.816E-12	2.365E-12
NW	6.167E-11	3.245E-11	2.066E-11	1.090E-11	6.879E-12	4.923E-12	3.719E-12	2.917E-12	2.353E-12	1.939E-12	1.626E-12
NNW	3.812E-11	2.013E-11	1.286E-11	6.844E-12	4.349E-12	3.160E-12	2.412E-12	1.906E-12	1.545E-12	1.278E-12	1.074E-12
N	9.821E-11	5.186E-11	3.316E-11	1.766E-11	1.123E-11	8.178E-12	6.251E-12	4.944E-12	4.010E-12	3.318E-12	2.789E-12
NNE	1.687E-10	8.896E-11	5.682E-11	3.021E-11	1.918E-11	1.391E-11	1.061E-11	8.378E-12	6.788E-12	5.611E-12	4.714E-12
NE	1.297E-10	6.819E-11	4.345E-11	2.296E-11	1.450E-11	1.041E-11	7.882E-12	6.191E-12	4.998E-12	4.121E-12	3.456E-12
ENE	6.668E-11	3.513E-11	2.244E-11	1.193E-11	7.570E-12	5.493E-12	4.189E-12	3.307E-12	2.679E-12	2.214E-12	1.860E-12
E	6.153E-11	3.253E-11	2.086E-11	1.119E-11	7.149E-12	5.267E-12	4.058E-12	3.226E-12	2.627E-12	2.178E-12	1.834E-12
ESE	9.096E-11	4.799E-11	3.073E-11	1.642E-11	1.047E-11	7.671E-12	5.889E-12	4.670E-12	3.795E-12	3.143E-12	2.644E-12
SE	1.342E-10	7.084E-11	4.538E-11	2.428E-11	1.549E-11	1.137E-11	8.738E-12	6.935E-12	5.639E-12	4.673E-12	3.932E-12
SSE	1.603E-10	8.429E-11	5.374E-11	2.844E-11	1.799E-11	1.295E-11	9.824E-12	7.727E-12	6.244E-12	5.151E-12	4.322E-12

Note: Directions are True North.

NAPS COL 2.0-11-A

Table 2.3-214 Long-Term D/Q (1/m^2) for Routine Releases at Distances Between 0.25 to 50 Miles

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 7/ 8/2013
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT ONE - GROUND LEVEL RELEASE - NO PURGE RELEASES
********** RELATIVE DEPOSITION PER UNIT AREA (M**-2) AT FIXED POINTS BY DOWNWIND SECTORS **********

DIRECTION	DISTANCES IN MILES									
FROM SITE	0.25	0.50	0.75	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50
S	4.819E-08	1.630E-08	8.367E-09	5.138E-09	2.561E-09	1.553E-09	1.050E-09	7.611E-10	5.787E-10	4.559E-10	3.691E-10
SSW	3.194E-08	1.080E-08	5.546E-09	3.405E-09	1.698E-09	1.030E-09	6.961E-10	5.045E-10	3.836E-10	3.022E-10	2.446E-10
SW	2.633E-08	8.902E-09	4.571E-09	2.807E-09	1.399E-09	8.486E-10	5.738E-10	4.158E-10	3.161E-10	2.491E-10	2.016E-10
WSW	2.286E-08	7.732E-09	3.970E-09	2.438E-09	1.215E-09	7.371E-10	4.983E-10	3.611E-10	2.746E-10	2.163E-10	1.751E-10
W	2.691E-08	9.101E-09	4.673E-09	2.869E-09	1.430E-09	8.676E-10	5.866E-10	4.251E-10	3.232E-10	2.546E-10	2.061E-10
WNW	2.495E-08	8.438E-09	4.333E-09	2.660E-09	1.326E-09	8.044E-10	5.439E-10	3.941E-10	2.997E-10	2.361E-10	1.911E-10
NW	2.242E-08	7.583E-09	3.893E-09	2.391E-09	1.192E-09	7.229E-10	4.887E-10	3.542E-10	2.693E-10	2.122E-10	1.718E-10
NNW	1.628E-08	5.504E-09	2.826E-09	1.735E-09	8.652E-10	5.247E-10	3.548E-10	2.571E-10	1.955E-10	1.540E-10	1.247E-10
N	4.309E-08	1.457E-08	7.481E-09	4.594E-09	2.290E-09	1.389E-09	9.391E-10	6.805E-10	5.175E-10	4.077E-10	3.300E-10
NNE	6.257E-08	2.116E-08	1.086E-08	6.671E-09	3.326E-09	2.017E-09	1.364E-09	9.882E-10	7.514E-10	5.920E-10	4.793E-10
NE	5.046E-08	1.706E-08	8.761E-09	5.379E-09	2.682E-09	1.627E-09	1.100E-09	7.969E-10	6.059E-10	4.774E-10	3.865E-10
ENE	2.720E-08	9.199E-09	4.723E-09	2.900E-09	1.446E-09	8.769E-10	5.929E-10	4.296E-10	3.267E-10	2.574E-10	2.084E-10
E	3.824E-08	1.293E-08	6.640E-09	4.077E-09	2.033E-09	1.233E-09	8.335E-10	6.040E-10	4.593E-10	3.618E-10	2.929E-10
ESE	5.097E-08	1.724E-08	8.849E-09	5.434E-09	2.709E-09	1.643E-09	1.111E-09	8.050E-10	6.121E-10	4.822E-10	3.904E-10
SE	4.574E-08	1.547E-08	7.942E-09	4.877E-09	2.431E-09	1.475E-09	9.970E-10	7.225E-10	5.493E-10	4.328E-10	3.504E-10
SSE	4.085E-08	1.381E-08	7.092E-09	4.355E-09	2.171E-09	1.317E-09	8.902E-10	6.451E-10	4.905E-10	3.865E-10	3.129E-10

0DIRECTION	DISTANCES IN MILES										
FROM SITE	5.00	7.50	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00
S	3.053E-10	1.496E-10	9.388E-11	4.745E-11	2.872E-11	1.926E-11	1.380E-11	1.036E-11	8.056E-12	6.435E-12	5.252E-12
SSW	2.024E-10	9.917E-11	6.222E-11	3.145E-11	1.904E-11	1.276E-11	9.145E-12	6.867E-12	5.339E-12	4.265E-12	3.481E-12
SW	1.668E-10	8.174E-11	5.129E-11	2.592E-11	1.569E-11	1.052E-11	7.538E-12	5.660E-12	4.401E-12	3.515E-12	2.869E-12
WSW	1.449E-10	7.099E-11	4.454E-11	2.251E-11	1.363E-11	9.136E-12	6.547E-12	4.916E-12	3.822E-12	3.053E-12	2.492E-12
W	1.705E-10	8.356E-11	5.243E-11	2.650E-11	1.604E-11	1.075E-11	7.706E-12	5.786E-12	4.499E-12	3.594E-12	2.933E-12
WNW	1.581E-10	7.748E-11	4.861E-11	2.457E-11	1.487E-11	9.971E-12	7.145E-12	5.365E-12	4.171E-12	3.332E-12	2.720E-12
NW	1.421E-10	6.962E-11	4.369E-11	2.208E-11	1.336E-11	8.961E-12	6.421E-12	4.821E-12	3.749E-12	2.994E-12	2.444E-12
NNW	1.031E-10	5.054E-11	3.171E-11	1.603E-11	9.701E-12	6.504E-12	4.661E-12	3.500E-12	2.721E-12	2.174E-12	1.774E-12
N	2.730E-10	1.338E-10	8.394E-11	4.243E-11	2.568E-11	1.722E-11	1.234E-11	9.264E-12	7.203E-12	5.754E-12	4.697E-12
NNE	3.964E-10	1.943E-10	1.219E-10	6.161E-11	3.729E-11	2.500E-11	1.792E-11	1.345E-11	1.046E-11	8.355E-12	6.820E-12
NE	3.197E-10	1.567E-10	9.830E-11	4.968E-11	3.007E-11	2.016E-11	1.445E-11	1.085E-11	8.435E-12	6.738E-12	5.500E-12
ENE	1.724E-10	8.446E-11	5.300E-11	2.679E-11	1.621E-11	1.087E-11	7.789E-12	5.849E-12	4.548E-12	3.633E-12	2.965E-12
E	2.423E-10	1.187E-10	7.451E-11	3.766E-11	2.279E-11	1.528E-11	1.095E-11	8.223E-12	6.393E-12	5.107E-12	4.168E-12
ESE	3.229E-10	1.583E-10	9.929E-11	5.019E-11	3.038E-11	2.037E-11	1.459E-11	1.096E-11	8.520E-12	6.806E-12	5.555E-12
SE	2.898E-10	1.420E-10	8.912E-11	4.504E-11	2.726E-11	1.828E-11	1.310E-11	9.835E-12	7.647E-12	6.108E-12	4.986E-12
SSE	2.588E-10	1.268E-10	7.957E-11	4.022E-11	2.434E-11	1.632E-11	1.170E-11	8.782E-12	6.828E-12	5.454E-12	4.452E-12

Note: Directions are True North. The results on this page are applicable to releases from the RW-VS.

NAPS COL 2.0-11-A

Table 2.3-215 Long-Term D/Q (1/m^2) for Routine Releases Along Various Distance Segments

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1USNRC COMPUTER CODE - XOQDOQ,  VERSION 2.0          RUN DATE:  8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
 EXIT RB - MIXED MODE RELEASE - NO PURGE RELEASES
0************************     RELATIVE DEPOSITION PER UNIT AREA (M**-2) BY DOWNWIND SECTORS     ************************
                                        SEGMENT BOUNDARIES IN MILES
 DIRECTION    .5-1        1-2         2-3         3-4         4-5         5-10        10-20       20-30       30-40       40-50
 FROM SITE
    S      1.550E-09   9.444E-10   5.535E-10   3.566E-10   2.432E-10   1.107E-10   3.644E-11   1.566E-11   9.071E-12   5.982E-12
   SSW     7.782E-10   5.509E-10   3.404E-10   2.226E-10   1.524E-10   6.937E-11   2.277E-11   9.689E-12   5.560E-12   3.650E-12
    SW     6.166E-10   4.363E-10   2.701E-10   1.769E-10   1.211E-10   5.522E-11   1.816E-11   7.746E-12   4.452E-12   2.924E-12
   WSW     5.929E-10   3.926E-10   2.370E-10   1.543E-10   1.056E-10   4.819E-11   1.592E-11   6.845E-12   3.961E-12   2.605E-12
    W      7.223E-10   4.556E-10   2.699E-10   1.748E-10   1.195E-10   5.458E-11   1.807E-11   7.810E-12   4.548E-12   3.005E-12
   WNW     8.439E-10   4.369E-10   2.372E-10   1.502E-10   1.023E-10   4.702E-11   1.583E-11   7.071E-12   4.246E-12   2.852E-12
    NW     5.030E-10   2.915E-10   1.670E-10   1.074E-10   7.342E-11   3.370E-11   1.128E-11   4.968E-12   2.944E-12   1.964E-12
   NNW     3.808E-10   1.950E-10   1.051E-10   6.651E-11   4.534E-11   2.090E-11   7.073E-12   3.183E-12   1.925E-12   1.299E-12
    N      1.013E-09   5.091E-10   2.718E-10   1.715E-10   1.168E-10   5.386E-11   1.825E-11   8.236E-12   4.995E-12   3.375E-12
   NNE     1.772E-09   8.836E-10   4.705E-10   2.961E-10   2.014E-10   9.256E-11   3.122E-11   1.401E-11   8.472E-12   5.728E-12
    NE     1.254E-09   6.591E-10   3.610E-10   2.286E-10   1.555E-10   7.114E-11   2.375E-11   1.051E-11   6.294E-12   4.260E-12
   ENE     7.199E-10   3.522E-10   1.865E-10   1.171E-10   7.958E-11   3.654E-11   1.233E-11   5.535E-12   3.351E-12   2.273E-12
    E      7.846E-10   3.505E-10   1.754E-10   1.083E-10   7.337E-11   3.383E-11   1.154E-11   5.314E-12   3.311E-12   2.297E-12
   ESE     1.164E-09   5.235E-10   2.624E-10   1.616E-10   1.093E-10   5.014E-11   1.695E-11   7.718E-12   4.759E-12   3.278E-12
    SE     1.741E-09   7.741E-10   3.872E-10   2.383E-10   1.611E-10   7.394E-11   2.504E-11   1.138E-11   6.945E-12   4.708E-12
   SSE     1.682E-09   8.446E-10   4.527E-10   2.844E-10   1.930E-10   8.811E-11   2.939E-11   1.299E-11   7.722E-12   5.157E-12
0VENT AND BUILDING PARAMETERS:
     RELEASE HEIGHT  (METERS)   52.77                 REP. WIND HEIGHT       (METERS)       10.0
     DIAMETER        (METERS)    2.40                 BUILDING HEIGHT        (METERS)       46.1
     EXIT VELOCITY   (METERS)   17.78                 BLDG.MIN.CRS.SEC.AREA  (SQ.METERS)  3098.0
                                                      HEAT EMISSION RATE     (CAL/SEC)       0.0
0AT THE RELEASE HEIGHT:                          /  AT THE MEASURED WIND HEIGHT ( 10.0 METERS):
 VENT RELEASE MODE   WIND SPEED (METERS/SEC)     /  VENT RELEASE MODE   WIND SPEED (METERS/SEC)       WIND SPEED (METERS/SEC)
                                                 /                      STABLE CONDITIONS             UNSTABLE/NEUTRAL CONDITIONS
     ELEVATED        LESS THAN  3.556            /      ELEVATED        LESS THAN  3.556              LESS THAN  3.556
     MIXED           BETWEEN    3.556 AND 17.780 /      MIXED           BETWEEN    3.556 AND 17.780   BETWEEN    3.556 AND 17.780
     GROUND LEVEL    ABOVE     17.780            /      GROUND LEVEL    ABOVE     17.780              ABOVE     17.780
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Note: Directions are True North.

NAPS COL 2.0-11-A

Table 2.3-215 Long-Term D/Q (1/m^2) for Routine Releases Along Various Distance Segments

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1USNRC COMPUTER CODE - XOQDOQ,  VERSION 2.0          RUN DATE:  8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
 EXIT TB - MIXED MODE RELEASE - NO PURGE RELEASES
0************************     RELATIVE DEPOSITION PER UNIT AREA (M**-2) BY DOWNWIND SECTORS     ************************
                                        SEGMENT BOUNDARIES IN MILES
 DIRECTION    .5-1         1-2         2-3         3-4         4-5         5-10        10-20       20-30       30-40       40-50
 FROM SITE
    S      1.458E-09   9.148E-10   5.442E-10   3.530E-10   2.413E-10   1.102E-10   3.646E-11   1.570E-11   9.087E-12   5.969E-12
  SSW      7.483E-10   5.399E-10   3.371E-10   2.214E-10   1.517E-10   6.919E-11   2.278E-11   9.696E-12   5.550E-12   3.626E-12
   SW      6.030E-10   4.316E-10   2.687E-10   1.763E-10   1.209E-10   5.514E-11   1.817E-11   7.747E-12   4.442E-12   2.904E-12
  WSW      5.796E-10   3.876E-10   2.355E-10   1.537E-10   1.053E-10   4.811E-11   1.592E-11   6.850E-12   3.961E-12   2.602E-12
    W      7.041E-10   4.487E-10   2.679E-10   1.740E-10   1.191E-10   5.447E-11   1.807E-11   7.814E-12   4.541E-12   2.990E-12
  WNW      8.343E-10   4.338E-10   2.362E-10   1.498E-10   1.021E-10   4.697E-11   1.583E-11   7.067E-12   4.229E-12   2.825E-12
   NW      5.030E-10   2.915E-10   1.670E-10   1.074E-10   7.342E-11   3.370E-11   1.128E-11   4.963E-12   2.931E-12   1.945E-12
  NNW      3.808E-10   1.950E-10   1.051E-10   6.651E-11   4.534E-11   2.090E-11   7.072E-12   3.178E-12   1.913E-12   1.282E-12
    N      1.012E-09   5.088E-10   2.717E-10   1.715E-10   1.168E-10   5.385E-11   1.825E-11   8.222E-12   4.962E-12   3.327E-12
  NNE      1.742E-09   8.741E-10   4.675E-10   2.950E-10   2.008E-10   9.241E-11   3.122E-11   1.400E-11   8.410E-12   5.627E-12
   NE      1.205E-09   6.435E-10   3.562E-10   2.267E-10   1.545E-10   7.087E-11   2.375E-11   1.049E-11   6.219E-12   4.134E-12
  ENE      7.080E-10   3.494E-10   1.855E-10   1.167E-10   7.936E-11   3.650E-11   1.233E-11   5.525E-12   3.320E-12   2.221E-12
    E      7.737E-10   3.479E-10   1.744E-10   1.079E-10   7.317E-11   3.379E-11   1.154E-11   5.285E-12   3.236E-12   2.184E-12
  ESE      1.113E-09   5.075E-10   2.573E-10   1.596E-10   1.082E-10   4.987E-11   1.696E-11   7.704E-12   4.685E-12   3.152E-12
   SE      1.664E-09   7.533E-10   3.801E-10   2.355E-10   1.596E-10   7.360E-11   2.506E-11   1.142E-11   6.957E-12   4.685E-12
  SSE      1.581E-09   8.143E-10   4.429E-10   2.805E-10   1.909E-10   8.761E-11   2.942E-11   1.304E-11   7.761E-12   5.168E-12
0VENT AND BUILDING PARAMETERS:
     RELEASE HEIGHT  (METERS)   71.30                 REP. WIND HEIGHT       (METERS)       10.0
     DIAMETER        (METERS)    1.95                 BUILDING HEIGHT        (METERS)       46.1
     EXIT VELOCITY   (METERS)   17.78                 BLDG.MIN.CRS.SEC.AREA  (SQ.METERS)  3098.0
                                                      HEAT EMISSION RATE     (CAL/SEC)       0.0
0AT THE RELEASE HEIGHT:                          /  AT THE MEASURED WIND HEIGHT ( 10.0 METERS):
 VENT RELEASE MODE   WIND SPEED (METERS/SEC)     /  VENT RELEASE MODE   WIND SPEED (METERS/SEC)       WIND SPEED (METERS/SEC)
                                                 /                      STABLE CONDITIONS             UNSTABLE/NEUTRAL CONDITIONS
     ELEVATED        LESS THAN  3.556            /      ELEVATED        LESS THAN  3.556              LESS THAN  3.556
     MIXED           BETWEEN    3.556 AND 17.780 /      MIXED           BETWEEN    3.556 AND 17.780   BETWEEN    3.556 AND 17.780
     GROUND LEVEL    ABOVE     17.780            /      GROUND LEVEL    ABOVE     17.780              ABOVE     17.780
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Note: Directions are True North.

NAPS COL 2.0-11-A

Table 2.3-215 Long-Term D/Q (1/m^2) for Routine Releases Along Various Distance Segments

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 7/ 8/2013
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT ONE - GROUND LEVEL RELEASE - NO PURGE RELEASES
0********** RELATIVE DEPOSITION PER UNIT AREA (M**-2) BY DOWNWIND SECTORS **********

	SEGMENT BOUNDARIES IN MILES									
DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	8.694E-09	2.686E-09	1.069E-09	5.841E-10	3.712E-10	1.594E-10	4.944E-11	1.960E-11	1.046E-11	6.477E-12
SSW	5.762E-09	1.780E-09	7.084E-10	3.871E-10	2.460E-10	1.057E-10	3.277E-11	1.299E-11	6.936E-12	4.293E-12
SW	4.749E-09	1.467E-09	5.839E-10	3.191E-10	2.028E-10	8.710E-11	2.701E-11	1.071E-11	5.717E-12	3.538E-12
WSW	4.125E-09	1.274E-09	5.071E-10	2.771E-10	1.761E-10	7.565E-11	2.346E-11	9.298E-12	4.965E-12	3.073E-12
W	4.855E-09	1.500E-09	5.969E-10	3.262E-10	2.073E-10	8.905E-11	2.761E-11	1.094E-11	5.844E-12	3.617E-12
WNW	4.502E-09	1.391E-09	5.534E-10	3.024E-10	1.922E-10	8.256E-11	2.560E-11	1.015E-11	5.419E-12	3.354E-12
NW	4.045E-09	1.250E-09	4.973E-10	2.718E-10	1.727E-10	7.420E-11	2.301E-11	9.119E-12	4.870E-12	3.014E-12
NNW	2.937E-09	9.072E-10	3.610E-10	1.973E-10	1.254E-10	5.386E-11	1.670E-11	6.619E-12	3.535E-12	2.188E-12
N	7.773E-09	2.402E-09	9.557E-10	5.222E-10	3.319E-10	1.426E-10	4.421E-11	1.752E-11	9.357E-12	5.792E-12
NNE	1.129E-08	3.487E-09	1.388E-09	7.583E-10	4.820E-10	2.070E-10	6.420E-11	2.544E-11	1.359E-11	8.410E-12
NE	9.103E-09	2.812E-09	1.119E-09	6.115E-10	3.887E-10	1.669E-10	5.177E-11	2.052E-11	1.096E-11	6.782E-12
ENE	4.908E-09	1.516E-09	6.033E-10	3.297E-10	2.095E-10	9.001E-11	2.791E-11	1.106E-11	5.907E-12	3.656E-12
E	6.899E-09	2.132E-09	8.482E-10	4.635E-10	2.946E-10	1.265E-10	3.924E-11	1.555E-11	8.305E-12	5.140E-12
ESE	9.195E-09	2.841E-09	1.130E-09	6.177E-10	3.926E-10	1.686E-10	5.230E-11	2.073E-11	1.107E-11	6.851E-12
SE	8.252E-09	2.550E-09	1.015E-09	5.544E-10	3.524E-10	1.514E-10	4.693E-11	1.860E-11	9.934E-12	6.149E-12
SSE	7.369E-09	2.277E-09	9.059E-10	4.950E-10	3.146E-10	1.351E-10	4.191E-11	1.661E-11	8.870E-12	5.490E-12

0VENT AND BUILDING PARAMETERS:

RELEASE HEIGHT	(METERS)	0.00	REP. WIND HEIGHT	(METERS)	10.0
DIAMETER	(METERS)	0.00	BUILDING HEIGHT	(METERS)	46.1
EXIT VELOCITY	(METERS)	0.00	BLDG.MIN.CRS.SEC.AREA	(SQ.METERS)	3098.0
			HEAT EMISSION RATE	(CAL/SEC)	0.0

0ALL GROUND LEVEL RELEASES.

Note: Directions are True North. The results on this page are applicable to releases from the RW-VS.

11.3 Gaseous Waste Management System

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

11.3.1 Design Basis

Add the following at the end of this section.

NAPS ESP COL 11.1-1

The methodology for performing cost-benefit analysis for the radwaste system is presented in Section 11.2.1.

The annual costs for augments for the gaseous radwaste treatment system were determined and the lowest annual cost was considered a threshold value. The lowest-cost option for a gaseous radwaste treatment system augment that applies to BWRs is the 1000 cfm Charcoal/HEPA Filtration System at $7,960 per year, which yields a threshold value of 7.96 person-rem whole body or thyroid from gaseous effluents for BWRs.

As shown in Table 12.2-204, the Unit 3 annual whole body dose from gaseous effluents is ~~4.3~~ 4.5 person-rem/yr, which is below the 7.96 person-rem/yr threshold value. Based on this comparison, no gaseous radwaste treatment system augment is cost-beneficial in reducing annual whole body dose and the cost-benefit analysis demonstrates compliance with 10 CFR 50, Appendix I, Section II.D, for this type of dose.

As shown in the table below, the Unit 3 thyroid dose from gaseous effluents is 25 person-rem/yr, which exceeds the 7.96 person-rem/yr threshold value for a BWR. Because the Unit 3 estimate exceeds this threshold value, further analysis is provided below.

Source	Thyroid Dose (person-rem/year)	% of Total
Iodines	2.1E+01	~~84.1~~ 83.3
Particulates	~~7.9E-01~~ 9.2E-01	~~3.2~~ 3.6
Noble gases	~~4.9E-01~~ 5.7E-01	~~2.0~~ 2.3
C-14	2.1E+00	~~8.4~~ 8.5
H-3	6.0E-01	2.4
Total	2.5E+01	100.0

The cost-benefit analysis described in Section 11.2.1 is based on RG 1.110, which provides the gaseous radwaste augments applicable to a BWR to be considered for Unit 3. Based on the estimated 25 person-rem/year thyroid dose, those augments with a TAC less than $25,000 are considered below. In some cases, the system augments less than $25,000 per year have insufficient capacity. System augments with greater capacities were considered but eliminated because they had TAC values greater than $25,000. The gaseous radwaste system augments in RG 1.110 applicable to a BWR were considered.

15,000 cfm HEPA Filtration System (If in Auxiliary Building)

For Unit 3, the gaseous effluent releases "from the Auxiliary Building" were considered as follows because an ESBWR does not have an Auxiliary Building. Two ventilation systems that service contaminated air in the Reactor Building are combined: the Contaminated Area HVAC Subsystem (CONAVS) and the Refueling and Pool Area HVAC Subsystem (REPAVS). Per DCD Figure 9.4-10, the normal flow through the CONAVS exhaust fan is 9,975 l/sec (21,136 cfm). Per DCD Figure 9.4-11, the normal flow through the REPAVS exhaust fan is 32,050 l/sec (67,910 cfm). In both cases, the normal flow rates exceed the proposed 7079 l/sec (15,000 cfm) HEPA filtration system. Therefore, this augment is not effective for Unit 3 and is eliminated from further consideration.

15,000 cfm HEPA Filtration System (If in Turbine Building)

The Turbine Building HVAC System (TBVS) services the Turbine Building. DCD Figure 9.4-8 shows that the Turbine Building exhaust goes through the Turbine Building Air Exhaust Subsystem (TBE). Per DCD Table 9.4-15, the 100 percent capacity flow through TBE is 52,800 l/sec (111,877 cfm). Based on this design capacity, it is assumed that the normal flow exceeds 7079 l/sec (15,000 cfm), which is much less than the design capacity. Therefore, this augment is not effective for Unit 3 and is eliminated from further consideration.

3-Ton Charcoal Adsorber

Per DCD Table 11.3-1, the total mass of charcoal in the offgas system is 237 metric tons (523,000 lb), or approximately 262 tons. Addition of a 2.7 metric ton (3-ton) charcoal adsorber only provides an additional 1.1 percent capacity to the existing offgas system. DCD Table 12.2-16 shows that the annual airborne releases from the offgas system represent only about 4 percent of the total annual airborne releases from Unit 3. Additional charcoal adsorbers would improve the holdup times of the noble gases and C-14, but those only contribute approximately 10 percent to the thyroid dose. Therefore, the maximum improvement in the thyroid dose would be approximately 0.4 percent of 25 person-rem/year or 0.12 person-rem/year, equivalent to a benefit of $120 per year. As this annual benefit is less than the annual cost of $9,450 for the 3-ton charcoal adsorber, this augment is eliminated from further consideration.

Main Condenser Vacuum Pump (MCVP) Charcoal/HEPA Filtration System

DCD Table 12.2-16 shows that the annual airborne iodine releases from the MCVP represent approximately 0.7 percent of the total annual airborne iodine releases from Unit 3. Therefore, the maximum improvement in the thyroid dose would be 0.7 percent of 25 person-rem/year or approximately 0.17 person-rem/year, equivalent to a benefit of $170 per year. As this annual benefit is less than the annual cost of $8,170 for the MCVP charcoal/HEPA filtration system, this augment is eliminated from further consideration.

600-ft^3 Gas Decay Tank

It is assumed that the gas decay tank is an augment to the offgas system. The flow rate through the offgas system is 54 m^3/hr (31.8 cfm) per

DCD Table 12.2-15. As a result, the average residence time in a 600 ft^3 gas decay tank is approximately 19 minutes. While this decay time will have a negligible effect on iodines, particulates, C-14, and H-3, it will mitigate the dose consequences of short-lived noble gases. Because the noble gases contribute ~~0.49~~ 0.57 person-rem/year to the thyroid dose, even complete elimination of the noble gases represents a maximum improvement in the thyroid dose of only ~~0.49~~ 0.57 person-rem/year. This is equivalent to a benefit of ~~$490~~ $570 per year. As this annual benefit is less than the annual cost of $8,040 for the 600 ft^3 gas decay tank, this augment is eliminated from further consideration.

1000 cfm Charcoal/HEPA Filtration System

As discussed above for 15,000 cfm HEPA filtration systems, the Unit 3 building exhaust system flow rates greatly exceed 472 l/sec (1000 cfm). Therefore, this augment is not effective for Unit 3 and is eliminated from further consideration.

Conclusion

None of the gaseous radwaste augments are cost-beneficial in reducing the annual thyroid dose from gaseous effluents for Unit 3.

11.4 Solid Waste Management System

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

Replace the third and fourth sentences of the third paragraph with the following.

NAPS DEP 11.4-1

The SWMS component capacities are provided in Table 11.4-1R. The estimated annual waste generated from the SWMS Subsystem is provided in Table 11.4-2R. Table 11.4-2R also identifies Class A, B, and C waste in accordance with 10 CFR 61.55 (DCD Reference 11.4-16) and the quantities of waste that would be shipped or stored in the long-term storage area of the Radwaste Building if a licensed disposal facility is not available.

12.2.2.2 Airborne Dose Evaluation Offsite

Replace this section with the following.

NAPS COL 12.2-2-A

The bases for the calculation of Unit 3-specific airborne offsite doses are provided in Table 12.2-18aR. The annual gaseous pathway doses are provided in Table 12.2-18bR. The methodology of RG 1.109 was used in determining the annual airborne dose values. The bases include values that are default parameters in RG 1.109 and other values that are Unit 3 site-specific inputs.

The results of the Unit 3 gaseous pathway dose analysis are given in Table 12.2-18bR.

12.2.2.2.1 Compliance with 10 CFR 50, Appendix I, Sections II.B and II.C

Table 12.2-201 demonstrates that offsite doses due to Unit 3 radioactive airborne effluents comply with the regulatory dose limits in 10 CFR 50, Appendix I, Sections II.B and II.C.

NAPS ESP COL 11.1-1

12.2.2.2.2 Compliance with 10 CFR 50, Appendix I, Section II.D

Population dose is determined for the gaseous effluent releases from Unit 3 for both total body dose and thyroid dose. The total body dose is ~~4.3~~ 4.5 person-rem/yr as shown in Table 12.2-204. The thyroid dose is 25 person-rem/yr. The cost-benefit analysis performed to consider gaseous radwaste augments to reduce doses due to gaseous effluents is presented in Section 11.3. Based on the results from the cost-benefit analysis, no augments are cost-beneficial. Therefore, Unit 3 complies with 10 CFR 50, Appendix I, Section II.D.

12.2.2.2.3 Compliance with 10 CFR 20, Appendix B, Table 2, Column 1

Table 12.2-17R provides the gaseous effluent concentrations in comparison to the 10 CFR 20, Appendix B, Table 2, Column 1 limits. The Unit 3 gaseous effluent concentrations comply with 10 CFR 20, Appendix B, Table 2, Column 1.

12.2.2.2.4 Compliance with 10 CFR 20.1301 and 20.1302

NAPS ESP VAR 12.2-4

Compliance with 10 CFR 20.1301 and 20.1302 is demonstrated in Sections 12.2.2.4.4 and 12.2.2.4.5, respectively. Compliance with 10 CFR 20.1301(e) and 40 CFR 190 is described in Section 12.2.2.4.4.

Based on the annual liquid release offsite values in DCD Table 12.2-19b, which are repeated in Table 12.2-19bR, the Unit 3 annual liquid release concentrations were calculated based upon the criteria specified in DCD Section 12.2.2.3 and the Unit 3-specific input values shown in Table 12.2-20aR. Table 12.2-19bR also shows the maximum activity concentration for each nuclide at the end of the discharge canal from the combined operation of Units 1, 2, and 3, and the corresponding concentration limit for the NAPS site from 10 CFR 20, Appendix B, Table 2, Column 2.

The LADTAP II code is used to perform the liquid effluent dose analysis (DCD Reference 12.2-3). The results of the dose calculation are given in Table 12.2-20bR.

12.2.2.4.1 Compliance with 10 CFR 50, Appendix I, Section II.A

Table 12.2-202 demonstrates that offsite doses due to Unit 3 radioactive liquid effluents comply with the regulatory dose limits in 10 CFR 50, Appendix I, Section II.A.

NAPS ESP COL 11.1-1

12.2.2.4.2 Compliance with 10 CFR 50, Appendix I, Section II.D

Population dose is determined for the liquid effluent releases from Unit 3 for both total body dose and thyroid dose. The total body dose is 0.84 person-rem/yr as shown in Table 12.2-204. The thyroid dose is 0.99 person-rem/yr. The cost-benefit analysis performed to consider liquid radwaste augments to reduce doses due to liquid effluents is presented in Section 11.2. Based on the above liquid effluent dose estimate values and the threshold value from the cost-benefit analysis, no augments are cost-beneficial. Therefore, Unit 3 complies with 10 CFR 50, Appendix I, Section II.D.

12.2.2.4.3 Compliance with 10 CFR 20, Appendix B, Table 2, Column 2

Compliance with 10 CFR 20, Appendix B, Table 2, Column 2 is demonstrated in Table 12.2-19bR.

12.2.2.4.4 Compliance with 10 CFR 20.1301 and 20.1302

This section demonstrates that offsite doses due to Unit 3, combined with offsite doses due to Units 1 and 2 and the NAPS independent spent fuel storage installation (ISFSI), comply with the regulatory limits in 10 CFR 20.1301 for doses to members of the public.

Using the Unit 3-specific gaseous effluent release activities identified in Table 12.2-17R, and the Unit 3-specific liquid effluent release activities identified in Table 12.2-19bR, the total annual doses to the MEI and the population resulting from Unit 3 liquid and gaseous effluents are calculated and presented in Tables 12.2-203 and 12.2-204, respectively.

The direct radiation contribution due to contained sources from operation of Unit 3 is negligible. The direct dose contribution due to Turbine Building skyshine from Unit 3 at two distances is provided in DCD Table 12.2-21. That table shows the annual dose at 1000 m (0.62 mi) to be 1.66E-06 mSv/yr (1.66E-04 mrem/yr). Section 9.3.9 shows that Unit 3 uses hydrogen water chemistry, and DCD Section 12.2.1.3 explains that the direct dose contribution takes into account hydrogen water chemistry. The distance from Unit 3 to the nearest residence is assumed to be 0.74 mi in the NW direction, as described in Section 2.3.5.1. The distance from Unit 3 to the location on the site boundary with the highest gaseous effluent annual dose is 1416 m (0.88 mile) in the NNE direction. This is the distance from Unit 3 to the site boundary, that is, the exclusion area boundary (EAB) in the direction of maximum annual χ/Q, as shown in Table 2.3-16R. These distances from Unit 3 to each type of receptor location are greater than those presented in the DCD, so the Unit 3 direct radiation dose rate at each location is even lower than the very low rate cited above for 1000 m (0.62 mi).

The total annual doses to the MEI resulting from North Anna Units 1 and 2 liquid and gaseous effluents are provided in Table 12.2-203. The values shown are representative based on review of Units 1 and 2 annual radiological environmental operating reports (e.g., Reference 12.2-203).

The direct radiation contribution from operation of Units 1 and 2 is negligible. An evaluation of operating plants by the NRC states that:

> "...because the primary coolant of an LWR is contained in a heavily shielded area, dose rates in the vicinity of light water reactors are generally undetectable and are less than 1 mrem/year at the site boundary."

The NRC concludes that the direct radiation from normal operation results in "small contributions at site boundaries" (Reference 12.2-204, Section 4.6.1.2). For the NAPS site, the nearest residence is at a distance typical of a site boundary evaluated by NRC. An assumed value

of 1 mrem/yr is included in Table 12.2-203 to account for the dose to the MEI at the nearest residence from operation of Units 1 and 2.

Discharged fuel assemblies from NAPS Units 1 and 2 are stored in the NAPS ISFSI (Reference 12.2-205). The direct radiation contribution from operation of the NAPS ISFSI is small, both at the residence nearest to the ISFSI, which is south and slightly east of the ISFSI at about 870 m (0.54 mi), and at the closest point to the site boundary, which is south and slightly west of the ISFSI at approximately 760 m (0.47 mi). The annual contribution at the site boundary from the ISFSI is no more than 3.6E-02 mSv/yr (3.6 mrem/yr). This value is based on a conservatively estimated peak dose rate from a fully-filled ISFSI with 84 casks/modules, which bounds the planned 68 casks, containing NAPS Units 1 and 2 fuel assemblies and the distance from the ISFSI to the site boundary, which is shorter than that to the residence nearest the ISFSI. This ISFSI dose contribution is then conservatively applied to the MEI for the nearest residence from Unit 3, which is assumed to be 0.74 mi in the NW direction and even further from the ISFSI.

Table 12.2-203 shows that the total NAPS site doses resulting from the normal operation of Units 1, 2, and 3 and applied at the nearest residence meet 10 CFR 20.1301(e) and are well within the regulatory limits of 40 CFR 190. These doses are applied at the distance to the nearest residence from Unit 3, which is assumed to be 0.74 mi. These doses bound those at the site boundary.

NAPS ESP VAR 12.2-4

While the regulatory limits are met, the doses for total body, thyroid, and bone due to the existing units, as shown in bold in Table 12.2-203, do not fall within (are greater than) the corresponding values in ESP-ER Table 5.4-11. ~~Also, the total body and bone doses for the site, as shown in bold in Table 12.2-203, do not fall within (are greater than) the corresponding values in ESP-ER Table 5.4-11.~~

Table 12.2-204 shows the total body doses from liquid and gaseous effluents doses attributable to Unit 3 for the population within 50 miles of the NAPS site.

12.2.2.4.5 Compliance with 10 CFR 20.1302

Surveys of radiation levels in unrestricted and controlled areas and radioactive materials in effluents released to unrestricted and controlled areas are conducted to demonstrate compliance with the dose limits given in 10 CFR 20.1302 for individual members of the public.

NAPS COL 12.2-2-A
NAPS ESP COL 11.1-1
NAPS ESP VAR 12.2-5

Table 12.2-17R Comparison of Airborne Release Concentrations with 10 CFR 20 Limit

Nuclide	Unit 3 ~~Airborne~~ Annual Release MBq/yr	Ci/yr	~~Concentration Bq/m³~~	Unit 3 Concentration Bq/m³	µCi/ml	Units 1, 2 & 3 Concentration µCi/ml	~~10 CFR 20 Bq/m³~~	ECL µCi/ml	Units 1, 2, & 3 Fraction of ECL
Kr-83m	**8.5E+01**	**2.3E-03**	~~4.0E-07~~	1.9E-07	5.2E-18	5.2E-18	~~2.E+06~~	5.0E-05	1.0E-13
Kr-85m	6.6E+05	1.8E+01	~~2.6E-03~~	1.1E-03	3.1E-14	7.0E-11	~~4.E+03~~	1.0E-07	7.0E-04
Kr-85	5.2E+06	1.4E+02	~~2.0E-02~~	8.6E-03	2.3E-13	1.3E-09	~~3.E+04~~	7.0E-07	1.8E-03
Kr-87	1.4E+06	3.9E+01	~~5.4E-03~~	2.4E-03	6.5E-14	4.0E-11	~~7.E+02~~	2.0E-08	2.0E-03
Kr-88	2.1E+06	5.7E+01	~~8.2E-03~~	3.5E-03	9.5E-14	1.3E-10	~~3.E+02~~	9.0E-09	1.4E-02
Kr-89	1.4E+07	3.7E+02	~~1.5E-01~~	9.0E-02	2.4E-12	2.4E-12	~~4.E+01~~	1.0E-09	2.4E-03
Xe-131m	1.5E+05	4.1E+00	~~5.6E-04~~	2.5E-04	6.7E-15	1.8E-12	~~7.E+04~~	2.0E-06	8.9E-07
Xe-133m	1.9E+02	5.2E-03	~~9.2E-07~~	4.3E-07	1.2E-17	1.0E-10	~~2.E+04~~	6.0E-07	1.7E-04
Xe-133	4.1E+07	1.1E+03	~~9.3E-01~~	5.8E-01	1.6E-11	9.2E-09	~~2.E+04~~	5.0E-07	1.8E-02
Xe-135m	2.2E+07	6.1E+02	~~1.9E+00~~	1.3E+00	3.4E-11	4.1E-11	~~1.E+03~~	4.0E-08	1.0E-03
Xe-135	2.8E+07	7.5E+02	~~1.1E+00~~	7.0E-01	1.9E-11	2.3E-10	~~3.E+03~~	7.0E-08	3.3E-03
Xe-137	2.8E+07	7.8E+02	~~4.0E-01~~	2.5E-01	6.6E-12	6.6E-12	~~4.E+01~~	1.0E-09	6.6E-03
Xe-138	2.3E+07	6.3E+02	~~9.4E-02~~	4.3E-02	1.2E-12	2.3E-11	~~7.E+02~~	2.0E-08	1.2E-03
I-131	1.8E+04	5.0E-01	~~1.8E-04~~	1.0E-04	2.8E-15	2.3E-13	~~7.E+00~~	2.0E-10	1.2E-03
I-132	**9.4E+04**	**2.5E+00**	~~1.1E-03~~	6.7E-04	1.8E-14	6.4E-14	~~7.E+02~~	2.0E-08	3.2E-06
I-133	**8.9E+04**	**2.4E+00**	~~1.1E-03~~	6.3E-04	1.7E-14	3.0E-13	~~4.E+01~~	1.0E-09	3.0E-04
I-134	1.5E+05	4.0E+00	~~1.8E-03~~	1.0E-03	2.8E-14	4.5E-14	~~2.E+03~~	6.0E-08	7.5E-07

NAPS COL 12.2-2-A
NAPS ESP COL 11.1-1
NAPS ESP VAR 12.2-5

Table 12.2-17R Comparison of Airborne Release Concentrations with 10 CFR 20 Limit

Nuclide	Unit 3 ~~Airborne~~ Annual Release MBq/yr	Unit 3 ~~Airborne~~ Annual Release Ci/yr	~~Concentration Bq/m^3~~	Unit 3 Concentration Bq/m^3	Unit 3 Concentration µCi/ml	Units 1, 2 & 3 Concentration µCi/ml	~~10 CFR 20 Bq/m^3~~	ECL µCi/ml	Units 1, 2, & 3 Fraction of ECL
I-135	**1.2E+05**	**3.2E+00**	~~1.4E-03~~	8.3E-04	2.2E-14	1.4E-13	~~2.E+02~~	6.0E-09	2.3E-05
H-3	~~2.8E+06~~ 9.3E+06	2.5E+02	~~1.2E-02~~	1.4E+00	3.7E-11	3.7E-11	~~4.E+03~~	1.0E-07	3.7E-04
C-14	**5.3E+05**	**1.4E+01**	~~2.0E-03~~	8.7E-04	2.4E-14	2.4E-14	~~1.E+02~~	3.0E-09	7.9E-06
Na-24	5.9E+00	1.6E-04	~~2.8E-08~~	1.3E-08	3.6E-19	3.6E-19	~~3.E+02~~	7.0E-09	5.1E-11
P-32	1.5E+00	4.1E-05	~~7.1E-09~~	3.4E-09	9.1E-20	9.1E-20	~~2.E+01~~	5.0E-10	1.8E-10
Ar-41	1.4E+03	3.8E-02	~~5.4E-06~~	2.3E-06	6.2E-17	6.2E-17	~~4.E+02~~	1.0E-08	6.2E-09
Cr-51	2.7E+02	7.2E-03	~~6.6E-06~~	4.2E-06	1.1E-16	1.1E-16	~~1.E+03~~	3.0E-08	3.7E-09
Mn-54	**3.0E+02**	**8.2E-03**	~~3.2E-05~~	2.1E-05	5.7E-16	5.7E-16	~~4.E+01~~	1.0E-09	5.7E-07
Mn-56	1.2E+01	3.2E-04	~~5.6E-08~~	2.7E-08	7.3E-19	7.3E-19	~~7.E+02~~	2.0E-08	3.7E-11
Fe-55	5.1E+01	1.4E-03	~~2.4E-07~~	1.1E-07	3.1E-18	3.1E-18	~~1.E+02~~	3.0E-09	1.0E-09
Fe-59	**4.1E+01**	**1.1E-03**	~~2.5E-06~~	1.6E-06	4.4E-17	4.4E-17	~~2.E+01~~	5.0E-10	8.8E-08
Co-58	8.0E+01	2.2E-03	~~1.9E-06~~	1.2E-06	3.2E-17	3.2E-17	~~4.E+01~~	1.0E-09	3.2E-08
Co-60	**6.6E+02**	**1.8E-02**	~~5.7E-05~~	3.7E-05	1.0E-15	1.0E-15	~~2.E+00~~	5.0E-11	2.0E-05
Ni-63	5.2E-02	1.4E-06	~~2.5E-10~~	1.2E-10	3.2E-21	3.2E-21	~~4.E+01~~	1.0E-09	3.2E-12
Cu-64	7.5E+00	2.0E-04	~~3.6E-08~~	1.7E-08	4.6E-19	4.6E-19	~~1.E+03~~	3.0E-08	1.5E-11
Zn-65	**6.2E+02**	**1.7E-02**	~~5.0E-06~~	2.7E-06	7.4E-17	7.4E-17	~~1.E+01~~	4.0E-10	1.9E-07
Rb-89	2.0E-01	5.4E-06	~~9.5E-10~~	4.5E-10	1.2E-20	1.2E-20	~~7.E+03~~	2.0E-07	6.1E-14

NAPS COL 12.2-2-A
NAPS ESP COL 11.1-1
NAPS ESP VAR 12.2-5

Table 12.2-17R Comparison of Airborne Release Concentrations with 10 CFR 20 Limit

Nuclide	Unit 3 ~~Airborne~~ Annual Release MBq/yr	Unit 3 ~~Airborne~~ Annual Release Ci/yr	~~Concentration Bq/m³~~	Unit 3 Concentration Bq/m³	Unit 3 Concentration µCi/ml	Units 1, 2 & 3 Concentration µCi/ml	~~10 CFR 20 Bq/m³~~	ECL µCi/ml	Units 1, 2, & 3 Fraction of ECL
Sr-89	**3.1E+02**	**8.3E-03**	~~1.2E-06~~	5.1E-07	1.4E-17	1.4E-17	~~7.E+00~~	2.0E-10	6.9E-08
Sr-90	1.9E+00	5.0E-05	~~7.9E-09~~	3.6E-09	9.7E-20	9.7E-20	~~2.E-01~~	6.0E-12	1.6E-08
Y-90	8.9E-02	2.4E-06	~~4.2E-10~~	2.0E-10	5.4E-21	5.4E-21	~~3.E+01~~	9.0E-10	6.0E-12
Sr-91	7.5E+00	2.0E-04	~~3.6E-08~~	1.7E-08	4.6E-19	4.6E-19	~~2.E+02~~	5.0E-09	9.1E-11
Sr-92	4.9E+00	1.3E-04	~~2.3E-08~~	1.1E-08	3.0E-19	3.0E-19	~~3.E+02~~	9.0E-09	3.3E-11
Y-91	1.9E+00	5.1E-05	~~9.2E-09~~	4.3E-09	1.2E-19	1.2E-19	~~7.E+00~~	2.0E-10	5.8E-10
Y-92	3.8E+00	1.0E-04	~~1.8E-08~~	8.6E-09	2.3E-19	2.3E-19	~~4.E+02~~	1.0E-08	2.3E-11
Y-93	8.1E+00	2.2E-04	~~3.8E-08~~	1.8E-08	4.9E-19	4.9E-19	~~1.E+02~~	3.0E-09	1.6E-10
Zr-95	**9.2E+01**	**2.5E-03**	~~6.6E-06~~	4.3E-06	1.2E-16	1.2E-16	~~1.E+01~~	4.0E-10	2.9E-07
Nb-95	**5.0E+02**	**1.4E-02**	~~2.4E-06~~	1.1E-06	3.1E-17	3.1E-17	~~7.E+01~~	2.0E-09	1.6E-08
Mo-99	**3.4E+03**	**9.3E-02**	~~1.6E-05~~	7.7E-06	2.1E-16	2.1E-16	~~7.E+01~~	2.0E-09	1.0E-07
Tc-99m	2.4E+00	6.5E-05	~~1.2E-08~~	5.4E-09	1.5E-19	1.5E-19	~~7.E+03~~	2.0E-07	7.3E-13
Ru-103	**2.1E+02**	**5.8E-03**	~~1.0E-06~~	4.8E-07	1.3E-17	1.3E-17	~~3.E+01~~	9.0E-10	1.5E-08
Rh-103m	3.8E-03	1.0E-07	~~1.8E-11~~	8.6E-12	2.3E-22	2.3E-22	~~7.E+04~~	2.0E-06	1.2E-16
Ru-106	1.6E-01	4.3E-06	~~7.4E-10~~	3.6E-10	9.7E-21	9.7E-21	~~7.E-01~~	2.0E-11	4.9E-10
Rh-106	5.2E-06	1.4E-10	~~2.5E-14~~	1.2E-14	3.2E-25	3.2E-25	~~4.E+01~~	1.0E-09	3.2E-16
Ag-110m	**1.7E-01**	**4.6E-06**	~~8.1E-10~~	3.8E-10	1.0E-20	1.0E-20	~~4.E+00~~	1.0E-10	1.0E-10
Sb-124	**1.1E+01**	**3.0E-04**	~~5.9E-07~~	3.8E-07	1.0E-17	1.0E-17	~~1.E+01~~	3.0E-10	3.4E-08
Te-129m	1.8E+00	4.9E-05	~~8.6E-09~~	4.1E-09	1.1E-19	1.1E-19	~~1.E+01~~	3.0E-10	3.7E-10

NAPS COL 12.2-2-A
NAPS ESP COL 11.1-1
NAPS ESP VAR 12.2-5

Table 12.2-17R Comparison of Airborne Release Concentrations with 10 CFR 20 Limit

Nuclide	Unit 3 ~~Airborne~~ Annual Release MBq/yr	Unit 3 ~~Airborne~~ Annual Release Ci/yr	~~Concentration Bq/m³~~	Unit 3 Concentration Bq/m³	Unit 3 Concentration µCi/ml	Units 1, 2 & 3 Concentration µCi/ml	~~10 CFR 20 Bq/m³~~	ECL µCi/ml	Units 1, 2, & 3 Fraction of ECL
Te-131m	6.0E-01	1.6E-05	~~2.9E-09~~	1.4E-09	3.7E-20	3.7E-20	~~4.E+01~~	1.0E-09	3.7E-11
Te-132	1.5E-01	4.1E-06	~~7.3E-10~~	3.4E-10	9.1E-21	9.1E-21	~~3.E+01~~	9.0E-10	1.0E-11
Cs-134	**3.7E+02**	**1.0E-02**	~~2.0E-05~~	1.3E-05	3.5E-16	3.5E-16	~~7.E+00~~	2.0E-10	1.8E-06
Cs-136	**3.1E+01**	**8.3E-04**	~~1.4E-07~~	6.6E-08	1.8E-18	1.8E-18	~~3.E+01~~	9.0E-10	2.0E-09
Cs-137	**5.5E+02**	**1.5E-02**	~~3.3E-05~~	2.2E-05	5.9E-16	5.9E-16	~~7.E+00~~	2.0E-10	2.9E-06
Cs-138	8.5E-01	2.3E-05	~~4.0E-09~~	1.9E-09	5.2E-20	5.2E-20	~~3.E+03~~	8.0E-08	6.5E-13
Ba-140	**1.6E+03**	**4.4E-02**	~~7.2E-06~~	3.4E-06	9.1E-17	9.1E-17	~~7.E+01~~	2.0E-09	4.5E-08
La-140	1.4E+01	3.8E-04	~~6.8E-08~~	3.2E-08	8.5E-19	8.5E-19	~~7.E+01~~	2.0E-09	4.3E-10
Ce-141	**5.5E+02**	**1.5E-02**	~~2.2E-06~~	9.7E-07	2.6E-17	2.6E-17	~~3.E+01~~	8.0E-10	3.3E-08
Ce-144	1.6E-01	4.3E-06	~~7.4E-10~~	3.6E-10	9.7E-21	9.7E-21	~~7.E 01~~	2.0E-11	4.9E-10
Pr-144	1.8E-04	4.9E-09	~~8.6E-13~~	4.1E-13	1.1E-23	1.1E-23	~~7.E+00~~	2.0E-07	5.5E-17
W-187	1.4E+00	3.8E-05	~~6.6E-09~~	3.2E-09	8.5E-20	8.5E-20	~~4.E+02~~	1.0E-08	8.5E-12
Np-239	9.0E+01	2.4E-03	~~4.3E-07~~	2.0E-07	5.5E-18	5.5E-18	~~1.E+02~~	3.0E-09	1.8E-09
Total	1.8E+08	4.8E+03		4.3E+00	1.2E-10	1.1E-08		NA	5.3E-02

Note: Concentrations for Units 1 and 2 are based on the activity releases in NAPS UFSAR (Reference 12.2-206) Table 11.3-2. Effluent concentration limits (ECLs) are from 10 CFR 20, Appendix B, Table 2, Column 1. The H-3 release includes a contribution from the circulating water hybrid cooling tower evaporation of 180 Ci/yr (6.7E+06 MBq/yr).

NAPS COL 12.2-2-A
NAPS ESP COL 11.1-1
NAPS ESP VAR 12.2-1

Table 12.2-18bR Gaseous Pathway Doses to the MEI (mrem/yr)

		ESP			Unit 3		
Location	Pathway	Total Body	Thyroid	Skin	Total Body	Thyroid	Skin
Site Boundary (1416 m (0.88 mi) ESE for ESP-ER ~~and NNE~~ ;1416 m NNE/ESE, 547 m (0.34 mi) W for FSAR)	Plume	2.1E+00	NA	6.2E+00	~~1.3E-01~~ 2.8E-01	~~1.3E-01~~ **2.8E-01**	~~2.1E-01~~ 5.0E-01
	Inhalation						
	Adult	3.0E-01	1.6E+00	NA	2.7E-02	~~6.2E-02~~ 1.0E-01	NA
	Teen	3.1E-01	2.0E+00	NA	2.7E-02	~~7.3E-02~~ 1.3E-01	NA
	Child	2.7E-01	2.3E+00	NA	2.4E-02	~~8.1E-02~~ 1.5E-01	NA
	Infant	1.6E-01	2.0E+00	NA	1.4E-02	~~6.6E-02~~ 1.3E-01	NA
Nearest Garden (1513 m (0.94 mi) NE for ESP-ER; 1191 m (0.74 mi) ~~NNE~~ NNE/ESE for FSAR)	Vegetable						
	Adult	4.4E-01	4.9E+00	NA	~~6.6E-02~~ 8.0E-02	~~1.5E+00~~ 1.6E+00	NA
	Teen	5.7E-01	6.6E+00	NA	~~7.7E-02~~ 8.9E-02	~~1.9E+00~~ 2.2E+00	NA
	Child	1.1E+00	1.3E+01	NA	~~1.2E-01~~ 1.3E-01	~~3.7E+00~~ 4.2E+00	NA
Nearest Residence (1545 m (0.96 mi) NNE for ESP-ER; 1191 m (0.74 mi) ~~NNE~~ NNE/ESE for FSAR)	Plume	1.4E+00	NA	4.0E+00	~~1.2E-01~~ 3.2E-01	~~1.2E-01~~ **3.2E-01**	~~2.1E-01~~ 5.9E-01
	Inhalation						
	Adult	2.0E-01	1.0E+00	NA	~~2.6E-02~~ 2.7E-02	~~6.3E-02~~ 1.2E-01	NA
	Teen	2.0E-01	1.3E+00	NA	~~2.6E-02~~ 2.7E-02	~~7.5E-02~~ 1.5E-01	NA
	Child	1.8E-01	1.5E+00	NA	~~2.3E-02~~ 2.4E-02	~~8.2E-02~~ 1.8E-01	NA
	Infant	1.0E-01	1.3E+00	NA	~~1.3E-02~~ 1.4E-02	~~6.7E-02~~ 1.5E-01	NA

NAPS COL 12.2-2-A
NAPS ESP COL 11.1-1
NAPS ESP VAR 12.2-1

Table 12.2-18bR Gaseous Pathway Doses to the MEI (mrem/yr)

		ESP			Unit 3		
Location	Pathway	Total Body	Thyroid	Skin	Total Body	Thyroid	Skin
Nearest Meat Animal (2205 m (1.37 mi) SE for ESP-ER; 1191 m (0.74 mi) ~~NNE~~ NNE/ESE for FSAR)	Meat Adult	6.7E-02	1.5E-01	NA	~~1.0E-02~~ 1.2E-02	~~5.8E-02~~ 6.5E-02	NA
	Teen	4.9E-02	1.1E-01	NA	~~6.5E-03~~ 7.2E-03	~~4.2E-02~~ 4.6E-02	NA
	Child	7.9E-02	1.7E-01	NA	~~8.6E-03~~ 9.2E-03	~~6.2E-02~~ 6.9E-02	NA
Nearest Garden/ Residence/ Meat Animal (Varies for ESP-ER; 1191 m (0.74 mi) ~~NNE~~ NNE/ESE for FSAR)	All Adult	1.6E+00	4.9E+00	4.0E+00	~~2.2E-01~~ 4.3E-01	~~1.7E+00~~ 2.1E+00	~~2.1E-01~~ 5.9E-01
	Teen	1.6E+00	6.6E+00	4.0E+00	~~2.3E-01~~ 4.4E-01	~~2.2E+00~~ 2.7E+00	~~2.1E-01~~ 5.9E-01
	Child	1.6E+00	1.3E+01	4.0E+00	~~2.7E-01~~ 4.8E-01	~~4.0E+00~~ 4.7E+00	~~2.1E-01~~ 5.9E-01
	Infant	1.5E+00	1.3E+00	4.0E+00	~~1.3E-01~~ 3.3E-01	~~1.9E-01~~ 4.7E-01	~~2.1E-01~~ 5.9E-01

Notes:

1. There are no infant doses for the vegetable and meat pathways because infants do not consume these foods.
2. "NA" denotes "not applicable."
3. 1 mrem = 0.01 msv
4. For Unit 3, the doses shown for "nearest garden/residence/meat animal" location are the sum of garden, residence, and meat animal doses at 1191 m NNE for releases from reactor and turbine buildings and 1191 m ESE for releases from Radwaste Building and circulating water hybrid cooling tower. For ESP, these doses are the maximum of garden, residence, and meat animal doses at 1513 m NE, 1545 m NNE, and 2205 m SE, respectively. The site boundary and residence plume doses include ground shine contribution. For Unit 3, the site boundary doses are the sum of the maximum from each release point regardless of distance or direction (1416 m NNE for Reactor and Turbine Buildings,1416 m ESE for Radwaste Building, 547 m W for cooling tower).
5. The maximum (child) bone dose for Unit 3 from all gaseous effluent pathways is shown in Table 12.2-203.

NAPS COL 12.2-2-A
NAPS ESP COL 11.1-1

Table 12.2-201 Comparison of Annual Doses to the MEI from Gaseous Effluents Per Unit

Type of Dose	Location	ESP (Single Unit)	Unit 3	10 CFR 50 Limit
Gamma Air (mrad/yr)	Residence	3.2	~~0.078~~ 0.27	10
Beta Air (mrad/yr)	Residence	4.8	~~0.078~~ 0.25	20
Total Body (mrem/yr)	~~Site Boundary~~ Residence	2.4	~~0.13~~ 0.32	5
Skin (mrem/yr)	~~Site Boundary~~ Residence	6.2	~~0.21~~ 0.59	15
Iodines and Particulates - Thyroid (mrem/yr)	Garden/ Residence/ Meat Animal	12	~~3.8~~ 4.4	15

1 mrad = 0.01 mGy
1 mrem = 0.01 mSv

NAPS COL 12.2-2-A
NAPS COL 12.2-3-A
NAPS ESP COL 11.1-1
NAPS ESP VAR 12.2-4

Table 12.2-203 Comparison of Site Doses to the MEI

Type of Dose	ESP Site Total[1]	Unit 3 (ESBWR) Liquid	Gaseous	Total[5]	Existing Units[2]	Site Total[3]	40 CFR 190 Limit
Total Body (mrem/yr)	6.8	0.079	~~0.27~~ 0.48	~~0.35~~ 0.56	**5.0**	~~5.3~~ 5.5	25
Thyroid (mrem/yr)	27	0.26	~~4.0~~ 4.7	~~4.2~~ 5.0	**5.1**	~~9.4~~ 10	75
Bone (mrem/yr)	12	1.1	~~0.31~~ 0.55	~~1.4~~ 1.6	**5.1**	~~6.5~~ 6.8	25

Notes:

1. The ESP site total doses are for two new units and two existing units, and do not include a dose contribution from the ISFSI.
2. The doses from existing units include ISFSI contribution and an assumed dose of 1 mrem/yr due to direct radiation from the existing units.
3. This site total dose includes the Unit 3 total dose and the dose from the existing units.
4. 1 mrem = 0.01 mSv
5. Unit 3 total annual doses include a Turbine Building skyshine contribution of less than 1.66E-04 mrem/yr.

NAPS COL 12.2-2-A
NAPS COL 12.2-3-A
NAPS ESP COL 11.1-1

Table 12.2-204 Collective Total Body (Population) Doses Within 50 Miles

Units in person-rem/yr

	ESP (Single Unit)	Unit 3
Liquid	8.6	0.84
Noble Gases (Gaseous)	3.5	~~0.49~~ 0.57
Iodines and Particulates (Gaseous)	1.4	~~1.1~~ 1.2
H-3 and C-14 (Gaseous)	14	2.7
Gaseous Total	19	~~4.3~~ 4.5
Total	28	~~5.1~~ 5.3

Notes:

1. 1 rem = 0.01 Sv
2. ESP doses are based on data from ESP-ER Tables 2.5-8, 5.4-1, and 5.4-3.
3. The corresponding collective thyroid doses for Unit 3 are 0.99 person-rem/year from liquid effluents and 25 person-rem/year from gaseous effluents.
4. The long-term χ/Q and D/Q values used in deriving Unit 3 collective doses from routine gaseous effluent releases within 50 miles of the plant are shown in Tables 2.3-208 to 2.3-223.

2.7.6 Long-Term (Routine) Diffusion Estimates

As a part of the preparation of this ER, the annual Radiological Environmental Monitoring Program was reviewed to determine if the distances to any of the nearest sensitive receptors, modeled for the ESP-ER have changed. The results are documented in Table 2.7-1 based on a field survey and plotting of receptor locations using Geographic Information System (GIS) technology. This process provided improved distance accuracy for these receptors. The results show the closest receptor to be a residence in the NW direction at a distance of 1.28 km (4207 feet). For the purposes of the atmospheric dispersion analysis and the subsequent dose evaluations, it was conservatively assumed that each sensitive receptor (meat animal, vegetable garden, residence) is at the distance to the closest receptor and that the closest receptor is the residence in the NW direction at the previously determined distance of 1.20 km (3930 ft). Therefore, one of each type of receptor was assumed to be at 1.20 km (3930 feet) in each compass direction. ~~The~~ For releases originating from within the plant facility boundary (i.e., from the Reactor Building, Turbine Building, and Radwaste Building), the maximum annual average χ/Q value calculated for the nearest residence, vegetable garden, and meat animal, all assumed at 1.20 km (0.74 mi), is ~~8.30E-07~~ 4.2E-06 sec/m^3 in the ~~NNE~~ ESE direction. The maximum D/Q for those receptors is ~~4.40E-09~~ 1.1E-08 m^{-2} in the ~~S~~ NNE direction. In the evaluation performed for this ER, the maximum annual χ/Q (no decay, undepleted) at the EAB is ~~8.1E-07~~ 3.3E-06 sec/m^3, based on a distance of 1.42 km (0.88 mile) to the ~~NNE~~ ESE of the facility boundary from ESP-ER Table 2.7-16 and a minimum Turbine Building cross-sectional area of 3098 m^2 (33,347 ft^2). The results are summarized in Table 2.7-2. This table presents the maximum calculated χ/Qs and D/Qs at sensitive receptors.

Long-term (annual average) χ/Q and D/Q estimates generated by the XOQDOQ model for the sensitive receptors and at distances between 0.25 mile to 50 miles, as well as for various segment boundaries, are also presented. Table 2.7-4 presents χ/Q and D/Q estimates at the specific points of interest.

Table 2.7-5 presents the no decay and undepleted χ/Q estimates at various downwind distances between 0.4 km (0.25 mi) and 80.5 km (50 mi). Table 2.7-6 presents the no decay and undepleted χ/Q estimates for various distance segments out to 80.5 km (50 mi).

Table 2.7-7 presents the 2.26 day decay (for short-lived noble gases) and undepleted χ/Q estimates at the same downwind distances. Table 2.7-8 presents the 2.26 day decay and undepleted χ/Q estimates for the same distance segments.

Table 2.7-9 presents the 8 day decay (for all iodines released to the atmosphere) and depleted χ/Q estimates at the same downwind distances. Table 2.7-10 presents the 8 day decay and depleted χ/Q estimates for the same distance segments.

Table 2.7-11 presents the D/Q estimates for the same downwind distances. Table 2.7-12 presents the D/Q estimates for the same distance segments.

The methodology used to determine the long-term dispersion and deposition coefficients (used in the evaluation of doses due to normal operating releases) remains the same as that described in ESP-ER Section 2.7.6.

[The following input data and assumptions were used in the XOQDOQ modeling of routine releases from the vent stacks of the Reactor Building (RB-VS), Turbine Building (TB-VS), and Radwaste Building (RW-VS); and from the CIRC cooling tower:

- Meteorological Data: Three-year combined (1996–1998) onsite joint frequency distribution of wind speed, wind direction, and atmospheric stability.
- Type of Release: Mixed mode (RB-VS~~,~~ and TB-VS ~~and RW-VS~~) and ground level (RW-VS and CIRC cooling tower).
- Wind Sensor Height: 10 m (33 ft).
- Vertical Temperature Difference from instruments at: 10 m (33 ft) - 48.4 m (158.9 ft).
- Number of Wind Speed Categories: 7.
- Release Height: 52.77 m (173.09 ft) for RB-VS, 71.3 m (234 ft) for TB-VS, ~~18.15 m (59.59 ft)~~ 0.0 m (0.0 ft) for RW-VS, 0.0 m (0.0 ft) for CIRC cooling tower.
- Building Height: 46.1 m (151.2 ft) effective height of Turbine Building (TB) for RB-VS, ~~and~~ TB-VS, and RW-VS releases, ~~12.15 m (39.89 ft) for RW-VS release,~~ and 0.0 m (0.0 ft) for CIRC Cooling Tower.
- Minimum Turbine Building Cross-Sectional Area: 3098 m^2 (33,347 ft^2).
- Stack Average Velocity: 17.78 m/s (58.33 ft/s) for RB-VS~~,~~ and TB-VS~~, and RW-VS~~.
- Stack Inside Diameter: 2.40 m (7.9 ft) for RB, 1.95 m (6.4 ft) for TB, ~~1.34 m (4.4 ft)~~ 0.0 m (0.0 ft) for RW, 0.0 m (0.0 ft) for CIRC cooling tower.
- Distances from the release point to the nearest point on the site boundary: See Tables 2.7-1 and 2.7-4, which provide the same distances as ESP-ER Table 2.7-16.
- The distance for each sensitive receptor in each direction was assumed to occur at the distance for the nearest residence for releases from the RB, TB, and RW vent stacks.

~~Two sets of χ/Q and D/Q values were calculated. One analysis was performed for releases from the RB, TB, and RW vent stacks using distances from the plant facility boundary in FSAR Figure 2.0-205 to the EAB. These releases were based on the release heights and exit velocities for each building's vent stack as provided in DCD Table 2B-1. An additional analysis was performed for ground level releases from the CIRC cooling tower.~~

For releases from the RB-VS, TB-VS, and RW-VS, χ/Q and D/Q calculations at the EAB were computed using distances from the plant facility boundary (FSAR Figure 2.0-205) to the EAB in each sector. For releases from the CIRC cooling tower, which lies outside the plant facility

boundary, χ/Q and D/Q calculations at the EAB were computed using distances from the CIRC cooling tower to the EAB in each sector.

For the RB-VS, TB-VS, and RW-VS dispersion analyses, the Turbine Building was used to determine the minimum building cross-sectional area for evaluating building downwash effects. The height of this building is approximately 52 m (170.6 ft), and as the tallest building within the plant facility boundary, this building creates the largest wake. Because the Turbine Building is close enough to each of the three stacks, each will experience wake effects (dispersion) due to the Turbine Building. Also, because the Turbine Building is taller than the other buildings within the plant facility boundary, the building-induced turbulence for the Turbine Building effectively envelops the wakes from the other lower height structures. Therefore, only the Turbine Building wake was considered and was based on the Turbine Building cross-sectional area. A width of 67.2 m (220.5 ft) at the base of the building, and a minimum building cross-sectional area of 3098 m^2 (33,347 ft^2) were used to determine χ/Q and D/Q estimates. This minimum Turbine Building area was divided by the width at the base to obtain the effective height, which accounts for the irregular shape of the top of the Turbine Building. An effective Turbine Building height of 46.1 m (151.2 ft) was used for modeling the releases from ~~both~~ the RB-VS, ~~and~~ TB-VS, and RW-VS. For Unit 3, the χ/Q and D/Q values were found to depend on building height but not cross-sectional area. ~~Because building height is a more sensitive input than the cross-sectional area, and there is a large difference in the heights of the Turbine Building and the Radwaste Building, the Radwaste Building height of 12.15 m (39.89 ft) was used to ensure conservative results.]~~

ESP-ER Tables 2.7-13 through 2.7-20 have been replaced in this ER by Tables 2.7-1 through 2.7-12.

No other new and significant information has been identified for this section.

Table 2.7-2 XOQDOQ Predicted Maximum χ/Q and D/Q Values at Specific Points of Interest

Type of Location	Structure	Release Type	Direction from Site (True North)	Distance (miles)	χ/Q (No Decay, Undepleted)	χ/Q (2.26 Day Decay, Undepleted)	χ/Q (8 Day Decay, Depleted)	D/Q
Residence	RB	Mixed	NNE	0.74	6.8E-08	6.8E-08	6.6E-08	1.8E-09 [b]
EAB	RB	Mixed	NNE	0.88	7.1E-08	~~7.1E08~~ 7.1E-08	6.9E-08	1.7E-09 [a]
Meat Animal	RB	Mixed	NNE	0.74	6.8E-08	6.8E-08	6.6E-08	1.8E-09 [b]
Veg. Garden	RB	Mixed	NNE	0.74	6.8E-08	6.8E-08	6.6E-08	1.8E-09 [b]
Residence	TB	Mixed	NNE	0.74	5.5E-08	5.5E-08	5.3E-08	1.8E-09
EAB	TB	Mixed	NNE	0.88	5.2E-08	5.2E-08	5.0E-08	1.6E-09 [c]
Meat Animal	TB	Mixed	NNE	0.74	5.5E-08	5.5E-08	5.3E-08	1.8E-09
Veg. Garden	TB	Mixed	NNE	0.74	5.5E-08	5.5E-08	5.3E-08	1.8E-09
Residence	RW	~~Mixed~~ Ground	~~NNE~~ ESE	0.74	~~8.3E-07~~ 4.2E-06	~~8.3E-07~~ 4.2E-06	~~8.2E-07~~ 3.8E-06	~~4.4E-09~~ [e] 1.1E-08 [e]
EAB	RW	~~Mixed~~ Ground	~~NNE~~ ESE	0.88	~~8.1E-07~~ 3.3E-06	~~8.1E-07~~ 3.3E-06	~~8.0E-07~~ 2.9E-06	~~5.5E-09~~ [d] 1.1E-08 [d]
Meat Animal	RW	~~Mixed~~ Ground	~~NNE~~ ESE	0.74	~~8.3E-07~~ 4.2E-06	~~8.3E-07~~ 4.2E-06	~~8.2E-07~~ 3.8E-06	~~4.4E-09~~ [e] 1.1E-08 [e]
Veg. Garden	RW	~~Mixed~~ Ground	~~NNE~~ ESE	0.74	~~8.3E-07~~ 4.2E-06	~~8.3E-07~~ 4.2E-06	~~8.2E-07~~ 3.8E-06	~~4.4E-09~~ [e] 1.1E-08 [e]
Residence	CIRC CT	Ground	ESE	0.74	6.3E-06	6.2E-06	5.6E-06	1.1E-08 [g]
EAB	CIRC CT	Ground	W	0.34	6.4E-06	6.4E-06	6.0E-06	2.1E-08 [f]
Meat Animal	CIRC CT	Ground	ESE	0.74	6.3E-06	6.2E-06	5.6E-06	1.1E-08 [g]
Veg. Garden	CIRC CT	Ground	ESE	0.74	6.3E-06	6.2E-06	5.6E-06	1.1E-08 [g]

Table 2.7-2 XOQDOQ Predicted Maximum χ/Q and D/Q Values at Specific Points of Interest

Notes:

χ/Q – sec/m^3

D/Q – $1/m^2$

RB – Reactor Building

TB – Turbine Building

RW – Radwaste Building

CIRC CT – CIRC Cooling Tower

a - Direction South and South-Southeast at distances of 0.62 and 0.73 mi, respectively, for maximum D/Q for EAB.

b - Direction North-Northeast and Southeast at distances of 0.74 mi for maximum D/Q for Residence, Meat Animal and Veg. Garden.

c - Direction North-Northeast and South-Southeast at distances of 0.88 and 0.73 mi, respectively, for maximum D/Q for EAB.

d – Direction South at distance of 0.62 mi for maximum D/Q for EAB.

e - Direction ~~South~~ North-Northeast at distance of 0.74 mi for maximum D/Q for Residence, Meat Animal and Veg. Garden.

f - Direction South at distance of 0.43 mi for maximum D/Q for EAB.

g - Direction North-Northeast at distance of 0.74 mi for maximum D/Q for Residence, Meat Animal and Veg. Garden.

Table 2.7-3 [Deleted]

Table 2.7-4 Long-Term Average χ/Q (sec/m^3) for Routine Releases at Specific Points of Interest (Sheet 1 of 4)

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014

0XOQDOQ - North Anna COL (1996-98 Met Data)

EXIT RB - MIXED MODE RELEASE - NO PURGE RELEASES
SPECIFIC POINTS OF INTEREST

0RELEASE ID	TYPE OF LOCATION	DIRECTION FROM SITE	DISTANCE (MILES)	DISTANCE (METERS)	X/Q (SEC/CUB.METER) NO DECAY	X/Q (SEC/CUB.METER) 2.260 DAY DECAY	X/Q (SEC/CUB.METER) 8.000 DAY DECAY	D/Q (PER SQ.METER)
+								
+								
					UNDEPLETED	UNDEPLETED	DEPLETED	
A	RESIDENCE	S	0.74	1198.	6.5E-08	6.5E-08	6.2E-08	1.5E-09
A	RESIDENCE	SSW	0.74	1198.	3.2E-08	3.2E-08	3.1E-08	7.7E-10
A	RESIDENCE	SW	0.74	1198.	2.4E-08	2.4E-08	2.3E-08	6.1E-10
A	RESIDENCE	WSW	0.74	1198.	2.3E-08	2.3E-08	2.3E-08	5.9E-10
A	RESIDENCE	W	0.74	1198.	2.8E-08	2.8E-08	2.7E-08	7.3E-10
A	RESIDENCE	WNW	0.74	1198.	3.5E-08	3.5E-08	3.4E-08	8.6E-10
A	RESIDENCE	NW	0.74	1198.	1.9E-08	1.9E-08	1.8E-08	5.1E-10
A	RESIDENCE	NNW	0.74	1198.	1.3E-08	1.3E-08	1.3E-08	3.9E-10
A	RESIDENCE	N	0.74	1198.	3.5E-08	3.5E-08	3.4E-08	1.0E-09
A	RESIDENCE	NNE	0.74	1198.	6.8E-08	6.8E-08	6.6E-08	1.8E-09
A	RESIDENCE	NE	0.74	1198.	4.8E-08	4.8E-08	4.6E-08	1.3E-09
A	RESIDENCE	ENE	0.74	1198.	2.7E-08	2.7E-08	2.6E-08	7.3E-10
A	RESIDENCE	E	0.74	1198.	2.5E-08	2.4E-08	2.4E-08	8.0E-10
A	RESIDENCE	ESE	0.74	1198.	3.9E-08	3.9E-08	3.8E-08	1.2E-09
A	RESIDENCE	SE	0.74	1198.	5.7E-08	5.7E-08	5.5E-08	1.8E-09
A	RESIDENCE	SSE	0.74	1198.	6.3E-08	6.3E-08	6.1E-08	1.7E-09
A	EAB	S	0.62	998.	6.3E-08	6.3E-08	6.0E-08	1.7E-09
A	EAB	SSW	0.57	917.	2.9E-08	2.9E-08	2.8E-08	7.9E-10
A	EAB	SW	0.54	869.	2.2E-08	2.2E-08	2.1E-08	6.3E-10
A	EAB	WSW	0.55	885.	2.1E-08	2.1E-08	2.1E-08	6.4E-10
A	EAB	W	0.54	869.	2.7E-08	2.7E-08	2.6E-08	8.1E-10
A	EAB	WNW	0.56	901.	3.5E-08	3.5E-08	3.4E-08	1.0E-09
A	EAB	NW	0.62	998.	1.8E-08	1.8E-08	1.7E-08	5.5E-10
A	EAB	NNW	0.72	1159.	1.3E-08	1.3E-08	1.3E-08	4.0E-10
A	EAB	N	0.87	1400.	3.8E-08	3.8E-08	3.8E-08	9.3E-10
A	EAB	NNE	0.88	1416.	7.1E-08	7.1E-08	6.9E-08	1.6E-09
A	EAB	NE	0.90	1448.	5.3E-08	5.3E-08	5.2E-08	1.1E-09
A	EAB	ENE	0.91	1465.	2.9E-08	2.9E-08	2.8E-08	6.3E-10
A	EAB	E	0.89	1432.	2.6E-08	2.6E-08	2.6E-08	6.8E-10
A	EAB	ESE	0.88	1416.	4.0E-08	4.0E-08	3.9E-08	1.0E-09
A	EAB	SE	0.83	1336.	5.4E-08	5.4E-08	5.3E-08	1.6E-09
A	EAB	SSE	0.73	1175.	6.3E-08	6.3E-08	6.1E-08	1.7E-09
A	MEAT ANIMAL	S	0.74	1198.	6.5E-08	6.5E-08	6.2E-08	1.5E-09
A	MEAT ANIMAL	SSW	0.74	1198.	3.2E-08	3.2E-08	3.1E-08	7.7E-10
A	MEAT ANIMAL	SW	0.74	1198.	2.4E-08	2.4E-08	2.3E-08	6.1E-10
A	MEAT ANIMAL	WSW	0.74	1198.	2.3E-08	2.3E-08	2.3E-08	5.9E-10
A	MEAT ANIMAL	W	0.74	1198.	2.8E-08	2.8E-08	2.7E-08	7.3E-10
A	MEAT ANIMAL	WNW	0.74	1198.	3.5E-08	3.5E-08	3.4E-08	8.6E-10
A	MEAT ANIMAL	NW	0.74	1198.	1.9E-08	1.9E-08	1.8E-08	5.1E-10
A	MEAT ANIMAL	NNW	0.74	1198.	1.3E-08	1.3E-08	1.3E-08	3.9E-10
A	MEAT ANIMAL	N	0.74	1198.	3.5E-08	3.5E-08	3.4E-08	1.0E-09
A	MEAT ANIMAL	NNE	0.74	1198.	6.8E-08	6.8E-08	6.6E-08	1.8E-09
A	MEAT ANIMAL	NE	0.74	1198.	4.8E-08	4.8E-08	4.6E-08	1.3E-09
A	MEAT ANIMAL	ENE	0.74	1198.	2.7E-08	2.7E-08	2.6E-08	7.3E-10
A	MEAT ANIMAL	E	0.74	1198.	2.5E-08	2.4E-08	2.4E-08	8.0E-10
A	MEAT ANIMAL	ESE	0.74	1198.	3.9E-08	3.9E-08	3.8E-08	1.2E-09
A	MEAT ANIMAL	SE	0.74	1198.	5.7E-08	5.7E-08	5.5E-08	1.8E-09
A	MEAT ANIMAL	SSE	0.74	1198.	6.3E-08	6.3E-08	6.1E-08	1.7E-09
A	VEG. GARDEN	S	0.74	1198.	6.5E-08	6.5E-08	6.2E-08	1.5E-09
A	VEG. GARDEN	SSW	0.74	1198.	3.2E-08	3.2E-08	3.1E-08	7.7E-10
A	VEG. GARDEN	SW	0.74	1198.	2.4E-08	2.4E-08	2.3E-08	6.1E-10
A	VEG. GARDEN	WSW	0.74	1198.	2.3E-08	2.3E-08	2.3E-08	5.9E-10
A	VEG. GARDEN	W	0.74	1198.	2.8E-08	2.8E-08	2.7E-08	7.3E-10
A	VEG. GARDEN	WNW	0.74	1198.	3.5E-08	3.5E-08	3.4E-08	8.6E-10
A	VEG. GARDEN	NW	0.74	1198.	1.9E-08	1.9E-08	1.8E-08	5.1E-10
A	VEG. GARDEN	NNW	0.74	1198.	1.3E-08	1.3E-08	1.3E-08	3.9E-10
A	VEG. GARDEN	N	0.74	1198.	3.5E-08	3.5E-08	3.4E-08	1.0E-09
A	VEG. GARDEN	NNE	0.74	1198.	6.8E-08	6.8E-08	6.6E-08	1.8E-09
A	VEG. GARDEN	NE	0.74	1198.	4.8E-08	4.8E-08	4.6E-08	1.3E-09
A	VEG. GARDEN	ENE	0.74	1198.	2.7E-08	2.7E-08	2.6E-08	7.3E-10
A	VEG. GARDEN	E	0.74	1198.	2.5E-08	2.4E-08	2.4E-08	8.0E-10
A	VEG. GARDEN	ESE	0.74	1198.	3.9E-08	3.9E-08	3.8E-08	1.2E-09
A	VEG. GARDEN	SE	0.74	1198.	5.7E-08	5.7E-08	5.5E-08	1.8E-09
A	VEG. GARDEN	SSE	0.74	1198.	6.3E-08	6.3E-08	6.1E-08	1.7E-09

0VENT AND BUILDING PARAMETERS:

RELEASE HEIGHT	(METERS)	52.77	REF. WIND HEIGHT	(METERS)	10.0
DIAMETER	(METERS)	2.40	BUILDING HEIGHT	(METERS)	46.1
EXIT VELOCITY	(METERS)	17.78	BLDG.MIN.CRS.SEC.AREA	(SQ.METERS)	3098.0
			HEAT EMISSION RATE	(CAL/SEC)	0.0

0AT THE RELEASE HEIGHT:

VENT RELEASE MODE	WIND SPEED (METERS/SEC)
ELEVATED	LESS THAN 3.556
MIXED	BETWEEN 3.556 AND 17.780
GROUND LEVEL	ABOVE 17.780

/ AT THE MEASURED WIND HEIGHT (10.0 METERS):

VENT RELEASE MODE	WIND SPEED (METERS/SEC) STABLE CONDITIONS	WIND SPEED (METERS/SEC) UNSTABLE/NEUTRAL CONDITIONS
ELEVATED	LESS THAN 3.556	LESS THAN 3.556
MIXED	BETWEEN 3.556 AND 17.780	BETWEEN 3.556 AND 17.780
GROUND LEVEL	ABOVE 17.780	ABOVE 17.780

Note: Directions are True North.

Table 2.7-4 Long-Term Average χ/Q (sec/m^3) for Routine Releases at Specific Points of Interest (Sheet 2 of 4)

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014

0XOQDOQ - North Anna COL (1996-98 Met Data)

EXIT TB - MIXED MODE RELEASE - NO PURGE RELEASES
SPECIFIC POINTS OF INTEREST

0RELEASE ID	TYPE OF LOCATION	DIRECTION FROM SITE	DISTANCE (MILES)	DISTANCE (METERS)	X/Q (SEC/CUB.METER) NO DECAY	X/Q (SEC/CUB.METER) 2.260 DAY DECAY	X/Q (SEC/CUB.METER) 8.000 DAY DECAY	D/Q (PER SQ.METER)
+								
+								
					UNDEPLETED	UNDEPLETED	DEPLETED	
B	RESIDENCE	S	0.74	1198.	4.7E-08	4.7E-08	4.5E-08	1.5E-09
B	RESIDENCE	SSW	0.74	1198.	2.3E-08	2.3E-08	2.2E-08	7.4E-10
B	RESIDENCE	SW	0.74	1198.	1.7E-08	1.7E-08	1.6E-08	6.0E-10
B	RESIDENCE	WSW	0.74	1198.	1.7E-08	1.7E-08	1.7E-08	5.8E-10
B	RESIDENCE	W	0.74	1198.	2.2E-08	2.2E-08	2.1E-08	7.1E-10
B	RESIDENCE	WNW	0.74	1198.	2.9E-08	2.9E-08	2.8E-08	8.5E-10
B	RESIDENCE	NW	0.74	1198.	1.4E-08	1.4E-08	1.4E-08	5.1E-10
B	RESIDENCE	NNW	0.74	1198.	1.1E-08	1.1E-08	1.1E-08	3.9E-10
B	RESIDENCE	N	0.74	1198.	2.9E-08	2.9E-08	2.8E-08	1.0E-09
B	RESIDENCE	NNE	0.74	1198.	5.5E-08	5.5E-08	5.3E-08	1.8E-09
B	RESIDENCE	NE	0.74	1198.	3.7E-08	3.7E-08	3.5E-08	1.2E-09
B	RESIDENCE	ENE	0.74	1198.	2.1E-08	2.1E-08	2.1E-08	7.2E-10
B	RESIDENCE	E	0.74	1198.	1.9E-08	1.9E-08	1.9E-08	7.9E-10
B	RESIDENCE	ESE	0.74	1198.	3.2E-08	3.2E-08	3.0E-08	1.1E-09
B	RESIDENCE	SE	0.74	1198.	4.7E-08	4.7E-08	4.6E-08	1.7E-09
B	RESIDENCE	SSE	0.74	1198.	5.0E-08	5.0E-08	4.8E-08	1.6E-09
B	EAB	S	0.62	998.	4.9E-08	4.9E-08	4.7E-08	1.5E-09
B	EAB	SSW	0.57	917.	2.4E-08	2.4E-08	2.3E-08	7.5E-10
B	EAB	SW	0.54	869.	1.9E-08	1.9E-08	1.8E-08	6.1E-10
B	EAB	WSW	0.55	885.	1.8E-08	1.8E-08	1.7E-08	6.2E-10
B	EAB	W	0.54	869.	2.4E-08	2.4E-08	2.3E-08	7.9E-10
B	EAB	WNW	0.56	901.	3.1E-08	3.1E-08	3.0E-08	1.0E-09
B	EAB	NW	0.62	998.	1.5E-08	1.5E-08	1.5E-08	5.5E-10
B	EAB	NNW	0.72	1159.	1.1E-08	1.1E-08	1.1E-08	4.0E-10
B	EAB	N	0.87	1400.	2.7E-08	2.7E-08	2.7E-08	9.3E-10
B	EAB	NNE	0.88	1416.	5.2E-08	5.2E-08	5.0E-08	1.6E-09
B	EAB	NE	0.90	1448.	3.6E-08	3.6E-08	3.5E-08	1.1E-09
B	EAB	ENE	0.91	1465.	2.0E-08	2.0E-08	1.9E-08	6.2E-10
B	EAB	E	0.89	1432.	1.8E-08	1.8E-08	1.7E-08	6.7E-10
B	EAB	ESE	0.88	1416.	2.9E-08	2.9E-08	2.8E-08	9.8E-10
B	EAB	SE	0.83	1336.	4.4E-08	4.4E-08	4.2E-08	1.5E-09
B	EAB	SSE	0.73	1175.	5.1E-08	5.1E-08	4.9E-08	1.6E-09
B	MEAT ANIMAL	S	0.74	1198.	4.7E-08	4.7E-08	4.5E-08	1.5E-09
B	MEAT ANIMAL	SSW	0.74	1198.	2.3E-08	2.3E-08	2.2E-08	7.4E-10
B	MEAT ANIMAL	SW	0.74	1198.	1.7E-08	1.7E-08	1.6E-08	6.0E-10
B	MEAT ANIMAL	WSW	0.74	1198.	1.7E-08	1.7E-08	1.7E-08	5.8E-10
B	MEAT ANIMAL	W	0.74	1198.	2.2E-08	2.2E-08	2.1E-08	7.1E-10
B	MEAT ANIMAL	WNW	0.74	1198.	2.9E-08	2.9E-08	2.8E-08	8.5E-10
B	MEAT ANIMAL	NW	0.74	1198.	1.4E-08	1.4E-08	1.4E-08	5.1E-10
B	MEAT ANIMAL	NNW	0.74	1198.	1.1E-08	1.1E-08	1.1E-08	3.9E-10
B	MEAT ANIMAL	N	0.74	1198.	2.9E-08	2.9E-08	2.8E-08	1.0E-09
B	MEAT ANIMAL	NNE	0.74	1198.	5.5E-08	5.5E-08	5.3E-08	1.8E-09
B	MEAT ANIMAL	NE	0.74	1198.	3.7E-08	3.7E-08	3.5E-08	1.2E-09
B	MEAT ANIMAL	ENE	0.74	1198.	2.1E-08	2.1E-08	2.1E-08	7.2E-10
B	MEAT ANIMAL	E	0.74	1198.	1.9E-08	1.9E-08	1.9E-08	7.9E-10
B	MEAT ANIMAL	ESE	0.74	1198.	3.2E-08	3.2E-08	3.0E-08	1.1E-09
B	MEAT ANIMAL	SE	0.74	1198.	4.7E-08	4.7E-08	4.6E-08	1.7E-09
B	MEAT ANIMAL	SSE	0.74	1198.	5.0E-08	5.0E-08	4.8E-08	1.6E-09
B	VEG. GARDEN	S	0.74	1198.	4.7E-08	4.7E-08	4.5E-08	1.5E-09
B	VEG. GARDEN	SSW	0.74	1198.	2.3E-08	2.3E-08	2.2E-08	7.4E-10
B	VEG. GARDEN	SW	0.74	1198.	1.7E-08	1.7E-08	1.6E-08	6.0E-10
B	VEG. GARDEN	WSW	0.74	1198.	1.7E-08	1.7E-08	1.7E-08	5.8E-10
B	VEG. GARDEN	W	0.74	1198.	2.2E-08	2.2E-08	2.1E-08	7.1E-10
B	VEG. GARDEN	WNW	0.74	1198.	2.9E-08	2.9E-08	2.8E-08	8.5E-10
B	VEG. GARDEN	NW	0.74	1198.	1.4E-08	1.4E-08	1.4E-08	5.1E-10
B	VEG. GARDEN	NNW	0.74	1198.	1.1E-08	1.1E-08	1.1E-08	3.9E-10
B	VEG. GARDEN	N	0.74	1198.	2.9E-08	2.9E-08	2.8E-08	1.0E-09
B	VEG. GARDEN	NNE	0.74	1198.	5.5E-08	5.5E-08	5.3E-08	1.8E-09
B	VEG. GARDEN	NE	0.74	1198.	3.7E-08	3.7E-08	3.5E-08	1.2E-09
B	VEG. GARDEN	ENE	0.74	1198.	2.1E-08	2.1E-08	2.1E-08	7.2E-10
B	VEG. GARDEN	E	0.74	1198.	1.9E-08	1.9E-08	1.9E-08	7.9E-10
B	VEG. GARDEN	ESE	0.74	1198.	3.2E-08	3.2E-08	3.0E-08	1.1E-09
B	VEG. GARDEN	SE	0.74	1198.	4.7E-08	4.7E-08	4.6E-08	1.7E-09
B	VEG. GARDEN	SSE	0.74	1198.	5.0E-08	5.0E-08	4.8E-08	1.6E-09

0VENT AND BUILDING PARAMETERS:

RELEASE HEIGHT	(METERS)	71.30	REP. WIND HEIGHT	(METERS)	10.0
DIAMETER	(METERS)	1.95	BUILDING HEIGHT	(METERS)	46.1
EXIT VELOCITY	(METERS)	17.78	BLDG.MIN.CRS.SEC.AREA	(SQ.METERS)	3098.0
			HEAT EMISSION RATE	(CAL/SEC)	0.0

0AT THE RELEASE HEIGHT: / AT THE MEASURED WIND HEIGHT (10.0 METERS):

VENT RELEASE MODE	WIND SPEED (METERS/SEC)	/	VENT RELEASE MODE	WIND SPEED (METERS/SEC)	
	/		STABLE CONDITIONS		UNSTABLE/NEUTRAL CONDITIONS
ELEVATED	LESS THAN 3.556	/	ELEVATED	LESS THAN 3.556	LESS THAN 3.556
MIXED	BETWEEN 3.556 AND 17.780	/	MIXED	BETWEEN 3.556 AND 17.780	BETWEEN 3.556 AND 17.780
GROUND LEVEL	ABOVE 17.780	/	GROUND LEVEL	ABOVE 17.780	ABOVE 17.780

Note: Directions are True North.

Table 2.7-4 Long-Term Average χ/Q (sec/m^3) for Routine Releases at Specific Points of Interest (Sheet 3 of 4)

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 7/ 8/2013

0XOQDOQ - North Anna COL (1996-98 Met Data)

EXIT ONE - GROUND LEVEL RELEASE - NO PURGE RELEASES
SPECIFIC POINTS OF INTEREST

0RELEASE ID	TYPE OF LOCATION	DIRECTION FROM SITE	DISTANCE (MILES)	DISTANCE (METERS)	X/Q (SEC/CUB.METER) NO DECAY	X/Q (SEC/CUB.METER) 2.260 DAY DECAY	X/Q (SEC/CUB.METER) 8.000 DAY DECAY	D/Q (PER SQ.METER)
+								
+								
					UNDEPLETED	UNDEPLETED	DEPLETED	
A	RESIDENCE	S	0.74	1198.	1.6E-06	1.6E-06	1.5E-06	8.5E-09
A	RESIDENCE	SSW	0.74	1198.	1.3E-06	1.3E-06	1.2E-06	5.6E-09
A	RESIDENCE	SW	0.74	1198.	1.2E-06	1.2E-06	1.0E-06	4.6E-09
A	RESIDENCE	WSW	0.74	1198.	1.1E-06	1.1E-06	9.6E-07	4.0E-09
A	RESIDENCE	W	0.74	1198.	1.3E-06	1.3E-06	1.2E-06	4.7E-09
A	RESIDENCE	WNW	0.74	1198.	1.1E-06	1.1E-06	1.0E-06	4.4E-09
A	RESIDENCE	NW	0.74	1198.	1.2E-06	1.2E-06	1.0E-06	3.9E-09
A	RESIDENCE	NNW	0.74	1198.	9.9E-07	9.9E-07	8.8E-07	2.9E-09
A	RESIDENCE	N	0.74	1198.	2.5E-06	2.5E-06	2.3E-06	7.6E-09
A	RESIDENCE	NNE	0.74	1198.	3.2E-06	3.2E-06	2.9E-06	1.1E-08
A	RESIDENCE	NE	0.74	1198.	2.6E-06	2.6E-06	2.3E-06	8.9E-09
A	RESIDENCE	ENE	0.74	1198.	1.6E-06	1.6E-06	1.4E-06	4.8E-09
A	RESIDENCE	E	0.74	1198.	3.0E-06	2.9E-06	2.6E-06	6.7E-09
A	RESIDENCE	ESE	0.74	1198.	4.2E-06	4.2E-06	3.8E-06	9.0E-09
A	RESIDENCE	SE	0.74	1198.	3.0E-06	3.0E-06	2.7E-06	8.0E-09
A	RESIDENCE	SSE	0.74	1198.	1.7E-06	1.7E-06	1.5E-06	7.2E-09
A	EAB	S	0.62	998.	2.2E-06	2.2E-06	2.0E-06	1.1E-08
A	EAB	SSW	0.57	917.	2.0E-06	1.9E-06	1.8E-06	8.7E-09
A	EAB	SW	0.54	869.	1.9E-06	1.9E-06	1.7E-06	7.9E-09
A	EAB	WSW	0.55	885.	1.7E-06	1.7E-06	1.6E-06	6.6E-09
A	EAB	W	0.54	869.	2.1E-06	2.1E-06	1.9E-06	8.0E-09
A	EAB	WNW	0.56	901.	1.7E-06	1.7E-06	1.6E-06	7.0E-09
A	EAB	NW	0.62	998.	1.5E-06	1.5E-06	1.4E-06	5.3E-09
A	EAB	NNW	0.72	1159.	1.0E-06	1.0E-06	9.3E-07	3.0E-09
A	EAB	N	0.87	1400.	2.0E-06	2.0E-06	1.8E-06	5.8E-09
A	EAB	NNE	0.88	1416.	2.5E-06	2.5E-06	2.2E-06	8.3E-09
A	EAB	NE	0.90	1448.	2.0E-06	2.0E-06	1.7E-06	6.4E-09
A	EAB	ENE	0.91	1465.	1.2E-06	1.2E-06	1.0E-06	3.4E-09
A	EAB	E	0.89	1432.	2.3E-06	2.3E-06	2.0E-06	5.0E-09
A	EAB	ESE	0.88	1416.	3.3E-06	3.3E-06	2.9E-06	6.8E-09
A	EAB	SE	0.83	1336.	2.5E-06	2.5E-06	2.2E-06	6.7E-09
A	EAB	SSE	0.73	1175.	1.7E-06	1.7E-06	1.5E-06	7.4E-09
A	MEAT ANIMAL	S	0.74	1198.	1.6E-06	1.6E-06	1.5E-06	8.5E-09
A	MEAT ANIMAL	SSW	0.74	1198.	1.3E-06	1.3E-06	1.2E-06	5.6E-09
A	MEAT ANIMAL	SW	0.74	1198.	1.2E-06	1.2E-06	1.0E-06	4.6E-09
A	MEAT ANIMAL	WSW	0.74	1198.	1.1E-06	1.1E-06	9.6E-07	4.0E-09
A	MEAT ANIMAL	W	0.74	1198.	1.3E-06	1.3E-06	1.2E-06	4.7E-09
A	MEAT ANIMAL	WNW	0.74	1198.	1.1E-06	1.1E-06	1.0E-06	4.4E-09
A	MEAT ANIMAL	NW	0.74	1198.	1.2E-06	1.2E-06	1.0E-06	3.9E-09
A	MEAT ANIMAL	NNW	0.74	1198.	9.9E-07	9.9E-07	8.8E-07	2.9E-09
A	MEAT ANIMAL	N	0.74	1198.	2.5E-06	2.5E-06	2.3E-06	7.6E-09
A	MEAT ANIMAL	NNE	0.74	1198.	3.2E-06	3.2E-06	2.9E-06	1.1E-08
A	MEAT ANIMAL	NE	0.74	1198.	2.6E-06	2.6E-06	2.3E-06	8.9E-09
A	MEAT ANIMAL	ENE	0.74	1198.	1.6E-06	1.6E-06	1.4E-06	4.8E-09
A	MEAT ANIMAL	E	0.74	1198.	3.0E-06	2.9E-06	2.6E-06	6.7E-09
A	MEAT ANIMAL	ESE	0.74	1198.	4.2E-06	4.2E-06	3.8E-06	9.0E-09
A	MEAT ANIMAL	SE	0.74	1198.	3.0E-06	3.0E-06	2.7E-06	8.0E-09
A	MEAT ANIMAL	SSE	0.74	1198.	1.7E-06	1.7E-06	1.5E-06	7.2E-09
A	VEG. GARDEN	S	0.74	1198.	1.6E-06	1.6E-06	1.5E-06	8.5E-09
A	VEG. GARDEN	SSW	0.74	1198.	1.3E-06	1.3E-06	1.2E-06	5.6E-09
A	VEG. GARDEN	SW	0.74	1198.	1.2E-06	1.2E-06	1.0E-06	4.6E-09
A	VEG. GARDEN	WSW	0.74	1198.	1.1E-06	1.1E-06	9.6E-07	4.0E-09
A	VEG. GARDEN	W	0.74	1198.	1.3E-06	1.3E-06	1.2E-06	4.7E-09
A	VEG. GARDEN	WNW	0.74	1198.	1.1E-06	1.1E-06	1.0E-06	4.4E-09
A	VEG. GARDEN	NW	0.74	1198.	1.2E-06	1.2E-06	1.0E-06	3.9E-09
A	VEG. GARDEN	NNW	0.74	1198.	9.9E-07	9.9E-07	8.8E-07	2.9E-09
A	VEG. GARDEN	N	0.74	1198.	2.5E-06	2.5E-06	2.3E-06	7.6E-09
A	VEG. GARDEN	NNE	0.74	1198.	3.2E-06	3.2E-06	2.9E-06	1.1E-08
A	VEG. GARDEN	NE	0.74	1198.	2.6E-06	2.6E-06	2.3E-06	8.9E-09
A	VEG. GARDEN	ENE	0.74	1198.	1.6E-06	1.6E-06	1.4E-06	4.8E-09
A	VEG. GARDEN	E	0.74	1198.	3.0E-06	2.9E-06	2.6E-06	6.7E-09
A	VEG. GARDEN	ESE	0.74	1198.	4.2E-06	4.2E-06	3.8E-06	9.0E-09
A	VEG. GARDEN	SE	0.74	1198.	3.0E-06	3.0E-06	2.7E-06	8.0E-09
A	VEG. GARDEN	SSE	0.74	1198.	1.7E-06	1.7E-06	1.5E-06	7.2E-09

0VENT AND BUILDING PARAMETERS:

RELEASE HEIGHT	(METERS)	0.00	REP. WIND HEIGHT	(METERS)	10.0
DIAMETER	(METERS)	0.00	BUILDING HEIGHT	(METERS)	46.1
EXIT VELOCITY	(METERS)	0.00	BLDG.MIN.CRS.SEC.AREA	(SQ.METERS)	3098.0
			HEAT EMISSION RATE	(CAL/SEC)	0.0

0ALL GROUND LEVEL RELEASES.

Note: Directions are True North. The results on this page are applicable to releases from the RW-VS.

Table 2.7-5 Long-Term χ/Q (sec/m^3) for Routine Releases at Distances Between 0.25 to 50 Miles, No Decay, Undepleted (Sheet 1 of 4)

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT RB - MIXED MODE RELEASE - NO PURGE RELEASES
NO DECAY, UNDEPLETED
0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	0.250	0.500	0.750	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500
S	1.215E-07	6.850E-08	6.533E-08	7.487E-08	8.482E-08	8.163E-08	7.439E-08	6.675E-08	5.975E-08	5.363E-08	4.836E-08
SSW	5.450E-08	3.120E-08	3.230E-08	4.172E-08	5.403E-08	5.532E-08	5.227E-08	4.804E-08	4.377E-08	3.981E-08	3.628E-08
SW	4.108E-08	2.332E-08	2.410E-08	3.227E-08	4.374E-08	4.576E-08	4.381E-08	4.064E-08	3.728E-08	3.411E-08	3.122E-08
WSW	3.446E-08	2.254E-08	2.357E-08	2.932E-08	3.737E-08	3.866E-08	3.708E-08	3.459E-08	3.193E-08	2.937E-08	2.703E-08
W	4.658E-08	2.971E-08	2.844E-08	3.446E-08	4.328E-08	4.447E-08	4.252E-08	3.961E-08	3.656E-08	3.366E-08	3.100E-08
WNW	4.676E-08	3.794E-08	3.545E-08	3.894E-08	4.490E-08	4.478E-08	4.207E-08	3.868E-08	3.533E-08	3.224E-08	2.949E-08
NW	2.899E-08	2.013E-08	1.912E-08	2.602E-08	3.864E-08	4.243E-08	4.170E-08	3.930E-08	3.643E-08	3.358E-08	3.093E-08
NNW	3.068E-08	1.997E-08	1.382E-08	1.696E-08	2.674E-08	3.105E-08	3.171E-08	3.072E-08	2.908E-08	2.724E-08	2.542E-08
N	8.469E-08	4.920E-08	3.659E-08	4.590E-08	7.175E-08	8.282E-08	8.430E-08	8.149E-08	7.702E-08	7.208E-08	6.720E-08
NNE	1.495E-07	8.914E-08	6.988E-08	7.852E-08	1.039E-07	1.125E-07	1.110E-07	1.054E-07	9.853E-08	9.149E-08	8.481E-08
NE	1.070E-07	5.723E-08	4.874E-08	5.915E-08	8.211E-08	8.991E-08	8.903E-08	8.467E-08	7.917E-08	7.353E-08	6.817E-08
ENE	7.397E-08	3.692E-08	2.785E-08	3.128E-08	4.206E-08	4.634E-08	4.640E-08	4.461E-08	4.213E-08	3.948E-08	3.688E-08
E	8.171E-08	3.661E-08	2.533E-08	3.063E-08	4.870E-08	5.852E-08	6.186E-08	6.179E-08	6.007E-08	5.760E-08	5.485E-08
ESE	1.130E-07	5.568E-08	4.030E-08	4.415E-08	6.015E-08	6.798E-08	6.973E-08	6.847E-08	6.586E-08	6.273E-08	5.948E-08
SE	1.522E-07	8.406E-08	5.817E-08	5.493E-08	5.937E-08	5.990E-08	5.768E-08	5.439E-08	5.084E-08	4.738E-08	4.416E-08
SSE	1.199E-07	7.853E-08	6.419E-08	6.486E-08	6.805E-08	6.486E-08	5.942E-08	5.379E-08	4.862E-08	4.404E-08	4.005E-08

0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	5.000	7.500	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	50.000
S	4.383E-08	2.875E-08	2.063E-08	1.253E-08	8.675E-09	6.485E-09	5.099E-09	4.155E-09	3.477E-09	2.970E-09	2.579E-09
SSW	3.316E-08	2.233E-08	1.624E-08	1.000E-08	6.972E-09	5.232E-09	4.125E-09	3.367E-09	2.822E-09	2.413E-09	2.097E-09
SW	2.865E-08	1.954E-08	1.432E-08	8.907E-09	6.247E-09	4.710E-09	3.726E-09	3.051E-09	2.563E-09	2.196E-09	1.912E-09
WSW	2.492E-08	1.730E-08	1.281E-08	8.065E-09	5.702E-09	4.323E-09	3.434E-09	2.822E-09	2.378E-09	2.043E-09	1.782E-09
W	2.862E-08	2.000E-08	1.491E-08	9.498E-09	6.780E-09	5.182E-09	4.145E-09	3.426E-09	2.902E-09	2.505E-09	2.195E-09
WNW	2.707E-08	1.862E-08	1.378E-08	8.734E-09	6.239E-09	4.774E-09	3.823E-09	3.164E-09	2.682E-09	2.318E-09	2.033E-09
NW	2.853E-08	1.985E-08	1.477E-08	9.404E-09	6.722E-09	5.144E-09	4.121E-09	3.409E-09	2.890E-09	2.497E-09	2.189E-09
NNW	2.370E-08	1.706E-08	1.293E-08	8.397E-09	6.059E-09	4.665E-09	3.752E-09	3.114E-09	2.646E-09	2.289E-09	2.010E-09
N	6.261E-08	4.498E-08	3.404E-08	2.206E-08	1.590E-08	1.223E-08	9.824E-09	8.145E-09	6.913E-09	5.977E-09	5.244E-09
NNE	7.870E-08	5.597E-08	4.222E-08	2.732E-08	1.970E-08	1.516E-08	1.219E-08	1.012E-08	8.598E-09	7.440E-09	6.533E-09
NE	6.325E-08	4.493E-08	3.387E-08	2.189E-08	1.578E-08	1.214E-08	9.763E-09	8.102E-09	6.884E-09	5.958E-09	5.232E-09
ENE	3.446E-08	2.515E-08	1.931E-08	1.280E-08	9.376E-09	7.306E-09	5.933E-09	4.965E-09	4.248E-09	3.698E-09	3.265E-09
E	5.207E-08	4.012E-08	3.186E-08	2.202E-08	1.657E-08	1.317E-08	1.086E-08	9.196E-09	7.949E-09	6.982E-09	6.211E-09
ESE	5.632E-08	4.337E-08	3.468E-08	2.442E-08	1.871E-08	1.511E-08	1.263E-08	1.083E-08	9.467E-09	8.399E-09	7.540E-09
SE	4.125E-08	3.040E-08	2.370E-08	1.623E-08	1.225E-08	9.805E-09	8.151E-09	6.963E-09	6.069E-09	5.374E-09	4.817E-09
SSE	3.660E-08	2.486E-08	1.831E-08	1.157E-08	8.267E-09	6.338E-09	5.090E-09	4.224E-09	3.593E-09	3.114E-09	2.739E-09

0VENT AND BUILDING PARAMETERS:

RELEASE HEIGHT	(METERS)	52.77	REF. WIND HEIGHT	(METERS)	10.0
DIAMETER	(METERS)	2.40	BUILDING HEIGHT	(METERS)	46.1
EXIT VELOCITY	(METERS)	17.78	BLDG.MIN.CRS.SEC.AREA	(SQ.METERS)	3098.0
			HEAT EMISSION RATE	(CAL/SEC)	0.0

0AT THE RELEASE HEIGHT:

VENT RELEASE MODE	WIND SPEED (METERS/SEC)	
ELEVATED	LESS THAN	3.556
MIXED	BETWEEN	3.556 AND 17.780
GROUND LEVEL	ABOVE	17.780

AT THE MEASURED WIND HEIGHT (10.0 METERS):

VENT RELEASE MODE	WIND SPEED (METERS/SEC) STABLE CONDITIONS		WIND SPEED (METERS/SEC) UNSTABLE/NEUTRAL CONDITIONS	
ELEVATED	LESS THAN	3.556	LESS THAN	3.556
MIXED	BETWEEN	3.556 AND 17.780	BETWEEN	3.556 AND 17.780
GROUND LEVEL	ABOVE	17.780	ABOVE	17.780

Note: Directions are True North.

Table 2.7-5 Long-Term χ/Q (sec/m^3) for Routine Releases at Distances Between 0.25 to 50 Miles, No Decay, Undepleted (Sheet 2 of 4)

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT TB - MIXED MODE RELEASE - NO PURGE RELEASES
NO DECAY, UNDEPLETED

0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	0.250	0.500	0.750	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500
S	1.147E-07	5.912E-08	4.785E-08	5.254E-08	6.329E-08	6.493E-08	6.190E-08	5.730E-08	5.244E-08	4.784E-08	4.366E-08
SSW	5.197E-08	2.729E-08	2.301E-08	2.804E-08	3.902E-08	4.298E-08	4.271E-08	4.064E-08	3.793E-08	3.511E-08	3.241E-08
SW	3.866E-08	2.069E-08	1.738E-08	2.166E-08	3.127E-08	3.515E-08	3.541E-08	3.402E-08	3.200E-08	2.980E-08	2.765E-08
WSW	3.221E-08	1.974E-08	1.770E-08	2.053E-08	2.708E-08	2.984E-08	3.005E-08	2.900E-08	2.742E-08	2.567E-08	2.393E-08
W	4.366E-08	2.686E-08	2.209E-08	2.471E-08	3.166E-08	3.437E-08	3.432E-08	3.299E-08	3.113E-08	2.912E-08	2.714E-08
WNW	4.287E-08	3.378E-08	2.939E-08	2.983E-08	3.313E-08	3.400E-08	3.304E-08	3.124E-08	2.916E-08	2.707E-08	2.508E-08
NW	2.612E-08	1.808E-08	1.485E-08	1.724E-08	2.515E-08	2.947E-08	3.062E-08	3.006E-08	2.873E-08	2.710E-08	2.541E-08
NNW	2.768E-08	1.883E-08	1.150E-08	1.104E-08	1.605E-08	2.010E-08	2.199E-08	2.242E-08	2.203E-08	2.123E-08	2.025E-08
N	7.522E-08	4.563E-08	2.991E-08	2.954E-08	4.271E-08	5.325E-08	5.813E-08	5.918E-08	5.811E-08	5.597E-08	5.335E-08
NNE	1.330E-07	8.002E-08	5.611E-08	5.368E-08	6.653E-08	7.601E-08	7.916E-08	7.836E-08	7.555E-08	7.187E-08	6.789E-08
NE	9.706E-08	5.066E-08	3.734E-08	3.839E-08	5.136E-08	6.011E-08	6.316E-08	6.278E-08	6.065E-08	5.775E-08	5.459E-08
ENE	6.623E-08	3.337E-08	2.189E-08	2.066E-08	2.601E-08	3.028E-08	3.202E-08	3.209E-08	3.127E-08	3.002E-08	2.859E-08
E	7.219E-08	3.341E-08	2.009E-08	1.895E-08	2.721E-08	3.485E-08	3.916E-08	4.096E-08	4.122E-08	4.060E-08	3.951E-08
ESE	1.009E-07	5.030E-08	3.241E-08	2.978E-08	3.669E-08	4.301E-08	4.613E-08	4.694E-08	4.640E-08	4.515E-08	4.354E-08
SE	1.348E-07	7.571E-08	4.873E-08	4.191E-08	4.236E-08	4.353E-08	4.323E-08	4.185E-08	3.992E-08	3.779E-08	3.563E-08
SSE	1.092E-07	6.871E-08	5.128E-08	4.905E-08	5.158E-08	5.106E-08	4.843E-08	4.502E-08	4.149E-08	3.815E-08	3.508E-08

0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	5.000	7.500	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	50.000
S	3.995E-08	2.689E-08	1.951E-08	1.196E-08	8.316E-09	6.229E-09	4.903E-09	3.997E-09	3.346E-09	2.859E-09	2.482E-09
SSW	2.993E-08	2.072E-08	1.526E-08	9.498E-09	6.653E-09	5.007E-09	3.954E-09	3.231E-09	2.710E-09	2.319E-09	2.016E-09
SW	2.563E-08	1.800E-08	1.336E-08	8.405E-09	5.927E-09	4.483E-09	3.553E-09	2.913E-09	2.450E-09	2.101E-09	1.830E-09
WSW	2.229E-08	1.590E-08	1.191E-08	7.578E-09	5.384E-09	4.093E-09	3.258E-09	2.680E-09	2.260E-09	1.943E-09	1.697E-09
W	2.528E-08	1.812E-08	1.366E-08	8.782E-09	6.297E-09	4.825E-09	3.866E-09	3.199E-09	2.712E-09	2.342E-09	2.054E-09
WNW	2.328E-08	1.654E-08	1.244E-08	8.012E-09	5.772E-09	4.440E-09	3.569E-09	2.961E-09	2.515E-09	2.177E-09	1.912E-09
NW	2.378E-08	1.728E-08	1.313E-08	8.545E-09	6.177E-09	4.761E-09	3.832E-09	3.181E-09	2.704E-09	2.341E-09	2.056E-09
NNW	1.922E-08	1.457E-08	1.134E-08	7.563E-09	5.537E-09	4.303E-09	3.483E-09	2.904E-09	2.477E-09	2.150E-09	1.893E-09
N	5.061E-08	3.835E-08	2.983E-08	1.989E-08	1.456E-08	1.131E-08	9.148E-09	7.625E-09	6.499E-09	5.638E-09	4.961E-09
NNE	6.398E-08	4.769E-08	3.687E-08	2.450E-08	1.793E-08	1.393E-08	1.128E-08	9.413E-09	8.031E-09	6.974E-09	6.141E-09
NE	5.145E-08	3.831E-08	2.958E-08	1.962E-08	1.434E-08	1.113E-08	9.008E-09	7.512E-09	6.407E-09	5.562E-09	4.897E-09
ENE	2.713E-08	2.078E-08	1.637E-08	1.115E-08	8.300E-09	6.534E-09	5.346E-09	4.498E-09	3.866E-09	3.378E-09	2.992E-09
E	3.818E-08	3.112E-08	2.549E-08	1.825E-08	1.401E-08	1.128E-08	9.389E-09	8.010E-09	6.965E-09	6.146E-09	5.490E-09
ESE	4.180E-08	3.354E-08	2.737E-08	1.966E-08	1.522E-08	1.237E-08	1.039E-08	8.942E-09	7.839E-09	6.972E-09	6.273E-09
SE	3.358E-08	2.532E-08	1.988E-08	1.363E-08	1.028E-08	8.212E-09	6.817E-09	5.816E-09	5.066E-09	4.483E-09	4.017E-09
SSE	3.235E-08	2.250E-08	1.672E-08	1.064E-08	7.612E-09	5.835E-09	4.683E-09	3.884E-09	3.300E-09	2.858E-09	2.512E-09

0VENT AND BUILDING PARAMETERS:

RELEASE HEIGHT	(METERS)	71.30	REP. WIND HEIGHT	(METERS)	10.0
DIAMETER	(METERS)	1.95	BUILDING HEIGHT	(METERS)	46.1
EXIT VELOCITY	(METERS)	17.78	BLDG.MIN.CRS.SEC.AREA	(SQ.METERS)	3098.0
			HEAT EMISSION RATE	(CAL/SEC)	0.0

0AT THE RELEASE HEIGHT:

VENT RELEASE MODE	WIND SPEED (METERS/SEC)
ELEVATED	LESS THAN 3.556
MIXED	BETWEEN 3.556 AND 17.780
GROUND LEVEL	ABOVE 17.780

AT THE MEASURED WIND HEIGHT (10.0 METERS):

VENT RELEASE MODE	WIND SPEED (METERS/SEC) STABLE CONDITIONS	WIND SPEED (METERS/SEC) UNSTABLE/NEUTRAL CONDITIONS
ELEVATED	LESS THAN 3.556	LESS THAN 3.556
MIXED	BETWEEN 3.556 AND 17.780	BETWEEN 3.556 AND 17.780
GROUND LEVEL	ABOVE 17.780	ABOVE 17.780

Note: Directions are True North.

Table 2.7-5 Long-Term χ/Q (sec/m^3) for Routine Releases at Distances Between 0.25 to 50 Miles, No Decay, Undepleted (Sheet 3 of 4)

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 7/ 8/2013
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT ONE - GROUND LEVEL RELEASE - NO PURGE RELEASES
NO DECAY, UNDEPLETED
0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	0.250	0.500	0.750	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500
S	8.557E-06	3.035E-06	1.618E-06	1.035E-06	5.561E-07	3.586E-07	2.555E-07	1.939E-07	1.538E-07	1.258E-07	1.055E-07
SSW	6.692E-06	2.387E-06	1.281E-06	8.219E-07	4.431E-07	2.864E-07	2.044E-07	1.553E-07	1.233E-07	1.010E-07	8.472E-08
SW	5.993E-06	2.128E-06	1.143E-06	7.348E-07	3.972E-07	2.571E-07	1.838E-07	1.399E-07	1.111E-07	9.113E-08	7.654E-08
WSW	5.628E-06	1.979E-06	1.062E-06	6.824E-07	3.695E-07	2.396E-07	1.715E-07	1.307E-07	1.039E-07	8.530E-08	7.169E-08
W	7.005E-06	2.408E-06	1.286E-06	8.272E-07	4.513E-07	2.943E-07	2.117E-07	1.619E-07	1.292E-07	1.063E-07	8.961E-08
WNW	6.098E-06	2.086E-06	1.117E-06	7.181E-07	3.907E-07	2.544E-07	1.828E-07	1.397E-07	1.115E-07	9.173E-08	7.729E-08
NW	6.083E-06	2.108E-06	1.143E-06	7.395E-07	4.052E-07	2.651E-07	1.912E-07	1.465E-07	1.172E-07	9.661E-08	8.154E-08
NNW	5.158E-06	1.787E-06	9.783E-07	6.369E-07	3.503E-07	2.297E-07	1.659E-07	1.274E-07	1.019E-07	8.414E-08	7.108E-08
N	1.311E-05	4.572E-06	2.516E-06	1.640E-06	8.999E-07	5.891E-07	4.249E-07	3.257E-07	2.605E-07	2.148E-07	1.813E-07
NNE	1.674E-05	5.775E-06	3.165E-06	2.064E-06	1.134E-06	7.425E-07	5.358E-07	4.109E-07	3.287E-07	2.711E-07	2.289E-07
NE	1.366E-05	4.720E-06	2.583E-06	1.683E-06	9.262E-07	6.076E-07	4.390E-07	3.370E-07	2.698E-07	2.227E-07	1.881E-07
ENE	8.564E-06	2.868E-06	1.566E-06	1.025E-06	5.709E-07	3.777E-07	2.747E-07	2.120E-07	1.705E-07	1.412E-07	1.197E-07
E	1.674E-05	5.376E-06	2.919E-06	1.921E-06	1.089E-06	7.297E-07	5.356E-07	4.165E-07	3.371E-07	2.808E-07	2.391E-07
ESE	2.574E-05	8.002E-06	4.182E-06	2.707E-06	1.560E-06	1.059E-06	7.848E-07	6.153E-07	5.012E-07	4.200E-07	3.595E-07
SE	1.829E-05	5.731E-06	2.952E-06	1.888E-06	1.080E-06	7.295E-07	5.392E-07	4.218E-07	3.430E-07	2.870E-07	2.453E-07
SSE	9.435E-06	3.165E-06	1.663E-06	1.062E-06	5.835E-07	3.829E-07	2.767E-07	2.126E-07	1.703E-07	1.406E-07	1.189E-07

0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	5.000	7.500	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	50.000
S	9.015E-08	4.946E-08	3.242E-08	1.799E-08	1.191E-08	8.665E-09	6.692E-09	5.384E-09	4.462E-09	3.783E-09	3.265E-09
SSW	7.245E-08	3.984E-08	2.616E-08	1.453E-08	9.620E-09	6.999E-09	5.404E-09	4.346E-09	3.601E-09	3.053E-09	2.634E-09
SW	6.551E-08	3.614E-08	2.379E-08	1.327E-08	8.809E-09	6.424E-09	4.969E-09	4.003E-09	3.321E-09	2.819E-09	2.435E-09
WSW	6.141E-08	3.400E-08	2.243E-08	1.256E-08	8.366E-09	6.116E-09	4.741E-09	3.827E-09	3.180E-09	2.703E-09	2.338E-09
W	7.695E-08	4.302E-08	2.860E-08	1.619E-08	1.087E-08	7.997E-09	6.232E-09	5.053E-09	4.217E-09	3.596E-09	3.121E-09
WNW	6.637E-08	3.714E-08	2.470E-08	1.401E-08	9.435E-09	6.957E-09	5.432E-09	4.410E-09	3.685E-09	3.146E-09	2.733E-09
NW	7.011E-08	3.938E-08	2.626E-08	1.493E-08	1.005E-08	7.411E-09	5.785E-09	4.695E-09	3.922E-09	3.347E-09	2.906E-09
NNW	6.116E-08	3.445E-08	2.302E-08	1.311E-08	8.831E-09	6.512E-09	5.083E-09	4.126E-09	3.445E-09	2.940E-09	2.553E-09
N	1.559E-07	8.755E-08	5.837E-08	3.315E-08	2.228E-08	1.640E-08	1.278E-08	1.036E-08	8.642E-09	7.367E-09	6.390E-09
NNE	1.969E-07	1.107E-07	7.388E-08	4.201E-08	2.827E-08	2.083E-08	1.625E-08	1.318E-08	1.100E-08	9.388E-09	8.147E-09
NE	1.618E-07	9.115E-08	6.089E-08	3.468E-08	2.336E-08	1.722E-08	1.344E-08	1.091E-08	9.112E-09	7.777E-09	6.751E-09
ENE	1.033E-07	5.889E-08	3.967E-08	2.286E-08	1.552E-08	1.152E-08	9.035E-09	7.365E-09	6.174E-09	5.287E-09	4.603E-09
E	2.072E-07	1.199E-07	8.167E-08	4.776E-08	3.276E-08	2.450E-08	1.934E-08	1.585E-08	1.335E-08	1.148E-08	1.003E-08
ESE	3.130E-07	1.843E-07	1.270E-07	7.556E-08	5.246E-08	3.960E-08	3.150E-08	2.599E-08	2.201E-08	1.902E-08	1.669E-08
SE	2.134E-07	1.253E-07	8.621E-08	5.120E-08	3.553E-08	2.681E-08	2.133E-08	1.760E-08	1.491E-08	1.288E-08	1.131E-08
SSE	1.024E-07	5.791E-08	3.884E-08	2.228E-08	1.512E-08	1.122E-08	8.804E-09	7.181E-09	6.023E-09	5.162E-09	4.498E-09

0VENT AND BUILDING PARAMETERS:

RELEASE HEIGHT	(METERS)	0.00	REP. WIND HEIGHT	(METERS)	10.0
DIAMETER	(METERS)	0.00	BUILDING HEIGHT	(METERS)	46.1
EXIT VELOCITY	(METERS)	0.00	BLDG.MIN.CRS.SEC.AREA	(SQ.METERS)	3098.0
			HEAT EMISSION RATE	(CAL/SEC)	0.0

0ALL GROUND LEVEL RELEASES.

Note: Directions are True North. The results on this page are applicable to releases from the RW-VS.

Table 2.7-6 Long-Term χ/Q (sec/m^3) for Routine Releases Along Various Distance Segments, No Decay, Undepleted (Sheet 1 of 4)

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT RB - MIXED MODE RELEASE - NO PURGE RELEASES
NO DECAY, UNDEPLETED
0CHI/Q (SEC/METER CUBED) FOR EACH SEGMENT

	SEGMENT BOUNDARIES IN MILES FROM THE SITE									
DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	7.027E-08	8.119E-08	7.326E-08	5.942E-08	4.824E-08	2.849E-08	1.261E-08	6.515E-09	4.166E-09	2.975E-09
SSW	3.625E-08	5.187E-08	5.139E-08	4.348E-08	3.617E-08	2.203E-08	1.004E-08	5.253E-09	3.376E-09	2.417E-09
SW	2.756E-08	4.209E-08	4.306E-08	3.703E-08	3.112E-08	1.925E-08	8.929E-09	4.726E-09	3.058E-09	2.200E-09
WSW	2.590E-08	3.616E-08	3.651E-08	3.171E-08	2.694E-08	1.700E-08	8.069E-09	4.335E-09	2.828E-09	2.045E-09
W	3.140E-08	4.185E-08	4.188E-08	3.633E-08	3.090E-08	1.965E-08	9.493E-09	5.193E-09	3.432E-09	2.508E-09
WNW	3.756E-08	4.352E-08	4.144E-08	3.511E-08	2.941E-08	1.835E-08	8.746E-09	4.784E-09	3.169E-09	2.320E-09
NW	2.241E-08	3.752E-08	4.093E-08	3.616E-08	3.083E-08	1.952E-08	9.404E-09	5.155E-09	3.415E-09	2.499E-09
NNW	1.658E-08	2.648E-08	3.114E-08	2.885E-08	2.532E-08	1.670E-08	8.366E-09	4.672E-09	3.118E-09	2.291E-09
N	4.353E-08	7.093E-08	8.278E-08	7.642E-08	6.694E-08	4.404E-08	2.199E-08	1.225E-08	8.155E-09	5.983E-09
NNE	7.800E-08	1.021E-07	1.092E-07	9.783E-08	8.453E-08	5.491E-08	2.724E-08	1.518E-08	1.013E-08	7.447E-09
NE	5.525E-08	8.047E-08	8.752E-08	7.859E-08	6.794E-08	4.409E-08	2.184E-08	1.216E-08	8.112E-09	5.963E-09
ENE	3.139E-08	4.157E-08	4.567E-08	4.183E-08	3.676E-08	2.462E-08	1.272E-08	7.309E-09	4.968E-09	3.701E-09
E	3.019E-08	4.905E-08	6.094E-08	5.962E-08	5.463E-08	3.910E-08	2.179E-08	1.315E-08	9.195E-09	6.983E-09
ESE	4.543E-08	6.008E-08	6.876E-08	6.541E-08	5.927E-08	4.239E-08	2.417E-08	1.508E-08	1.083E-08	8.397E-09
SE	6.248E-08	5.862E-08	5.695E-08	5.053E-08	4.404E-08	2.983E-08	1.612E-08	9.797E-09	6.962E-09	5.374E-09
SSE	6.768E-08	6.592E-08	5.862E-08	4.835E-08	3.995E-08	2.456E-08	1.160E-08	6.353E-09	4.231E-09	3.117E-09

0AVERAGE EFFECTIVE STACK HEIGHT IN METERS FOR EACH SEGMENT

DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	1.039E+02	1.039E+02	1.039E+02	1.039E+02	1.039E+02	1.039E+02	1.039E+02	1.039E+02	1.039E+02	1.039E+02
SSW	1.091E+02	1.091E+02	1.091E+02	1.091E+02	1.091E+02	1.091E+02	1.091E+02	1.091E+02	1.091E+02	1.091E+02
SW	1.111E+02	1.111E+02	1.111E+02	1.111E+02	1.111E+02	1.111E+02	1.111E+02	1.111E+02	1.111E+02	1.111E+02
WSW	1.144E+02	1.144E+02	1.144E+02	1.144E+02	1.144E+02	1.144E+02	1.144E+02	1.144E+02	1.144E+02	1.144E+02
W	1.138E+02	1.139E+02	1.139E+02	1.139E+02	1.139E+02	1.139E+02	1.139E+02	1.139E+02	1.139E+02	1.139E+02
WNW	1.100E+02	1.100E+02	1.100E+02	1.100E+02	1.100E+02	1.100E+02	1.100E+02	1.100E+02	1.100E+02	1.100E+02
NW	1.061E+02	1.061E+02	1.061E+02	1.061E+02	1.061E+02	1.061E+02	1.061E+02	1.061E+02	1.061E+02	1.061E+02
NNW	1.090E+02	1.090E+02	1.090E+02	1.090E+02	1.090E+02	1.090E+02	1.090E+02	1.090E+02	1.090E+02	1.090E+02
N	1.069E+02	1.069E+02	1.069E+02	1.069E+02	1.069E+02	1.069E+02	1.069E+02	1.069E+02	1.069E+02	1.069E+02
NNE	1.023E+02	1.023E+02	1.023E+02	1.023E+02	1.023E+02	1.023E+02	1.023E+02	1.023E+02	1.023E+02	1.023E+02
NE	1.005E+02	1.005E+02	1.005E+02	1.005E+02	1.005E+02	1.005E+02	1.005E+02	1.005E+02	1.005E+02	1.005E+02
ENE	9.853E+01	9.854E+01	9.854E+01	9.854E+01	9.854E+01	9.854E+01	9.854E+01	9.854E+01	9.854E+01	9.854E+01
E	9.598E+01	9.599E+01	9.599E+01	9.599E+01	9.599E+01	9.599E+01	9.599E+01	9.599E+01	9.599E+01	9.599E+01
ESE	9.461E+01	9.461E+01	9.461E+01	9.461E+01	9.461E+01	9.461E+01	9.461E+01	9.461E+01	9.461E+01	9.461E+01
SE	1.016E+02	1.016E+02	1.016E+02	1.016E+02	1.016E+02	1.016E+02	1.016E+02	1.016E+02	1.016E+02	1.016E+02
SSE	1.050E+02	1.050E+02	1.050E+02	1.050E+02	1.050E+02	1.050E+02	1.050E+02	1.050E+02	1.050E+02	1.050E+02

Note: Directions are True North.

Table 2.7-6 Long-Term χ/Q (sec/m^3) for Routine Releases Along Various Distance Segments, No Decay, Undepleted (Sheet 2 of 4)

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT TB - MIXED MODE RELEASE - NO PURGE RELEASES
NO DECAY, UNDEPLETED
0CHI/Q (SEC/METER CUBED) FOR EACH SEGMENT

	SEGMENT BOUNDARIES IN MILES FROM THE SITE									
DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	5.244E-08	6.163E-08	6.087E-08	5.207E-08	4.352E-08	2.651E-08	1.202E-08	6.255E-09	4.008E-09	2.864E-09
SSW	2.619E-08	3.834E-08	4.196E-08	3.763E-08	3.229E-08	2.034E-08	9.513E-09	5.025E-09	3.239E-09	2.322E-09
SW	2.002E-08	3.086E-08	3.479E-08	3.174E-08	2.754E-08	1.763E-08	8.405E-09	4.496E-09	2.920E-09	2.104E-09
WSW	1.941E-08	2.685E-08	2.957E-08	2.721E-08	2.384E-08	1.555E-08	7.566E-09	4.103E-09	2.686E-09	1.946E-09
W	2.431E-08	3.132E-08	3.380E-08	3.089E-08	2.704E-08	1.773E-08	8.760E-09	4.834E-09	3.204E-09	2.345E-09
WNW	3.056E-08	3.279E-08	3.258E-08	2.896E-08	2.500E-08	1.621E-08	8.000E-09	4.447E-09	2.965E-09	2.179E-09
NW	1.663E-08	2.532E-08	3.009E-08	2.849E-08	2.531E-08	1.688E-08	8.512E-09	4.767E-09	3.185E-09	2.343E-09
NNW	1.292E-08	1.673E-08	2.166E-08	2.184E-08	2.016E-08	1.417E-08	7.502E-09	4.304E-09	2.907E-09	2.152E-09
N	3.324E-08	4.447E-08	5.725E-08	5.760E-08	5.311E-08	3.729E-08	1.973E-08	1.131E-08	7.631E-09	5.643E-09
NNE	6.034E-08	6.788E-08	7.800E-08	7.495E-08	6.762E-08	4.650E-08	2.433E-08	1.394E-08	9.420E-09	6.979E-09
NE	4.076E-08	5.237E-08	6.220E-08	6.015E-08	5.436E-08	3.735E-08	1.949E-08	1.114E-08	7.519E-09	5.566E-09
ENE	2.389E-08	2.672E-08	3.159E-08	3.103E-08	2.847E-08	2.023E-08	1.104E-08	6.530E-09	4.500E-09	3.380E-09
E	2.254E-08	2.877E-08	3.873E-08	4.091E-08	3.934E-08	3.019E-08	1.798E-08	1.125E-08	8.006E-09	6.146E-09
ESE	3.522E-08	3.796E-08	4.562E-08	4.608E-08	4.337E-08	3.263E-08	1.940E-08	1.234E-08	8.935E-09	6.970E-09
SE	5.170E-08	4.278E-08	4.276E-08	3.966E-08	3.551E-08	2.474E-08	1.353E-08	8.206E-09	5.816E-09	4.483E-09
SSE	5.416E-08	5.079E-08	4.777E-08	4.123E-08	3.498E-08	2.212E-08	1.065E-08	5.848E-09	3.890E-09	2.861E-09

0AVERAGE EFFECTIVE STACK HEIGHT IN METERS FOR EACH SEGMENT

DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	1.130E+02	1.131E+02	1.131E+02	1.131E+02	1.131E+02	1.131E+02	1.131E+02	1.131E+02	1.131E+02	1.131E+02
SSW	1.174E+02	1.174E+02	1.174E+02	1.174E+02	1.174E+02	1.174E+02	1.174E+02	1.174E+02	1.174E+02	1.174E+02
SW	1.190E+02	1.190E+02	1.190E+02	1.190E+02	1.190E+02	1.190E+02	1.190E+02	1.190E+02	1.190E+02	1.190E+02
WSW	1.217E+02	1.217E+02	1.217E+02	1.217E+02	1.217E+02	1.217E+02	1.217E+02	1.217E+02	1.217E+02	1.217E+02
W	1.214E+02	1.214E+02	1.214E+02	1.214E+02	1.214E+02	1.214E+02	1.214E+02	1.214E+02	1.214E+02	1.214E+02
WNW	1.184E+02	1.184E+02	1.184E+02	1.184E+02	1.184E+02	1.184E+02	1.184E+02	1.184E+02	1.184E+02	1.184E+02
NW	1.155E+02	1.155E+02	1.155E+02	1.155E+02	1.155E+02	1.155E+02	1.155E+02	1.155E+02	1.155E+02	1.155E+02
NNW	1.180E+02	1.180E+02	1.180E+02	1.180E+02	1.180E+02	1.180E+02	1.180E+02	1.180E+02	1.180E+02	1.180E+02
N	1.163E+02	1.163E+02	1.163E+02	1.163E+02	1.163E+02	1.163E+02	1.163E+02	1.163E+02	1.163E+02	1.163E+02
NNE	1.124E+02	1.124E+02	1.124E+02	1.124E+02	1.124E+02	1.124E+02	1.124E+02	1.124E+02	1.124E+02	1.124E+02
NE	1.110E+02	1.110E+02	1.110E+02	1.110E+02	1.110E+02	1.110E+02	1.110E+02	1.110E+02	1.110E+02	1.110E+02
ENE	1.094E+02	1.094E+02	1.094E+02	1.094E+02	1.094E+02	1.094E+02	1.094E+02	1.094E+02	1.094E+02	1.094E+02
E	1.077E+02	1.077E+02	1.077E+02	1.077E+02	1.077E+02	1.077E+02	1.077E+02	1.077E+02	1.077E+02	1.077E+02
ESE	1.065E+02	1.065E+02	1.065E+02	1.065E+02	1.065E+02	1.065E+02	1.065E+02	1.065E+02	1.065E+02	1.065E+02
SE	1.118E+02	1.118E+02	1.118E+02	1.118E+02	1.118E+02	1.118E+02	1.118E+02	1.118E+02	1.118E+02	1.118E+02
SSE	1.141E+02	1.141E+02	1.141E+02	1.141E+02	1.141E+02	1.141E+02	1.141E+02	1.141E+02	1.141E+02	1.141E+02

Note: Directions are True North.

Table 2.7-6 Long-Term χ/Q (sec/m^3) for Routine Releases Along Various Distance Segments, No Decay, Undepleted (Sheet 3 of 4)

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 7/ 8/2013
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT ONE - GROUND LEVEL RELEASE - NO PURGE RELEASES
NO DECAY, UNDEPLETED
0CHI/Q (SEC/METER CUBED) FOR EACH SEGMENT

	SEGMENT BOUNDARIES IN MILES FROM THE SITE									
DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	1.674E-06	5.747E-07	2.584E-07	1.546E-07	1.058E-07	5.093E-08	1.850E-08	8.741E-09	5.406E-09	3.792E-09
SSW	1.323E-06	4.576E-07	2.066E-07	1.239E-07	8.500E-08	4.101E-08	1.493E-08	7.060E-09	4.365E-09	3.060E-09
SW	1.181E-06	4.100E-07	1.858E-07	1.117E-07	7.678E-08	3.718E-08	1.363E-08	6.478E-09	4.019E-09	2.825E-09
WSW	1.097E-06	3.813E-07	1.733E-07	1.045E-07	7.191E-08	3.495E-08	1.289E-08	6.166E-09	3.842E-09	2.709E-09
W	1.331E-06	4.651E-07	2.138E-07	1.298E-07	8.988E-08	4.415E-08	1.658E-08	8.057E-09	5.071E-09	3.604E-09
WNW	1.155E-06	4.029E-07	1.847E-07	1.120E-07	7.752E-08	3.811E-08	1.435E-08	7.008E-09	4.426E-09	3.153E-09
NW	1.178E-06	4.172E-07	1.930E-07	1.177E-07	8.177E-08	4.038E-08	1.528E-08	7.465E-09	4.712E-09	3.354E-09
NNW	1.006E-06	3.604E-07	1.675E-07	1.024E-07	7.127E-08	3.530E-08	1.341E-08	6.558E-09	4.140E-09	2.946E-09
N	2.583E-06	9.262E-07	4.290E-07	2.617E-07	1.818E-07	8.977E-08	3.392E-08	1.652E-08	1.040E-08	7.383E-09
NNE	3.256E-06	1.166E-06	5.410E-07	3.303E-07	2.296E-07	1.135E-07	4.299E-08	2.098E-08	1.323E-08	9.407E-09
NE	2.658E-06	9.528E-07	4.432E-07	2.710E-07	1.886E-07	9.341E-08	3.547E-08	1.735E-08	1.095E-08	7.793E-09
ENE	1.615E-06	5.860E-07	2.771E-07	1.712E-07	1.200E-07	6.023E-08	2.333E-08	1.159E-08	7.389E-09	5.296E-09
E	3.022E-06	1.114E-06	5.397E-07	3.383E-07	2.397E-07	1.223E-07	4.863E-08	2.464E-08	1.590E-08	1.149E-08
ESE	4.375E-06	1.592E-06	7.900E-07	5.029E-07	3.602E-07	1.874E-07	7.673E-08	3.979E-08	2.605E-08	1.904E-08
SE	3.097E-06	1.104E-06	5.430E-07	3.442E-07	2.458E-07	1.275E-07	5.201E-08	2.694E-08	1.764E-08	1.290E-08
SSE	1.730E-06	6.008E-07	2.794E-07	1.711E-07	1.192E-07	5.931E-08	2.278E-08	1.129E-08	7.204E-09	5.171E-09

Note: Directions are True North. The results on this page are applicable to releases from the RW-VS.

Table 2.7-7 Long-Term χ/Q (sec/m^3) for Routine Releases at Distances Between 0.25 to 50 Miles, 2.260 Day Decay, Undepleted (Sheet 1 of 4)

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT RB - MIXED MODE RELEASE - NO PURGE RELEASES
2.260 DAY DECAY, UNDEPLETED

0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	0.250	0.500	0.750	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500
S	1.215E-07	6.844E-08	6.524E-08	7.472E-08	8.453E-08	8.122E-08	7.390E-08	6.619E-08	5.915E-08	5.299E-08	4.769E-08
SSW	5.448E-08	3.117E-08	3.226E-08	4.163E-08	5.383E-08	5.501E-08	5.188E-08	4.759E-08	4.327E-08	3.928E-08	3.571E-08
SW	4.106E-08	2.330E-08	2.407E-08	3.220E-08	4.356E-08	4.548E-08	4.345E-08	4.022E-08	3.682E-08	3.361E-08	3.070E-08
WSW	3.445E-08	2.252E-08	2.353E-08	2.925E-08	3.721E-08	3.842E-08	3.677E-08	3.422E-08	3.151E-08	2.892E-08	2.655E-08
W	4.656E-08	2.967E-08	2.839E-08	3.437E-08	4.309E-08	4.418E-08	4.215E-08	3.919E-08	3.609E-08	3.314E-08	3.045E-08
WNW	4.674E-08	3.789E-08	3.538E-08	3.883E-08	4.469E-08	4.447E-08	4.169E-08	3.825E-08	3.485E-08	3.173E-08	2.895E-08
NW	2.897E-08	2.010E-08	1.908E-08	2.594E-08	3.845E-08	4.213E-08	4.131E-08	3.884E-08	3.593E-08	3.304E-08	3.036E-08
NNW	3.066E-08	1.994E-08	1.379E-08	1.690E-08	2.658E-08	3.078E-08	3.134E-08	3.028E-08	2.859E-08	2.671E-08	2.485E-08
N	8.464E-08	4.913E-08	3.651E-08	4.575E-08	7.132E-08	8.212E-08	8.336E-08	8.037E-08	7.576E-08	7.071E-08	6.574E-08
NNE	1.494E-07	8.904E-08	6.976E-08	7.831E-08	1.034E-07	1.117E-07	1.099E-07	1.041E-07	9.707E-08	8.990E-08	8.312E-08
NE	1.070E-07	5.717E-08	4.866E-08	5.900E-08	8.171E-08	8.926E-08	8.817E-08	8.365E-08	7.802E-08	7.229E-08	6.685E-08
ENE	7.393E-08	3.688E-08	2.780E-08	3.120E-08	4.185E-08	4.598E-08	4.592E-08	4.403E-08	4.147E-08	3.875E-08	3.611E-08
E	8.167E-08	3.657E-08	2.528E-08	3.054E-08	4.840E-08	5.798E-08	6.112E-08	6.087E-08	5.900E-08	5.641E-08	5.356E-08
ESE	1.130E-07	5.562E-08	4.024E-08	4.404E-08	5.982E-08	6.741E-08	6.895E-08	6.751E-08	6.475E-08	6.149E-08	5.814E-08
SE	1.522E-07	8.396E-08	5.807E-08	5.479E-08	5.909E-08	5.946E-08	5.710E-08	5.370E-08	5.006E-08	4.653E-08	4.324E-08
SSE	1.199E-07	7.844E-08	6.409E-08	6.472E-08	6.778E-08	6.447E-08	5.895E-08	5.325E-08	4.802E-08	4.340E-08	3.937E-08

0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	5.000	7.500	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	50.000
S	4.314E-08	2.803E-08	1.991E-08	1.185E-08	8.047E-09	5.896E-09	4.543E-09	3.627E-09	2.975E-09	2.490E-09	2.119E-09
SSW	3.258E-08	2.170E-08	1.561E-08	9.408E-09	6.415E-09	4.709E-09	3.631E-09	2.900E-09	2.377E-09	1.988E-09	1.690E-09
SW	2.810E-08	1.896E-08	1.373E-08	8.344E-09	5.717E-09	4.210E-09	3.253E-09	2.601E-09	2.135E-09	1.787E-09	1.520E-09
WSW	2.442E-08	1.674E-08	1.225E-08	7.522E-09	5.187E-09	3.835E-09	2.972E-09	2.381E-09	1.957E-09	1.640E-09	1.396E-09
W	2.804E-08	1.936E-08	1.426E-08	8.857E-09	6.165E-09	4.594E-09	3.583E-09	2.888E-09	2.384E-09	2.007E-09	1.715E-09
WNW	2.652E-08	1.802E-08	1.318E-08	8.154E-09	5.684E-09	4.244E-09	3.317E-09	2.679E-09	2.217E-09	1.869E-09	1.600E-09
NW	2.794E-08	1.921E-08	1.412E-08	8.781E-09	6.127E-09	4.577E-09	3.579E-09	2.891E-09	2.392E-09	2.018E-09	1.727E-09
NNW	2.311E-08	1.641E-08	1.227E-08	7.750E-09	5.441E-09	4.076E-09	3.190E-09	2.576E-09	2.130E-09	1.794E-09	1.533E-09
N	6.108E-08	4.329E-08	3.233E-08	2.039E-08	1.430E-08	1.070E-08	8.372E-09	6.757E-09	5.584E-09	4.701E-09	4.017E-09
NNE	7.693E-08	5.401E-08	4.022E-08	2.535E-08	1.781E-08	1.336E-08	1.047E-08	8.466E-09	7.011E-09	5.913E-09	5.062E-09
NE	6.187E-08	4.340E-08	3.230E-08	2.036E-08	1.430E-08	1.073E-08	8.414E-09	6.808E-09	5.642E-09	4.762E-09	4.079E-09
ENE	3.364E-08	2.422E-08	1.834E-08	1.182E-08	8.422E-09	6.382E-09	5.042E-09	4.103E-09	3.415E-09	2.893E-09	2.485E-09
E	5.070E-08	3.849E-08	3.012E-08	2.022E-08	1.477E-08	1.140E-08	9.126E-09	7.507E-09	6.303E-09	5.377E-09	4.648E-09
ESE	5.489E-08	4.166E-08	3.283E-08	2.244E-08	1.669E-08	1.308E-08	1.062E-08	8.837E-09	7.498E-09	6.457E-09	5.628E-09
SE	4.028E-08	2.927E-08	2.250E-08	1.497E-08	1.098E-08	8.532E-09	6.888E-09	5.714E-09	4.837E-09	4.159E-09	3.621E-09
SSE	3.591E-08	2.411E-08	1.754E-08	1.082E-08	7.546E-09	5.644E-09	4.422E-09	3.580E-09	2.970E-09	2.510E-09	2.154E-09

0VENT AND BUILDING PARAMETERS:

RELEASE HEIGHT	(METERS)	52.77	REP. WIND HEIGHT	(METERS)	10.0
DIAMETER	(METERS)	2.40	BUILDING HEIGHT	(METERS)	46.1
EXIT VELOCITY	(METERS)	17.78	BLDG.MIN.CRS.SEC.AREA	(SQ.METERS)	3098.0
			HEAT EMISSION RATE	(CAL/SEC)	0.0

0AT THE RELEASE HEIGHT:

VENT RELEASE MODE	WIND SPEED (METERS/SEC)	
ELEVATED	LESS THAN	3.556
MIXED	BETWEEN	3.556 AND 17.780
GROUND LEVEL	ABOVE	17.780

AT THE MEASURED WIND HEIGHT (10.0 METERS):

VENT RELEASE MODE	WIND SPEED (METERS/SEC) STABLE CONDITIONS		WIND SPEED (METERS/SEC) UNSTABLE/NEUTRAL CONDITIONS	
ELEVATED	LESS THAN	3.556	LESS THAN	3.556
MIXED	BETWEEN	3.556 AND 17.780	BETWEEN	3.556 AND 17.780
GROUND LEVEL	ABOVE	17.780	ABOVE	17.780

Note: Directions are True North.

Table 2.7-7 Long-Term χ/Q (sec/m^3) for Routine Releases at Distances Between 0.25 to 50 Miles, 2.260 Day Decay, Undepleted (Sheet 2 of 4)

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT TB - MIXED MODE RELEASE - NO PURGE RELEASES
2.260 DAY DECAY, UNDEPLETED

0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	0.250	0.500	0.750	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500
S	1.147E-07	5.906E-08	4.779E-08	5.244E-08	6.308E-08	6.462E-08	6.150E-08	5.682E-08	5.191E-08	4.727E-08	4.306E-08
SSW	5.195E-08	2.726E-08	2.297E-08	2.798E-08	3.888E-08	4.275E-08	4.240E-08	4.026E-08	3.750E-08	3.464E-08	3.192E-08
SW	3.865E-08	2.067E-08	1.735E-08	2.161E-08	3.114E-08	3.495E-08	3.513E-08	3.368E-08	3.161E-08	2.937E-08	2.719E-08
WSW	3.220E-08	1.972E-08	1.767E-08	2.048E-08	2.697E-08	2.966E-08	2.980E-08	2.870E-08	2.707E-08	2.529E-08	2.351E-08
W	4.364E-08	2.683E-08	2.204E-08	2.464E-08	3.153E-08	3.415E-08	3.404E-08	3.264E-08	3.073E-08	2.867E-08	2.666E-08
WNW	4.285E-08	3.373E-08	2.932E-08	2.974E-08	3.298E-08	3.378E-08	3.276E-08	3.090E-08	2.878E-08	2.665E-08	2.464E-08
NW	2.610E-08	1.806E-08	1.482E-08	1.719E-08	2.503E-08	2.927E-08	3.034E-08	2.972E-08	2.834E-08	2.668E-08	2.496E-08
NNW	2.766E-08	1.880E-08	1.147E-08	1.100E-08	1.596E-08	1.993E-08	2.175E-08	2.211E-08	2.167E-08	2.083E-08	1.981E-08
N	7.517E-08	4.557E-08	2.985E-08	2.945E-08	4.247E-08	5.282E-08	5.750E-08	5.839E-08	5.718E-08	5.492E-08	5.221E-08
NNE	1.329E-07	7.992E-08	5.602E-08	5.354E-08	6.623E-08	7.548E-08	7.841E-08	7.743E-08	7.447E-08	7.065E-08	6.658E-08
NE	9.702E-08	5.061E-08	3.728E-08	3.830E-08	5.114E-08	5.971E-08	6.258E-08	6.205E-08	5.980E-08	5.680E-08	5.356E-08
ENE	6.620E-08	3.333E-08	2.186E-08	2.061E-08	2.589E-08	3.006E-08	3.171E-08	3.170E-08	3.080E-08	2.949E-08	2.801E-08
E	7.216E-08	3.338E-08	2.006E-08	1.890E-08	2.706E-08	3.455E-08	3.871E-08	4.037E-08	4.051E-08	3.979E-08	3.860E-08
ESE	1.009E-07	5.025E-08	3.236E-08	2.971E-08	3.651E-08	4.268E-08	4.564E-08	4.631E-08	4.566E-08	4.429E-08	4.259E-08
SE	1.348E-07	7.561E-08	4.865E-08	4.181E-08	4.218E-08	4.324E-08	4.282E-08	4.135E-08	3.934E-08	3.713E-08	3.492E-08
SSE	1.092E-07	6.862E-08	5.119E-08	4.894E-08	5.138E-08	5.077E-08	4.806E-08	4.458E-08	4.100E-08	3.761E-08	3.451E-08

0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	5.000	7.500	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	50.000
S	3.932E-08	2.622E-08	1.884E-08	1.132E-08	7.721E-09	5.670E-09	4.375E-09	3.497E-09	2.870E-09	2.404E-09	2.047E-09
SSW	2.941E-08	2.015E-08	1.467E-08	8.940E-09	6.127E-09	4.512E-09	3.486E-09	2.787E-09	2.287E-09	1.915E-09	1.629E-09
SW	2.516E-08	1.746E-08	1.282E-08	7.880E-09	5.430E-09	4.012E-09	3.108E-09	2.489E-09	2.045E-09	1.714E-09	1.459E-09
WSW	2.185E-08	1.539E-08	1.139E-08	7.074E-09	4.904E-09	3.637E-09	2.824E-09	2.267E-09	1.865E-09	1.564E-09	1.333E-09
W	2.478E-08	1.755E-08	1.307E-08	8.198E-09	5.735E-09	4.286E-09	3.350E-09	2.704E-09	2.235E-09	1.883E-09	1.610E-09
WNW	2.282E-08	1.602E-08	1.190E-08	7.488E-09	5.266E-09	3.954E-09	3.103E-09	2.513E-09	2.084E-09	1.761E-09	1.510E-09
NW	2.330E-08	1.673E-08	1.257E-08	7.987E-09	5.638E-09	4.242E-09	3.334E-09	2.703E-09	2.244E-09	1.897E-09	1.627E-09
NNW	1.875E-08	1.403E-08	1.076E-08	6.986E-09	4.976E-09	3.763E-09	2.964E-09	2.406E-09	1.997E-09	1.687E-09	1.446E-09
N	4.939E-08	3.693E-08	2.834E-08	1.839E-08	1.310E-08	9.908E-09	7.805E-09	6.334E-09	5.257E-09	4.442E-09	3.806E-09
NNE	6.258E-08	4.606E-08	3.515E-08	2.276E-08	1.623E-08	1.229E-08	9.702E-09	7.890E-09	6.562E-09	5.555E-09	4.769E-09
NE	5.035E-08	3.703E-08	2.824E-08	1.826E-08	1.301E-08	9.851E-09	7.775E-09	6.324E-09	5.261E-09	4.455E-09	3.827E-09
ENE	2.651E-08	2.002E-08	1.556E-08	1.032E-08	7.469E-09	5.720E-09	4.553E-09	3.727E-09	3.117E-09	2.650E-09	2.284E-09
E	3.719E-08	2.988E-08	2.413E-08	1.677E-08	1.251E-08	9.778E-09	7.905E-09	6.552E-09	5.534E-09	4.745E-09	4.118E-09
ESE	4.077E-08	3.225E-08	2.594E-08	1.810E-08	1.361E-08	1.074E-08	8.760E-09	7.322E-09	6.234E-09	5.384E-09	4.705E-09
SE	3.282E-08	2.441E-08	1.890E-08	1.260E-08	9.240E-09	7.173E-09	5.787E-09	4.798E-09	4.061E-09	3.493E-09	3.042E-09
SSE	3.175E-08	2.183E-08	1.604E-08	9.965E-09	6.964E-09	5.212E-09	4.084E-09	3.306E-09	2.742E-09	2.318E-09	1.989E-09

0VENT AND BUILDING PARAMETERS:

RELEASE HEIGHT	(METERS)	71.30	REF. WIND HEIGHT	(METERS)	10.0
DIAMETER	(METERS)	1.95	BUILDING HEIGHT	(METERS)	46.1
EXIT VELOCITY	(METERS)	17.78	BLDG.MIN.CRS.SEC.AREA	(SQ.METERS)	3098.0
			HEAT EMISSION RATE	(CAL/SEC)	0.0

0AT THE RELEASE HEIGHT:

VENT RELEASE MODE	WIND SPEED (METERS/SEC)	
ELEVATED	LESS THAN	3.556
MIXED	BETWEEN	3.556 AND 17.780
GROUND LEVEL	ABOVE	17.780

AT THE MEASURED WIND HEIGHT (10.0 METERS):

VENT RELEASE MODE	WIND SPEED (METERS/SEC) STABLE CONDITIONS		WIND SPEED (METERS/SEC) UNSTABLE/NEUTRAL CONDITIONS	
ELEVATED	LESS THAN	3.556	LESS THAN	3.556
MIXED	BETWEEN	3.556 AND 17.780	BETWEEN	3.556 AND 17.780
GROUND LEVEL	ABOVE	17.780	ABOVE	17.780

Note: Directions are True North.

Table 2.7-7 Long-Term χ/Q (sec/m^3) for Routine Releases at Distances Between 0.25 to 50 Miles, 2.260 Day Decay, Undepleted (Sheet 3 of 4)

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 7/ 8/2013
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT ONE - GROUND LEVEL RELEASE - NO PURGE RELEASES
2.260 DAY DECAY, UNDEPLETED
0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	0.250	0.500	0.750	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500
S	8.548E-06	3.029E-06	1.613E-06	1.031E-06	5.527E-07	3.556E-07	2.528E-07	1.915E-07	1.515E-07	1.237E-07	1.035E-07
SSW	6.685E-06	2.381E-06	1.276E-06	8.183E-07	4.402E-07	2.838E-07	2.021E-07	1.532E-07	1.213E-07	9.914E-08	8.299E-08
SW	5.986E-06	2.123E-06	1.139E-06	7.314E-07	3.944E-07	2.547E-07	1.816E-07	1.379E-07	1.093E-07	8.938E-08	7.488E-08
WSW	5.620E-06	1.974E-06	1.058E-06	6.790E-07	3.667E-07	2.372E-07	1.693E-07	1.287E-07	1.021E-07	8.355E-08	7.004E-08
W	6.996E-06	2.402E-06	1.281E-06	8.230E-07	4.478E-07	2.913E-07	2.089E-07	1.593E-07	1.268E-07	1.041E-07	8.749E-08
WNW	6.090E-06	2.081E-06	1.112E-06	7.145E-07	3.878E-07	2.519E-07	1.805E-07	1.376E-07	1.095E-07	8.986E-08	7.552E-08
NW	6.075E-06	2.103E-06	1.138E-06	7.358E-07	4.022E-07	2.625E-07	1.888E-07	1.443E-07	1.151E-07	9.466E-08	7.969E-08
NNW	5.151E-06	1.782E-06	9.742E-07	6.333E-07	3.473E-07	2.271E-07	1.636E-07	1.252E-07	9.994E-08	8.224E-08	6.928E-08
N	1.309E-05	4.559E-06	2.505E-06	1.631E-06	8.925E-07	5.826E-07	4.190E-07	3.203E-07	2.554E-07	2.100E-07	1.768E-07
NNE	1.672E-05	5.760E-06	3.153E-06	2.053E-06	1.125E-06	7.347E-07	5.287E-07	4.044E-07	3.226E-07	2.654E-07	2.234E-07
NE	1.364E-05	4.708E-06	2.573E-06	1.674E-06	9.190E-07	6.013E-07	4.333E-07	3.317E-07	2.649E-07	2.180E-07	1.837E-07
ENE	8.552E-06	2.860E-06	1.559E-06	1.019E-06	5.660E-07	3.734E-07	2.707E-07	2.083E-07	1.670E-07	1.380E-07	1.166E-07
E	1.671E-05	5.360E-06	2.906E-06	1.909E-06	1.079E-06	7.206E-07	5.273E-07	4.088E-07	3.298E-07	2.739E-07	2.325E-07
ESE	2.570E-05	7.976E-06	4.162E-06	2.690E-06	1.545E-06	1.045E-06	7.722E-07	6.033E-07	4.899E-07	4.091E-07	3.491E-07
SE	1.826E-05	5.713E-06	2.938E-06	1.876E-06	1.069E-06	7.203E-07	5.306E-07	4.137E-07	3.353E-07	2.796E-07	2.383E-07
SSE	9.423E-06	3.157E-06	1.657E-06	1.057E-06	5.790E-07	3.789E-07	2.731E-07	2.092E-07	1.671E-07	1.376E-07	1.160E-07

0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	5.000	7.500	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	50.000
S	8.824E-08	4.788E-08	3.104E-08	1.684E-08	1.090E-08	7.753E-09	5.854E-09	4.605E-09	3.732E-09	3.094E-09	2.612E-09
SSW	7.080E-08	3.847E-08	2.496E-08	1.354E-08	8.750E-09	6.215E-09	4.685E-09	3.680E-09	2.977E-09	2.464E-09	2.077E-09
SW	6.393E-08	3.483E-08	2.264E-08	1.231E-08	7.970E-09	5.666E-09	4.274E-09	3.357E-09	2.716E-09	2.248E-09	1.894E-09
WSW	5.983E-08	3.268E-08	2.128E-08	1.160E-08	7.521E-09	5.353E-09	4.040E-09	3.175E-09	2.569E-09	2.127E-09	1.792E-09
W	7.492E-08	4.132E-08	2.709E-08	1.492E-08	9.740E-09	6.971E-09	5.285E-09	4.169E-09	3.385E-09	2.809E-09	2.373E-09
WNW	6.468E-08	3.572E-08	2.345E-08	1.295E-08	8.492E-09	6.099E-09	4.638E-09	3.669E-09	2.986E-09	2.485E-09	2.103E-09
NW	6.834E-08	3.789E-08	2.494E-08	1.382E-08	9.062E-09	6.510E-09	4.952E-09	3.917E-09	3.189E-09	2.653E-09	2.246E-09
NNW	5.944E-08	3.300E-08	2.174E-08	1.203E-08	7.877E-09	5.646E-09	4.284E-09	3.381E-09	2.746E-09	2.280E-09	1.925E-09
N	1.516E-07	8.395E-08	5.519E-08	3.047E-08	1.992E-08	1.426E-08	1.081E-08	8.529E-09	6.923E-09	5.744E-09	4.849E-09
NNE	1.916E-07	1.063E-07	6.999E-08	3.874E-08	2.537E-08	1.820E-08	1.382E-08	1.092E-08	8.878E-09	7.377E-09	6.237E-09
NE	1.576E-07	8.759E-08	5.773E-08	3.201E-08	2.100E-08	1.508E-08	1.146E-08	9.064E-09	7.375E-09	6.134E-09	5.190E-09
ENE	1.004E-07	5.635E-08	3.741E-08	2.093E-08	1.380E-08	9.941E-09	7.575E-09	5.999E-09	4.886E-09	4.065E-09	3.440E-09
E	2.009E-07	1.144E-07	7.670E-08	4.347E-08	2.891E-08	2.096E-08	1.605E-08	1.276E-08	1.042E-08	8.692E-09	7.371E-09
ESE	3.029E-07	1.754E-07	1.189E-07	6.846E-08	4.600E-08	3.362E-08	2.590E-08	2.069E-08	1.698E-08	1.421E-08	1.209E-08
SE	2.065E-07	1.193E-07	8.072E-08	4.639E-08	3.115E-08	2.276E-08	1.753E-08	1.400E-08	1.149E-08	9.618E-09	8.181E-09
SSE	9.963E-08	5.557E-08	3.674E-08	2.049E-08	1.351E-08	9.741E-09	7.431E-09	5.893E-09	4.806E-09	4.005E-09	3.394E-09

0VENT AND BUILDING PARAMETERS:

RELEASE HEIGHT	(METERS)	0.00	REP. WIND HEIGHT	(METERS)	10.0
DIAMETER	(METERS)	0.00	BUILDING HEIGHT	(METERS)	46.1
EXIT VELOCITY	(METERS)	0.00	BLDG.MIN.CRS.SEC.AREA	(SQ.METERS)	3098.0
			HEAT EMISSION RATE	(CAL/SEC)	0.0
			HEAT EMISSION RATE	(CAL/SEC)	0.0

0ALL GROUND LEVEL RELEASES.

Note: Directions are True North. The results on this page are applicable to releases from the RW-VS.

Table 2.7-8 Long-Term χ/Q (sec/m^3) for Routine Releases Along Various Distance Segments, 2.260 Day Decay, Undepleted (Sheet 1 of 2)

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT RB - MIXED MODE RELEASE - NO PURGE RELEASES
2.260 DAY DECAY, UNDEPLETED
0CHI/Q (SEC/METER CUBED) FOR EACH SEGMENT

	SEGMENT BOUNDARIES IN MILES FROM THE SITE									
DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	7.017E-08	8.088E-08	7.277E-08	5.882E-08	4.758E-08	2.778E-08	1.195E-08	5.928E-09	3.640E-09	2.496E-09
SSW	5.164E-08	5.100E-08	4.298E-08	3.561E-08	2.141E-08	9.457E-09	4.733E-09	2.909E-09	1.993E-09	
SW	2.751E-08	4.189E-08	4.270E-08	3.657E-08	3.060E-08	1.867E-08	8.374E-09	4.229E-09	2.610E-09	1.791E-09
WSW	2.585E-08	3.598E-08	3.619E-08	3.130E-08	2.646E-08	1.645E-08	7.534E-09	3.850E-09	2.388E-09	1.643E-09
W	3.133E-08	4.164E-08	4.151E-08	3.585E-08	3.035E-08	1.902E-08	8.861E-09	4.609E-09	2.895E-09	2.010E-09
WNW	3.747E-08	4.329E-08	4.105E-08	3.463E-08	2.888E-08	1.776E-08	8.173E-09	4.258E-09	2.685E-09	1.873E-09
NW	2.236E-08	3.730E-08	4.054E-08	3.566E-08	3.026E-08	1.889E-08	8.789E-09	4.591E-09	2.898E-09	2.021E-09
NNW	1.654E-08	2.629E-08	3.077E-08	2.836E-08	2.476E-08	1.606E-08	7.728E-09	4.085E-09	2.581E-09	1.797E-09
N	4.342E-08	7.044E-08	8.183E-08	7.515E-08	6.549E-08	4.237E-08	2.034E-08	1.073E-08	6.772E-09	4.709E-09
NNE	7.784E-08	1.015E-07	1.081E-07	9.636E-08	8.284E-08	5.298E-08	2.530E-08	1.339E-08	8.484E-09	5.923E-09
NE	5.515E-08	8.002E-08	8.665E-08	7.744E-08	6.662E-08	4.257E-08	2.032E-08	1.076E-08	6.822E-09	4.770E-09
ENE	3.133E-08	4.132E-08	4.518E-08	4.116E-08	3.598E-08	2.370E-08	1.176E-08	6.390E-09	4.109E-09	2.897E-09
E	3.013E-08	4.869E-08	6.018E-08	5.855E-08	5.335E-08	3.748E-08	2.000E-08	1.139E-08	7.511E-09	5.381E-09
ESE	4.534E-08	5.969E-08	6.796E-08	6.429E-08	5.793E-08	4.068E-08	2.220E-08	1.306E-08	8.835E-09	6.458E-09
SE	6.237E-08	5.830E-08	5.637E-08	4.975E-08	4.312E-08	2.871E-08	1.487E-08	8.527E-09	5.716E-09	4.161E-09
SSE	6.756E-08	6.563E-08	5.814E-08	4.775E-08	3.928E-08	2.381E-08	1.086E-08	5.662E-09	3.588E-09	2.515E-09

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT TB - MIXED MODE RELEASE - NO PURGE RELEASES
2.260 DAY DECAY, UNDEPLETED
0CHI/Q (SEC/METER CUBED) FOR EACH SEGMENT

	SEGMENT BOUNDARIES IN MILES FROM THE SITE									
DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	5.236E-08	6.140E-08	6.046E-08	5.155E-08	4.292E-08	2.585E-08	1.139E-08	5.699E-09	3.509E-09	2.410E-09
SSW	2.615E-08	3.818E-08	4.164E-08	3.720E-08	3.180E-08	1.977E-08	8.964E-09	4.532E-09	2.796E-09	1.919E-09
SW	1.998E-08	3.072E-08	3.450E-08	3.135E-08	2.708E-08	1.711E-08	7.888E-09	4.028E-09	2.497E-09	1.718E-09
WSW	1.937E-08	2.672E-08	2.932E-08	2.685E-08	2.342E-08	1.505E-08	7.069E-09	3.650E-09	2.273E-09	1.568E-09
W	2.426E-08	3.116E-08	3.351E-08	3.049E-08	2.656E-08	1.716E-08	8.185E-09	4.298E-09	2.710E-09	1.886E-09
WNW	3.049E-08	3.262E-08	3.229E-08	2.857E-08	2.456E-08	1.570E-08	7.482E-09	3.964E-09	2.518E-09	1.764E-09
NW	1.659E-08	2.517E-08	2.981E-08	2.810E-08	2.485E-08	1.634E-08	7.960E-09	4.251E-09	2.708E-09	1.900E-09
NNW	1.289E-08	1.662E-08	2.141E-08	2.148E-08	1.972E-08	1.362E-08	6.932E-09	3.767E-09	2.409E-09	1.690E-09
N	3.317E-08	4.418E-08	5.661E-08	5.666E-08	5.197E-08	3.588E-08	1.825E-08	9.919E-09	6.344E-09	4.448E-09
NNE	6.023E-08	6.752E-08	7.724E-08	7.386E-08	6.630E-08	4.488E-08	2.261E-08	1.231E-08	7.902E-09	5.562E-09
NE	4.070E-08	5.209E-08	6.160E-08	5.930E-08	5.333E-08	3.608E-08	1.814E-08	9.863E-09	6.333E-09	4.461E-09
ENE	2.386E-08	2.657E-08	3.126E-08	3.056E-08	2.789E-08	1.948E-08	1.022E-08	5.719E-09	3.731E-09	2.653E-09
E	2.250E-08	2.858E-08	3.826E-08	4.020E-08	3.843E-08	2.895E-08	1.651E-08	9.756E-09	6.551E-09	4.746E-09
ESE	3.516E-08	3.774E-08	4.512E-08	4.532E-08	4.242E-08	3.134E-08	1.785E-08	1.071E-08	7.318E-09	5.385E-09
SE	5.160E-08	4.257E-08	4.234E-08	3.907E-08	3.480E-08	2.383E-08	1.251E-08	7.170E-09	4.800E-09	3.494E-09
SSE	5.406E-08	5.056E-08	4.739E-08	4.073E-08	3.440E-08	2.146E-08	9.981E-09	5.228E-09	3.313E-09	2.322E-09

Note: Directions are True North.

Table 2.7-8 Long-Term χ/Q (sec/m^3) for Routine Releases Along Various Distance Segments, 2.260 Day Decay, Undepleted (Sheet 2 of 2)

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 7/ 8/2013
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT ONE - GROUND LEVEL RELEASE - NO PURGE RELEASES
2.260 DAY DECAY, UNDEPLETED
0CHI/Q (SEC/METER CUBED) FOR EACH SEGMENT

	SEGMENT BOUNDARIES IN MILES FROM THE SITE									
DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	1.669E-06	5.713E-07	2.557E-07	1.523E-07	1.038E-07	4.936E-08	1.735E-08	7.832E-09	4.629E-09	3.104E-09
SSW	1.318E-06	4.547E-07	2.043E-07	1.220E-07	8.326E-08	3.965E-08	1.395E-08	6.279E-09	3.699E-09	2.473E-09
SW	1.177E-06	4.072E-07	1.836E-07	1.099E-07	7.512E-08	3.588E-08	1.268E-08	5.723E-09	3.375E-09	2.256E-09
WSW	1.093E-06	3.785E-07	1.712E-07	1.026E-07	7.026E-08	3.365E-08	1.194E-08	5.406E-09	3.191E-09	2.134E-09
W	1.326E-06	4.616E-07	2.110E-07	1.275E-07	8.776E-08	4.246E-08	1.532E-08	7.035E-09	4.189E-09	2.818E-09
WNW	1.151E-06	4.000E-07	1.824E-07	1.100E-07	7.576E-08	3.670E-08	1.330E-08	6.152E-09	3.686E-09	2.492E-09
NW	1.174E-06	4.143E-07	1.907E-07	1.157E-07	7.992E-08	3.890E-08	1.418E-08	6.567E-09	3.935E-09	2.661E-09
NNW	1.002E-06	3.574E-07	1.652E-07	1.004E-07	6.947E-08	3.387E-08	1.234E-08	5.696E-09	3.397E-09	2.286E-09
N	2.573E-06	9.189E-07	4.231E-07	2.567E-07	1.773E-07	8.619E-08	3.127E-08	1.439E-08	8.570E-09	5.762E-09
NNE	3.243E-06	1.158E-06	5.339E-07	3.242E-07	2.241E-07	1.091E-07	3.974E-08	1.836E-08	1.097E-08	7.399E-09
NE	2.648E-06	9.457E-07	4.375E-07	2.661E-07	1.842E-07	8.988E-08	3.283E-08	1.521E-08	9.106E-09	6.152E-09
ENE	1.608E-06	5.811E-07	2.731E-07	1.678E-07	1.169E-07	5.771E-08	2.142E-08	1.002E-08	6.025E-09	4.077E-09
E	3.008E-06	1.104E-06	5.315E-07	3.310E-07	2.330E-07	1.169E-07	4.438E-08	2.111E-08	1.281E-08	8.715E-09
ESE	4.355E-06	1.577E-06	7.774E-07	4.915E-07	3.497E-07	1.786E-07	6.969E-08	3.383E-08	2.076E-08	1.424E-08
SE	3.083E-06	1.094E-06	5.344E-07	3.365E-07	2.388E-07	1.215E-07	4.725E-08	2.290E-08	1.405E-08	9.640E-09
SSE	1.724E-06	5.963E-07	2.757E-07	1.679E-07	1.164E-07	5.699E-08	2.100E-08	9.822E-09	5.918E-09	4.016E-09

Note: The results on the top half of this page are applicable to releases from the RW-VS.

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 7/16/2013
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT TWR - GROUND LEVEL RELEASE - NO PURGE RELEASES
2.260 DAY DECAY, UNDEPLETED
0CHI/Q (SEC/METER CUBED) FOR EACH SEGMENT

	SEGMENT BOUNDARIES IN MILES FROM THE SITE									
DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	2.037E-06	6.349E-07	2.726E-07	1.601E-07	1.083E-07	5.101E-08	1.776E-08	7.978E-09	4.705E-09	3.151E-09
SSW	1.619E-06	5.061E-07	2.179E-07	1.281E-07	8.675E-08	4.094E-08	1.427E-08	6.390E-09	3.756E-09	2.507E-09
SW	1.457E-06	4.556E-07	1.965E-07	1.157E-07	7.847E-08	3.712E-08	1.298E-08	5.830E-09	3.430E-09	2.289E-09
WSW	1.365E-06	4.265E-07	1.841E-07	1.086E-07	7.369E-08	3.493E-08	1.226E-08	5.519E-09	3.249E-09	2.169E-09
W	1.699E-06	5.317E-07	2.308E-07	1.368E-07	9.322E-08	4.455E-08	1.586E-08	7.230E-09	4.291E-09	2.881E-09
WNW	1.469E-06	4.580E-07	1.984E-07	1.175E-07	8.010E-08	3.834E-08	1.372E-08	6.300E-09	3.762E-09	2.538E-09
NW	1.518E-06	4.764E-07	2.077E-07	1.236E-07	8.450E-08	4.063E-08	1.461E-08	6.719E-09	4.013E-09	2.708E-09
NNW	1.303E-06	4.096E-07	1.791E-07	1.067E-07	7.308E-08	3.519E-08	1.266E-08	5.802E-09	3.450E-09	2.318E-09
N	3.321E-06	1.044E-06	4.555E-07	2.711E-07	1.854E-07	8.907E-08	3.192E-08	1.460E-08	8.671E-09	5.821E-09
NNE	4.211E-06	1.323E-06	5.773E-07	3.437E-07	2.351E-07	1.131E-07	4.066E-08	1.866E-08	1.112E-08	7.487E-09
NE	3.460E-06	1.088E-06	4.759E-07	2.837E-07	1.943E-07	9.359E-08	3.372E-08	1.551E-08	9.259E-09	6.243E-09
ENE	2.182E-06	6.882E-07	3.032E-07	1.819E-07	1.251E-07	6.081E-08	2.219E-08	1.029E-08	6.163E-09	4.160E-09
E	4.319E-06	1.368E-06	6.091E-07	3.684E-07	2.551E-07	1.254E-07	4.661E-08	2.192E-08	1.323E-08	8.971E-09
ESE	6.580E-06	2.088E-06	9.392E-07	5.726E-07	3.991E-07	1.986E-07	7.524E-08	3.594E-08	2.189E-08	1.495E-08
SE	4.560E-06	1.442E-06	6.461E-07	3.928E-07	2.732E-07	1.356E-07	5.120E-08	2.442E-08	1.487E-08	1.015E-08
SSE	2.265E-06	7.085E-07	3.094E-07	1.843E-07	1.262E-07	6.090E-08	2.206E-08	1.022E-08	6.131E-09	4.148E-09

Note: Directions are True North.

Table 2.7-9 Long-Term χ/Q (sec/m^3) for Routine Releases at Distances Between 0.25 to 50 Miles, 8.000 Day Decay, Depleted (Sheet 1 of 4)

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT RB - MIXED MODE RELEASE - NO PURGE RELEASES
8.000 DAY DECAY, DEPLETED
0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	0.250	0.500	0.750	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500
S	1.169E-07	6.545E-08	6.291E-08	7.283E-08	8.268E-08	7.920E-08	7.173E-08	6.394E-08	5.687E-08	5.072E-08	4.545E-08
SSW	5.238E-08	2.982E-08	3.120E-08	4.080E-08	5.294E-08	5.395E-08	5.066E-08	4.627E-08	4.190E-08	3.788E-08	3.432E-08
SW	3.959E-08	2.234E-08	2.331E-08	3.159E-08	4.291E-08	4.468E-08	4.253E-08	3.922E-08	3.578E-08	3.254E-08	2.962E-08
WSW	3.339E-08	2.178E-08	2.287E-08	2.867E-08	3.659E-08	3.771E-08	3.598E-08	3.337E-08	3.064E-08	2.804E-08	2.566E-08
W	4.527E-08	2.876E-08	2.756E-08	3.364E-08	4.231E-08	4.331E-08	4.121E-08	3.820E-08	3.507E-08	3.212E-08	2.944E-08
WNW	4.579E-08	3.709E-08	3.445E-08	3.789E-08	4.373E-08	4.352E-08	4.076E-08	3.734E-08	3.397E-08	3.089E-08	2.815E-08
NW	2.863E-08	1.976E-08	1.866E-08	2.553E-08	3.800E-08	4.165E-08	4.081E-08	3.833E-08	3.542E-08	3.255E-08	2.988E-08
NNW	3.052E-08	1.970E-08	1.349E-08	1.662E-08	2.634E-08	3.058E-08	3.118E-08	3.014E-08	2.846E-08	2.660E-08	2.476E-08
N	8.413E-08	4.846E-08	3.569E-08	4.497E-08	7.066E-08	8.158E-08	8.291E-08	7.999E-08	7.544E-08	7.044E-08	6.552E-08
NNE	1.470E-07	8.704E-08	6.779E-08	7.656E-08	1.019E-07	1.103E-07	1.087E-07	1.030E-07	9.602E-08	8.894E-08	8.225E-08
NE	1.043E-07	5.532E-08	4.706E-08	5.765E-08	8.057E-08	8.823E-08	8.722E-08	8.275E-08	7.718E-08	7.150E-08	6.613E-08
ENE	7.254E-08	3.586E-08	2.692E-08	3.048E-08	4.127E-08	4.549E-08	4.551E-08	4.368E-08	4.116E-08	3.849E-08	3.589E-08
E	8.066E-08	3.577E-08	2.455E-08	2.993E-08	4.796E-08	5.771E-08	6.099E-08	6.087E-08	5.910E-08	5.659E-08	5.382E-08
ESE	1.108E-07	5.409E-08	3.891E-08	4.291E-08	5.893E-08	6.672E-08	6.843E-08	6.712E-08	6.449E-08	6.134E-08	5.808E-08
SE	1.496E-07	8.197E-08	5.625E-08	5.319E-08	5.771E-08	5.823E-08	5.599E-08	5.268E-08	4.912E-08	4.566E-08	4.245E-08
SSE	1.164E-07	7.604E-08	6.198E-08	6.287E-08	6.605E-08	6.277E-08	5.726E-08	5.159E-08	4.639E-08	4.183E-08	3.786E-08

0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	5.000	7.500	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	50.000
S	4.095E-08	2.620E-08	1.841E-08	1.081E-08	7.278E-09	5.311E-09	4.087E-09	3.265E-09	2.682E-09	2.259E-09	1.926E-09
SSW	3.119E-08	2.052E-08	1.463E-08	8.732E-09	5.932E-09	4.354E-09	3.365E-09	2.698E-09	2.223E-09	1.877E-09	1.603E-09
SW	2.704E-08	1.805E-08	1.299E-08	7.841E-09	5.368E-09	3.963E-09	3.077E-09	2.477E-09	2.047E-09	1.733E-09	1.484E-09
WSW	2.354E-08	1.599E-08	1.163E-08	7.113E-09	4.910E-09	3.646E-09	2.843E-09	2.296E-09	1.904E-09	1.615E-09	1.387E-09
W	2.705E-08	1.853E-08	1.359E-08	8.425E-09	5.883E-09	4.411E-09	3.469E-09	2.822E-09	2.355E-09	2.008E-09	1.733E-09
WNW	2.575E-08	1.744E-08	1.274E-08	7.897E-09	5.533E-09	4.162E-09	3.281E-09	2.676E-09	2.237E-09	1.909E-09	1.650E-09
NW	2.748E-08	1.888E-08	1.390E-08	8.694E-09	6.119E-09	4.619E-09	3.654E-09	2.987E-09	2.503E-09	2.141E-09	1.855E-09
NNW	2.303E-08	1.640E-08	1.232E-08	7.868E-09	5.597E-09	4.253E-09	3.379E-09	2.772E-09	2.328E-09	1.994E-09	1.731E-09
N	6.091E-08	4.330E-08	3.248E-08	2.073E-08	1.473E-08	1.118E-08	8.879E-09	7.278E-09	6.109E-09	5.228E-09	4.535E-09
NNE	7.613E-08	5.356E-08	4.003E-08	2.549E-08	1.812E-08	1.377E-08	1.094E-08	8.976E-09	7.541E-09	6.459E-09	5.607E-09
NE	6.120E-08	4.301E-08	3.212E-08	2.044E-08	1.453E-08	1.104E-08	8.777E-09	7.205E-09	6.055E-09	5.190E-09	4.507E-09
ENE	3.347E-08	2.420E-08	1.843E-08	1.205E-08	8.718E-09	6.715E-09	5.394E-09	4.466E-09	3.781E-09	3.260E-09	2.847E-09
E	5.102E-08	3.905E-08	3.082E-08	2.107E-08	1.570E-08	1.234E-08	1.008E-08	8.455E-09	7.237E-09	6.296E-09	5.546E-09
ESE	5.492E-08	4.201E-08	3.340E-08	2.326E-08	1.764E-08	1.410E-08	1.167E-08	9.917E-09	8.583E-09	7.543E-09	6.705E-09
SE	3.955E-08	2.881E-08	2.225E-08	1.500E-08	1.118E-08	8.833E-09	7.260E-09	6.133E-09	5.288E-09	4.635E-09	4.109E-09
SSE	3.445E-08	2.295E-08	1.663E-08	1.024E-08	7.161E-09	5.388E-09	4.254E-09	3.476E-09	2.912E-09	2.492E-09	2.160E-09

0VENT AND BUILDING PARAMETERS:

RELEASE HEIGHT	(METERS)	52.77	REP. WIND HEIGHT	(METERS)	10.0
DIAMETER	(METERS)	2.40	BUILDING HEIGHT	(METERS)	46.1
EXIT VELOCITY	(METERS)	17.78	BLDG.MIN.CRS.SEC.AREA	(SQ.METERS)	3098.0
			HEAT EMISSION RATE	(CAL/SEC)	0.0

0AT THE RELEASE HEIGHT:

VENT RELEASE MODE	WIND SPEED (METERS/SEC)	
ELEVATED	LESS THAN	3.556
MIXED	BETWEEN	3.556 AND 17.780
GROUND LEVEL	ABOVE	17.780

AT THE MEASURED WIND HEIGHT (10.0 METERS):

VENT RELEASE MODE	WIND SPEED (METERS/SEC) STABLE CONDITIONS		WIND SPEED (METERS/SEC) UNSTABLE/NEUTRAL CONDITIONS	
ELEVATED	LESS THAN	3.556	LESS THAN	3.556
MIXED	BETWEEN	3.556 AND 17.780	BETWEEN	3.556 AND 17.780
GROUND LEVEL	ABOVE	17.780	ABOVE	17.780

Note: Directions are True North.

Table 2.7-9 Long-Term χ/Q (sec/m^3) for Routine Releases at Distances Between 0.25 to 50 Miles, 8.000 Day Decay, Depleted (Sheet 2 of 4)

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1USNRC COMPUTER CODE - XOQDOQ,  VERSION 2.0          RUN DATE:  8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
 EXIT TB - MIXED MODE RELEASE - NO PURGE RELEASES
   8.000 DAY DECAY,    DEPLETED
0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED)                DISTANCE INMILES FROM THE SITE
   SECTOR          0.250     0.500     0.750     1.000     1.500     2.000     2.500     3.000     3.500     4.000     4.500
      S         1.101E-07 5.617E-08 4.555E-08 5.062E-08 6.141E-08 6.281E-08 5.953E-08 5.475E-08 4.978E-08 4.512E-08 4.092E-08
    SSW         4.985E-08 2.592E-08 2.194E-08 2.715E-08 3.807E-08 4.179E-08 4.128E-08 3.902E-08 3.619E-08 3.329E-08 3.055E-08
     SW         3.718E-08 1.972E-08 1.661E-08 2.101E-08 3.053E-08 3.420E-08 3.426E-08 3.272E-08 3.059E-08 2.832E-08 2.612E-08
    WSW         3.114E-08 1.900E-08 1.703E-08 1.990E-08 2.638E-08 2.900E-08 2.905E-08 2.788E-08 2.621E-08 2.440E-08 2.262E-08
      W         4.234E-08 2.592E-08 2.124E-08 2.392E-08 3.078E-08 3.333E-08 3.313E-08 3.167E-08 2.972E-08 2.765E-08 2.564E-08
    WNW         4.190E-08 3.296E-08 2.843E-08 2.882E-08 3.204E-08 3.284E-08 3.183E-08 2.999E-08 2.788E-08 2.579E-08 2.381E-08
     NW         2.576E-08 1.773E-08 1.442E-08 1.677E-08 2.457E-08 2.877E-08 2.981E-08 2.918E-08 2.779E-08 2.614E-08 2.443E-08
    NNW         2.752E-08 1.857E-08 1.118E-08 1.072E-08 1.568E-08 1.968E-08 2.151E-08 2.189E-08 2.146E-08 2.063E-08 1.963E-08
      N         7.467E-08 4.492E-08 2.905E-08 2.866E-08 4.172E-08 5.214E-08 5.688E-08 5.781E-08 5.665E-08 5.444E-08 5.177E-08
    NNE         1.305E-07 7.802E-08 5.413E-08 5.183E-08 6.470E-08 7.406E-08 7.707E-08 7.614E-08 7.325E-08 6.950E-08 6.549E-08
     NE         9.437E-08 4.883E-08 3.575E-08 3.698E-08 5.000E-08 5.864E-08 6.155E-08 6.105E-08 5.883E-08 5.588E-08 5.268E-08
    ENE         6.483E-08 3.235E-08 2.101E-08 1.989E-08 2.530E-08 2.953E-08 3.122E-08 3.125E-08 3.039E-08 2.912E-08 2.767E-08
      E         7.116E-08 3.261E-08 1.936E-08 1.828E-08 2.654E-08 3.415E-08 3.840E-08 4.015E-08 4.037E-08 3.972E-08 3.859E-08
    ESE         9.879E-08 4.878E-08 3.109E-08 2.861E-08 3.559E-08 4.190E-08 4.498E-08 4.575E-08 4.519E-08 4.391E-08 4.229E-08
     SE         1.322E-07 7.376E-08 4.693E-08 4.029E-08 4.085E-08 4.203E-08 4.170E-08 4.029E-08 3.833E-08 3.618E-08 3.402E-08
    SSE         1.058E-07 6.637E-08 4.921E-08 4.719E-08 4.978E-08 4.920E-08 4.648E-08 4.300E-08 3.944E-08 3.608E-08 3.302E-08
0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED)                DISTANCE INMILES FROM THE SITE
   SECTOR          5.000     7.500    10.000    15.000    20.000    25.000    30.000    35.000    40.000    45.000    50.000
      S         3.721E-08 2.442E-08 1.734E-08 1.027E-08 6.938E-09 5.070E-09 3.903E-09 3.119E-09 2.563E-09 2.159E-09 1.840E-09
    SSW         2.805E-08 1.895E-08 1.368E-08 8.246E-09 5.626E-09 4.139E-09 3.203E-09 2.571E-09 2.119E-09 1.790E-09 1.530E-09
     SW         2.409E-08 1.653E-08 1.205E-08 7.354E-09 5.059E-09 3.746E-09 2.913E-09 2.348E-09 1.942E-09 1.645E-09 1.410E-09
    WSW         2.095E-08 1.461E-08 1.075E-08 6.638E-09 4.602E-09 3.426E-09 2.675E-09 2.163E-09 1.795E-09 1.524E-09 1.308E-09
      W         2.377E-08 1.668E-08 1.235E-08 7.727E-09 5.415E-09 4.068E-09 3.203E-09 2.608E-09 2.177E-09 1.858E-09 1.604E-09
    WNW         2.202E-08 1.539E-08 1.142E-08 7.193E-09 5.082E-09 3.841E-09 3.039E-09 2.484E-09 2.081E-09 1.779E-09 1.540E-09
     NW         2.279E-08 1.634E-08 1.229E-08 7.856E-09 5.592E-09 4.251E-09 3.378E-09 2.772E-09 2.329E-09 1.997E-09 1.734E-09
    NNW         1.858E-08 1.394E-08 1.074E-08 7.053E-09 5.091E-09 3.905E-09 3.123E-09 2.574E-09 2.171E-09 1.865E-09 1.623E-09
      N         4.900E-08 3.675E-08 2.833E-08 1.860E-08 1.343E-08 1.030E-08 8.235E-09 6.786E-09 5.721E-09 4.914E-09 4.276E-09
    NNE         6.156E-08 4.540E-08 3.477E-08 2.274E-08 1.641E-08 1.259E-08 1.007E-08 8.310E-09 7.013E-09 6.030E-09 5.251E-09
     NE         4.952E-08 3.648E-08 2.791E-08 1.822E-08 1.313E-08 1.007E-08 8.059E-09 6.647E-09 5.611E-09 4.826E-09 4.204E-09
    ENE         2.621E-08 1.989E-08 1.554E-08 1.045E-08 7.679E-09 5.976E-09 4.837E-09 4.028E-09 3.426E-09 2.966E-09 2.599E-09
      E         3.724E-08 3.017E-08 2.457E-08 1.740E-08 1.322E-08 1.054E-08 8.686E-09 7.341E-09 6.323E-09 5.529E-09 4.892E-09
    ESE         4.054E-08 3.231E-08 2.621E-08 1.862E-08 1.427E-08 1.148E-08 9.552E-09 8.144E-09 7.072E-09 6.234E-09 5.555E-09
     SE         3.198E-08 2.381E-08 1.850E-08 1.248E-08 9.274E-09 7.312E-09 5.997E-09 5.058E-09 4.357E-09 3.817E-09 3.382E-09
    SSE         3.030E-08 2.066E-08 1.510E-08 9.344E-09 6.535E-09 4.910E-09 3.871E-09 3.158E-09 2.642E-09 2.259E-09 1.955E-09
0VENT AND BUILDING PARAMETERS:
     RELEASE HEIGHT  (METERS)   71.30                  REF. WIND HEIGHT       (METERS)       10.0
     DIAMETER        (METERS)    1.95                  BUILDING HEIGHT        (METERS)       46.1
     EXIT VELOCITY   (METERS)   17.78                  BLDG.MIN.CRS.SEC.AREA  (SQ.METERS)  3098.0
                                                       HEAT EMISSION RATE     (CAL/SEC)       0.0
0AT THE RELEASE HEIGHT:                          /  AT THE MEASURED WIND HEIGHT ( 10.0 METERS):
 VENT RELEASE MODE   WIND SPEED (METERS/SEC)     /  VENT RELEASE MODE   WIND SPEED (METERS/SEC)       WIND SPEED (METERS/SEC)
                                                 /                      STABLE CONDITIONS             UNSTABLE/NEUTRAL CONDITIONS
     ELEVATED        LESS THAN  3.556            /      ELEVATED        LESS THAN  3.556              LESS THAN  3.556
     MIXED           BETWEEN    3.556 AND 17.780 /      MIXED           BETWEEN    3.556 AND 17.780   BETWEEN    3.556 AND 17.780
     GROUND LEVEL    ABOVE     17.780            /      GROUND LEVEL    ABOVE     17.780              ABOVE     17.780
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Note: Directions are True North.

Table 2.7-9 Long-Term χ/Q (sec/m^3) for Routine Releases at Distances Between 0.25 to 50 Miles, 8.000 Day Decay, Depleted (Sheet 3 of 4)

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 7/ 8/2013
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT ONE - GROUND LEVEL RELEASE - NO PURGE RELEASES
8.000 DAY DECAY, DEPLETED
0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	0.250	0.500	0.750	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500
S	8.096E-06	2.770E-06	1.441E-06	9.047E-07	4.714E-07	2.962E-07	2.064E-07	1.535E-07	1.195E-07	9.613E-08	7.933E-08
SSW	6.331E-06	2.178E-06	1.140E-06	7.185E-07	3.756E-07	2.365E-07	1.650E-07	1.229E-07	9.576E-08	7.711E-08	6.368E-08
SW	5.670E-06	1.942E-06	1.018E-06	6.424E-07	3.366E-07	2.124E-07	1.484E-07	1.107E-07	8.631E-08	6.958E-08	5.751E-08
WSW	5.324E-06	1.806E-06	9.450E-07	5.965E-07	3.132E-07	1.979E-07	1.384E-07	1.033E-07	8.069E-08	6.509E-08	5.385E-08
W	6.627E-06	2.197E-06	1.145E-06	7.231E-07	3.824E-07	2.430E-07	1.708E-07	1.280E-07	1.003E-07	8.114E-08	6.730E-08
WNW	5.769E-06	1.903E-06	9.940E-07	6.277E-07	3.311E-07	2.101E-07	1.475E-07	1.105E-07	8.654E-08	7.001E-08	5.806E-08
NW	5.755E-06	1.924E-06	1.017E-06	6.464E-07	3.434E-07	2.189E-07	1.543E-07	1.159E-07	9.097E-08	7.373E-08	6.125E-08
NNW	4.880E-06	1.630E-06	8.708E-07	5.566E-07	2.968E-07	1.896E-07	1.339E-07	1.007E-07	7.910E-08	6.417E-08	5.335E-08
N	1.240E-05	4.172E-06	2.239E-06	1.433E-06	7.625E-07	4.863E-07	3.428E-07	2.575E-07	2.021E-07	1.638E-07	1.361E-07
NNE	1.584E-05	5.270E-06	2.817E-06	1.804E-06	9.605E-07	6.130E-07	4.324E-07	3.249E-07	2.551E-07	2.069E-07	1.719E-07
NE	1.292E-05	4.307E-06	2.299E-06	1.471E-06	7.849E-07	5.017E-07	3.543E-07	2.665E-07	2.094E-07	1.699E-07	1.413E-07
ENE	8.102E-06	2.617E-06	1.394E-06	8.958E-07	4.837E-07	3.118E-07	2.216E-07	1.676E-07	1.323E-07	1.077E-07	8.985E-08
E	1.583E-05	4.905E-06	2.598E-06	1.679E-06	9.225E-07	6.021E-07	4.320E-07	3.291E-07	2.614E-07	2.140E-07	1.794E-07
ESE	2.435E-05	7.301E-06	3.722E-06	2.365E-06	1.321E-06	8.734E-07	6.328E-07	4.860E-07	3.886E-07	3.200E-07	2.695E-07
SE	1.730E-05	5.229E-06	2.627E-06	1.650E-06	9.144E-07	6.019E-07	4.348E-07	3.332E-07	2.659E-07	2.187E-07	1.840E-07
SSE	8.926E-06	2.888E-06	1.481E-06	9.287E-07	4.945E-07	3.161E-07	2.233E-07	1.681E-07	1.322E-07	1.073E-07	8.926E-08

0ANNUAL AVERAGE CHI/Q (SEC/METER CUBED) DISTANCE INMILES FROM THE SITE

SECTOR	5.000	7.500	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	50.000
S	6.679E-08	3.455E-08	2.151E-08	1.098E-08	6.780E-09	4.644E-09	3.396E-09	2.598E-09	2.054E-09	1.666E-09	1.378E-09
SSW	5.366E-08	2.781E-08	1.734E-08	8.857E-09	5.468E-09	3.743E-09	2.735E-09	2.091E-09	1.653E-09	1.340E-09	1.108E-09
SW	4.849E-08	2.521E-08	1.576E-08	8.078E-09	4.999E-09	3.429E-09	2.509E-09	1.921E-09	1.520E-09	1.233E-09	1.020E-09
WSW	4.544E-08	2.370E-08	1.485E-08	7.637E-09	4.739E-09	3.257E-09	2.388E-09	1.831E-09	1.450E-09	1.177E-09	9.751E-10
W	5.693E-08	2.998E-08	1.892E-08	9.834E-09	6.151E-09	4.254E-09	3.135E-09	2.413E-09	1.919E-09	1.563E-09	1.298E-09
WNW	4.911E-08	2.589E-08	1.635E-08	8.520E-09	5.346E-09	3.707E-09	2.737E-09	2.111E-09	1.681E-09	1.372E-09	1.141E-09
NW	5.188E-08	2.746E-08	1.739E-08	9.081E-09	5.699E-09	3.951E-09	2.917E-09	2.250E-09	1.791E-09	1.461E-09	1.215E-09
NNW	4.522E-08	2.399E-08	1.521E-08	7.956E-09	4.992E-09	3.459E-09	2.552E-09	1.967E-09	1.565E-09	1.276E-09	1.060E-09
N	1.153E-07	6.099E-08	3.860E-08	2.012E-08	1.260E-08	8.718E-09	6.425E-09	4.946E-09	3.931E-09	3.202E-09	2.659E-09
NNE	1.456E-07	7.716E-08	4.888E-08	2.553E-08	1.601E-08	1.109E-08	8.181E-09	6.305E-09	5.015E-09	4.088E-09	3.397E-09
NE	1.197E-07	6.354E-08	4.029E-08	2.108E-08	1.323E-08	9.173E-09	6.772E-09	5.222E-09	4.157E-09	3.390E-09	2.818E-09
ENE	7.639E-08	4.100E-08	2.621E-08	1.386E-08	8.764E-09	6.109E-09	4.530E-09	3.505E-09	2.798E-09	2.288E-09	1.906E-09
E	1.531E-07	8.343E-08	5.390E-08	2.891E-08	1.846E-08	1.296E-08	9.668E-09	7.517E-09	6.026E-09	4.944E-09	4.132E-09
ESE	2.311E-07	1.281E-07	8.375E-08	4.568E-08	2.950E-08	2.090E-08	1.570E-08	1.228E-08	9.898E-09	8.158E-09	6.845E-09
SE	1.576E-07	8.710E-08	5.684E-08	3.095E-08	1.998E-08	1.415E-08	1.063E-08	8.316E-09	6.701E-09	5.524E-09	4.636E-09
SSE	7.572E-08	4.035E-08	2.568E-08	1.353E-08	8.548E-09	5.960E-09	4.421E-09	3.423E-09	2.735E-09	2.238E-09	1.867E-09

0VENT AND BUILDING PARAMETERS:

RELEASE HEIGHT	(METERS)	0.00	REP. WIND HEIGHT	(METERS)	10.0
DIAMETER	(METERS)	0.00	BUILDING HEIGHT	(METERS)	46.1
EXIT VELOCITY	(METERS)	0.00	BLDG.MIN.CRS.SEC.AREA	(SQ.METERS)	3098.0
			HEAT EMISSION RATE	(CAL/SEC)	0.0

0ALL GROUND LEVEL RELEASES.

Note: Directions are True North. The results on this page are applicable to releases from the RW-VS.

Table 2.7-10 Long-Term χ/Q (sec/m^3) for Routine Releases Along Various Distance Segments, 8.000 Day Decay, Depleted (Sheet 1 of 2)

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT RB - MIXED MODE RELEASE - NO PURGE RELEASES
8.000 DAY DECAY, DEPLETED
0CHI/Q (SEC/METER CUBED) FOR EACH SEGMENT

	SEGMENT BOUNDARIES IN MILES FROM THE SITE									
DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	6.788E-08	7.894E-08	7.061E-08	5.655E-08	4.535E-08	2.602E-08	1.093E-08	5.346E-09	3.278E-09	2.261E-09
SSW	3.516E-08	5.069E-08	4.978E-08	4.162E-08	3.421E-08	2.027E-08	8.799E-09	4.379E-09	2.708E-09	1.878E-09
SW	2.678E-08	4.118E-08	4.178E-08	3.553E-08	2.953E-08	1.780E-08	7.886E-09	3.983E-09	2.485E-09	1.734E-09
WSW	2.521E-08	3.533E-08	3.540E-08	3.043E-08	2.558E-08	1.573E-08	7.138E-09	3.662E-09	2.303E-09	1.616E-09
W	3.053E-08	4.083E-08	4.056E-08	3.484E-08	2.935E-08	1.823E-08	8.443E-09	4.427E-09	2.829E-09	2.009E-09
WNW	3.656E-08	4.234E-08	4.013E-08	3.376E-08	2.808E-08	1.720E-08	7.922E-09	4.175E-09	2.681E-09	1.910E-09
NW	2.196E-08	3.685E-08	4.004E-08	3.516E-08	2.979E-08	1.858E-08	8.707E-09	4.633E-09	2.993E-09	2.143E-09
NNW	1.626E-08	2.607E-08	3.060E-08	2.823E-08	2.466E-08	1.606E-08	7.847E-09	4.262E-09	2.776E-09	1.995E-09
N	4.265E-08	6.981E-08	8.139E-08	7.484E-08	6.527E-08	4.241E-08	2.067E-08	1.121E-08	7.290E-09	5.232E-09
NNE	7.597E-08	1.000E-07	1.069E-07	9.532E-08	8.197E-08	5.256E-08	2.544E-08	1.380E-08	8.991E-09	6.464E-09
NE	5.360E-08	7.888E-08	8.570E-08	7.661E-08	6.590E-08	4.221E-08	2.041E-08	1.107E-08	7.216E-09	5.193E-09
ENE	3.049E-08	4.075E-08	4.477E-08	4.086E-08	3.576E-08	2.370E-08	1.199E-08	6.721E-09	4.470E-09	3.262E-09
E	2.944E-08	4.829E-08	6.007E-08	5.865E-08	5.360E-08	3.806E-08	2.085E-08	1.233E-08	8.455E-09	6.297E-09
ESE	4.406E-08	5.883E-08	6.745E-08	6.404E-08	5.787E-08	4.105E-08	2.301E-08	1.407E-08	9.911E-09	7.541E-09
SE	6.060E-08	5.694E-08	5.526E-08	4.882E-08	4.233E-08	2.828E-08	1.491E-08	8.828E-09	6.133E-09	4.633E-09
SSE	6.550E-08	6.388E-08	5.646E-08	4.614E-08	3.777E-08	2.270E-08	1.029E-08	5.407E-09	3.483E-09	2.493E-09

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT TB - MIXED MODE RELEASE - NO PURGE RELEASES
8.000 DAY DECAY, DEPLETED
0CHI/Q (SEC/METER CUBED) FOR EACH SEGMENT

	SEGMENT BOUNDARIES IN MILES FROM THE SITE									
DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	5.017E-08	5.964E-08	5.849E-08	4.942E-08	4.079E-08	2.412E-08	1.036E-08	5.101E-09	3.131E-09	2.160E-09
SSW	2.514E-08	3.730E-08	4.052E-08	3.590E-08	3.044E-08	1.863E-08	8.289E-09	4.161E-09	2.579E-09	1.791E-09
SW	1.925E-08	3.005E-08	3.363E-08	3.033E-08	2.602E-08	1.622E-08	7.377E-09	3.763E-09	2.355E-09	1.646E-09
WSW	1.874E-08	2.611E-08	2.857E-08	2.600E-08	2.253E-08	1.431E-08	6.647E-09	3.439E-09	2.169E-09	1.524E-09
W	2.347E-08	3.039E-08	3.260E-08	2.949E-08	2.554E-08	1.633E-08	7.728E-09	4.082E-09	2.614E-09	1.859E-09
WNW	2.961E-08	3.168E-08	3.136E-08	2.769E-08	2.373E-08	1.510E-08	7.194E-09	3.851E-09	2.489E-09	1.780E-09
NW	1.620E-08	2.470E-08	2.928E-08	2.756E-08	2.433E-08	1.597E-08	7.835E-09	4.259E-09	2.777E-09	1.998E-09
NNW	1.262E-08	1.635E-08	2.117E-08	2.127E-08	1.954E-08	1.355E-08	7.001E-09	3.908E-09	2.577E-09	1.866E-09
N	3.240E-08	4.345E-08	5.599E-08	5.614E-08	5.153E-08	3.573E-08	1.846E-08	1.031E-08	6.794E-09	4.917E-09
NNE	5.842E-08	6.600E-08	7.590E-08	7.265E-08	6.522E-08	4.427E-08	2.260E-08	1.260E-08	8.320E-09	6.032E-09
NE	3.920E-08	5.095E-08	6.057E-08	5.834E-08	5.246E-08	3.557E-08	1.811E-08	1.008E-08	6.656E-09	4.828E-09
ENE	2.303E-08	2.598E-08	3.078E-08	3.015E-08	2.756E-08	1.936E-08	1.035E-08	5.975E-09	4.030E-09	2.967E-09
E	2.182E-08	2.809E-08	3.797E-08	4.006E-08	3.843E-08	2.925E-08	1.713E-08	1.051E-08	7.337E-09	5.528E-09
ESE	3.392E-08	3.684E-08	4.447E-08	4.486E-08	4.212E-08	3.143E-08	1.837E-08	1.145E-08	8.138E-09	6.231E-09
SE	4.994E-08	4.125E-08	4.122E-08	3.807E-08	3.390E-08	2.327E-08	1.239E-08	7.309E-09	5.059E-09	3.816E-09
SSE	5.213E-08	4.895E-08	4.581E-08	3.918E-08	3.292E-08	2.033E-08	9.374E-09	4.928E-09	3.165E-09	2.260E-09

Note: Directions are True North.

Table 2.7-10 Long-Term χ/Q (sec/m^3) for Routine Releases Along Various Distance Segments, 8.000 Day Decay, Depleted (Sheet 2 of 2)

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 7/ 8/2013
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT ONE - GROUND LEVEL RELEASE - NO PURGE RELEASES
8.000 DAY DECAY, DEPLETED
0CHI/Q (SEC/METER CUBED) FOR EACH SEGMENT

	SEGMENT BOUNDARIES IN MILES FROM THE SITE									
DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	1.498E-06	4.898E-07	2.092E-07	1.203E-07	7.966E-08	3.592E-08	1.145E-08	4.714E-09	2.619E-09	1.675E-09
SSW	1.183E-06	3.900E-07	1.672E-07	9.641E-08	6.395E-08	2.890E-08	9.236E-09	3.800E-09	2.108E-09	1.346E-09
SW	1.056E-06	3.493E-07	1.504E-07	8.689E-08	5.775E-08	2.619E-08	8.417E-09	3.480E-09	1.936E-09	1.239E-09
WSW	9.814E-07	3.249E-07	1.402E-07	8.122E-08	5.407E-08	2.460E-08	7.952E-09	3.305E-09	1.845E-09	1.183E-09
W	1.191E-06	3.962E-07	1.729E-07	1.009E-07	6.756E-08	3.105E-08	1.022E-08	4.312E-09	2.431E-09	1.570E-09
WNW	1.033E-06	3.432E-07	1.494E-07	8.709E-08	5.829E-08	2.681E-08	8.850E-09	3.756E-09	2.126E-09	1.378E-09
NW	1.054E-06	3.554E-07	1.562E-07	9.153E-08	6.148E-08	2.841E-08	9.424E-09	4.004E-09	2.266E-09	1.468E-09
NNW	8.999E-07	3.069E-07	1.354E-07	7.958E-08	5.355E-08	2.481E-08	8.251E-09	3.505E-09	1.981E-09	1.282E-09
N	2.310E-06	7.888E-07	3.469E-07	2.034E-07	1.366E-07	6.310E-08	2.088E-08	8.836E-09	4.982E-09	3.217E-09
NNE	2.912E-06	9.935E-07	4.376E-07	2.567E-07	1.725E-07	7.981E-08	2.649E-08	1.124E-08	6.350E-09	4.107E-09
NE	2.377E-06	8.115E-07	3.585E-07	2.107E-07	1.418E-07	6.570E-08	2.186E-08	9.295E-09	5.259E-09	3.406E-09
ENE	1.444E-06	4.989E-07	2.240E-07	1.330E-07	9.016E-08	4.229E-08	1.434E-08	6.185E-09	3.529E-09	2.298E-09
E	2.702E-06	9.482E-07	4.362E-07	2.627E-07	1.799E-07	8.579E-08	2.982E-08	1.311E-08	7.563E-09	4.964E-09
ESE	3.914E-06	1.354E-06	6.382E-07	3.903E-07	2.703E-07	1.313E-07	4.695E-08	2.112E-08	1.235E-08	8.187E-09
SE	2.771E-06	9.390E-07	4.387E-07	2.671E-07	1.845E-07	8.932E-08	3.183E-08	1.430E-08	8.362E-09	5.544E-09
SSE	1.548E-06	5.117E-07	2.260E-07	1.329E-07	8.959E-08	4.169E-08	1.402E-08	6.035E-09	3.446E-09	2.248E-09

Note: Directions are True North. The results on this page are applicable to releases from the RW-VS.

Table 2.7-11 Long-Term D/Q (1/m^2) for Routine Releases at Distances Between 0.25 to 50 Miles (Sheet 1 of 4)

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT RB - MIXED MODE RELEASE - NO PURGE RELEASES
********** RELATIVE DEPOSITION PER UNIT AREA (M**-2) AT FIXED POINTS BY DOWNWIND SECTORS **********

DIRECTION FROM SITE	DISTANCES IN MILES 0.25	0.50	0.75	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50
S	3.039E-09	1.897E-09	1.544E-09	1.381E-09	9.561E-10	7.176E-10	5.564E-10	4.416E-10	3.568E-10	2.926E-10	2.429E-10
SSW	1.184E-09	8.178E-10	7.730E-10	7.624E-10	5.636E-10	4.356E-10	3.431E-10	2.746E-10	2.229E-10	1.832E-10	1.522E-10
SW	9.372E-10	6.500E-10	6.118E-10	6.036E-10	4.461E-10	3.453E-10	2.723E-10	2.182E-10	1.772E-10	1.457E-10	1.211E-10
WSW	9.115E-10	6.612E-10	5.927E-10	5.590E-10	3.989E-10	3.047E-10	2.386E-10	1.905E-10	1.545E-10	1.269E-10	1.055E-10
W	1.177E-09	8.409E-10	7.241E-10	6.617E-10	4.609E-10	3.485E-10	2.715E-10	2.161E-10	1.749E-10	1.436E-10	1.194E-10
WNW	1.599E-09	1.131E-09	8.545E-10	6.923E-10	4.326E-10	3.125E-10	2.376E-10	1.867E-10	1.501E-10	1.229E-10	1.022E-10
NW	8.198E-10	6.218E-10	5.076E-10	4.401E-10	2.918E-10	2.171E-10	1.677E-10	1.330E-10	1.075E-10	8.820E-11	7.334E-11
NNW	6.798E-10	5.102E-10	3.870E-10	3.116E-10	1.924E-10	1.386E-10	1.052E-10	8.265E-11	6.647E-11	5.445E-11	4.527E-11
N	1.856E-09	1.373E-09	1.030E-09	8.202E-10	5.015E-10	3.593E-10	2.720E-10	2.132E-10	1.713E-10	1.403E-10	1.166E-10
NNE	3.560E-09	2.438E-09	1.794E-09	1.422E-09	8.718E-10	6.231E-10	4.708E-10	3.686E-10	2.959E-10	2.420E-10	2.011E-10
NE	2.590E-09	1.685E-09	1.262E-09	1.031E-09	6.560E-10	4.753E-10	3.617E-10	2.843E-10	2.285E-10	1.870E-10	1.553E-10
ENE	1.563E-09	1.011E-09	7.263E-10	5.695E-10	3.472E-10	2.473E-10	1.865E-10	1.459E-10	1.170E-10	9.566E-11	7.944E-11
E	1.739E-09	1.149E-09	7.962E-10	5.938E-10	3.412E-10	2.359E-10	1.748E-10	1.354E-10	1.080E-10	8.816E-11	7.321E-11
ESE	2.690E-09	1.708E-09	1.179E-09	8.812E-10	5.117E-10	3.535E-10	2.616E-10	2.023E-10	1.612E-10	1.314E-10	1.090E-10
SE	4.132E-09	2.588E-09	1.758E-09	1.306E-09	7.562E-10	5.218E-10	3.859E-10	2.984E-10	2.378E-10	1.938E-10	1.608E-10
SSE	3.761E-09	2.348E-09	1.690E-09	1.343E-09	8.385E-10	5.999E-10	4.530E-10	3.544E-10	2.841E-10	2.322E-10	1.926E-10

0DIRECTION FROM SITE	DISTANCES IN MILES 5.00	7.50	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00
S	2.039E-10	1.064E-10	6.729E-11	3.511E-11	2.201E-11	1.548E-11	1.157E-11	9.015E-12	7.245E-12	5.959E-12	4.994E-12
SSW	1.278E-10	6.671E-11	4.218E-11	2.193E-11	1.370E-11	9.571E-12	7.116E-12	5.523E-12	4.426E-12	3.634E-12	3.043E-12
SW	1.016E-10	5.310E-11	3.361E-11	1.750E-11	1.094E-11	7.653E-12	5.695E-12	4.423E-12	3.545E-12	2.911E-12	2.438E-12
WSW	8.857E-11	4.636E-11	2.938E-11	1.535E-11	9.618E-12	6.771E-12	5.058E-12	3.937E-12	3.159E-12	2.594E-12	2.171E-12
W	1.003E-10	5.251E-11	3.329E-11	1.742E-11	1.094E-11	7.730E-12	5.793E-12	4.522E-12	3.637E-12	2.993E-12	2.509E-12
WNW	8.597E-11	4.526E-11	2.887E-11	1.531E-11	9.709E-12	7.023E-12	5.352E-12	4.228E-12	3.432E-12	2.843E-12	2.396E-12
NW	6.167E-11	3.245E-11	2.066E-11	1.090E-11	6.881E-12	4.927E-12	3.728E-12	2.930E-12	2.369E-12	1.957E-12	1.646E-12
NNW	3.812E-11	2.013E-11	1.286E-11	6.844E-12	4.350E-12	3.164E-12	2.421E-12	1.918E-12	1.560E-12	1.295E-12	1.093E-12
N	9.823E-11	5.187E-11	3.316E-11	1.766E-11	1.124E-11	8.190E-12	6.273E-12	4.977E-12	4.052E-12	3.365E-12	2.842E-12
NNE	1.692E-10	8.908E-11	5.684E-11	3.019E-11	1.918E-11	1.392E-11	1.064E-11	8.438E-12	6.872E-12	5.710E-12	4.829E-12
NE	1.305E-10	6.840E-11	4.348E-11	2.293E-11	1.450E-11	1.042E-11	7.920E-12	6.264E-12	5.102E-12	4.245E-12	3.601E-12
ENE	6.685E-11	3.515E-11	2.244E-11	1.192E-11	7.574E-12	5.497E-12	4.206E-12	3.338E-12	2.722E-12	2.266E-12	1.919E-12
E	6.169E-11	3.256E-11	2.086E-11	1.118E-11	7.159E-12	5.289E-12	4.105E-12	3.301E-12	2.724E-12	2.290E-12	1.961E-12
ESE	9.178E-11	4.820E-11	3.076E-11	1.639E-11	1.046E-11	7.674E-12	5.925E-12	4.742E-12	3.899E-12	3.268E-12	2.790E-12
SE	1.353E-10	7.108E-11	4.539E-11	2.423E-11	1.547E-11	1.132E-11	8.704E-12	6.921E-12	5.648E-12	4.696E-12	3.968E-12
SSE	1.619E-10	8.467E-11	5.379E-11	2.837E-11	1.795E-11	1.288E-11	9.768E-12	7.686E-12	6.221E-12	5.141E-12	4.321E-12

Note: Directions are True North.

Table 2.7-11 Long-Term D/Q (1/m^2) for Routine Releases at Distances Between 0.25 to 50 Miles (Sheet 2 of 4)

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT TB - MIXED MODE RELEASE - NO PURGE RELEASES

********** RELATIVE DEPOSITION PER UNIT AREA (M**-2) AT FIXED POINTS BY DOWNWIND SECTORS **********											
DIRECTION					DISTANCES IN MILES						
FROM SITE	0.25	0.50	0.75	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50
S	2.773E-09	1.735E-09	1.452E-09	1.325E-09	9.255E-10	7.018E-10	5.477E-10	4.364E-10	3.534E-10	2.901E-10	2.411E-10
SSW	1.144E-09	7.743E-10	7.406E-10	7.410E-10	5.524E-10	4.299E-10	3.400E-10	2.728E-10	2.218E-10	1.824E-10	1.516E-10
SW	9.066E-10	6.276E-10	5.977E-10	5.947E-10	4.413E-10	3.429E-10	2.710E-10	2.174E-10	1.767E-10	1.453E-10	1.208E-10
WSW	8.970E-10	6.425E-10	5.782E-10	5.494E-10	3.938E-10	3.022E-10	2.373E-10	1.897E-10	1.539E-10	1.265E-10	1.052E-10
W	1.159E-09	8.155E-10	7.041E-10	6.484E-10	4.539E-10	3.450E-10	2.696E-10	2.150E-10	1.742E-10	1.431E-10	1.190E-10
WNW	1.572E-09	1.114E-09	8.449E-10	6.864E-10	4.294E-10	3.108E-10	2.367E-10	1.861E-10	1.498E-10	1.227E-10	1.020E-10
NW	8.198E-10	6.218E-10	5.076E-10	4.401E-10	2.918E-10	2.171E-10	1.677E-10	1.330E-10	1.075E-10	8.820E-11	7.334E-11
NNW	6.798E-10	5.102E-10	3.870E-10	3.116E-10	1.924E-10	1.386E-10	1.052E-10	8.265E-11	6.647E-11	5.445E-11	4.527E-11
N	1.855E-09	1.372E-09	1.029E-09	8.195E-10	5.011E-10	3.591E-10	2.719E-10	2.132E-10	1.713E-10	1.403E-10	1.166E-10
NNE	3.456E-09	2.381E-09	1.765E-09	1.405E-09	8.619E-10	6.180E-10	4.679E-10	3.669E-10	2.947E-10	2.412E-10	2.005E-10
NE	2.440E-09	1.597E-09	1.214E-09	1.002E-09	6.398E-10	4.670E-10	3.571E-10	2.815E-10	2.267E-10	1.857E-10	1.543E-10
ENE	1.486E-09	9.816E-10	7.164E-10	5.649E-10	3.441E-10	2.457E-10	1.855E-10	1.453E-10	1.166E-10	9.536E-11	7.923E-11
E	1.675E-09	1.123E-09	7.869E-10	5.892E-10	3.383E-10	2.344E-10	1.739E-10	1.348E-10	1.077E-10	8.789E-11	7.301E-11
ESE	2.520E-09	1.613E-09	1.129E-09	8.516E-10	4.951E-10	3.449E-10	2.568E-10	1.994E-10	1.593E-10	1.301E-10	1.080E-10
SE	3.739E-09	2.416E-09	1.688E-09	1.269E-09	7.340E-10	5.100E-10	3.792E-10	2.942E-10	2.350E-10	1.918E-10	1.593E-10
SSE	3.371E-09	2.148E-09	1.593E-09	1.288E-09	8.067E-10	5.833E-10	4.437E-10	3.487E-10	2.804E-10	2.295E-10	1.906E-10
0DIRECTION					DISTANCES IN MILES						
FROM SITE	5.00	7.50	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00
S	2.024E-10	1.060E-10	6.722E-11	3.516E-11	2.204E-11	1.553E-11	1.161E-11	9.033E-12	7.244E-12	5.946E-12	4.971E-12
SSW	1.272E-10	6.655E-11	4.214E-11	2.195E-11	1.371E-11	9.580E-12	7.115E-12	5.513E-12	4.408E-12	3.611E-12	3.014E-12
SW	1.014E-10	5.304E-11	3.360E-11	1.751E-11	1.094E-11	7.656E-12	5.691E-12	4.413E-12	3.530E-12	2.892E-12	2.415E-12
WSW	8.834E-11	4.629E-11	2.936E-11	1.536E-11	9.625E-12	6.777E-12	5.061E-12	3.938E-12	3.158E-12	2.592E-12	2.167E-12
W	9.994E-11	5.240E-11	3.327E-11	1.743E-11	1.094E-11	7.735E-12	5.792E-12	4.515E-12	3.625E-12	2.978E-12	2.492E-12
WNW	8.581E-11	4.522E-11	2.886E-11	1.532E-11	9.710E-12	7.022E-12	5.343E-12	4.212E-12	3.409E-12	2.816E-12	2.365E-12
NW	6.167E-11	3.245E-11	2.066E-11	1.090E-11	6.879E-12	4.923E-12	3.719E-12	2.917E-12	2.353E-12	1.939E-12	1.626E-12
NNW	3.812E-11	2.013E-11	1.286E-11	6.844E-12	4.349E-12	3.160E-12	2.412E-12	1.906E-12	1.545E-12	1.278E-12	1.074E-12
N	9.821E-11	5.186E-11	3.316E-11	1.766E-11	1.123E-11	8.178E-12	6.251E-12	4.944E-12	4.010E-12	3.318E-12	2.789E-12
NNE	1.687E-10	8.896E-11	5.682E-11	3.021E-11	1.918E-11	1.391E-11	1.061E-11	8.378E-12	6.788E-12	5.611E-12	4.714E-12
NE	1.297E-10	6.819E-11	4.345E-11	2.296E-11	1.450E-11	1.041E-11	7.882E-12	6.191E-12	4.998E-12	4.121E-12	3.456E-12
ENE	6.668E-11	3.513E-11	2.244E-11	1.193E-11	7.570E-12	5.493E-12	4.189E-12	3.307E-12	2.679E-12	2.214E-12	1.860E-12
E	6.153E-11	3.253E-11	2.086E-11	1.119E-11	7.149E-12	5.267E-12	4.058E-12	3.226E-12	2.627E-12	2.178E-12	1.834E-12
ESE	9.096E-11	4.799E-11	3.073E-11	1.642E-11	1.047E-11	7.671E-12	5.889E-12	4.670E-12	3.795E-12	3.143E-12	2.644E-12
SE	1.342E-10	7.084E-11	4.538E-11	2.428E-11	1.549E-11	1.137E-11	8.738E-12	6.935E-12	5.639E-12	4.673E-12	3.932E-12
SSE	1.603E-10	8.429E-11	5.374E-11	2.844E-11	1.799E-11	1.295E-11	9.824E-12	7.727E-12	6.244E-12	5.151E-12	4.322E-12

Note: Directions are True North.

Table 2.7-11 Long-Term D/Q (1/m^2) for Routine Releases at Distances Between 0.25 to 50 Miles (Sheet 3 of 4)

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 7/ 8/2013
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT ONE - GROUND LEVEL RELEASE - NO PURGE RELEASES
********** RELATIVE DEPOSITION PER UNIT AREA (M**-2) AT FIXED POINTS BY DOWNWIND SECTORS **********

DIRECTION FROM SITE	DISTANCES IN MILES 0.25	0.50	0.75	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50
S	4.819E-08	1.630E-08	8.367E-09	5.138E-09	2.561E-09	1.553E-09	1.050E-09	7.611E-10	5.787E-10	4.559E-10	3.691E-10
SSW	3.194E-08	1.080E-08	5.546E-09	3.405E-09	1.698E-09	1.030E-09	6.961E-10	5.045E-10	3.836E-10	3.022E-10	2.446E-10
SW	2.633E-08	8.902E-09	4.571E-09	2.807E-09	1.399E-09	8.486E-10	5.738E-10	4.158E-10	3.161E-10	2.491E-10	2.016E-10
WSW	2.286E-08	7.732E-09	3.970E-09	2.438E-09	1.215E-09	7.371E-10	4.983E-10	3.611E-10	2.746E-10	2.163E-10	1.751E-10
W	2.691E-08	9.101E-09	4.673E-09	2.869E-09	1.430E-09	8.676E-10	5.866E-10	4.251E-10	3.232E-10	2.546E-10	2.061E-10
WNW	2.495E-08	8.438E-09	4.333E-09	2.660E-09	1.326E-09	8.044E-10	5.439E-10	3.941E-10	2.997E-10	2.361E-10	1.911E-10
NW	2.242E-08	7.583E-09	3.893E-09	2.391E-09	1.192E-09	7.229E-10	4.887E-10	3.542E-10	2.693E-10	2.122E-10	1.718E-10
NNW	1.628E-08	5.504E-09	2.826E-09	1.735E-09	8.652E-10	5.247E-10	3.548E-10	2.571E-10	1.955E-10	1.540E-10	1.247E-10
N	4.309E-08	1.457E-08	7.481E-09	4.594E-09	2.290E-09	1.389E-09	9.391E-10	6.805E-10	5.175E-10	4.077E-10	3.300E-10
NNE	6.257E-08	2.116E-08	1.086E-08	6.671E-09	3.326E-09	2.017E-09	1.364E-09	9.882E-10	7.514E-10	5.920E-10	4.793E-10
NE	5.046E-08	1.706E-08	8.761E-09	5.379E-09	2.682E-09	1.627E-09	1.100E-09	7.969E-10	6.059E-10	4.774E-10	3.865E-10
ENE	2.720E-08	9.199E-09	4.723E-09	2.900E-09	1.446E-09	8.769E-10	5.929E-10	4.296E-10	3.267E-10	2.574E-10	2.084E-10
E	3.824E-08	1.293E-08	6.640E-09	4.077E-09	2.033E-09	1.233E-09	8.335E-10	6.040E-10	4.593E-10	3.618E-10	2.929E-10
ESE	5.097E-08	1.724E-08	8.849E-09	5.434E-09	2.709E-09	1.643E-09	1.111E-09	8.050E-10	6.121E-10	4.822E-10	3.904E-10
SE	4.574E-08	1.547E-08	7.942E-09	4.877E-09	2.431E-09	1.475E-09	9.970E-10	7.225E-10	5.493E-10	4.328E-10	3.504E-10
SSE	4.085E-08	1.381E-08	7.092E-09	4.355E-09	2.171E-09	1.317E-09	8.902E-10	6.451E-10	4.905E-10	3.865E-10	3.129E-10

0DIRECTION FROM SITE	DISTANCES IN MILES 5.00	7.50	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00
S	3.053E-10	1.496E-10	9.388E-11	4.745E-11	2.872E-11	1.926E-11	1.380E-11	1.036E-11	8.056E-12	6.435E-12	5.252E-12
SSW	2.024E-10	9.917E-11	6.222E-11	3.145E-11	1.904E-11	1.276E-11	9.145E-12	6.867E-12	5.339E-12	4.265E-12	3.481E-12
SW	1.668E-10	8.174E-11	5.129E-11	2.592E-11	1.569E-11	1.052E-11	7.538E-12	5.660E-12	4.401E-12	3.515E-12	2.869E-12
WSW	1.449E-10	7.099E-11	4.454E-11	2.251E-11	1.363E-11	9.136E-12	6.547E-12	4.916E-12	3.822E-12	3.053E-12	2.492E-12
W	1.705E-10	8.356E-11	5.243E-11	2.650E-11	1.604E-11	1.075E-11	7.706E-12	5.786E-12	4.499E-12	3.594E-12	2.933E-12
WNW	1.581E-10	7.748E-11	4.861E-11	2.457E-11	1.487E-11	9.971E-12	7.145E-12	5.365E-12	4.171E-12	3.332E-12	2.720E-12
NW	1.421E-10	6.962E-11	4.369E-11	2.208E-11	1.336E-11	8.961E-12	6.421E-12	4.821E-12	3.749E-12	2.994E-12	2.444E-12
NNW	1.031E-10	5.054E-11	3.171E-11	1.603E-11	9.701E-12	6.504E-12	4.661E-12	3.500E-12	2.721E-12	2.174E-12	1.774E-12
N	2.730E-10	1.338E-10	8.394E-11	4.243E-11	2.568E-11	1.722E-11	1.234E-11	9.264E-12	7.203E-12	5.754E-12	4.697E-12
NNE	3.964E-10	1.943E-10	1.219E-10	6.161E-11	3.729E-11	2.500E-11	1.792E-11	1.345E-11	1.046E-11	8.355E-12	6.820E-12
NE	3.197E-10	1.567E-10	9.830E-11	4.968E-11	3.007E-11	2.016E-11	1.445E-11	1.085E-11	8.435E-12	6.738E-12	5.500E-12
ENE	1.724E-10	8.446E-11	5.300E-11	2.679E-11	1.621E-11	1.087E-11	7.789E-12	5.849E-12	4.548E-12	3.633E-12	2.965E-12
E	2.423E-10	1.187E-10	7.451E-11	3.766E-11	2.279E-11	1.528E-11	1.095E-11	8.223E-12	6.393E-12	5.107E-12	4.168E-12
ESE	3.229E-10	1.583E-10	9.929E-11	5.019E-11	3.038E-11	2.037E-11	1.459E-11	1.096E-11	8.520E-12	6.806E-12	5.555E-12
SE	2.898E-10	1.420E-10	8.912E-11	4.504E-11	2.726E-11	1.828E-11	1.310E-11	9.835E-12	7.647E-12	6.108E-12	4.986E-12
SSE	2.588E-10	1.268E-10	7.957E-11	4.022E-11	2.434E-11	1.632E-11	1.170E-11	8.782E-12	6.828E-12	5.454E-12	4.452E-12

Note: Directions are True North. The results on this page are applicable to releases from the RW-VS.

Table 2.7-12 Long-Term D/Q (1/m^2) for Routine Releases Along Various Distance Segments (Sheet 1 of 4)

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT RB - MIXED MODE RELEASE - NO PURGE RELEASES
0********** RELATIVE DEPOSITION PER UNIT AREA (M**-2) BY DOWNWIND SECTORS **********
SEGMENT BOUNDARIES IN MILES

DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	1.550E-09	9.444E-10	5.535E-10	3.566E-10	2.432E-10	1.107E-10	3.644E-11	1.566E-11	9.071E-12	5.982E-12
SSW	7.782E-10	5.509E-10	3.404E-10	2.226E-10	1.524E-10	6.937E-11	2.277E-11	9.689E-12	5.560E-12	3.650E-12
SW	6.166E-10	4.363E-10	2.701E-10	1.769E-10	1.211E-10	5.522E-11	1.816E-11	7.746E-12	4.452E-12	2.924E-12
WSW	5.929E-10	3.926E-10	2.370E-10	1.543E-10	1.056E-10	4.819E-11	1.592E-11	6.845E-12	3.961E-12	2.605E-12
W	7.223E-10	4.556E-10	2.699E-10	1.748E-10	1.195E-10	5.458E-11	1.807E-11	7.810E-12	4.548E-12	3.005E-12
WNW	8.439E-10	4.369E-10	2.372E-10	1.502E-10	1.023E-10	4.702E-11	1.583E-11	7.071E-12	4.246E-12	2.852E-12
NW	5.030E-10	2.915E-10	1.670E-10	1.074E-10	7.342E-11	3.370E-11	1.128E-11	4.968E-12	2.944E-12	1.964E-12
NNW	3.808E-10	1.950E-10	1.051E-10	6.651E-11	4.534E-11	2.090E-11	7.073E-12	3.183E-12	1.925E-12	1.299E-12
N	1.013E-09	5.091E-10	2.718E-10	1.715E-10	1.168E-10	5.386E-11	1.825E-11	8.236E-12	4.995E-12	3.375E-12
NNE	1.772E-09	8.836E-10	4.705E-10	2.961E-10	2.014E-10	9.256E-11	3.122E-11	1.401E-11	8.472E-12	5.728E-12
NE	1.254E-09	6.591E-10	3.610E-10	2.286E-10	1.555E-10	7.114E-11	2.375E-11	1.051E-11	6.294E-12	4.260E-12
ENE	7.199E-10	3.522E-10	1.865E-10	1.171E-10	7.958E-11	3.654E-11	1.233E-11	5.535E-12	3.351E-12	2.273E-12
E	7.846E-10	3.505E-10	1.754E-10	1.083E-10	7.337E-11	3.383E-11	1.154E-11	5.314E-12	3.311E-12	2.297E-12
ESE	1.164E-09	5.235E-10	2.624E-10	1.616E-10	1.093E-10	5.014E-11	1.695E-11	7.718E-12	4.759E-12	3.278E-12
SE	1.741E-09	7.741E-10	3.872E-10	2.383E-10	1.611E-10	7.394E-11	2.504E-11	1.138E-11	6.945E-12	4.708E-12
SSE	1.682E-09	8.446E-10	4.527E-10	2.844E-10	1.930E-10	8.811E-11	2.939E-11	1.299E-11	7.722E-12	5.157E-12

0VENT AND BUILDING PARAMETERS:

RELEASE HEIGHT	(METERS)	52.77	REP. WIND HEIGHT	(METERS)	10.0
DIAMETER	(METERS)	2.40	BUILDING HEIGHT	(METERS)	46.1
EXIT VELOCITY	(METERS)	17.78	BLDG.MIN.CRS.SEC.AREA	(SQ.METERS)	3098.0
			HEAT EMISSION RATE	(CAL/SEC)	0.0

0AT THE RELEASE HEIGHT:

VENT RELEASE MODE	WIND SPEED (METERS/SEC)	
ELEVATED	LESS THAN	3.556
MIXED	BETWEEN	3.556 AND 17.780
GROUND LEVEL	ABOVE	17.780

AT THE MEASURED WIND HEIGHT (10.0 METERS):

VENT RELEASE MODE	WIND SPEED (METERS/SEC) STABLE CONDITIONS		WIND SPEED (METERS/SEC) UNSTABLE/NEUTRAL CONDITIONS	
ELEVATED	LESS THAN	3.556	LESS THAN	3.556
MIXED	BETWEEN	3.556 AND 17.780	BETWEEN	3.556 AND 17.780
GROUND LEVEL	ABOVE	17.780	ABOVE	17.780

Note: Directions are True North.

Table 2.7-12 Long-Term D/Q (1/m^2) for Routine Releases Along Various Distance Segments (Sheet 2 of 4)

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1USNRC COMPUTER CODE - XOQDOQ,  VERSION 2.0          RUN DATE:  8/28/2014
0XOQDOQ - North Anna COL (1996-98 Met Data)
 EXIT TB - MIXED MODE RELEASE - NO PURGE RELEASES
0**********************     RELATIVE DEPOSITION PER UNIT AREA (M**-2) BY DOWNWIND SECTORS     **********************
                                    SEGMENT BOUNDARIES IN MILES
 DIRECTION    .5-1        1-2         2-3         3-4         4-5         5-10        10-20       20-30       30-40       40-50
 FROM SITE
    S      1.458E-09   9.148E-10   5.442E-10   3.530E-10   2.413E-10   1.102E-10   3.646E-11   1.570E-11   9.087E-12   5.969E-12
   SSW     7.483E-10   5.399E-10   3.371E-10   2.214E-10   1.517E-10   6.919E-11   2.278E-11   9.696E-12   5.550E-12   3.626E-12
    SW     6.030E-10   4.316E-10   2.687E-10   1.763E-10   1.209E-10   5.514E-11   1.817E-11   7.747E-12   4.442E-12   2.904E-12
   WSW     5.796E-10   3.876E-10   2.355E-10   1.537E-10   1.053E-10   4.811E-11   1.592E-11   6.850E-12   3.961E-12   2.602E-12
    W      7.041E-10   4.487E-10   2.679E-10   1.740E-10   1.191E-10   5.447E-11   1.807E-11   7.814E-12   4.541E-12   2.990E-12
   WNW     8.343E-10   4.338E-10   2.362E-10   1.498E-10   1.021E-10   4.697E-11   1.583E-11   7.067E-12   4.229E-12   2.825E-12
    NW     5.030E-10   2.915E-10   1.670E-10   1.074E-10   7.342E-11   3.370E-11   1.128E-11   4.963E-12   2.931E-12   1.945E-12
   NNW     3.808E-10   1.950E-10   1.051E-10   6.651E-11   4.534E-11   2.090E-11   7.072E-12   3.178E-12   1.913E-12   1.282E-12
    N      1.012E-09   5.088E-10   2.717E-10   1.715E-10   1.168E-10   5.385E-11   1.825E-11   8.222E-12   4.962E-12   3.327E-12
   NNE     1.742E-09   8.741E-10   4.675E-10   2.950E-10   2.008E-10   9.241E-11   3.122E-11   1.400E-11   8.410E-12   5.627E-12
   NE      1.205E-09   6.435E-10   3.562E-10   2.267E-10   1.545E-10   7.087E-11   2.375E-11   1.049E-11   6.219E-12   4.134E-12
   ENE     7.080E-10   3.494E-10   1.855E-10   1.167E-10   7.936E-11   3.650E-11   1.233E-11   5.525E-12   3.320E-12   2.221E-12
    E      7.737E-10   3.479E-10   1.744E-10   1.079E-10   7.317E-11   3.379E-11   1.154E-11   5.285E-12   3.236E-12   2.184E-12
   ESE     1.113E-09   5.075E-10   2.573E-10   1.596E-10   1.082E-10   4.987E-11   1.696E-11   7.704E-12   4.685E-12   3.152E-12
   SE      1.664E-09   7.533E-10   3.801E-10   2.355E-10   1.596E-10   7.360E-11   2.506E-11   1.142E-11   6.957E-12   4.685E-12
   SSE     1.581E-09   8.143E-10   4.429E-10   2.805E-10   1.909E-10   8.761E-11   2.942E-11   1.304E-11   7.761E-12   5.168E-12
0VENT AND BUILDING PARAMETERS:
     RELEASE HEIGHT   (METERS)    71.30                  REF. WIND HEIGHT        (METERS)        10.0
     DIAMETER         (METERS)     1.95                  BUILDING HEIGHT         (METERS)        46.1
     EXIT VELOCITY    (METERS)    17.78                  BLDG.MIN.CRS.SEC.AREA   (SQ.METERS)   3098.0
                                                         HEAT EMISSION RATE      (CAL/SEC)        0.0
0AT THE RELEASE HEIGHT:                          /  AT THE MEASURED WIND HEIGHT ( 10.0 METERS):
 VENT RELEASE MODE   WIND SPEED (METERS/SEC)     /  VENT RELEASE MODE   WIND SPEED (METERS/SEC)       WIND SPEED (METERS/SEC)
                                                 /                      STABLE CONDITIONS             UNSTABLE/NEUTRAL CONDITIONS
     ELEVATED        LESS THAN  3.556            /      ELEVATED        LESS THAN  3.556              LESS THAN  3.556
     MIXED           BETWEEN    3.556 AND 17.780 /      MIXED           BETWEEN    3.556 AND 17.780   BETWEEN    3.556 AND 17.780
     GROUND LEVEL    ABOVE     17.780            /      GROUND LEVEL    ABOVE     17.780              ABOVE     17.780
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Note: Directions are True North.

Table 2.7-12 Long-Term D/Q (1/m^2) for Routine Releases Along Various Distance Segments (Sheet 3 of 4)

1USNRC COMPUTER CODE - XOQDOQ, VERSION 2.0 RUN DATE: 7/ 8/2013
0XOQDOQ - North Anna COL (1996-98 Met Data)
EXIT ONE - GROUND LEVEL RELEASE - NO PURGE RELEASES
0********** RELATIVE DEPOSITION PER UNIT AREA (M**-2) BY DOWNWIND SECTORS **********

	SEGMENT BOUNDARIES IN MILES									
DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	8.694E-09	2.686E-09	1.069E-09	5.841E-10	3.712E-10	1.594E-10	4.944E-11	1.960E-11	1.046E-11	6.477E-12
SSW	5.762E-09	1.780E-09	7.084E-10	3.871E-10	2.460E-10	1.057E-10	3.277E-11	1.299E-11	6.936E-12	4.293E-12
SW	4.749E-09	1.467E-09	5.839E-10	3.191E-10	2.028E-10	8.710E-11	2.701E-11	1.071E-11	5.717E-12	3.538E-12
WSW	4.125E-09	1.274E-09	5.071E-10	2.771E-10	1.761E-10	7.565E-11	2.346E-11	9.298E-12	4.965E-12	3.073E-12
W	4.855E-09	1.500E-09	5.969E-10	3.262E-10	2.073E-10	8.905E-11	2.761E-11	1.094E-11	5.844E-12	3.617E-12
WNW	4.502E-09	1.391E-09	5.534E-10	3.024E-10	1.922E-10	8.256E-11	2.560E-11	1.015E-11	5.419E-12	3.354E-12
NW	4.045E-09	1.250E-09	4.973E-10	2.718E-10	1.727E-10	7.420E-11	2.301E-11	9.119E-12	4.870E-12	3.014E-12
NNW	2.937E-09	9.072E-10	3.610E-10	1.973E-10	1.254E-10	5.386E-11	1.670E-11	6.619E-12	3.535E-12	2.188E-12
N	7.773E-09	2.402E-09	9.557E-10	5.222E-10	3.319E-10	1.426E-10	4.421E-11	1.752E-11	9.357E-12	5.792E-12
NNE	1.129E-08	3.487E-09	1.388E-09	7.583E-10	4.820E-10	2.070E-10	6.420E-11	2.544E-11	1.359E-11	8.410E-12
NE	9.103E-09	2.812E-09	1.119E-09	6.115E-10	3.887E-10	1.669E-10	5.177E-11	2.052E-11	1.096E-11	6.782E-12
ENE	4.908E-09	1.516E-09	6.033E-10	3.297E-10	2.095E-10	9.001E-11	2.791E-11	1.106E-11	5.907E-12	3.656E-12
E	6.899E-09	2.132E-09	8.482E-10	4.635E-10	2.946E-10	1.265E-10	3.924E-11	1.555E-11	8.305E-12	5.140E-12
ESE	9.195E-09	2.841E-09	1.130E-09	6.177E-10	3.926E-10	1.686E-10	5.230E-11	2.073E-11	1.107E-11	6.851E-12
SE	8.252E-09	2.550E-09	1.015E-09	5.544E-10	3.524E-10	1.514E-10	4.693E-11	1.860E-11	9.934E-12	6.149E-12
SSE	7.369E-09	2.277E-09	9.059E-10	4.950E-10	3.146E-10	1.351E-10	4.191E-11	1.661E-11	8.870E-12	5.490E-12

0VENT AND BUILDING PARAMETERS:

RELEASE HEIGHT	(METERS)	0.00	REP. WIND HEIGHT	(METERS)	10.0
DIAMETER	(METERS)	0.00	BUILDING HEIGHT	(METERS)	46.1
EXIT VELOCITY	(METERS)	0.00	BLDG.MIN.CRS.SEC.AREA	(SQ.METERS)	3098.0
			HEAT EMISSION RATE	(CAL/SEC)	0.0
			HEAT EMISSION RATE	(CAL/SEC)	0.0

0ALL GROUND LEVEL RELEASES.

Note: Directions are True North. The results on this page are applicable to releases from the RW-VS.

Table 3.0-1 Evaluation of ESP Site Characteristics

ESP Site Characteristics (From FEIS Table I-1)			Unit 3 Site Characteristic Value	
Item	**ESP Value**	**Description and References**		**Evaluation**
Gaseous Effluents Dispersion, Deposition (Annual Average)				
Atmospheric Dispersion (χ/Q)	χ/Q values presented in ESP-ER Table 2.7-14	The atmospheric dispersion coefficients used to estimate dose consequences of normal airborne releases.		
Residence	2.4×10^{-6} sec/m^3	No decay, undepleted	RB-VS: 6.8×10^{-8} sec/m^3 TB-VS: 5.5×10^{-8} sec/m^3 RW-VS: ~~8.3×10^{-7} sec/m^3~~ 4.2×10^{-6} sec/m^3	The Unit 3 site characteristic values for the no decay, undepleted long-term (annual average) atmospheric dispersion factor, χ/Q, for the nearest residence are provided in Table 2.7-2. The Unit 3 site characteristic ~~values fall within (are less than)~~ value for the Radwaste Building vent stack release does not fall within (is not equal to or less than) the ESP value identified in FEIS Table I-1 and the ESP, Appendix A. See Section 5.4 for the analysis of radiological consequences of routine airborne releases.
	2.4×10^{-6} sec/m^3	2.26-day decay, undepleted	RB-VS: 6.8×10^{-8} sec/m^3 TB-VS: 5.5×10^{-8} sec/m^3 RW-VS: ~~8.3×10^{-7} sec/m^3~~ 4.2×10^{-6} sec/m^3	The Unit 3 site characteristic values for the 2.26-day decay, undepleted long-term (annual average) atmospheric dispersion factor, χ/Q, for the nearest residence are provided in Table 2.7-2. The Unit 3 site characteristic ~~values fall within (are less than)~~ value for the Radwaste Building vent stack release does not fall within (is not equal to or less than) the ESP value identified in FEIS Table I-1 and the ESP, Appendix A. See Section 5.4 for the analysis of radiological consequences of routine airborne releases.
	2.1×10^{-6} sec/m^3	8-day decay, depleted	RB-VS: 6.6×10^{-8} sec/m^3 TB-VS: 5.3×10^{-8} sec/m^3 RW-VS: ~~8.2×10^{-7} sec/m^3~~ 3.8×10^{-6} sec/m^3	The Unit 3 site characteristic values for the 8-day decay, depleted long-term (annual average) atmospheric dispersion factor, χ/Q, for the nearest residence are provided in Table 2.7-2. The Unit 3 site characteristic ~~values fall within (are less than)~~ value for the Radwaste Building vent stack release does not fall within (is not equal to or less than) the ESP value identified in FEIS Table I-1 and the ESP, Appendix A. See Section 5.4 for the analysis of radiological consequences of routine airborne releases.

Table 3.0-1 Evaluation of ESP Site Characteristics

ESP Site Characteristics (From FEIS Table I-1)			Unit 3 Site Characteristic Value	
Item	**ESP Value**	**Description and References**		**Evaluation**
Gaseous Effluents Dispersion, Deposition (Annual Average) (continued)				
EAB	3.7×10^{-6} sec/m^3	No decay, undepleted	RB-VS: 7.1×10^{-8} sec/m^3 TB-VS: 5.2×10^{-8} sec/m^3 RW-VS: ~~8.1×10^{-7} sec/m^3~~ 3.3×10^{-6} sec/m^3	The Unit 3 site characteristic values for the no decay, undepleted long term (annual average) atmospheric dispersion factors, χ/Qs, for the EAB are taken from Table 2.7-4. The Unit 3 site characteristic values fall within (are less than) the ESP value identified in FEIS Table I-1 and the ESP, Appendix A. See Section 5.4 for the analysis of radiological consequences of routine airborne releases.
	3.7×10^{-6} sec/m^3	2.26-day decay, undepleted	RB-VS: 7.1×10^{-8} sec/m^3 TB-VS: 5.2×10^{-8} sec/m^3 RW-VS: ~~8.1×10^{-7} sec/m^3~~ 3.3×10^{-6} sec/m^3	The Unit 3 site characteristic values for the 2.26-day decay, undepleted long term (annual average) atmospheric dispersion factors, χ/Qs, for the EAB are taken from Table 2.7-4. The Unit 3 site characteristic values fall within (are less than) the ESP value identified in FEIS Table I-1 and the ESP, Appendix A. See Section 5.4 for the analysis of radiological consequences of routine airborne releases.
	3.3×10^{-6} sec/m^3	8-day decay, depleted	RB-VS: 6.9×10^{-8} sec/m^3 TB-VS: 5.0×10^{-8} sec/m^3 RW-VS: ~~8.0×10^{-7} sec/m^3~~ 2.9×10^{-6} sec/m^3	The Unit 3 site characteristic values for the 8-day decay, depleted long term (annual average) atmospheric dispersion factors, χ/Qs, for the EAB are taken from Table 2.7-4. The Unit 3 site characteristic values fall within (are less than) the ESP value identified in FEIS Table I-1 and the ESP, Appendix A. See Section 5.4 for the analysis of radiological consequences of routine airborne releases.

Table 3.0-1 Evaluation of ESP Site Characteristics

ESP Site Characteristics (From FEIS Table I-1)			Unit 3 Site Characteristic	
Item	**ESP Value**	**Description and References**	**Value**	**Evaluation**
Gaseous Effluents Dispersion, Deposition (Annual Average) (continued)				
Meat animal	1.4×10^{-6} sec/m^3	No decay, undepleted	RB-VS: 6.8×10^{-8} sec/m^3 TB-VS: 5.5×10^{-8} sec/m^3 RW-VS: ~~8.3×10^{-7} sec/m^3~~ 4.2×10^{-6} sec/m^3	The Unit 3 site characteristic values for the no decay, undepleted long-term (annual average) atmospheric dispersion factors, χ/Qs, for the nearest meat animal are provided in Table 2.7-2. The Unit 3 site characteristic ~~values fall within (are less than)~~ value for the Radwaste Building vent stack release does not fall within (is not equal to or less than) the ESP value identified in FEIS Table I-1 and the ESP, Appendix A. See Section 5.4 for the analysis of radiological consequences of routine airborne releases.
	1.4×10^{-6} sec/m^3	2.26-day decay, undepleted	RB-VS: 6.8×10^{-8} sec/m^3 TB-VS: 5.5×10^{-8} sec/m^3 RW-VS: ~~8.3×10^{-7} sec/m^3~~ 4.2×10^{-6} sec/m^3	The Unit 3 site characteristic values for the 2.26-day decay, undepleted long-term (annual average) atmospheric dispersion factors, χ/Qs, for the nearest meat animal are provided in Table 2.7-2. The Unit 3 site characteristic ~~values fall within (are less than)~~ value for the Radwaste Building vent stack release does not fall within (is not equal to or less than) the ESP value identified in FEIS Table I-1 and the ESP, Appendix A. See Section 5.4 for the analysis of radiological consequences of routine airborne releases.
	1.2×10^{-6} sec/m^3	8-day decay, depleted	RB-VS: 6.6×10^{-8} sec/m^3 TB-VS: 5.3×10^{-8} sec/m^3 RW-VS: ~~8.2×10^{-7} sec/m^3~~ 3.8×10^{-6} sec/m^3	The Unit 3 site characteristic values for the 8-day decay, depleted long-term (annual average) atmospheric dispersion factors, χ/Qs, for the nearest meat animal are provided in Table 2.7-2. The Unit 3 site characteristic ~~values fall within (are less than)~~ value for the Radwaste Building vent stack release does not fall within (is not equal to or less than) the ESP value identified in FEIS Table I-1 and the ESP, Appendix A. See Section 5.4 for the analysis of radiological consequences of routine airborne releases.

Table 3.0-1 Evaluation of ESP Site Characteristics

Item	ESP Site Characteristics (From FEIS Table I-1) ESP Value	Description and References	Unit 3 Site Characteristic Value	Evaluation
Gaseous Effluents Dispersion, Deposition (Annual Average) (continued)				
Vegetable garden	2.0×10^{-6} sec/m^3	No decay, undepleted	RB-VS: 6.8×10^{-8} sec/m^3 TB-VS: 5.5×10^{-8} sec/m^3 RW-VS: ~~8.3×10^{-7} sec/m^3~~ 4.2×10^{-6} sec/m^3	The Unit 3 site characteristic values for the no decay, undepleted long-term (annual average) atmospheric dispersion factors, χ/Qs, for the nearest vegetable garden are provided in Table 2.7-2. The Unit 3 site characteristic ~~values fall within (are less than)~~ value for the Radwaste Building vent stack release does not fall within (is not equal to or less than) the ESP value identified in FEIS Table I-1 and the ESP, Appendix A. See Section 5.4 for the analysis of radiological consequences of routine airborne releases.
	2.0×10^{-6} sec/m^3	2.26-day decay, undepleted	RB-VS: 6.8×10^{-8} sec/m^3 TB-VS: 5.5×10^{-8} sec/m^3 RW-VS: ~~8.3×10^{-7} sec/m^3~~ 4.2×10^{-6} sec/m^3	The Unit 3 site characteristic values for the 2.26-day decay, undepleted long-term (annual average) atmospheric dispersion factors, χ/Qs, for the nearest vegetable garden are provided in Table 2.7-2. The Unit 3 site characteristic ~~values fall within (are less than)~~ value for the Radwaste Building vent stack release does not fall within (is not equal to or less than) the ESP value identified in FEIS Table I-1 and the ESP, Appendix A. See Section 5.4 for the analysis of radiological consequences of routine airborne releases.
	1.8×10^{-6} sec/m^3	8-day decay, depleted	RB-VS: 6.6×10^{-8} sec/m^3 TB-VS: 5.3×10^{-8} sec/m^3 RW-VS: ~~8.2×10^{-7} sec/m^3~~ 3.8×10^{-6} sec/m^3	The Unit 3 site characteristic values for the 8-day decay, depleted long-term (annual average) atmospheric dispersion factors, χ/Qs, for the nearest vegetable garden are provided in Table 2.7-2. The Unit 3 site characteristic ~~values fall within (are less than)~~ value for the Radwaste Building vent stack release does not fall within (is not equal to or less than) the ESP value identified in FEIS Table I-1 and the ESP, Appendix A. See Section 5.4 for the analysis of radiological consequences of routine airborne releases.

Table 3.0-1 Evaluation of ESP Site Characteristics

ESP Site Characteristics (From FEIS Table I-1)			Unit 3 Site Characteristic Value	Evaluation
Item	**ESP Value**	**Description and References**		
Gaseous Effluents Dispersion, Deposition (Annual Average) (continued)				
Ground Deposition (D/Q)	D/Q values presented in ESP-ER Table 2.7-14 and the ESP, Appendix A	The ground deposition coefficients used to estimate dose consequences of normal airborne releases		
Residence	7.2×10^{-9} /m^2		RB-VS: 1.8×10^{-9} ~~sec/m^3~~ 1/m^2 TB-VS: 1.8×10^{-9} ~~sec/m^3~~ 1/m^2 RW-VS: ~~4.4×10^{-9} sec/m^3~~ 1.1×10^{-8} 1/m^2	The Unit 3 site characteristic values for the long-term (annual average) ground deposition factors, D/Qs, for the nearest residence are provided in Table 2.7-2. The Unit 3 site characteristic ~~values fall within (are less than)~~ value for the Radwaste Building vent stack release does not fall within (is not equal to or less than) the ESP value identified in FEIS Table I-1 and the ESP, Appendix A. See Section 5.4 for the analysis of radiological consequences of routine airborne releases.
EAB	1.2×10^{-8} /m^2		RB-VS: 1.7×10^{-9} ~~sec/m^3~~ 1/m^2 TB-VS: 1.6×10^{-9} ~~sec/m^3~~ 1/m^2 RW-VS: ~~5.5×10^{-9} sec/m^3~~ 1.1×10^{-8} 1/m^2	The Unit 3 site characteristic values for the long-term (annual average) ground deposition factors, D/Qs, for the EAB are taken from Table 2.7-4. The Unit 3 site characteristic values fall within (are less than) the ESP value identified in FEIS Table I-1 and the ESP, Appendix A. See Section 5.4 for the analysis of radiological consequences of routine airborne releases.

Table 3.0-1 Evaluation of ESP Site Characteristics

ESP Site Characteristics (From FEIS Table I-1)			Unit 3 Site Characteristic Value	Evaluation
Item	**ESP Value**	**Description and References**		
Gaseous Effluents Dispersion, Deposition (Annual Average) (continued)				
Meat animal	3.1×10^{-9} /m^2		RB-VS: 1.8×10^{-9} ~~sec/m^3~~ 1/m^2 TB-VS: 1.8×10^{-9} ~~sec/m^3~~ 1/m^2 RW-VS: ~~4.4×10^{-9} sec/m^3~~ 1.1×10^{-8} 1/m^2	The Unit 3 site characteristic values for the long-term (annual average) ground deposition factors, D/Qs, for the nearest meat animal are provided in Table 2.7-2. The Unit 3 site characteristic value for the Radwaste Building vent stack release does not fall within (is not equal to or less than) the ESP value identified in FEIS Table I-1 and the ESP, Appendix A. See Section 5.4 for the analysis of radiological consequences of routine airborne releases. See also FSAR Section 1.8 and FSAR Table 12.2-201 for NAPS ESP VAR 2.0-1.
Vegetable garden	6.0×10^{-9} /m^2		RB-VS: 1.8×10^{-9} ~~sec/m^3~~ 1/m^2 TB-VS: 1.8×10^{-9} ~~sec/m^3~~ 1/m^2 RW-VS: ~~4.4×10^{-9} sec/m^3~~ 1.1×10^{-8} 1/m^2	The Unit 3 site characteristic values for the long-term (annual average) ground deposition factors, D/Qs, for the nearest vegetable garden are provided in Table 2.7-2. The Unit 3 site characteristic ~~values fall within (are less than)~~ value for the Radwaste Building vent stack release does not fall within (is not equal to or less than) the ESP value identified in FEIS Table I-1 and the ESP, Appendix A. See Section 5.4 for the analysis of radiological consequences of routine airborne releases.

Table 3.0-1 Evaluation of ESP Site Characteristics

ESP Site Characteristics (From FEIS Table I-1)			Unit 3 Site Characteristic Value	
Item	**ESP Value**	**Description and References**		**Evaluation**
Dose Consequences (continued)				
Gaseous effluent	4.8 mrem/yr	Total body (Value for two units, see ESP-ER Table 5.4-11)	~~0.27~~ 0.48mrem/yr	The Unit 3 site characteristic value is the highest total body dose to the MEI from Unit 3 gaseous effluents as shown in Tables 5.4-4 and 5.4-6. The Unit 3 site characteristic value falls within (is less than) the ESP value identified in FEIS Table I-1 for two units. See also FSAR Tables 12.2-18bR and 12.2-203.
	25 mrem/yr	Thyroid (Value for two units, see ESP-ER Table 5.4-11)	~~4.0~~ 4.7 mrem/yr	The Unit 3 site characteristic value is the highest thyroid dose to the MEI from Unit 3 gaseous effluents as shown in Tables 5.4-4 and 5.4-6. The Unit 3 site characteristic value falls within (is less than) the ESP value identified in FEIS Table I-1 for two units and is well below the 40 CFR 190 limit. See also FSAR Tables 12.2-18bR and 12.2-203.
	6.5 mrem/yr	Other organ (Value for two units, see ESP-ER Table 5.4-11)	~~0.32~~ 0.57mrem/yr	The Unit 3 site characteristic value is the highest other organ (liver) dose to the MEI from Unit 3 gaseous effluents ~~as shown in Table 5.4-6~~. The Unit 3 site characteristic value falls within (is less than) the ESP value identified in FEIS Table I-1 for two units. ~~See also FSAR Table 12.2-203.~~
	6.2 mrem/yr	Skin (Value for one unit, see ESP-ER Table 5.4-10)	~~0.21~~ 0.59mrem/yr	The Unit 3 site characteristic value is the highest skin dose to the MEI from Unit 3 gaseous effluents as shown in Tables 5.4-4 and 5.4-5. It represents the summation of plume and ground shine doses. The Unit 3 site characteristic value falls within (is less than) the ESP value identified in FEIS Table I-1. See also FSAR Tables 12.2-18bR and 12.2-201.

Table 3.0-1 Evaluation of ESP Site Characteristics

Item	ESP Site Characteristics (From FEIS Table I-1) ESP Value	Description and References	Unit 3 Site Characteristic Value	Evaluation
Dose Consequences (continued)				
Total	6.4 mrem/yr	Total body (Value for two units, see ESP-ER Table 5.4-11)	~~0.35~~ 0.56 mrem/yr	The Unit 3 site characteristic value is the total total-body dose to the MEI from Unit 3 liquid and gaseous effluents as shown in Table 5.4-6. The Unit 3 site characteristic value falls within (is less than) the ESP value identified in FEIS Table I-1 for two units. See also FSAR Table 12.2-203.
	27 mrem/yr	Thyroid (Value for two units, see ESP-ER Table 5.4-11)	~~4.2~~ 5.0 mrem/yr	The Unit 3 site characteristic value is the total thyroid dose to the MEI from Unit 3 liquid and gaseous effluents as shown in Table 5.4-6. The Unit 3 site characteristic value falls within (is less than) the ESP value identified in FEIS Table I-1 for two units. See also FSAR Table 12.2-203.
	11 mrem/yr	Other organ (Value for two units, see ESP-ER Table 5.4-11)	~~1.4~~ 1.6 mrem/yr	The Unit 3 site characteristic value is the total other organ dose to the MEI from Unit 3 liquid and gaseous effluents as shown in Table 5.4-6. The Unit 3 site characteristic value falls within (is less than) the ESP value identified in FEIS Table I-1 for two units. See also FSAR Table 12.2-203.
	6.2 mrem/yr	Skin (Value for one unit, see ESP-ER Table 5.4-10)	~~0.21~~ 0.59 mrem/yr	This Unit 3 site characteristic value is the total skin dose to the MEI from Unit 3 gaseous effluents as shown in Table 5.4-5. The Unit 3 site characteristic value falls within (is less than) the ESP value identified in FEIS Table I-1. See also FSAR Table 12.2-201.

Table 3.0-2 Evaluation of ESP Design Parameters

	ESP Plant Parameters [From ESP Table D-1]		Unit 3 Design Characteristic Value	
Item	**ESP Value**	**Description and References**		**Evaluation**
Release Point				
Elevation	Ground Level	The elevation above finished grade of the release point for routine operational and accident sequence releases	Mixed mode and ground level (routine operational releases); ground level (accident sequence releases)	This Unit 3 design characteristic value for routine operational releases includes mixed mode release points from the vent stacks of the Turbine Building~~,~~ and Reactor Building~~, and Radwaste Building,~~ along with ~~a~~ ground level ~~release~~ releases from the vent stack of the Radwaste Building and the CIRC cooling tower. The Unit 3 design characteristic value for routine operational releases does not fall within (is not the same as) the ESP plant parameter value identified in ESP Table D-1. The Unit 3 design characteristic value for accident sequence releases is a ground level release. The Unit 3 design characteristic value for accident sequence releases falls within (is the same as) the ESP plant parameter value identified in ESP Table D-1.
Source Term				
Gaseous (Normal)	Maximum values presented in Tables D-2 and D-3	The annual activity, by isotope, contained in routine plant airborne effluent streams	Values presented in Table 5.4-3	The Unit 3 design characteristic source term values for normal gaseous releases are provided in Table 5.4-3. All Unit 3 design characteristic values fall within (are less than) the ESP plant parameter values identified in ESP Table D-1. See Section 5.4 for the analysis of radiological consequences of routine airborne releases.

Table 5.4-1 and compared to the ESP-ER composite release activities. Activities in bold print indicate isotopes for which the estimated ESBWR release activity is greater than the corresponding ESP-ER composite release activity. "NP" denotes isotopes which are not present in ESBWR liquid effluents.

There are increases in liquid effluent release activities for some radioisotopes associated with normal operation of Unit 3 as compared to the composite release activities presented in the ESP-ER. However, the total liquid effluent release activity of Unit 3 is less than the total ESP-ER composite release activity.

ESP-ER Table 5.4-10 provided the total body and organ doses to the maximally exposed individual (MEI) resulting from liquid and gaseous effluent releases of a single new unit. These calculated doses were determined to be within the design objectives of 10 CFR 50, Appendix I. Using design-specific release activities of liquid effluents from Unit 3, the total annual doses to the MEI from liquid effluents are calculated and presented in Table 5.4-2. The total annual doses from liquid effluents were calculated using the same methodologies and parameters (with the exception of release activity) as those used in ESP-ER annual MEI dose calculations.

As shown in Table 5.4-2, the annual doses to the MEI from some liquid effluent pathways are consistently lower than those calculated and presented in the ESP-ER. Therefore, the dose impacts to the MEI remain SMALL, and no new mitigation measures or controls are warranted.

5.4.2.2 Gaseous Pathway Doses

ESP-ER Table 5.4-7 presented the composite release activities of gaseous effluents for a single new unit. These composite activities were obtained by taking the maximum activity for each isotope from multiple reactor designs. ESBWR-specific gaseous effluent release activities are presented in Table 5.4-3 and are compared to ESP-ER composite release activities. Activities in bold print indicate isotopes for which the estimated ESBWR release activity is greater than the corresponding ESP-ER composite release activity. "NP" denotes isotopes which are not present in ESBWR gaseous effluents.

The total annual doses to the MEI from gaseous effluents have been re-calculated using the ESBWR-specific gaseous release activities and the same methodologies and parameters as those used in ESP-ER calculations, with the exception of MEI locations. As discussed in Section 2.7, the MEI locations for the vegetable garden, residential, and meat animal receptors have changed. A single, bounding location, has been selected for these receptors and the doses from the garden, residential, and meat animal pathways are summed to arrive at the total dose at this location. ~~The~~ For Reactor Building releases, the χ/Q values are at 0.74 mile NNE from the facility boundary and the D/Q values are at the same distance in the NNE direction. ~~The~~ For Reactor Building releases, the maximum χ/Q site boundary MEI location (0.88 mile NNE of the plant boundary) and maximum D/Q site boundary location (0.62 mile in the south direction) are the same as were used in the ESP-ER. Table 2.7-2 summarizes the distances and directions from the Reactor Building, Turbine

Building, Radwaste Building, and the circulating water cooling tower to receptors of interest, as well as the associated χ/Q and D/Q values. The results of the total annual dose calculations are provided in Table 5.4-4.

Table 5.4-5 shows that the annual total body, maximum organ, and skin doses to the MEI are lower than those calculated and presented in the ESP-ER. Therefore, the impact of gaseous pathway doses remains SMALL, and no mitigation measures or controls are warranted.

5.4.2.3 Direct Radiation from Station Operation

As indicated in ESP-ER Section 5.4.1.3, the offsite dose due to direct radiation from the new and existing units will be negligible. However, an assumed value of 1 mrem/yr is included in Table 5.4-6 to account for the dose to the MEI at the nearest residence from operation of Units 1 and 2. Another source of direct radiation is the NAPS ISFSI, which is located south of the proposed Unit 3 site. The distance from the ISFSI to the site boundary is 2500 ft. The annual direct radiation contribution at the site boundary from the ISFSI is no more than 3.6 mrem/yr. The distance from the ISFSI to the nearest residence is 2860 ft. Since this is farther away than the site boundary, the direct radiation dose to the MEI at the nearest residence would be less than 3.6 mrem/yr.

5.4.3 Impacts to Members of the Public

ESP-ER Table 5.4-11 demonstrated that the total site liquid and gaseous effluent doses resulting from the normal operation of the two existing North Anna units and two proposed new units would be well within the regulatory limits of 40 CFR 190. ESP-ER Table 5.4-12 presented the collective doses attributable to two new units for the population within 50 miles of the proposed ESP site. Accounting for changes in the liquid and gaseous effluent release activities, identified in Table 5.4-1 and Table 5.4-3, the total annual doses to the MEI and the total population doses resulting from the proposed Unit 3 liquid and gaseous effluents are calculated and presented in Table 5.4-6 and Table 5.4-7, respectively. These total annual doses to the MEI and to the population were calculated using the same methodologies and parameters (with the exception of the release activities) as those used in ESP-ER.

As shown in Table 5.4-4 some of the annual doses to the MEI resulting from Unit 3 gaseous effluents are higher than those in the ESP-ER. However, as shown in Table 5.4-6, even when direct radiation doses from operation of the ISFSI and Units 1 and 2 are included with the gaseous effluent doses to the MEI, the total site doses are below regulatory limits, the impact to members of the public remains SMALL, and no mitigation measures or controls are warranted.

As shown in Table 5.4-7, the annual dose to the population within 50 miles resulting from Unit 3 liquid and gaseous effluents are lower than those calculated for a single unit and presented in the ESP-ER. Therefore, the liquid and gaseous effluent doses to the population provided in the ESP-ER are bounding, the impact to members of the public remains SMALL, and no mitigation measures or controls are warranted.

Table 5.4-4 Gaseous Pathway Doses (mrem/yr) to the MEI

		ESP-ER			Unit 3		
Location	**Pathway**	**Total Body**	**Thyroid**	**Skin**	**Total Body**	**Thyroid**	**Skin**
Site Boundary (0.88 mi ESE for ESP-ER; ~~same location~~ 0.88 mi NNE/ESE, 0.34 mi W for this ER)	Plume	2.1E+00	N/A	6.2E+00	~~1.3E-01~~ 2.8E-01	~~**1.3E-01**~~ **2.8E-01**	~~2.1E-01~~ 5.0E-01
	Inhalation						
	Adult	3.0E-01	1.6E+00	N/A	2.7E-02	~~6.2E-02~~ 1.0E-01	N/A
	Teen	3.1E-01	2.0E+00	N/A	2.7E-02	~~7.3E-02~~ 1.3E-01	N/A
	Child	2.7E-01	2.3E+00	N/A	2.4E-02	~~8.1E-02~~ 1.5E-01	N/A
	Infant	1.6E-01	2.0E+00	N/A	1.4E-02	~~6.6E-02~~ 1.3E-01	N/A
Nearest Garden (0.94 mi NE for ESP-ER; 0.74 mi ~~NNE~~ NNE/ESE for this ER)	Vegetable						
	Adult	4.4E-01	4.9E+00	N/A	~~6.6E-02~~ 8.0E-02	~~1.5E+00~~ 1.6E+00	N/A
	Teen	5.7E-01	6.6E+00	N/A	~~7.7E-02~~ 8.9E-02	~~1.9E+00~~ 2.2E+00	N/A
	Child	1.1E-00	1.3E+01	N/A	~~1.2E-01~~ 1.3E-01	~~3.7E+00~~ 4.2E+00	N/A
Nearest Residence (0.96 mi NNE for ESP-ER; 0.74 mi ~~NNE~~ NNE/ESE for this ER)	Plume	1.4E+00	N/A	4.0E+00	~~1.2E-01~~ 3.2E-01	~~**1.2E-01**~~ **3.2E-01**	2.1E-~~01~~ 5.9E-01
	Inhalation						
	Adult	2.0E-01	1.0E+00	N/A	~~2.6E-02~~ 2.7E-02	~~6.3E-02~~ 1.2E-01	N/A
	Teen	2.0E-01	1.3E+00	N/A	~~2.6E-02~~ 2.7E-02	~~7.5E-02~~ 1.5E-01	N/A
	Child	1.8E-01	1.5E+00	N/A	~~2.3E-02~~ 2.4E-02	~~8.2E-02~~ 1.8E-01	N/A
	Infant	1.0E-01	1.3E+00	N/A	~~1.3E-02~~ 1.4E-02	~~6.7E-02~~ 1.5E-01	N/A

Table 5.4-4 Gaseous Pathway Doses (mrem/yr) to the MEI

		ESP-ER			Unit 3		
Location	**Pathway**	**Total Body**	**Thyroid**	**Skin**	**Total Body**	**Thyroid**	**Skin**
Nearest Meat Animal (1.37 mi SE for ESP-ER; 0.74 mi ~~NNE~~ NNE/ESE for this ER)	Meat						
	Adult	6.7E-02	1.5E-01	N/A	~~1.0E-02~~ 1.2E-02	~~5.8E-02~~ 6.5E-02	N/A
	Teen	4.9E-02	1.1E-01	N/A	~~6.5E-03~~ 7.2E-03	~~4.2E-02~~ 4.6E-02	N/A
	Child	7.9E-02	1.7E-01	N/A	~~8.6E-03~~ 9.2E-03	~~6.2E-02~~ 6.9E-02	N/A
Nearest Garden/ Residence/ Meat Animal (Varies for ESP-ER; 0.74 mi ~~NNE~~ NNE/ESE for this ER)	All						
	Adult	1.6E+00	4.9E+00	4.0E+00	~~2.2E-01~~ 4.3E-01	~~1.7E+00~~ 2.1E+00	~~2.1E-01~~ 5.9E-01
	Teen	1.6E+00	6.6E+00	4.0E+00	~~2.3E-01~~ 4.4E-01	~~2.2E+00~~ 2.7E+00	~~2.1E-01~~ 5.9E-01
	Child	1.6E+00	1.3E+01	4.0E+00	~~2.7E-01~~ 4.8E-01	~~4.0E+00~~ 4.7E+00	~~2.1E-01~~ 5.9E-01
	Infant	1.5E+00	1.3E+00	4.0E+00	~~1.3E-01~~ 3.3E-01	~~1.9E-01~~ 4.7E-01	~~2.1E-01~~ 5.9E-01

Table 5.4-4 Gaseous Pathway Doses (mrem/yr) to the MEI

Notes:

1. There are no infant doses for the vegetable and meat pathways because infants do not consume these foods.
2. "N/A" denotes "not applicable."
3. For Unit 3, the doses shown for "nearest garden/residence/meat animal" location are the sum of garden, residence, and meat animal doses at 0.74 mi NNE for releases from Reactor and Turbine Buildings and 0.74 mi ESE for releases from Radwaste Building and circulating water hybrid cooling tower. For ESP-ER, these doses are the maximum of garden, residence, and meat animal doses at 0.94 mi NE, 0.96 mi NNE, and 1.37 mi SE, respectively. The site boundary and residence plume doses include ground shine contribution. For Unit 3, the site boundary doses are the sum of the maximum from each release point regardless of distance and direction (0.88 mi NNE for Reactor and Turbine Buildings, 0.88 mi ESE for Radwaste Building, 0.34 mi W for cooling tower).
4. The maximum (child) bone dose for Unit 3 from all gaseous effluent pathways is shown in Table 5.4-6.

Table 5.4-5 Comparison of Annual Doses to the MEI from Gaseous Effluents

Type of Dose	ESP-ER 1 New Unit (MEI Location)	Unit 3 (MEI Location)	10 CFR 50 Appendix I Limit
Gamma Air (mrad/yr)	3.2 (Site Boundary)	~~7.8E-02~~ 2.7E-01 (Residence)	10
Beta Air (mrad/yr)	4.8 (Site Boundary)	~~7.8E-02~~ 2.5E-01 (Residence)	20
Total Body (mrem/yr)	2.4 (Site Boundary)	~~1.3E-01~~ 3.2E-01 (~~Site Boundary~~ Residence)	5
Skin (mrem/yr)	6.2 (Site Boundary)	~~2.1E-01~~ 5.9E-01 (~~Site Boundary~~ Residence)	15
Iodine and Particulates – Maximum Organ (mrem/yr)	12 (Garden)	~~3.8E+00~~ 4.4E+00 (Residence/ Garden/ Meat Animal)	15

Table 5.4-6 Comparison of Site Doses (mrem/yr) to the MEI

Type of Dose	ESP Site Total (1)(4)	Unit 3			Existing Units (2)(4)	Site Total (3)	40 CFR 190 Limit
		Liquid	Gaseous	Total			
Total Body (mrem/yr)	6.8	7.9E-02	~~2.7E-01~~ 4.8E-01	~~3.5E-01~~ 5.6E-01	5.0E+00	~~5.3E+00~~ 5.5E+00	25
Thyroid (mrem/yr)	27	2.6E-01	~~4.0E+00~~ 4.7E+00	~~4.2E+00~~ 5.0E+00	5.1E+00	~~9.4E+00~~ 1.0E+01	75
Bone (mrem/yr)	12	1.1E+00	~~3.1E-01~~ 5.5E-01	~~1.4E+00~~ 1.6E+00	5.1E+00	~~6.5E+00~~ 6.8E+00	25

Notes:

1. The ESP site total doses are for two new units and the two existing units, and do not include a dose contribution from the ISFSI.
2. The doses from existing units include contributions from liquid and gaseous effluents (0.37 mrem), ISFSI (3.6 mrem), and an assumed dose of 1 mrem/yr due to direct radiation from the existing units.
3. This site total dose includes the Unit 3 total dose and the dose from the existing units.
4. The effluent dose from ESP-ER Section 5.4, Reference 11, is a critical organ dose that is applied as the thyroid and bone dose.

Table 5.4-7 Collective Total Body (Population) Doses (person-rem/yr) Within 50 Miles

	ESP-ER 1 New Unit	Unit 3
Liquid	8.6E+00	8.4E-01
Noble Gases (Gaseous)	3.5E+00	~~4.9E-01~~ 5.7E-01
Iodines and Particulates (Gaseous)	1.4E+00	~~1.1E+00~~ 1.2E+00
H-3 and C-14 (Gaseous)	1.4E+01	2.7E+00
Total	2.8E+01	~~5.1E+00~~ 5.3E+00
Natural Background	9.2E+05	9.2E+05

Notes:

1. ESP doses are based on data from ESP-ER Tables 2.5-8, 5.4-1, and 5.4-3.
2. The corresponding collective thyroid doses for Unit 3 are 9.9E-01 person-rem/year from liquid effluents and 25 person-rem/year from gaseous effluents.
3. The long-term χ/Q and D/Q values used in deriving Unit 3 collective doses from routine gaseous effluent releases within 50 miles of the plant are shown in Tables 2.7-5 to 2.7-12.

Table 5.4-8 Comparison of Annual Doses (mrad/yr) to Biota from Liquid and Gaseous Effluent

Biota Effluents	ESP-ER		Unit 3	
	Liquid	Gaseous	Liquid	Gaseous
Fish	9.7E+00	N/A	2.8E+00	N/A
Invertebrates	4.6E+01	N/A	9.3E+00	N/A
Algae	5.4E+01	N/A	1.4E+01	N/A
Muskrat	4.3E+01	3.4E+01	1.8E+01	~~1.2E+00~~ 3.4E+00
Raccoon	4.9E+00	3.4E+01	5.2E-01	~~1.2E+00~~ 3.4E+00
Heron	5.4E+01	3.4E+01	8.3E+00	~~1.2E+00~~ 3.4E+00
Duck	4.3E+01	3.4E+01	1.8E+01	~~1.2E+00~~ 3.4E+00

Table 10.4-2 Internal and External Costs of Proposed Unit 3

Category of Cost	Description of Cost
Terrestrial and Aquatic Species *(continued)*	There would be no perceptible impact on the temperature (estimated temperature increase attributable to Unit 3 would be a maximum of one-tenth of a degree Fahrenheit at the end of the discharge canal) and there would be no impact on aquatic communities of Lake Anna.
Radioactive Effluents and Emissions, Radioactive Dose	SMALL. Radioactive waste is generated. The plant would produce radioactive air emissions. Low concentrations of radioactive liquid effluents are introduced into Lake Anna. The estimated radioactive doses from all sources would be as follows: • occupational dose: 84.5 person-rem/yr • total body dose to the MEI: ~~5.3~~ 5.5 mrem/yr • collective total body dose to population within 50 miles: ~~5.1~~ 5.3 person-rem/yr • dose to biota: 0.5 to 18 mrad/yr (liquid), ~~1.2~~ 3.4 mrad/yr (gaseous)
Hazardous and Radioactive Waste	SMALL. Storage, treatment, and disposal of high-level radioactive spent nuclear fuel would occur, with a commitment of underground geological resources for disposal of radioactive spent fuel. Generation of 16,742 ft^3/yr of solid radioactive wastes with activity of 1,718 Curies would be expected. Generation of 15 ft^3/yr mixed liquid waste and 5 ft^3/yr mixed solid waste, and maximum generation of 30 ft^3/yr mixed liquid waste and 10 ft^3/yr of mixed solid waste would also be expected.
Air Emissions	SMALL. Air emissions from gas turbine and diesel generators, auxiliary boilers and equipment, and vehicles that have a small impact on workers and local residents would occur. Cooling tower drift would deposit some salt in the immediate vicinity, but the level is unlikely to result in any measurable impact on vegetation. Cooling tower atmospheric plume discharge would be abated by cooling tower design.
Meteorological	SMALL. Heated air from Unit 3's cooling towers would not increase the atmospheric and ground temperature beyond the NAPS site boundary. Blowdown from Unit 3 to the WHTF would lead to negligible additional steam fog. Cooling tower atmospheric plume discharge would be abated by cooling tower design.
Noise	SMALL. Construction activities would have a noise level of 60–80 dBA at 120 m (400 ft) from the Unit 3 construction site. Noise levels from cooling tower operation will be confirmed to be < 65 dBA at the EAB. Other noises would be as they are currently for Units 1 and 2.

VARIANCES

Introduction

A *variance* is a plant-specific deviation from one or more of the site characteristics, design parameters, or terms and conditions of an ESP or from the site safety analysis report (SSAR). A variance to an ESP is analogous to a departure from a standard design certification.

The following sections provide requests for variances from the site characteristics for the North Anna ESP (Reference 1) and from the ESPA SSAR. The requests comply with the requirements of 10 CFR 52.39 and 10 CFR 52.93. To support a decision whether to grant a variance, each variance request provides the technical justification and supporting cross-references to the Unit 3 FSAR information that meet the technically relevant regulatory acceptance criteria.

This COLA complies with the requirements of 10 CFR 52.79, *Contents of Applications; Technical Information in Final Safety Analysis Report*, and 10 CFR 52.39, *Finality of Early Site Permit Determinations*. In accordance with 10 CFR 52.79(b)(2) and 10 CFR 52.39(d), this COLA requests a variance where the Unit 3 FSAR references the North Anna ESP and: a) the Unit 3 FSAR does not demonstrate that the design of Unit 3 falls within the ESP site characteristics; or b) the Unit 3 FSAR does not demonstrate that the design of Unit 3 falls within the ESP (design) controlling parameters; or c) the Unit 3 FSAR does not incorporate the ESP SSAR information by reference without the need for certain changes. Accordingly, this COLA includes the following requests for variances:

NAPS ESP VAR 2.0-1 - Long-Term ~~Deposition Value (D/Q) Estimate~~ Dispersion Estimates (χ/Q and D/Q)
NAPS ESP VAR 2.0-2 - Hydraulic Conductivity
NAPS ESP VAR 2.0-3 - Hydraulic Gradient
NAPS ESP VAR 2.0-4 - Vibratory Ground Motion
NAPS ESP VAR 2.0-5 - Distribution Coefficients (K_d)
NAPS ESP VAR 2.0-6 - DBA Source Term Parameters and Doses
NAPS ESP VAR 2.0-7 - Coordinates and Abandoned Mat Foundations
NAPS ESP VAR 2.3-1 - Tornado Site Characteristics
NAPS ESP VAR 2.4-1 - Void Ratio, Porosity, and Seepage Velocity
NAPS ESP VAR 2.4-2 - NAPS Water Supply Well Information
NAPS ESP VAR 2.4-3 - Well Reference Point Elevation
NAPS ESP VAR 2.4.4 - Lake Level Increase
NAPS ESP VAR 2.4-5 - Lake Anna PMF Level Increase
NAPS ESP VAR 2.5-1 - Stability of Slopes
NAPS ESP VAR 2.5-2 - [Deleted]
NAPS ESP VAR 12.2-1 - Gaseous Pathway Doses

NAPS ESP VAR 12.2-2 - [Deleted]
NAPS ESP VAR 12.2-3 - Annual Liquid Effluent Releases
NAPS ESP VAR 12.2-4 - Existing Units' ~~and Site Total~~ Doses
NAPS ESP VAR 12.2-5 - Annual Gaseous Effluent Releases

Variance: NAPS ESP VAR 2.0-1 – Long-Term ~~Deposition Value (D/Q) Estimate~~ Dispersion Estimates (χ/Q and D/Q)

Request

This is a request to use the Unit 3 maximum long-term ~~deposition value (D/Q) estimate~~ dispersion estimates (χ/Q and D/Q) values provided in FSAR Table 2.3-16R for ~~the maximum annual average meat animal D/Q value in the South direction for releases from the Radwaste Building ventilation stack~~ types of locations other than the EAB rather than the corresponding ESP ~~value~~ values in FSER Supplement 1, Appendix A and in SSAR Table 2.3-16. The Unit 3 ~~value (4.4×10^{-9} 1/m^2) does not fall within (is larger than) the ESP and SSAR value (3.1×10^{-9} 1/m^2)~~ values for the Radwaste Building ventilation stack do not fall within (are greater than) the ESP and SSAR values.

This variance results from a review of the Radiological Environmental Monitoring Program (FSAR Reference 2.3-201). The review and subsequent plotting of updated receptor locations using Geographic Information System (GIS) technology determined that since the time of the SSAR, locations of and distances to several of the "closest receptors" had changed. ~~FSAR Table 2.3-15R shows a meat animal present in the South direction which did not have such receptor at the time of the SSAR.~~ The χ/Q and D/Q evaluation, and the subsequent normal gaseous effluent dose evaluation, conservatively assumed that each receptor (meat animal, vegetable garden, residence) is at the distance of that closest receptor and in the true East-southeast direction, which is the direction of the maximum annual χ/Q value at that distance.

Justification

This variance is acceptable because ~~this Unit 3 D/Q value (along with other updated Unit 3 long-term dispersion and deposition estimates) were used to determine Unit 3 doses. The~~ all estimated annual doses from normal gaseous effluent releases remain within applicable limits as shown in FSAR Table 12.2-201.

Because of the changes in Unit 3 maximum long-term dispersion and deposition estimates, and also because of changes in maximum annual gaseous release values, some of the gaseous effluent doses are higher than the corresponding ESP value. See related variance NAPS ESP VAR 12.2-1, which is addressed below.

Justification

This variance is acceptable because the estimated Unit 3 concentrations of normal liquid effluent releases remain within the applicable concentration limits and the annual doses from normal liquid effluent releases remain within applicable limits.

The estimated Unit 3 concentrations of normal liquid effluent releases for all nuclides meet the 10 CFR 20 concentration limits as shown in FSAR Table 12.2-19bR.

The estimated annual doses from Unit 3 to the MEI from liquid effluents are compared with the applicable limit in FSAR Table 12.2-202. The Unit 3 dose meets the 10 CFR Part 50, Appendix I, limit, and the Unit 3 dose estimates are lower than the corresponding ESP values.

Variance: NAPS ESP VAR 12.2-4 - Existing Units' ~~and Site Total~~ Doses

Request

This is a request to use updated information for doses for the existing units ~~and the site total doses~~ in FSAR Table 12.2-203 rather than the information in SSAR Section 2.3.5.1 that refers to ESP ER Section 5.4, which contains ESP ER Table 5.4-11.

The doses for total body, thyroid, and bone due to the existing units, as shown in FSAR Table 12.2-203, do not fall within (are greater than) the corresponding values in ESP ER Table 5.4-11. Because these values are higher, they are shown in bold font in FSAR Table 12.2-203.

This variance is due to the conservative dose estimates for direct radiation from Units 1 and 2 and the Independent Spent Fuel Storage Installation (ISFSI), which were added to the doses for liquid and gaseous effluents from Units 1 and 2. The direct radiation dose contributions were included in the FSAR dose estimates, but not in the ESP Application dose estimates. The addition of these direct radiation doses to the existing units' doses (annual total body, thyroid, and bone) caused the FSAR values to exceed the SSAR values.

Justification

This variance is acceptable because the dose estimates are more conservative and complete with the addition of the dose contributions from direct radiation from the existing units and the ISFSI. As shown in FSAR Table 12.2-203, the annual total body, thyroid, and bone doses for the site, including the doses from the existing units and the ISFSI, meet the applicable 40 CFR 190 limits.

Variance: NAPS ESP VAR 12.2-5 - Annual Gaseous Effluent Releases

Request

This is a request to use the Unit 3 maximum annual gaseous effluent release values provided in FSAR Table 12.2-17R rather than the corresponding ESP values in EIS (Reference 6) Appendix I

ENCLOSURE 2

CD-ROM Containing XOQDOQ Code Input and Output Files

ENCLOSURE 3

CD-ROM Containing GASPAR II Code Input and Output Files