STUDENT SUMMER INTERNSHIP TECHNICAL REPORT

HVAC Design Assessments for the Hanford Waste Treatment and Immobilization Plant

DOE-FIU SCIENCE & TECHNOLOGY WORKFORCE DEVELOPMENT PROGRAM

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ABSTRACT

During the summer of 2014, DOE Fellow Sasha Philius had the unique opportunity to intern with the Office of River Protection in Richland, Washington. During this time, Mr. Philius assisted Mr. Bradley Eccleston and Mrs. Elaine Diaz in providing oversight on Bechtel National Inc. plans for the construction of the Waste Treatment and Immobilization Plant (WTP) site. WTP facilities include the Analytical Laboratory (LAB), Low-Activity Waste Facility (LAW), High-Level Waste Facility (HLW), and Pretreatment Facility (PTF). The DOE Office of River Protection is dedicated to ensuring the safe and timely construction of the WTP site in the continued effort to remove the nuclear waste buildup of previous decades. This report summarizes the findings for Heating, Ventilation, and Air Conditioning (HVAC) related assessments of various design issues for different buildings on the construction site that will be used to store, treat, and transport nuclear waste. These assessments evaluated calculations and requirements to ensure they meet DOE standards. One major finding was the need to redesign the exhaust stacks to adequately drain potential condensation as the current design will create an excessive burden on workers to continuously remove several 55-gallon drums full of potentially contaminated water from stack condensate.

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1. INTRODUCTION

In 1943, the Hanford Site began producing plutonium for nuclear bombs used in World War II and stockpiled during the "Cold War." This continued until 1987 when the operations were finally ceased. Solid and liquid wastes from the production processes were left behind, posing a serious risk to the local environment. In 1989, the U. S. Department of Energy (DOE), Environmental Protection Agency (EPA), and Washington State Department of Ecology entered into a legally binding accord, the Tri-Party Agreement (TPA), to clean up the Hanford Site. Now, in 2014, Bechtel National Inc. (BNI) is the primary contractor tasked with creating the various facilities needed to treat and remove the vast amount of nuclear waste.

The DOE Office of River Protection (ORP) provides oversight on the construction of the Waste Treatment and Immobilization Plant (WTP) site, working side-by-side with BNI to achieve success. Currently, a number of technical issues exist that are slowing down the construction of the four main treatment facilities. One of the primary issues involves HVAC – proper ventilation of facilities used to process radioactive waste ensures confinement of the waste and of the chemicals used in the treatment process. Therefore, the design of the HVAC systems is critical to protecting workers, the public, and the environment.

2. EXECUTIVE SUMMARY

This research work has been supported by the DOE-FIU Science & Technology Workforce Initiative, an innovative program developed by the US Department of Energy's Environmental Management (DOE-EM) and Florida International University's Applied Research Center (FIU-ARC). During the summer of 2014, a DOE Fellow intern Sasha Philius spent 10 weeks doing a summer internship at the DOE ORP in Richland, WA, under the supervision and guidance of Mr. Bradley Eccleston. The intern's project was initiated in June 23, 2014, and continued through August 29, 2014 with the objective of assisting the U.S. DOE-ORP WTP Engineering Division (WED) in providing oversight on BNI's plans for the WTP facilities: the Analytical Laboratory (LAB), Low-Activity Waste Facility (LAW), High-Level Waste Facility (HLW), and Pretreatment Facility (PTF).

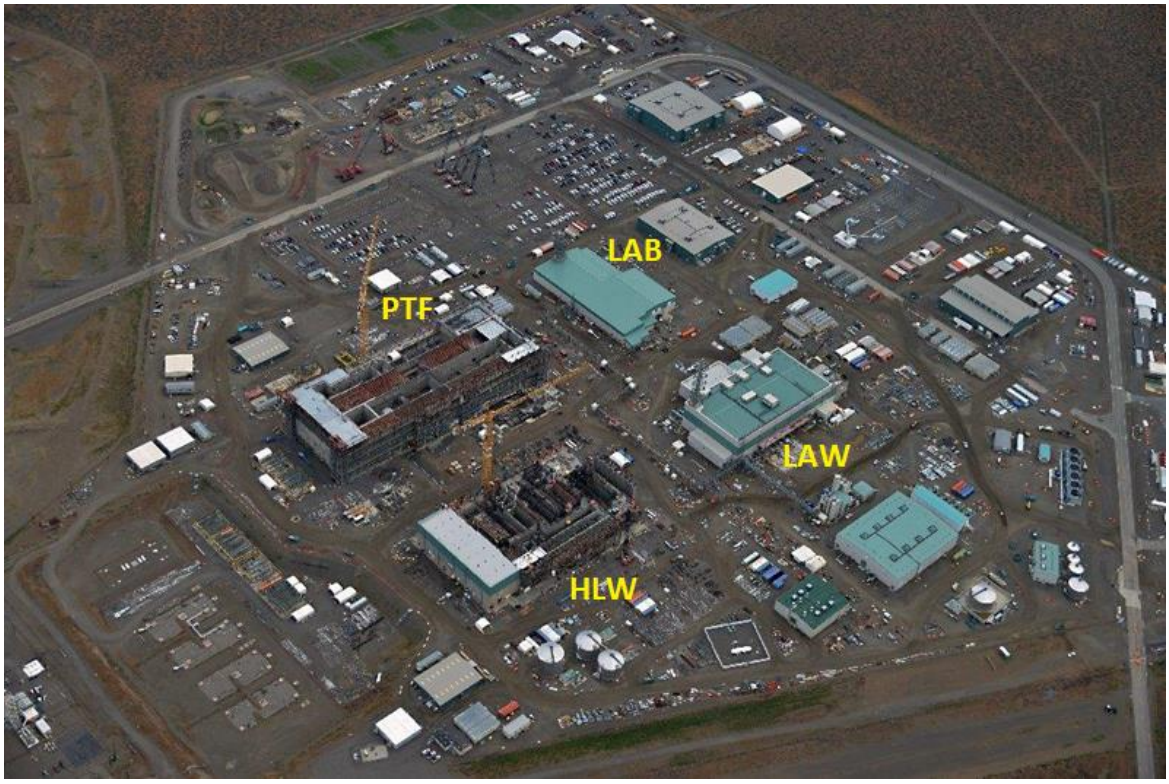

Figure 1. Overview of Waste Immobilization and Treatment Plant Site.

3. ASSESSMENTS

Figure 2. Close up of exhaust stack on LAB facility.

Condensation Build Up in Exhaust Stacks

Scope

The WED conducted a Level 2 assessment to evaluate the accumulation levels of condensation in ventilation and offgas in the exhaust stacks of each WTP facility. It must be determined if it is appropriate or necessary to provide active stack drains to the Radioactive Liquid Drain (RLD) system. BNI documents were reviewed for specific measurements relating to ventilation and offgas systems. A condensation rate calculation was performed for each stack. The calculations will determine if the operational impact from changing out stack drain accumulation drums and manipulating the manual stack drain valves will be excessive. The safety or operational risk to system functionality must also be determined as it relates to the lack of an active drain for the accumulation of condensation.

Evaluation

Multiple BNI drawings and engineering texts were reviewed to find the data needed to accurately calculate condensation accumulation within the ventilation and offgas exhaust stacks. Calculation methodology and assumptions were identical to those used by BNI in

calculation 24590-LAW-M6C-LVP-00018, unless otherwise noted. The mass flow rate of condensation back into the facility is calculated using multiple equations, including: heat transfer rate, volumetric flow rate, mass of dry air, mass of water, and gallons of water produced every minute, as shown in Appendix A, Exhaust Stack Condensate Calculations. The result is an excessive amount of condensation as shown in Table 1.

Table 1. Mass Flow Rate of Condensation (gal/hour) in Ventilation and Offgas Stacks

Exhaust Stacks	HLW	LAW	LAB	PTF
C2V	13	17	22*	25*
C3V (IHLW)	40	–	–	–
C3V	32	53	45*	19*
C5V	36	75	8*	23*
HOP	48	–	–	–
PJV	7	–	–	33
PVV	–	–	–	12
*Systems for which drawings do not specify any stack drains				

Stack drains currently incorporated in WTP facilities are not equipped with loop seals, allowing exhaust air to be released back into the facility if manual valves are leaking or left open. Air released back into the facility C2 areas, where 55-gallon waste drums reside, can create worker hazards and potential migration of contamination. In a winter design degree day, the condensation accumulation for these systems results in each of the 18 systems filling a 55-gallon drum in between 45 minutes and 8 hours with potentially contaminated water. This means a total production rate of over 9 waste drums per hour for WTP ventilation and offgas systems. These levels of accumulation are excessive for a manual drain system, in terms of the time it takes to handle and dispose of, or make provisions to drain, a 55-gallon drum filled with low-level liquid radioactive waste. Challenges to system functionality are imposed by the lack of an active stack drain. The stack drains, where specified on drawings, are equipped with a manual valve to drain condensation to a drum. If the manual valve isn't constantly cycled to release water, or if there is no specified stack drain at all, water can migrate into the low point in the system where no drain exists. This can cause equipment malfunction and damage, or could block system flow.

In response to BNI's factual accuracy review, a sensitivity analysis was conducted. The analysis was less conservative and uses an updated American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) winter outdoor design temperature (7.4 °F) and the 1% annual extreme wind speed (25 mph); results were not significantly different. In Table 2., with the exception of five systems (including the systems with no accumulation due to evaporation), all systems still result in filling a 55-gallon drum at least every 24 hours, and most (12 of the 18 systems listed) fill a 55-gallon drum in less than 12 hours.

Table 2. Sensitivity Calculations for Stack Exhaust

	Condensation at 25 MPH Winds	Condensation at 70 MPH Winds
	Q	Q
	gph	gph
PTF		
C2V	5.3	22.1
C3V	0.8	12.1
C5V	2.7	20.6
PJV	9.1	29.7
PVV	6.4	20.9
HLW		
C2V	3.1	11.9
C3V (IHLW)	9.0	34.1
C3V	4.1	24.5
C5V	10.7	43.0
HOP A/B	10.6	34.2
PJV		
LAB		
C2V	2.4	17.2
C3V	14.0	48.2
C5V		
LAW		
C2V	4.1	17.8
C3V	10.5	48.8
C5V	14.7	77.0
LVP	20.7	64.6

Notes:
1. Greyed out cells indicate no condensation due to evaporation

The mass flow rate of condensation and evaporation is calculated using multiple equations including: heat transfer rate, volumetric flow rate, mass of dry air, mass of water, and gallons of water produced every minute. The completed calculations can be found in Appendix B, Sensitivity Calculations.

If the drain valve on the stack drain is closed or the drum is full, the potential to drain back, collect at the system low point, and block flow presents a significant potential for loss of confinement ventilation flow and loss of system safety functions. In summer months, if the drain valve is left open, there is potential to blow stack exhaust into uncontaminated areas within the building. Further, the aggregate problem of manually disposing of large quantities of low level radioactive waste for 18 exhaust systems, aside from the Secondary Offgas/Vessel Vent Process (LVP), which is actively drained to the LAW RLD tank via the LVP scrubber, will impose a significant manpower burden and disposal expense on operations.

Summary of Findings

The lack of active stack drains can result in loss of ventilation and gas treatment system safety function or exposure of personnel within facilities to stack exhaust air and potential contaminants. Of the 18 confinement and gas treatment systems evaluated in this assessment, 15 are expected to produce significant stack condensate. However, aside from LVP, none are equipped with active stack drains to channel water to the RLD system, and several have no stack drains specified on the drawings at all. Accumulation of water in the ductwork can cause equipment malfunction or blocked flow, resulting in loss of confinement. Additionally, if stack drains are left open to the C2 spaces within the facilities near the base of the stacks, facility workers could be exposed to contamination and hazardous gas.

The lack of active stack drains will result in an excessive burden on operations to handle and dispose of significant quantities of stack condensation in winter months. On a winter design degree day, the condensation accumulation for these systems results in a total production rate of 3 waste drums of low level radioactive liquid waste per hour for WTP ventilation and offgas systems. This level of accumulation seems excessive for a manual drain system, in terms of the time it takes to handle and dispose of, or make provisions to drain, a 55-gallon drum filled with low-level liquid radioactive waste.

Exhaust Stack Height and Locations

Figure 3. LAW exhaust stack as seen from PTF.

Scope

The WED conducted a Level 3 assessment to evaluate the current exhaust stack heights and locations calculations. The current design must be able to preclude possible re-entrainment of stack exhaust plumes into adjacent building air intakes. This is especially important in the case of the LVP as it contains toxic levels of nitric-oxide fumes.

Evaluation

The BNI calculation sheet was developed to demonstrate the current exhaust stack height and locations of the intake and exhaust discharge points are adequate to prevent re-entrainment. BNI's evaluation looked at the LAB, LAW, HLW, and PTF. In the initial calculations, re-entrainment was only considered for exhaust stacks relative to their respective building's air intake with the exception of the PTF stack and the LAB intake. This evaluation investigated the critical dilution factor for different cases of re-entrainment occurring from any of the building's exhaust stack with an adjacent building's intake. Calculations were based on information from the updated ASHRAE references since the original calculations utilized outdated formulas.

Summary of Findings

Results of the calculation are shown in Appendix C; based upon ASHRAE criteria, only one stack exhibits notable re-entrainment. In a 5% wind frequency scenario, approximately 0.6% of the air exhausted from the HLW C2V exhaust stack re-entrains into the LAB ventilation intakes. However, this is likely an acceptable condition because the dilution factor is significant and the HLW C2V system does not contain hazardous materials, but rather ventilates hallways and clean areas. Dilution is adequate for all other combinations of stacks and intakes within the four facilities, including the process gas treatment exhaust, which could contain significant amounts of hazardous chemicals in off-normal scenarios. The results of this calculation indicate BNI's current design specifications for the WTP exhaust stack heights and locations are adequate to prevent significant re-entrainment.

Test Acceptance Criteria for New Ventilation/Offgas System Design Descriptions

Figure 4. HLW ventilation fans.

Scope

The WED conducted a Level 2 assessment to review and evaluate selected Test Acceptance Criteria (TAC) for the new ventilation/offgas system design descriptions for the HLW and LAW.

Evaluation

The assessment reviewed BNI subcontractor specifications for TAC for: the HLW Melter Offgas Treatment Process (HOP) and Process Vessel Vent Exhaust (PVV) systems; the HLW Ventilation Systems C1V, C2V, C3V, C5V, and ARV; the LAW Primary Offgas Process (LOP), and LVP systems; and the LAW Ventilation Systems C1V, C2V, C3V, C5V, and ARV.

Summary of Findings

For HLW ventilation systems, the TAC for HEPA Filters In-Place Leak Test requires the HEPA filter banks demonstrate a system efficiency of 99.97%. The function requirements within the main body of the document state a minimum of 99.95% efficiency. For the HOP, four TAC items (Opacity, Carbon Monoxide, Hydrocarbon Emission, and Report System Data – Process Control System) were missing the necessary function requirements. For both LAW ventilation systems (C1V, C2V, C3V, C5V, and ARV) and LOP, the TAC referenced the necessary requirements for assessing the various system functions.

4. CONCLUSION

Based upon the attached calculation for the buildup of condensation in exhaust stacks, this assessment concluded that stack drain designs are less than adequate to provide confinement of stack condensate and ensure confinement of stack exhaust air.

The assessment of the exhaust stack height and locations concluded that BNI has adequately calculated and implemented the necessary exhaust stack heights and locations to prevent any significant impact to air intake quality for LAB, LAW, HLW, and PTF facilities.

The assessment of the test acceptance criteria for new ventilation/offgas system design descriptions found two documents containing TAC discrepancies. The document 24590-HLW-3YD-30-00002, Rev 1, has a different HEPA filter testing efficiency minimum than what is listed in the function requirements. The requirements of four TAC items, as listed above, in 24590-HLW-3 YD-HOP-00001, Rev 2, could not be found in neither the section referenced or in any other part of the document. With the exception of 24590-HLW-3YD-HOP-00001, Rev 2, none of the documents label which sections contain the requirements for a given TAC item. This makes it difficult to properly locate the various TAC requirements.

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APPENDIX A. STACK CONDENSATE CALCULATIONS

Table 3. Stack Condensate Calculations I

	Dry Air	Mass Flow Rate	Offgas Steam Temperature	Offgas Steam Temperature	Humidity Ratio	Relative Humidity	Density	Specific Heat	Thermal Conductivity	Viscosity	Viscosity	Length of Stack	Diameter of Stack	Outdoor Air Temperature	Outside Air Speed	Stack Wall Temperature
	$\dot{V}$	m	T_S	T_S	w_s	RH	ρ	Cp	k	μ	μ	L	D	T_o	V	T_w
	SCFM	lb/hr	°F	°C	lb H2O/ lb dry air	%	lb/ft^3	BTU/lb-°F	BTU/hr-°F-ft	cp	lb/ft-sec	ft	ft	°F	mph	°F
PTF																
C2V	63400	279594	80	26.66666667	0.0098	47.5	0.0735	0.24	0.01516		0.0000133	76	4.5	5	70	42.5
C3V	72500	311605	95	35	0.0034	47.5	0.07163333	0.2401667	0.015525		0.0000134	76	5.1666667	5	70	50
C5V	70500	293533.8	113	45	0.004	47.5	0.06939333	0.2403667	0.015963		0.00001352	76	5.1666667	5	70	59
PJV	40000	173413.333	90	32.22222222	0.03	70	0.07225556	0.2401111	0.015403333		1.33667E-05	76	3	5	70	47.5
PVV	4000	17132.2667	97	36.11111111	0.03	70	0.07138444	0.2401889	0.015573667		1.34133E-05	76	2	5	70	51
HLW																
C2V	40000	173413.333	90	32.22222222	0.017	47.5	0.07225556	0.2401111	0.015403333		1.33667E-05	37	3.6666667	5	70	47.5
C3V (IHLW)	10500	40033	160	71.11111111	0.021	52.5	0.06354444	0.2408889	0.017106667		1.38333E-05	110	2	5	70	82.5
C3V	47500	200608.333	105	40.55555556	0.005	52.5	0.07038889	0.2402778	0.015768333		1.34667E-05	110	4.1666667	5	70	55
C5V	51000	220721.2	91	32.77777778	0.012	37	0.07213111	0.2401222	0.015427667		1.33733E-05	110	4.3333333	5	70	48
HOP A/B	1812	9281	369	187.2222222	0.13	1.6	0.044	0.271	0.0208	0.0246	1.65434E-05	110	1	5	70	187
PJV	2982	13606	141	60.55555556	0.0084	6.5	0.064	0.24	0.0157	0.02	1.34499E-05	110	1.6666667	5	70	73
LAB																
C2V	42000	174871.2	113	45	0.0055	47.5	0.06939333	0.2403667	0.015963		0.00001352	78	4	5	70	59
C3V	69000	287288.4	113	45	0.02	50	0.06939333	0.2403667	0.015963		0.00001352	78	5	5	70	59
C5V	14500	60372.2	113	45	0.002	47.5	0.06939333	0.2403667	0.015963		0.00001352	78	2.3333333	5	70	59
LAW																
C2V	56000	221872	140	60	0.02	15	0.06603333	0.2406667	0.01662		0.0000137	37	5	5	70	72.5
C3V	40000	158480	140	60	0.02	15	0.06603333	0.2406667	0.01662		0.0000137	132	4	5	70	72.5
C5V	64000	226988.891	210	98.88888889	0.025	4	0.05911169	0.2414428	0.018275495		1.45642E-05	132	5	5	70	107.5
LVP	3597	18100	282	138.8888889	0.156	6	0.047	0.273	0.0189	0.0224	1.50639E-05	129	1.5	5	70	143.5

Table 4. Stack Condensate Calculations II

	Prandtl Number	Stack Area	Mass Velocity	Reynolds Number	Nusselt Number	Internal convection heart transfer coefficient	Density	Specific Heat of Outside Air	Dynamic Viscosity of Outside Air	Thermal Conductivity of Outside Air	Prandtl Number	Outside Air Speed	Reynold's Number	Nusselt Number	External convection heat transfer coefficient	Stack wall temperature
	Pr	A	G	Re	Nu	hi	ρ	Cp	μ	k	Pr	V	Re	Nu	hw	Tw
	unitless	ft^2	lb/hr-ft2	unitless	unitless	BTU/hr-°F-ft^2	lb/ft^3	BTU/lb-°F	lb/ft-sec	BTU/hr-ft-°F	unitless	ft/sec	unitless	unitless	BTU/hr-°F-ft^2	°F
PTF																
C2V	0.757995	15.89625	17589	1653071	1996	6.72585664	0.079625	0.24	1.19E-05	0.014205833	0.713833	103	3084842.8	3324	10.49463	34
C3V	0.746257	20.95514	14870	1592638	1929	5.79574331	0.0784	0.24	1.22E-05	0.014396667	0.712667	103	3408757.7	3638	10.13838	38
C5V	0.73289	20.95514	14008	1486958	1816	5.61025552	0.07693	0.24	1.25E-05	0.014625667	0.711267	103	3256751.1	3487	9.872201	44
PJV	0.750107	7.065	24545	1530263	1871	9.60662877	0.078808	0.24	1.21E-05	0.014333056	0.713056	103	2004649.7	2257	10.78203	45
PVV	0.744734	3.14	5456	225983.1	404	3.1473849	0.078237	0.24	1.22E-05	0.014422111	0.712511	103	1312824.5	1558	11.23658	25
HLW																
C2V	0.750107	10.55389	16431	1252033	1594	6.69423097	0.078808	0.24	1.21E-05	0.014333056	0.713056	103	2450127.4	2699	10.55046	38
C3V (IHLW)	0.701263	3.14	12749	512022.6	764	6.5321893	0.073092	0.24	1.34E-05	0.015223611	0.707611	103	1120708.6	1357	10.32925	65
C3V	0.738738	13.62847	14720	1265109	1599	6.05305127	0.077583	0.24	1.24E-05	0.014523889	0.711889	103	2680088.2	2924	10.19182	42
C5V	0.749332	14.74056	14974	1347752	1690	6.01584125	0.078727	0.24	1.21E-05	0.014345778	0.712978	103	2888231.4	3130	10.36266	37
HOP A/B	0.775948	0.785	11823	198517.4	369	7.67325676	0.154273	0.241	1.42E-05	0.017743336	0.695494	103	1116791.5	1344	23.84037	94
PJV	0.740173	2.180556	6240	214778.4	387	3.64897678	0.074643	0.24	1.3E-05	0.014981889	0.709089	103	979220.83	1211	10.88985	39
LAB																
C2V	0.73289	12.56	13923	1144220	1472	5.87626799	0.07693	0.24	1.25E-05	0.014625667	0.711267	103	2521355.7	2767	10.11571	45
C3V	0.73289	19.625	14639	1503832	1832	5.84983223	0.07693	0.24	1.25E-05	0.014625667	0.711267	103	3151694.6	3385	9.901343	45
C5V	0.73289	4.273889	14126	677191.3	968	6.62134679	0.07693	0.24	1.25E-05	0.014625667	0.711267	103	1470790.8	1718	10.7685	46
LAW																
C2V	0.714181	19.625	11306	1146146	1463	4.86321045	0.074725	0.24	1.3E-05	0.014969167	0.709167	103	2945016	3179	9.517479	51
C3V	0.714181	12.56	12618	1023344	1336	5.55211763	0.074725	0.24	1.3E-05	0.014969167	0.709167	103	2356012.8	2600	9.730765	54
C5V	0.692684	19.625	11566	1102998	1406	5.13863125	0.070078	0.240306	1.35E-05	0.015829167	0.704639	103	2667979.7	2900	9.181011	79
LVP	0.783322	1.76625	10248	283451.1	492	6.1981629	0.065598	0.240706	1.37E-05	0.016705167	0.700239	103	736122.74	950	10.58511	107

Table 5. Stack Condensate Calculations III

	ρ	Cp	μ	k	Pr	V	Re	Nu	hw	Tw	q	Tdp	Tdp	hfg
	lb/ft^3	Btu/lb-°F	lb/ft-sec	BTU/hr-ft-°F	unitless	ft/sec	unitless	unitless	BTU/hr-°F-ft^2	°F	BTU/hr-ft^2	°C	°F	BTU/lb
PTF														
C2V	0.080965	0.24	1.16E-05	0.013997	0.71511	103	3217980.9	3457	10.753093	34	310.3323	15	58	1059.0
C3V	0.080403	0.24	1.18E-05	0.014085	0.714574	103	3629639.4	3858	10.515944	37	336.28	22	72	1052.9
C5V	0.079358	0.24	1.2E-05	0.014247	0.713579	103	3512318.4	3741	10.316703	43	392.4772	31	88	1046.6
PJV	0.079209	0.24	1.2E-05	0.014271	0.713437	103	2029889.9	2282	10.85723	45	433.2329	26	79	1049.0
PVV	0.082462	0.24	1.13E-05	0.013764	0.716535	103	1500000.5	1753	12.06241	24	229.6405	30	86	1048.4
HLW														
C2V	0.080361	0.24	1.18E-05	0.014091	0.714534	103	2572420.6	2822	10.845373	37	351.8393	20	67	1055.5
C3V (IHLW)	0.075942	0.24	1.28E-05	0.01478	0.710326	103	1222849.8	1464	10.820246	63	631.3456	57	134	1018.4
C3V	0.079664	0.24	1.19E-05	0.0142	0.71387	103	2859833.4	3104	10.577806	41	384.9952	29	84	1046.0
C5V	0.080591	0.24	1.17E-05	0.014055	0.714753	103	3062282.1	3304	10.716753	36	331.3559	16	61	1059.1
HOP A/B	0.071804	0.240151	1.34E-05	0.015492	0.76743	103	550513.47	779	12.064086	147	1707.21	61	142	1013.1
PJV	0.081634	0.24	1.15E-05	0.013893	0.715747	103	1217402.4	1463	12.195817	36	381.9745	11	52	1052.6
LAB														
C2V	0.079268	0.24	1.2E-05	0.014261	0.713493	103	2711578.8	2958	10.544542	44	407.529	31	88	1043.7
C3V	0.079199	0.24	1.2E-05	0.014272	0.713427	103	3382107.8	3614	10.316061	44	403.1636	32	90	1043.2
C5V	0.079033	0.24	1.21E-05	0.014298	0.71327	103	1570176.9	1821	11.156399	45	448.7634	31	88	1046.6
LAW														
C2V	0.078293	0.24	1.22E-05	0.014413	0.712565	103	3287843.7	3520	10.147974	49	443.8347	24	75	1051.1
C3V	0.077739	0.24	1.23E-05	0.0145	0.712038	103	2585379.5	2831	10.261624	52	486.378	24	75	1051.1
C5V	0.073734	0.24	1.32E-05	0.015123	0.708223	103	2857197	3091	9.3506123	78	679.8227	29	84	1046.0
LVP	0.070103	0.240303	1.35E-05	0.015824	0.704664	103	800761.38	1021	10.77557	106	1089.948	62	144	1011.6

Table 6. Stack Condensate Calculations IV

	Specifc Volume	Condensate mass flow rate per stack unit area	Stack inner surface area	Mass flow rate of condensate	Volumetric flow rate of condensate	Volumetric flow rate of condensate
	y	w	A	m	Q	Q
	lb/ft^3	lb/hr-ft^2	ft^2	lb/hr	gpm	gph
PTF						
C2V	0.01603	0.20	1073.9	209.4	0.4	25.1
C3V	0.01605	0.13	1233.0	154.6	0.3	18.6
C5V	0.01609	0.16	1233.0	191.1	0.4	23.0
PJV	0.01607	0.38	715.9	272.6	0.5	32.8
PVV	0.01609	0.20	477.3	96.2	0.2	11.6
HLW						
C2V	0.01604	0.26	426.0	109.0	0.2	13.1
C3V (IHLW)	0.01621	0.48	690.8	332.7	0.7	40.3
C3V	0.01602	0.19	1439.2	270.3	0.5	32.4
C5V	0.01603	0.20	1496.7	299.3	0.6	35.9
HOP A/B	0.01629	1.15	345.4	396.6	0.8	48.3
PJV	0.01602	0.11	575.7	61.3	0.1	7.3
LAB						
C2V	0.01602	0.19	979.7	188.0	0.4	22.5
C3V	0.01609	0.31	1224.6	373.8	0.7	45.0
C5V	0.01609	0.11	571.5	63.8	0.1	7.7
LAW						
C2V	0.01606	0.24	580.9	141.1	0.3	16.9
C3V	0.01606	0.27	1657.9	441.2	0.9	53.0
C5V	0.01608	0.30	2072.4	623.1	1.2	75.0
LVP	0.01630	0.87	607.6	528.6	1.1	64.5

APPENDIX B. CONDENSATE SENSITIVITY ANALYSIS

Table 7. Input Values for Stack Condensation Calculation

	Dry Air	Length of Stack	Diameter of Stack	Humidity Ratio	Relative Humidity	Offgas Stream Temperature	Theta	Saturation Vapor Pressure	Partial Vapor Pressure	Dew Point	Specific Volume	Air Density	Air Heat Capicity	Air Thermal Conductivity	Air Dynamic Viscosity	Air Prandtl Number	Reynolds Number (25 MPH)	Heat Transfer Coefficient	Reynolds Number (70 MPH)	Heat Transfer Coefficient
	$\dot{V}$	L	D	W_s	RH	T_g	ϑ	P_{ws}	P_w	T_{dp}	γ	ρ	Cp	k	μ	Pr	Re	$h_{i,25}$	Re	$h_{i,70}$
	SCFM	ft	ft	lb H2O/lb dry air	%	°F	-			°F	lbm/ft³	lbm/ft³	BTU/lbm-°F	BTU/hr-ft-°F	lbm/ft-s	-	-	BTU/hr-ft²-°F	-	BTU/hr-ft²-°F
PTF																				
C2V	63400	76	4.50	0.010	47.5	80	0.5367	34.99	16.62	58.3	0.016031	0.07350	0.24040	0.01481	1.247E-05	0.72900	9.57E+05	4.06	2.72E+06	9.38
C3V	72500	76	5.17	0.003	47.5	95	0.5238	56.29	26.74	71.9	0.016054	0.07153	0.24045	0.01517	1.273E-05	0.72675	1.05E+06	3.89	2.98E+06	8.98
C5V	70500	76	5.17	0.004	47.5	113	0.5083	95.95	45.58	88.2	0.016094	0.06927	0.24050	0.01559	1.304E-05	0.72405	9.90E+05	3.82	2.82E+06	8.82
PJV	40000	76	3.00	0.030	70	90	0.5281	48.20	33.74	78.9	0.016069	0.07217	0.24040	0.01505	1.265E-05	0.72750	6.18E+05	4.36	1.76E+06	10.06
PVV	4000	76	2.00	0.030	70	97	0.5221	59.84	41.89	85.6	0.016086	0.06762	0.24050	0.01592	1.327E-05	0.72202	3.68E+05	4.55	1.05E+06	10.51
HLW																				
C2V	40000	37	3.67	0.017	47.5	90	0.5281	48.20	22.89	67.4	0.016045	0.07217	0.24040	0.01505	1.265E-05	0.72750	7.55E+05	4.19	2.15E+06	9.67
C3V (IHLW)	10500	110	2.00	0.021	52.5	160	0.4680	327.32	171.84	134.3	0.016207	0.06402	0.24060	0.01669	1.382E-05	0.71740	3.34E+05	4.41	9.51E+05	10.19
C3V	47500	110	4.17	0.005	52.5	105	0.5152	76.07	39.94	84.1	0.016020	0.07026	0.24050	0.01541	1.290E-05	0.72525	8.19E+05	4.02	2.33E+06	9.28
C5V	51000	110	4.33	0.012	37	91	0.5272	49.73	18.40	61.1	0.016035	0.06290	0.24071	0.01694	1.400E-05	0.71597	7.03E+05	3.74	2.00E+06	8.64
HOP A/B	1812	110	1.00	0.130	1.6	369	0.2886	11806.20	188.90	137.7	0.016290	0.04791	0.24376	0.02134	1.699E-05	0.69859	1.02E+05	4.31	2.89E+05	9.95
PJV	2982	110	1.67	0.008	6.5	141	0.4843	204.66	13.30	52.4	0.016024	0.06604	0.24060	0.01625	1.351E-05	0.72006	2.94E+05	4.66	8.37E+05	10.76
LAB																				
C2V	42000	78	4.00	0.006	47.5	113	0.5083	95.95	45.58	88.2	0.016020	0.06927	0.24050	0.01559	1.304E-05	0.72405	7.67E+05	4.02	2.18E+06	9.28
C3V	69000	78	5.00	0.020	50	113	0.5083	95.95	47.98	89.9	0.016090	0.06927	0.24050	0.01559	1.304E-05	0.72405	9.58E+05	3.84	2.73E+06	8.87
C5V	14500	78	2.33	0.002	47.5	113	0.5083	95.95	45.58	88.2	0.016094	0.06927	0.24050	0.01559	1.304E-05	0.72405	4.47E+05	4.48	1.27E+06	10.33
LAW																				
C2V	56000	37	5.00	0.020	15	140	0.4852	199.47	29.92	75.4	0.016061	0.06615	0.24060	0.01623	1.349E-05	0.72020	8.85E+05	3.75	2.52E+06	8.65
C3V	40000	132	4.00	0.020	15	140	0.4852	199.47	29.92	75.4	0.016061	0.06615	0.24060	0.01623	1.349E-05	0.72020	7.08E+05	3.92	2.01E+06	9.04
C5V	64000	132	5.00	0.025	4	210	0.4251	974.62	38.98	83.4	0.016081	0.05928	0.24102	0.01784	1.462E-05	0.71134	7.32E+05	3.52	2.08E+06	8.12
LVP	3597	129	1.50	0.156	6	282	0.3632	3503.11	210.19	142.1	0.016304	0.05354	0.24201	0.01945	1.572E-05	0.70435	1.84E+05	4.23	5.25E+05	9.76

Table 8. Condensation Due to 25 MPH Winds

	Assumed Duct Wall Temperature	Film Temperature	Air Density	Air Heat Capicity	Air Thermal Conductivity	Air Dynamic Viscosity	Air Prandtl Number	Reynolds Number	Nusselt Number	Heat Transfer Coefficient	Heat Flux	Heat of Vaporization	Condensate Potential	Mass Transfer Coefficient	Evaporation Potential	Potential Volumetric Flow Rate
	$T_{s,i}$	T_f	ρ	Cp	k	μ	Pr	Re	Nu	h_n	q"	h_{fg}	m_{cond}	h_M	m_{evap}	Q
	°F	°F	lbm/ft³	BTU/lbm-°F	BTU/hr-ft-°F	lbm/ft-s	-	-	-	BTU/hr-ft²-°F	BTU/hr-ft²	BTU/lb	lbm/hr	ft/h	lbm/hr	gph
PTF																
C2V	43	25	0.08182	0.24030	0.01349	1.149E-05	0.7371	1.16E+06	1416.09	4.245	157.1	1059.0	106	6	62	5.3
C3V	50	29	0.08123	0.24030	0.01358	1.156E-05	0.7363	1.31E+06	1576.24	4.142	186.4	1052.9	86	6	79	0.8
C5V	51	23	0.08219	0.24030	0.01344	1.145E-05	0.7375	1.34E+06	1605.68	4.175	258.9	1046.6	126	5	103	2.7
PJV	41	18	0.08305	0.24028	0.01331	1.136E-05	0.7383	7.91E+05	1030.37	4.572	224.0	1049.0	141	7	65	9.1
PVV	44	20	0.08270	0.24030	0.01336	1.140E-05	0.7382	5.23E+05	736.50	4.920	260.8	1048.4	109	9	56	6.4
HLW																
C2V	48	28	0.08140	0.24030	0.01355	1.154E-05	0.7365	9.33E+05	1181.28	4.366	183.4	1055.5	57	7	31	3.1
C3V (IHLW)	81	44	0.07873	0.24040	0.01395	1.184E-05	0.7342	4.80E+05	686.07	4.786	378.1	1018.4	199	9	124	9.0
C3V	55	31	0.08082	0.24031	0.01364	1.160E-05	0.7359	1.05E+06	1301.31	4.260	213.0	1046.0	150	6	115	4.1
C5V	40	18	0.08314	0.24028	0.01330	1.135E-05	0.7383	1.15E+06	1405.75	4.315	220.0	1059.1	199	6	110	10.7
HOP A/B	160	78	0.07385	0.24040	0.01475	1.243E-05	0.7292	2.14E+05	370.92	5.471	1143.5	1013.1	273	11	187	10.6
PJV	65	30	0.08101	0.24030	0.01361	1.158E-05	0.7360	4.21E+05	619.09	5.055	384.2	1052.6	62	9	105	
LAB																
C2V	59	33	0.08049	0.24033	0.01369	1.164E-05	0.7357	9.98E+05	1249.47	4.275	230.9	1043.7	106	6	87	2.4
C3V	58	33	0.08049	0.24033	0.01369	1.164E-05	0.7357	1.25E+06	1510.79	4.136	227.5	1043.2	211	6	95	14.0
C5V	52	24	0.08211	0.24030	0.01345	1.146E-05	0.7374	6.03E+05	824.73	4.753	289.9	1046.6	41	8	72	
LAW																
C2V	71	39	0.07952	0.24039	0.01383	1.175E-05	0.7349	1.22E+06	1482.75	4.102	283.0	1051.1	90	6	56	4.1
C3V	71	39	0.07952	0.24039	0.01383	1.175E-05	0.7349	9.77E+05	1226.67	4.241	292.7	1051.1	265	6	178	10.5
C5V	95	45	0.07861	0.24040	0.01397	1.185E-05	0.7341	1.20E+06	1456.47	4.069	468.0	1046.0	428	5	306	14.7
LVP	126	61	0.07626	0.24040	0.01434	1.213E-05	0.7319	3.40E+05	524.33	5.013	782.1	1011.6	387	9	218	20.7

Table 9. Condensation Due to 70 MPH Winds

	Assumed Duct Wall Temperature	Film Temperature	Air Density	Air Heat Capicity	Air Thermal Conductivity	Air Dynamic Viscosity	Air Prandtl Number	Reynolds Number	Nusselt Number	Heat Transfer Coefficient	Heat Flux	Heat of Vaporization	Condensate Potential	Mass Transfer Coefficient	Evaporation Potential	Potential Volumetric Flow Rate
	$T_{s,i}$	T_f	ρ	Cp	k	μ	Pr	Re	Nu	h_n	q"	h_{fg}	m_{cond}	h_M	m_{evap}	Q
	°F	°F	lbm/ft³	BTU/lbm-°F	BTU/hr-ft-°F	lbm/ft-s	-	-	-	BTU/hr-ft²-°F	BTU/hr-ft²	BTU/lb	lbm/hr	ft/h	lbm/hr	gph
PTF																
C2V	41	24	0.08199	0.24030	0.01347	1.148E-05	0.7373	3.30E+06	3581.60	10.717	418.0	1059.0	282	10	98	22
C3V	48	28	0.08140	0.24030	0.01355	1.154E-05	0.7365	3.74E+06	4015.22	10.532	495.0	1052.9	228	9	127	12
C5V	48	22	0.08245	0.24030	0.01340	1.143E-05	0.7378	3.83E+06	4101.93	10.637	691.4	1046.6	336	9	165	21
PJV	40	18	0.08314	0.24028	0.01330	1.135E-05	0.7383	2.26E+06	2541.65	11.268	563.4	1049.0	355	12	107	30
PVV	43	19	0.08288	0.24029	0.01334	1.138E-05	0.7382	1.50E+06	1768.91	11.795	636.9	1048.4	267	15	93	21
HLW																
C2V	46	27	0.08157	0.24030	0.01353	1.152E-05	0.7367	2.67E+06	2949.55	10.882	478.8	1055.5	148	11	49	12
C3V (IHLW)	79	43	0.07889	0.24040	0.01393	1.182E-05	0.7344	1.37E+06	1637.08	11.400	923.4	1018.4	486	15	204	34
C3V	53	30	0.08101	0.24030	0.01361	0.00001	0.7360	2.99E+06	3273.97	10.694	556.1	1046.0	390	10	186	24
C5V	37	16	0.08340	0.24026	0.01326	1.132E-05	0.7384	3.28E+06	3559.95	10.897	588.4	1059.1	531	10	173	43
HOP A/B	163	79	0.07364	0.24040	0.01479	1.245E-05	0.7289	6.07E+05	825.40	12.204	2514.1	1013.1	601	19	320	34
PJV	64	30	0.08101	0.24030	0.01361	1.158E-05	0.7360	1.20E+06	1458.34	11.909	917.0	1052.6	147	16	174	
LAB																
C2V	56	32	0.08073	0.24032	0.01365	1.161E-05	0.7358	2.86E+06	3137.54	10.707	610.3	1043.7	281	11	138	17
C3V	56	32	0.08073	0.24032	0.01365	1.161E-05	0.7358	3.57E+06	3843.87	10.494	598.2	1043.2	555	10	154	48
C5V	51	23	0.08219	0.24030	0.01344	1.145E-05	0.7375	1.72E+06	1997.39	11.501	713.0	1046.6	101	13	120	
LAW																
C2V	68	38	0.07976	0.24038	0.01379	1.172E-05	0.7351	3.49E+06	3767.99	10.396	748.5	1051.1	238	9	90	18
C3V	68	38	0.07976	0.24038	0.01379	1.172E-05	0.7351	2.80E+06	3076.28	10.609	763.9	1051.1	693	11	287	49
C5V	90	43	0.07900	0.24040	0.01391	1.181E-05	0.7345	3.44E+06	3708.78	10.318	1238.1	1046.0	1133	9	493	77
LVP	126	61	0.07626	0.24040	0.01434	1.213E-05	0.7319	9.68E+05	1215.31	11.620	1812.7	1011.6	897	16	367	65

APPENDIX C. STACK RE-ENTRAINMENT CALCULATIONS

Table 10. Dilution Factor for LAB Intake (5% Frequency)

5% Wind Frequency	Zo =	0.16	ft		n =	0.12												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	0.69	13.80	4.36E+07	37.79	27.24	27.24	0.77	144.48	14.94	129.54	1.40	144.48	0.12	23.42	15.61	25.38	17.57	5.81E+12
LAB C3V	0.67	13.80	7.66E+07	46.53	37.22	37.22	0.11	155.11	14.94	140.17	1.75	155.11	0.11	23.17	15.45	26.24	18.51	1.70E+13
LAB C5V	0.68	13.80	1.57E+07	27.19	16.63	16.63	0.25	134.38	14.94	119.44	0.82	134.38	0.12	23.67	15.78	24.33	16.45	6.66E+12
LAW C2V	1.21	15.38	4.90E+07	18.24	8.24	8.24	9.33	103.91	28.30	75.61	1.75	103.91	0.12	33.69	22.46	36.75	25.52	1.60E+03
LAWC3V	1.10	15.38	4.10E+07	18.31	8.28	8.28	6.81	201.47	28.30	173.17	1.40	201.47	0.11	30.56	20.38	32.52	22.34	2.38E+14
LAW C5V	1.08	15.38	6.81E+07	21.99	10.91	10.91	8.31	202.60	28.30	174.30	1.75	202.60	0.11	30.54	20.36	33.60	23.42	1.50E+13
LAW LVP	0.95	15.38	9.00E+06	12.21	4.51	4.51	2.07	202.45	28.30	174.14	0.53	202.45	0.11	30.54	20.36	30.82	20.64	3.04E+17
HLW C2V	1.06	15.83	4.12E+07	20.90	8.59	8.59	5.93	73.66	31.98	41.68	1.28	73.66	0.13	50.73	33.82	52.38	35.47	1.67E+02
HLW C3V	0.65	15.83	5.32E+07	63.43	35.97	35.97	-0.59	236.56	31.98	204.58	1.46	236.56	0.11	67.92	45.28	70.04	47.41	2.04E+06
HLW C5V	0.66	15.83	5.43E+07	63.26	35.83	35.83	-0.23	236.05	31.98	204.07	1.52	236.05	0.11	67.94	45.29	70.24	47.59	1.74E+06
HLW IHLW	0.67	15.83	1.09E+07	36.67	15.81	15.81	0.08	215.74	31.98	183.76	0.70	215.74	0.11	68.79	45.86	69.28	46.35	2.12E+06
HLW PJV	1.45	15.83	6.94E+05	8.77	1.85	1.85	3.50	198.35	31.98	166.37	0.58	198.35	0.11	69.60	46.40	69.94	46.74	2.24E+06
HLW HOP	0.75	15.83	1.82E+06	18.83	5.82	5.82	0.58	205.24	31.98	173.26	0.35	205.24	0.11	69.27	46.18	69.39	46.30	4.41E+06
PTF C2V	0.62	16.63	8.10E+07	59.11	45.40	45.40	-1.95	247.35	39.64	207.71	1.58	247.35	0.11	36.04	24.02	38.52	26.50	4.93E+14
PTF C3V	0.67	16.63	8.18E+07	56.80	42.76	42.76	-0.02	242.78	39.64	203.15	1.81	242.78	0.11	36.13	24.08	39.40	27.35	1.96E+13
PTF C5V	0.68	16.63	7.71E+07	55.17	40.94	40.94	0.42	240.52	39.64	200.88	1.81	240.52	0.11	36.17	24.12	39.44	27.39	1.03E+13
PTF PJV	0.53	16.63	7.57E+07	64.14	51.31	51.31	-5.94	257.25	39.64	217.61	1.05	257.25	0.11	35.84	23.90	36.95	25.00	9.08E+17
PTF PVV	1.23	16.63	1.69E+06	10.36	3.33	3.33	3.77	199.56	39.64	159.93	0.70	199.56	0.11	37.12	24.75	37.61	25.24	1.73E+11
																	Min	**1.67E+02**
5% Wind Frequency	Zo =	0.08	ft		n =	0.10												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	0.69	15.54	4.36E+07	37.79	28.90	28.90	0.77	146.14	14.94	131.20	1.40	146.14	0.10	19.78	13.18	21.74	15.14	1.34E+17
LAB C3V	0.67	15.54	7.66E+07	46.53	39.49	39.49	0.11	157.38	14.94	142.44	1.75	157.38	0.10	19.58	13.06	22.65	16.12	4.11E+17
LAB C5V	0.68	15.54	1.57E+07	27.19	17.64	17.64	0.25	135.39	14.94	120.45	0.82	135.39	0.10	19.98	13.32	20.65	13.99	2.15E+17
LAW C2V	1.21	17.11	4.90E+07	18.24	8.69	8.69	9.33	104.36	28.30	76.06	1.75	104.36	0.10	28.34	18.90	31.41	21.96	5.90E+03
LAWC3V	1.10	17.11	4.10E+07	18.31	8.74	8.74	6.81	201.93	28.30	173.63	1.40	201.93	0.09	25.96	17.30	27.92	19.26	6.79E+18
LAW C5V	1.08	17.11	6.81E+07	21.99	11.51	11.51	8.31	203.19	28.30	174.89	1.75	203.19	0.09	25.94	17.29	29.00	20.35	1.15E+17
LAW LVP	0.95	17.11	9.00E+06	12.21	4.76	4.76	2.07	202.69	28.30	174.39	0.53	202.69	0.09	25.94	17.30	26.22	17.57	1.86E+23
HLW C2V	1.06	17.56	4.12E+07	20.90	9.05	9.05	5.93	74.11	31.98	42.14	1.28	74.11	0.11	42.44	28.29	44.09	29.94	*1.60E+02*
HLW C3V	1.06	17.56	5.32E+07	45.95	23.36	23.36	-0.59	223.95	31.98	191.98	1.46	223.95	0.09	58.21	38.81	60.34	40.93	8.19E+06
HLW C5V	1.08	17.56	5.43E+07	45.65	23.14	23.14	-0.23	223.36	31.98	191.39	1.52	223.36	0.09	58.23	38.82	60.53	41.12	6.65E+06
HLW IHLW	1.10	17.56	1.09E+07	26.36	10.15	10.15	0.08	210.08	31.98	178.10	0.70	210.08	0.09	58.68	39.12	59.17	39.61	1.47E+07
HLW PJV	2.87	17.56	6.94E+05	5.57	0.98	0.98	3.50	197.48	31.98	165.50	0.58	197.48	0.09	59.15	39.43	59.49	39.77	1.65E+07
HLW HOP	1.27	17.56	1.82E+06	13.20	3.60	3.60	0.58	203.02	31.98	171.04	0.35	203.02	0.09	58.94	39.29	59.06	39.41	3.57E+07
PTF C2V	0.62	18.37	8.10E+07	59.11	47.71	47.71	-1.95	249.66	39.64	210.02	1.58	249.66	0.09	30.65	20.44	33.13	22.92	2.92E+19
PTF C3V	0.67	18.37	8.18E+07	56.80	44.93	44.93	-0.02	244.95	39.64	205.32	1.81	244.95	0.09	30.73	20.48	34.00	23.75	2.60E+17
PTF C5V	0.68	18.37	7.71E+07	55.17	43.02	43.02	0.42	242.60	39.64	202.96	1.81	242.60	0.09	30.76	20.51	34.03	23.78	1.06E+17
PTF PJV	0.53	18.37	7.57E+07	64.14	53.92	53.92	-5.94	259.85	39.64	220.22	1.05	259.85	0.09	30.50	20.33	31.60	21.44	1.93E+24
PTF PVV	1.23	18.37	1.69E+06	10.36	3.50	3.50	3.77	199.73	39.64	160.10	0.70	199.73	0.09	31.53	21.02	32.02	21.51	2.56E+14
																	Min	**1.60E+02**
5% Wind Frequency	Zo =	0.24	ft		n =	0.14												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	0.69	12.79	4.36E+07	37.79	26.23	26.23	0.77	143.46	14.94	128.52	1.40	143.46	0.13	25.77	17.18	27.73	19.14	6.75E+10
LAB C3V	0.67	12.79	7.66E+07	46.53	35.83	35.83	0.11	153.72	14.94	138.78	1.75	153.72	0.13	25.49	16.99	28.55	20.06	1.76E+11
LAB C5V	0.68	12.79	1.57E+07	27.19	16.00	16.00	0.25	133.76	14.94	118.81	0.82	133.76	0.13	26.05	17.37	26.72	18.04	7.49E+10
LAW C2V	1.21	14.36	4.90E+07	18.24	7.96	7.96	9.33	103.64	28.30	75.34	1.75	103.64	0.13	37.17	24.78	40.23	27.84	9.24E+02
LAWC3V	1.10	14.36	4.10E+07	18.31	8.01	8.01	6.81	201.19	28.30	172.89	1.40	201.19	0.12	33.50	22.34	35.46	24.30	2.48E+12
LAW C5V	1.08	14.36	6.81E+07	21.99	10.54	10.54	8.31	202.23	28.30	173.93	1.75	202.23	0.12	33.48	22.32	36.54	25.38	2.63E+11
LAW LVP	0.95	14.36	9.00E+06	12.21	4.36	4.36	2.07	202.29	28.30	173.99	0.53	202.29	0.12	33.48	22.32	33.75	22.59	9.51E+14
HLW C2V	1.06	14.82	4.12E+07	20.90	8.31	8.31	5.93	73.38	31.98	41.40	1.28	73.38	0.14	56.19	37.46	57.84	39.11	1.78E+02
HLW C3V	1.06	14.82	5.32E+07	45.95	21.46	21.46	-0.59	222.05	31.98	190.07	1.46	222.05	0.12	75.03	50.02	77.15	52.15	1.71E+05
HLW C5V	1.08	14.82	5.43E+07	45.65	21.25	21.25	-0.23	221.48	31.98	189.50	1.52	221.48	0.12	75.06	50.04	77.36	52.34	1.50E+05
HLW IHLW	1.10	14.82	1.09E+07	26.36	9.32	9.32	0.08	209.25	31.98	177.27	0.70	209.25	0.12	75.69	50.46	76.18	50.95	4.22E+05
HLW PJV	2.87	14.82	6.94E+05	5.57	0.90	0.90	3.50	197.40	31.98	165.42	0.58	197.40	0.12	76.34	50.90	76.68	51.24	8.75E+05
HLW HOP	1.27	14.82	1.82E+06	13.20	3.30	3.30	0.58	202.73	31.98	170.75	0.35	202.73	0.12	76.04	50.69	76.16	50.82	1.37E+06
PTF C2V	0.62	15.62	8.10E+07	59.11	43.99	43.99	-1.95	245.94	39.64	206.31	1.58	245.94	0.12	39.46	26.31	41.94	28.79	3.82E+12
PTF C3V	0.67	15.62	8.18E+07	56.80	41.44	41.44	-0.02	241.46	39.64	201.82	1.81	241.46	0.12	39.56	26.38	42.83	29.65	2.83E+11
PTF C5V	0.68	15.62	7.71E+07	55.17	39.67	39.67	0.42	239.25	39.64	199.61	1.81	239.25	0.12	39.62	26.41	42.89	29.68	1.67E+11
PTF PJV	0.53	15.62	7.57E+07	64.14	49.72	49.72	-5.94	255.66	39.64	216.02	1.05	255.66	0.12	39.24	26.16	40.34	27.26	1.63E+15
PTF PVV	1.23	15.62	1.69E+06	10.36	3.23	3.23	3.77	199.46	39.64	159.82	0.70	199.46	0.12	40.69	27.13	41.18	27.62	7.38E+09
																	Min	**1.78E+02**
																	Overall Minimum	*1.60E+02*

Table 11. Dilution Factor for LAB Intake (10% Frequency)

10% Wind Frequency	Zo =	0.16	ft		n =	0.12												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	0.80	13.80	4.36E+07	28.63	17.97	17.97	3.41	132.56	14.94	117.61	1.40	132.56	0.12	23.72	15.81	25.68	17.77	1.73E+11
LAB C3V	0.77	13.80	7.66E+07	35.35	24.64	24.64	3.61	139.03	14.94	124.09	1.75	139.03	0.12	23.55	15.70	26.61	18.76	1.11E+11
LAB C5V	0.79	13.80	1.57E+07	20.63	10.99	10.99	1.84	127.15	14.94	112.21	0.82	127.15	0.12	23.86	15.91	24.53	16.58	1.20E+12
LAW C2V	1.21	15.38	4.90E+07	18.24	8.24	8.24	9.33	103.91	28.30	75.61	1.75	103.91	0.12	33.69	22.46	36.75	25.52	1.07E+04
LAWC3V	1.10	15.38	4.10E+07	18.31	8.28	8.28	6.81	201.47	28.30	173.17	1.40	201.47	0.11	30.56	20.38	32.52	22.34	1.58E+15
LAW C5V	1.08	15.38	6.81E+07	21.99	10.91	10.91	8.31	202.60	28.30	174.30	1.75	202.60	0.11	30.54	20.36	33.60	23.42	9.98E+13
LAW LVP	0.95	15.38	9.00E+06	12.21	4.51	4.51	2.07	202.45	28.30	174.14	0.53	202.45	0.11	30.54	20.36	30.82	20.64	2.02E+18
HLW C2V	1.06	15.83	4.12E+07	20.90	8.59	8.59	5.93	73.66	31.98	41.68	1.28	73.66	0.13	50.73	33.82	52.38	35.47	7.98E+02
HLW C3V	1.06	15.83	5.32E+07	26.58	9.76	9.76	6.74	203.02	31.98	171.04	1.46	203.02	0.11	69.37	46.25	71.50	48.37	2.99E+05
HLW C5V	1.08	15.83	5.43E+07	26.41	9.66	9.66	7.18	202.48	31.98	170.51	1.52	202.48	0.11	69.40	46.26	71.70	48.57	2.62E+05
HLW IHLW	1.10	15.83	1.09E+07	15.25	4.24	4.24	3.39	200.85	31.98	168.87	0.70	200.85	0.11	69.48	46.32	69.97	46.81	1.68E+06
HLW PJV	2.87	15.83	6.94E+05	3.22	0.41	0.41	4.34	196.07	31.98	164.09	0.58	196.07	0.11	69.71	46.47	70.05	46.81	5.57E+06
HLW HOP	1.27	15.83	1.82E+06	7.63	1.50	1.50	1.93	199.57	31.98	167.59	0.35	199.57	0.11	69.54	46.36	69.66	46.48	8.08E+06
PTF C2V	0.95	16.63	8.10E+07	27.09	14.08	14.08	6.21	207.88	39.64	168.24	1.58	207.88	0.11	36.91	24.61	39.39	27.09	3.10E+10
PTF C3V	1.04	16.63	8.18E+07	25.61	12.95	12.95	8.17	204.78	39.64	165.14	1.81	204.78	0.11	36.99	24.66	40.26	27.93	4.65E+09
PTF C5V	1.06	16.63	7.71E+07	24.79	12.33	12.33	8.38	203.95	39.64	164.31	1.81	203.95	0.11	37.01	24.67	40.28	27.94	3.95E+09
PTF PJV	0.76	16.63	7.57E+07	30.77	17.05	17.05	1.95	215.10	39.64	175.46	1.05	215.10	0.11	36.73	24.49	37.84	25.59	2.95E+12
PTF PVV	2.23	16.63	1.69E+06	4.22	0.87	0.87	4.95	195.92	39.64	156.28	0.70	195.92	0.11	37.22	24.81	37.71	25.30	3.49E+11
																	Min	7.98E+02

10% Wind Frequency	Zo =	0.08	ft		n =	0.10												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	0.80	15.54	4.36E+07	28.63	19.06	19.06	3.41	133.65	14.94	118.71	1.40	133.65	0.10	20.01	13.34	21.97	15.30	4.57E+14
LAB C3V	0.77	15.54	7.66E+07	35.35	26.14	26.14	3.61	140.53	14.94	125.59	1.75	140.53	0.10	19.88	13.25	22.94	16.32	1.93E+14
LAB C5V	0.79	15.54	1.57E+07	20.63	11.66	11.66	1.84	127.82	14.94	112.88	0.82	127.82	0.10	20.14	13.42	20.80	14.09	8.38E+15
LAW C2V	1.21	17.11	4.90E+07	18.24	8.69	8.69	9.33	104.36	28.30	76.06	1.75	104.36	0.10	28.34	18.90	31.41	21.96	3.92E+04
LAWC3V	1.10	17.11	4.10E+07	18.31	8.74	8.74	6.81	201.93	28.30	173.63	1.40	201.93	0.09	25.96	17.30	27.92	19.26	4.52E+19
LAW C5V	1.08	17.11	6.81E+07	21.99	11.51	11.51	8.31	203.19	28.30	174.89	1.75	203.19	0.09	25.94	17.29	29.00	20.35	7.65E+17
LAW LVP	0.95	17.11	9.00E+06	12.21	4.76	4.76	2.07	202.69	28.30	174.39	0.53	202.69	0.09	25.94	17.30	26.22	17.57	1.24E+24
HLW C2V	1.06	17.56	4.12E+07	20.90	9.05	9.05	5.93	74.11	31.98	42.14	1.28	74.11	0.11	42.44	28.29	44.09	29.94	7.65E+02
HLW C3V	1.06	17.56	5.32E+07	26.58	10.28	10.28	6.74	203.54	31.98	171.56	1.46	203.54	0.09	58.92	39.28	61.05	41.41	2.25E+06
HLW C5V	1.08	17.56	5.43E+07	26.41	10.18	10.18	7.18	203.00	31.98	171.02	1.52	203.00	0.09	58.94	39.29	61.24	41.59	1.90E+06
HLW IHLW	1.10	17.56	1.09E+07	15.25	4.47	4.47	3.39	201.07	31.98	169.10	0.70	201.07	0.09	59.01	39.34	59.50	39.83	1.49E+07
HLW PJV	2.87	17.56	6.94E+05	3.22	0.43	0.43	4.34	196.09	31.98	164.11	0.58	196.09	0.09	59.20	39.47	59.54	39.81	4.24E+07
HLW HOP	1.27	17.56	1.82E+06	7.63	1.58	1.58	1.93	199.65	31.98	167.67	0.35	199.65	0.09	59.06	39.38	59.19	39.50	7.18E+07
PTF C2V	0.95	18.37	8.10E+07	27.09	14.80	14.80	6.21	208.59	39.64	168.96	1.58	208.59	0.09	31.35	20.90	33.83	23.38	2.10E+13
PTF C3V	1.04	18.37	8.18E+07	25.61	13.61	13.61	8.17	205.43	39.64	165.80	1.81	205.43	0.09	31.41	20.94	34.68	24.21	1.35E+12
PTF C5V	1.06	18.37	7.71E+07	24.79	12.96	12.96	8.38	204.58	39.64	164.94	1.81	204.58	0.09	31.43	20.95	34.70	24.22	1.07E+12
PTF PJV	0.76	18.37	7.57E+07	30.77	17.92	17.92	1.95	215.97	39.64	176.33	1.05	215.97	0.09	31.22	20.81	32.32	21.91	1.54E+16
PTF PVV	2.23	18.37	1.69E+06	4.22	0.91	0.91	4.95	195.96	39.64	156.33	0.70	195.96	0.09	31.60	21.07	32.09	21.56	3.43E+14
																	Min	7.65E+02

10% Wind Frequency	Zo =	0.24	ft		n =	0.14												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	0.80	12.79	4.36E+07	28.63	17.30	17.30	3.41	131.88	14.94	116.94	1.40	131.88	0.13	26.11	17.41	28.07	19.37	5.23E+09
LAB C3V	0.77	12.79	7.66E+07	35.35	23.72	23.72	3.61	138.11	14.94	123.16	1.75	138.11	0.13	25.92	17.28	28.98	20.34	3.77E+09
LAB C5V	0.79	12.79	1.57E+07	20.63	10.58	10.58	1.84	126.74	14.94	111.80	0.82	126.74	0.13	26.28	17.52	26.94	18.18	2.62E+10
LAW C2V	1.21	14.36	4.90E+07	18.24	7.96	7.96	9.33	103.64	28.30	75.34	1.75	103.64	0.13	37.17	24.78	40.23	27.84	6.15E+03
LAWC3V	1.10	14.36	4.10E+07	18.31	8.01	8.01	6.81	201.19	28.30	172.89	1.40	201.19	0.12	33.50	22.34	35.46	24.30	1.65E+13
LAW C5V	1.08	14.36	6.81E+07	21.99	10.54	10.54	8.31	202.23	28.30	173.93	1.75	202.23	0.12	33.48	22.32	36.54	25.38	1.75E+12
LAW LVP	0.95	14.36	9.00E+06	12.21	4.36	4.36	2.07	202.29	28.30	173.99	0.53	202.29	0.12	33.48	22.32	33.75	22.59	6.33E+15
HLW C2V	1.06	14.82	4.12E+07	20.90	8.31	8.31	5.93	73.38	31.98	41.40	1.28	73.38	0.14	56.19	37.46	57.84	39.11	8.53E+02
HLW C3V	1.06	14.82	5.32E+07	26.58	9.44	9.44	6.74	202.70	31.98	170.72	1.46	202.70	0.12	76.04	50.69	78.17	52.82	1.28E+05
HLW C5V	1.08	14.82	5.43E+07	26.41	9.35	9.35	7.18	202.17	31.98	170.19	1.52	202.17	0.12	76.07	50.71	78.37	53.02	1.14E+05
HLW IHLW	1.10	14.82	1.09E+07	15.25	4.10	4.10	3.39	200.71	31.98	168.73	0.70	200.71	0.12	76.15	50.77	76.64	51.26	6.79E+05
HLW PJV	2.87	14.82	6.94E+05	3.22	0.40	0.40	4.34	196.06	31.98	164.08	0.58	196.06	0.12	76.42	50.95	76.76	51.29	2.40E+06
HLW HOP	1.27	14.82	1.82E+06	7.63	1.45	1.45	1.93	199.52	31.98	167.54	0.35	199.52	0.12	76.22	50.81	76.34	50.94	3.26E+06
PTF C2V	0.95	15.62	8.10E+07	27.09	13.65	13.65	6.21	207.44	39.64	167.81	1.58	207.44	0.12	40.45	26.97	42.93	29.45	1.73E+09
PTF C3V	1.04	15.62	8.18E+07	25.61	12.55	12.55	8.17	204.37	39.64	164.74	1.81	204.37	0.12	40.54	27.03	43.81	30.30	3.69E+08
PTF C5V	1.06	15.62	7.71E+07	24.79	11.95	11.95	8.38	203.57	39.64	163.93	1.81	203.57	0.12	40.57	27.04	43.84	30.31	3.24E+08
PTF PJV	0.76	15.62	7.57E+07	30.77	16.52	16.52	1.95	214.57	39.64	174.94	1.05	214.57	0.12	40.25	26.83	41.35	27.94	7.14E+10
PTF PVV	2.23	15.62	1.69E+06	4.22	0.84	0.84	4.95	195.89	39.64	156.26	0.70	195.89	0.12	40.80	27.20	41.29	27.69	1.79E+10
																	Min	8.53E+02
																Overall Minimum		7.65E+02

Table 12. Dilution Factor for LAB Intake (15% Frequency)

15% Wind Frequency	Zo =	0.16	ft		n =	0.12												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	1.02	13.80	4.36E+07	18.84	9.59	9.59	6.16	121.43	14.94	106.49	1.40	121.43	0.12	24.03	16.02	25.99	17.98	3.32E+09
LAB C3V	0.98	13.80	7.66E+07	23.34	13.22	13.22	7.26	123.97	14.94	109.02	1.75	123.97	0.12	23.95	15.97	27.02	19.03	*7.09E+08*
LAB C5V	1.00	13.80	1.57E+07	13.60	5.88	5.88	3.49	120.39	14.94	105.45	0.82	120.39	0.12	24.06	16.04	24.73	16.71	9.02E+10
PTF C2V	0.95	16.63	8.10E+07	27.09	14.08	14.08	6.21	207.88	39.64	168.24	1.58	207.88	0.11	36.91	24.61	39.39	27.09	3.10E+10
PTF C3V	1.04	16.63	8.18E+07	25.61	12.95	12.95	8.17	204.78	39.64	165.14	1.81	204.78	0.11	36.99	24.66	40.26	27.93	4.65E+09
PTF C5V	1.06	16.63	7.71E+07	24.79	12.33	12.33	8.38	203.95	39.64	164.31	1.81	203.95	0.11	37.01	24.67	40.28	27.94	3.95E+09
PTF PJV	0.76	16.63	7.57E+07	30.77	17.05	17.05	1.95	215.10	39.64	175.46	1.05	215.10	0.11	36.73	24.49	37.84	25.59	2.95E+12
PTF PVV	2.23	16.63	1.69E+06	4.22	0.87	0.87	4.95	195.92	39.64	156.28	0.70	195.92	0.11	37.22	24.81	37.71	25.30	3.49E+11
																	Min	**7.09E+08**
15% Wind Frequency	Zo =	0.08	ft		n =	0.10												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	1.02	15.54	4.36E+07	18.84	10.17	10.17	6.16	122.02	14.94	107.07	1.40	122.02	0.10	20.26	13.51	22.22	15.47	1.49E+12
LAB C3V	0.98	15.54	7.66E+07	23.34	14.03	14.03	7.26	124.77	14.94	109.83	1.75	124.77	0.10	20.20	13.47	23.26	16.53	1.53E+11
LAB C5V	1.00	15.54	1.57E+07	13.60	6.24	6.24	3.49	120.75	14.94	105.81	0.82	120.75	0.10	20.29	13.53	20.96	14.19	1.69E+14
PTF C2V	0.95	18.37	8.10E+07	27.09	14.80	14.80	6.21	208.59	39.64	168.96	1.58	208.59	0.09	31.35	20.90	33.83	23.38	2.10E+13
PTF C3V	1.04	18.37	8.18E+07	25.61	13.61	13.61	8.17	205.43	39.64	165.80	1.81	205.43	0.09	31.41	20.94	34.68	24.21	1.35E+12
PTF C5V	1.06	18.37	7.71E+07	24.79	12.96	12.96	8.38	204.58	39.64	164.94	1.81	204.58	0.09	31.43	20.95	34.70	24.22	1.07E+12
PTF PJV	0.76	18.37	7.57E+07	30.77	17.92	17.92	1.95	215.97	39.64	176.33	1.05	215.97	0.09	31.22	20.81	32.32	21.91	1.54E+16
PTF PVV	2.23	18.37	1.69E+06	4.22	0.91	0.91	4.95	195.96	39.64	156.33	0.70	195.96	0.09	31.60	21.07	32.09	21.56	3.43E+14
																	Min	**1.53E+11**
15% Wind Frequency	Zo =	0.24	ft		n =	0.10												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	1.02	12.79	4.36E+07	18.84	9.23	9.23	6.16	121.07	14.94	106.13	1.40	121.07	0.10	20.14	13.42	22.10	15.38	1.26E+12
LAB C3V	0.98	12.79	7.66E+07	23.34	12.73	12.73	7.26	123.47	14.94	108.53	1.75	123.47	0.10	20.07	13.38	23.13	16.44	1.13E+11
LAB C5V	1.00	12.79	1.57E+07	13.60	5.66	5.66	3.49	120.17	14.94	105.23	0.82	120.17	0.10	20.16	13.44	20.83	14.11	1.74E+14
PTF C2V	0.95	15.62	8.10E+07	27.09	13.65	13.65	6.21	207.44	39.64	167.81	1.58	207.44	0.09	30.77	20.52	33.25	23.00	3.41E+13
PTF C3V	1.04	15.62	8.18E+07	25.61	12.55	12.55	8.17	204.37	39.64	164.74	1.81	204.37	0.09	30.84	20.56	34.11	23.83	2.05E+12
PTF C5V	1.06	15.62	7.71E+07	24.79	11.95	11.95	8.38	203.57	39.64	163.93	1.81	203.57	0.09	30.86	20.57	34.13	23.84	1.63E+12
PTF PJV	0.76	15.62	7.57E+07	30.77	16.52	16.52	1.95	214.57	39.64	174.94	1.05	214.57	0.09	30.62	20.41	31.72	21.52	2.92E+16
PTF PVV	2.23	15.62	1.69E+06	4.22	0.84	0.84	4.95	195.89	39.64	156.26	0.70	195.89	0.09	31.04	20.69	31.53	21.18	8.34E+14
																	Min	**1.13E+11**
																Overall Minimum		*7.09E+08*

Table 13. Dilution Factor for LAB Intake (20% Frequency)

20% Wind Frequency	Zo =	0.16	ft		n =	0.12												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	0.99	13.80	4.36E+07	19.71	10.26	10.26	5.92	122.35	14.94	107.40	1.40	122.35	0.12	24.00	16.00	25.96	17.96	4.46E+09
LAB C3V	0.95	13.80	7.66E+07	24.41	14.14	14.14	6.94	125.21	14.94	110.27	1.75	125.21	0.12	23.92	15.95	26.98	19.01	*1.03E+09*
LAB C5V	0.97	13.80	1.57E+07	14.22	6.29	6.29	3.34	120.95	14.94	106.00	0.82	120.95	0.12	24.04	16.03	24.71	16.70	1.10E+11
PTF C2V	0.97	16.63	8.10E+07	26.22	13.41	13.41	6.42	206.99	39.64	167.36	1.58	206.99	0.11	36.93	24.62	39.41	27.10	2.56E+10
PTF C3V	1.06	16.63	8.18E+07	24.78	12.32	12.32	8.39	203.93	39.64	164.30	1.81	203.93	0.11	37.01	24.67	40.28	27.94	3.94E+09
PTF C5V	1.08	16.63	7.71E+07	23.98	11.73	11.73	8.59	203.14	39.64	163.51	1.81	203.14	0.11	37.03	24.69	40.30	27.96	3.38E+09
PTF PJV	0.77	16.63	7.57E+07	29.84	16.28	16.28	2.15	214.13	39.64	174.49	1.05	214.13	0.11	36.76	24.50	37.86	25.61	2.28E+12
PTF PVV	2.29	16.63	1.69E+06	4.07	0.82	0.82	4.98	195.84	39.64	156.21	0.70	195.84	0.11	37.22	24.81	37.71	25.30	3.52E+11
																	Min	**1.03E+09**
20% Wind Frequency	Zo =	0.08	ft		n =	0.10												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	0.99	15.54	4.36E+07	19.71	10.89	10.89	5.92	122.97	14.94	108.03	1.40	122.97	0.10	20.24	13.49	22.20	15.45	2.30E+12
LAB C3V	0.95	15.54	7.66E+07	24.41	15.00	15.00	6.94	126.07	14.94	111.13	1.75	126.07	0.10	20.17	13.45	23.24	16.51	2.61E+11
LAB C5V	0.97	15.54	1.57E+07	14.22	6.67	6.67	3.34	121.33	14.94	106.39	0.82	121.33	0.10	20.28	13.52	20.95	14.19	2.27E+14
PTF C2V	0.97	18.37	8.10E+07	26.22	14.09	14.09	6.42	207.68	39.64	168.04	1.58	207.68	0.09	31.37	20.91	33.85	23.39	1.59E+13
PTF C3V	1.06	18.37	8.18E+07	24.78	12.95	12.95	8.39	204.56	39.64	164.92	1.81	204.56	0.09	31.43	20.95	34.70	24.22	1.06E+12
PTF C5V	1.08	18.37	7.71E+07	23.98	12.33	12.33	8.59	203.74	39.64	164.10	1.81	203.74	0.09	31.45	20.96	34.72	24.24	8.52E+11
PTF PJV	0.77	18.37	7.57E+07	29.84	17.11	17.11	2.15	214.95	39.64	175.32	1.05	214.95	0.09	31.23	20.82	32.34	21.93	1.06E+16
PTF PVV	2.29	18.37	1.69E+06	4.07	0.86	0.86	4.98	195.88	39.64	156.25	0.70	195.88	0.09	31.61	21.07	32.10	21.56	3.43E+14
																	Min	**2.61E+11**
20% Wind Frequency	Zo =	0.24	ft		n =	0.10												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	0.99	12.79	4.36E+07	19.71	9.88	9.88	5.92	121.96	14.94	107.02	1.40	121.96	0.10	20.11	13.41	22.07	15.37	1.89E+12
LAB C3V	0.95	12.79	7.66E+07	24.41	13.61	13.61	6.94	124.68	14.94	109.74	1.75	124.68	0.10	20.04	13.36	23.10	16.42	1.86E+11
LAB C5V	0.97	12.79	1.57E+07	14.22	6.06	6.06	3.34	120.71	14.94	105.77	0.82	120.71	0.10	20.15	13.43	20.81	14.10	2.30E+14
PTF C2V	0.97	15.62	8.10E+07	26.22	13.00	13.00	6.42	206.58	39.64	166.94	1.58	206.58	0.09	30.79	20.53	33.27	23.01	7.57E+14
PTF C3V	1.06	15.62	8.18E+07	24.78	11.94	11.94	8.39	203.55	39.64	163.92	1.81	203.55	0.09	30.86	20.57	34.13	23.84	5.62E+13
PTF C5V	1.08	15.62	7.71E+07	23.98	11.37	11.37	8.59	202.78	39.64	163.14	1.81	202.78	0.09	30.88	20.58	34.15	23.85	1.47E+12
PTF PJV	0.77	15.62	7.57E+07	29.84	15.78	15.78	2.15	213.62	39.64	173.99	1.05	213.62	0.09	30.64	20.43	31.74	21.53	1.13E+16
PTF PVV	2.29	15.62	1.69E+06	4.07	0.79	0.79	4.98	195.82	39.64	156.18	0.70	195.82	0.09	31.04	20.69	31.53	21.18	4.78E+13
																	Min	**1.86E+11**
																Overall Minimum		*1.03E+09*

Table 14. Dilution Factor for LAW Intake (5% Frequency)

5% Wind Frequency	Zo =	0.16	ft		n =	0.12												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	0.69	13.80	4.36E+07	49.45	27.24	27.24	0.77	144.48	14.94	129.54	1.40	144.48	0.12	52.45	34.96	54.41	36.92	8.41E+04
LAB C3V	0.67	13.80	7.66E+07	60.88	37.22	37.22	0.11	155.11	14.94	140.17	1.75	155.11	0.11	51.91	34.60	54.97	37.67	1.13E+05
LAB C5V	0.68	13.80	1.57E+07	35.58	16.63	16.63	0.25	134.38	14.94	119.44	0.82	134.38	0.12	53.01	35.34	53.68	36.01	1.20E+05
LAW C2V	0.72	15.38	4.90E+07	40.20	31.54	31.54	2.11	134.43	28.30	106.13	1.75	134.43	0.12	23.67	15.78	26.73	18.84	2.43E+08
LAWC3V	0.67	15.38	4.10E+07	39.66	30.92	30.92	0.21	230.70	28.30	202.40	1.40	230.70	0.11	21.91	14.61	23.87	16.57	8.72E+33
LAW C5V	0.66	15.38	6.81E+07	47.46	40.47	40.47	-0.19	240.66	28.30	212.36	1.75	240.66	0.11	21.78	14.52	24.84	17.58	1.08E+33
LAW LVP	0.60	15.38	9.00E+06	25.69	16.12	16.12	-1.02	217.14	28.30	188.84	0.53	217.14	0.11	22.09	14.73	22.37	15.00	4.04E+36
HLW C2V	0.54	15.83	4.12E+07	76.39	60.47	60.47	-7.10	138.58	31.98	106.60	1.28	138.58	0.12	45.29	30.20	46.94	31.84	2.44E+04
HLW C3V	0.54	15.83	5.32E+07	96.25	68.72	68.72	-8.07	276.79	31.98	244.81	1.46	276.79	0.11	63.65	42.43	65.77	44.56	4.91E+08
HLW C5V	0.54	15.83	5.43E+07	96.20	68.66	68.66	-7.78	276.44	31.98	244.47	1.52	276.44	0.11	63.66	42.44	65.96	44.74	3.99E+08
HLW IHLW	0.55	15.83	1.09E+07	55.88	30.40	30.40	-3.31	233.71	31.98	201.74	0.70	233.71	0.11	65.13	43.42	65.62	43.91	2.38E+07
HLW PJV	1.04	15.83	6.94E+05	14.55	4.04	4.04	2.65	201.39	31.98	169.41	0.58	201.39	0.11	66.48	44.32	66.82	44.66	4.06E+06
HLW HOP	0.60	15.83	1.82E+06	29.13	11.44	11.44	-0.81	212.25	31.98	180.27	0.35	212.25	0.11	66.00	44.00	66.12	44.12	1.29E+07
PTF C2V	0.52	16.63	8.10E+07	100.35	85.97	85.97	-10.79	296.76	39.64	257.12	1.58	296.76	0.10	47.98	31.99	50.46	34.47	7.74E+13
PTF C3V	0.55	16.63	8.18E+07	97.37	82.17	82.17	-8.90	291.07	39.64	251.44	1.81	291.07	0.10	48.10	32.07	51.37	35.34	5.67E+12
PTF C5V	0.55	16.63	7.71E+07	94.79	78.92	78.92	-8.21	287.13	39.64	247.49	1.81	287.13	0.10	48.19	32.13	51.46	35.40	2.46E+12
PTF PJV	0.46	16.63	7.57E+07	106.10	93.46	93.46	-14.48	307.94	39.64	268.31	1.05	307.94	0.10	47.74	31.83	48.85	32.93	2.37E+16
PTF PVV	0.90	16.63	1.69E+06	19.08	7.13	7.13	2.49	204.64	39.64	165.00	0.70	204.64	0.11	50.47	33.65	50.96	34.14	1.17E+08
																	Min	**2.44E+04**

5% Wind Frequency	Zo =	0.08	ft		n =	0.10												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	0.69	15.54	4.36E+07	49.45	28.90	28.90	0.77	146.14	14.94	131.20	1.40	146.14	0.10	44.30	29.53	46.26	31.49	7.62E+05
LAB C3V	0.67	15.54	7.66E+07	60.88	39.49	39.49	0.11	157.38	14.94	142.44	1.75	157.38	0.10	19.58	13.06	22.65	16.12	1.78E+18
LAB C5V	0.68	15.54	1.57E+07	35.58	17.64	17.64	0.25	135.39	14.94	120.45	0.82	135.39	0.10	19.98	13.32	20.65	13.99	9.32E+17
LAW C2V	0.72	17.11	4.90E+07	40.20	33.27	33.27	2.11	136.16	28.30	107.86	1.75	136.16	0.10	27.33	18.22	30.39	21.28	1.52E+07
LAWC3V	0.67	17.11	4.10E+07	39.66	32.61	32.61	0.21	232.40	28.30	204.10	1.40	232.40	0.09	25.50	17.00	27.46	18.96	6.45E+26
LAW C5V	0.66	17.11	6.81E+07	47.46	42.69	42.69	-0.19	242.88	28.30	214.58	1.75	242.88	0.09	25.36	16.91	28.42	19.97	3.57E+26
LAW LVP	0.60	17.11	9.00E+06	25.69	17.00	17.00	-1.02	218.03	28.30	189.73	0.53	218.03	0.09	25.70	17.14	25.98	17.41	1.32E+28
HLW C2V	0.54	17.56	4.12E+07	76.39	63.70	63.70	-7.10	141.80	31.98	109.82	1.28	141.80	0.10	38.76	25.84	40.41	27.49	1.96E+05
HLW C3V	0.54	17.56	5.32E+07	96.25	72.38	72.38	-8.07	280.45	31.98	248.48	1.46	280.45	0.09	56.61	37.74	58.73	39.86	2.99E+10
HLW C5V	0.54	17.56	5.43E+07	96.20	72.32	72.32	-7.78	280.11	31.98	248.13	1.52	280.11	0.09	56.61	37.74	58.91	40.04	2.28E+10
HLW IHLW	0.55	17.56	1.09E+07	55.88	32.03	32.03	-3.31	235.33	31.98	203.36	0.70	235.33	0.09	57.85	38.57	58.34	39.06	3.78E+08
HLW PJV	1.04	17.56	6.94E+05	14.55	4.25	4.25	2.65	201.60	31.98	169.63	0.58	201.60	0.09	58.99	39.33	59.33	39.67	2.25E+07
HLW HOP	0.60	17.56	1.82E+06	29.13	12.05	12.05	-0.81	212.86	31.98	180.88	0.35	212.86	0.09	58.58	39.06	58.71	39.18	1.03E+08
PTF C2V	0.52	18.37	8.10E+07	100.35	90.33	90.33	-10.79	301.12	39.64	261.49	1.58	301.12	0.09	29.96	19.97	32.44	22.45	7.64E+30
PTF C3V	0.55	18.37	8.18E+07	97.37	86.34	86.34	-8.90	295.25	39.64	255.61	1.81	295.25	0.09	30.03	20.02	33.30	23.29	3.56E+27
PTF C5V	0.55	18.37	7.71E+07	94.79	82.93	82.93	-8.21	291.14	39.64	251.50	1.81	291.14	0.09	30.08	20.05	33.35	23.32	4.53E+26
PTF PJV	0.46	18.37	7.57E+07	106.10	98.21	98.21	-14.48	312.69	39.64	273.05	1.05	312.69	0.09	29.82	19.88	30.92	20.98	2.20E+38
PTF PVV	0.90	18.37	1.69E+06	19.08	7.49	7.49	2.49	205.00	39.64	165.36	0.70	205.00	0.09	31.42	20.95	31.91	21.44	3.24E+15
																	Min	**1.96E+05**

5% Wind Frequency	Zo =	0.24	ft		n =	0.14												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	0.69	12.79	4.36E+07	49.45	26.23	26.23	0.77	143.46	14.94	128.52	1.40	143.46	0.13	25.77	17.18	27.73	19.14	2.93E+11
LAB C3V	0.67	12.79	7.66E+07	60.88	35.83	35.83	0.11	153.72	14.94	138.78	1.75	153.72	0.13	25.49	16.99	28.55	20.06	7.65E+11
LAB C5V	0.68	12.79	1.57E+07	35.58	16.00	16.00	0.25	133.76	14.94	118.81	0.82	133.76	0.13	26.05	17.37	26.72	18.04	3.25E+11
LAW C2V	0.72	14.36	4.90E+07	40.20	30.48	30.48	2.11	133.37	28.30	105.07	1.75	133.37	0.13	35.68	23.79	38.74	26.85	1.37E+05
LAWC3V	0.67	14.36	4.10E+07	39.66	29.88	29.88	0.21	229.67	28.30	201.37	1.40	229.67	0.12	32.86	21.90	34.82	23.86	2.03E+17
LAW C5V	0.66	14.36	6.81E+07	47.46	39.11	39.11	-0.19	239.31	28.30	211.01	1.75	239.31	0.12	32.66	21.77	35.72	24.84	2.20E+17
LAW LVP	0.60	14.36	9.00E+06	25.69	15.58	15.58	-1.02	216.60	28.30	188.30	0.53	216.60	0.12	33.14	22.09	33.42	22.37	8.81E+17
HLW C2V	0.54	14.82	4.12E+07	76.39	58.51	58.51	-7.10	136.61	31.98	104.63	1.28	136.61	0.13	50.69	33.79	52.33	35.44	*8.73E+03*
HLW C3V	0.54	14.82	5.32E+07	96.25	66.48	66.48	-8.07	274.55	31.98	242.58	1.46	274.55	0.12	72.77	48.51	74.89	50.64	1.70E+07
HLW C5V	0.54	14.82	5.43E+07	96.20	66.43	66.43	-7.78	274.21	31.98	242.23	1.52	274.21	0.12	72.78	48.52	75.08	50.82	1.45E+07
HLW IHLW	0.55	14.82	1.09E+07	55.88	29.42	29.42	-3.31	232.72	31.98	200.75	0.70	232.72	0.12	74.52	49.68	75.01	50.17	2.43E+06
HLW PJV	1.04	14.82	6.94E+05	14.55	3.91	3.91	2.65	201.26	31.98	169.28	0.58	201.26	0.12	76.12	50.75	76.46	51.09	9.66E+05
HLW HOP	0.60	14.82	1.82E+06	29.13	11.07	11.07	-0.81	211.88	31.98	179.90	0.35	211.88	0.12	75.55	50.36	75.67	50.49	2.29E+06
PTF C2V	0.52	15.62	8.10E+07	100.35	83.30	83.30	-10.79	294.10	39.64	254.46	1.58	294.10	0.11	38.47	25.65	40.95	28.13	2.50E+19
PTF C3V	0.55	15.62	8.18E+07	97.37	79.63	79.63	-8.90	288.53	39.64	248.89	1.81	288.53	0.11	38.57	25.71	41.84	28.98	3.96E+17
PTF C5V	0.55	15.62	7.71E+07	94.79	76.48	76.48	-8.21	284.68	39.64	245.05	1.81	284.68	0.11	38.64	25.76	41.91	29.03	1.17E+17
PTF PJV	0.46	15.62	7.57E+07	106.10	90.57	90.57	-14.48	305.05	39.64	265.41	1.05	305.05	0.11	38.27	25.51	39.37	26.62	2.33E+23
PTF PVV	0.90	15.62	1.69E+06	19.08	6.91	6.91	2.49	204.42	39.64	164.78	0.70	204.42	0.12	40.54	27.03	41.03	27.52	3.94E+10
																	Min	**8.73E+03**
																	Overall Minimum	*8.73E+03*

Table 15. Dilution Factor for LAW Intake (10% Frequency)

10% Wind Frequency	Zo =	0.16	ft		n =	0.12												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	0.80	13.80	4.36E+07	37.46	17.97	17.97	3.41	132.56	14.94	117.61	1.40	132.56	0.12	53.12	35.41	55.08	37.37	3.39E+04
LAB C3V	0.77	13.80	7.66E+07	46.25	24.64	24.64	3.61	139.03	14.94	124.09	1.75	139.03	0.12	52.75	35.16	55.81	38.23	2.91E+04
LAB C5V	0.79	13.80	1.57E+07	26.99	10.99	10.99	1.84	127.15	14.94	112.21	0.82	127.15	0.12	53.45	35.63	54.12	36.30	7.75E+04
LAW C2V	0.93	15.38	4.90E+07	33.15	15.79	15.79	6.66	114.13	28.30	85.83	1.75	114.13	0.12	24.26	16.17	27.32	19.23	1.06E+06
LAWC3V	0.86	15.38	4.10E+07	33.02	15.69	15.69	4.37	211.32	28.30	183.02	1.40	211.32	0.11	22.18	14.78	24.14	16.74	4.64E+27
LAW C5V	0.84	15.38	6.81E+07	39.60	20.61	20.61	5.17	215.44	28.30	187.14	1.75	215.44	0.11	22.12	14.74	25.18	17.81	3.51E+25
LAW LVP	0.75	15.38	9.00E+06	21.74	8.38	8.38	0.92	207.46	28.30	179.16	0.53	207.46	0.11	22.23	14.82	22.51	15.10	9.54E+32
HLW C2V	0.68	15.83	4.12E+07	47.87	27.79	27.79	0.44	98.35	31.98	66.38	1.28	98.35	0.12	47.71	31.81	49.36	33.46	1.22E+03
HLW C3V	0.68	15.83	5.32E+07	52.13	31.58	31.58	0.50	231.08	31.98	199.11	1.46	231.08	0.11	65.23	43.48	67.35	45.61	3.38E+06
HLW C5V	0.69	15.83	5.43E+07	51.97	31.43	31.43	0.87	230.56	31.98	198.58	1.52	230.56	0.11	65.25	43.50	67.55	45.80	2.85E+06
HLW IHLW	0.70	15.83	1.09E+07	30.11	13.86	13.86	0.57	213.30	31.98	181.32	0.70	213.30	0.11	65.95	43.97	66.44	44.46	4.45E+06
HLW PJV	1.55	15.83	6.94E+05	7.10	1.59	1.59	3.63	197.96	31.98	165.98	0.58	197.96	0.11	66.64	44.43	66.98	44.77	5.06E+06
HLW HOP	0.78	15.83	1.82E+06	15.42	5.08	5.08	0.78	204.30	31.98	172.32	0.35	204.30	0.11	66.35	44.23	66.47	44.36	1.01E+07
PTF C2V	0.65	16.63	8.10E+07	59.94	39.92	39.92	-0.66	240.58	39.64	200.94	1.58	240.58	0.11	49.35	32.90	51.83	35.38	1.16E+09
PTF C3V	0.70	16.63	8.18E+07	57.49	37.49	37.49	1.27	236.22	39.64	196.58	1.81	236.22	0.11	49.48	32.99	52.75	36.26	2.52E+08
PTF C5V	0.71	16.63	7.71E+07	55.82	35.87	35.87	1.68	234.19	39.64	194.55	1.81	234.19	0.11	49.54	33.02	52.81	36.29	1.86E+08
PTF PJV	0.55	16.63	7.57E+07	65.39	45.48	45.48	-4.69	250.17	39.64	210.53	1.05	250.17	0.11	49.09	32.73	50.19	33.83	4.24E+10
PTF PVV	1.31	16.63	1.69E+06	10.35	2.86	2.86	3.95	198.91	39.64	159.27	0.70	198.91	0.11	50.67	33.78	51.16	34.27	8.40E+07
																	Min	1.22E+03

10% Wind Frequency	Zo =	0.08	ft		n =	0.10												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	0.80	15.54	4.36E+07	37.46	19.06	19.06	3.41	133.65	14.94	118.71	1.40	133.65	0.10	44.83	29.89	46.79	31.85	1.81E+05
LAB C3V	0.77	15.54	7.66E+07	46.25	26.14	26.14	3.61	140.53	14.94	125.59	1.75	140.53	0.10	44.53	29.69	47.59	32.75	1.71E+05
LAB C5V	0.79	15.54	1.57E+07	26.99	11.66	11.66	1.84	127.82	14.94	112.88	0.82	127.82	0.10	45.10	30.07	45.77	30.73	3.97E+05
LAW C2V	0.93	17.11	4.90E+07	33.15	16.65	16.65	6.66	114.99	28.30	86.69	1.75	114.99	0.10	20.43	13.62	23.49	16.68	2.75E+07
LAWC3V	0.86	17.11	4.10E+07	33.02	16.55	16.55	4.37	212.18	28.30	183.88	1.40	212.18	0.09	18.84	12.56	20.80	14.52	2.63E+36
LAW C5V	0.84	17.11	6.81E+07	39.60	21.74	21.74	5.17	216.57	28.30	188.27	1.75	216.57	0.09	18.79	12.53	21.85	15.59	1.29E+33
LAW LVP	0.75	17.11	9.00E+06	21.74	8.84	8.84	0.92	207.92	28.30	179.62	0.53	207.92	0.09	18.89	12.59	19.17	12.87	3.70E+44
HLW C2V	0.68	17.56	4.12E+07	47.87	29.27	29.27	0.44	99.84	31.98	67.86	1.28	99.84	0.10	40.05	26.70	41.70	28.35	2.14E+03
HLW C3V	0.68	17.56	5.32E+07	52.13	33.27	33.27	0.50	232.77	31.98	200.79	1.46	232.77	0.09	55.45	36.97	57.58	39.10	9.62E+07
HLW C5V	0.69	17.56	5.43E+07	51.97	33.11	33.11	0.87	232.24	31.98	200.26	1.52	232.24	0.09	55.47	36.98	57.77	39.28	7.61E+07
HLW IHLW	0.70	17.56	1.09E+07	30.11	14.60	14.60	0.57	214.04	31.98	182.06	0.70	214.04	0.09	56.04	37.36	56.53	37.85	8.31E+07
HLW PJV	1.55	17.56	6.94E+05	7.10	1.67	1.67	3.63	198.04	31.98	166.07	0.58	198.04	0.09	56.60	37.73	56.94	38.07	5.13E+07
HLW HOP	0.78	17.56	1.82E+06	15.42	5.35	5.35	0.78	204.57	31.98	172.59	0.35	204.57	0.09	56.37	37.58	56.49	37.70	1.36E+08
PTF C2V	0.65	18.37	8.10E+07	59.94	41.95	41.95	-0.66	242.61	39.64	202.97	1.58	242.61	0.09	41.97	27.98	44.45	30.46	3.71E+11
PTF C3V	0.70	18.37	8.18E+07	57.49	39.39	39.39	1.27	238.12	39.64	198.49	1.81	238.12	0.09	42.07	28.05	45.34	31.32	4.08E+10
PTF C5V	0.71	18.37	7.71E+07	55.82	37.69	37.69	1.68	236.01	39.64	196.38	1.81	236.01	0.09	42.12	28.08	45.39	31.35	2.64E+10
PTF PJV	0.55	18.37	7.57E+07	65.39	47.79	47.79	-4.69	252.48	39.64	212.84	1.05	252.48	0.09	41.77	27.84	42.87	28.95	6.64E+13
PTF PVV	1.31	18.37	1.69E+06	10.35	3.01	3.01	3.95	199.05	39.64	159.42	0.70	199.05	0.09	43.04	28.69	43.53	29.18	3.76E+09
																	Min	2.14E+03

10% Wind Frequency	Zo =	0.24	ft		n =	0.14												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	0.80	12.79	4.36E+07	37.46	17.30	17.30	3.41	131.88	14.94	116.94	1.40	131.88	0.13	58.48	38.99	60.44	40.95	1.70E+04
LAB C3V	0.77	12.79	7.66E+07	46.25	23.72	23.72	3.61	138.11	14.94	123.16	1.75	138.11	0.13	58.06	38.71	61.12	41.77	1.39E+04
LAB C5V	0.79	12.79	1.57E+07	26.99	10.58	10.58	1.84	126.74	14.94	111.80	0.82	126.74	0.13	58.86	39.24	59.52	39.90	3.99E+04
LAW C2V	0.93	14.36	4.90E+07	33.15	10.37	10.37	6.66	108.72	28.30	80.42	1.75	108.72	0.13	26.94	17.96	30.00	21.02	9.11E+04
LAWC3V	0.86	14.36	4.10E+07	33.02	10.31	10.31	4.37	205.94	28.30	177.64	1.40	205.94	0.12	24.39	16.26	26.35	18.22	2.77E+22
LAW C5V	0.84	14.36	6.81E+07	39.60	13.54	13.54	5.17	208.38	28.30	180.08	1.75	208.38	0.12	24.35	16.23	27.41	19.29	3.56E+20
LAW LVP	0.75	14.36	9.00E+06	21.74	5.51	5.51	0.92	204.58	28.30	176.28	0.53	204.58	0.12	24.41	16.27	24.69	16.55	1.32E+27
HLW C2V	0.68	14.82	4.12E+07	47.87	12.90	12.90	0.44	83.46	31.98	51.49	1.28	83.46	0.14	54.12	36.08	55.77	37.73	5.51E+02
HLW C3V	0.68	14.82	5.32E+07	52.13	14.66	14.66	0.50	214.16	31.98	182.19	1.46	214.16	0.12	72.21	48.14	74.33	50.26	2.13E+05
HLW C5V	0.69	14.82	5.43E+07	51.97	14.59	14.59	0.87	213.72	31.98	181.74	1.52	213.72	0.12	72.23	48.15	74.53	50.45	1.88E+05
HLW IHLW	0.70	14.82	1.09E+07	30.11	6.44	6.44	0.57	205.87	31.98	173.89	0.70	205.87	0.12	72.63	48.42	73.12	48.91	7.32E+05
HLW PJV	1.55	14.82	6.94E+05	7.10	0.74	0.74	3.63	197.11	31.98	165.13	0.58	197.11	0.12	73.10	48.73	73.44	49.07	1.81E+06
HLW HOP	0.78	14.82	1.82E+06	15.42	2.36	2.36	0.78	201.58	31.98	169.60	0.35	201.58	0.12	72.86	48.57	72.98	48.69	2.76E+06
PTF C2V	0.65	15.62	8.10E+07	59.94	19.92	19.92	-0.66	220.58	39.64	180.95	1.58	220.58	0.12	54.70	36.47	57.18	38.95	6.80E+06
PTF C3V	0.70	15.62	8.18E+07	57.49	18.71	18.71	1.27	217.44	39.64	177.80	1.81	217.44	0.12	54.81	36.54	58.08	39.81	2.70E+06
PTF C5V	0.71	15.62	7.71E+07	55.82	17.90	17.90	1.68	216.22	39.64	176.59	1.81	216.22	0.12	54.86	36.57	58.13	39.84	2.39E+06
PTF PJV	0.55	15.62	7.57E+07	65.39	22.69	22.69	-4.69	227.38	39.64	187.75	1.05	227.38	0.12	54.46	36.30	55.56	37.41	5.98E+07
PTF PVV	1.31	15.62	1.69E+06	10.35	1.43	1.43	3.95	197.47	39.64	157.84	0.70	197.47	0.12	55.60	37.07	56.09	37.56	1.41E+07
																	Min	5.51E+02
																Overall Minimum		5.51E+02

Table 16. Dilution Factor for LAW Intake (15% Frequency)

15% Wind Frequency	Zo =	0.16	ft		n =	0.12												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	1.02	13.80	4.36E+07	24.65	9.59	9.59	6.16	121.43	14.94	106.49	1.40	121.43	0.12	53.82	35.88	55.78	37.84	1.90E+04
LAB C3V	0.98	13.80	7.66E+07	30.54	13.22	13.22	7.26	123.97	14.94	109.02	1.75	123.97	0.12	53.65	35.77	56.72	38.83	1.17E+04
LAB C5V	1.00	13.80	1.57E+07	17.79	5.88	5.88	3.49	120.39	14.94	105.45	0.82	120.39	0.12	53.89	35.93	54.56	36.59	6.19E+04
LAW C2V	1.21	15.38	4.90E+07	16.43	8.24	8.24	9.33	103.91	14.94	88.97	1.75	103.91	0.12	24.61	16.40	27.67	19.47	2.61E+06
LAWC3V	1.10	15.38	4.10E+07	16.49	8.28	8.28	6.81	201.47	14.94	186.53	1.40	201.47	0.11	22.32	14.88	24.28	16.84	3.38E+28
LAW C5V	1.08	15.38	6.81E+07	19.81	10.91	10.91	8.31	202.60	14.94	187.65	1.75	202.60	0.11	22.31	14.87	25.37	17.93	3.24E+25
LAW LVP	0.95	15.38	9.00E+06	11.00	4.51	4.51	2.07	202.45	14.94	187.50	0.53	202.45	0.11	22.31	14.87	22.59	15.15	6.94E+35
HLW C2V	1.06	15.83	4.12E+07	20.79	8.59	8.59	5.93	73.66	14.94	58.71	1.28	73.66	0.13	49.96	33.31	51.61	34.96	1.59E+03
HLW C3V	1.06	15.83	5.32E+07	26.20	9.76	9.76	6.74	203.02	14.94	188.08	1.46	203.02	0.11	66.41	44.27	68.54	46.40	1.96E+06
HLW C5V	1.08	15.83	5.43E+07	26.03	9.66	9.66	7.18	202.48	14.94	187.54	1.52	202.48	0.11	66.43	44.29	68.73	46.59	1.68E+06
HLW IHLW	1.10	15.83	1.09E+07	15.03	4.24	4.24	3.39	200.85	14.94	185.90	0.70	200.85	0.11	66.51	44.34	67.00	44.83	1.25E+07
HLW PJV	2.87	15.83	6.94E+05	3.17	0.41	0.41	4.34	196.07	14.94	181.13	0.58	196.07	0.11	66.73	44.49	67.07	44.83	3.84E+07
HLW HOP	1.27	15.83	1.82E+06	7.52	1.50	1.50	1.93	199.57	14.94	184.63	0.35	199.57	0.11	66.57	44.38	66.69	44.50	6.08E+07
PTF C2V	0.95	16.63	8.10E+07	30.05	14.08	14.08	6.21	207.88	39.64	168.24	1.58	207.88	0.11	50.36	33.57	52.84	36.05	1.24E+07
PTF C3V	1.04	16.63	8.18E+07	28.41	12.95	12.95	8.17	204.78	39.64	165.14	1.81	204.78	0.11	50.47	33.64	53.74	36.91	4.65E+06
PTF C5V	1.06	16.63	7.71E+07	27.50	12.33	12.33	8.38	203.95	39.64	164.31	1.81	203.95	0.11	50.49	33.66	53.76	36.93	4.29E+06
PTF PJV	0.76	16.63	7.57E+07	34.13	17.05	17.05	1.95	215.10	39.64	175.46	1.05	215.10	0.11	50.12	33.41	51.22	34.52	1.37E+08
PTF PVV	2.23	16.63	1.69E+06	4.68	0.87	0.87	4.95	195.92	39.64	156.28	0.70	195.92	0.11	50.78	33.85	51.27	34.34	1.05E+08
																	Min	1.59E+03

15% Wind Frequency	Zo =	0.08	ft		n =	0.10												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	1.02	15.54	4.36E+07	24.65	10.17	10.17	6.16	122.02	14.94	107.07	1.40	122.02	0.10	45.39	30.26	47.35	32.22	6.54E+04
LAB C3V	0.98	15.54	7.66E+07	30.54	14.03	14.03	7.26	124.77	14.94	109.83	1.75	124.77	0.10	45.25	30.17	48.31	33.23	3.91E+04
LAB C5V	1.00	15.54	1.57E+07	17.79	6.24	6.24	3.49	120.75	14.94	105.81	0.82	120.75	0.10	45.45	30.30	46.12	30.97	2.39E+05
LAW C2V	1.21	17.11	4.90E+07	16.43	8.69	8.69	9.33	104.36	14.94	89.42	1.75	104.36	0.10	20.70	13.80	23.77	16.87	7.19E+07
LAWC3V	1.10	17.11	4.10E+07	16.49	8.74	8.74	6.81	201.93	14.94	186.98	1.40	201.93	0.09	18.96	12.64	20.92	14.60	2.44E+37
LAW C5V	1.08	17.11	6.81E+07	19.81	11.51	11.51	8.31	203.19	14.94	188.25	1.75	203.19	0.09	18.94	12.63	22.01	15.69	7.36E+32
LAW LVP	0.95	17.11	9.00E+06	11.00	4.76	4.76	2.07	202.69	14.94	187.75	0.53	202.69	0.09	18.95	12.63	19.23	12.91	2.32E+48
HLW C2V	1.06	17.56	4.12E+07	20.79	9.05	9.05	5.93	74.11	14.94	59.17	1.28	74.11	0.11	41.80	27.87	43.45	29.51	2.06E+03
HLW C3V	1.06	17.56	5.32E+07	26.20	10.28	10.28	6.74	203.54	14.94	188.60	1.46	203.54	0.09	56.40	37.60	58.53	39.73	3.03E+07
HLW C5V	1.08	17.56	5.43E+07	26.03	10.18	10.18	7.18	203.00	14.94	188.06	1.52	203.00	0.09	56.42	37.61	58.72	39.91	2.46E+07
HLW IHLW	1.10	17.56	1.09E+07	15.03	4.47	4.47	3.39	201.07	14.94	186.13	0.70	201.07	0.09	56.49	37.66	56.98	38.15	2.46E+08
HLW PJV	2.87	17.56	6.94E+05	3.17	0.43	0.43	4.34	196.09	14.94	181.15	0.58	196.09	0.09	56.67	37.78	57.01	38.12	6.34E+08
HLW HOP	1.27	17.56	1.82E+06	7.52	1.58	1.58	1.93	199.65	14.94	184.71	0.35	199.65	0.09	56.54	37.69	56.66	37.82	1.22E+09
PTF C2V	0.95	18.37	8.10E+07	30.05	14.80	14.80	6.21	208.59	39.64	168.96	1.58	208.59	0.09	42.78	28.52	45.26	31.00	4.82E+08
PTF C3V	1.04	18.37	8.18E+07	28.41	13.61	13.61	8.17	205.43	39.64	165.80	1.81	205.43	0.09	42.86	28.58	46.13	31.85	1.19E+08
PTF C5V	1.06	18.37	7.71E+07	27.50	12.96	12.96	8.38	204.58	39.64	164.94	1.81	204.58	0.09	42.89	28.59	46.16	31.86	1.06E+08
PTF PJV	0.76	18.37	7.57E+07	34.13	17.92	17.92	1.95	215.97	39.64	176.33	1.05	215.97	0.09	42.59	28.39	43.69	29.50	1.40E+10
PTF PVV	2.23	18.37	1.69E+06	4.68	0.91	0.91	4.95	195.96	39.64	156.33	0.70	195.96	0.09	43.12	28.75	43.61	29.24	3.90E+09
																	Min	2.06E+03

15% Wind Frequency	Zo =	0.24	ft		n =	0.10												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	1.02	12.79	4.36E+07	24.65	9.23	9.23	6.16	121.07	14.94	106.13	1.40	121.07	0.10	45.10	30.07	47.06	32.03	6.25E+04
LAB C3V	0.98	12.79	7.66E+07	30.54	12.73	12.73	7.26	123.47	14.94	108.53	1.75	123.47	0.10	44.96	29.97	48.02	33.04	3.62E+04
LAB C5V	1.00	12.79	1.57E+07	17.79	5.66	5.66	3.49	120.17	14.94	105.23	0.82	120.17	0.10	45.16	30.10	45.82	30.77	2.38E+05
LAW C2V	1.21	14.36	4.90E+07	16.43	7.96	7.96	9.33	103.64	14.94	88.69	1.75	103.64	0.13	27.15	18.10	30.21	21.16	5.88E+05
LAWC3V	1.10	14.36	4.10E+07	16.49	8.01	8.01	6.81	201.19	14.94	186.25	1.40	201.19	0.12	24.47	16.32	26.43	18.28	3.34E+24
LAW C5V	1.08	14.36	6.81E+07	19.81	10.54	10.54	8.31	202.23	14.94	187.29	1.75	202.23	0.12	24.45	16.30	27.52	19.37	1.31E+22
LAW LVP	0.95	14.36	9.00E+06	11.00	4.36	4.36	2.07	202.29	14.94	187.35	0.53	202.29	0.12	24.45	16.30	24.73	16.58	2.44E+30
HLW C2V	1.06	14.82	4.12E+07	20.79	8.31	8.31	5.93	73.38	14.94	58.43	1.28	73.38	0.14	55.34	36.89	56.99	38.54	*1.49E+03*
HLW C3V	1.06	14.82	5.32E+07	26.20	9.44	9.44	6.74	202.70	14.94	187.76	1.46	202.70	0.12	72.80	48.53	74.92	50.66	6.09E+05
HLW C5V	1.08	14.82	5.43E+07	26.03	9.35	9.35	7.18	202.17	14.94	187.23	1.52	202.17	0.12	72.82	48.55	75.12	50.85	5.33E+05
HLW IHLW	1.10	14.82	1.09E+07	15.03	4.10	4.10	3.39	200.71	14.94	185.77	0.70	200.71	0.12	72.90	48.60	73.39	49.09	3.56E+06
HLW PJV	2.87	14.82	6.94E+05	3.17	0.40	0.40	4.34	196.06	14.94	181.11	0.58	196.06	0.12	73.16	48.77	73.50	49.11	1.18E+07
HLW HOP	1.27	14.82	1.82E+06	7.52	1.45	1.45	1.93	199.52	14.94	184.58	0.35	199.52	0.12	72.97	48.64	73.09	48.77	1.73E+07
PTF C2V	0.95	15.62	8.10E+07	30.05	13.65	13.65	6.21	207.44	39.64	167.81	1.58	207.44	0.09	41.99	27.99	44.47	30.47	6.35E+08
PTF C3V	1.04	15.62	8.18E+07	28.41	12.55	12.55	8.17	204.37	39.64	164.74	1.81	204.37	0.09	42.08	28.05	45.35	31.32	1.52E+08
PTF C5V	1.06	15.62	7.71E+07	27.50	11.95	11.95	8.38	203.57	39.64	163.93	1.81	203.57	0.09	42.11	28.07	45.38	31.34	1.35E+08
PTF PJV	0.76	15.62	7.57E+07	34.13	16.52	16.52	1.95	214.57	39.64	174.94	1.05	214.57	0.09	41.78	27.85	42.88	28.96	1.98E+10
PTF PVV	2.23	15.62	1.69E+06	4.68	0.84	0.84	4.95	195.89	39.64	156.26	0.70	195.89	0.09	42.35	28.23	42.84	28.72	6.25E+09
																	Min	1.49E+03
																Overall Minimum		*1.49E+03*

Table 17. Dilution Factor for LAW Intake (20% Frequency)

20% Wind Frequency	Zo =	0.16	ft		n =	0.12												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	0.99	13.80	4.36E+07	25.79	10.26	10.26	5.92	122.35	14.94	107.40	1.40	122.35	0.12	53.76	35.84	55.72	37.80	1.96E+04
LAB C3V	0.95	13.80	7.66E+07	31.94	14.14	14.14	6.94	125.21	14.94	110.27	1.75	125.21	0.12	53.57	35.72	56.64	38.78	*1.24E+04*
LAB C5V	0.97	13.80	1.57E+07	18.61	6.29	6.29	3.34	120.95	14.94	106.00	0.82	120.95	0.12	53.85	35.90	54.52	36.57	6.24E+04
LAW C2V	1.18	15.38	4.90E+07	17.22	8.84	8.84	9.09	104.75	28.30	76.45	1.75	104.75	0.12	24.58	16.38	27.64	19.45	1.65E+05
LAWC3V	1.07	15.38	4.10E+07	17.27	8.88	8.88	6.60	202.28	28.30	173.98	1.40	202.28	0.11	22.31	14.87	24.27	16.83	1.18E+25
LAW C5V	1.05	15.38	6.81E+07	20.74	11.69	11.69	8.04	203.66	28.30	175.36	1.75	203.66	0.11	22.29	14.86	25.35	17.92	3.18E+22
LAW LVP	0.93	15.38	9.00E+06	11.50	4.83	4.83	1.97	202.86	28.30	174.56	0.53	202.86	0.11	22.30	14.87	22.58	15.14	2.55E+31
PTF C2V	1.06	16.63	4.12E+07	21.87	8.74	8.74	5.95	202.79	39.64	163.16	1.58	202.79	0.11	50.53	33.69	53.02	36.17	1.09E+07
PTF C3V	1.06	16.63	8.18E+07	27.48	12.32	12.32	6.76	205.56	39.64	165.92	1.81	205.56	0.11	50.44	33.63	53.71	36.90	8.17E+06
PTF C5V	1.08	16.63	7.71E+07	26.60	11.73	11.73	7.20	204.53	39.64	164.89	1.81	204.53	0.11	50.47	33.65	53.74	36.92	6.78E+06
PTF PJV	1.10	16.63	7.57E+07	26.07	11.38	11.38	3.40	207.98	39.64	168.34	1.05	207.98	0.11	50.36	33.57	51.46	34.67	1.81E+08
PTF PVV	2.88	16.63	1.69E+06	3.88	0.65	0.65	4.34	196.31	39.64	156.67	0.70	196.31	0.11	50.77	33.84	51.26	34.33	2.14E+08
																	Min	**1.24E+04**
20% Wind Frequency	Zo =	0.08	ft		n =	0.10												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	0.99	15.54	4.36E+07	25.79	10.89	10.89	5.92	122.97	14.94	108.03	1.40	122.97	0.10	45.34	30.23	47.30	32.19	6.99E+04
LAB C3V	0.95	15.54	7.66E+07	31.94	15.00	15.00	6.94	126.07	14.94	111.13	1.75	126.07	0.10	45.18	30.12	48.25	33.19	4.32E+04
LAB C5V	0.97	15.54	1.57E+07	18.61	6.67	6.67	3.34	121.33	14.94	106.39	0.82	121.33	0.10	45.42	30.28	46.09	30.95	2.46E+05
LAW C2V	1.18	15.38	4.90E+07	18.60	8.49	8.49	9.09	104.40	28.30	76.10	1.75	104.40	0.12	24.59	16.39	27.65	19.46	1.53E+05
LAWC3V	1.07	15.38	4.10E+07	18.66	8.52	8.52	6.60	201.93	28.30	173.63	1.40	201.93	0.11	22.32	14.88	24.28	16.84	9.26E+24
LAW C5V	1.05	15.38	6.81E+07	22.41	11.22	11.22	8.04	203.19	28.30	174.89	1.75	203.19	0.11	22.30	14.87	25.36	17.93	2.41E+22
LAW LVP	0.93	15.38	9.00E+06	12.43	4.63	4.63	1.97	202.67	28.30	174.37	0.53	202.67	0.11	22.31	14.87	22.58	15.15	2.16E+31
PTF C2V	1.06	18.37	4.12E+07	21.87	9.19	9.19	5.95	203.24	39.64	163.60	1.58	203.24	0.09	42.92	28.61	45.40	31.10	3.13E+08
PTF C3V	1.06	18.37	8.18E+07	27.48	12.95	12.95	6.76	206.18	39.64	166.55	1.81	206.18	0.09	42.84	28.56	46.11	31.83	2.16E+08
PTF C5V	1.08	18.37	7.71E+07	26.60	12.33	12.33	7.20	205.12	39.64	165.49	1.81	205.12	0.09	42.87	28.58	46.14	31.85	1.70E+08
PTF PJV	1.10	18.37	7.57E+07	26.07	11.96	11.96	3.40	208.56	39.64	168.92	1.05	208.56	0.09	42.78	28.52	43.88	29.62	1.15E+10
PTF PVV	2.88	18.37	1.69E+06	3.88	0.69	0.69	4.34	196.34	39.64	156.71	0.70	196.34	0.09	43.11	28.74	43.60	29.23	8.12E+09
																	Min	**4.32E+04**
20% Wind Frequency	Zo =	0.24	ft		n =	0.10												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	0.99	12.79	4.36E+07	25.79	9.88	9.88	5.92	121.96	14.94	107.02	1.40	121.96	0.10	45.05	30.03	47.01	31.99	6.65E+04
LAB C3V	0.95	12.79	7.66E+07	31.94	13.61	13.61	6.94	124.68	14.94	109.74	1.75	124.68	0.10	44.89	29.93	47.95	32.99	3.97E+04
LAB C5V	0.97	12.79	1.57E+07	18.61	6.06	6.06	3.34	120.71	14.94	105.77	0.82	120.71	0.10	45.12	30.08	45.79	30.75	2.45E+05
LAW C2V	1.18	15.38	4.90E+07	18.60	8.49	8.49	9.09	104.40	28.30	76.10	1.75	104.40	0.12	24.59	16.39	27.65	19.46	1.53E+05
LAWC3V	1.07	15.38	4.10E+07	18.66	8.52	8.52	6.60	201.93	28.30	173.63	1.40	201.93	0.11	22.32	14.88	24.28	16.84	9.26E+24
LAW C5V	1.05	15.38	6.81E+07	22.41	11.22	11.22	8.04	203.19	28.30	174.89	1.75	203.19	0.11	22.30	14.87	25.36	17.93	2.41E+22
LAW LVP	0.93	15.38	9.00E+06	12.43	4.63	4.63	1.97	202.67	28.30	174.37	0.53	202.67	0.11	22.31	14.87	22.58	15.15	2.16E+31
PTF C2V	1.06	15.62	4.12E+07	21.87	8.47	8.47	5.95	202.52	39.64	162.89	1.58	202.52	0.09	42.14	28.09	44.62	30.57	4.30E+08
PTF C3V	1.06	15.62	8.18E+07	27.48	11.94	11.94	6.76	205.18	39.64	165.54	1.81	205.18	0.09	42.06	28.04	45.33	31.31	2.80E+08
PTF C5V	1.08	15.62	7.71E+07	26.60	11.37	11.37	7.20	204.17	39.64	164.53	1.81	204.17	0.09	42.09	28.06	45.36	31.33	2.21E+08
PTF PJV	1.10	15.62	7.57E+07	26.07	11.03	11.03	3.40	207.63	39.64	167.99	1.05	207.63	0.09	41.98	27.99	43.09	29.09	1.68E+10
PTF PVV	2.88	15.62	1.69E+06	3.88	0.63	0.63	4.34	196.29	39.64	156.65	0.70	196.29	0.09	42.33	28.22	42.82	28.71	1.31E+10
																	Min	**3.97E+04**
																Overall Minimum		*1.24E+04*

Table 18. Dilution Factor for HLW Intake (5% Frequency)

5% Wind Frequency	Zo =	0.16	ft		n =	0.12												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	0.69	13.80	4.36E+07	55.94	27.24	27.24	0.77	144.48	14.94	129.54	1.40	144.48	0.12	75.95	50.63	77.91	52.59	7.57E+03
LAB C3V	0.67	13.80	7.66E+07	68.87	37.22	37.22	0.11	155.11	14.94	140.17	1.75	155.11	0.11	75.17	50.11	78.23	53.17	7.21E+03
LAB C5V	0.68	13.80	1.57E+07	40.25	16.63	16.63	0.25	134.38	14.94	119.44	0.82	134.38	0.12	76.77	51.18	77.43	51.84	1.45E+04
LAW C2V	0.79	15.38	4.90E+07	38.93	24.32	24.32	4.09	125.24	28.30	96.94	1.75	125.24	0.12	36.54	24.36	39.60	27.42	4.12E+04
LAWC3V	0.73	15.38	4.10E+07	38.56	23.97	23.97	2.02	221.95	28.30	193.65	1.40	221.95	0.11	33.65	22.43	35.61	24.39	4.23E+15
LAW C5V	0.72	15.38	6.81E+07	46.18	31.42	31.42	2.14	229.29	28.30	200.98	1.75	229.29	0.11	33.50	22.33	36.56	25.39	2.31E+15
LAW LVP	0.65	15.38	9.00E+06	25.13	12.62	12.62	-0.18	212.79	28.30	184.49	0.53	212.79	0.11	33.85	22.56	34.12	22.84	6.56E+16
HLW C2V	0.71	15.83	4.12E+07	32.20	24.59	24.59	1.26	94.33	31.98	62.35	1.28	94.33	0.12	21.75	14.50	23.40	16.15	7.30E+04
HLW C3V	0.71	15.83	5.32E+07	31.49	27.94	27.94	1.43	226.51	31.98	194.53	1.46	226.51	0.11	13.86	9.24	15.99	11.37	6.38E+64
HLW C5V	0.72	15.83	5.43E+07	31.38	27.79	27.79	1.81	225.98	31.98	194.00	1.52	225.98	0.11	13.86	9.24	16.16	11.54	3.36E+62
HLW IHLW	0.73	15.83	1.09E+07	18.18	12.25	12.25	0.99	211.26	31.98	179.28	0.70	211.26	0.11	13.99	9.33	14.48	9.82	1.40E+74
HLW PJV	1.65	15.83	6.94E+05	4.22	1.37	1.37	3.73	197.64	31.98	165.66	0.58	197.64	0.11	14.12	9.42	14.47	9.76	1.07E+65
HLW HOP	0.82	15.83	1.82E+06	9.28	4.47	4.47	0.95	203.52	31.98	171.54	0.35	203.52	0.11	14.07	9.38	14.19	9.50	1.65E+73
PTF C2V	0.68	16.63	8.10E+07	51.63	35.40	35.40	0.43	234.98	39.64	195.34	1.58	234.98	0.11	39.76	26.50	42.24	28.98	6.07E+11
PTF C3V	0.73	16.63	8.18E+07	49.42	33.16	33.16	2.37	230.79	39.64	191.16	1.81	230.79	0.11	39.85	26.57	43.12	29.84	6.19E+10
PTF C5V	0.74	16.63	7.71E+07	47.97	31.71	31.71	2.74	228.97	39.64	189.33	1.81	228.97	0.11	39.90	26.60	43.17	29.87	4.15E+10
PTF PJV	0.57	16.63	7.57E+07	56.59	40.63	40.63	-3.64	244.27	39.64	204.63	1.05	244.27	0.11	39.55	26.36	40.65	27.47	1.33E+14
PTF PVV	1.39	16.63	1.69E+06	8.79	2.49	2.49	4.11	198.38	39.64	158.74	0.70	198.38	0.11	40.70	27.13	41.19	27.62	1.78E+10
																	Min	**7.21E+03**
5% Wind Frequency	Zo =	0.08	ft		n =	0.10												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	0.69	15.54	4.36E+07	55.94	28.90	28.90	0.77	146.14	14.94	131.20	1.40	146.14	0.10	64.15	42.76	66.11	44.72	1.94E+04
LAB C3V	0.67	15.54	7.66E+07	68.87	39.49	39.49	0.11	157.38	14.94	142.44	1.75	157.38	0.10	63.52	42.35	66.58	45.41	2.22E+04
LAB C5V	0.68	15.54	1.57E+07	40.25	17.64	17.64	0.25	135.39	14.94	120.45	0.82	135.39	0.10	64.80	43.20	65.47	43.87	3.16E+04
LAW C2V	0.79	17.11	4.90E+07	38.93	25.66	25.66	4.09	126.57	28.30	98.27	1.75	126.57	0.10	30.80	20.53	33.86	23.60	3.42E+05
LAWC3V	0.73	17.11	4.10E+07	38.56	25.29	25.29	2.02	223.27	28.30	194.97	1.40	223.27	0.09	28.60	19.07	30.56	21.03	3.03E+20
LAW C5V	0.72	17.11	6.81E+07	46.18	33.15	33.15	2.14	231.01	28.30	202.71	1.75	231.01	0.09	28.48	18.98	31.54	22.05	9.87E+19
LAW LVP	0.65	17.11	9.00E+06	25.13	13.31	13.31	-0.18	213.48	28.30	185.18	0.53	213.48	0.09	28.76	19.17	29.04	19.45	1.56E+22
HLW C2V	0.71	17.56	4.12E+07	32.20	25.90	25.90	1.26	95.64	31.98	63.66	1.28	95.64	0.10	18.25	12.17	19.90	13.82	1.26E+06
HLW C3V	0.71	17.56	5.32E+07	31.49	29.43	29.43	1.43	228.00	31.98	196.02	1.46	228.00	0.09	11.78	7.85	13.91	9.98	6.96E+84
HLW C5V	0.72	17.56	5.43E+07	31.38	29.27	29.27	1.81	227.46	31.98	195.48	1.52	227.46	0.09	11.78	7.86	14.08	10.16	3.26E+81
HLW IHLW	0.73	17.56	1.09E+07	18.18	12.90	12.90	0.99	211.92	31.98	179.94	0.70	211.92	0.09	11.89	7.93	12.38	8.42	7.25E+100
HLW PJV	1.65	17.56	6.94E+05	4.22	1.45	1.45	3.73	197.71	31.98	165.73	0.58	197.71	0.09	12.00	8.00	12.34	8.34	1.24E+88
HLW HOP	0.82	17.56	1.82E+06	9.28	4.71	4.71	0.95	203.76	31.98	171.78	0.35	203.76	0.09	11.95	7.97	12.07	8.09	1.61E+100
PTF C2V	0.68	18.37	8.10E+07	51.63	37.20	37.20	0.43	236.78	39.64	197.14	1.58	236.78	0.09	33.80	22.54	36.29	25.02	1.88E+15
PTF C3V	0.73	18.37	8.18E+07	49.42	34.85	34.85	2.37	232.48	39.64	192.84	1.81	232.48	0.09	33.88	22.59	37.15	25.86	6.76E+13
PTF C5V	0.74	18.37	7.71E+07	47.97	33.32	33.32	2.74	230.58	39.64	190.94	1.81	230.58	0.09	33.92	22.61	37.19	25.88	3.85E+13
PTF PJV	0.57	18.37	7.57E+07	56.59	42.70	42.70	-3.64	246.33	39.64	206.70	1.05	246.33	0.09	33.64	22.43	34.74	23.53	4.95E+18
PTF PVV	1.39	18.37	1.69E+06	8.79	2.61	2.61	4.11	198.50	39.64	158.87	0.70	198.50	0.09	34.57	23.04	35.06	23.53	6.86E+12
																	Min	**1.94E+04**
5% Wind Frequency	Zo =	0.24	ft		n =	0.14												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	0.69	12.79	4.36E+07	55.94	26.23	26.23	0.77	143.46	14.94	128.52	1.40	143.46	0.13	83.58	55.72	85.54	57.68	5.26E+03
LAB C3V	0.67	12.79	7.66E+07	68.87	35.83	35.83	0.11	153.72	14.94	138.78	1.75	153.72	0.13	82.68	55.12	85.75	58.18	*4.61E+03*
LAB C5V	0.68	12.79	1.57E+07	40.25	16.00	16.00	0.25	133.76	14.94	118.81	0.82	133.76	0.13	84.50	56.34	85.17	57.00	1.08E+04
LAW C2V	0.79	14.36	4.90E+07	38.93	23.51	23.51	4.09	124.42	28.30	96.12	1.75	124.42	0.13	40.26	26.84	43.32	29.90	1.66E+04
LAWC3V	0.73	14.36	4.10E+07	38.56	23.17	23.17	2.02	221.15	28.30	192.85	1.40	221.15	0.12	36.87	24.58	38.83	26.54	3.02E+13
LAW C5V	0.72	14.36	6.81E+07	46.18	30.37	30.37	2.14	228.23	28.30	199.93	1.75	228.23	0.12	36.70	24.47	39.76	27.53	1.94E+13
LAW LVP	0.65	14.36	9.00E+06	25.13	12.19	12.19	-0.18	212.37	28.30	184.07	0.53	212.37	0.12	37.09	24.73	37.36	25.00	3.14E+14
HLW C2V	0.71	14.82	4.12E+07	32.20	23.79	23.79	1.26	93.53	31.98	61.55	1.28	93.53	0.14	24.05	16.03	25.70	17.68	2.18E+04
HLW C3V	0.71	14.82	5.32E+07	31.49	27.03	27.03	1.43	225.60	31.98	193.63	1.46	225.60	0.12	15.18	10.12	17.31	12.25	3.33E+55
HLW C5V	0.72	14.82	5.43E+07	31.38	26.89	26.89	1.81	225.08	31.98	193.10	1.52	225.08	0.12	15.19	10.13	17.49	12.43	4.89E+53
HLW IHLW	0.73	14.82	1.09E+07	18.18	11.85	11.85	0.99	210.86	31.98	178.89	0.70	210.86	0.12	15.34	10.22	15.83	10.71	2.35E+62
HLW PJV	1.65	14.82	6.94E+05	4.22	1.33	1.33	3.73	197.59	31.98	165.62	0.58	197.59	0.12	15.48	10.32	15.82	10.66	7.81E+54
HLW HOP	0.82	14.82	1.82E+06	9.28	4.32	4.32	0.95	203.37	31.98	171.40	0.35	203.37	0.12	15.42	10.28	15.54	10.40	2.95E+61
PTF C2V	0.68	15.62	8.10E+07	51.63	34.31	34.31	0.43	233.88	39.64	194.24	1.58	233.88	0.12	43.55	29.03	46.03	31.51	1.76E+10
PTF C3V	0.73	15.62	8.18E+07	49.42	32.14	32.14	2.37	229.77	39.64	190.13	1.81	229.77	0.12	43.66	29.11	46.93	32.38	2.76E+09
PTF C5V	0.74	15.62	7.71E+07	47.97	30.73	30.73	2.74	227.99	39.64	188.35	1.81	227.99	0.12	43.71	29.14	46.98	32.41	1.99E+09
PTF PJV	0.57	15.62	7.57E+07	56.59	39.37	39.37	-3.64	243.01	39.64	203.37	1.05	243.01	0.12	43.31	28.87	44.41	29.97	1.40E+12
PTF PVV	1.39	15.62	1.69E+06	8.79	2.41	2.41	4.11	198.30	39.64	158.66	0.70	198.30	0.12	44.62	29.74	45.11	30.23	1.38E+09
																	Min	**4.61E+03**
																Overall Minimum		*4.61E+03*

Table 19. Dilution Factor for HLW Intake (10% Frequency)

10% Wind Frequency	Zo =	0.16	ft		n =	0.12													
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
HLW C3V	0.83	15.83	5.32E+07	23.81	18.37	18.37	4.03	214.34	31.98	182.36	1.46	214.34	0.11	13.97	9.31	16.09	11.44	4.33E+56
HLW C5V	0.84	15.83	5.43E+07	23.70	18.24	18.24	4.44	213.80	31.98	181.82	1.52	213.80	0.11	13.97	9.31	16.27	11.61	3.65E+54
HLW IHLW	0.86	15.83	1.09E+07	13.71	8.02	8.02	2.17	205.86	31.98	173.88	0.70	205.86	0.11	14.04	9.36	14.53	9.85	6.74E+68
HLW PJV	2.06	15.83	6.94E+05	3.05	0.84	0.84	4.03	196.81	31.98	164.83	0.58	196.81	0.11	14.13	9.42	14.47	9.76	1.96E+64
HLW HOP	0.97	15.83	1.82E+06	6.94	2.89	2.89	1.43	201.46	31.98	169.48	0.35	201.46	0.11	14.09	9.39	14.21	9.51	1.01E+71
																	Min	**3.65E+54**
10% Wind Frequency	Zo =	0.08	ft		n =	0.10													
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
HLW C3V	0.83	17.56	5.32E+07	23.81	19.35	19.35	4.03	215.32	31.98	183.34	1.46	215.32	0.09	11.87	7.91	13.99	10.04	5.75E+73
HLW C5V	0.84	17.56	5.43E+07	23.70	19.21	19.21	4.44	214.77	31.98	182.79	1.52	214.77	0.09	11.87	7.91	14.17	10.21	6.00E+70
HLW IHLW	0.86	17.56	1.09E+07	13.71	8.45	8.45	2.17	206.29	31.98	174.31	0.70	206.29	0.09	11.93	7.95	12.42	8.44	3.95E+93
HLW PJV	2.06	17.56	6.94E+05	3.05	0.89	0.89	4.03	196.86	31.98	164.88	0.58	196.86	0.09	12.00	8.00	12.34	8.34	1.19E+87
HLW HOP	0.97	17.56	1.82E+06	6.94	3.04	3.04	1.43	201.61	31.98	169.64	0.35	201.61	0.09	11.97	7.98	12.09	8.10	1.57E+97
																	Min	**6.00E+70**
10% Wind Frequency	Zo =	0.24	ft		n =	0.14													
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
HLW C3V	0.83	14.82	5.32E+07	23.81	17.77	17.77	4.03	213.74	31.98	181.77	1.46	213.74	0.12	15.30	10.20	17.43	12.33	4.90E+48
HLW C5V	0.84	14.82	5.43E+07	23.70	17.65	17.65	4.44	213.20	31.98	181.23	1.52	213.20	0.12	15.31	10.21	17.61	12.51	*1.00E+47*
HLW IHLW	0.86	14.82	1.09E+07	13.71	7.76	7.76	2.17	205.60	31.98	173.62	0.70	205.60	0.12	15.39	10.26	15.88	10.75	7.97E+57
HLW PJV	2.06	14.82	6.94E+05	3.05	0.82	0.82	4.03	196.78	31.98	164.81	0.58	196.78	0.12	15.49	10.33	15.83	10.67	1.90E+54
HLW HOP	0.97	14.82	1.82E+06	6.94	2.80	2.80	1.43	201.36	31.98	169.39	0.35	201.36	0.12	15.44	10.29	15.56	10.42	3.99E+59
																	Min	**1.00E+47**
																	Overall Minimum	*1.00E+47*

Table 20. Dilution Factor for HLW Intake (15% Frequency)

15% Wind Frequency	Zo =	0.16	ft		n =	0.12													
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
HLW C3V	1.06	15.83	5.32E+07	15.62	9.76	9.76	6.74	203.02	31.98	171.04	1.46	203.02	0.11	14.07	9.38	16.20	11.51	2.89E+49
HLW C5V	1.08	15.83	5.43E+07	15.52	9.66	9.66	7.18	202.48	31.98	170.51	1.52	202.48	0.11	14.08	9.38	16.38	11.68	5.23E+47
HLW IHLW	1.10	15.83	1.09E+07	8.96	4.24	4.24	3.39	200.85	31.98	168.87	0.70	200.85	0.11	14.09	9.40	14.58	9.89	2.59E+65
HLW PJV	2.87	15.83	6.94E+05	1.89	0.41	0.41	4.34	196.07	31.98	164.09	0.58	196.07	0.11	14.14	9.43	14.48	9.77	9.99E+63
HLW HOP	1.27	15.83	1.82E+06	4.49	1.50	1.50	1.93	199.57	31.98	167.59	0.35	199.57	0.11	14.11	9.40	14.23	9.53	8.18E+69
																	Min	**5.23E+47**
15% Wind Frequency	Zo =	0.08	ft		n =	0.10													
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
HLW C3V	1.06	17.56	5.32E+07	15.62	10.28	10.28	6.74	121.54	14.94	106.60	1.46	121.54	0.10	12.79	8.53	14.92	10.66	1.43E+23
HLW C5V	1.08	17.56	5.43E+07	15.52	10.18	10.18	7.18	121.00	14.94	106.06	1.52	121.00	0.10	12.80	8.53	15.10	10.83	1.67E+22
HLW IHLW	1.10	17.56	1.09E+07	8.96	4.47	4.47	3.39	119.07	14.94	104.13	0.70	119.07	0.10	12.83	8.55	13.32	9.04	5.79E+30
HLW PJV	2.87	17.56	6.94E+05	1.89	0.43	0.43	4.34	101.09	14.94	86.15	0.58	101.09	0.10	13.12	8.75	13.46	9.09	1.44E+22
HLW HOP	1.27	17.56	1.82E+06	4.49	1.58	1.58	1.93	199.65	14.94	184.71	0.35	199.65	0.09	11.98	7.99	12.10	8.11	1.61E+115
																	Min	**1.44E+22**
15% Wind Frequency	Zo =	0.24	ft		n =	0.10													
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
HLW C3V	1.06	14.82	5.32E+07	15.62	9.44	9.44	6.74	120.70	14.94	105.76	1.46	120.70	0.10	12.71	8.47	14.84	10.60	1.07E+23
HLW C5V	1.08	14.82	5.43E+07	15.52	9.35	9.35	7.18	120.17	14.94	105.23	1.52	120.17	0.10	12.72	8.48	15.02	10.78	*1.25E+22*
HLW IHLW	1.10	14.82	1.09E+07	8.96	4.10	4.10	3.39	118.71	14.94	103.77	0.70	118.71	0.10	12.75	8.50	13.24	8.99	8.09E+30
HLW PJV	2.87	14.82	6.94E+05	1.89	0.40	0.40	4.34	101.06	14.94	86.11	0.58	101.06	0.10	13.09	8.72	13.43	9.06	1.77E+22
HLW HOP	1.27	14.82	1.82E+06	4.49	1.45	1.45	1.93	199.52	14.94	184.58	0.35	199.52	0.09	11.76	7.84	11.88	7.96	1.60E+119
																	Min	**1.25E+22**
																	Overall Minimum	*1.25E+22*

Table 21. Dilution Factor for HLW Intake (20% Frequency)

20% Wind Frequency	Zo =	0.16	ft		n =	0.12												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
HLW C3V	1.03	15.83	5.32E+07	16.35	10.45	10.45	6.50	121.95	31.98	89.97	1.46	121.95	0.12	215.42	143.61	217.54	145.74	6.14E+03
HLW C5V	1.05	15.83	5.43E+07	16.24	10.35	10.35	6.94	121.41	31.98	89.43	1.52	121.41	0.12	215.56	143.71	217.86	146.01	5.84E+03
HLW IHLW	1.07	15.83	1.09E+07	9.38	4.54	4.54	3.29	119.26	31.98	87.28	0.70	119.26	0.12	216.14	144.09	216.63	144.58	2.77E+04
HLW PJV	2.76	15.83	6.94E+05	1.99	0.44	0.44	4.31	101.13	31.98	69.15	0.58	101.13	0.12	221.67	147.78	222.01	148.12	1.28E+05
HLW HOP	1.23	15.83	1.82E+06	4.70	1.61	1.61	1.89	199.72	31.98	167.75	0.35	199.72	0.11	200.51	133.67	200.63	133.80	2.12E+05
																	Min	**5.84E+03**
20% Wind Frequency	Zo =	0.08	ft		n =	0.10												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
HLW C3V	1.03	17.56	5.32E+07	16.35	11.01	11.01	6.50	122.51	31.98	90.53	1.46	122.51	0.10	181.67	121.11	183.80	123.24	4.75E+03
HLW C5V	1.05	17.56	5.43E+07	16.24	10.90	10.90	6.94	121.96	31.98	89.99	1.52	121.96	0.10	181.78	121.19	184.08	123.49	4.51E+03
HLW IHLW	1.07	17.56	1.09E+07	9.38	4.79	4.79	3.29	119.50	31.98	87.52	0.70	119.50	0.10	182.29	121.52	182.78	122.01	2.12E+04
HLW PJV	2.76	17.56	6.94E+05	1.99	0.47	0.47	4.31	101.15	31.98	69.18	0.58	101.15	0.10	186.54	124.36	186.88	124.70	9.51E+04
HLW HOP	1.23	17.56	1.82E+06	4.70	1.70	1.70	1.89	199.81	31.98	167.83	0.35	199.81	0.09	170.31	113.54	170.43	113.66	2.08E+05
																	Min	**4.51E+03**
20% Wind Frequency	Zo =	0.24	ft		n =	0.10												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
HLW C3V	1.03	14.82	5.32E+07	16.35	10.11	10.11	6.50	121.61	31.98	89.63	1.46	121.61	0.10	180.50	120.33	182.63	122.46	4.68E+03
HLW C5V	1.05	14.82	5.43E+07	16.24	10.01	10.01	6.94	121.07	31.98	89.10	1.52	121.07	0.10	180.63	120.42	182.93	122.72	*4.45E+03*
HLW IHLW	1.07	14.82	1.09E+07	9.38	4.40	4.40	3.29	119.11	31.98	87.13	0.70	119.11	0.10	181.10	120.73	181.59	121.22	2.10E+04
HLW PJV	2.76	14.82	6.94E+05	1.99	0.43	0.43	4.31	101.12	31.98	69.14	0.58	101.12	0.10	186.01	124.01	186.35	124.35	9.47E+04
HLW HOP	1.23	14.82	1.82E+06	4.70	1.56	1.56	1.89	199.67	31.98	167.69	0.35	199.67	0.09	167.19	111.46	167.31	111.58	2.08E+05
																	Min	**4.45E+03**
																	Overall Minimum	*4.45E+03*

Table 22. Dilution Factor for PTF Intake (5% Frequency)

5% Wind Frequency	Zo =	0.16	ft		n =	0.12												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	0.69	13.80	4.36E+07	49.45	27.24	27.24	0.77	144.48	14.94	129.54	1.40	144.48	0.12	25.32	16.88	27.28	18.84	8.48E+11
LAB C3V	0.67	13.80	7.66E+07	60.88	37.22	37.22	0.11	155.11	14.94	140.17	1.75	155.11	0.11	25.06	16.70	28.12	19.77	2.48E+12
LAB C5V	0.68	13.80	1.57E+07	35.58	16.63	16.63	0.25	134.38	14.94	119.44	0.82	134.38	0.12	25.59	17.06	26.26	17.73	8.52E+11
LAW C2V	0.83	15.38	4.90E+07	36.69	21.62	21.62	4.87	121.75	28.30	93.45	1.75	121.75	0.12	37.31	24.88	40.38	27.94	2.39E+04
LAWC3V	0.77	15.38	4.10E+07	36.40	21.36	21.36	2.74	218.62	28.30	190.32	1.40	218.62	0.11	34.29	22.86	36.25	24.82	5.70E+14
LAW C5V	0.75	15.38	6.81E+07	43.61	28.01	28.01	3.06	224.95	28.30	196.65	1.75	224.95	0.11	34.15	22.77	37.22	25.83	2.47E+14
LAW LVP	0.68	15.38	9.00E+06	23.79	11.29	11.29	0.16	211.13	28.30	182.83	0.53	211.13	0.11	34.46	22.97	34.73	23.25	1.34E+16
HLW C2V	1.06	15.83	4.12E+07	48.58	8.59	8.59	5.93	73.66	31.98	41.68	1.28	73.66	0.13	36.35	24.23	37.99	25.88	7.74E+02
HLW C3V	1.06	15.83	5.32E+07	61.21	9.76	9.76	6.74	203.02	31.98	171.04	1.46	203.02	0.11	52.91	35.28	55.04	37.40	1.19E+07
HLW C5V	1.08	15.83	5.43E+07	60.81	9.66	9.66	7.18	202.48	31.98	170.51	1.52	202.48	0.11	52.93	35.29	55.23	37.59	9.68E+06
HLW IHLW	1.10	15.83	1.09E+07	35.11	4.24	4.24	3.39	200.85	31.98	168.87	0.70	200.85	0.11	52.99	35.33	53.48	35.82	9.86E+07
HLW PJV	2.87	15.83	6.94E+05	7.41	0.41	0.41	4.34	196.07	31.98	164.09	0.58	196.07	0.11	53.17	35.45	53.51	35.79	2.56E+08
HLW HOP	1.27	15.83	1.82E+06	17.58	1.50	1.50	1.93	199.57	31.98	167.59	0.35	199.57	0.11	53.04	35.36	53.16	35.48	4.94E+08
PTF C2V	1.00	16.63	8.10E+07	64.97	12.53	12.53	6.70	205.83	39.64	166.19	1.58	205.83	0.11	11.75	7.83	14.23	10.31	5.02E+57
PTF C3V	1.09	16.63	8.18E+07	61.35	11.50	11.50	8.67	202.83	39.64	163.19	1.81	202.83	0.11	11.77	7.85	15.04	11.12	1.19E+48
PTF C5V	1.11	16.63	7.71E+07	59.37	10.95	10.95	8.87	202.08	39.64	162.44	1.81	202.08	0.11	11.78	7.85	15.05	11.12	4.25E+47
PTF PJV	0.79	16.63	7.57E+07	74.11	15.27	15.27	2.43	212.84	39.64	173.20	1.05	212.84	0.11	11.69	7.79	12.79	8.90	4.73E+83
PTF PVV	2.37	16.63	1.69E+06	10.03	0.76	0.76	5.02	195.74	39.64	156.11	0.70	195.74	0.11	11.83	7.89	12.32	8.38	5.75E+77
																	Min	**7.74E+02**

5% Wind Frequency	Zo =	0.08	ft		n =	0.10												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	0.69	15.54	4.36E+07	49.45	28.90	28.90	0.77	146.14	14.94	131.20	1.40	146.14	0.10	21.38	14.25	23.34	16.21	5.54E+15
LAB C3V	0.67	15.54	7.66E+07	60.88	39.49	39.49	0.11	157.38	14.94	142.44	1.75	157.38	0.10	21.17	14.12	24.24	17.18	1.90E+16
LAB C5V	0.68	15.54	1.57E+07	35.58	17.64	17.64	0.25	135.39	14.94	120.45	0.82	135.39	0.10	21.60	14.40	22.27	15.07	6.40E+15
LAW C2V	0.83	17.11	4.90E+07	36.69	22.80	22.80	4.87	122.93	28.30	94.63	1.75	122.93	0.10	31.45	20.96	34.51	24.03	1.53E+05
LAWC3V	0.77	17.11	4.10E+07	36.40	22.53	22.53	2.74	219.79	28.30	191.49	1.40	219.79	0.09	29.14	19.43	31.10	21.39	1.84E+19
LAW C5V	0.75	17.11	6.81E+07	43.61	29.55	29.55	3.06	226.49	28.30	198.19	1.75	226.49	0.09	29.03	19.35	32.09	22.42	4.55E+18
LAW LVP	0.68	17.11	9.00E+06	23.79	11.90	11.90	0.16	211.75	28.30	183.45	0.53	211.75	0.09	29.28	19.52	29.55	19.79	1.61E+21
HLW C2V	1.06	17.56	4.12E+07	48.58	9.05	9.05	5.93	74.11	31.98	42.14	1.28	74.11	0.11	30.41	20.27	32.05	21.92	9.60E+02
HLW C3V	1.06	17.56	5.32E+07	61.21	10.28	10.28	6.74	203.54	31.98	171.56	1.46	203.54	0.09	44.94	29.96	47.07	32.09	4.06E+08
HLW C5V	1.08	17.56	5.43E+07	60.81	10.18	10.18	7.18	203.00	31.98	171.02	1.52	203.00	0.09	44.96	29.97	47.26	32.27	3.04E+08
HLW IHLW	1.10	17.56	1.09E+07	35.11	4.47	4.47	3.39	201.07	31.98	169.10	0.70	201.07	0.09	45.01	30.01	45.50	30.50	5.05E+09
HLW PJV	2.87	17.56	6.94E+05	7.41	0.43	0.43	4.34	196.09	31.98	164.11	0.58	196.09	0.09	45.16	30.10	45.50	30.44	1.03E+10
HLW HOP	1.27	17.56	1.82E+06	17.58	1.58	1.58	1.93	199.65	31.98	167.67	0.35	199.65	0.09	45.05	30.03	45.17	30.16	2.64E+10
PTF C2V	1.00	18.37	8.10E+07	64.97	13.17	13.17	6.70	206.47	39.64	166.83	1.58	206.47	0.09	9.98	6.65	12.46	9.13	4.50E+73
PTF C3V	1.09	18.37	8.18E+07	61.35	12.08	12.08	8.67	203.41	39.64	163.78	1.81	203.41	0.09	10.00	6.66	13.27	9.93	1.58E+60
PTF C5V	1.11	18.37	7.71E+07	59.37	11.50	11.50	8.87	202.64	39.64	163.00	1.81	202.64	0.09	10.00	6.67	13.27	9.94	4.14E+59
PTF PJV	0.79	18.37	7.57E+07	74.11	16.04	16.04	2.43	213.61	39.64	173.98	1.05	213.61	0.09	9.93	6.62	11.04	7.72	2.43E+111
PTF PVV	2.37	18.37	1.69E+06	10.03	0.80	0.80	5.02	195.78	39.64	156.14	0.70	195.78	0.09	10.04	6.70	10.53	7.19	5.10E+104
																	Min	**9.60E+02**

5% Wind Frequency	Zo =	0.24	ft		n =	0.14												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
LAB C2V	0.69	12.79	4.36E+07	49.45	26.23	26.23	0.77	143.46	14.94	128.52	1.40	143.46	0.13	27.86	18.57	29.82	20.53	1.75E+10
LAB C3V	0.67	12.79	7.66E+07	60.88	35.83	35.83	0.11	153.72	14.94	138.78	1.75	153.72	0.13	27.56	18.37	30.62	21.44	4.45E+10
LAB C5V	0.68	12.79	1.57E+07	35.58	16.00	16.00	0.25	133.76	14.94	118.81	0.82	133.76	0.13	28.17	18.78	28.83	19.45	1.82E+10
LAW C2V	0.83	14.36	4.90E+07	36.69	20.89	20.89	4.87	121.02	28.30	92.72	1.75	121.02	0.13	41.12	27.42	44.19	30.48	1.09E+04
LAWC3V	0.77	14.36	4.10E+07	36.40	20.64	20.64	2.74	217.90	28.30	189.60	1.40	217.90	0.12	37.57	25.05	39.53	27.01	5.80E+12
LAW C5V	0.75	14.36	6.81E+07	43.61	27.07	27.07	3.06	224.01	28.30	195.71	1.75	224.01	0.12	37.42	24.95	40.48	28.01	3.03E+12
LAW LVP	0.68	14.36	9.00E+06	23.79	10.91	10.91	0.16	210.75	28.30	182.45	0.53	210.75	0.12	37.76	25.17	38.03	25.45	8.63E+13
HLW C2V	1.06	14.82	4.12E+07	48.58	8.31	8.31	5.93	73.38	31.98	41.40	1.28	73.38	0.14	40.26	26.84	41.90	28.49	*7.39E+02*
HLW C3V	1.06	14.82	5.32E+07	61.21	9.44	9.44	6.74	202.70	31.98	170.72	1.46	202.70	0.12	58.00	38.67	60.13	40.79	2.60E+06
HLW C5V	1.08	14.82	5.43E+07	60.81	9.35	9.35	7.18	202.17	31.98	170.19	1.52	202.17	0.12	58.02	38.68	60.32	40.98	2.18E+06
HLW IHLW	1.10	14.82	1.09E+07	35.11	4.10	4.10	3.39	200.71	31.98	168.73	0.70	200.71	0.12	58.09	38.72	58.58	39.21	1.85E+07
HLW PJV	2.87	14.82	6.94E+05	7.41	0.40	0.40	4.34	196.06	31.98	164.08	0.58	196.06	0.12	58.29	38.86	58.63	39.20	5.34E+07
HLW HOP	1.27	14.82	1.82E+06	17.58	1.45	1.45	1.93	199.52	31.98	167.54	0.35	199.52	0.12	58.14	38.76	58.26	38.88	9.15E+07
PTF C2V	1.00	15.62	8.10E+07	64.97	12.15	12.15	6.70	205.44	39.64	165.81	1.58	205.44	0.12	12.87	8.58	15.35	11.06	1.33E+50
PTF C3V	1.09	15.62	8.18E+07	61.35	11.14	11.14	8.67	202.47	39.64	162.84	1.81	202.47	0.12	12.90	8.60	16.17	11.87	1.57E+42
PTF C5V	1.11	15.62	7.71E+07	59.37	10.61	10.61	8.87	201.74	39.64	162.11	1.81	201.74	0.12	12.91	8.61	16.18	11.88	6.48E+41
PTF PJV	0.79	15.62	7.57E+07	74.11	14.79	14.79	2.43	212.37	39.64	172.73	1.05	212.37	0.12	12.81	8.54	13.91	9.64	1.28E+71
PTF PVV	2.37	15.62	1.69E+06	10.03	0.74	0.74	5.02	195.72	39.64	156.08	0.70	195.72	0.12	12.97	8.64	13.46	9.13	6.30E+65
																	Min	**7.39E+02**
																	Overall Minimum	*7.39E+02*

Table 23. Dilution Factor for PTF Intake (10% Frequency)

10% Wind Frequency	Zo =	0.16	ft		n =	0.12												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
HLW C3V	1.06	15.83	5.32E+07	24.29	9.76	9.76	6.74	203.02	31.98	171.04	1.46	203.02	0.11	52.91	35.28	55.04	37.40	1.19E+07
HLW C5V	1.08	15.83	5.43E+07	24.13	9.66	9.66	7.18	202.48	31.98	170.51	1.52	202.48	0.11	52.93	35.29	55.23	37.59	9.68E+06
HLW IHLW	1.10	15.83	1.09E+07	13.93	4.24	4.24	3.39	200.85	31.98	168.87	0.70	200.85	0.11	52.99	35.33	53.48	35.82	9.86E+07
HLW PJV	2.87	15.83	6.94E+05	2.94	0.41	0.41	4.34	196.07	31.98	164.09	0.58	196.07	0.11	53.17	35.45	53.51	35.79	2.56E+08
HLW HOP	1.27	15.83	1.82E+06	6.98	1.50	1.50	1.93	199.57	31.98	167.59	0.35	199.57	0.11	53.04	35.36	53.16	35.48	4.94E+08
PTF C2V	1.00	16.63	8.10E+07	17.10	12.53	12.53	6.70	205.83	39.64	166.19	1.58	205.83	0.11	11.75	7.83	14.23	10.31	5.02E+57
PTF C3V	1.09	16.63	8.18E+07	16.15	11.50	11.50	8.67	202.83	39.64	163.19	1.81	202.83	0.11	11.77	7.85	15.04	11.12	1.19E+48
PTF C5V	1.11	16.63	7.71E+07	15.63	10.95	10.95	8.87	202.08	39.64	162.44	1.81	202.08	0.11	11.78	7.85	15.05	11.12	4.25E+47
PTF PJV	0.79	16.63	7.57E+07	19.51	15.27	15.27	2.43	212.84	39.64	173.20	1.05	212.84	0.11	11.69	7.79	12.79	8.90	4.73E+83
PTF PVV	2.37	16.63	1.69E+06	2.64	0.76	0.76	5.02	195.74	39.64	156.11	0.70	195.74	0.11	11.83	7.89	12.32	8.38	5.75E+77
																	Min	**9.68E+06**
10% Wind Frequency	Zo =	0.08	ft		n =	0.10												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
HLW C3V	1.06	17.56	5.32E+07	24.29	10.28	10.28	6.74	203.54	31.98	171.56	1.46	203.54	0.09	44.94	29.96	47.07	32.09	4.06E+08
HLW C5V	1.08	17.56	5.43E+07	24.13	10.18	10.18	7.18	203.00	31.98	171.02	1.52	203.00	0.09	44.96	29.97	47.26	32.27	3.04E+08
HLW IHLW	1.10	17.56	1.09E+07	13.93	4.47	4.47	3.39	201.07	31.98	169.10	0.70	201.07	0.09	45.01	30.01	45.50	30.50	5.05E+09
HLW PJV	2.87	17.56	6.94E+05	2.94	0.43	0.43	4.34	196.09	31.98	164.11	0.58	196.09	0.09	45.16	30.10	45.50	30.44	1.03E+10
HLW HOP	1.27	17.56	1.82E+06	6.98	1.58	1.58	1.93	199.65	31.98	167.67	0.35	199.65	0.09	45.05	30.03	45.17	30.16	2.64E+10
PTF C2V	1.00	18.37	8.10E+07	17.10	13.17	13.17	6.70	206.47	39.64	166.83	1.58	206.47	0.09	9.98	6.65	12.46	9.13	4.50E+73
PTF C3V	1.09	18.37	8.18E+07	16.15	12.08	12.08	8.67	203.41	39.64	163.78	1.81	203.41	0.09	10.00	6.66	13.27	9.93	1.58E+60
PTF C5V	1.11	18.37	7.71E+07	15.63	11.50	11.50	8.87	202.64	39.64	163.00	1.81	202.64	0.09	10.00	6.67	13.27	9.94	4.14E+59
PTF PJV	0.79	18.37	7.57E+07	19.51	16.04	16.04	2.43	213.61	39.64	173.98	1.05	213.61	0.09	9.93	6.62	11.04	7.72	2.43E+111
PTF PVV	2.37	18.37	1.69E+06	2.64	0.80	0.80	5.02	195.78	39.64	156.14	0.70	195.78	0.09	10.04	6.70	10.53	7.19	5.10E+104
																	Min	**3.04E+08**
10% Wind Frequency	Zo =	0.24	ft		n =	0.14												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
HLW C3V	1.06	14.82	5.32E+07	24.29	9.44	9.44	6.74	202.70	31.98	170.72	1.46	202.70	0.12	58.00	38.67	60.13	40.79	2.60E+06
HLW C5V	1.08	14.82	5.43E+07	24.13	9.35	9.35	7.18	202.17	31.98	170.19	1.52	202.17	0.12	58.02	38.68	60.32	40.98	*2.18E+06*
HLW IHLW	1.10	14.82	1.09E+07	13.93	4.10	4.10	3.39	200.71	31.98	168.73	0.70	200.71	0.12	58.09	38.72	58.58	39.21	1.85E+07
HLW PJV	2.87	14.82	6.94E+05	2.94	0.40	0.40	4.34	196.06	31.98	164.08	0.58	196.06	0.12	58.29	38.86	58.63	39.20	5.34E+07
HLW HOP	1.27	14.82	1.82E+06	6.98	1.45	1.45	1.93	199.52	31.98	167.54	0.35	199.52	0.12	58.14	38.76	58.26	38.88	9.15E+07
PTF C2V	1.00	15.62	8.10E+07	17.10	12.15	12.15	6.70	205.44	39.64	165.81	1.58	205.44	0.12	12.87	8.58	15.35	11.06	1.33E+50
PTF C3V	1.09	15.62	8.18E+07	16.15	11.14	11.14	8.67	202.47	39.64	162.84	1.81	202.47	0.12	12.90	8.60	16.17	11.87	1.57E+42
PTF C5V	1.11	15.62	7.71E+07	15.63	10.61	10.61	8.87	201.74	39.64	162.11	1.81	201.74	0.12	12.91	8.61	16.18	11.88	6.48E+41
PTF PJV	0.79	15.62	7.57E+07	19.51	14.79	14.79	2.43	212.37	39.64	172.73	1.05	212.37	0.12	12.81	8.54	13.91	9.64	1.28E+71
PTF PVV	2.37	15.62	1.69E+06	2.64	0.74	0.74	5.02	195.72	39.64	156.08	0.70	195.72	0.12	12.97	8.64	13.46	9.13	6.30E+65
																	Min	**2.18E+06**
																	Overall Minimum	***2.18E+06***

Table 24. Dilution Factor for PTF Intake (15% Frequency)

15% Wind Frequency	Zo =	0.16	ft		n =	0.12												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
PTF C2V	1.00	16.63	8.10E+07	17.10	12.53	12.53	6.70	205.83	39.64	166.19	1.58	205.83	0.11	11.75	7.83	14.23	10.31	5.02E+57
PTF C3V	1.09	16.63	8.18E+07	16.15	11.50	11.50	8.67	202.83	39.64	163.19	1.81	202.83	0.11	11.77	7.85	15.04	11.12	1.19E+48
PTF C5V	1.11	16.63	7.71E+07	15.63	10.95	10.95	8.87	202.08	39.64	162.44	1.81	202.08	0.11	11.78	7.85	15.05	11.12	*4.25E+47*
PTF PJV	0.79	16.63	7.57E+07	19.51	15.27	15.27	2.43	212.84	39.64	173.20	1.05	212.84	0.11	11.69	7.79	12.79	8.90	4.73E+83
PTF PVV	2.37	16.63	1.69E+06	2.64	0.76	0.76	5.02	195.74	39.64	156.11	0.70	195.74	0.11	11.83	7.89	12.32	8.38	5.75E+77
																	Min	**4.25E+47**
15% Wind Frequency	Zo =	0.08	ft		n =	0.10												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
PTF C2V	1.00	18.37	8.10E+07	17.10	13.17	13.17	6.70	206.47	39.64	166.83	1.58	206.47	0.09	9.98	6.65	12.46	9.13	4.50E+73
PTF C3V	1.09	18.37	8.18E+07	16.15	12.08	12.08	8.67	203.41	39.64	163.78	1.81	203.41	0.09	10.00	6.66	13.27	9.93	1.58E+60
PTF C5V	1.11	18.37	7.71E+07	15.63	11.50	11.50	8.87	202.64	39.64	163.00	1.81	202.64	0.09	10.00	6.67	13.27	9.94	4.14E+59
PTF PJV	0.79	18.37	7.57E+07	19.51	16.04	16.04	2.43	213.61	39.64	173.98	1.05	213.61	0.09	9.93	6.62	11.04	7.72	2.43E+111
PTF PVV	2.37	18.37	1.69E+06	2.64	0.80	0.80	5.02	195.78	39.64	156.14	0.70	195.78	0.09	10.04	6.70	10.53	7.19	5.10E+104
																	Min	**4.14E+59**
15% Wind Frequency	Zo =	0.24	ft		n =	0.10												
	β_j	U_H/U_*	F_m	h_x	h_f	h_r	h_d	h_{plume}	h_{top}	ζ	σ_0	z	i_x	$i_y x$	$i_z x$	σ_y	σ_z	D_r
	(-)	(-)	(ft^4/s^2)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(-)	(ft)	(ft)	(ft)	(ft)	(-)
PTF C2V	1.00	15.62	8.10E+07	17.10	12.15	12.15	6.70	205.44	39.64	165.81	1.58	205.44	0.09	9.79	6.53	12.27	9.01	5.12E+74
PTF C3V	1.09	15.62	8.18E+07	16.15	11.14	11.14	8.67	202.47	39.64	162.84	1.81	202.47	0.09	9.81	6.54	13.08	9.81	9.07E+60
PTF C5V	1.11	15.62	7.71E+07	15.63	10.61	10.61	8.87	201.74	39.64	162.11	1.81	201.74	0.09	9.82	6.55	13.09	9.82	2.47E+60
PTF PJV	0.79	15.62	7.57E+07	19.51	14.79	14.79	2.43	212.37	39.64	172.73	1.05	212.37	0.09	9.75	6.50	10.85	7.60	2.57E+113
PTF PVV	2.37	15.62	1.69E+06	2.64	0.74	0.74	5.02	195.72	39.64	156.08	0.70	195.72	0.09	9.86	6.58	10.35	7.07	1.35E+108
																	Min	**2.47E+60**
																	Overall Minimum	***4.25E+47***

Table 25. Dilution Factor Results

Exhaust	Critical Dilution Factor (20% Frequency)				Critical Dilution Factor (15% Frequency)				Critical Dilution Factor (10% Frequency)				Critical Dilution Factor (5% Frequency)			
Stack	LAB	LAW	HLW	PTF	LAB	LAW	HLW	PTF	LAB	LAW	HLW	PTF	LAB	LAW	HLW	PTF
LAB C2V	4.46E+09	1.96E+04			3.32E+09	1.90E+04			5.23E+09	1.70E+04			6.75E+10	8.41E+04	5.26E+03	1.75E+10
LAB C3V	**1.03E+09**	**1.24E+04**			**7.09E+08**	1.17E+04			3.77E+09	1.39E+04			1.76E+11	1.13E+05	**4.61E+03**	4.45E+10
LAB C5V	1.10E+11	6.24E+04			9.02E+10	6.19E+04			2.62E+10	3.99E+04			7.49E+10	1.20E+05	1.08E+04	1.82E+10
LAW C2V		1.53E+05				5.88E+05			6.15E+03	9.11E+04			9.24E+02	1.37E+05	1.66E+04	1.09E+04
LAWC3V		9.26E+24				3.34E+24			1.65E+13	2.77E+22			2.48E+12	2.03E+17	3.02E+13	5.80E+12
LAW C5V		2.41E+22				1.31E+22			1.75E+12	3.56E+20			2.63E+11	2.20E+17	1.94E+13	3.03E+12
LAW LVP		2.16E+31				2.44E+30			6.33E+15	1.32E+27			9.51E+14	8.81E+17	3.14E+14	8.63E+13
HLW C2V						**1.49E+03**			**7.65E+02**	**5.51E+02**			***1.60E+02***	**8.73E+03**	2.18E+04	**7.39E+02**
HLW C3V			4.68E+03			6.09E+05	1.07E+23		1.28E+05	2.13E+05	4.90E+48	2.60E+06	1.71E+05	1.70E+07	3.33E+55	2.60E+06
HLW C5V			**4.45E+03**			5.33E+05	**1.25E+22**		1.14E+05	1.88E+05	**1.00E+47**	**2.18E+06**	1.50E+05	1.45E+07	4.89E+53	2.18E+06
HLW IHLW			2.10E+04			3.56E+06	5.79E+30		6.79E+05	7.32E+05	7.97E+57	1.85E+07	4.22E+05	2.43E+06	2.35E+62	1.85E+07
HLW PJV			9.47E+04			1.18E+07	1.44E+22		2.40E+06	1.81E+06	1.90E+54	5.34E+07	8.75E+05	9.66E+05	7.81E+54	5.34E+07
HLW HOP			2.08E+05			1.73E+07	1.61E+115		3.26E+06	2.76E+06	3.99E+59	9.15E+07	1.37E+06	2.29E+06	2.95E+61	9.15E+07
PTF C2V	2.56E+10	1.09E+07			3.10E+10	1.24E+07		5.02E+57	1.73E+09	6.80E+06		1.33E+50	3.82E+12	7.74E+13	1.76E+10	1.33E+50
PTF C3V	3.94E+09	8.17E+06			4.65E+09	4.65E+06		1.19E+48	3.69E+08	2.70E+06		1.57E+42	2.83E+11	5.67E+12	2.76E+09	1.57E+42
PTF C5V	3.38E+09	6.78E+06			3.95E+09	4.29E+06		**4.25E+47**	3.24E+08	2.39E+06		6.48E+41	1.67E+11	2.46E+12	1.99E+09	6.48E+41
PTF PJV	2.28E+12	1.81E+08			2.95E+12	1.37E+08		4.73E+83	7.14E+10	5.98E+07		1.28E+71	1.63E+15	2.37E+16	1.40E+12	1.28E+71
PTF PVV	3.52E+11	2.14E+08			3.49E+11	1.05E+08		5.75E+77	1.79E+10	1.41E+07		6.30E+65	7.38E+09	1.17E+08	1.38E+09	6.30E+65

Notes:

1. Indicates dilution factor less than 200.

2. Indicates the lowest dilution factor for that air intake with respect to wind frequency.

3. Wind speed and direction was based on wind rose obtained from CALC NO.: 24590-WTP-M0C-M20T-00001. Cases where wind direction was unlikely to cause re-entrainment are filled in gray.