

### 6. ADDITIONAL IMPACTS

In addition to the NAAQS and PSD Increment modeling analyses described previously in this report, applicants are required to perform additional impacts evaluations including: a growth analysis, a soil and vegetation analysis, and a plume visibility analysis.

### 6.1. PLUME VISIBILITY ANALYSIS

There are no airports or state parks located within the maximum daily SIA ( $2.3\,\mathrm{km}$ ) and as such, no plume visibility analysis was required.

### 6.2. GROWTH ANALYSIS

The project will consist of the construction and operation of a new wood pellet facility. There will be temporary jobs associated with facility construction as well as the creation of approximately 80 permanent jobs to staff the site. It is anticipated that the large majority of the permanent jobs will be filled with residents that are already located in the area, and thus, no significant growth (in population or infrastructure) is expected in association with the new facility.

### 6.3. SOIL AND VEGETATION ANALYSIS

To assess soil and vegetation impacts, two comparisons were used. First, the NAAQS results (or significance results if SILs were not reached) were assessed against the secondary NAAQS standards, which provide protection for public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. Second, the NAAQS results (or significance results if SILs were not reached) were compared to values from the EPA document, A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals (EPA 450/2-81-078), 1981.<sup>39</sup>

The results for both comparisons are presented in Table 6-1 and show that no impacts exceed the secondary NAAQS or the EPA screening levels. Thus, there are no adverse impacts expected on soils or vegetation.

<sup>&</sup>lt;sup>39</sup> EPA, A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals (EPA 450/2-81-078), 1981.

TABLE 6-1. SOIL AND VEGETATION IMPACTS

Pollutant	Averaging Period	Total Concentration <sup>1</sup> (µg/m <sup>3</sup> )	Ve Sensitive (μg/m³)	getation Sensitiv Intermediate (µg/m³)	ity <sup>2</sup> Resistant (μg/m³)	Secondary NAAQS (µg/m³)	Minimum Threshold (µg/m³)	Exceeds Threshold? (Yes/No)
NO2 <sup>4</sup>	4-Hour	127.8	3,760	6,400	16,920	_	3,760	No
	8-Hour	127.8	3,760	7,520	15.040		3,760	No No
	1-Month	127.8	-	564	-		564	No No
	Annual	11.0	-	94	_	100	94	No
PM <sub>10</sub> <sup>5</sup>	24-Hour	46.6	-	-	-	150	150	No
	Annual	17.2	*	~	-	50	50	No
PM <sub>2.5</sub>	24-Hour	20.9	-	-	-	35	35	No
	Annual	9.9	~	-	-	15	15	No

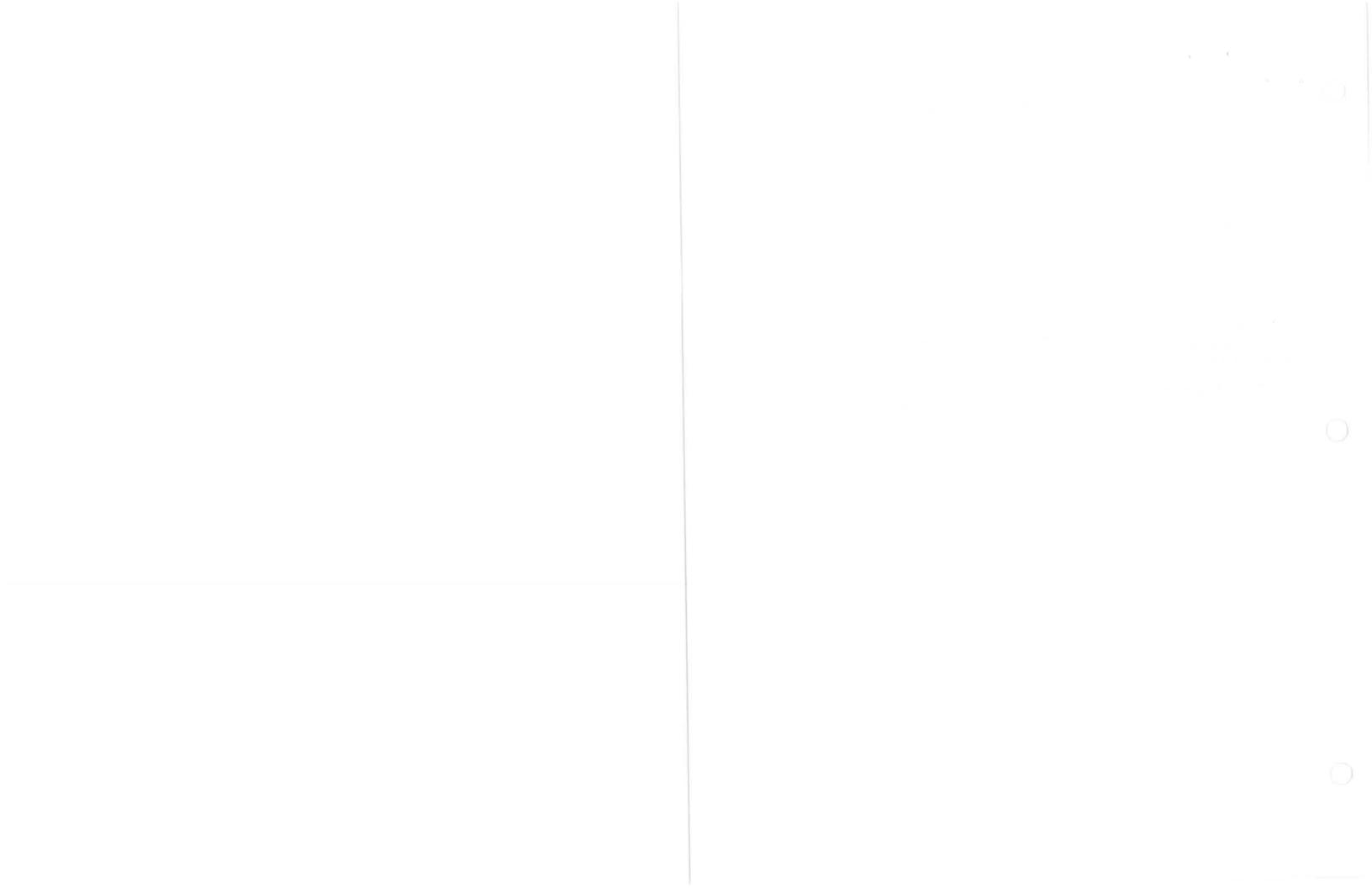
Results from the Significance Analysis or NAAQS Analysis where modeled impacts exceeded the SIL.

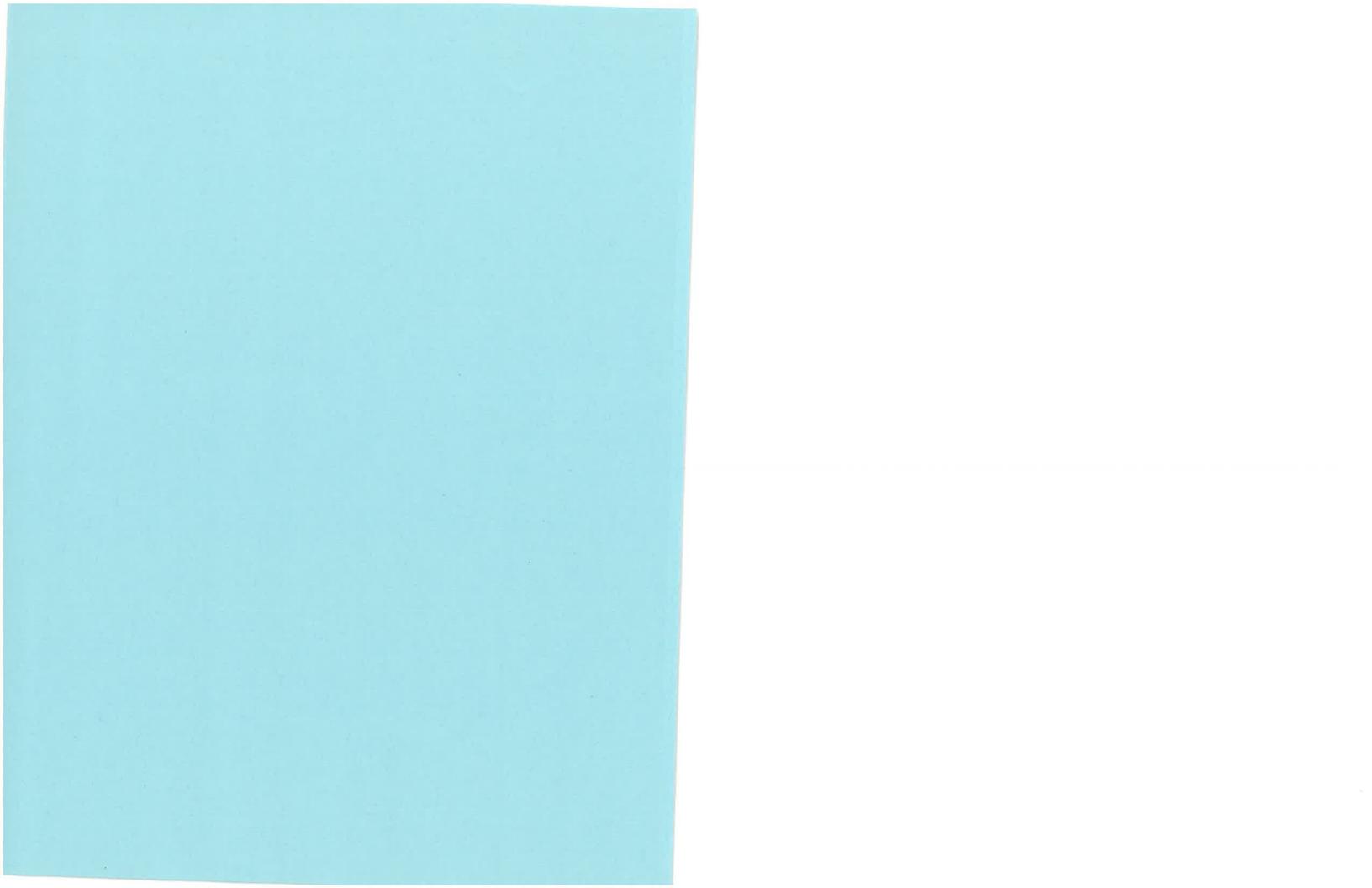
<sup>&</sup>lt;sup>2</sup> Screening Concentrations based on Table 3.1 A Screening Procedure for Impact of Air Pollution Sources on Plants, Soil and Animals, USEPA, Dec. 12, 1980.

<sup>&</sup>lt;sup>3</sup> 1-Week Average is conservatively estimated by the 8-hour SIL modeling results.

<sup>&</sup>lt;sup>4</sup> 4-Hour, 8-Hour and Monthly Averages are conservatively estimated by the 1-hour NAAQS modeling results.

Annual results are based on the increment analysis (with background added), since no annual NAAQS exists.





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Facility Forms



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## FORM A1 FACILITY (General Information)

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O THE	CHIM	Section	١

REVISED 11/01/02 NCDENR/Division of Air Quality - Ap	oplication for Air Permit to Construct/Operate
NOTE- APPLICATION WILL NOT B	E PROCESSED WITHOUT THE FOLLOWING:
Local Zoning Consistency Determination (if required)	Facility Reduction & Recycling Survey Form (Form A4)  Application Fee
Responsible Official/Authorized Contact Signature	Appropriate Number of Copies of Application   P.E. Seal (if required)
GENERA	AL INFORMATION
Legal Corporate/Owner Name: Enviva Pellets Hamlet, LLC	CONTROL AND CONTROL AND CONTROL OF CONTROL O
Site Name: Enviva Pellets Hamlet, LLC	
Site Address (911 Address) Line 1: Highway 117	
Site Address Line 2:	
City: Hamlet	State: North Carolina
Zip Code: 28345	County: Richmond
CONTAC	CT INFORMATION
Permit/Technical Contact:	Facility/Inspection Contact:
Name/Title: Joe Harrell	Name/Title: Joe Harrell
Mailing Address Line 1: 142 N.C. Route 561 East	
Mailing Address Line 2:	Mailing Address Line 1: 142 N.C. Route 561 East  Mailing Address Line 2:
City: Ahoskie State: NC Zip Code: 27	040 C2
Phone No. (area code) (252) 209-6032 Fax No. (area code)	Di Vi ( Zip Code. Zigit
Email Addres: Joe.Harrell@envivabiomass.com	Phone No. (area code) (252) 209-6032 Fax No. (area code)  Email Addres: Joe.Harrell@envlvabiomass.com
Responsible Official/Authorized Contact:	Invoice Contact:
Name/Title: Pete Najera	
Mailing Address Line 1: 7200 Wisconsin Avenue	Name/Title: Same as permit/technical contact
Mailing Address Line 2: Suite 1100	Mailing Address Line 1:
Chica Best and City	Mailing Address Line 2:
Phone No. (area code) (703) 380-9957 Fax No. (area code)	B14 City: State: Zip Code:
Email Addres: Pete.Najera@envivabiomass.com	Phone No. (area code) Fax No. (area code)
	Email Address:
New Non-permitted Facility/Greenfield Modification of	CE We do not be
	Renewal with Modification  The wal (TV Only)
FACILITY CLASSIFICATION AL	FTER APPLICATION (Check Only One)
General Small Prohibitory Small	
	Synthetic Minor  J Title V  nt Site) INFORMATION
Describe potago of Johant State Constitution (1)	
Vood pellet manufacturing facility (to be assigned by the control of the control	(ned)
Primary SIC/NAICS Code: 2499 (Wood Products, Not Elsewhere Classified)	
The state of the s	Current/Previous Air Permit N/A Expiration Date:
OF GOLD OF HIM 2.4 SECONDS N	Longitude: 79 deg 38 min 3,3 seconds W
	✓ NO
Person Name: Dale Overcash	AT PREPARED APPLICATION
1 10	Firm Name: Trinity Consultants, Inc.
The state of the s	Mailing Address Line 2: Suite 310
Sinte. Notificational	Zip Code: 27560 County: Wake
FEATTO: (515) 402-3034	Email Address: DOvernan @printers = 100 and
JONATURE OF RESPONSIBL	E OFFICIAL/AUTHORIZED CONTACT
lame (typed): Pete Najera  ( Signature(Blue Ink):	Title: VICE PRESIDENT, OPERATIONS
Put Nain	Date: 1/9/14
Attach Additiona	I Sheets As Negessary

File:Enviva Hamlet Forms v3 Trinity Consultants Page 1 of 2 Sheet:A1



A started 6.1.1.0 THE STREET

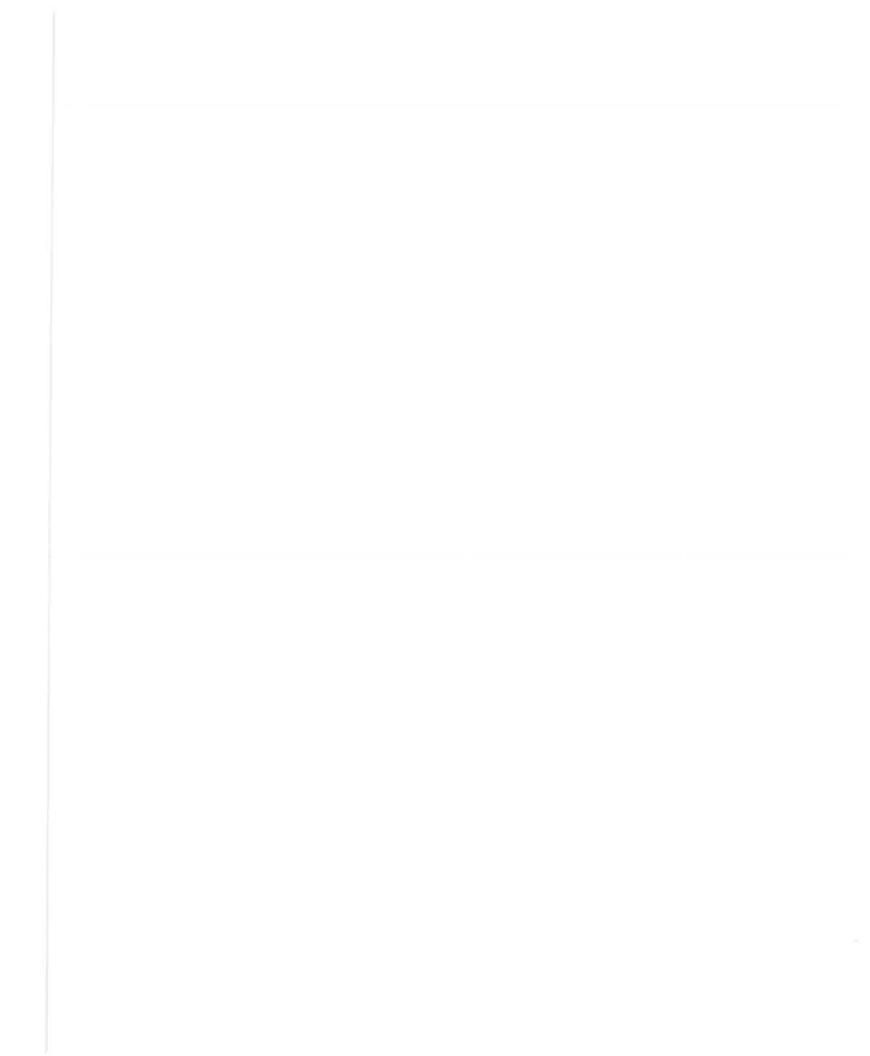
# FORMs A2, A3 EMISSION SOURCE LISTING FOR THIS APPLICATION - A2 112r APPLICABILITY INFORMATION - A3

ES-GHM-1, 2 C ES-CHIP-2 F ES-BARKHOG E ES-DRYER C	EMISSION SOURCE LISTING: New, EMISSION SOURCE DESCRIPTION  Equipment To Be ADDED By This App Log Chipping Green Wood Hammermills Portable Chipper Bark Hog Green Wood Direct-Fired Dryer System Eight (8) Hammermills	CONTRO	L DEVICE NO.	CONTROL DEVICE DESCRIPTION		
ES-GHM-1, 2 C ES-CHIP-2 F ES-BARKHOG E ES-DRYER C	Equipment To Be ADDED By This App Log Chipping Green Wood Hammermills Portable Chipper Bark Hog Green Wood Direct-Fired Dryer System	N/A CD-RCHP-CYC N/A N/A N/A CD-DC CD-WESP	iously Unpermit	ked, or Replacement)  N/A  Simple Cyclone  N/A		
ES-GHM-1, 2 C ES-CHIP-2 F ES-BARKHOG E ES-DRYER C	Log Chipping Green Wood Hammermills Portable Chipper Bark Hog Green Wood Direct-Fired Dryer System	N/A CD-RCHP-CYC N/A N/A CD-DC CD-WESP		N/A Simple Cyclone N/A		
ES-GHM-1, 2 C ES-CHIP-2 F ES-BARKHOG E ES-DRYER C	Green Wood Hammermills Portable Chipper Bark Hog Green Wood Direct-Fired Dryer System	CD-RCHP-CYC N/A N/A CD-DC CD-WESP		Simple Cyclone N/A		
ES-CHIP-2 F ES-BARKHOG E ES-DRYER G	Portable Chipper Bark Hog Green Wood Direct-Fired Dryer System	N/A N/A CD-DC CD-WESP		N/A		
ES-BARKHOG E ES-DRYER G	Bark Hog Green Wood Direct-Fired Dryer System	N/A CD-DC CD-WESP				
ES-DRYER C	Green Wood Direct-Fired Dryer System	CD-DC CD-WESP		IN/A		
		CD-WESP		Three (3) Simple Cyclones		
ES-HM-1 through 8 E	Eight (8) Hammermills			Wet Electrostatic Precipitator		
	- g-it (o) riddiniorinino		CD-HM-BF1			
		CD-HM-CYC-2		Simple Cyclone, Bagfilter		
		CD-HM-CYC-3	CD-HM-BF1	Simple Cyclone, Bagfilter		
			CD-HM-BF1	Simple Cyclone, Bagfilter		
		CD-HM-CYC-4	CD-HM-BF2	Simple Cyclone, Bagfilter		
		CD-HM-CYC-5	CD-HM-BF2	Simple Cyclone, Bagfilter		
		CD-HM-CYC-6	CD-HM-BF2	Simple Cyclone, Bagfilter		
		CD-HM-CYC-7	CD-HM-BF3	Simple Cyclone, Bagfilter		
FO LUIA		CD-HM-CYC-8	CD-HM-BF3	Simple Cyclone, Bagfilter		
	fammermill Area Filter	CD-HMA-BF3		Bagfilter		
	Pellet Mill Feed Silo	CD-PMFS-BV		Bin Vent Baghouse		
	Six (6) Pellet Coolers		CLR-1 through 6 Six (6) Pellet Cooler Cyclones			
	Pellet Fines Bin	CD-PFB-BF		Bin Vent Baghouse		
	inished Product Handling					
	Pellet Loadout Bins	CD-FPH-BF Finished Product Handling Ba		Finished Product Handling Bagfilte	r	
	Pellet Mill Loadout					
	mergency Generator (250 bhp)	N/A		N/A		
ES-FWP F	ire Water Pump (250 bhp)	N/A		N/A		
	Existing Permitted Equipm	ent To Be MODIFII	ED By This App	lication		
	Equipment To Be	DELETED By Thi	s Application			
s your facility subject to 40 CFR	112/-\ ADDI I	CABILITY INFOR	RMATION		A 3	

is your facility subject to 40 CFR Part 68 "Prevention of Accidental Releases" - Section 112(r) of the Federal Clean If No, please specify in detail how your facility avoided applicability:	Air Act?	Yes / No	3
if your facility is Subject to 112(r), please complete the following: A. Have you already submitted a Risk Management Plan (RMP) to EPA Pursuant to 40 CFR Part 68.10 or Part Yes	t 68.150? If submitted, RMP submittal date:		

Attach Additional Sheets As Necessary

File:Enviva Hamlet Forms v4 submittal to DAQ Sheet:A2 and A3 Trinity Consultants Page 2 of 51



FORM A4 . SURVEY OF AIR EMISSIONS AND FACILITY AND RECYCLING ACTIVITIES.

Does facility have an environmental management system in place? () YES (X) NO If so, is facility ISO 14000 Certified? () YES (X) NO Facility Name: Enviva Pellets Hamlet, LLC Permit Number: Facility ID: to be assigned County: Environmental Contact: Joe Harrell Mailing Address Line 1: 142 N.C. Route 561 East Phone No. ( ) (252) 209-6032 Mailing Address Line 2: Fax No. ( ) Zip Code: 28341 County: City: Ahoskie Sampson State: North Carolina Email Address: Joe.Harrell@envivabiomass.com AIR EMISSIONS SOURCE REDUCTIONS S Any Air Emissions Source Reductions in the past year? ( ) YES (X) NO

Enter Code for Date Reduction Quantity Emitted Quantity Emitted Has reduction activity Addition detail about source Source Air Pollutant Emission Option Implemented from prior annual from current annual Description and discontinued? If so, Reduction when Option (See Codes) (mo/yr) report to DAQ (lb/yr) report to DAQ (lb/yr) was it discontinued? N/A

Comments:

FACILITY - WIDE REDUCTIONS & RECYCLING ACTIVITIES

| Poliutant | Enter Code for | Date Reduction | Quantity Emitted | Quantity Emitted | Has reduction activity | Addition detail about source been Source OF Emission Reduction Option from prior annual from current annual Description o Activity discontinued? If so, when Option (See Codes) (mo/yr) report report was it discontinued? Reduced Materials (mo/yr) N/A

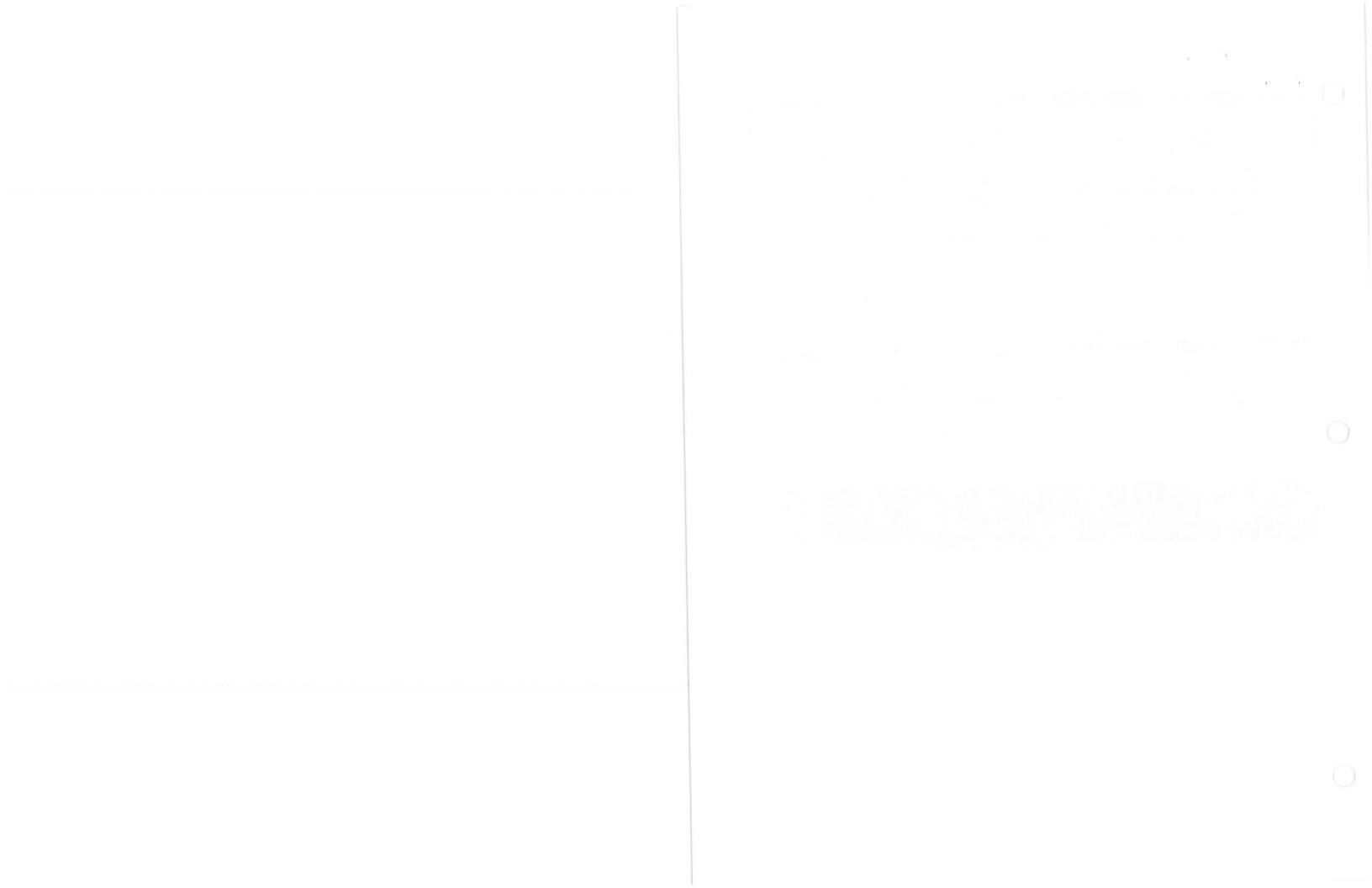
The requested information above shall be used for fulfilling the requirements of North Carolina General Statute 143-215.108(g). The permit holder shall submit to the Department a written description of current and projected plans to reduce the emissions of air pollutants by source reduction or recycling. The written description of shall accompany any application for a new permit, modification of an existing permit and for each annual air quality permit fee payment. Source reduction is defined as reducing the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment (including lugitive emissions) prior to recycling, treatment, or disposal. If no activity has taken place since the previous report, simply indicate so by checking the no box in that execution. Once completed, this form should be submitted along with your fee payment. Examples are listed on the first line of each section of the form for your benefit.



REVISED 1/07

Attach Additional Sheets As Necessary

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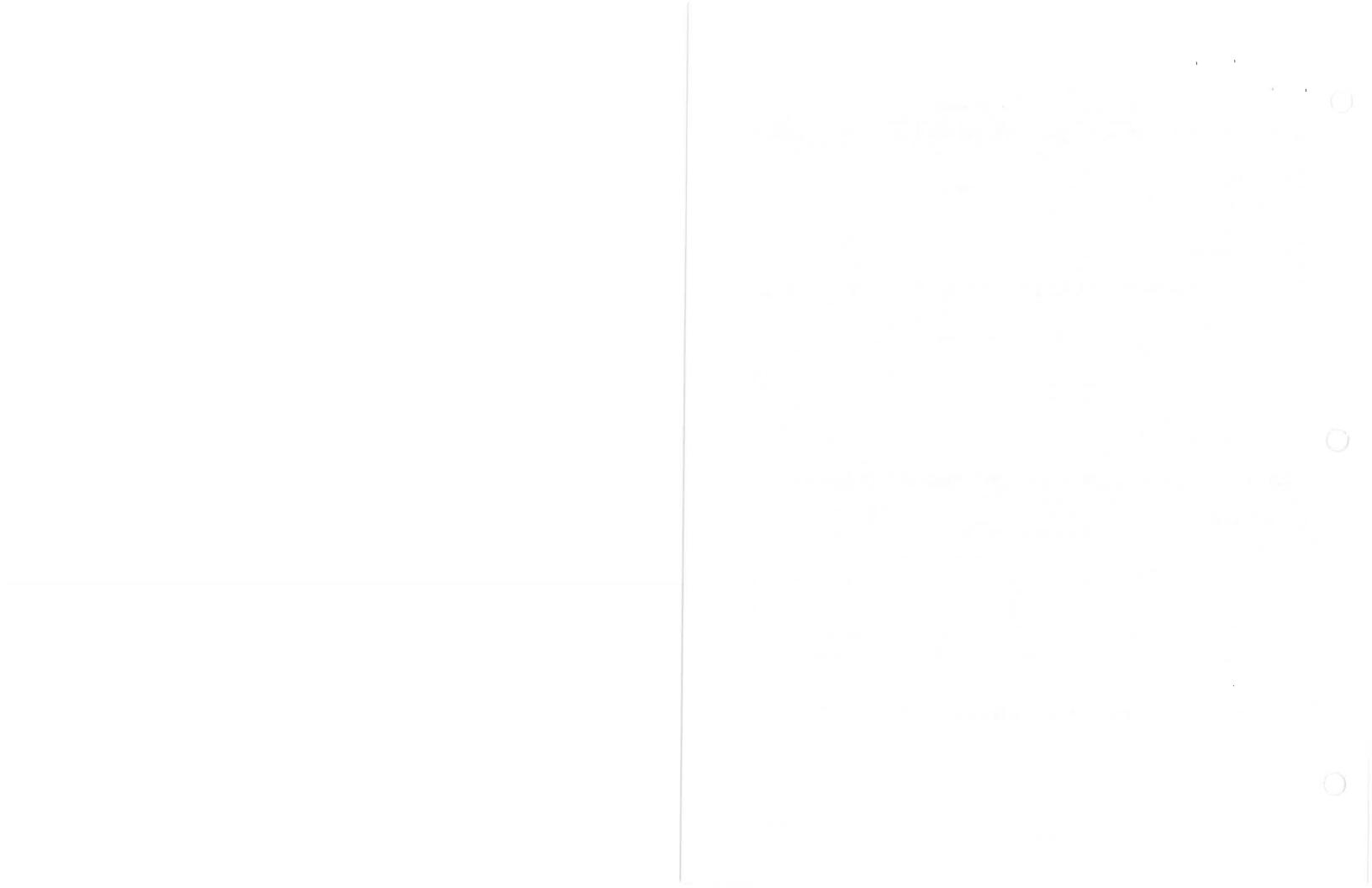
## FORM D1 FACILITY-WIDE EMISSIONS SUMMARY

REVISED 12/01/01 NCDEN	R/Division of Air (	Quality - Application	for Air Permit to	Construct/Op	erate		D1
CRITERIA	AIR POLLUTAN	NT EMISSIONS IN	FORMATION - FA	ACILITY-WI	DE	45.34.24	
		EXPECTED ACT	UAL EMISSIONS	POTENTIAL	EMISSIONS		
		,	ONTROLS /		ONTROLS /		CONTROLS /
			TIONS)		TIONS)		rations)
AIR POLLUTANT EMITTED			ıs/yr		ıs/yr	t	ons/yr
PARTICULATE MATTER (PM)		See Emission Cal	culations in Appen	idix B			
PARTICULATE MATTER < 10 MICRONS (PM <sub>10</sub> )							
PARTICULATE MATTER < 2.5 MICRONS ( $PM_{2.5}$	5)						
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							
HAZARDOL	IS AIR POLLUTA	ANT EMISSIONS I	NFORMATION -	FACILITY-V	VIDE	+ graft 1655	
		EXPECTED ACT					AL EMISSIONS
			ONTROLS /	1 '	ONTROLS /	,	CONTROLS /
			TIONS)		TIONS)		rations)
HAZARDOUS AIR POLLUTANT EMITTED	CAS NO.		ns/yr		is/yr	1	ons/yr
		See Emission Cal-	culations in Appen	ndix B			
Water and the second of the se	UR POLLUTANT	EMISSIONS INFO	ORMATION - FAC	CILITY-WID		WEST AND	
INDICATE REQUESTED ACTUAL EMISSIONS	AFTER CONTROL	S/LIMITATIONS. E	MISSIONS ABOVE	THE TOXIC	PERMIT EMIS	SSION RAT	E (TPER) IN
15A NCAC 2Q .0711 MAY REQUIRE AIR DISPE	ERSION MODELIN	G. USE NETTING F	ORM D2 IF NECES	SARY.	14-4 C - 7	In median of C	1
	T 212	T 1		0.4	Modeling R		
TOXIC AIR POLLUTANT EMITTED	CAS NO.	lb/hr	lb/day	ib/year	Yes	No	
		See Emission Cat	culations in Apper	ndix B			
							-
						-	
COMMENTS:							
					,		
	Attach Add	ditional Sheets	s As Necessai	ry			

File:Enviva Hamlet Forms v3 Sheet:D1

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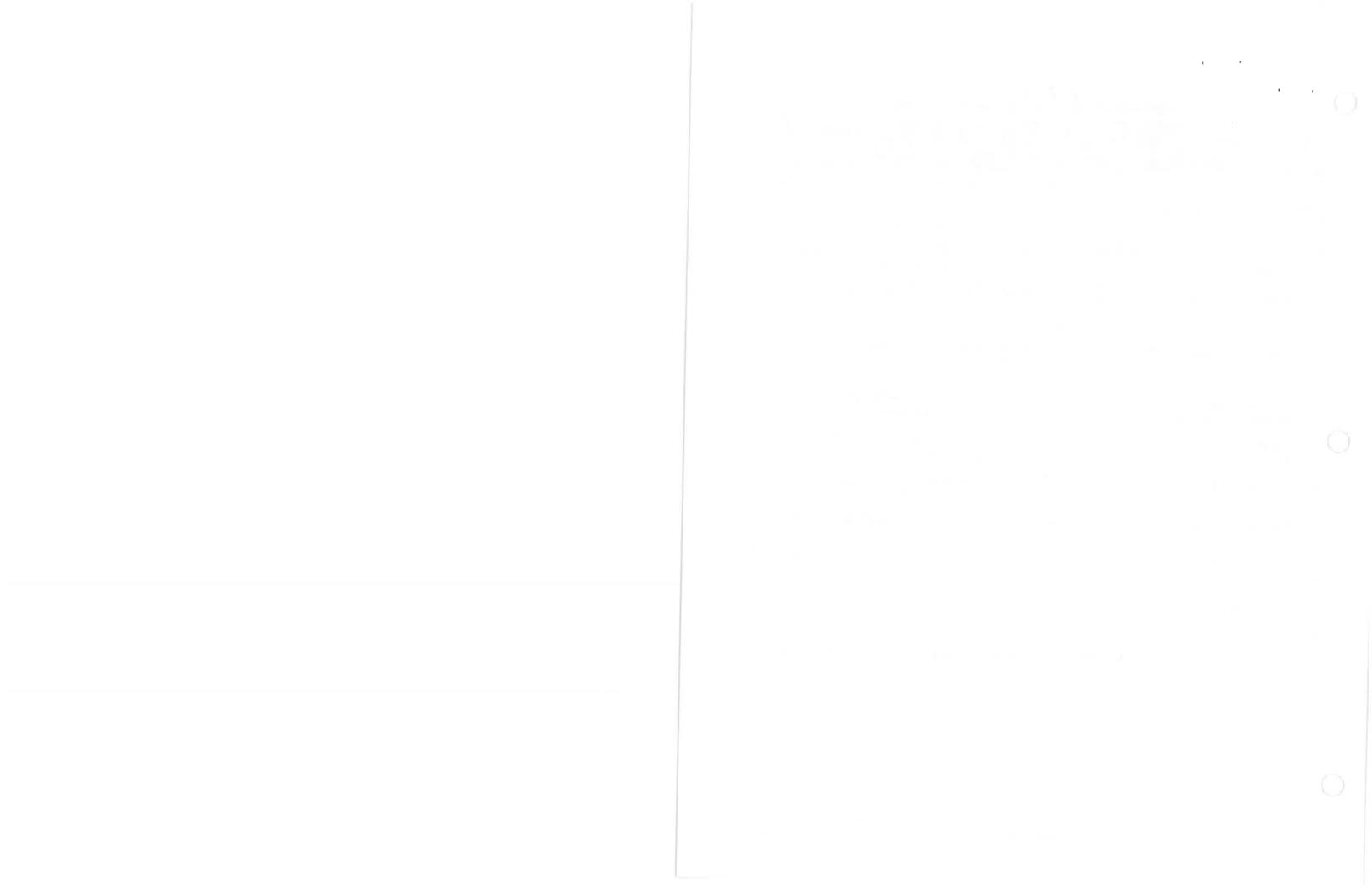
### FORM D4

### EXEMPT AND INSIGNIFICANT ACTIVITIES SUMMARY

EVIS	ACTIVITIES EXEM	MPTED PER 20	.0102 OR
		THE RESERVE OF STREET	· 网络拉拉斯特尔斯巴拉斯特尔斯特斯特斯特斯特斯特斯特斯特斯特斯特斯特斯特斯特斯特斯特斯特斯特斯特斯特
	INSIGNIFICANT ACTIVITIES F	SIZE OR	OR THE V SOUNGEO
	DESCRIPTION OF EMISSION SOURCE	PRODUCTION RATE	BASIS FOR EXEMPTION OR INSIGNIFICANT ACTIVITY
	Green Wood Handling and Sizing Operations		15A NCAC 02Q .0102 (c)(2)(E) -low
•	IES-GWHS		emissions, see Appendix B
2.	Dried Wood Handling and Sizing Operations IES-DWHS	N/A	15A NCAC 02Q .0102 (c)(2)(E) -negligible emissions, enclosed
3.	Emergency Generator Diesel Fuel Storage Tank TK-1	Up to 2,500 gallons	15A NCAC 02Q .0102 (c)(1)(D)
4.	Firewater Pump Diesel Fuel Storage Tank TK-2	Up to 1,000 gallons	15A NCAC 02Q .0102 (c)(1)(D)
5.	Green Wood Storage Piles IES-GWSP1 and IES-GWSP2	N/A	15A NCAC 02Q .0102 (c)(2)(E) -low emissions, see Appendix B
6.	Debarker IES-DEBARK-1	N/A	15A NCAC 02Q .0102 (c)(2)(E) -negligible emissions
7.	Green Wood Fuel Bin IES-GWFB	13.93 ODT/hr	15A NCAC 02Q .0102 (c)(2)(E) -no quantifiable emissions
8.	Mobile Fuel Diesel Tank TK-3	Jp to 2,500 gallor	15A NCAC 02Q .0102 (c)(1)(D)
9.			
10.			

Attach Additional Sheets As Necessary

File:Enviva Hamlet Forms v3 Sheet:D4



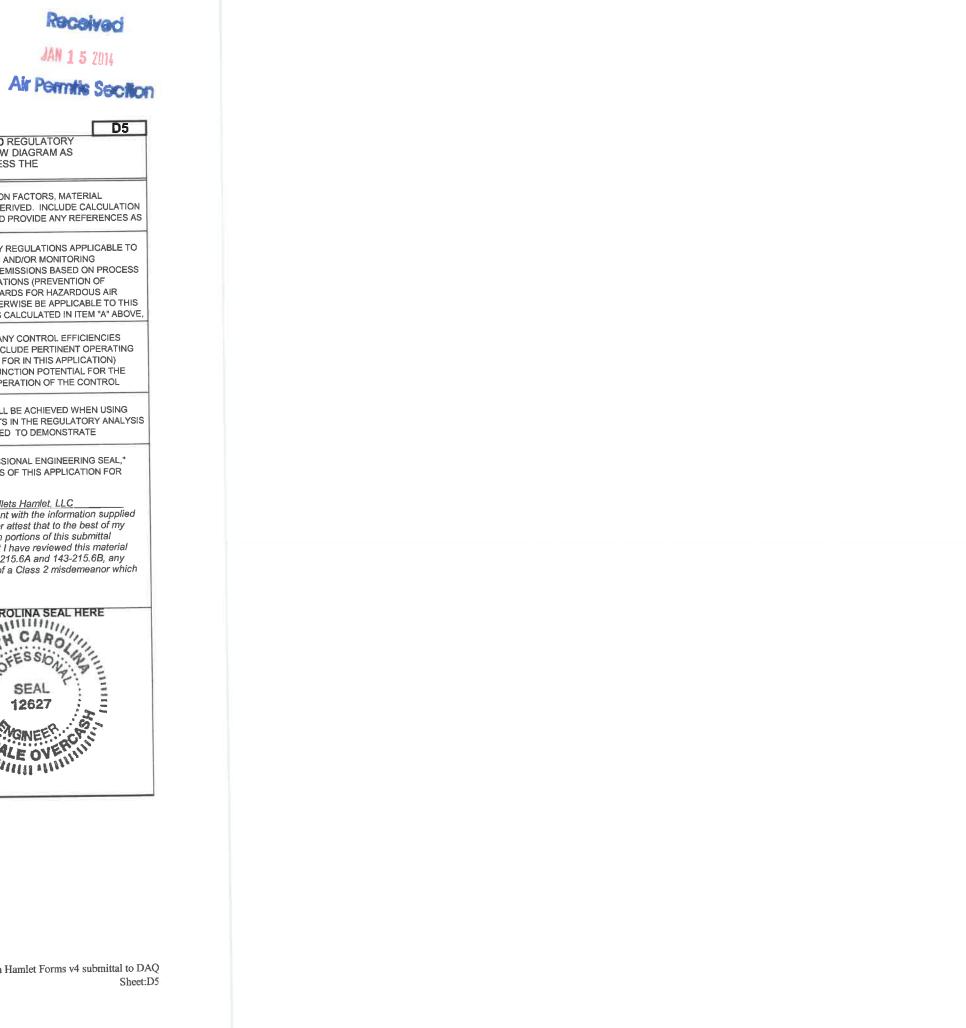
## FORM D TECHNICAL ANALYSIS TO SUPPORT PERMIT APPLICATION

		tite Occational Oceania	D5
SED: 12/01/01 PROVI DEMON	NCDENR/Division of Air Quality - Application for Air Per IDE DETAILED TECHNICAL CALCULATIONS TO SUPPOR STRATIONS MADE IN THIS APPLICATION. INCLUDE A C	T ALL EMISSION, CONTROL, AND REGULATORY OMPREHENSIVE PROCESS FLOW DIAGRAM AS	
	NECESSARY TO SUPPORT AND CLARIFY CALCULATIO FOLLOWING SPECIFIC ISSUES ON	NS AND ASSUMPTIONS. ADDRESS THE	
BALANCES, AND/OR OF POTENTIAL BEFOR MEEDED TO SUPPOR	SOURCE (EMISSION INFORMATION) (FORM B) - SHOW CALCU DTHER METHODS FROM WHICH THE POLLUTANT EMISSION RA RE AND, WHERE APPLICABLE, AFTER CONTROLS. CLEARLY S T MATERIAL BALANCE CALCULATIONS	TES IN THIS APPLICATION WERE DERIVED. INCLUDE OF TATE ANY ASSUMPTIONS MADE AND PROVIDE ANY REI	FERENCES AS
NDIVIDUAL SOURCE: REQUIREMENTS) FOR RATES OR OTHER OF SIGNIFICANT DETERI	SOURCE (REGULATORY INFORMATION)(FORM E2 - TITLE V ON S AND THE FACILITY AS A WHOLE. INCLUDE A DISCUSSION OF R COMPLYING WITH APPLICABLE REGULATIONS, PARTICULAR PERATIONAL PARAMETERS. PROVIDE JUSTIFICATION FOR AV IORATION (PSD), NEW SOURCE PERFORMANCE STANDARDS ( APS), TITLE V), INCLUDING EXEMPTIONS FROM THE FEDERAL IN NY REQUIRED TO DOCUMENT COMPLIANCE WITH ANY REGUL	JTING ME I HODS (e.g. FOR TESTING ANDJOR MIGHTINE) LY THOSE REGULATIONS LIMITING EMISSIONS BASED ( DIDANCE OF ANY FEDERAL REGULATIONS (PREVENTIC MSPS), NATIONAL EMISSION STANDARDS FOR HAZARD' REGULATIONS WHICH WOULD OTHERWISE BE APPLICA	ON PROCESS ON OF OUS AIR ABLE TO THIS
LISTED ON SECTION PARAMETERS (e.g. O CRITICAL TO ENSURI	NALYSIS (FORM C) - PROVIDE A TECHNICAL EVALUATION WITH C FORMS, OR USED TO REDUCE EMISSION RATES IN CALCUL PERATING CONDITIONS, MANUFACTURING RECOMMENDATIO ING PROPER PERFORMANCE OF THE CONTROL DEVICES). IN IOL DEVICES AS EMPLOYED AT THIS FACILITY. DETAIL PROCE	ATIONS UNDER THEM A" ABOVE. INCLUDE PERTITATIONS, AND PARAMETERS AS APPLIED FOR IN THIS APPLIC CLUDE AND LIMITATIONS OR MALFUNCTION POTENTIAL DURES FOR ASSURING PROPER OPERATION OF THE C	CATION) FOR THE
PROCESS AND OPER PROCESS, OPERATION IN ITEM "B" WHERE A	RATIONAL COMPLIANCE ANALYSIS - (FORM E3 - TITLE V ONLY ONAL, OR OTHER DATA TO DEMONSTRATE COMPLIANCE. REF APPROPRIATE: LIST ANY CONDITIONS OR PARAMETERS THAT THE APPLICABLE REGULATIONS	- SHOWING HOW COMPLIANCE WILL BE ACHIEVED WH ER TO COMPLIANCE REQUIREMENTS IN THE REGULATI CAN BE MONITORED AND REPORTED TO DEMONSTRA	ATE
PROFESSIONAL ENG A PROFESSIONAL E NEW SOURCES AND	GINEERING SEAL - PURSUANT TO 15A NCAC 2Q .0112 "/ NGINEER REGISTERED IN NORTH CAROLINA SHALL BE REQUI MODIFICATIONS OF EXISTING SOURCES. (SEE INSTRUCTION	IS FOR FURTHER APPLICABILITY).	NG SEAL," FION FOR
in the engineering p knowledge the prop package may have and have judged it t	Dale Overcash, attest that this applicance, accordance with the applicance with the applicance with the application developed by other professionals, inclusion of these mix to be consistent with the proposed design. Note: In accordagly makes any false statement, representation, or certification of to exceed \$10,000 as well as civil penalties up to \$25,000.	is accurate, complete and consistent with the informat the best of my knowledge. I further attest that to the cable regulations. Although certain portions of this su aterials under my seal signifies that I have reviewed th nce with NC General Statutes 143-215.6A and 143-21 t in any application shall be guilty of a Class 2 misden	best of my bmittal is material 5.6B, any
NAME: DATE: COMPANY: ADDRESS: TELEPHONE: SIGNATURE: PAGES CERTIFIED:	DENTIFY ABOVE EACH PERMIT FORM AND ATTACHMENT	SEAL 12627	ERE MAINTENANT TO A STATE OF THE STATE OF TH
5	SIGNATURE: PAGES CERTIFIED:	ELEPHONE: (919) 462-9693	(IDENTIFY ABOVE EACH PERMIT FORM AND ATTACHMENT

Attach Additional Sheets As Necessary

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14-48-575 3.1.65 CONTROL STORY TO

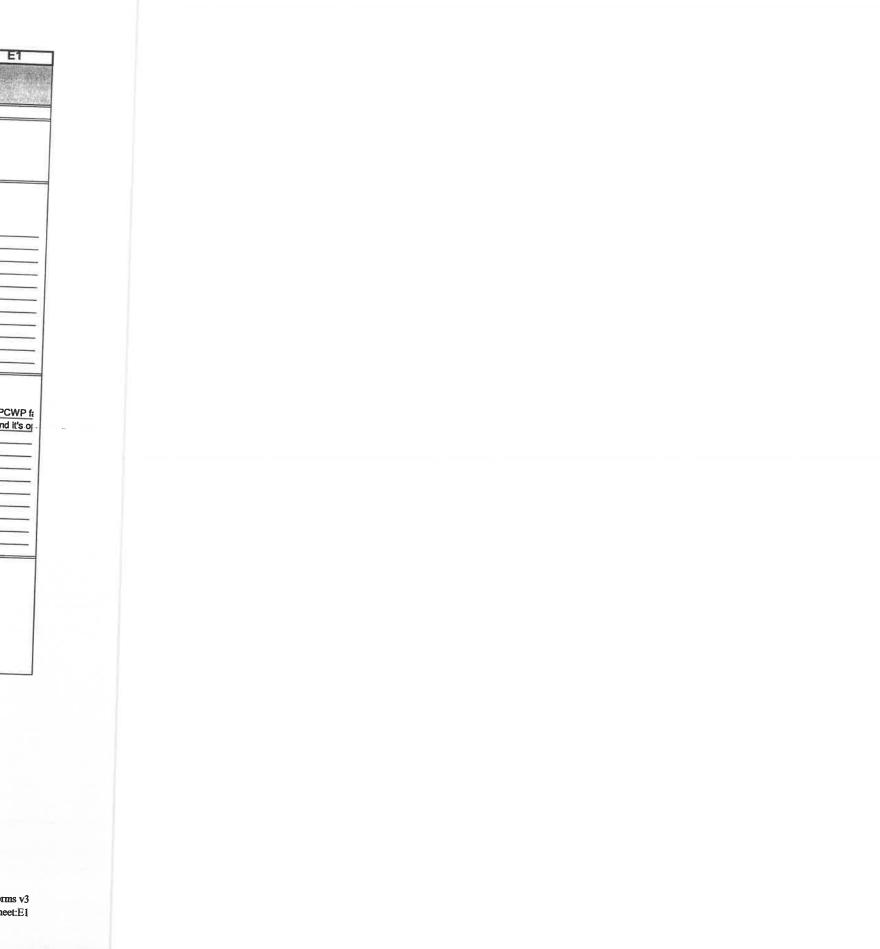
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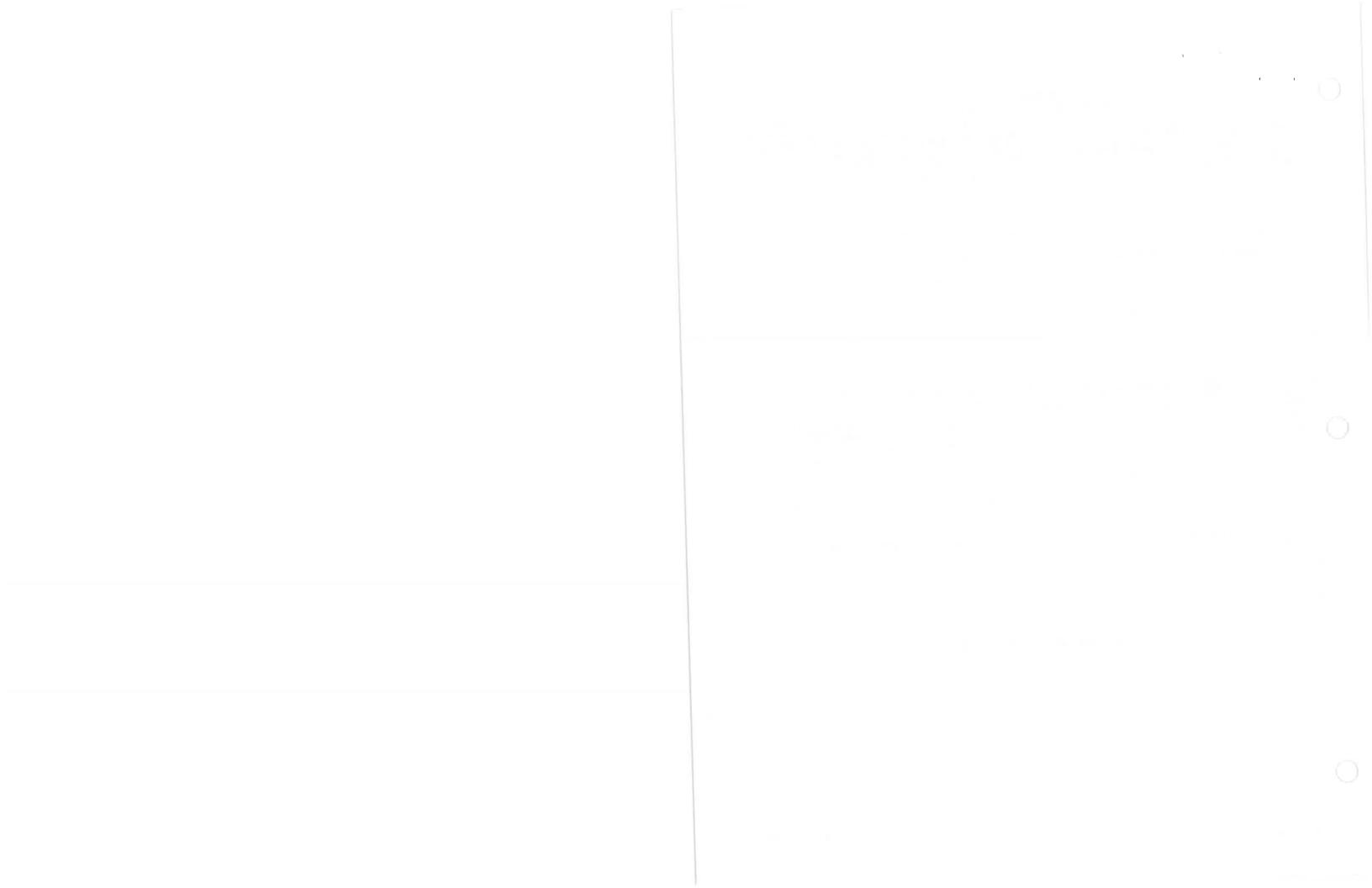
REVISED: 12/01/01

FORM E1
TITLE V GENERAL INFORMATION

	Division of Air Quality - Application for Air	r Permit to Construct/Operate	E1
IF YC	DUR FACILITY IS CLASSIFIED AS "MAJ	OR" FOR TITLE V YOU MUST COMPLETE	NAME OF THE OWNER, OWNE
THE PARTY OF THE P	ALL OTHER REQUIRED "F" E	ORMS (E2 THROUGH E5 AS APPLICABLE)	
ndicate here if your facility is	subject to Title V by: X Emissions	ONLING (CZ THROUGH E5 AS APPLICABLE)	
f subject to Title V by other, o		Other	
Other, specify:	NESH	APS (MACT) # TITLE IV	
•			
f you are or will be subject to	2DV movies 1		
12(d) of the Clean Air Act, sp	any maximum achievable control technology s pecify below: EMISSION SOURCE	standards (MACT) issued pursuant to section	_
MISSION SOURCE ID	EMISSION SOURCE		
S-EG, ES-FWP	DESCRIPTION	MACT	
S-DRYER	Emergency Generator and Firepump	Subpart ZZZZ	
	Green Wood Direct-Fired Dryer Syste	40 CFR 63 Subpart B, [112(g)]	
		1 -13/1	
A NCAC 2D .1111	hich are requested to be included in the shield  EMISSION SOURCE (Include ID)  All sources at site	EXPLANATION	
ubpart DDDD)	31.010	A pellet manufacturing facility has operations similar to a P	CWP
		as defined by the fule, but a pellet manufacturing facturing	d it's
		are not included in this subpart.	
	(A====================================		
:			
			_
nments:			
	Au. 1 2 7 11		
	Attach Additional Shoots	An No.	

Trinity Consultants File:Enviva Hamlet Forms v3 Page 7 of 51 Sheet:E1





# FORM E2 EMISSION SOURCE APPLICABLE REGULATION LISTING

MISSION SOURCE ID NO.	SOURCE	f Air Quality - Application fo OPERATING SCENARIO INDICATE PRIMARY (P) OR ALTERNATIVE (A)			-
oce allacrieu	table following Form E3 for a	a summary of regulator	requirements	APPLICABLE REGULATION and associated compliance requireme	
					ents
					_
					_
					_
					-
					_

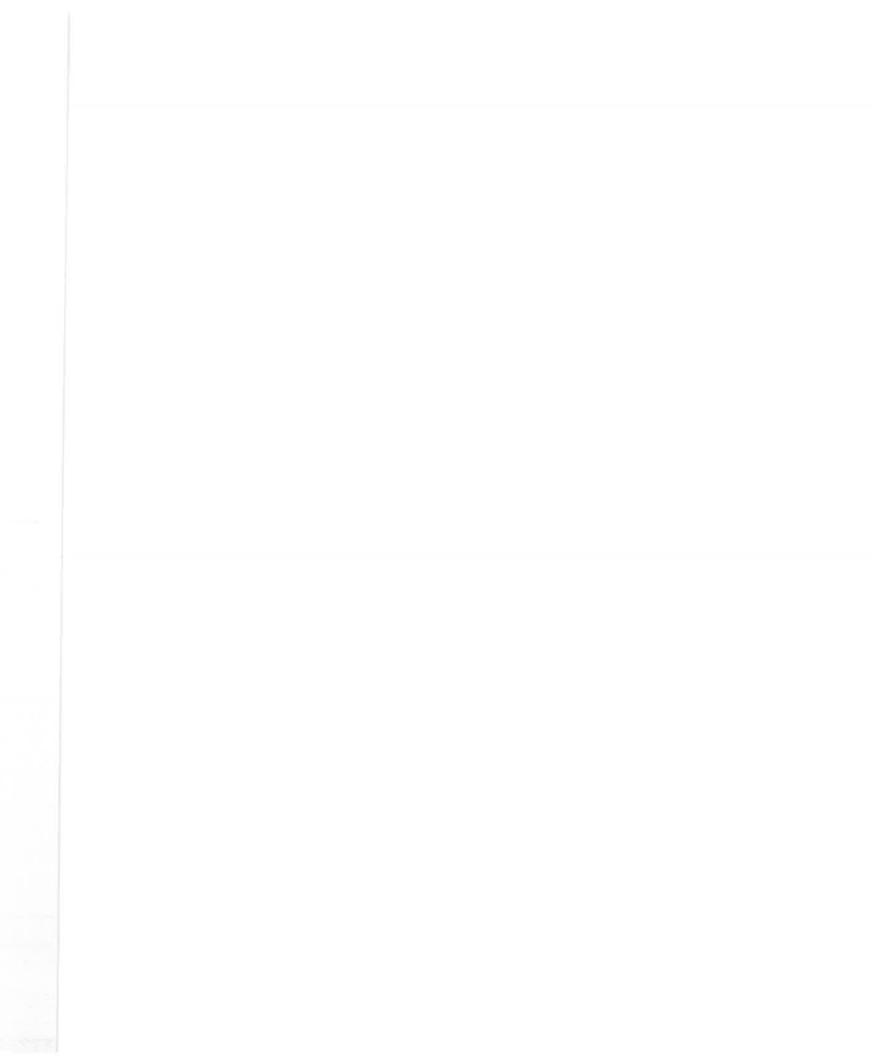
	Attach Additional Sheets As Necessary	
	Auditional Sneets As Necessary	
Trinity Consultants		File:Enviva Hamlet Forms v3
	Page 8 of 51	Sheet:E2
		Successe2

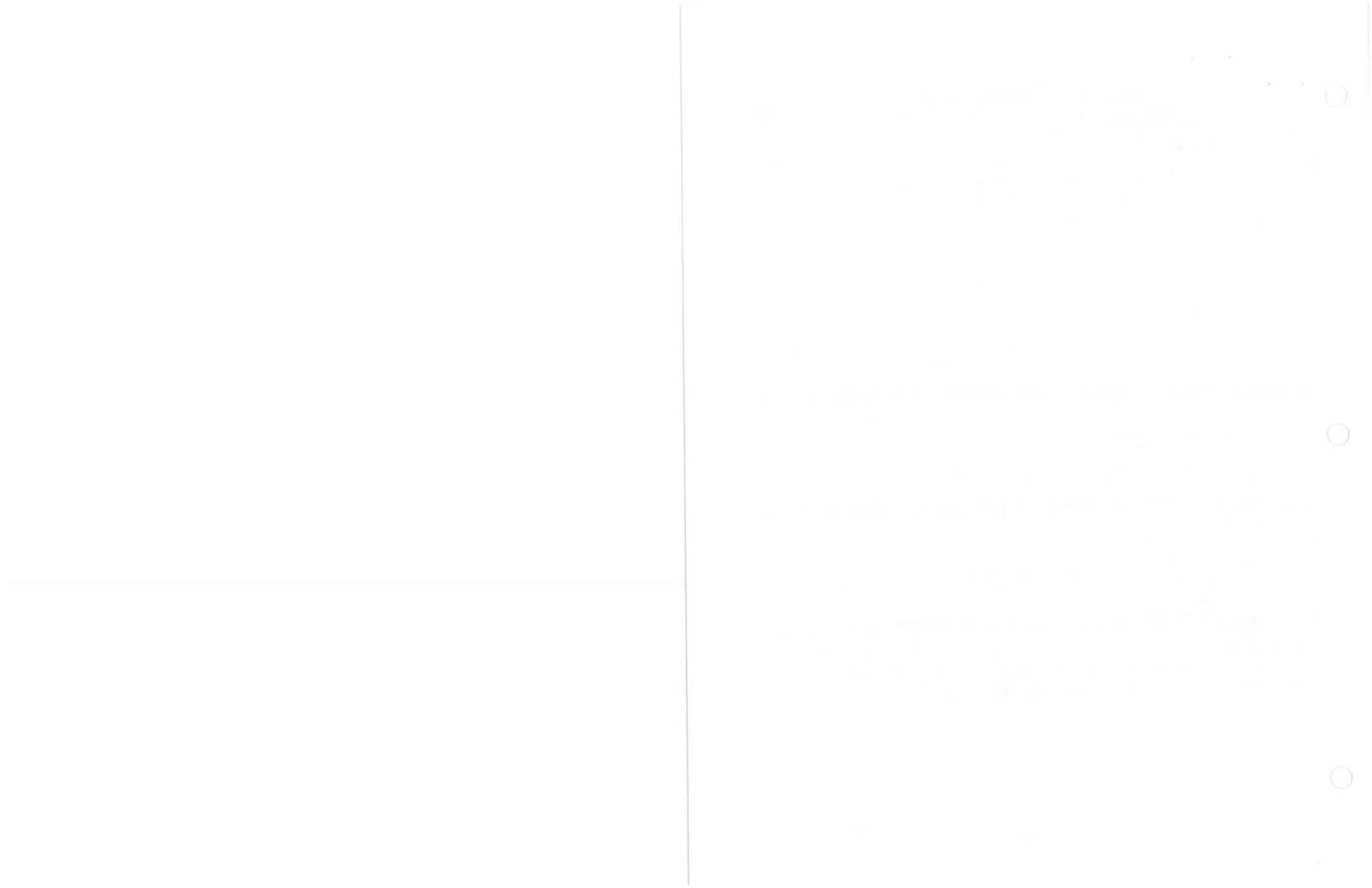
## FORM E3 EMISSION SOURCE COMPLIANCE METHOD

REVISED 12/01/01		tuality - Applicat	ion for Air Pe	rmit to Constri	uct/Operate	Si Si	E3
Emission Source ID	NO. See attached table following Form						LJ
E3 for a summar	ry of regulatory requirements and	Regulated	Pollutant				
associated comp	pliance requirements						
Altomotivo Operation	- C	Applicable	Regulation				
Atternative Operating	ng Scenario (AOS) NO:						
	ATTACH A SEPARATE PAG						
AND SHOULD SEE STATE	STEER STATE OF SKITCH STATE OF SKIND	NITORING RE	QUIREMENT	rs	Earl back and a	<b>有有些的人还是</b> 可以	No constitution of
Is Compliano	ce Assurance Monitoring (CAM) 40 CFR Part 64	Applicable?	e Yes		<b>N</b> 1.		
If yes, is CAI	M Plan Attached (if applicable, CAM plan must be	Applicable :	e res		No No		
Describe Mo	nitoring Device Type:		0 100	V	140		
	nitoring Location:						
Other Monito	oring Methods (Describe In Detail):						
-							
Describe the	e frequency and duration of monitoring and how t	be date will be an					
readings tak	ten to produce an hourly average):	ne data will be rec	coraea (i.e., ev	ery 15 minutes	, 1 minute instantan	eous	
-							
-							
Allega Sultant Inte	RECO	RDKEEPING R	EQUIREMEN	NTS	10年2年1月1日日	Mary Mary Mary	Sign Francisco
Data (Parame	eter) being recording:		7				
Frequency of	recordkeeping (How often is data recorded?):						
-							
-							
<b>拉克特医伊斯里 炎神性</b>	RE	PORTING REQ	UIREMENTS	<b>学院的</b> 以他的学院是否		all at the last and a second	Contract of the
			O III LIII LIII O	Assessment of the last			edise Alik
Generally des	scribe what is being reported:						
-						1	
-							
Frequency:		d QUARTERL		<b>♦ EVERY</b>	6 MONTHS		
	OTHER (DESCRIBE):			3			
是到唐堂的是表	ALL STATE OF THE S	TESTING	G	MANAGE HAVE	地方的更加的一种	THE REPORT OF	BANG-SWEE
Specify proposed refe	erence test method:			THE RESERVE	REAL PROPERTY.	NOTICE \$10 PERSONNE	
pecify reference test	t method rule and citation:						
pecify testing freque	ency:						
NOTE	E - Proposed test method subject to appr	roval and poss	ible change	during the te	st protocol proc	ess	

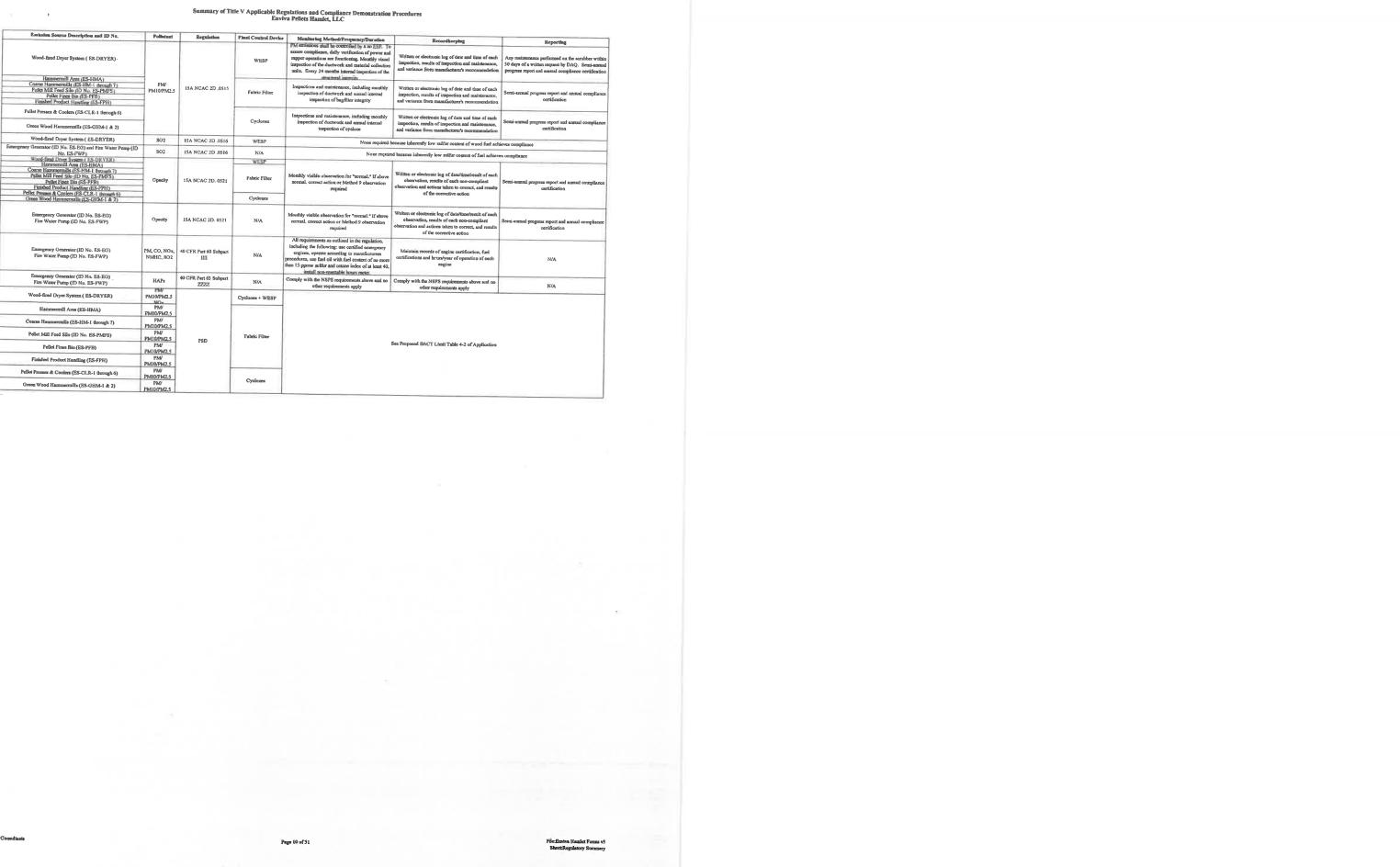
Attach Additional Sheets As Necessary

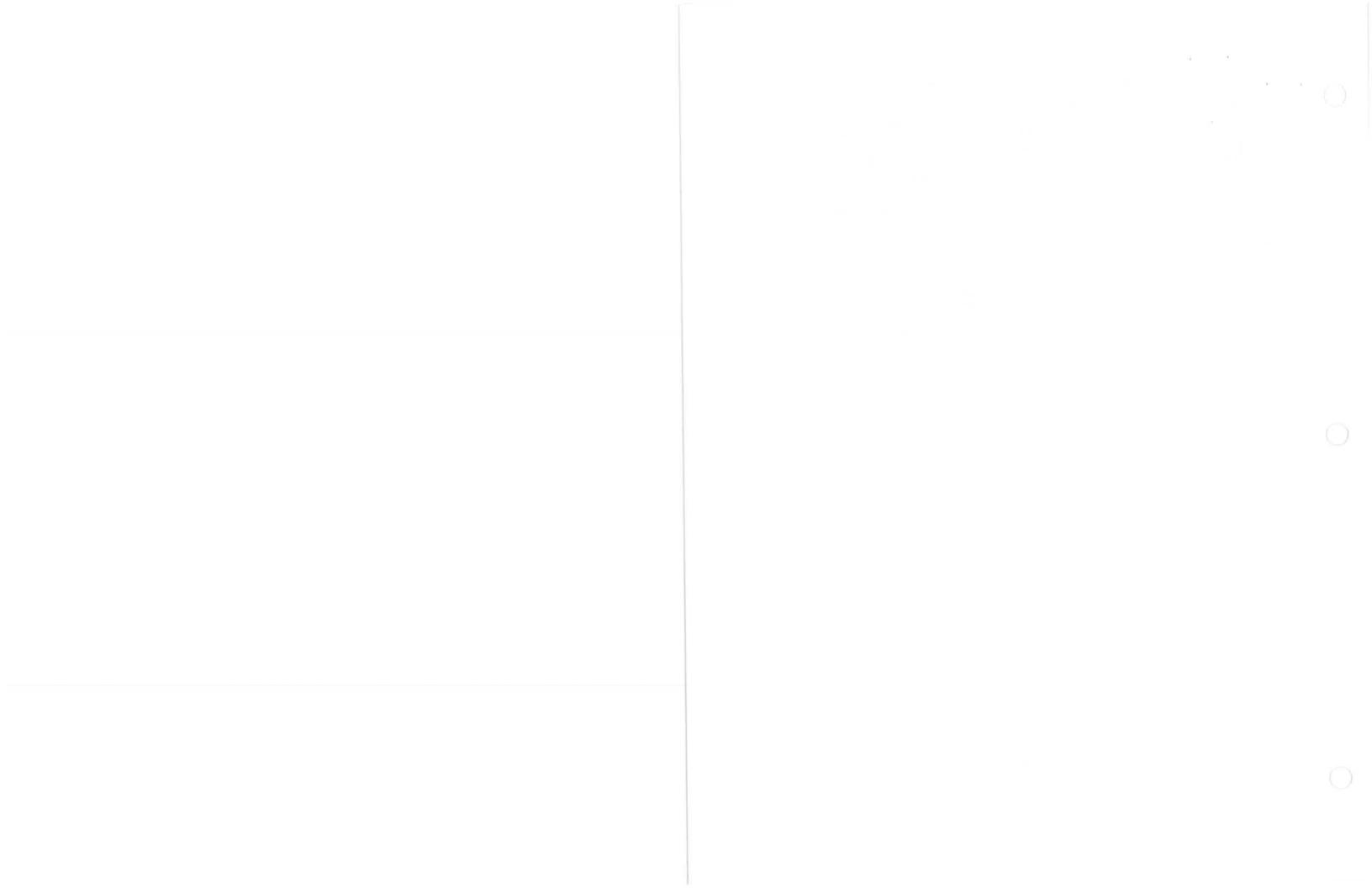
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## FORM E4 EMISSION SOURCE COMPLIANCE SCHEDULE

		LITTODITISION OF	f Air Quality - Application for Air Permit to Construct/Operate
cc	OMPLIANO	E STATUS V	VITH RESPECT TO ALL APPLICABLE REQUIREMENTS
Will each emission sou continue to comply with	arce at your	facility be in	compliance with all applicable requirements at the time of permit issuance and If NO, complete A through F below for each requirement for which compliance is not achieved.
Will your facility be in crequirements on a time	compliance	with all applic	cable requirements taking effect during the term of the permit and meet such
	X Yes	No	If NO, complete A through F below for each requirement for which compliance is not achieved.
If this application is for a applicable requirements	a modificat	tion of existing	g emissions source(s), is each emission source currently in compliance with all
	X Yes	No	If NO, complete A through F below for each requirement for which compliance is not achieved.
Emission Source Descr	ription (Inc	lude ID NO.)	
Narrative description of	f how comp	liance will be	achieved with this applicable requirements:
Detailed Schedule of Co			e achieved with this applicable requirements:  Date Expected
Narrative description of Detailed Schedule of Co			
Detailed Schedule of Co	ompliance:		Date Expected

COMPLIANCE STATUS	WITH RESPECT TO ALL APPLICABLE REQUIREMENTS	
Will each emission source at your facility be in	n compliance with all applicable requirements at the time of permit incures a	nd
continue to comply with these requirements?  X Yes No	If NO, complete A through F below for each requirement for which compliance is not achieved.	
Will your facility be in compliance with all appli requirements on a timely basis?  X Yes No	licable requirements taking effect during the term of the permit and meet such	
	If NO, complete A through F below for each requirement for which compliance is not achieved.	
applicable requirements r	ng emissions source(s), is each emission source currently in compliance with a	all
X Yes No	If NO, complete A through F below for each requirement for which compliance is not achieved.	Y
A. Emission Source Description (Include ID NO.)	)	_
B. Identify applicable requirement for which comp		=
		=
C. Narrative description of how compliance will be	e achieved with this applicable requirements.	_
		_
		_
D. Datailed Sehadula at Co. v. II		-
D. Detailed Schedule of Compliance: <u>Step(s)</u>	Date Expected	
		_
		_
E. Frequency for submittal of progress reports (6	month minimum):	
F. Starting date of submittal of progress reports:		-
		-
Attach	Additional Sheets As Necessary	
	Ella Bardin Hand CE	
Trinity Consultants	Page 11 of 51 File:Enviva Hamlet Form	ns v3 et:E4

### FORM E5

### TITLE V COMPLIANCE CERTIFICATION (Required) NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operation

Application of All Quality - Application for Air Permit to Construct/Operate							
In accordance with	th the provisions of Title 15A NCAC 2Q .0520 and .0515(b)(4) the responsible company official	of:					
SITE NAME:	SITE NAME: Enviva Pellets Hamlet, LLC						
SITE ADDRESS:	SITE ADDRESS: Highway 117 (Street Number TBD)						
CITY, NC :	Hamlet, NC	Ī					
COUNTY:	Richmond	-					
PERMIT NUMBER :	N/A #AN 1 5 2014	=0					
CERTIFIES THAT(Check	k the appropriate statement(s):	Mon					
The facility is in	n compliance with all applicable requirements						
l ale biobosed iii	In accordance with the provisions of Title 15A NCAC 2Q .0515(b)(4) the responsible company official certifities that the proposed minor modification meets the criteria for using the procedures set out in 2Q .0515 and requests that these procedures be used to process the permit application.						
The facility is no	not currently in compliance with all applicable requirements ed, you must also complete form E4 "Emission Source Compliance Schedule"						
The undersigned certifies information and belief for	s under the penalty of law, that all information and statements provided in the application, bas rmed after reasonable inquiry, are true, accurate, and complete.	ed on					
Signature of responsible company official (REQUIRED, USE BLUE INK)  Date: 1/9/19							
Pete Najera, Vice Preside Name, Title of respons	ent of Operations sible company official (Type or print)						

Attach Additional Sheets As Necessary

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File:Enviva Hamlet Forms v3

Sheet:E5



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Source Specific Forms - Chipper

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FORM B

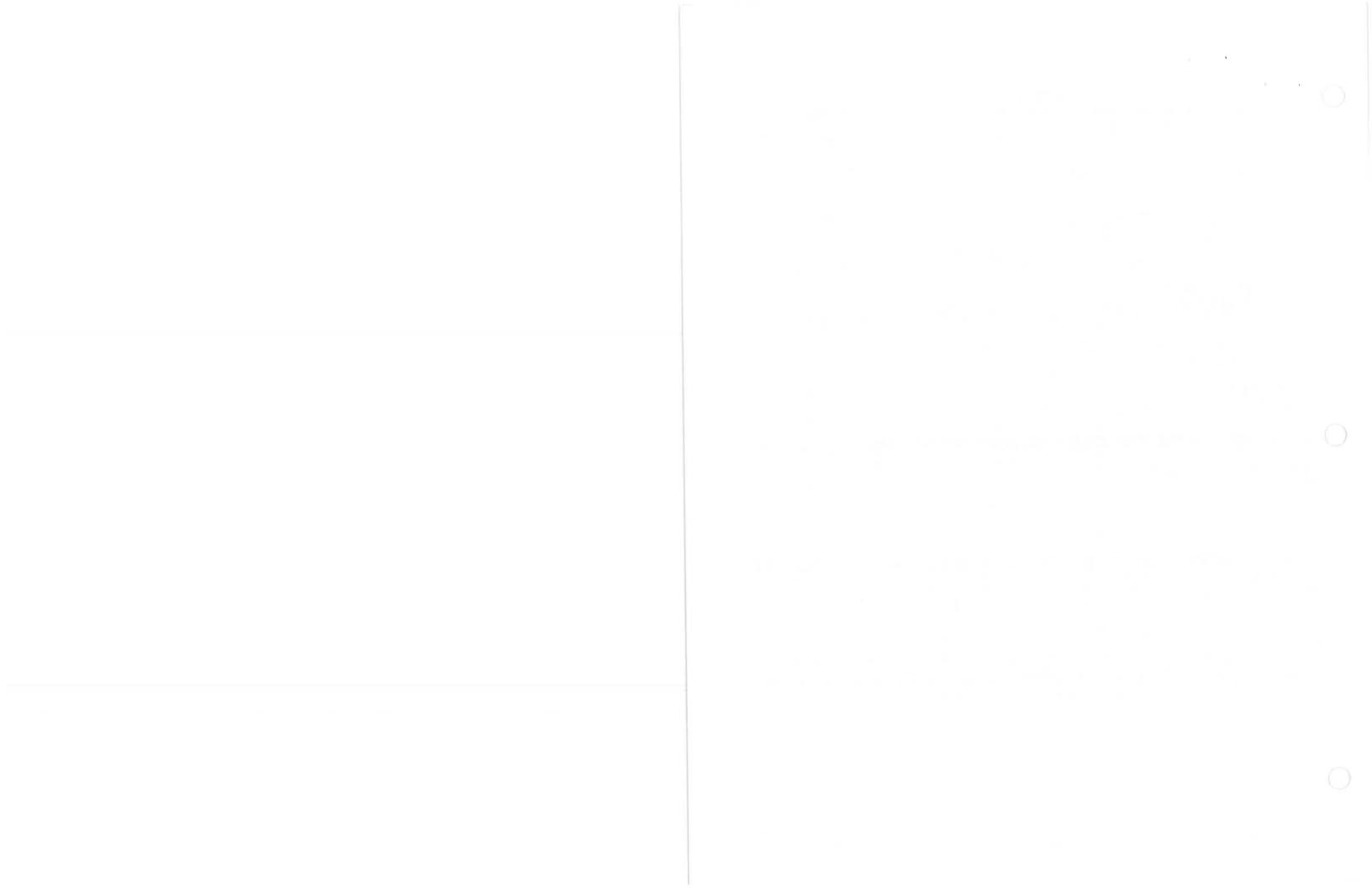
SPECIFIC EMI	SSIONS SOURCE INFORMATION (REQUI	IRED FOR ALL	SOURCES)
REVISED 12/01/01	NCDENR/Division of Air Quality - Application for Air Permit	to Construct/Operate	Г
EMISSION SOURCE DESCRIPTION:		OURCE ID NO:	ES-CHIP-1
Chipper			N/A

EMISSION SOURCE DESCRIPTION:	- Civili deduity	Application	TOT All CETTIN				D
Chipper			EMISSION .	SOURCE ID	NO:	ES-CHIP-1	
			CONTROL	DEVICE ID N	O(S):	N/A	
OPERATING SCENARIO 1 OF	1						
DESCRIBE IN DETAILTHE EMISSION SOURCE PROCES	S /ATTACH EL	OW DIACEA	TEMISSION I	PUINT (STAC	CK) ID NO(S):	N/A	
Green wood chips are screened and oversized chips wil	l undergo addit	ional abinati	.WI):				
The second and storaled only will	i undergo addit	ионая спіррії	ig as required	3.			
TYPE OF EMISSION SOURCE (CHECK	AND COMPLE	TE APPROPI	RIATE FORM	B1-B9 ON TI	HE FOLLOWIN	G PAGESI:	
☐ Coal,wood,oil, gas, other burner (Form B1)   Woods	working (Form B	4)	☐ Manufac	ct. of chemica	ls/coatings/ink	s (Form B7)	
☐ Int.combustion engine/generator (Form B2) ☐ Coatin	g/finishing/printi		□Incinera	tion (Form B8	1)	» (« OIIII B7)	
☐ Liquid storage tanks (Form B3) ☐ Storage	e silos/bins (For	m B6)	Other (F		"		
START CONSTRUCTION DATE: TBD   OPERATION		TBD		JFACTURED		TBD	
MANUFACTURER / MODEL NO.: TRD			OP. SCHEDU	II E. 24 LI	R/DAY 7		0 140/0/0
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?):	NESH	AP (SUBPAR	3T?)·		(SUBPART?):	DATIVVE _ 5	2_WK/YR
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB	25% MAR-		JUN-AUG		SEP-NOV	25%	
EXPECTED ANNUAL HOURS OF OPERATION 8,70	O VISIBLE STA	CK EMISSIC	NC LINDED N	IODMAL ODG	DATION		VTIV
CRITERIA AIR POLLU	ANT EMISS	IONS INF	ORMATION	TEOR THI	SSOURCE	AUSTRALIA SERVICE	AND THE REAL PROPERTY.
	SOURCE OF	EXPECTE	D ACTUAL	1		L EMSSIONS	
	EMISSION	(AFTER CONT	(ROLS/LIMITS)	(BEFORE CO	NTROLS / LIMITS)		TROLS / LIMITS)
AIR POLLUTANT EMITTED	FACTOR	lb/hr	tons/vr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	See Emissio	n Calculation	ns in Appendi	xВ		15/11	toriaryi
PARTICULATE MATTER<10 MICRONS (PM <sub>10</sub> )							
PARTICULATE MATTER<2.5 MICRONS (PM <sub>2.5</sub> )							
SULFUR DIOXIDE (SO2) NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
EAD							
OTHER							
	86888652711	Y-Y/-Y-Y/	7 7 7 8 11 1 1 1				
HAZARDOUS AIR ROLL	MAINI EMIS	digind in		JN FOR			位是自然的第一位 1000
	SOURCE OF EMISSION		D ACTUAL			L EMSSIONS	
IAZARDOUS AIR POLLUTANT AND CAS NO.	FACTOR		ROLS / LIMITS)		TROLS / LIMITS)		ROLS / LIMITS)
N/A	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
	1						
	1						
	1				-		
TOXIC AIR POLLUTA	NT EMISSIO	NS INFOR	MATION F	OR THIS	OURCE	THE THE STATE OF THE PARTY.	The state of the said
INDICATE EXPECTE	D ACTUAL EMIS	SSIONS AFT	ER CONTROL	S/LIMITATI	ONS	THE REAL PROPERTY.	391104 EVENUE OF
UXIC AIR PULLUTANT AND CAS NO.	EF SOURCE		hr I		dav	Ih	/ут
VA						10	yı
Hankmania (4) an indiana and diff							
ttachments: (1) emissions calculations and supporting documentation	; (2) indicate all re	quested state a	nd federal enfor	ceable permit li	mits (e.g. hours o	f operation, emis	sion rates) and
COMPLETE THIS FORM AND COMPLETE A	MATTACH	APPROPI	KIATE B1	HROUGH	B9 FORM	FOR EACH	SOURCE
Attach	Additional	Sheets A	S Nacase	an/			

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Sheet:B (ES-CHP-1)



EMISSION SOURCE ID NO: ES-CHIP-1 CONTROL DEVICE ID NO(S): M/A  OPERATING SCENARIO: 1 OF 1 EMISSION POINT (STACK) ID NO(S): N/A  DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM); Green wood chips are screened and oversized chips will undergo additional chipping as required.  MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS TYPE UNITS CAPACITY (UNIT/HR) LIMITATION(UNIT/H Green Wood ODT 71.71  MATERIALS ENTERING PROCESS - BATCH OPERATION TYPE UNITS CAPACITY (UNIT/BATCH) LIMITATION (UNIT/BATCH) TYPE UNITS CAPACITY (UNIT/BATCH)  MATERIALS ENTERING PROCESS - BATCH OPERATION TYPE UNITS CAPACITY (UNIT/BATCH)  MAX. DESIGN REQUESTED CAPACITY (UNIT/BATCH) LIMITATION (UNIT/BATCH)  MAX. DESIGN REQUESTED CAPACITY (UNIT/BATCH) LIMITATION (UNIT/BATCH)  AMAXIMUM DESIGN (BATCHES / HOUR):  WAXIMUM FIRING RATE (MILLION BTU/HR): N/A	EMISSION SOURCE DESCRIPTION: Chipper  EMISSION SOURCE ID NO: ES-CHIP-1 CONTROL DEVICE ID NO(S): M/A  OPERATING SCENARIO: 1 OF 1 EMISSION POINT (STACK) ID NO(S): N/A  DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Green wood chips are screened and oversized chips will undergo additional chipping as required.  MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS  MAX. DESIGN TYPE UNITS CAPACITY (UNIT/HR) LIMITATION(UNIT/HR)  Green Wood  ODT 71.71  MATERIALS ENTERING PROCESS - BATCH OPERATION MAX. DESIGN CAPACITY (UNIT/BATCH) LIMITATION (UNIT/BATCH) LIMITATION (UNIT/BATCH) LIMITATION (UNIT/BATCH) LIMITATION (UNIT/BATCH) LIMITATION (UNIT/BATCH)  MAXIMUM DESIGN (BATCHES / HOUR): EQUESTED LIMITATION (BATCHES / HOUR):  (BATCHES/YR):	REVISED: 12/01/01 NCDENR/Division of Ai	ir Quality - Application	on for Air Permit to Construct/Ope	erate	B9
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TYPE  UNITS  CAPACITY (UNIT/HR)  LIMITATION(UNIT/H  ODT  71.71  MAX. DESIGN  TYPE  UNITS  CAPACITY (UNIT/HR)  LIMITATION (UNIT/H  AXIMUM DESIGN (BATCHES / HOUR):  REQUESTED LIMITATION (BATCHES / HOUR):  (BATCHES/YR):  UNITS  CAPACITY (UNIT/BATCH)  MAX. DESIGN  CAPACITY (UNIT/BATCH)  LIMITATION (	TYPE UNITS CAPACITY (UNIT/HR) LIMITATION(UNIT/HR)  Green Wood ODT 71.71  MATERIALS ENTERING PROCESS - BATCH OPERATION MAX. DESIGN CAPACITY (UNIT/BATCH)  TYPE UNITS CAPACITY (UNIT/BATCH)  UNITS CAPACITY (UNIT/BATCH)  IMITATION (UNIT/BATCH)  MAX. DESIGN (BATCHES / HOUR): (BATCHES / HOUR): (BATCHES / YR): USED: N/A  INA TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A  MAX. CAPACITY HOURLY FUEL USE: N/A  REQUESTED CAPACITY ANNUAL EVEL USE: N/A  REQUESTED CAPACITY ANNUAL EVEL USE: N/A	Green wood chips are screened and oversized chips t	will undergo addition	al chipping as required.		
TYPE  UNITS  CAPACITY (UNIT/HR)  LIMITATION(UNIT/H  ODT  71.71  MAX. DESIGN  TYPE  UNITS  CAPACITY (UNIT/HR)  LIMITATION (UNIT/H  AXIMUM DESIGN (BATCHES / HOUR):  REQUESTED LIMITATION (BATCHES / HOUR):  (BATCHES/YR):  UNITS  CAPACITY (UNIT/BATCH)  MAX. DESIGN  CAPACITY (UNIT/BATCH)  LIMITATION (	TYPE UNITS CAPACITY (UNIT/HR) LIMITATION(UNIT/HR)  Green Wood ODT 71.71  MATERIALS ENTERING PROCESS - BATCH OPERATION MAX. DESIGN CAPACITY (UNIT/BATCH)  TYPE UNITS CAPACITY (UNIT/BATCH)  UNITS CAPACITY (UNIT/BATCH)  IMITATION (UNIT/BATCH)  MAX. DESIGN (BATCHES / HOUR): (BATCHES / HOUR): (BATCHES / YR): USED: N/A  INA TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A  MAX. CAPACITY HOURLY FUEL USE: N/A  REQUESTED CAPACITY ANNUAL EVEL USE: N/A  REQUESTED CAPACITY ANNUAL EVEL USE: N/A	MATERIALS ENTERING PROCESS - CONTINUOUS	PROCESS	MAY DEGION		
Green Wood  ODT 71.71  MAX. DESIGN REQUESTED CAPACITY (UNIT/BATCH)  LIMITATION (UNIT/BAT  LIMITATION (UNIT/BAT  AXIMUM DESIGN (BATCHES / HOUR):  REQUESTED LIMITATION (BATCHES / HOUR):  (BATCHES/YR):  USED: N/A  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A	Green Wood  ODT 71.71  MAX. DESIGN MAX. DESIGN REQUESTED CAPACITY (UNIT/BATCH)  TYPE  UNITS  CAPACITY (UNIT/BATCH)  LIMITATION (UNIT/BATCH)  MAXIMUM DESIGN (BATCHES / HOUR):  EQUESTED LIMITATION (BATCHES / HOUR):  (BATCHES/YR):  UEL USED: N/A  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A  REQUESTED CAPACITY HOURLY FUEL USE: N/A  REQUESTED CAPACITY ANNUAL EVEL LICE.	TYPE				
MATERIALS ENTERING PROCESS BATCH OPERATION  MAX. DESIGN  CAPACITY (UNIT/BATCH)  LIMITATION (UNIT/BAT  LIMITATION (UNIT/BAT  MAXIMUM DESIGN (BATCHES / HOUR):  REQUESTED LAPACITY (UNIT/BATCH)  MAXIMUM DESIGN (BATCHES / HOUR):  REQUESTED LIMITATION (BATCHES / HOUR):  UNITS  MAXIMUM DESIGN (BATCHES / HOUR):  REQUESTED LIMITATION (BATCHES / HOUR):  UNITS  MAXIMUM DESIGN (BATCHES / HOUR):  NA  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):  NA	MATERIALS ENTERING PROCESS BATCH OPERATION  TYPE  UNITS  CAPACITY (UNIT/BATCH)  LIMITATION (UNIT/BATCH)  MAX. DESIGN  CAPACITY (UNIT/BATCH)  LIMITATION (UNIT/BATCH)  LIMITATION (UNIT/BATCH)  IAXIMUM DESIGN (BATCHES / HOUR):  EQUESTED LIMITATION (BATCHES / HOUR):  UEL USED: N/A  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A  IAX. CAPACITY HOURLY FUEL USE: N/A  REQUESTED CAPACITY ANNUAL ELECTION.	Green Wood			LIMITATIO	N(UNIT/HR)
MAXIMUM DESIGN (BATCHES / HOUR):  REQUESTED LIMITATION (BATCHES / HOUR):  REQUESTED LIMITATION (BATCHES / HOUR):  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):  NA	TYPE UNITS CAPACITY (UNIT/BATCH)  LIMITATION (UNIT/BATCH)  MAXIMUM DESIGN (BATCHES / HOUR):  EQUESTED LIMITATION (BATCHES / HOUR):  UEL USED: N/A  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A  IAX. CAPACITY HOURLY FUEL USE: N/A  REQUESTED CAPACITY ANNIAL ELECTOR AND			71.71		
TYPE  UNITS  CAPACITY (UNIT/BATCH)  LIMITATION (UNIT/BAT  LIMITATI	TYPE UNITS CAPACITY (UNIT/BATCH)  LIMITATION (UNIT/BATCH)  MAXIMUM DESIGN (BATCHES / HOUR):  EQUESTED LIMITATION (BATCHES / HOUR):  UEL USED: N/A  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A  IAX. CAPACITY HOURLY FUEL USE: N/A  REQUESTED CAPACITY ANNIAL ELECTOR AND					
MAXIMUM DESIGN (BATCHES / HOUR):  REQUESTED LIMITATION (BATCHES / HOUR):  REQUESTED LIMITATION (BATCHES / HOUR):  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):  NA	TYPE UNITS CAPACITY (UNIT/BATCH)  LIMITATION (UNIT/BATCH)  MAXIMUM DESIGN (BATCHES / HOUR):  EQUESTED LIMITATION (BATCHES / HOUR):  UEL USED: N/A  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A  IAX. CAPACITY HOURLY FUEL USE: N/A  REQUESTED CAPACITY ANNIAL ELECTOR AND					
MAXIMUM DESIGN (BATCHES / HOUR):  REQUESTED LIMITATION (BATCHES / HOUR):  REQUESTED LIMITATION (BATCHES / HOUR):  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):  NA	TYPE UNITS CAPACITY (UNIT/BATCH)  LIMITATION (UNIT/BATCH)  MAXIMUM DESIGN (BATCHES / HOUR):  EQUESTED LIMITATION (BATCHES / HOUR):  UEL USED: N/A  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A  IAX. CAPACITY HOURLY FUEL USE: N/A  REQUESTED CAPACITY ANNIAL ELECTOR AND					
MAXIMUM DESIGN (BATCHES / HOUR):  REQUESTED LIMITATION (BATCHES / HOUR):  WAXIMUM DESIGN (BATCHES / HOUR):  REQUESTED LIMITATION (BATCHES / HOUR):  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):  NA	TYPE UNITS CAPACITY (UNIT/BATCH)  LIMITATION (UNIT/BATCH)  MAXIMUM DESIGN (BATCHES / HOUR):  EQUESTED LIMITATION (BATCHES / HOUR):  UEL USED: N/A  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A  IAX. CAPACITY HOURLY FUEL USE: N/A  REQUESTED CAPACITY ANNIAL ELECTOR AND					
MAXIMUM DESIGN (BATCHES / HOUR):  REQUESTED LIMITATION (BATCHES / HOUR):  WAXIMUM DESIGN (BATCHES / HOUR):  REQUESTED LIMITATION (BATCHES / HOUR):  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):  NA	TYPE UNITS CAPACITY (UNIT/BATCH)  LIMITATION (UNIT/BATCH)  MAXIMUM DESIGN (BATCHES / HOUR):  EQUESTED LIMITATION (BATCHES / HOUR):  UEL USED: N/A  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A  IAX. CAPACITY HOURLY FUEL USE: N/A  REQUESTED CAPACITY ANNIAL ELECTOR AND					
MAXIMUM DESIGN (BATCHES / HOUR):  REQUESTED LIMITATION (BATCHES / HOUR):  REQUESTED LIMITATION (BATCHES / HOUR):  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):  NA	TYPE UNITS CAPACITY (UNIT/BATCH)  LIMITATION (UNIT/BATCH)  MAXIMUM DESIGN (BATCHES / HOUR):  EQUESTED LIMITATION (BATCHES / HOUR):  UEL USED: N/A  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A  IAX. CAPACITY HOURLY FUEL USE: N/A  REQUESTED CAPACITY ANNIAL ELECTOR AND	MATERIAL & ENTERING PROGRESS IN A VIOLENTIAL				
MAXIMUM DESIGN (BATCHES / HOUR):  REQUESTED LIMITATION (BATCHES / HOUR):  ULMITATION (UNIT/BATCHES / HOUR):  (BATCHES/YR):  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):  N/A	MAXIMUM DESIGN (BATCHES / HOUR):  EQUESTED LIMITATION (BATCHES / HOUR):  UEL USED: N/A  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A  IAX. CAPACITY HOURLY FUEL USE: N/A  REQUESTED CAPACITY ANNUAL ELECTRONS  REQUESTED CAPACITY ANNUAL ELECTRONS  REQUESTED CAPACITY ANNUAL ELECTRONS  MA  MA  MA  MA  MA  MA  MA  MA  MA  M	TYPE				
MAXIMUM DESIGN (BATCHES / HOUR):  REQUESTED LIMITATION (BATCHES / HOUR):  USED:  N/A  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):  N/A	#AXIMUM DESIGN (BATCHES / HOUR):  #EQUESTED LIMITATION (BATCHES / HOUR): (BATCHES/YR):  ##USED: N/A  ##USED:	.111 3m	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (	UNIT/BATCH)
MAXIMUM DESIGN (BATCHES / HOUR):  REQUESTED LIMITATION (BATCHES / HOUR):  USED:  N/A  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):  N/A	#AXIMUM DESIGN (BATCHES / HOUR):  #EQUESTED LIMITATION (BATCHES / HOUR): (BATCHES/YR):  ##USED: N/A  ##USED:					
MAXIMUM DESIGN (BATCHES / HOUR):  REQUESTED LIMITATION (BATCHES / HOUR):  USED:  N/A  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):  N/A	#AXIMUM DESIGN (BATCHES / HOUR):  #EQUESTED LIMITATION (BATCHES / HOUR): (BATCHES/YR):  ##USED: N/A  ##USED:					
MAXIMUM DESIGN (BATCHES / HOUR):  REQUESTED LIMITATION (BATCHES / HOUR):  USED: N/A  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A	#AXIMUM DESIGN (BATCHES / HOUR):  #EQUESTED LIMITATION (BATCHES / HOUR): (BATCHES/YR):  ##USED: N/A  ##USED:					
MAXIMUM DESIGN (BATCHES / HOUR):  REQUESTED LIMITATION (BATCHES / HOUR):  USED:  N/A  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):  N/A	AXIMUM DESIGN (BATCHES / HOUR):  EQUESTED LIMITATION (BATCHES / HOUR):  UEL USED:  N/A  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):  N/A  IAX. CAPACITY HOURLY FUEL USE:  N/A  REQUESTED CAPACITY ANNUAL EVEL USE:  N/A					
MAXIMUM DESIGN (BATCHES / HOUR):  REQUESTED LIMITATION (BATCHES / HOUR):  USED: N/A  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A	AXIMUM DESIGN (BATCHES / HOUR):  EQUESTED LIMITATION (BATCHES / HOUR):  UEL USED:  N/A  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):  N/A  IAX. CAPACITY HOURLY FUEL USE:  N/A  REQUESTED CAPACITY ANNUAL EVEL USE:  N/A					
MAXIMUM DESIGN (BATCHES / HOUR):  REQUESTED LIMITATION (BATCHES / HOUR):  USED: N/A  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A	AXIMUM DESIGN (BATCHES / HOUR):  EQUESTED LIMITATION (BATCHES / HOUR):  UEL USED:  N/A  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):  N/A  IAX. CAPACITY HOURLY FUEL USE:  N/A  REQUESTED CAPACITY ANNUAL EVEL USE:  N/A					
REQUESTED LIMITATION (BATCHES / HOUR): (BATCHES/YR):  TUEL USED: N/A  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A	EQUESTED LIMITATION (BATCHES / HOUR): (BATCHES/YR):  UEL USED: N/A  TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A  IAX. CAPACITY HOURLY FUEL USE: N/A  REQUESTED CAPACITY ANNUAL FUEL USE: N/A				ļ	
TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A	UEL USED: N/A TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A  IAX. CAPACITY HOURLY FUEL USE: N/A REQUESTED CAPACITY ANNUAL ELECTRICAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A	MAXIMUM DESIGN (BATCHES / HOUR):				
TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A	IAX. CAPACITY HOURLY FUEL USE:  N/A  REQUESTED CAPACITY ANNUAL ELECTRICAL  N/A		(BATCHES/Y	₹):		
	REQUESTED CAPACITY ANNUAL ELECTRICS.		TOTAL MAXIN	MUM FIRING RATE (MILLION BTU/	HR): N/A	
REQUESTED CAPACITY ANNUAL EVEL USE:	CIVITATIO.	MAX. CAPACHY HOURLY FUEL USE; N/A	ACIT ROURLY FOEL USE: N/A IREQUESTED CAPACITY ANNUAL ELECTION.			
OWNER 13.		CAMINEN 13.				
		Attach A	Iditional Sheets	an Name		

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File:Enviva Hamlet Forms v3
Sheet:B9 (ES-CHP-1)



Source Specific Forms - Green Wood Hammermills

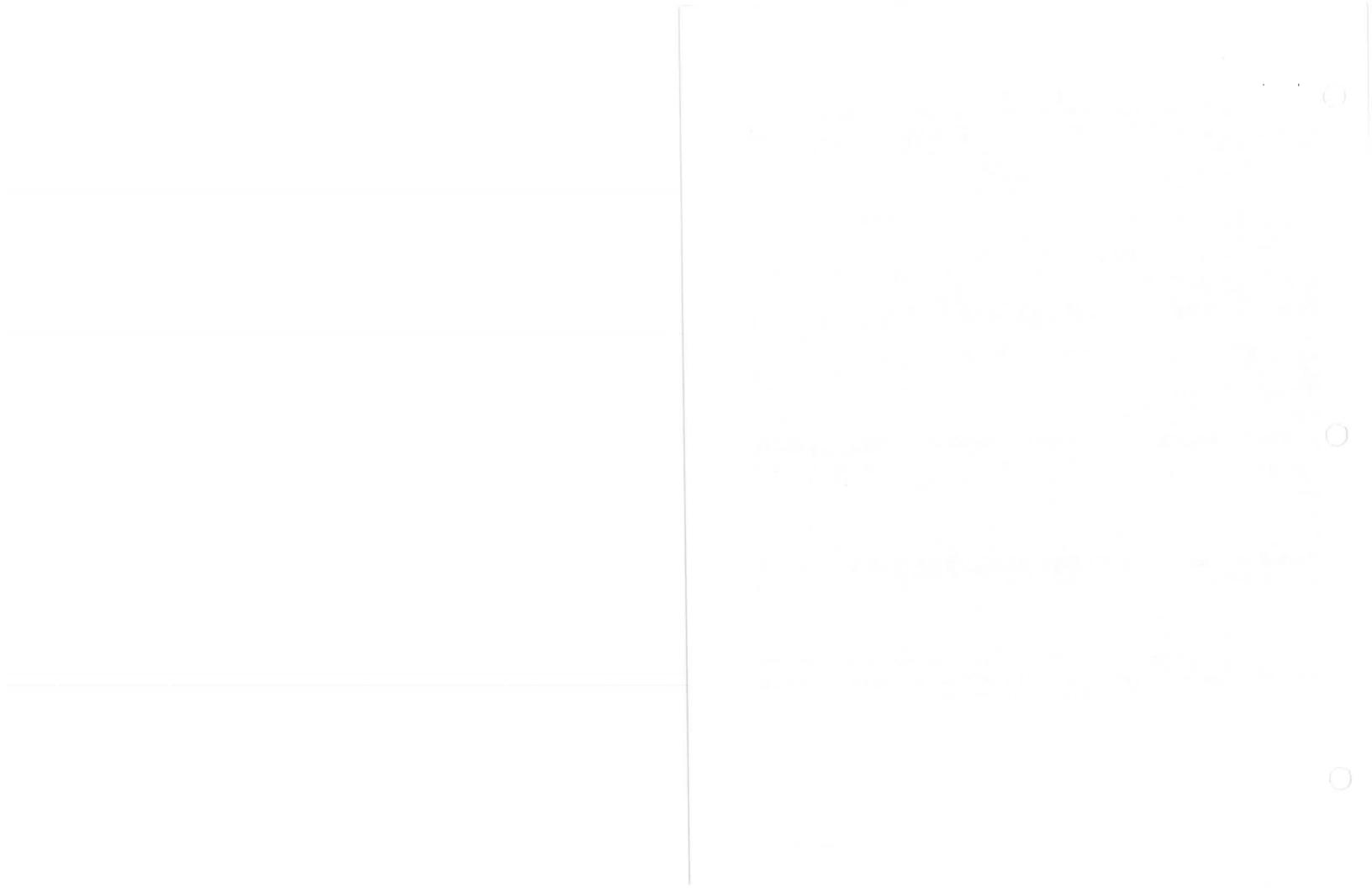
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FORM B
SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALI

REVISED 12/01/01 NCDENR/Divisio	n of Air Quality	- Application	for Air Perm	it to Constru	WODERS OF	DONOLG	"
EMISSION SOURCE DESCRIPTION:		- tablicación		SOURCE ID I			В
Green Wood Hammermills						ES-GHM-1,	
			CONTROL	DEVICE ID N	O(S):	CD-GHM-C	YC
OPERATING SCENARIO 1 OF	1		EMISSION	POINT (STAC	K) ID NOVEL	EP-6	
DESCRIBE IN DETAILTHE EMISSION SOURCE PROCE	SS (ATTACH FL	OW DIAGRA	M/\-		K) ID NO(3).	EF-0	
Green wood chips are screened and oversized chips w	ill undergo addit	ional chippi	ng as require	d.			
TVDF OF ENIODISM							
TYPE OF EMISSION SOURCE (CHECK	AND COMPLE	TE APPROP	RIATE FORM	B1-B9 ON TH	E FOLLOWIN	G PAGES):	
MANOOCON, Bas, office printer (LOLLY D.I.) MANOOC	working (Form B	4)	☐ Manufa	ct. of chemica	ls/coatings/inks	(Form B7)	
☐ Int.combustion engine/generator (Form B2) ☐ Coati	ng/finishing/printi	ng (Form B5)	Incinera	ation (Form B8			
	ge silos/bins (For	m B6)	Other (				
START CONSTRUCTION DATE: TBD   OPERATION	ON DATE:	TBD	DATE MAN	UFACTURED:		TBD	
MANUFACTURER / MODEL NO.: TBD		EXPECTED	OP. SCHED	JLE: 24 Hi			52 WK/YR
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?):		IAP (SUBPA		MACT	(SUBPART?):		
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB EXPECTED ANNUAL HOURS OF OPERATION 8,7	25% MAR-		JUN-AU	G 25%	SEP-NOV	25%	
EN LOTED ANNOAL HOURS OF OPERATION 8,1	60 VISIBLE STA	CK EMISSIC	NS UNDER I	NORMAL OPE	RATION:<2	0 % OPA	CITY
CRITERIA AIR POLLU	IANI EMISS		OKWIANIO)				
	SOURCE OF		D ACTUAL			L EMSSIONS	3
AIR POLLUTANT EMITTED	EMISSION FACTOR	(AFTER CONT	ROLS / LIMITS)		TROLS / LIMITS)	(AFTER CON	TROLS / LIMITS)
PARTICULATE MATTER (PM)		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER<10 MICRONS (PM)	Jee Linissio	ii Calculatioi	із іп Аррепа	IX B			
PARTICULATE MATTER<2.5 MICRONS (PM. a)	_		<del></del>	-			
SULFUR DIOXIDE (SO2)				-			
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)				1	_		
LEAD							
OTHER							
HAZARDOUS AIR POL	UTANT EMIS	SIONS IN	FORMATIC	N FOR TH	IS SOURC	C VILLE SOM	ASSESSED FOR
	SOURCE OF	EXPECTE	DACTUAL		POTENTIAL	EMSSIONS	
HAZARDOUS AIR POLLUTANT AND CAS NO.	EMISSION		ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)		TROLS / LIMITS)
N/A	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
in the second se							
	+						
	-						
TOXIC AIR POLICY	NE MISSIO	NS INFOR	MATION	OR THIS S	OURCE		2000年1月1日
	D ACTUAL EMIS	SIONS AFTE	R CONTROL	S/LIMITATIO	ONS		
OXIC AIR POLLUTANT AND CAS NO.	EF SOURCE	lb/		lb/d		Ih.	yr
UA							Tyl
	+						
	+						
ttachments: (1) emissions calculations and supporting documents	n: /2\ indicate ="						
ttachments: (1) emissions calculations and supporting documentation escribe how these are monitored and with what frequency; and (3) do	n, (4) mulcate all rec escribe any monitori	quested state a	na tederal enfor	ceable permit lin	nits (e.g. hours o	f operation, emi	ssion rates) and
COMPLETE THIS FORM AND COMPLETE A	ND ATTACH	APPROPI	VIATE RA	IN TOT WIS SOURCE	e.	CAD FXA	TOATES
Attack	Additional	Shoote A	e Negera	THOUGH	D3 FURINI I	OR EACH	SOURCE
ritaci	· · wwitiviidi	OHECT2 W	is inecess	агу			

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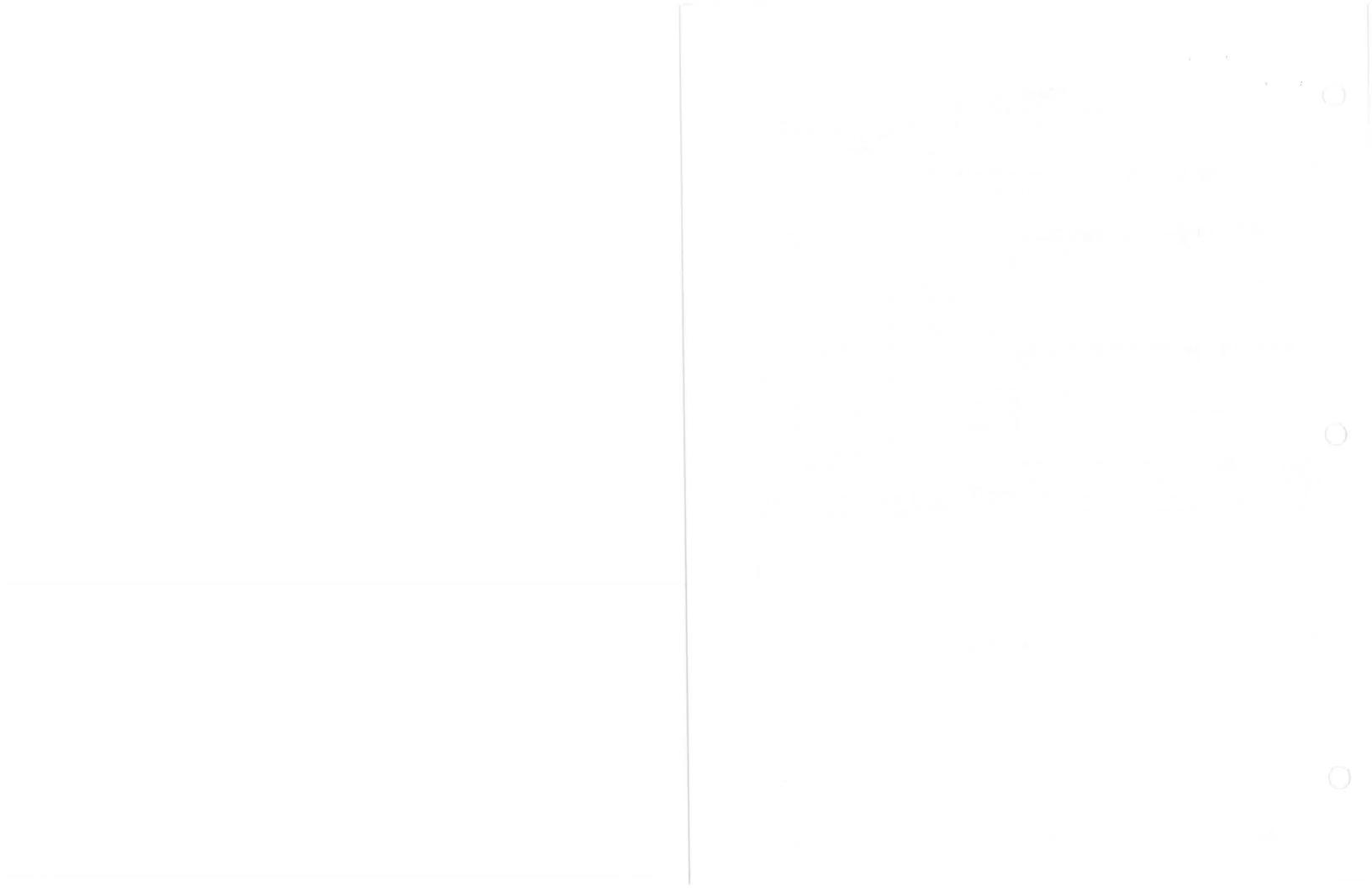
L SOURCES)				
e B ES-GHM-1, 2	]			
CD-GHM-CYC	-			
(S): EP-6				
OWING PAGES): s/inks (Form B7)				
TBD 7 DAY/WK52 WK/YR RT?):NOV 25%				
-NOV 25% _<20 % OPACITY				
<20 % OPACITY RCE NTIAL EMSSIONS				
MITS) (AFTER CONTROLS / LIMITS) /yr lb/hr tons/yr				
DRGE				
NTIAL EMSSIONS  IITS) (AFTER CONTROLS / LIMITS)				
yr lb/hr tons/yr				
E				
lb/yr				
ours of operation, emission rates) and				
RM FOR EACH SOURCE				
File:Enviva Hamlet Forms v3 Sheet:B (ES-GHM)				
(NHD-ca) d.solid				



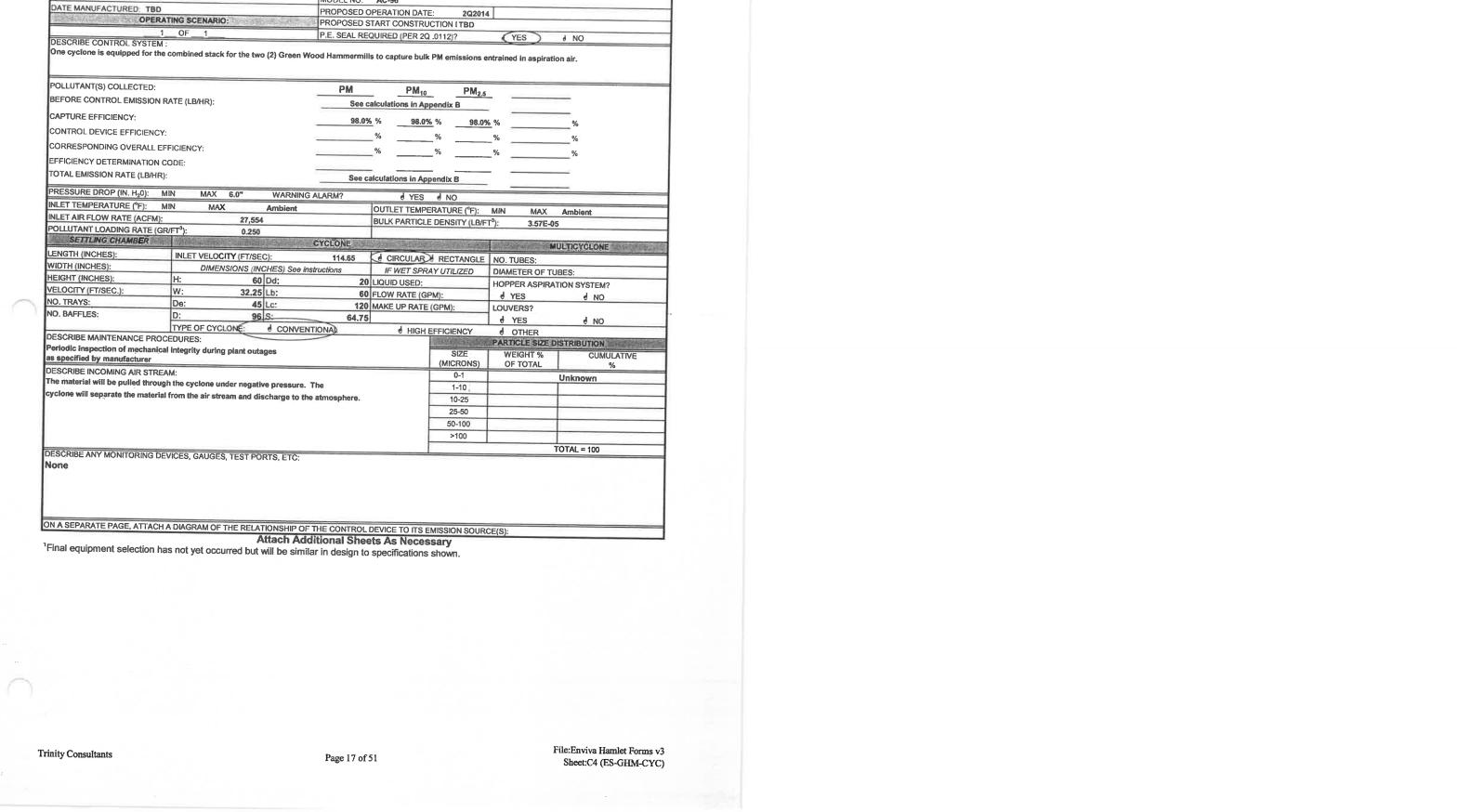
EMISSION SOLIDOS DECODIDATION	NCDENR/Division of Air C	Quality - Application	on for Air Permit to Construct/Ope	erate	B9
EMISSION SOURCE DESCRIPTION:	Green Wood Hamr	nermills	EMISSION SOURCE ID NO:	ES-GHM-1, 2	
			CONTROL DEVICE ID NO(S):	CD-GHM-CYC	
OPERATING SCENARIO: 1	OF1	2	EMISSION POINT (STACK) ID N	O(S): EP-6	
DESCRIBE IN DETAIL THE PROCESS (A Green wood chips are screened	d and oversized chips will	undergo addition			
MATERIALS ENTERING PRO	CESS - CONTINUOUS PR	COCESS	MAX. DESIGN	REQUESTE	CAPACITY
TYPE		UNITS	CAPACITY (UNIT/HR)	LIMITATION	
Green Wood		ODT	71.71		Oramiy
MATERIALS ENTERING PR TYPE	OCESS - BAYCHORERA	UNITS	MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED LIMITATION (U	
					4
MAXIMUM DESIGN (BATCHES / HOUR):					
REQUESTED LIMITATION (BATCHES / H	OUR):	(BATCHES/Y			
FUEL USED: N/A MAX. CAPACITY HOURLY FUEL USE:		TOTAL MAXII	MUM FIRING RATE (MILLION BTU	/HR): N/A	
COMMENTS:	N/A	REQUESTED	CAPACITY ANNUAL FUEL USE:	N/A	
			:		
	Attach Add	itional Sheets	s as Necessary		

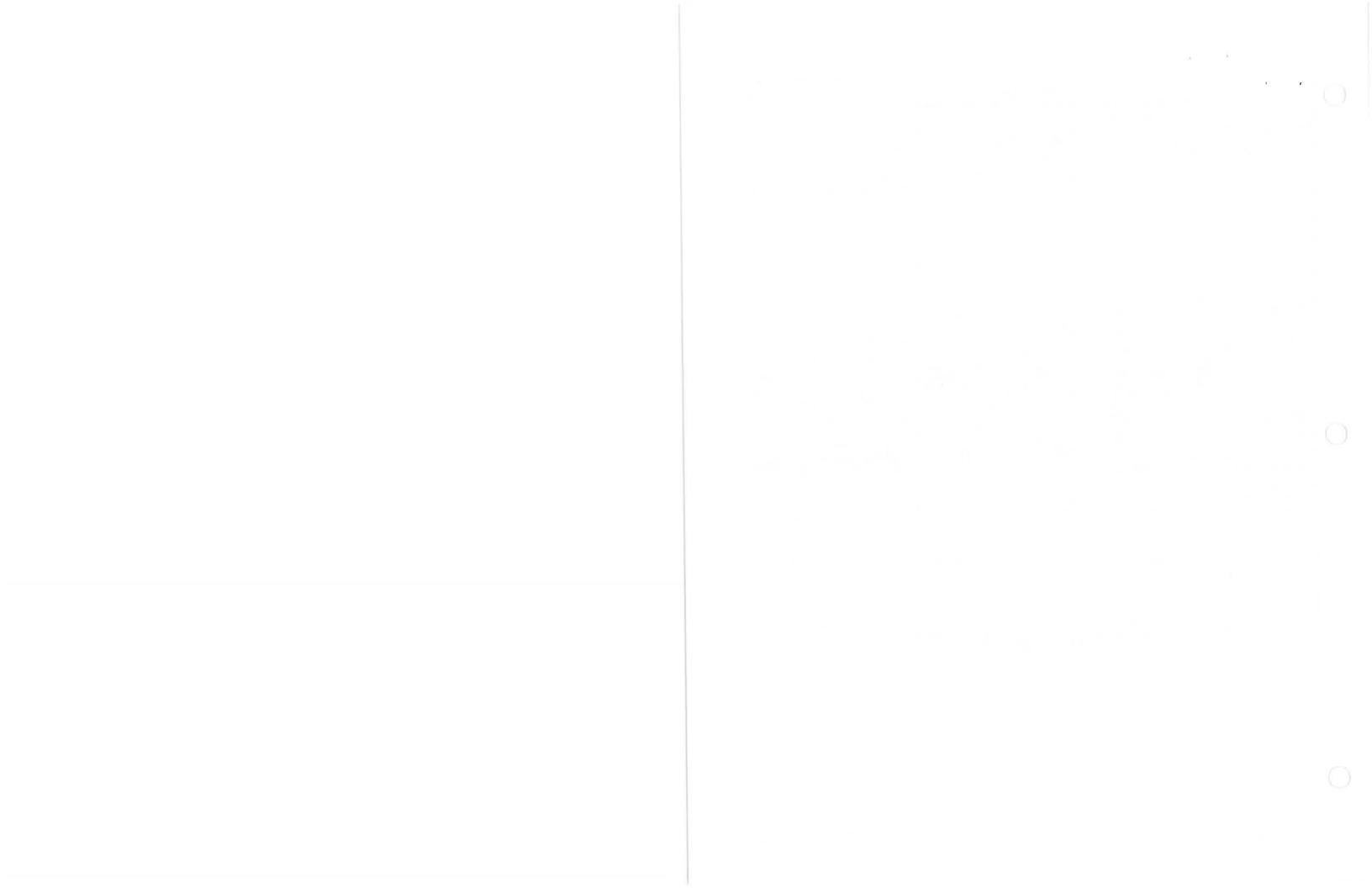
Trinity Consultants
Page 16 of 51
File:Enviva Hamlet Forms v3
Sheet:B9 (ES-GHM)





1		EODI	1.04			
l co	NTROL DEVICE	FORI CYCLONE, MULTIC	VI C4	OD OTHER	MEGUANUA	
REVISED 12/01/01	NCDENR/I	Division of Air Quality - Appl	ication for Air Po	OK UTHEK	MECHANICA	
CONTROL DEVICE ID NO: CD-GH	M-CYC	CONTROLS EMISSIONS FE				
EMISSION POINT (STACK) ID NO	(S): EP-6	POSITION IN SERIES OF C	ONTROLS	NO.	1 OF 1	ES-GHM-1,2
MANUFACTURER: Aircon 1		MODEL NO:	AC-96	140.	1 01 1	UNITS
DATE MANUFACTURED: TBD			OPERATION DATE	E: 2Q2014	4	
OPERAT	ING SCENARIO:		START CONSTRU		*	
1_	OF1		QUIRED (PER 20		(YES)	d NO
DESCRIBE CONTROL SYSTEM: One cyclone is equipped for the o	combined stack for the two	(2) Green Wood Hammermil	ls to capture bulk	PM emissions e	entrained in aspirati	
POLLUTANT/OX COLUENTED		PM				
POLLUTANT(S) COLLECTED:			PM <sub>10</sub>	PM <sub>2.5</sub>		
BEFORE CONTROL EMISSION RA	ATE (LB/HR):	See o	calculations in Ap	pendix B		
CAPTURE EFFICIENCY:		98.09	% 98.09	<u>%</u> % 98.09	% %	 %
CONTROL DEVICE EFFICIENCY:			%	%	%	
CORRESPONDING OVERALL EFF	ICIENCY:	-				%
EFFICIENCY DETERMINATION CO				_%	%	%
TOTAL EMISSION RATE (LB/HR):	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	See c	alculations in Ap	pendix B		_
PRESSURE DROP (IN. H20): MI	N MAX 6.0"	WARNING ALARM?	€ YES	₫ NO		
INLET TEMPERATURE (°F): MI		Ambient	OUTLET TEMPI		MINI MAN	
INLET AIR FLOW RATE (ACFM):	27,554			E DENSITY (LB/F	MIN MAX	Ambient
POLLUTANT LOADING RATE (GR/			DOLK! AKTIOE	L DENSITT (LB/F	T <sup>3</sup> ): 3.57E-0	5
SETTLING CHAMBER	· 经税率 (基本) (基本) (基本)	CYCLONE	DAY TO EVE	TORK BYELLIAM	A Charles	IULTICYCLONE
ENGTH (INCHES):	NLET VELOCITY (FT/SEC): 114.65 CIRCULAR			RECTANGLE		hate the first state of the
WIDTH (INCHES):		DIMENSIONS (INCHES) See instructions IF WET SPR.			DIAMETER OF TO	JBES:
HEIGHT (INCHES):	H: 60			HOPPER ASPIRA		
VELOCITY (FT/SEC.):	W: 32.25		PM):	d YES	9 NO	
NO. TRAYS:	De: 45		MAKE UP RATE	(GPM):	LOUVERS?	
NO. BAFFLES:	D: 96 S: 64.75				d YES	€ NO
TYPE OF CYCLONE: CONVENTIONAL HIGH DESCRIBE MAINTENANCE PROCEDURES:				EFFICIENCY	₫ OTHER	
Periodic inspection of mechanical	:UURES: Integrity during plant outer	100		小色的跨海地震	PARTICLE SIZE	
s specified by manufacturer				SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %
DESCRIBE INCOMING AIR STREAT The material will be pulled through	VI:	* ********* ****		0-1		Unknown
cyclone will separate the material f	rom the air streem and dis-	e pressure. The		1-10 ;		
	iviii uie ali suealii and dis	charge to the atmosphere.		10-25		
				25-50		
			9	50-100		
				>100		
ESCRIBE ANY MONITORING DEV	ICES, GAUGES. TEST POR	RTS, ETC:				TOTAL = 100
lone			DELIOS TO US			
IN A SEPARATE PAGE, ATTACH A	DINGRAM OF THE RELAT	UNSHIP OF THE CONTROL	DEVICE TO ITS E	MISSION SOUR	CE(S):	





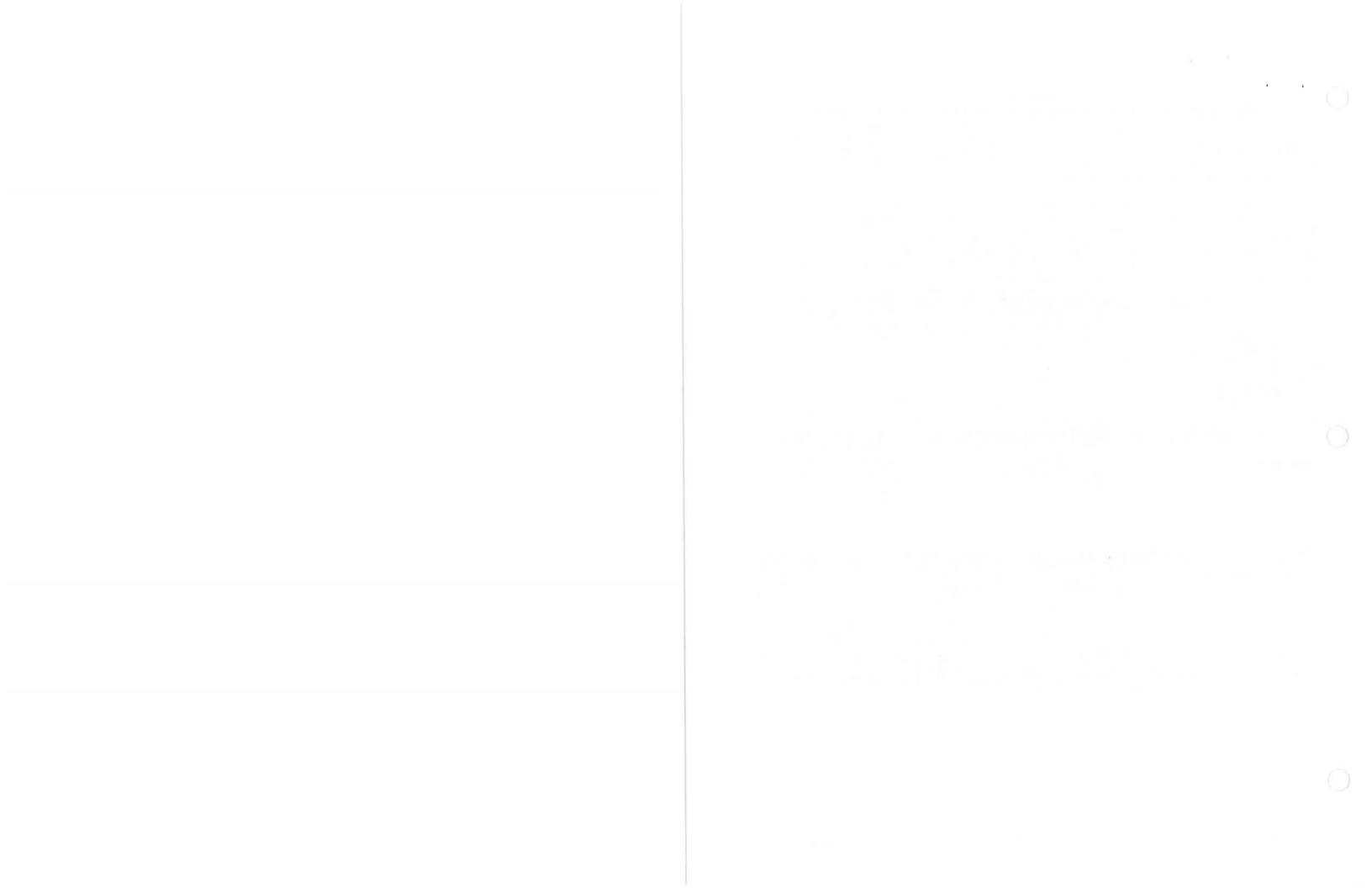
Source Specific Forms - Portable Chipper



FORM B
SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 NCDENR/Division of	of Air Quality -		or Air Permit		t/Operate	OITOLO	′ <u>в</u>
EMISSION SOURCE DESCRIPTION:				OURCE ID N		ES-CHIP-2	1250
Portable Chipper (up to 1,300 bhp)				DEVICE ID NO		N/A	
OPERATING SCENARIO 1 OF	1		EMISSION E	OINT (STAC		EP-9	
DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS	(ATTACH FL	OW DIAGRAM	d):		14,15110(0).		
Diesel-fired internal combustion chipper to provide addit	ional chipping	to the prima	ry chipper.				
		•	,				
TYPE OF EMISSION SOURCE (CHECK A	ND COMPLET	E APPROPRI	ATE FORM B	1-B9 ON THE	FOLLOWING	PAGES):	
Coal,wood,oil, gas, other burner (Form B1) Woodw	orking (Form B	4)			s/coatings/inks		
	/finishing/printi	ng (Form B5)	☐ Incinerat	ion (Form B8		,	
	silos/bins (For	m B6)	Other (F	orm B9)			
START CONSTRUCTION DATE: TBD OPERATION	N DATE:	TBD	DATE MANU			TBD	
MANUFACTURER / MODEL NO.: TBD		EXPECTED	OP. SCHEDU	LE: 24 HF		DAY/WK	52 WK/YR
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?):	_ NESHAP (	SUBPART?):_		MACT (SUB			02 1110111
	25% MAR-	MAY 25%	JUN-AUG	25%	SEP-NOV	25%	
EXPECTED ANNUAL HOURS OF OPERATION 100	VISIBLE STA	CK EMISSION	NS UNDER NO	ORMAL OPE	RATION: <2		CITY
CRITERIA AIR POLLUTA	ANT EMISSI	ONS INFO	RMATION	FOR THIS	SOURCE	TO ME LEVEL Y	
	SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMSSIONS	,
	EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CON	ITROLS / LIMITS)
AIR POLLUTANT EMITTED	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	See Emissio	n Calculation	s in Appendi	кВ			
PARTICULATE MATTER<10 MICRONS (PM <sub>10</sub> )							
PARTICULATE MATTER<2.5 MICRONS (PM <sub>2.5</sub> ) SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)	_						
LEAD							
OTHER							
HAZARDOUS AIR POLLU	TANTEMIS	SIONS INE	ODMATIO	WEAD WILL	CICOUDEE	(A)	
	SOURCE OF	EXPECTE	DACTILL	V FUK I HI			
	EMISSION	(AFTER CONTR		(BÉSODE COL	POTENTIAL		
HAZARDOUS AIR POLLUTANT AND CAS NO.	FACTOR	lb/hr	tons/vr	lb/hr	TROLS / LIMITS)		TROLS / LIMITS)
		n Calculation			tons/yr	lb/hr	tons/yr
		T Galoulation	a iii Appendia				
						-	
TOXIC AIR POLLUTAN	TEMISSIO	NS INFORM	NATION FO	Ja ilis s	OURCE	<b>建一个工作</b>	
INDICATE EXPECTED		SIONS AFTE	R CONTROLS	S/LIMITATIO	NS		
TOXIC AIR POLLUTANT AND CAS NO.	EF SOURCE	lb/			day	- Ik	o/yr
	See Emission	1 Calculations	s in Appendix	В			
	<b></b>						
Attachments: (1) emissions calculations and supporting documentation;	(2) indicate all co-	u postod ci-t-	d factored f	able as the s			
lescribe how these are monitored and with what frequency; and (3) describe how these are monitored and with what frequency; and (3) describe how these are monitored and with what frequency; and (3) describe how these are monitored and with what frequency; and (3) describe how these are monitored and with what frequency; and (3) describe how these are monitored and with what frequency; and (3) describe how these are monitored and with what frequency; and (3) describe how these are monitored and with what frequency; and (3) describe how these are monitored and with what frequency; and (3) describe how these are monitored and with what frequency; and (3) describe how these are monitored and with what frequency; and (3) describe how the second and with what frequency; and (3) describe how the second and with what frequency; and (3) describe how the second and with what frequency; and (3) describe how the second and with what frequency; and (3) describe how the second and with what frequency; and (3) describe how the second and with what frequency; and (3) describe how the second and whith what frequency is the second and whith the second and whith the second and the second and whith the second and the seco	(z) mulcate all feq	juestea state and	a rederal enforce	able permit limi	ts (e.g. hours of c	peration, emis	sion rates) and
COMPLETE THIS FORM AND COMPLETE AN	DATTACH	APPROPR	IATE RIT	HROUGH	RO FORM E	OPEACE	COURCE
Attach /	Additional	Sheets A	Noces	iru	J I JIMI F	UN LAUN	JOURGE
Actaon		UIIUUU M	~ 1400039C	u y			

File:Enviva Hamlet Forms v3 Trinity Consultants Page 18 of 51 Sheet:B (ES-CHIP-2)



# FORM B2 EMISSION SOURCE (INTERNAL COMBUSTION ENGINES/GENERATORS)

REVISED 12/01/01	NCDENR/Division of Air Qual	ity - Application for Air Perr	mit to Construct/Operate	B2
EMISSION SOURCE DESCRIPTION:			EMISSION SOURCE ID NO:	ES-CHIP-2
			CONTROL DEVICE ID NO(S):	N/A
OPERATING SCENARIO:	1 OF 1		EMISSION POINT (STACK) ID NO(S)	EP-9
CHECK ALL THAT APPLY	€ EMERGENCY €	SPACE HEAT	<b>♦</b> ELECTRICAL GENERATION	
	PEAK SHAVER	OTHER (DESCRIBE):		
GENERATOR OUTPUT (KW):	ANTICIP	ATED ACTUAL HOURS OF	OPERATION AS PEAK SHAVER (HRS	6/YR):
ENGINE OUTPUT (HP):				
TYPE ICE: GASOLINE ENGINE OTHER (DESCRIBE		A STATE OF THE PARTY OF THE PAR	EL ENGINE GREATER THAN 8000 HP (complete below)	DUAL FUEL ENGINE
ENGINE TYPE	ONS INJECTION TIMIN	N/A   IG RETARD	NITION CHAMBER COMBUSTION	OTHER
OR STATIONARY GAS TURE	BINE (complete below)	NATURAL GAS PIPELINE	COMPRESSOR OR TURBINE (comple	te below)
FUEL: NATURAL GAS	OIL ENGINE			TURBINE
Ø OTHER (DESCRIBE):		4-CYCLE RI		):
CYCLE: O COGENERATION	SIMPLE CONTRO		ON MODIFICATIONS (DESCRIBE):	
€ REGENERATIVE		SELECTIVE CATALYTIC REI		
		N BURN AND PRECOMBUS	STION CHAMBER # UNCON	TROLLED
d uncontrolled	LEAN-PREMIX	NO HOLOTARY IN IN		
HERSELENIM STATISTICS TO	FUEL USAGE (I	NCLUDE STARTUP/BA		ASSISTANCE OF THE PROPERTY OF THE PARTY OF T
FUEL TYPE	UNITS	MAXIMUM DESIGN		
		CAPACITY (UNIT/HR		N (UNIT/HR)
No. 2 Fuel Oil	gal	6.55	6.55	
Bell Michael Control of the Control	FUEL CHARACTERISTICS	COMPLETE ALL TH	AT ARE APPLICABLE)	
		JOOMI ELIEPALE III		CONTENT
· FUEL TYPE	BTU/UNIT	UNITS	(% BY W	
No. 2 Fuel Oil	19,300	ib.	<15 ppmw	2.0.33)
	10,000		415 pprilw	
SERVICE AND A PROPERTY OF	MANUFACTURER'S SPE	CIFIC EMISSION FACT	TORS (IF AVAILABLE)	
POLLUTANT		CO PM	PM10 VO	C OTHER
EMISSION FACTOR LB/UNIT				
UNIT				
DESCRIBE METHODS TO MINIM Periodic equipment maintenance will				
COMMENTS:				
Comment to				
	Attach Add	itional Sheete As No	ACACCAMI	

File:Enviva Hamlet Forms v3 Sheet:B2 (ES-CHIP-2

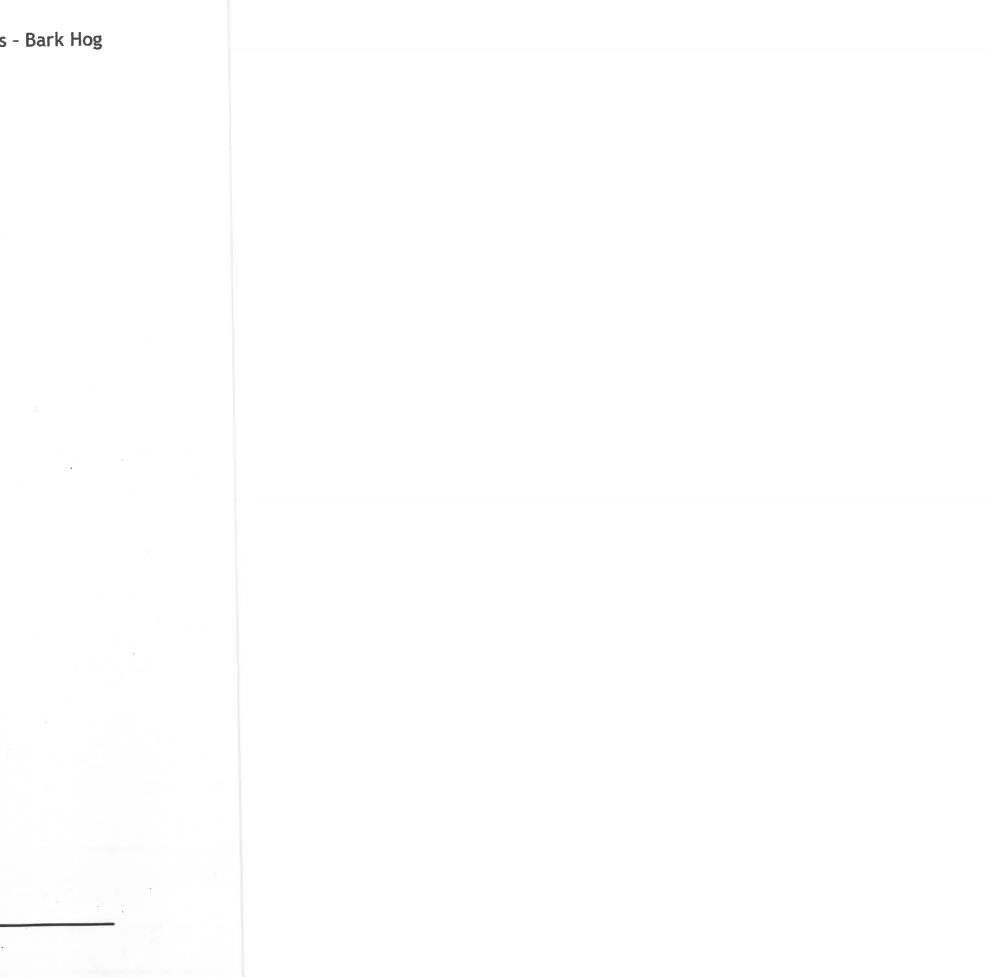
Trinity	Consul	ltants	
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REVISED: 12/01/01 NCDENR/Division of Air Quality	- Applicatio	n for Air Permit to Construct/Opera	te	B9
EMISSION SOURCE DESCRIPTION: Portable Chipper	- 4-1	EMISSION SOURCE ID NO:	ES-CHIP-2	
MIDDION DOUNGE, DESCRIPTION.		CONTROL DEVICE ID NO(S):	N/A	
DPERATING SCENARIO: 1 OF 1		EMISSION POINT (STACK) ID NO	S): EP-9	
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):		al abinaine sa sacrifad		
Green wood chips are screened and oversized chips will under	ergo addition	ial chipping as required.		
MATERIALS ENTERING PROCESS - CONTINUOUS PROCE	SS	MAX. DESIGN		DICAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION	(UNIT/HR)
Green Wood	ODT	71.71		
Ologii Wood				
			DECLIECTE.	D CAPACITY
MATERIALS ENTERING PROCESS - BATCH OPERATIO	N AFTERNAS			
TYPE	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (	DNITABATON
		*		
			<u> </u>	
MAXIMUM DESIGN (BATCHES / HOUR):		0.001		
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES		/HR): N/A	
FUEL USED: N/A	TOTAL MA	XIMUM FIRING RATE (MILLION BTU	/HR): N/A	
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTE	ED CAPACITY ANNUAL FUEL USE:	N/A	
COMMENTS:				
A		eta da Nacassani		
Attach Addit	uonai Sne	eets as Necessary		

File:Enviva Hamlet Forms v3 Sheet:B9 (ES-CHIP-2)

Source Specific Forms - Bark Hog



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FORM B
SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)\_

EVISED 12/01/01 NCDENR/Division			EMISSION SC	OURCE ID NO		ES-BARKHO	G
				EVICE ID NO(		N/A	
arkhog						A1/A	
PERATING SCENARIO 1 OF	1		EMISSION PO	DINT (STACK)	ID NO(S):	N/A	
ECODIDE IN DETAIL THE EMISSION SOURCE PROCES	S (ATTACH FLO	W DIAGRAM	):				
reen wood bark fuel is sent to the bark hog to break up	bark into smalle	r pieces prid	or to the drye	r.			
TYPE OF EMISSION SOURCE (CHECK	AND COMPLETE	APPROPR	ATE FORM B	1-B9 ON THE	FOLLOWING	PAGES):	
TYPE OF EMISSION SOURCE (CHECK	vorking (Form B4)	)	Manufact	. of chemicals/	coatings/inks	(Form B7)	
	g/finishing/printing	(Form B5)	☐ Incinerati	on (Form B8)			
Introduipadadin driginary	e silos/bins (Form	B6)	Other (Fo	rm B9)			
Eliquid Storage all little (1 Since = 7		TBD	DATE MANU	FACTURED:		TBD	
IANI CONSTRUCTION DIVID	NOATE.		OP. SCHEDU		DAY7	DAY/WK!	52_WK/YR_
IANUFACTURER / MODEL NO.: TBD S THIS SOURCE SUBJECT TO? NSPS (SUBPART?):		P (SUBPAR		MACT (S	SUBPART?):_		
	25% MARA	IAY 25%	JUN-AUG	25%	SEP-NOV	25%	O LETA C
		CK EMISSIO	NS UNDER N	ORMAL OPER	ATION: <2		
CRITERIA AIR POLLU	TANT EMISS	<b>ONSTINE</b>	KMATION		SUURCE	HOLD MOVED IN	
1.4 (1.76) (1.76) (1.76) (1.76) (1.76)	SOURCE OF	EXPECTE	D ACTUAL		POTENTIA	F EMPSIONS	
	EMISSION		ROLS / LIMITS)	(BEFORE CONT		(AFTER CON	tons/yr
AIR POLLUTANT EMITTED	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	ID/EII	tonaryi
PARTICULATE MATTER (PM)	See Emission	n Calculation	s in Appendi	XB			
PARTICULATE MATTER<10 MICRONS (PM <sub>10</sub> )							
PARTICULATE MATTER<2.5 MICRONS (PM <sub>2.5</sub> )			-				
SULFUR DIOXIDE (SO2)				-			
NITROGEN OXIDES (NOx)			-				
CARBON MONOXIDE (CO)			_				
/OLATILE ORGANIC COMPOUNDS (VOC)	_						
EAD							
OTHER HAZARDOUS AIR POLL	UTANTEMIS	N CHOK		oneore	IS SOURCE	Estatace	SERVICE DE LA COMP
FLR ALL ALL ALL ALL ALL ALL ALL ALL ALL A	SOURCE OF	EXPECT	D ACTUAL		POILITIE	IL LINGOIGH	_
	EMISSION	(AFTER CON	TROLS / LIMITS)		TROLS / LIMITS)	(AFTER CO	NTROLS / LIMITS
HAZARDOUS AIR POLLUTANT AND CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	ID/III	torioryi
N/A				ļ		-	+
			-	-			
		-	_	+	-		
	_		-				
TOXIC AIR POLLUT	ANT EMISSI	ONS INFO	RIVATION	FORTHIS	SOURCE	Paris HA	STATE OF THE
INDICATE EXPEC	TED ACTUAL EN	ISSIONS AF	TER CONTRO	OLS / LIMITAT	IONS		u. 1 -
TOXIC AIR POLLUTANT AND CAS NO.	EF SOURCE		b/hr	lb	/day		lb/yr
N/A							
						-	
						1	
				-			
						+	
	(0)	sequented state	a and federal an	forceable permit	limits (e.a. hour	s of operation.	emission rates)
Attachments: (1) emissions calculations and supporting document describe how these are monitored and with what frequency; and (3	ation; (2) indicate all	requested stat	e and federal en	forceable permit	limits (e.g. hour	rs of operation,	emission rates)

File:Enviva Hamlet Forms v3 Sheet:B (ES-BARKHOG)

		on for Air Permit to Construct/Ope	rate	B9
EMISSION SOURCE DESCRIPTION: Barkhog		EMISSION SOURCE ID NO:	ES-BARKHOG	
		CONTROL DEVICE ID NO(S):	N/A	
OPERATING SCENARIO: 1 OF	1	EMISSION POINT (STACK) ID NO	O/O). But	
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW	DIAGRAM):	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	O(S): N/A	
Green wood bark fuel is sent to the bark hog to	o break up bark into smaller	pieces prior to the dryer.		
MATERIALS ENTERING PROCESS - CONTIL	NUOUS PROCESS	MAX. DESIGN	REQUESTER	D CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION	
Green Wood	ODT	8.02		
MATERIALS ENTERING PROCESS - BAT	CH OPERATION	MAX. DESIGN	REQUESTED	CAPACITY
TYPE	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (U	
	(I			
MAXIMUM DESIGN (BATCHES / HOUR):				
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YI			
FUEL USED: N/A MAX. CAPACITY HOURLY FUEL USE: N/A	TOTAL MAXII	MUM FIRING RATE (MILLION BTU/	HR): N/A	
MAX. CAPACITY HOURLY FUEL USE: N/A COMMENTS:	REQUESTED	CAPACITY ANNUAL FUEL USE:	N/A	
Atta	ach Additional Sheet	s as Necessarv		

Trinity Consultants
Page 22 of 51
File:Enviva Hamlet Forms v3
Sheet:B9 (ES-BARKHOG)



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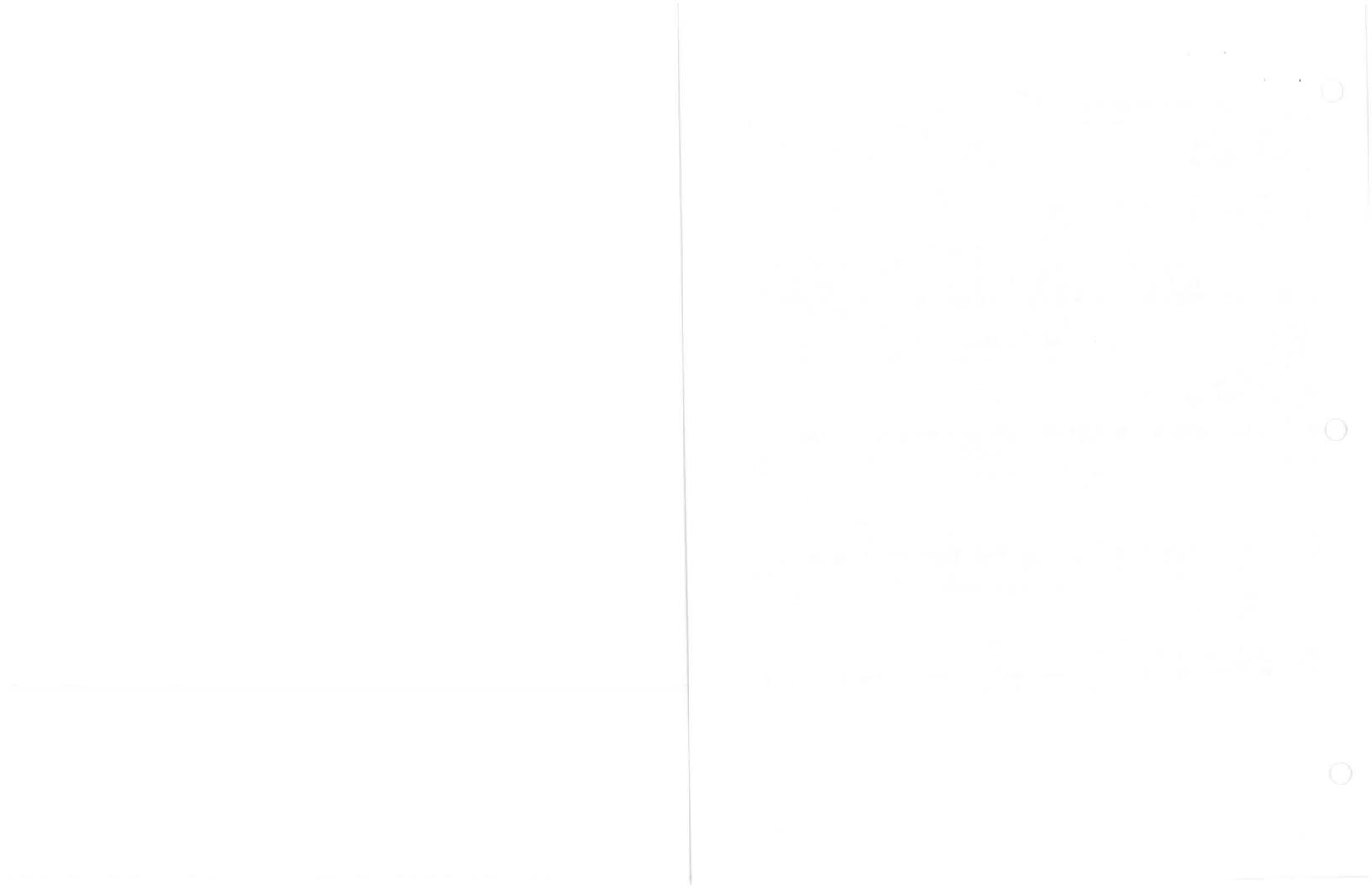
Source Specific Forms - Dryer Source



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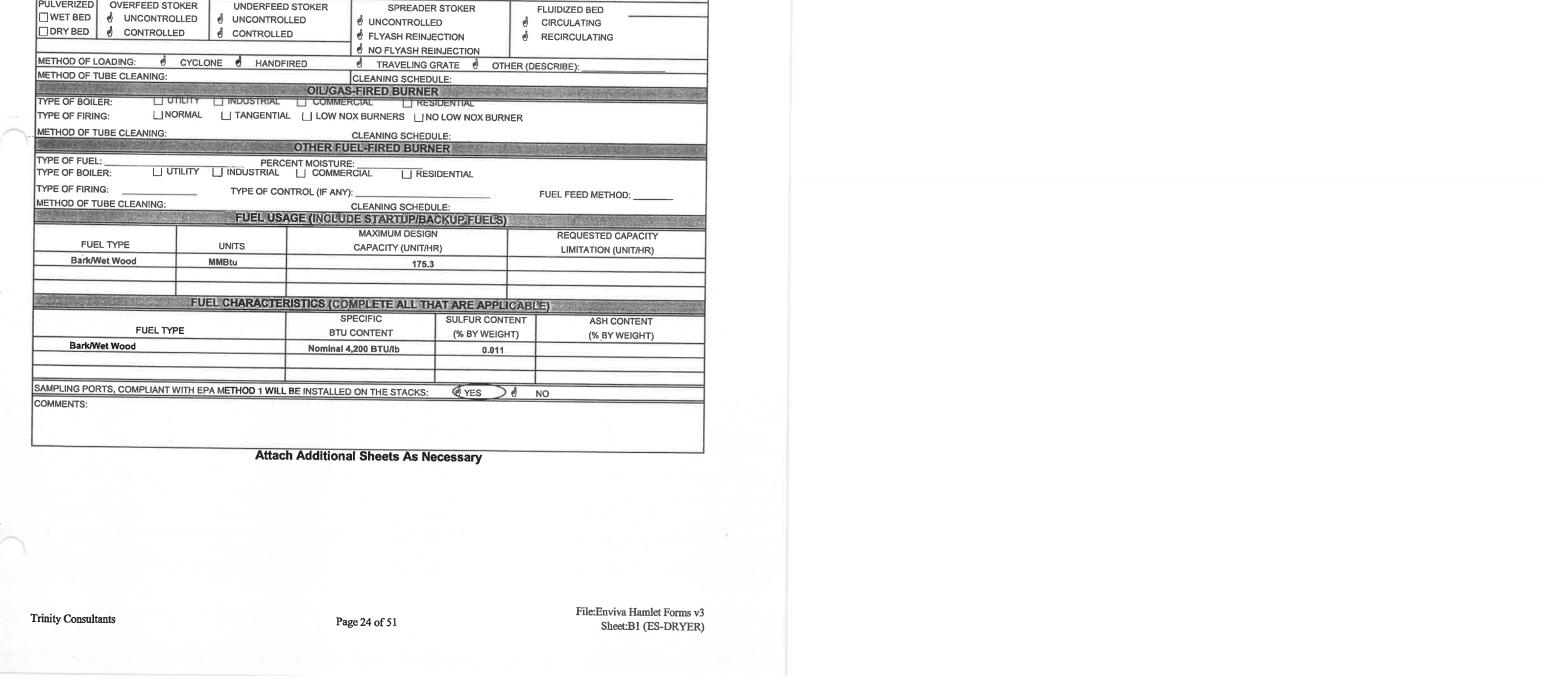
FORM B
SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 NCDENR/I	Division o	f Air Quality	Application	for Air Permi	14.0	"ALL OC	JUNCES	
EMISSION SOURCE DESCRIPTION:		Trin addity	Application					В
Green Wood Direct-Fired Dryer System				EMISSION	SOURCE ID N	10:	ES-DRYER	
OPERATING SCENARIO 1 OI	=	1		FILMOOLOLL	DEVICE ID N	O(S):	CD-DC, CD-	
DESCRIBE IN DETAILTHE EMISSION SOURCE F	ROCESS	(ATTACH EL	OW DIAGRA	B.43 -	POINT (STAC			EP-1
Green wood is conveyed to either a rotary dryer	evetem	Direct contac	4 hank to					
	articulate	removal and	additional a	videa to the s	ystem via a 1	175.3 mmBtu/	hr burner syst	tem. Air
(WESP) operating after the cyclones.		Temoral and	additional pa	articulate is re	emoved utiliti	izing a wet ele	ctrostatic pre	cipitator
TYPE OF EMISSION SOURCE (C	HECK AN	ND COMPLET	F APPROPR	IATE FORM D	A DO ON THE			
The state of the s	Woodwa	orking (Form B	(4)	Manufa	t of abasis	FULLOWING	PAGES):	
	Coating/	finishing/printi	ng (Form BS)	☐ Mariulat	c. or chemica.	ls/coatings/ink	s (Form B7)	
Till Clausial atomic to the common to the co		silos/bins (For		_	tion (Form B8	)		
	PERATION			Other (F				
MANUFACTURER / MODEL NO.: TR	D	DATE.	TBD	DATE MANG	JFACTURED:		TBD	
IS THIS SOURCE SUBJECT TO? NSPS (SUBPAR	T2\·	MEGL	IAD (CUDDAT	OP. SCHEDU			DAY/WK _ 5	2 WK/YR
PERCENTAGE ANNUAL THROUGHPUT (%): DEC	FEER 2	5% MAR-	IAP (SUBPAF			(SUBPART?):		
EXPECTED ANNUAL HOURS OF OPERATION	8 760	VISIBLE STA	MAY 25%	JUN-AUC	3 25%	SEP-NOV	25%	
CRITERIA AIR PO	DLLUTA	NIEMISS	ICK EMISSIO	NS UNDER N	ORMAL OPE	RATION: <2	0 % OPAC	ITY
		SOURCE OF	CACMAGE	RMAITUN	FURTHS		個位置が理論	<b>阿里斯斯</b>
		EMISSION		D ACTUAL			EMSSIONS	
AIR POLLUTANT EMITTED		FACTOR		ROLS/LIMITS)		TROLS / LIMITS)	(AFTER CONTR	ROLS / LIMITS)
PARTICULATE MATTER (PM)			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER<10 MICRONS (PM)		See Emissio	n Calculation	s in Appendi	хВ			
PARTICULATE MATTER<2.5 MICRONS (PM <sub>2.5</sub> )								
SULFUR DIOXIDE (SO2)								
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (VOC)								
LEAD								
OTHER								
HAZARDOUS AIR F	OLLUT	ANT EMIS	SIONS INF	ORMATIO	V FOR THE	COUDE	the second second	
		SOURCE OF	EXPECTE	DACTUAL	THE OIL STATE	DOTENTIAL	EMOOVENIO	STEP OF THE
	- 1	EMISSION	(AFTER CONTE		(BEFORE CONT	POTENTIAL		
HAZARDOUS AIR POLLUTANT AND CAS NO.		FACTOR	lb/hr	tons/yr	ib/hr	tons/yr	(AFTER CONTRO	
		See Emission	Calculation	s in Appendix	B	£OHS/yI	lb/hr	tons/yr
TOVIO AIR POLI								
TOXIC AIR POLL	UTANI	EMISSION	IS INFORM	NATION FO	R THIS SC	URCE	100 100 100 100 100	学院が
	ECTED A	CTUAL EMIS	SIONS AFTE	R CONTROLS	LIMITATIO	NS		
TOXIC AIR POLLUTANT AND CAS NO.	IE	F SOURCE	lb/l	hr T	lh/d		lb/y	r
		See Emission	Calculations	in Appendix	В		- ADI y	
ttachments: (4) emissions color 1.								
attachments: (1) emissions calculations and supporting docum escribe how these are monitored and with what frequency: an	entation; (2)	indicate all requ	ested state and	federal enforces	able permit limits	s (e.g. hours of o	peration, emission	n rates) and
escribe how these are monitored and with what frequency; an	u (3) descri	oe any monitorin	g devices, gaug	es, or test ports	for this source.		,	and wild
COMPLE	IE AND	ALIACH	<i><b>APPROPR</b></i>	IATE B1 TF	ROUGHE	9 FORM F	OR EACH S	OURCE
At	tach A	aditional	Sheets As	Necessa	ry			



FORM B1
EMISSION SOURCE (WOOD, COAL, OIL, GAS, OTHER FUEL-FIRED BURNER)

REVISED 12/01/01	NCDENR/Division	of Air Quality -	Application for A	Air Permit to Co	oruct/Oper	ate BURNER)	B1
EMISSION SOURCE DESCRIPTION	ON:			MISSION SOUR		ES-DRYER	
Green Wood Direct-Fired Dryer S				ONTROL DEVIC		CD-DC, CD-WESP	
OPERATING SCENARIO:	1OF	1		MISSION POINT			EP-1
DESCRIBE USE PROC	ESS HEAT	SPACE HEAT			RICAL GENE		CF-1
		STAND BY/EN			R (DESCRIBE		
HEATING MECHANISM:	<b>₫</b> INDIRECT		DIRECT		1-40011100	-/-	
MAX. FIRING RATE (MMBTU/HOU	JR): 175.3						
<b>化水色和多类型的对应性的形态的</b> 自由于	NAME OF THE PARTY OF THE PARTY.		-FIRED BURN	ER SEE	Nation with	Market Carlot	The section is a march to
WOOD TYPE:	✓ WOOD/BARK	DWET WO		DRY WOOD	d	OTHER (DESCRIBE):	Marie San
PERCENT MOISTURE OF FUEL::	20 to 50%					O LIT (DECONDE).	
UNCONTROLLED		D WITH FLYAS	H REINJECTION		CON	TROLLED W/O REINJE	CIOND
FUEL FEED METHOD:			SFER MEDIA:	1		OTHER	311019
METHOD OF TUBE CLEANING:	N/A			0 0127	5 Till ( )	OTTEN	
開始後世界的最后自然可能	CALLES CONTRACTO	COAL-	FIRED BURNE	ER			100 St. 100 St. 100 St.
TYPE OF BOILER	IF OTHER DESCR				Chiese SWOTH I	DANGE TO DESCRIPTION OF THE PERSON	HIGH HARRING AND SOL
PULVERIZED OVERFEED STO			SPREAM	DER STOKER		ELUDIZED DED	
□WET BED   JUNCONTROL			₫ UNCONTRO		ا ا	FLUIDIZED BED CIRCULATING	
DRYBED   CONTROLLE			FLYASH REI			RECIRCULATING	
			NO FLYASH		A	REGIRCOLATING	
METHOD OF LOADING:	CYCLONE HANDE	IRED	TRAVELIN		OTHER (D	ESCRIBE):	
METHOD OF TUBE CLEANING:			CLEANING SCH		OHILITE	LOURIDE).	
SSEMMENT STATEMENT OF STREET		OIL/GAS	FIRED BURN	NER	A STATE OF		
TYPE OF BOILER:	TILITY   INDUSTRIAL	☐ COMME	RCIAL LIF	RESIDENTIAL			THE PART OF THE PART OF THE
TYPE OF FIRING: UNO	RMAL   TANGENTIA	L LOW NO	OX BURNERS L	INO FOM NOX	BURNER		
METHOD OF TUBE CLEANING:			CLEANING SCH	EDULE:			
<b>是体的表示。</b> 第四种形式的	計學學院的研究是自然的	OTHER FU	EL-FIRED BU	RNER	We thank the	AND THE REPORT OF	の後にしている。
TYPE OF FUEL:	PERC	ENT MOISTURE		_			
TYPE OF BOILER: UT	ILITY   INDUSTRIAL	☐ COMMER	RCIAL LIF	RESIDENTIAL			
TYPE OF FIRING:	TYPE OF COM	NTROL (IF ANY)	):			FUEL FEED METHOD:	
METHOD OF TUBE CLEANING:		A	CLEANING SCH	EDULE:			
<b>公司的国际公司</b>	ARUEL USA	KGE (INGLUE	DE STARTUPI	BACKUPFU	ELS)	Bostomorphism Anni	STATE OF STREET
			MAXIMUM DES	SIGN		REQUESTED CAP	PACITY
FUEL TYPE	UNITS		CAPACITY (UNI	T/HR)		LIMITATION (UNI	T/HR)
Bark/Wet Wood	MMBtu		17	75.3			
	THE OWNER	77 T Y Y Y Y					
<b>州海岸岛川州学院外出版员 以从 水泥 区</b>	FUEL G: ARAGIE						
FUEL TYP	)=		SPECIFIC		CONTENT	ASH CON	TENT
	Ε	вти	CONTENT	(% BY WEIGHT)		(% BY WE	IGHT)
Bark/Wet Wood		Nominal 4	,200 BTU/lb		0.011		
SAMPLING POPTS COMPLIANT IN	WITH EDA HETHOD 4 1477	DE MOTAL :					
SAMPLING PORTS, COMPLIANT VICTOR PORTS:	VIII EPA METHOD 1 WILL	DE INSTALLED	ON THE STACK	S: QYES	20	NO	
OMINENTS:							
	Attac	h Additiona	I Sheets As	Necessary			



3 2								
			FO	RM C4				
CONT	ROL DEVICE (	CYCLON	E, MUI	LTICYCLO	NE. OR OT	HER MECHA	ANICAL)	
REVISED 12/01/01	NCDENR/Di	vision of Alr C	Quality - A	pplication for Ai	r Permit to Con	struct/Onerate	ANIOAL)	C4
CONTROL DEVICE ID NO:	CD-DC			NS FROM WHICH			EC DOVED	04
EMISSION POINT (STACK) ID	NO(S): EP-1	POSITION IN	SERIES	OF CONTROLS	NO.	1 OF 2	ES-DRYER UNITS	
MANUFACTURER: TBD1			MODEL				ONTO	
DATE MANUFACTURE: TBD			PROPOS	SED OPERATION	DATE: TBD			
OPERAT	ING SCENARIO:		PROPOS	SED START CON	ISTRUCTION DA	TE: TBD		
DESCRIPE CONTROL SUCTO	_OF1		P.E. SEA	AL REQUIRED (P	ER 2Q .0112)?	₫ YES	S ∉ NO	
DESCRIBE CONTROL SYSTEM  Three identical simple cyclon	M : ss are equipped to the	alla alla a						
Three identical simple cyclon Emissions from each the cycl	uites are compined in	to a common	the rotar	y dryer system to	o capture bulk F	M emissions.		
The parameters presented ne	re are per each cyclon	e:	aut and	are routed to tile	WESP.			
POLLUTANT(S) COLLECTED:			PM	PM <sub>10</sub>	PM <sub>2</sub>			
BEFORE CONTROL EMISSION	RATE (LB/HR)					5		
CAPTURE EFFICIENCY:	11011 E (EB/1111).					_		
			98.	5 %98.	5 % _ 98	.5 %	%	
CONTROL DEVICE EFFICIENC					%	%	%	
CORRESPONDING OVERALL	EFFICIENCY:			%	%	%		
EFFICIENCY DETERMINATION	CODE:					-		
TOTAL EMISSION RATE (LB/H	R):					_	_	
PRESSURE DROP (IN. H <sub>2</sub> 0):							<del>_</del>	
NLET TEMPERATURE (°F):	***		ARNING A	ALARM? YES	€ NO			
NLET AIR FLOW RATE (ACFM	MIN MAX	Nominal 400	_	OUTLET TEMPI			Nominal 400	
POLLUTANT LOADING RATE (				BULK PARTICLI	E DENSITY (LB/	FT <sup>3</sup> ): 3.43E-05	5	
SETTLING CHAMBER	0.24	要型的数据。(C	CYCLONE	MANUFACTURE STATE	Ship in the same		1000-0	
ENGTH (INCHES):	INLET VELOCITY (F		100010100000000000000000000000000000000		THE TANKS OF THE PARTY OF THE P		MULTICYCLONE	
WIDTH (INCHES):	DIMENSIONS (INC		CE enoitour	CIRCULAR 15 MET COR				
HEIGHT (INCHES):		Dd:	actions	LIQUID USED:	AY UTILIZED	DIAMETER OF		
/ELOCITY (FT/SEC.):		Test	156"	FLOW RATE (G	DM\.		RATION SYSTEM?	
IO. TRAYS:	_		312"	MAKE UP RATE		d YES	& NO	
O. BAFFLES:		S:	43	WATE OF TOTAL	(Grivi).	LOUVERS?	Jane :	
	TYPE OF CYCLONE:	d CONVENTI	ONAD	€ HIGH	EFFICIENCY	OTHER	9 NO	
DESCRIBE MAINTENANCE PRO	OCEDURES:				CONTRACTOR OF	PARTICLE SIZE	DISTRIBUTION	Carrier and
Periodic inspection of me	echanical integrity	during pla	ant outa	ges	SIZE	WEIGHT %	CUMULATIVE	
s specified by manufact					(MICRONS)	OF TOTAL		
					(MIORONO)	OF TOTAL	%	
ESCRIBE INCOMING AIR STR	EAM:				0-1		Unknown	
he flue gas from the dry	er will be split and	d distribute	d throu	gh a set of	1-10			
hree cyclones before en	tering the WESP.	After the c	yclones	, the gas	10-25			
tream will be combined oint.	mico a single duct	and directe	ed to the	e WESP inlet				
- W-11 1 1/4					50-100			
					>100			
ESCRIBE ANY MONITORING D	EVICES GALIGES TE	ST DODTS F	TC				TOTAL = 100	
lone		.01 FUR13, E	10:					
							•	
N A SEPARATE PAGE, ATTAC	H A DIAGRAM OF THE	RELATIONSH	IP OF TH	E CONTROL DE	VICE TO ITS EM	ISSION SOURCE	S):	-
	A4	took Addit	41				-1.	

Attach Additional Sheets As Necessary

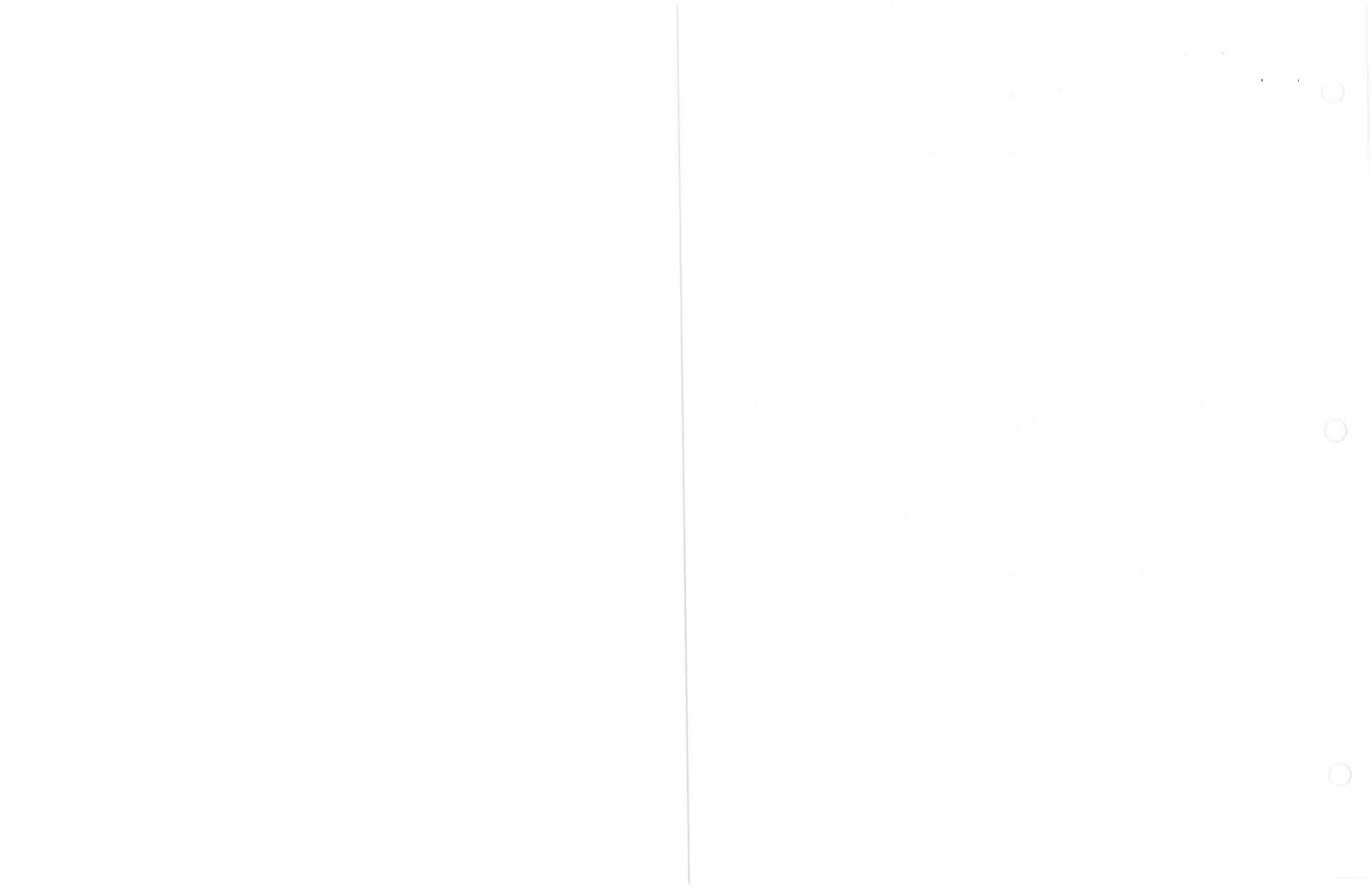
1 Final equipment selection has not yet occurred but will be similar in design to specifications shown.

Trinity Consultants

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File:Enviva Hamlet Forms v3 Sheet:C4 (ES-DRYER)

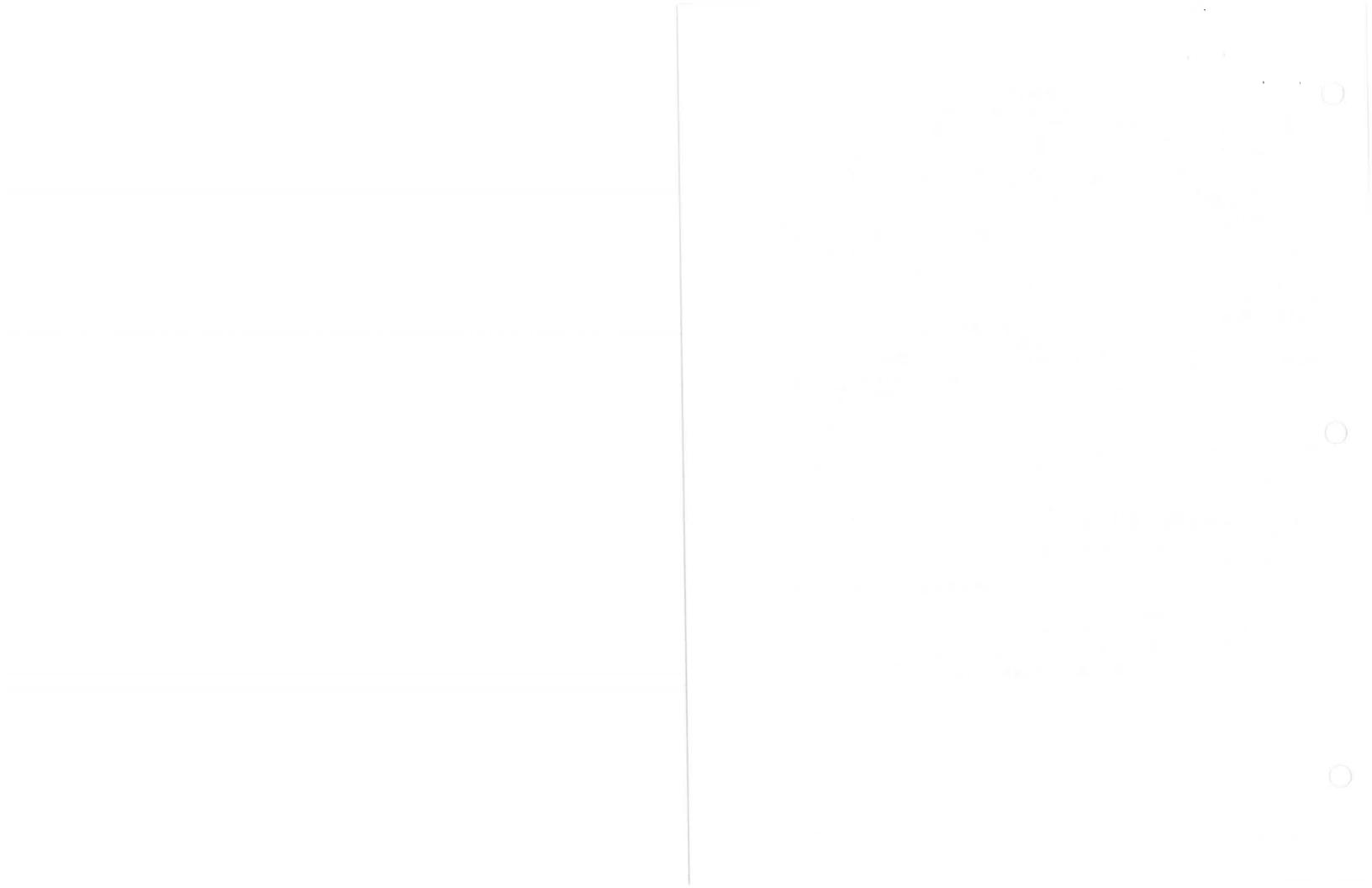
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FORM C2
CONTROL DEVICE (Electrostatic Precipitator)

REVISED 12/01/01	NCDENR/D	ivision of Air Quality - App	lication for Air Permit to Construct/Ope	annta.	
CONTROL DEVICE ID N	O: CD-WESP				C2
EMISSION POINT (STAC	CK) ID NO(S): EP-1		CONTROLS EMISSIONS FROM WHICE POSITION IN SERIES OF CONTROLS.	HEMISSION SOURCE ID N NO. 2 OF 2	
MANUFACTURER:	SonicKleen		Table 1		UNITS
MANUFACTURE DATE:	TBD		PROPOSED OPERATION DATE:	WESP-304L-567-12H19	
<b>等所仍是否创建物而此后</b> (	OPERATING SCENARIO	STATE OF THE PARTY	PROPOSED START CONSTRUCTION	TBD TBD	
	OF		P.E. SEAL REQUIRED (PER 2Q .0112)	PATE: TBD	NO
<b>,其然如此所类似的以</b>	QUIPMENT SPECIFICATIO	ONS TO THE RESERVE OF	GAS DISTRIBUTION GRIDS:	? (4 YES )4	NO
	WED 8	DRY			
TOTAL COLLECTION PL	ATE AREA (FT <sup>2</sup> ):	29,904	1	TWO-STAGE	
COLLECTOR PLATES SI	ZE (FT): LENGTH:	WIDTH:	SPACING BETWEEN COLLECTOR PL	CTOR PLATE PER FIELD:	567 tubes
TOTAL DISCHARGE ELE	CTRODE LENGTH(FT):	19"-0"	GAS VISCOSITY (POISE):		12" hextube
NUMBER OF DISCHARG	E ELECTRODES:	567	NUMBER OF COLLECTING ELECTROI	2.054E-04 Poise	
MAXIMUM INLET AIR FLO	OW RATE (ACFM):	117,000	PARTICLE MIGRATION VELOCITY (FT.	DE RAPPERS:	none
MINIMUM GAS TREATME	ENT TIME (SEC):	2.3	BULK PARTICLE DENSITY (LB/FT3):		0.234
FIELD STRENGTH (VOLT	S) CHARGING: 83 KVA	COLLECTING: N/A	CORONA POWER (WATTS/1000 CFM)	45 lb/cu. ft	
ELECTRICAL USAGE (kw	/HOUR): 141.5		CONTRACT CASE (AND 12/1000 CEW)		4000
CLEANING PROCEDURE	S: RAPPING	₱ PLATE VIBRATING	WASHING OTHER		
OPERATING PARA	METERS PRESSURE	DROP (IN. H20): MIN	2" MAX 2" WARNING ALAI		
RESISTIVITY OF POLLUT	ANT (OHM-CM):	N/A	GAS CONDITIONING: YES NO	RM? d YES	NO( )
INLET GAS TEMPERATU	RE (°F): 240 °F nominal		OUTLET GAS TEMPERATURE (°F):		
VOLUME OF GAS HANDL	.ED (ACFM):	117,000	INLET MOISTURE PERCENT:	180 °F nominal	
POWER REQUIRE	MENTS		1114 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	MIN 40% MAX 50% YES € NO	
FIELD NO.	NO. OF SETS	CHARGING	EACH TRANSFORMER (KVA)		
1	1		118	EACH RECTIFIER KV A	ve/Peak Ma Dc
2:	1		118	83 / 1265	
			110	83 / 1265	
POLLUTANT(S) COLLECT	ED: P	M / PM <sub>10</sub> / PM <sub>2.5</sub>			
BEFORE CONTROL EMIS	SION RATE (LB/HR):	150.00			
CAPTURE EFFICIENCY:		%			
CONTROL DEVICE EFFIC	IENCY:				6
CORRESPONDING OVER					6
EFFICIENCY DETERMINA		%	%	%9	6
TOTAL EMISSION RATE (I		0. 1.10			
Zan zanie zani	DTICLE SIZE DISTRIBUTE	See calculations in Appen			
SIZE	RTICLE SIZE DISTRIBUTIO		DESCRIBE STARTUP PROCEDURES:		
(MICRONS)	WEIGHT %		See attached		
0-1	OF TOTAL	%			
1-10	Unknown		DESCRIBE MAINTENANCE PROCEDUR	ES:	
10-25			See attached		
25-50					
50-100			DESCRIBE ANY AUXILIARY MATERIALS	INTRODUCED INTO THE C	ONTROL
>100			SYSTEM:		
7100			HAON		
	TOTAL	= 100			
LU	ING DEVICES, GAUGES, O				
ATTACH	A DIAGRAM OF THE TOP V	IEW OF THE ESP WITH D	IMENSIONS (include at a minimum the pla		
and	indicate the electrode type)	AND THE RELATIONSHIP	OF THE CONTROL DEVICE TO ITS EM	ate spacing and wire spacing	
	3,53,	Attach Additional	Shoote As Nococcan	IISSION SOURCE(S):	

File:Enviva Hamlet Forms v3 Trinity Consultants Page 26 of 51 Sheet:C2 (ES-DRYER)



Source Specific Forms - Hammermills & Hammermill Area

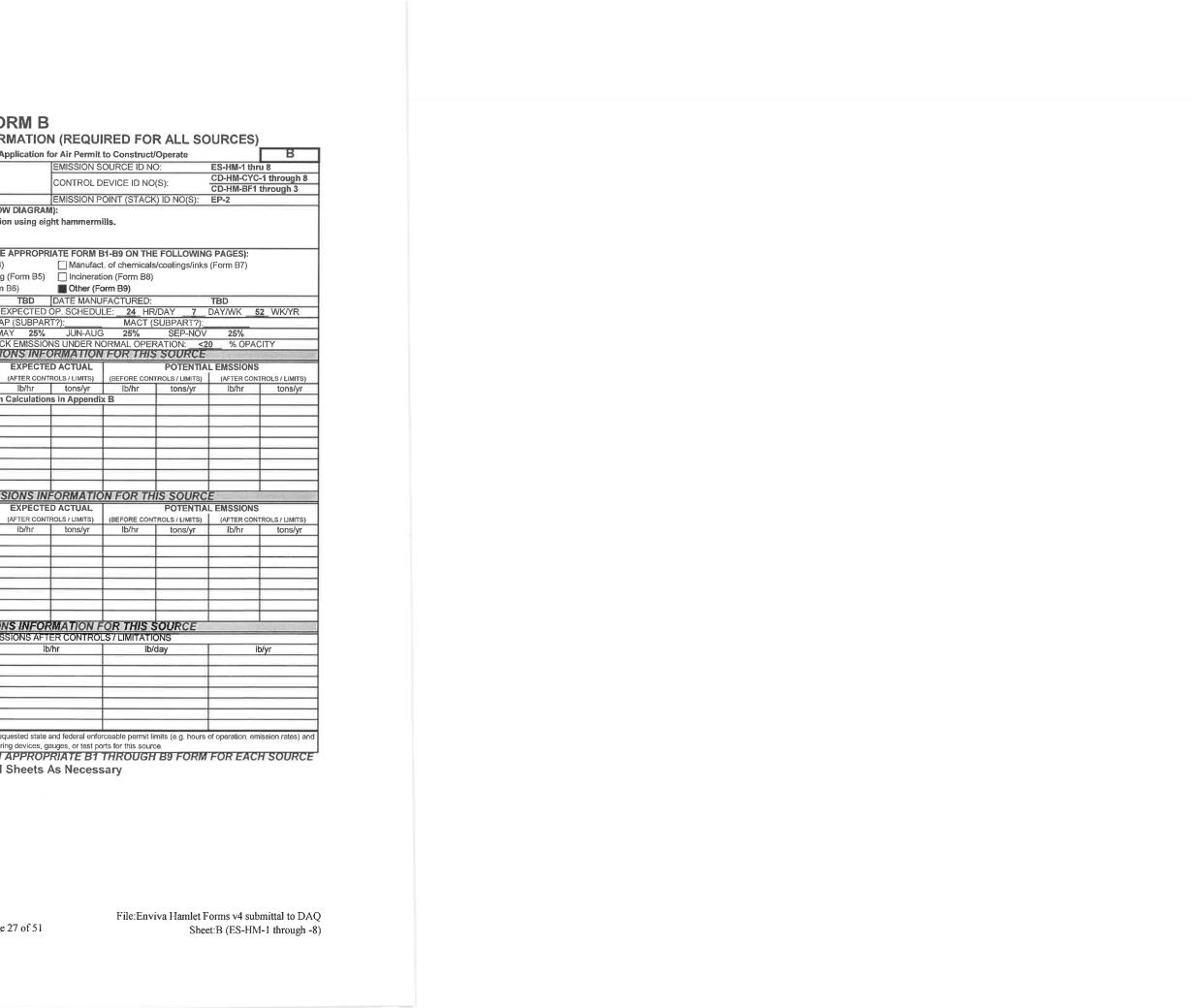


#### FORM B SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 NCDENR/Division o	f Air Quality -	Application for	or Air Permit	to Construct/	Operate	,	В
EMISSION SOURCE DESCRIPTION:8			EMISSION S	OURCE ID NO	D:	ES-HM-1 thr	u 8
Hammermills			CONTROLD	EVICE ID NO	(S):	CD-HM-CYC	
OPERATING SCENARIO 1 OF	1		EMISSION P	OINT (STACK	) ID NO(S):	EP-2	anougho
DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS	(ATTACH FLC	W DIAGRAN			,		
Dried materials are reduced to the appropriate size needed	d for pelletizati	ion using eig	ht hammerm	ills.			
		3 - 3					
TYPE OF EMISSION SOURCE (CHECK A	ND COMPLET	E APPROPR	ATE FORM E	31-B9 ON THE	FOLLOWIN	G PAGES):	
Coal,wood,oil, gas, other burner (Form B1) Woodwo	rking (Form B4	1)	Manufac	t. of chemicals	/coatings/inks	(Form B7)	
Int.combustion engine/generator (Form B2) Coating/	finishing/printin	a (Form B5)	☐ Incinerati	ion (Form B8)		,	
	silos/bins (Forn		Other (Fo				
START CONSTRUCTION DATE: TBD OPERATION	,	TBD	DATE MANU			TBD	
MANUFACTURER / MODEL NO.: TBD				LE: 24 HR	/DAY 7		2 WK/YR
S THIS SOURCE SUBJECT TO? NSPS (SUBPART?):		AP (SUBPAR			SUBPART?):	DATIVIN _ 3	Z VVIOTIC
	25% MAR-N		JUN-AUG		SEP-NOV	25%	
	VISIBLE STA						HTY
CRITERIA AIR POLLUTA							San San Land
	SOURCE OF	EXPECTE		I		L EMSSIONS	
	EMISSION	(AFTER CONTI		(BEFORE CONT	ROLS / LIMITS)	E.	TROLS / LIMITS)
AIR POLLUTANT EMITTED	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	See Emission				tono.y.		tonery
PARTICULATE MATTER<10 MICRONS (PM <sub>10</sub> )							
PARTICULATE MATTER<2.5 MICRONS (PM25)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							
HAZARDOUS AIR POLLU	TANT EMIS	SIONS INI	ORMATIC	N FOR TH	IS SOURC	E	
	SOURCE OF		D ACTUAL			L EMSSIONS	
	EMISSION	(AFTER CONTI	ROLS / LIMITS)	(BEFORE CONT	ROLS / LIMITS)	(AFTER CON	TROLS / LIMITS)
HAZARDOUS AIR POLLUTANT AND CAS NO.	FACTOR	1b/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
N/A							
TOYIC AIR BOLLUTAN	T FINICOIO		The second of	OO TIRO C	ALIBOR		
TOXIC AIR POLLUTAN							
INDICATE EXPECTED							
TOXIC AIR POLLUTANT AND CAS NO.	EF SOURCE	JD.	'hr	Ib/e	day		o/yr
N/A							
	-						
	-						
						l	
Attachments: (1) emissions calculations and supporting documentation,	(2) indicate all	outestad state -	and fordered s-f-	ranghia namii ii	mita /a a las	of execution	inging agtes) c : d
describe how these are monitored and with what frequency; and (3) des						or operation, em	ission rates) and
COMPLETE THIS FORM AND COMPLETE AN						FOR FAC	HSOURCE
restriction in society of the fact with the first time of the first time.	_ ,						

Attach Additional Sheets As Necessary

Trinity Consultants Page 27 of 51



### FORM B9 EMISSION SOURCE (OTHER)

REVISED: 12/01/01 NCDENR/Division of Air	Quality - Application	on for Air Permit to Construct/Ope	erate	B9
EMISSION SOURCE DESCRIPTION: 8 Hammermills	EMISSION SOURCE ID NO:	ES-HM-1 thru 8		
	CONTROL DEVICE ID NO(S):	CD-HM-CYC-1 through 8		
OPERATING SCENARIO: 1 OF 1	DEDATING COTATION			
OPERATING SCENARIO: 1 OF 1		EMISSION POINT (STACK) ID N	CD-HM-BF1 through 3 O(S): EP-2 through	ugh 4
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM	):			
Dried materials are reduced to the appropriate size need		n using eight hammermills.		
MATERIALS ENTERING PROCESS - CONTINUOUS PI	ROCESS	MAX. DESIGN	REQUESTED C	ADACID/
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UN	
Dried Wood	ODT	71.71	LIMITATION(UP	III/HR)
		71.71	+	
	_			
MATERIALS ENTERING PROCESS - BATCH OPER				
TYPE		MAX. DESIGN	REQUESTED CA	
IIFC	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (UNIT	/BATCH)
MAXIMUM DESIGN (BATCHES / HOUR):				
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/Y	B):		
FUEL USED: N/A			a Inti	
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED	CAPACITY ANNUAL FUEL LICE.		
	INCOCOTED	CAPACITY ANNUAL FUEL USE:	N/A	
MAX. CAPACITY HOURLY FUEL USE: N/A COMMENTS:	REQUESTED	MUM FIRING RATE (MILLION BTU. CAPACITY ANNUAL FUEL USE:	/HR): N/A N/A	
		·		
Attach Add	ditional Sheet	s as Necessarv		

File:Enviva Hamlet Forms v4 submittal to DAQ Sheet:B9 (ES-HM-1 through -8) Trinity Consultants Page 28 of 51

FORM D

SPECIFIC EMISSIONS	FUR S SOURCE INFORM	IVI B ATION (REQUIRED FOR ALL SC	JIIDCE6/
NCDENI	R/Division of Air Quality - Appl	ication for Air Permit to Construct/Operate	JORGES)
EMISSION SOURCE DESCRIPTION: Hammermill Area		EMISSION SOURCE ID NO:	ES-HMA
ODEDATING COSTUMENT	OF 1	CONTROL DEVICE ID NO(S):	CD-HM-BF-3
DESCRIBE IN DETAILTHE EMISSION SOURCE	PROCESS (ATTACH FLOW D	EMISSION POINT (STACK) ID NO(S):	EP-2

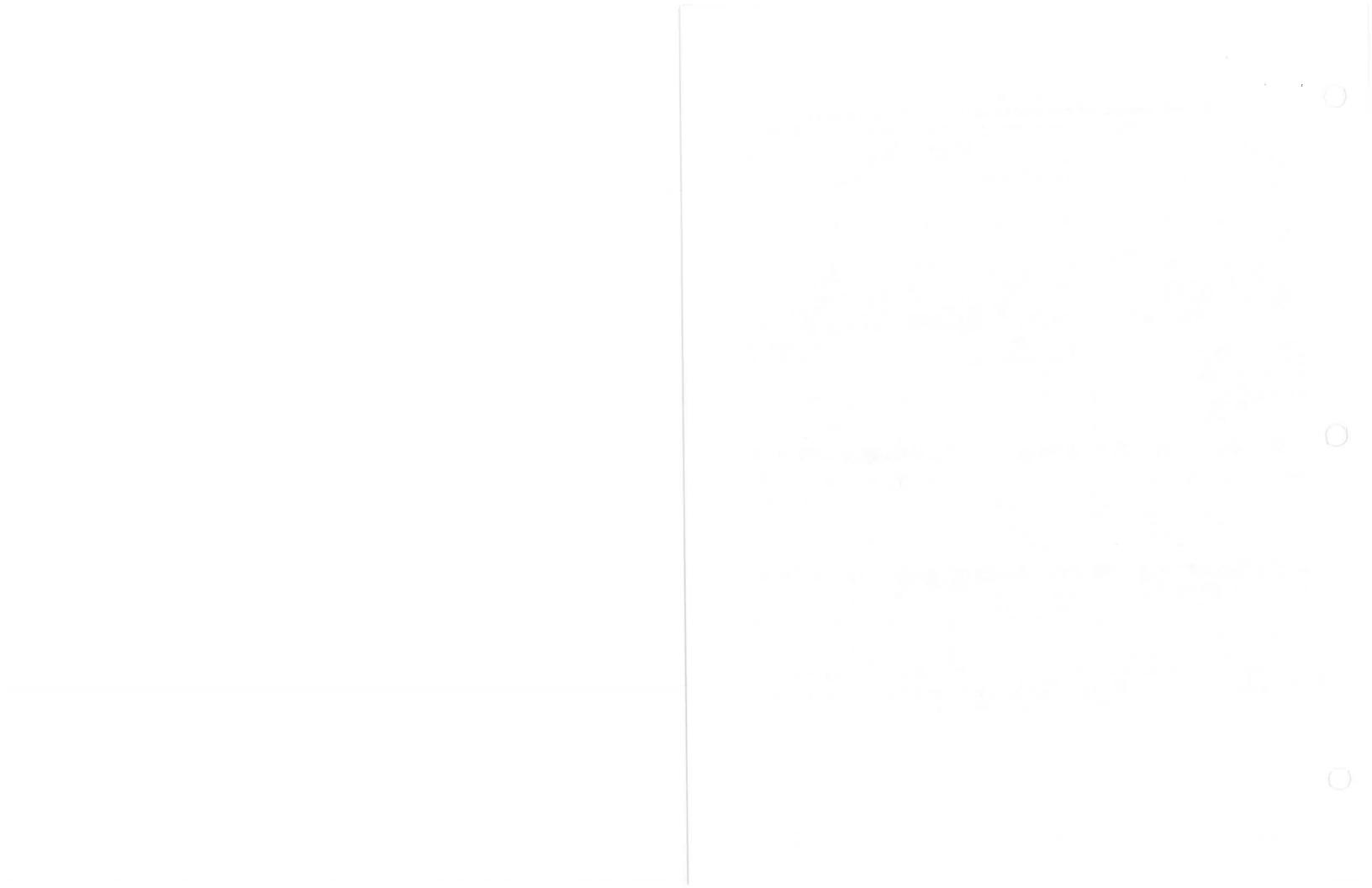
EMISSION SOURCE DESCRIPTION:				et to constitut			
Hammermili Area			EMISSION	SOURCE ID I	NO:	ES-HMA	
OPERATING SCENARIO 1 OF	4		CONTROL	DEVICE ID N	O(S):	CD-HM-BF-	3
DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS	· /ATTAOLLEL	0111 011 001	EMISSION	POINT (STAC	K) ID NO(S):	EP-2	
Hammermill area dust from the hammarmill and assessing	MATTACHEL	OW DIAGRA	M):				
Hammermill area dust from the hammermill and screenin particulate matter emissions.	g operations	will be vente	d to the ham	mermill bagfi	iter No. 3 (CD-	-HM-BF-3) to (	control
Particulate matter emissions.						•	
TYPE OF EMISSION SOURCE (CHECK A	ND COMPLET	E APPROPR	IATE FORM	R1-R9 ON TU	E EOL L OWING	2 DAGEON	
	orking (Form E	34)	Manufa	ct of chemica	ls/coatings/ink	> FAGES);	
I Int.combustion engine/generator (Form B2) ☐ Coating	/finishing/printi		Inciner	ation (Form B8	is/coatings/ink:	s (Form B/)	
Liquid storage tanks (Form B3)	silos/bins (For	m R61	Other (F	E DO)	,		
START CONSTRUCTION DATE: TRD   OPERATION		1Q2014	Outer (I	rorm B9)			
MANUFACTURER / MODEL NO.: TRD	I DATE.		DATE MAN	UFACTURED:		TBD	
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?):	NECL	AP (SUBPAR	OP. SCHEDU	JLE: <u>24</u> H	R/DAY	DAY/WK 5	2 WK/YR
PERCENTAGE ANNUAL THROUGHPUT (%) DEC-FEB	25% MAR-	MAY 25%			(SUBPART?):		
	VISIBLE STA	CK FAIRCIO	JUN-AU	G 25%	SEP-NOV		
CRITERIA AIR POLLUTA	VISIBLE STA	CK EMISSIO	NS UNDER N	ORMAL OPE	RATION: _ <2	0 % OPAC	ITY
	ISOURCE OF	TO VENINIE	Latula III (18)			Company of the Company	
	SOURCE OF EMISSION		D ACTUAL		POTENTIAL	EMSSIONS	
AIR POLLUTANT EMITTED		(AFTER CONT	ROLS / LIMITS)		TROLS / LIMITS)	(AFTER CONTE	ROLS / LIMITS)
PARTICULATE MATTER (PM)	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER<10 MICRONS (PM <sub>10</sub> )	See Emissio	n Calculation	is in Append	ix B			
PARTICULATE MATTER<2.5 MICRONS (PM <sub>2.5</sub> )	-						
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD COME CONTROL (VOC)							
OTHER							
HAZARDOUS AIR POLLUT	ANTERNO	CIANAME					
	ANT ENTS	SIUNS INF	ORMATIO	N FOR THI	SSOURCE	Beeries in the	ST WICHARD
	SOURCE OF	EXPECTE			POTENTIAL	EMSSIONS	
HAZARDOUS AIR POLLUTANT AND CAS NO.	EMISSION	(AFTER CONTI	ROLS / LIMITS)	(BEFORE CONT	ROLS / LIMITS)	(AFTER CONTR	OLS / LIMITS)
N/A	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
TOYIC AIR POLLUTAN	FEMILOSIO	10.00.00					
TOXIC AIR POLLUTAN	EMISSION	VS INFORM	NATION FO	OR THIS SC	DURCE	EQUINT STEELS	
TOVIO AID DOLLA INDICATE EXPECTED?	CTUAL EMIS	SIONS AFTE	R CONTROL	S/LIMITATIO	NS		
V/A	EF SOURCE	lb/l		lb/d		lb/y	r

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE Attach Additional Sheets As Necessary

File:Enviva Hamlet Forms v3 Trinity Consultants Page 29 of 51 Sheet:B (ES-HMA)





# FORM B9 EMISSION SOURCE (OTHER) NCDENR/Division of Air Quality - Application for Air Permit to C

REVISED: 12/01/01 NCDENR/Division of Air Qu		for Air Permit to Construct/Opera	ate B9
EMISSION SOURCE DESCRIPTION:	y - upinoucion	EMISSION SOURCE ID NO:	
Hamermill Area		CONTROL DEVICE ID NO(S):	ES-HMA CD-HM-BF3
OPERATING SCENARIO: 1 OF 1		EMISSION POINT (STACK) ID NO	
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM	);		
Hammermill area dust from the hammermill and screeni	ng operations will	be vented to the hammermill bac	filter No. 3 (CD-HM-RE-3) to control
particulate matter emissions.			
MATERIALS ENTERING PROCESS - CONTINUOUS PR	OCESS	MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY	LIMITATION(UNIT/HR)
Dried Wood	ODT	71.71	LIMITATION (ON 17/11)
MATERIALS ENTERING PROCESS - BATCH OPERA	ATION	MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (UNIT/BATCH)
MAXIMUM DESIGN (BATCHES / HOUR):			
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YF	₹):	
FUEL USED: N/A	TOTAL MAXIN	IUM FIRING RATE (MILLION BTU/	HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A		CAPACITY ANNUAL FUEL USE:	N/A
COMMENTS:		2-	
A44 1 4 4 4	41 10:		
Attach Addi	tional Sheets	as Necessary	

MATERIALS ENTERING PROCESS TYPE	S BATCH OPERATION UNITS	MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)			
7						
MAXIMUM DESIGN (BATCHES / HOUR):						
REQUESTED LIMITATION (BATCHES / HOUR):  FUEL USED: N/A  MAX. CAPACITY HOURLY FUEL USE: N  COMMENTS:	TOTAL MAXIN	R): IUM FIRING RATE (MILLION BTU CAPACITY ANNUAL FUEL USE:	/HR): N/A			
	Attach Additional Sheets	as Necessary				
Trinity Consultants						
	Page 30 of 51		File:Enviva Hamlet Forms v3 Sheet:B9 (ES-HMA)			

co	NTROL DEVICE (	CYCLONE	FORN E, MULTIC	YCLONE,	OR OTHE	R MEC	IANICA	L)	
REVISED 12/01/01	NCDENR/E	Division of Air (	Quality - Applic	ation for Air Per	rmit to Constr	uct/Operate		. г	C4
CONTROL DEVICE ID NO: CO-HM-		CONTROLS E	MISSIONS FR	OM WHICH EMIS	SSION SOUR	CE ID NO(\$)	:	ES-HM-1 through-8	
EMISSION POINT (STACK) ID NO	S): <b>EP-2</b>		SERIES OF CO		NO.		OF 2	UNITS	
MANUFACTURER: Aircon			MODEL NO:	AC-96					
DATE MANUFACTURED: TBD			PROPOSED O	PERATION DAT	E: 1Q2	014			
OPERATI	NG SCENARIO:	2018032078	PROPOSED S	TART CONSTRU	ICTION I TBD				
DESCRIBE CONTROL SYSTEM:	OF1		P.E. SEAL REC	UIRED (PER 20	.0112)?	(Y	ES )	d NO	
One cyclone is equipped for each	hammermill to capture bul	lk PM emission	ns. The emissi	ons from the cy	clone are ther	routed to	one of three	bagfilters.	
POLLUTANT(S) COLLECTED:			PM	PM <sub>10</sub>	PN	2.5			
BEFORE CONTROL EMISSION RA	TE (LB/HR):			alculations in Ap		2.5		_	
CAPTURE EFFICIENCY:	, ,					-			
		7	98.0%			3.0% %		%	
CONTROL DEVICE EFFICIENCY:		-		%	_%	%		%	
CORRESPONDING OVERALL EFFI	ICIENCY:	-		%	%	%		%	
EFFICIENCY DETERMINATION CO	DE:	_							- 1
TOTAL EMISSION RATE (LB/HR):			See ca	lculations in Ap	pendix B			=0	- 1
PRESSURE DROP (IN. H <sub>2</sub> 0): MIN	MAX 6.0"	WARNING A	LARM?	d YES	€ NO				
INLET TEMPERATURE (°F): MIN	V MAX	Ambient		OUTLET TEMP		): MIN	MAX	Ambinat	=
INLET AIR FLOW RATE (ACFM):	15,000 each cyclo			BULK PARTICL			1.43E-03	Ambient	
POLLUTANT LOADING RATE (GR/F					L DENOTITIE	Dati 1 J.	1.430-03		-
SETTIANG CHAMBER		THE WILLIAM C	YCLONE	Committee to be a few of the	BOOK SEE		M	ULTICYCLONE	(55) (SAII)
LENGTH (INCHES):	INLET VELOCITY (FT/SEC	2):	114.65	d CIRCULAR	RECTANG				
WIDTH (INCHES):	DIMENSIONS (INC	HES) See instri	uctions	IF WET SPR	RAY UTILIZED		TER OF TU	IBES:	$\neg$
	H: 60	Dd:	20	LIQUID USED:				TION SYSTEM?	$\neg$
	W: 32.25	Lb:	60	FLOW RATE (G	PM):	T & Y		■ d NO	- 1
	De: 45	Lc:	120	MAKE UP RATE	(GPM):	LOUVE	RS?		
NO. BAFFLES:	D: 96	S:	64.75			- d v	ES	d NO	- 1
	TYPE OF CYCLONE:	<b>♦</b> CONVENTE	ONAL	d HIGH	EFFICIENCY	8 0	THER		
DESCRIBE MAINTENANCE PROCE						PARTI	CLE SIZE D	ISTRIBUTION	東語機器
Periodic Inspection of mechanical i as specified by manufacturer		ges			SIZE (MICRON:		IGHT % TOTAL	CUMULATIVE %	
DESCRIBE INCOMING AIR STREAM	A:				0-1			Unknown	
The material will be pulled through	the cyclone under negativ	e pressure. Th	10		1-10				
cyclone will separate the material fi					10-25				
discharge to an associated bag filte		to atmosphere	•		25-50				
via a discharge stack common to al			50-100						
					>100				
DESCRIBE ANY MONITORING DEV	ICES CALICES TEST DO	TO FTO						TOTAL = 100	
None  DN A SEPARATE PAGE, ATTACH A			NE CONTEST						

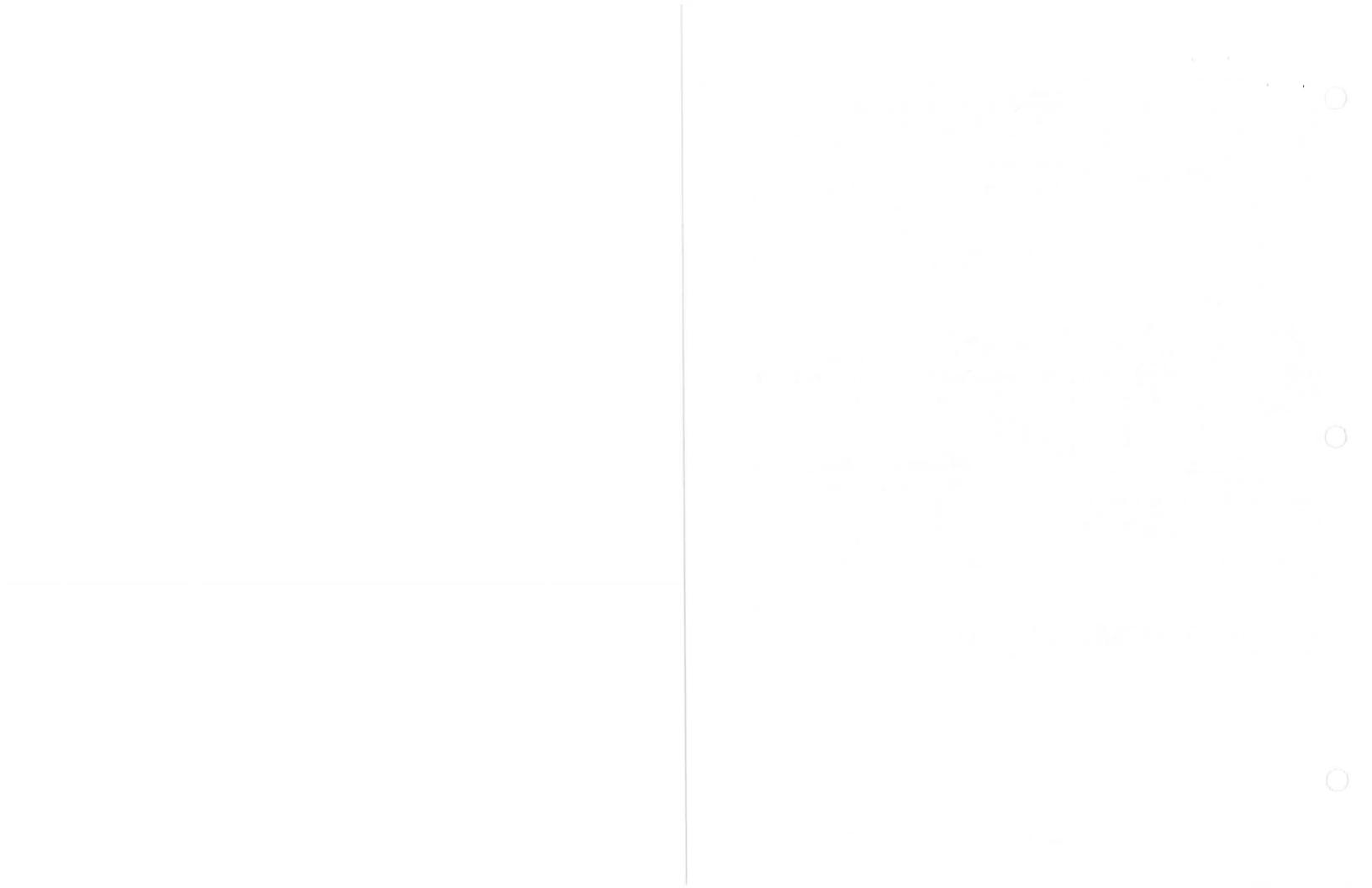
Attach Additional Sheets As Necessary

1-Final equipment selection has not yet occurred but will be similar in design to specifications shown.

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File:Enviva Hamlet Forms v3 Sheet:C4 (ES-HM-CYC-1 through -7)



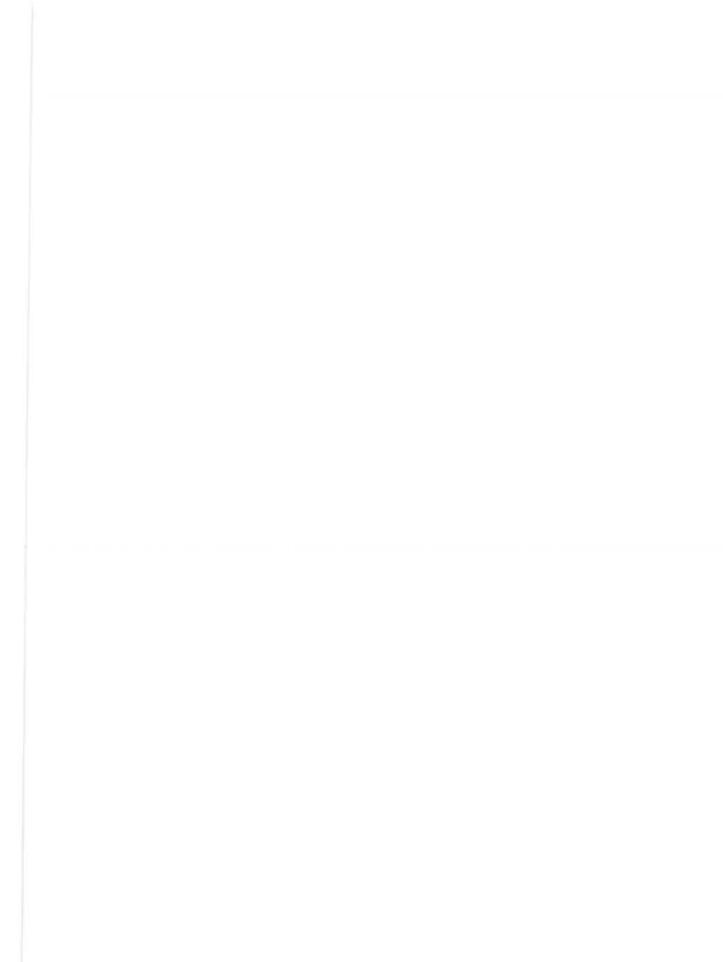
.1	
	FORM C1
CONTROL	DEVICE (FABRIC FILTER)
REVISED 12/01/01 NCDENR/Division of Air	Quality - Application for Air Permit to Construct/Operate
CONTROL DEVICE ID NO: CD-HM-BF-1 and 2 CONTRO	OLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): FS.HM-1 through 6
POSITIO	IN IN SERIES OF CONTROLS NO. 2 OF 2 UNITS
MANUFACTURER: Aircon	MODEL NO: 16 RAB 412-10
DATE MANUFACTURED: TBD  OPERATING SCENARIO:	PROPOSED OPERATION DATE: 1Q2014
1 OF 1	PROPOSED START CONSTRUCTION DATE: TBD
DESCRIBE CONTROL SYSTEM:	P.E. SEAL REQUIRED (PER 2Q .0112)? YES NO
7-8 cyclonse will be routed routed to the third bagfilter along with hammermi	mermill cyclones. HMs 1 - 3 vent through bagfilter 1, HMs 4-6 vent through bagfilter 2 and the ill area emissions.
POLLUTANT(S) COLLECTED:	PM PM-10 PM-2.5
BEFORE CONTROL EMISSION RATE (LB/HR):	See calculations in Appendix B
CAPTURE EFFICIENCY:	
CONTROL DEVICE EFFICIENCY:	
	%%%
CORRESPONDING OVERALL EFFICIENCY:	%%%
EFFICIENCY DETERMINATION CODE:	
TOTAL EMISSION RATE (LB/HR):	See calculations in Appendix B
PRESSURE DROP (IN. H₂0): MIN: MAX: 6"	GAUGE? YES NO WARNING ALARM? YES ONO
BULK PARTICLE DENSITY (LB/FT³): 1.43E-05	INLET TEMPERATURE (°F): 120
POLLUTANT LOADING RATE: 0.1 gricf inlet d LB/HR d GR	
INLET AIR FLOW RATE (ACFM): 45,000	FILTER MAX OPERATING TEMP. (°F): N/A
NO. OF COMPARTMENTS: 1 NO. OF BAGS PER COM	IPARTMENT: 412 LENGTH OF BAG (IN.): 144
D1444	CED/NEG. FORCED/POS FILTER SURFACE AREA (FT²): 6,250
AIR TO CLOTH RATIO: 7.20 FILTER MATERIAL: Poly	
DESCRIBE CLEANING PROCEDURES:	PARTICLE SIZE DISTRIBUTION
AIR PULSE SONIC	SIZE WEIGHT % CUMULATIVE
	E BAG COLLAPSE (MICRONS) OF TOTAL %
	BAG COLLAPSE 0-1 Unknown
● OTHER	1-10
DESCRIBE INCOMING AIR STREAM:	10-25
The air stream will contain wood dust particles. Larger particles will have bee	25-50
removed by the upstream cyclone.	50-100
	>100
METHOD FOR DETERMINING WHEN TO CLEAN:	TOTAL = 100
AUTOMATIO & TIMED & MANUAL	
METHOD FOR DETERMINING WHEN TO REPLACE THE BAGS:	
	E EMISSION
SPECIAL CONDITIONS: None	C DINCK
	d OTHER
DESCRIBE MAINTENANCE PROCEDURES: Per manufacturer recommendation	ns
ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP	OF THE CONTROL BE WATER TO THE TANK THE
THE RELATIONSHIP	OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):

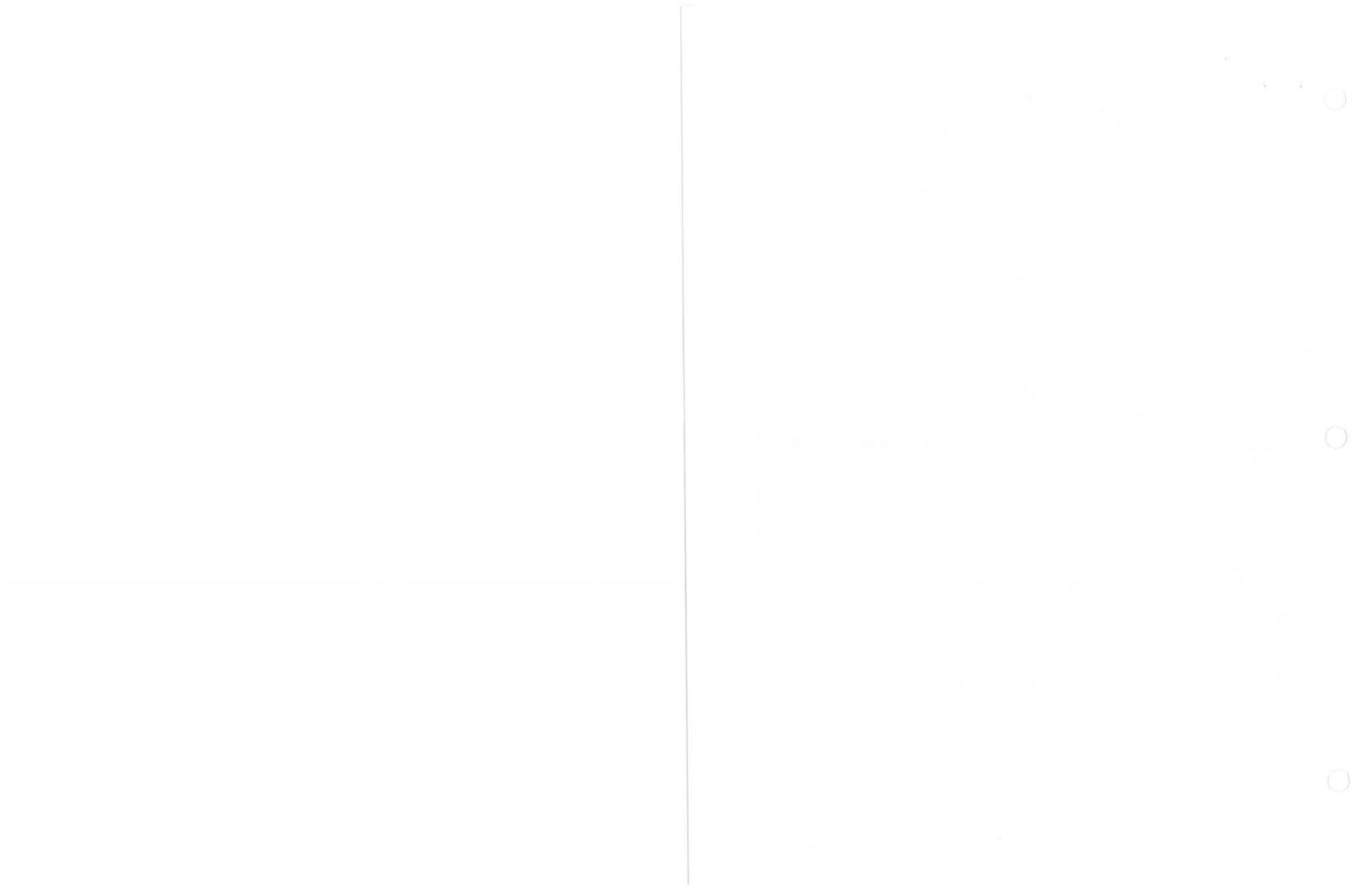
Attach Additional Sheets As Necessary

1 Final equipment selection has not yet occurred but will be similar in design to specifications shown.

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File:Enviva Hamlet Forms v3 Sheet:C1 (ES-HM-BF-1 and 2)





L. Comments	FORM	
	FORM C1	
CONTROL [	DEVICE (FABRIC FILTER)	
REVISED 12/01/01 NCDENR/Division of Air CONTROL DEVICE ID NO: CD-HM-BF-3 ICONTROL	Quality - Application for Air Permit to Construct/Operate	C
TANOSIGNI SERVICE CONTINUES CONTINUES	S EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-HM-7, 8 and ES-H IN SERIES OF CONTROLS NO. 2 OF 2 UNIT:	
MANUFACTURER: Aircon	MODEL NO: 16 RAB 412-10	S
DATE MANUFACTURED: TBD	PROPOSED OPERATION DATE: 102014	
OPERATING SCENARIO:		
1OF1	P.E. SEAL REQUIRED (PER 2Q .0112)? YES ON NO	
DESCRIBE CONTROL SYSTEM:		
Three (3) bagfilters will be utilized for emission control on seven of the hamma.  7-8 cyclones will be routed routed to the third bagfilter along with hammerm.	nermill cyclones. HMs 1 - 3 vent through bagfilter 1, HMs 4-6 vent through bagfilter 2 ill area emissions.	and the
POLLUTANT(S) COLLECTED:	PM PM-10 PM-2.5	
BEFORE CONTROL EMISSION RATE (LB/HR):		
CAPTURE EFFICIENCY:	See calculations in Appendix B	
	<del>~99.9</del> % <del>~99.9</del> % <del>~99.9</del> %	
CONTROL DEVICE EFFICIENCY:	%%%	
CORRESPONDING OVERALL EFFICIENCY:	%% %	
EFFICIENCY DETERMINATION CODE:		
TOTAL EMISSION RATE (LB/HR):	See calculations in Appendix B	
PRESSURE DROP (IN. H <sub>2</sub> 0): MIN: MAX: 6" GA	AUGE? YES NO WARNING ALARM? YES NO	
BULK PARTICLE DENSITY (LB/FT³): 1.43E-05	INLET TEMPERATURE (°F): 120	
POLLUTANT LOADING RATE: 0.1 gr/cf inlet		
INLET AIR FLOW RATE (ACFM): 45,000	FILTER MAX OPERATING TEMP. (°F): N/A	
NO. OF COMPARTMENTS: 1 NO. OF BAGS PER COMP.		
DIAMETER OF BAG (IN.): 5.75 DRAFT: INDUCE	DAIEC A FORGER POR	,250
AIR TO CLOTH RATIO: 7.20 FILTER MATERIAL: Polye	ster or equivalent	200
DESCRIBE CLEANING PROCEDURES:	PARTICLE SIZE DISTRIBUTIO	N
# AIR PULSE # SONIC		JULATIVE
A MEGITANIOAL PARTIES	BAG COLLAPSE (MICRONS) OF TOTAL	%
OTHER 6 OTHER	AG COLLAPSE 0-1 Unknown	
	1-10	
DESCRIBE INCOMING AIR STREAM: The air stream will contain used duct partials at a second stream will contain used duct partials.	10-25	
The air stream will contain wood dust particles. Larger particles will have bee removed by the upstream cyclone.		
This filter will control emissions from the seventh cyclone and hammermill are	50-100	
are		
METHOD FOR DETERMINING WHEN TO CLEAN:	TOTAL = 100	)
AUTOMATIO & TIMED & MANUAL		
METHOD FOR DETERMINING WHEN TO REPLACE THE BAGS:		
& ALARM & INTERNAL INSPECTION & VISIBLE	EMISSION # OTHER	
SPECIAL CONDITIONS: None  ### MOISTURE BLINDING ## CHEMICAL RESISTIVITY  EXPLAIN:	d OTHER	
DESCRIBE MAINTENANCE PROCEDURES: Per manufacturer recommendation	ns	
ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP	OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):	

Attach Additional Sheets As Necessary

Final equipment selection has not yet occurred but will be similar in design to specifications shown.

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File:Enviva Hamlet Forms v3 Sheet:C1 (ES-HM-BF-3)

Source Specific Forms - Pellet Presses & Coolers

0

FORM B

SPECIFIC EMISSIONS SOURCE INFORMATION	(REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 NCDENR/Divisio	n of Air Qualit	v - Applicatio	n for Air Per	nit to Constructio	Inerate		В
EMISSION SOURCE DESCRIPTION:		, , , , , , , , , , , , , , , , , , , ,		OURCE ID NO:	perate	ES CLD44	755
Pellet Coolers				DEVICE ID NO(S):	CD CLD 4	ES-CLR1 th	irough 6
OPERATING SCENARIO 1 OF	1		EMISSION	POINT (STACK) ID	NO(S)		
DESCRIBE IN DETAILTHE EMISSION SOURCE PROCES	S (ATTACH FI	OW DIAGRA	/M)·			EP-10 throu	Jgn 15
Six (6) Pellet Coolers follow the pellet presses to cool the	e newly forme	d nellets dow	m to an accer	stable eterese ter			
		a policio doli	in to an accep	ranie storage ten	nperature.		
TYPE OF EMISSION SOURCE (CHECK	AND COMPLE	TE APPROP	RIATE FORM	B1-B9 ON THE E	OL LOWING I	PAGESI:	
Coal,wood,oil, gas, other burner (Form B1) Woodw	orkina (Form B	4)	Manufac	t. of chemicals/coa	tinac/inke /E	MUES).	
	/finishing/printi			ion (Form B8)	itingarinka (i t	Aill Drj	
	silos/bins (For		110 T T T T T T T T T T T T T T T T T T				
START CONSTRUCTION DATE: TBD   OPERATIO		,	Other (F				
MANUFACTURER / MODEL NO.: TBD	N DATE:		DATE MANU			TBD	
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?):	MEG	TAR (CURRA	OP. SCHEDU			Y/WK52	WK/YR
PERCENTAGE ANNUAL THROUGHPUT (%): DECLEER	25% MAR	HAP (SUBPA		MACT (SUI			
EXPECTED ANNUAL HOURS OF OPERATION 8,76		MAY 25%	JUN-AU	G 25% ORMAL OPERAT	SEP-NOV	25%	
CRITERIA AIR POLLU	ANTIFILIES	CK EMISSIO	NO UNDER N	ORMAL OPERAT	ION: <20	% OPACITY	<u>r</u>
	ISOURCE OF	EXPENTE	ORMATION			- IN STATE OF	<b>原。</b> 重点超级
8	EMISSION		D ACTUAL		OTENTIAL E		
AIR POLLUTANT EMITTED	FACTOR		ROLS / LIMITS)	(BEFORE CONTRO		(AFTER CONTE	
PARTICULATE MATTER (PM)		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER<10 MICRONS (PM <sub>10</sub> )	See Emissio	n Calculation	s in Appendi	XB			
PARTICULATE MATTER<2.5 MICRONS (PM <sub>2.5</sub> )	-						
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)	_						
VOLATILE ORGANIC COMPOUNDS (VOC)	-						
LEAD							
OTHER							
HAZARDOUS AIR POLLU	TANTEMI	INI SIANISS	CODMATIC	M FOR TUIC	NO UDO E		
	ISOURCE OF	EXPECTE	DACTUAL				
	EMISSION	(AFTER CONTI			OTENTIAL E		
HAZARDOUS AIR POLLUTANT AND CAS NO.	FACTOR	lb/hr	tons/yr	(BEFORE CONTRO		(AFTER CONTR	
N/A	motor	IDITA	corraryi	ID/III	tons/yr	lb/hr	tons/yr
TOXIC AIR POLLUTAL	VTEMISSIC	NS INFOR	MATION	OR THIS SOL	RCE	archies are beautie	A Charles of the last of the l
INDICATE EXPECTED	ACTUAL EM	SSIONS AFT	ER CONTRO	S/I IMITATIONS	NOL	Name of Street, or other	THE STREET, SALES
TOXIC AIR POLLUTANT AND CAS NO.	EF SOURCE	lb/		lb/day		I IbA	-
N/A		107		ibruay		lb/y	/r
			-				
Attachments: (1) emissions calculations and supporting documentation,	(2) indicate all re	equested state a	ind federal enfor	ceable nermit limite /	e a hours of an	ecation emissis	n minal and
account upon prese are mountained and with Milat (leftheuts, aud (2) dec	scane say monito	an sesiveh ann	linge or toef no	to for this course			
COMPLETE THIS FORM AND COMPLETE AT	VD ATTACH	APPROP	RIATE B1	HROUGH RO	FORM FO	RFACHE	OURCE
Attach	Additiona	Sheets A	S Necess	arv	. 51 1 0	~~~~	JUNUL

UTPOCEN OVIDES (NO.)				1			1				
NITROGEN OXIDES (NOx)					-						
CARBON MONOXIDE (CO)											
OLATILE ORGANIC COMPOUNDS (VOC)											
EAD											
HER											
12K											
HAZARDOUS AIR F	POLLUTANT EMIS	SSIONS IN	FORMATIC	ON FOR THIS	SOURCE						
	SOURCE OF	EXPECTE	DACTUAL		POTENTIAL E	MSSIONS	Table State St				
	EMISSION	(AFTER CONTR	ROLS / LIMITS)	(BEFORE CONTR	OIR HIMTEL	AFTER CONTR	010111111				
AZARDOUS AIR POLLUTANT AND CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	(APTER CONTR	(OLS / LIMITS)				
/A			cornery	10/111	toris/yr	lb/hr	tons/yr				
					_						
TOXIC AIR POL	EULIANI DEMISSIO	NS INFOR	MATION	OP THIS SOL	IDCE	TO BUSINESS OF THE PARTY OF THE					
ND CAUSEY	PECTED ACTUAL EM	SCIONS ALT	ED CONTRO	CA THIS SUC	ORGE		TANK TON				
XIC AIR POLLUTANT AND CAS NO.	EE COURCE										
AND CAS NO.	EF SOURCE	lb/l	nr	lb/da	зу	lb/y	yr				
chments: (1) emissions calculations and supporting docum	nentation; (2) indicate all re	enuested state a	and federal enfo	rreahla narmit limita	lo a hours of sa						
chments: (1) emissions calculations and supporting documents the companion of the companion	nentation; (2) indicate all re	equested state a	and federal enfo	rceable permit limits	(e.g. hours of op	peration, emission	n rates) and				
chments: (1) emissions calculations and supporting docur in the how these are monitored and with what frequency; an	nentation; (2) indicate all re	equested state a ring devices, ga	and federal enfo auges, or test po	rceable permit limits orts for this source.	(e.g. hours of op	peration, emission	n rates) and				
	-IL AND ALIAUN	AFFRUPI	RIAIEBI	THROUGH BS	(e.g. hours of op	peration, emission	on rates) and				
COM EL	-IL AND ALIAUN	AFFRUPI	RIAIEBI	THROUGH BS	(e.g. hours of ap	eration, emission	on rates) and				
	mentation; (2) indicate all rend (3) describe any monitor	AFFRUPI	RIAIEBI	THROUGH BS	(e.g. hours of op	eration, emission	on rates) and				
The second secon	-IL AND ALIAUN	AFFRUPI	RIAIEBI	THROUGH BS	(e.g. hours of ap	eration, emission	on rates) and				
LINE COM AND COM LL	-IL AND ALIAUN	AFFRUPI	RIAIEBI	THROUGH BS	(e.g. hours of op	eration, emission	on rates) and				
The second secon	-IL AND ALIAUN	AFFRUPI	KIAIEBI	THROUGH BS	(e.g. hours of op	eration, emission	on rates) and				
	-IL AND ALIAUN	AFFRUPI	KIAIEBI	THROUGH BS	(e.g. hours of ap	eration, emission	on rates) and				
COM FILE	-IL AND ALIAUN	AFFRUPI	KIAIEBI	THROUGH BS	(e.g. hours of op	eration, emission	n rates) and				
COM AND COM LL	-IL AND ALIAUN	AFFRUPI	KIAIEBI	THROUGH BS	(e.g. hours of ap	eration, emission	on rates) and				
COM EL	-IL AND ALIAUN	AFFRUPI	KIAIEBI	THROUGH BS	(e.g. hours of ap	eration, emission	on rates) and				
	-IL AND ALIAUN	AFFRUPI	KIAIEBI	THROUGH BS	(e.g. hours of op	eration, emission	on rates) and				
COM FILE	-IL AND ALIAUN	AFFRUPI	KIAIEBI	THROUGH BS	(e.g. hours of op	eration, emission	on rates) and				
COM EL	-IL AND ALIAUN	AFFRUPI	KIAIEBI	THROUGH BS	(e.g. hours of ap	eration, emission	on rates) and				
	-IL AND ALIAUN	AFFRUPI	KIAIEBI	THROUGH BS	(e.g. hours of ap	eration, emission	on rates) and				
	-IL AND ALIAUN	AFFRUPI	KIAIEBI	THROUGH BS	(e.g. hours of op	Peration, emission	on rates) and				
- I COM LL	-IL AND ALIAUN	AFFRUPI	RIAIEBI	THROUGH BS	(e.g. hours of ap	eration, emission	or rates) and				
COM EL	-IL AND ALIAUN	AFFRUPI	RIAIEBI	THROUGH BS	(e.g. hours of ap	eration, emission	on rates) and				
The second secon	-IL AND ALIAUN	AFFRUPI	RIAIEBI	THROUGH BS	(e.g. hours of ap	Peration, emission	on rates) and				
COM FILE	-IL AND ALIAUN	AFFRUPI	RIAIEBI	THROUGH BS	(e.g. hours of op	eration, emission	on rates) and				
COM EL	-IL AND ALIAUN	AFFRUPI	RIAIEBI	THROUGH BS	FORM FO	R EACH SO	OURCE				
	Attach Additional	Sheets A	RIAIEBI	THROUGH BS	File:E	nviva Hamle	t Forms v3				
Time I ertili AND COMI EL	Attach Additional	AFFRUPI	RIAIEBI	THROUGH BS	File:E	nviva Hamle	t Forms v3				
A	Attach Additional	Sheets A	RIAIEBI	THROUGH BS	File:E	R EACH SO	t Forms v3				
A	Attach Additional	Sheets A	RIAIEBI	THROUGH BS	File:E	nviva Hamle	t Forms v3				
A	Attach Additional	Sheets A	RIAIEBI	THROUGH BS	File:E	nviva Hamle	t Forms v3				

### FORM B9 EMISSION SOURCE (OTHER)

REVISED: 12/01/01 NCDENR/Division of A	ir Quality - Application	for Air Permit to Construct/Opera	ate B9
EMISSION SOURCE DESCRIPTION:	The state of the s	EMISSION SOURCE ID NO:	
Pellet Coolers		CONTROL DEVICE ID NO(S):	ES-CLR1 through 6
OPERATING SCENARIO: 1 OF 1		EMISSION POINT (STACK) ID N	CD-CLR-1 through 6
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAG	RAM):		
Six (6) Pellet Coolers follow the pellet presses to co	ool the newly formed po	ellets down to an acceptable stor	age temperature.
MATERIALS ENTERING PROCESS CONTINUOU	SPROCESS	MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Dried Wood	ODT	76.07	LAWITATION(GINTIAR)
		10.07	
MATERIALS ENTERING PROCESS BATCH O	PERATION	MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/BATCH)	
		STATISTIC (STATISTICAL)	LIMITATION (UNIT/BATCH)
MAXIMUM DESIGN (BATCHES / HOUR):			
EQUESTED LIMITATION (BATCHES / HOUR):	//de a a a a a a a a		
UEL USED: N/A	(BATCHES/YF		
TAM A STATE OF THE	TOTAL MAXIN	IUM FIRING RATE (MILLION BTU/	HR): N/A
IAX. CAPACITY HOURLY FUEL USE: N/A OMMENTS:	IREQUESTED	CAPACITY ANNUAL FUEL USE:	N/A
OMMENTO.			
A4-aL A	dalitional Object	N	
Artach A	dditional Sheets	as Necessary	

File:Enviva Ham Sheet:B9 (ES-CLR-**Trinity Consultants** Page 35 of 51

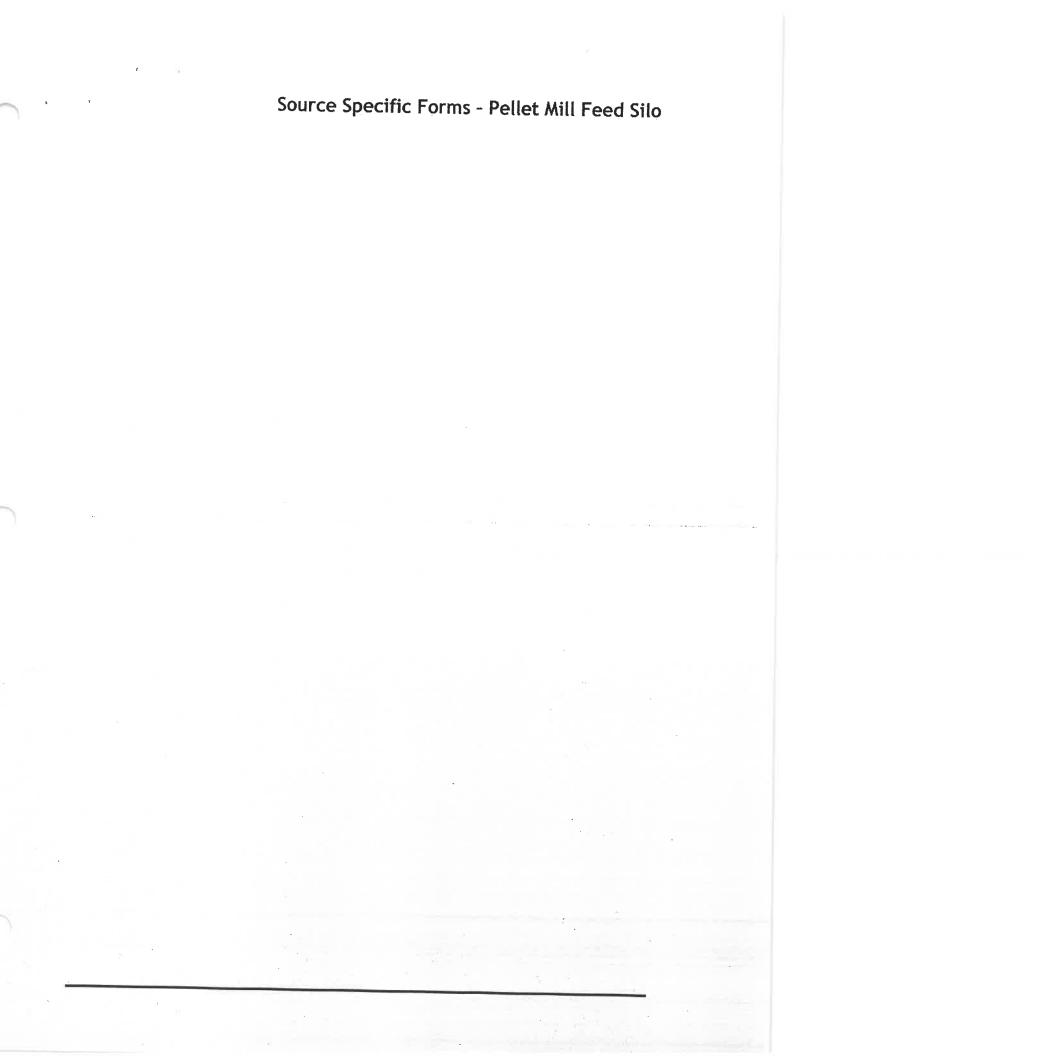
nlet Forms v3 -1 through -6)			

1 ' '							
1		F	ORM	C4			
CONT	ROL DEVICE (CY	CLONE. M	ULTIC	YCI ONE	OR OTHER I	MECHANICA	M V
REVISED 12/01/01	NCDENR/Divi	sion of Air Qual	ity - Appli	cation for Air Pe	ermit to Construct	Operate	C4
CONTROL DEVICE ID NO: CD-CLR-	1 through 6				H EMISSION SOUP		
EMISSION POINT (STACK) ID NO(S):	EP-10 through 15	POSITION IN	SERIES	OF CONTROLS	NO.	1 OF 1	ES-CLR1 through 6 UNITS
MANUFACTURER: TBD1	MODEL		NO.	1 01 1	UNITS		
DATE MANUFACTURED: TBD				SED OPERATION	N DATE: 2Q2014	1	
OPERATIN	NG SCENARIO:	当6. 不是不是			NSTRUCTION DAT		
1_	OF1			AL REQUIRED (F		∜(YES	) + NO
DESCRIBE CONTROL SYSTEM:							
Six (6) identical high efficiency cyclor cyclone. The cyclones will operate u	nes are to be used to cap	ture bulk PM en	nissions f	rom six (6) pelle	et coolers. Each c	poler vents to one	dedicated
oyolones will operate u	ilder negative pressure.						
POLLUTANT(S) COLLECTED:			PM	PM <sub>10</sub>	PM <sub>2,5</sub>		
BEFORE CONTROL EMISSION RATE	(LB/HR):		See Emis		ions in Appendix E		<del></del> 8
CAPTURE EFFICIENCY:					0+ % 90+		— %
CONTROL DEVICE EFFICIENCY:				%	%	%	_ ^ %
CORRESPONDING OVERALL EFFICIE	ENCY:				%	%	<del>-</del> %
EFFICIENCY DETERMINATION CODE	:						-
TOTAL EMISSION RATE (LB/HR):			See Emis	sions Calculati	ons in Appendix B		-
PRESSURE DROP (IN. H <sub>2</sub> 0): MIN	MAX 6.0" V	VARNING ALAR	M?	€ YES	9 40		
INLET TEMPERATURE (°F): MIN	MAX	Ambient		OUTLET TEMP	PERATURE (°F):	MIN MAX	Ambient
INLET AIR FLOW RATE (ACFM):	21,000 each				LE DENSITY (LB/F		Patibletit
POLLUTANT LOADING RATE (GR/FT3)	): 0.:	2				· /·	
SETTLING CHAMBER	AL ADDRESS TO SERVED	CYC	CLONE	WELL SERVICE	THE RESERVE TO THE	<b>建始建设国际</b> M	ULTICYCLONE
LENGTH (INCHES):	INLET VELOCITY (FT/SE	C):	94.75	d CIRCULAR	RECTANGLE	NO. TUBES:	
WIDTH (INCHES):	DIMENSIONS (INCH	(ES) See instruc	tions	IF WET SPI	RAY UTILIZED	DIAMETER OF T	UBES:
HEIGHT (INCHES):	H: 38	Dd:	22	LIQUID USED:		HOPPER ASPIR	ATION SYSTEM?
VELOCITY (FT/SEC.):	W: 25	Lb:	74.25	FLOW RATE (C	GPM):	# YES	d NO
NO. TRAYS: NO. BAFFLES:	De: 32	Lc:	84.5	MAKE UP RAT	E (GPM):	LOUVERS?	
NO. BAFFLES:	D: 54	54 S: 44.38 YES & NO					
	TYPE OF OVOLOUE	-				d YES	4 NO
DESCRIBE MAINTENANCE PROCEDU	TYPE OF CYCLONE:	€ CONVENT		d HIGH	I EFFICIENCY	<b>∂</b> OTHER	
	IRES:	€ CONVENT		( HIGH	ZHEAT STAN	OTHER PARTICLE SIZE D	ISTRIBUTION
Periodic inspection of mechanical inte	IRES:	€ CONVENT		4 HIGH	SIZE	OTHER PARTICLE SIZE D WEIGHT %	DISTRIBUTION CUMULATIVE
Periodic inspection of mechanical Inte as specified by manufacturer DESCRIBE INCOMING AIR STREAM:	RES: egrity during plant outage	d CONVENT		& HIGH	ZHEAT STAN	OTHER PARTICLE SIZE D	DISTRIBUTION CUMULATIVE %
Periodic inspection of mechanical inte as specified by manufacturer DESCRIBE INCOMING AIR STREAM: The cyclones used for particulate capi	RES: egrity during plant outage ture the pellet coolers will	d CONVENT		& HIGH	SIZE (MICRONS)	OTHER PARTICLE SIZE D WEIGHT %	DISTRIBUTION CUMULATIVE
Periodic inspection of mechanical inte as specified by manufacturer DESCRIBE INCOMING AIR STREAM: The cyclones used for particulate capi	RES: egrity during plant outage ture the pellet coolers will	d CONVENT		& HIGH	SIZE (MICRONS)	OTHER PARTICLE SIZE D WEIGHT %	DISTRIBUTION CUMULATIVE %
Periodic inspection of mechanical inte as specified by manufacturer DESCRIBE INCOMING AIR STREAM: The cyclones used for particulate capi	RES: egrity during plant outage ture the pellet coolers will	d CONVENT		& HIGH	SIZE (MICRONS) 0-1 1-10	OTHER PARTICLE SIZE D WEIGHT %	DISTRIBUTION CUMULATIVE %
Periodic inspection of mechanical inte as specified by manufacturer DESCRIBE INCOMING AIR STREAM: The cyclones used for particulate capi	RES: egrity during plant outage ture the pellet coolers will	d CONVENT		& HIGH	SIZE (MICRONS) 0-1 1-10 10-25	OTHER PARTICLE SIZE D WEIGHT %	DISTRIBUTION CUMULATIVE %
Periodic inspection of mechanical inte as specified by manufacturer DESCRIBE INCOMING AIR STREAM: The cyclones used for particulate capi	RES: egrity during plant outage ture the pellet coolers will	d CONVENT		& HIGH	SIZE (MICRONS) 0-1 1-10 10-25 25-50	OTHER PARTICLE SIZE D WEIGHT %	DISTRIBUTION CUMULATIVE %
Periodic inspection of mechanical Inte as specified by manufacturer DESCRIBE INCOMING AIR STREAM: The cyclones used for particulate capi a discharge stack. The stack will be c	RES: egrity during plant outage ture the pellet coolers will ommon to all cooler aspir	S CONVENT		& HIGH	SIZE (MICRONS) 0-1 1-10 10-25 25-50 50-100	OTHER PARTICLE SIZE D WEIGHT % OF TOTAL	DISTRIBUTION CUMULATIVE %
Periodic inspection of mechanical Inte as specified by manufacturer DESCRIBE INCOMING AIR STREAM: The cyclones used for particulate capital discharge stack. The stack will be compared to	RES: egrity during plant outage ture the pellet coolers will ommon to all cooler aspir	S CONVENT		& HIGH	SIZE (MICRONS) 0-1 1-10 10-25 25-50 50-100	OTHER PARTICLE SIZE D WEIGHT % OF TOTAL	CUMULATIVE % Unknown
Periodic inspection of mechanical Inte as specified by manufacturer DESCRIBE INCOMING AIR STREAM: The cyclones used for particulate capital discharge stack. The stack will be compared to	RES: egrity during plant outage ture the pellet coolers will ommon to all cooler aspir	S CONVENT		& HIGH	SIZE (MICRONS) 0-1 1-10 10-25 25-50 50-100	OTHER PARTICLE SIZE D WEIGHT % OF TOTAL	CUMULATIVE % Unknown
Periodic inspection of mechanical Inte as specified by manufacturer DESCRIBE INCOMING AIR STREAM: The cyclones used for particulate capital discharge stack. The stack will be compared to	RES: egrity during plant outage ture the pellet coolers will ommon to all cooler aspir	S CONVENT		& HIGH	SIZE (MICRONS) 0-1 1-10 10-25 25-50 50-100	OTHER PARTICLE SIZE D WEIGHT % OF TOTAL	CUMULATIVE % Unknown
Periodic inspection of mechanical Inte as specified by manufacturer DESCRIBE INCOMING AIR STREAM: The cyclones used for particulate capital discharge stack. The stack will be compared to	RES: egrity during plant outage ture the pellet coolers will ommon to all cooler aspir	S CONVENT		& HIGH	SIZE (MICRONS) 0-1 1-10 10-25 25-50 50-100	OTHER PARTICLE SIZE D WEIGHT % OF TOTAL	CUMULATIVE % Unknown
Periodic inspection of mechanical Inte as specified by manufacturer DESCRIBE INCOMING AIR STREAM: The cyclones used for particulate capital discharge stack. The stack will be compared to	RES: egrity during plant outage ture the pellet coolers will ommon to all cooler aspir	S CONVENT		& HIGH	SIZE (MICRONS) 0-1 1-10 10-25 25-50 50-100	OTHER PARTICLE SIZE D WEIGHT % OF TOTAL	CUMULATIVE % Unknown
DESCRIBE MAINTENANCE PROCEDU Periodic inspection of mechanical inte as specified by manufacturer DESCRIBE INCOMING AIR STREAM: The cyclones used for particulate capi a discharge stack. The stack will be co	RES: egrify during plant outage ture the pellet coolers will ommon to all cooler aspir	d CONVENT s be ducted to ration systems.	IONAL		SIZE (MICRONS) 0-1 1-10 10-25 25-50 50-100 >100	OTHER PARTICLE SIZE D WEIGHT % OF TOTAL	CUMULATIVE % Unknown
Periodic inspection of mechanical Inte as specified by manufacturer DESCRIBE INCOMING AIR STREAM: The cyclones used for particulate capital discharge stack. The stack will be compared to	RES: egrity during plant outage ture the pellet coolers will ommon to all cooler aspir S, GAUGES, TEST PORTS	d CONVENT  s  be ducted to ation systems.  3, ETC:	CONTROL	DEVICE TO ITS	SIZE (MICRONS) 0-1 1-10 10-25 25-50 50-100 >100	OTHER PARTICLE SIZE D WEIGHT % OF TOTAL	CUMULATIVE % Unknown

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File:Enviva Hamlet Forms v3 Sheet:C4 (ES-CLR-CYC-1 through -6)

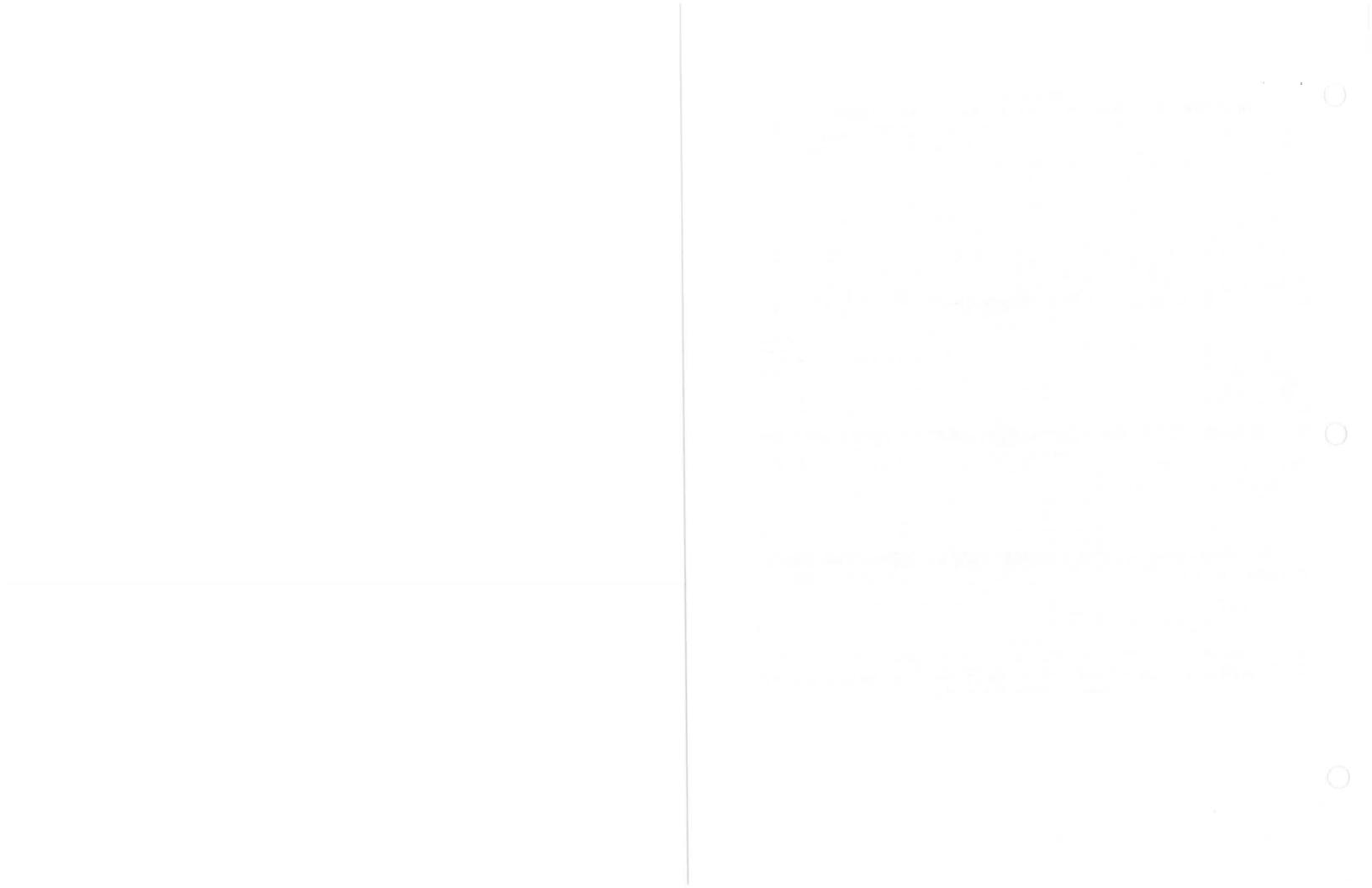


#### FORM B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 NCDENR/Division	of Air Quality -	Application	for Air Permi	to Construc	t/Operate	OITOLO	В
EMISSION SOURCE DESCRIPTION:				SOURCE ID N		ES-PMFS	
Pellet Mill Feed Silo				DEVICE ID NO		CD-PMFS-	BV
OPERATING SCENARIO1 OF	1		EMISSION I	POINT (STAC		EP-3	DA
DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS	ATTACH FLO	DW DIAGRA	VI):	Out To Into	N) ID NO(3).	EF-5	
A pellet press silo stores dried ground wood prior to trar	sport to the p	ellet presses					
		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	-				
TYPE OF EMISSION SOURCE (CHECK A	ND COMPLET	E APPROPRI	ATE FORM F	1-B9 ON THE	FOLLOWING	DACES).	
Coal,wood,oil, gas, other burner (Form B1) Woodw	orking (Form B	4)	Manufac	t of chemical	s/coatings/ink	FAGES).	
	/finishing/printi		Incinera	tion (Form B8		s (i Onn B/)	
	silos/bins (For		Other (F		,		
START CONSTRUCTION DATE: TBD   OPERATIO		TBD					
MANUFACTURER / MODEL NO.: TBD	N DATE.		OD COULD	JFACTURED:		TBD	
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?):	MESH	AP (SUBPAR	OP. SCHEDU			DAY/WK _	52 WK/YR
DECOEME OF ANNUAL PROPERTY.	25% MAR-I				SUBPART?):		
EXPECTED ANNUAL HOURS OF OPERATION 8,76	VISIBLE STA	MAY 25%	JUN-AUC	25%	SEP-NOV	25%	
CRITERIA AIR POLLUT	ANT FWISS	CK EMISSIO	NS UNDER N	ORMAL OPE	RATION: <2	0 % OP/	CITY
	SOURCE OF	C/ICA/MBC	MMAIJON	TOR INS		10012	
	posterio de la companya del la companya de la compa		D ACTUAL		POTENTIAL	EMSSIONS	3
AIR POLLUTANT EMITTED	EMISSION		ROLS / LIMITS)		TROLS / LIMITS)		NTROLS / LIMITS)
PARTICULATE MATTER (PM)	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	ib/hr	tons/yr
PARTICULATE MATTER<10 MICRONS (PM <sub>10</sub> )	See Emissio	n Calculation	s in Appendi	хВ			
PARTICULATE MATTER<2.5 MICRONS (PM <sub>2.5</sub> )	1						
SULFUR DIOXIDE (SO2)	-						
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)	-						
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							
HAZARDOUS AIR POLLU	TANT EMIC	CIONCINE	ODMATIO	V.FAD WIII	0.00/150		
STATE ATTENDED ATTAN POPEO	SOURCE OF	SICINS INF	UKMATIU	NEURIHI			
		EXPECTE			POTENTIAL	EMSSIONS	į.
HAZARDOUS AIR POLLUTANT AND CAS NO.	EMISSION	(AFTER CONTE			ROLS / LIMITS)		TROLS / LIMITS)
N/A	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
	_						
TOXIC AIR POLLUTAN	TEMISSION	VEHNEODA	AATIONUE	O TUO 0			
INDICATE EXPECTED	ACTUAL ENIC	CIONE	MAHUNFO	OK THIS S	DURGE	1.00.00	Andrew Brahma
TOXIC AIR POLLUTANT AND CAS NO.	ACTUAL EMIS						0:
N/A	EF SOURCE	lb/l	hr	lb/c	lay		o/yr
trachments: (1) emissions calculations and currenting described	2011 11 11 11						
utachments: (1) emissions calculations and supporting documentation; escribe how these are monitored and with what frequency; and (3) describe how these are monitored and with what frequency; and (3) describe how these are	2) indicate all require	uested state and	federal enforce	able permit limit	s (e.g. hours of c	peration, emis	sion rates) and
COMPLETE THIS FORM AND COMPLETE AND	any monitori	ig devices, gaug	jes, or test ports	for this source.			
COMPLETE THIS FORM AND COMPLETE AN	Al IACH .	AFFRUPR	TAIL BIT	HKOUGH E	39 FORM F	OR EACH	SOURCE
Aπach /	MOUTIONS	monto A	a Blacassa				

Trinity Consultants
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File:Enviva Hamlet Forms v3
Sheet:B (ES-PMFS)

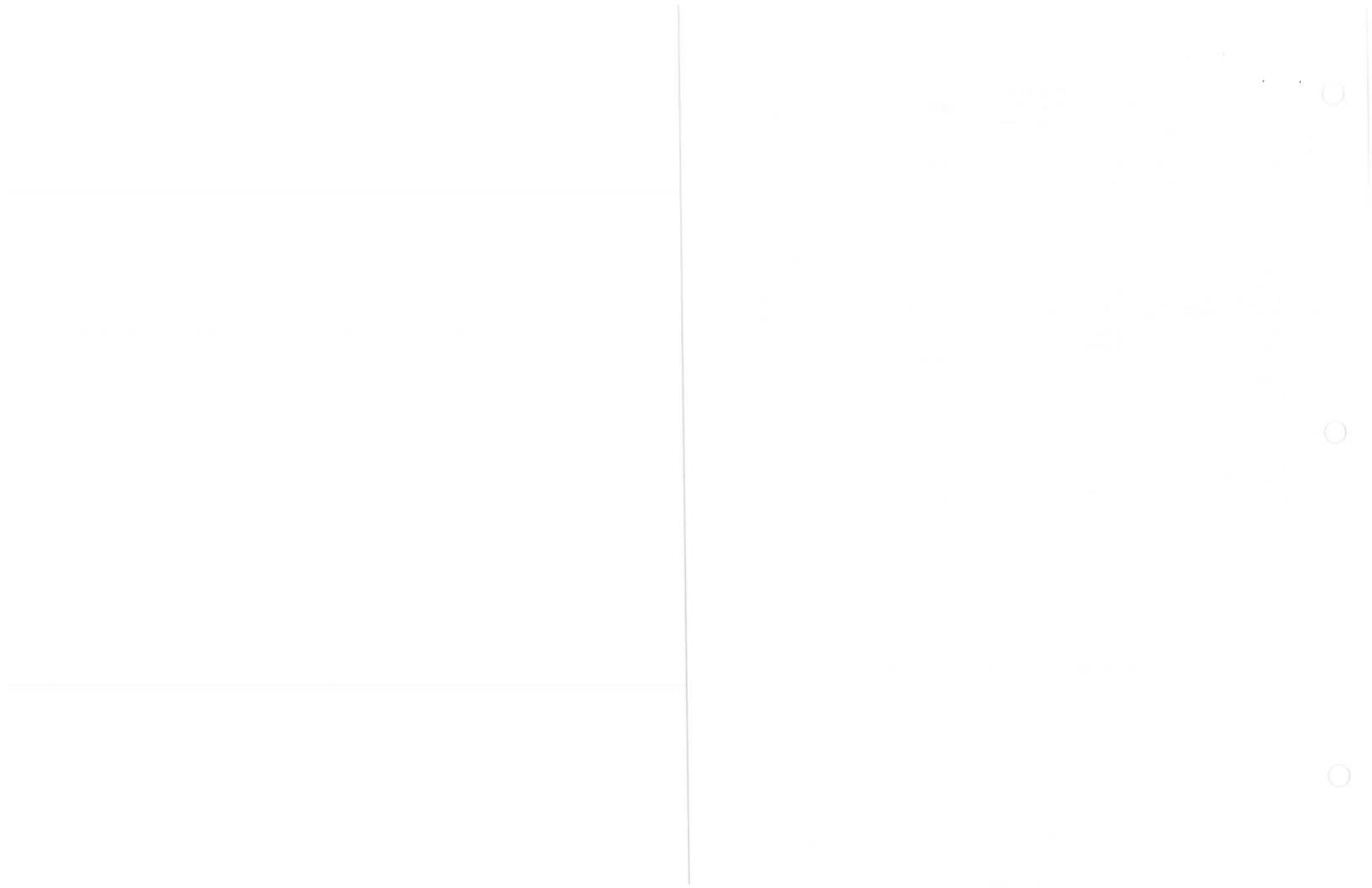


## FORM B6 EMISSION SOURCE (STORAGE SILO/BINS)

EMISSION SOURCE ID NO: ES-PMFS OPERATING SCENARIO: OF EMISSION POINT(STACK) ID NO(S): CD-PMFS-BV DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):  A pellet press sito stores dried ground wood prior to transport to the pellet presses.  MATERIAL STORED: DENSITY OF MATERIAL (LB/FT3): 40  CAPACITY CUBIC FEET: TBD TONS: TBD DIMENSIONS (FEET) HEIGHT: DIAMETER: (OR) LENGTH: WIDTH: HEIGHT:  ANNUAL PRODUCT THROUGHPUT (TONS) PREUMATICALLY FILLED MECHANICALLY FILLED FILLED FROM  BLOWER SCREW CONVEYOR MOTOR HP: TRUCK COMPRESSOR OTHER: OTHER: OTHER: OTHER: CONVEYOR OTHER: OTHER: OTHER: OTHER: CONVEYOR WAXIMUM ACFM: TBD  MAXIMUM ACFM: TBD  MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): 105  MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): 105  MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): 105  MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): 105	REVISED 12/01/01	NCD	ENR/Div	ision of Air Quality -	Applicati	on for Air Permit to C	onstruct/Onerate		B6
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):  A pellet press silo stores dried ground wood prior to transport to the pellet presses.  MATERIAL STORED:  CAPACITY CUBIC FEET: TBD TONS: TBD  DIMENSIONS (FEET) HEIGHT: DIAMETER: (OR) LENGTH: WIDTH: HEIGHT:  ANNUAL PRODUCT THROUGHPUT (TONS)  PNEUMATICALLY FILLED MECHANICALLY, FILLED FROM  BLOWER  COMPRESSOR  COMPRESSOR  COMPRESSOR  DENSITY OF MATERIAL (LB/FT3): 40  TONS: TBD  MAXIMUM DESIGN CAPACITY:  MAXIMUM DESIGN CAPACITY:  MECHANICALLY, FILLED FROM  BLOWER  COMPRESSOR  CO	EMISSION SOURCE DES							FS.DMFS	
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):  A pellet press sito stores dried ground wood prior to transport to the pellet presses.  MATERIAL STORED:  CAPACITY  CUBIC FEET:  DIMENSIONS (FEET)  MAXIMUM DESIGN CAPACITY  FILLED FROM  BELL CONVEYOR  DIMENSIONS (FEET)  DIMENSIONS (FEET)  FILLED FROM  TRUCK  TRU									d .
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):  A pellet press silo stores dried ground wood prior to transport to the pellet presses.  MATERIAL STORED:  CAPACITY  CUBIC FEET:  DIAMETER:  DIA							The state of the s		
CAPACITY  CUBIC FEET: TBD  DIMENSIONS (FEET)  HEIGHT:  DIAMETER:  (OR)  LENGTH:  WIDTH: HEIGHT:  MAXIMUM DESIGN CAPACITY:  PNEUMATICALLY FILLED  MECHANICALLY FILLED  MOTOR HP:  RAILCAR  MOTOR HP:  TRUCK  STORAGE PILE  OTHER:  OTHER:  OTHER:  OTHER:  CONVEYOR  WOTOR HP:  TRUCK  STORAGE PILE  OTHER:  OTHER:  CONVEYOR  WAXIMUM ACFM: TBD  MAXIMUM ACFM: TBD  MAXIMUM ACFM: TBD  MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR):  MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR):  105  MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR):  105	A pellet press sit	o stores dried grou	ach fic	IW DIAGRAM): d prior to transport to	the pell	et presses.			
CAPACITY  CUBIC FEET: TBD  DIMENSIONS (FEET)  HEIGHT:  DIAMETER:  (OR)  LENGTH:  WIDTH: HEIGHT:  MAXIMUM DESIGN CAPACITY:  PNEUMATICALLY FILLED  MECHANICALLY FILLED  MOTOR HP:  RAILCAR  MOTOR HP:  TRUCK  STORAGE PILE  OTHER:  OTHER:  OTHER:  OTHER:  CONVEYOR  WOTOR HP:  TRUCK  STORAGE PILE  OTHER:  OTHER:  CONVEYOR  WAXIMUM ACFM: TBD  MAXIMUM ACFM: TBD  MAXIMUM ACFM: TBD  MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR):  MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR):  105  MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR):  105	MATERIAL STORED:					D=10=10			
DIMENSIONS (FEET) HEIGHT: DIAMETER: (OR) LENGTH: WIDTH: HEIGHT:  ANNUAL PRODUCT THROUGHPUT (TONS) ACTUAL: MAXIMUM DESIGN CAPACITY:  PNEUMATICALLY FILLED MECHANICALLY FILLED FROM  BLOWER SCREW CONVEYOR BELT CONVEYOR BUCKET ELEVATOR OTHER:  NO. FILL TUBES: TBD MAXIMUM ACFM: TBD MAXIMUM ACFM: TBD  MAXIMUM ACFM: TBD  BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO?  MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): 105  MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): 105  MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): 105  MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): 105		CUBIC FEET		TRO			SIAL (LB/FT3):	40	
ANNUAL PRODUCT THROUGHPUT (TONS)  ACTUAL:  MAXIMUM DESIGN CAPACITY:  PNEUMATICALLY FILLED  MECHANICALLY, FILLED  MAXIMUM DESIGN CAPACITY:  FILLED FROM  FILLED FROM  RAILCAR  RAILCAR  TRUCK BUCKET ELEVATOR OTHER:  OTHER:  OTHER:  OTHER:  OTHER:  OTHER:  MAXIMUM ACFM: TBD  MAXIMUM ACFM: TBD  MAXIMUM ACFM: TBD  MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR):  MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR):  105  MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR):  105					(OB)		т. —		
PREUMATICALLY FILLED  MECHANICALLY, FILLED  BLOWER COMPRESSOR OTHER: BLUCKET ELEVATOR BUCKET ELEVATOR OTHER: OTHER: OTHER: Conveyor  MOTOR HP: STORAGE PILE OTHER:			ING)		(UK)			GHT:	
BLOWER COMPRESSOR BELT CONVEYOR BUCKET ELEVATOR OTHER:  NO. FILL TUBES: TBD MAXIMUM ACFM: TBD MAXIMUM ACFM: TBD MATERIAL IS FILLED TO:  WAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR):  MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR):  MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR):  105  MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): 105	PNEUMATICAL	LY FILLED			ALLY	IMAXIMUM DE			
COMPRESSOR OTHER: BELT CONVEYOR BUCKET ELEVATOR OTHER: OTHER: OTHER: OTHER: OTHER: Conveyor  MAXIMUM ACFM: TBD  MAXIMUM ACFM: TBD  WAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR):  MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR):  MAXIMUM DESIGN LINI OADING PATE OF MATERIAL (TONS/HR):  MAXIMUM DESIGN LINI OADING PATE OF MATERIAL (TONS/HR):  MAXIMUM DESIGN LINI OADING PATE OF MATERIAL (TONS/HR):	BLOWER	and the second second second						LED FROM	10000000
OTHER:  BUCKET ELEVATOR OTHER:  OTHER:	520						1		
MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR):  MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR):  MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR):  105	OTHER:		-			MOTOR HP;			
MAXIMUM ACFM: TBD  MATERIAL IS FILLED TO:  BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO?  WAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): 105  WAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): 105			1 7		, //				
MAXIMUM ACFM: TBD  MATERIAL IS FILLED TO:  BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO?  WAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): 105  WAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): 105	NO. FILL TUBES:	TBD	+ -	OTHER.			OTHER:	Conveyor	
MATERIAL IS FILLED TO:  BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO?  WAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): 105  MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): 105			1						
MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): 105									
MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): 105	MAXIMUM DESIGN FILLIN	G RATE OF MATER	PIAL (TO	NC# IDV					
					105				
COMMENTS:		DING RATE OF MA	ATERIAL	(TONS/HR):	105				
Attach Additional Sheets As Necessary			Δ	tach Additional	Shac	o An Nassass			

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File:Enviva Hamlet Forms v3 Sheet:B6 (ES-PMFS)



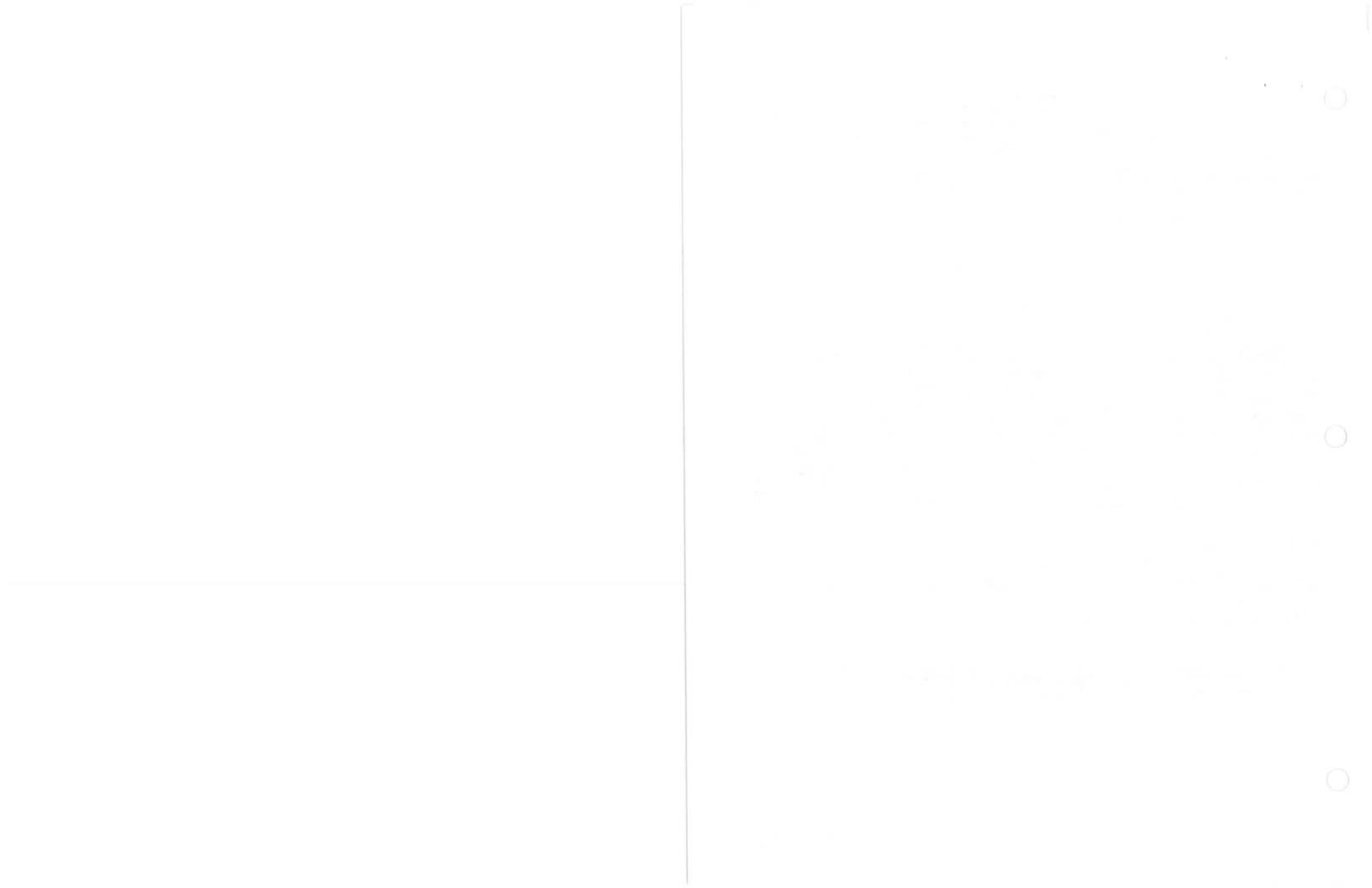
#### FORM C1 CONTROL DEVICE (FABRIC FILTER)

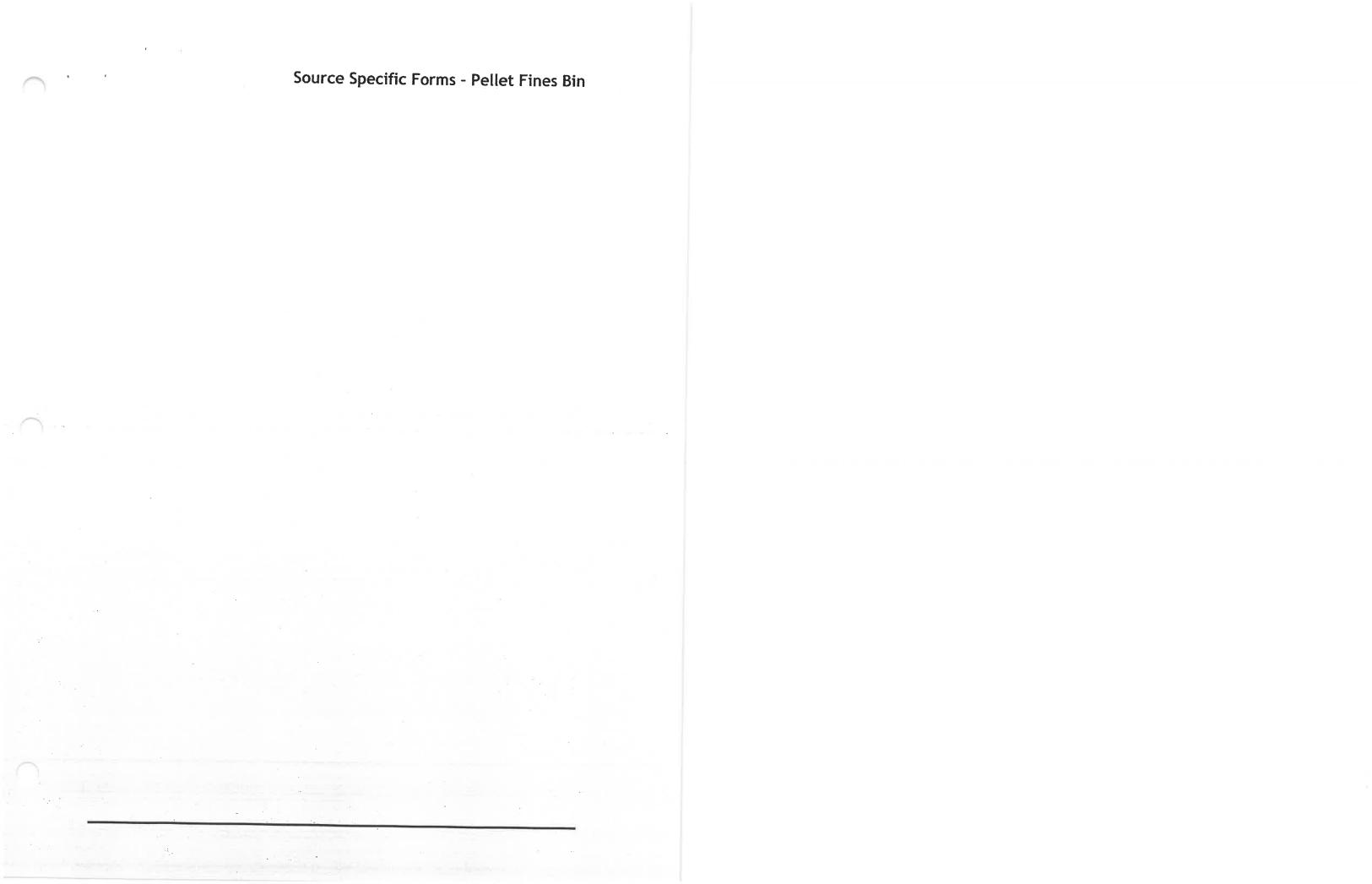
REVISED 12/01/01 NCDENR/Division of Air Qu	ality - Application for		notoustiOmesets		C1
CONTROL DEVICE ID NO: CD-PMFS-BV CONTROLS EN	ISSIONS EDOM WILL	L ENGERON CO	NIBOS ID NOISE		C1
	ERIES OF CONTROLS	IL EINISSION SC	NC	ES-PMFS	4 LINUTO
MANUFACTURER: TBD1		TBD	- NC	). 1 OF	1 UNITS
DATE MANUFACTURED: TBD	PROPOSED OPE		TBD		
OPERATING SCENARIO:	PROPOSED STA	RT CONSTRUC	TION DATE:	TBD	
	P.E. SEAL REQUI				NO
DESCRIBE CONTROL SYSTEM:				7 150	110
A bin vent filter is used to create a slight negative pressure on the Pellet Mill Fo	eed Silo. The bin vent	collects dust			
from the air volume present in the silo. The bin vent is sized to offset the air di feed to the silo.	isplacement created by	y the material			
POLLUTANT(S) COLLECTED:	PM	PM-10	PM-2.5		
BEFORE CONTROL EMISSION RATE (LB/HR):			2		_
CAPTURE EFFICIENCY:	%		%	%	_ %
CONTROL DEVICE EFFICIENCY:	~99.9 %	~99.9			-
CORRESPONDING OVERALL EFFICIENCY:		33.3		_%	_%
EFFICIENCY DETERMINATION CODE:	%	) =	_%		_%
TOTAL EMISSION RATE (LB/HR):		- 1 1 1 1 1	· . —		-
ODECCUPE DECC (N. C.			in Appendix B		-
			ARNING ALARM?	CLYES & N	0
	INLET TEMPERAT		Ambient		
POLLUTANT LOADING RATE: 0.1 & LB/HR C GR/FT			Ambient		
INLET AIR FLOW RATE (ACFM):	FILTER MAX OPE	RATING TEMP.	(°F): N/A		
NO. OF COMPARTMENTS: 1 NO. OF BAGS PER COMPARTME			LENGTH OF BAG		
DIAMETER OF BAG (IN.): 5.875 DRAFT: ♦ INDUCED/NE AIR TO CLOTH RATIO: 6 FILTER MATERIAL:	G. FORCED/	POS	FILTER SURFACE		377
AIR TO CLOTH RATIO: 6 FILTER MATERIAL: DESCRIBE CLEANING PROCEDURES:			₫ WOVEN	_	
d AIR PULSE d SONIC				ICLE SIZE DISTR	
REVERSE FLOW SIMPLE BAG	COLLARSE		SIZE	WEIGHT %	CUMULATIVE
MECHANICAL/SHAKER & RING BAG (			(MICRONS)	OF TOTAL	%
OTHER	DOLLAPSE		1-10	Unl	known
DESCRIBE INCOMING AIR STREAM:					
The air stream will contain wood dust particulate emissions			10-25		
The same with the same has defined chinestons			25-50		
			50-100 >100		
			>100	TOT	11 - 400
METHOD FOR DETERMINING WHEN TO CLEAN:				1017	AL = 100
& AUTOMATIC & TIMED & MANUAL					
METHOD FOR DETERMINING WHEN TO REPLACE THE BAGS:					
ALARM INTERNAL INSPECTION VISIBLE EMIS	SION & OTH	HER			
SPECIAL CONDITIONS: None					
	<b>d</b> OTHER				
EXPLAIN:					
DESCRIBE MAINTENANCE PROCEDURES: Per manufacturer recommendations	3				
ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP O	F THE CONTROL DEV	ICE TO ITS FMI	SSION SOURCE(S)		
Attach Addition	nal Sheets As No	Coccan/	00.011 000NOE(3)	·	

Attach Additional Sheets As Necessary

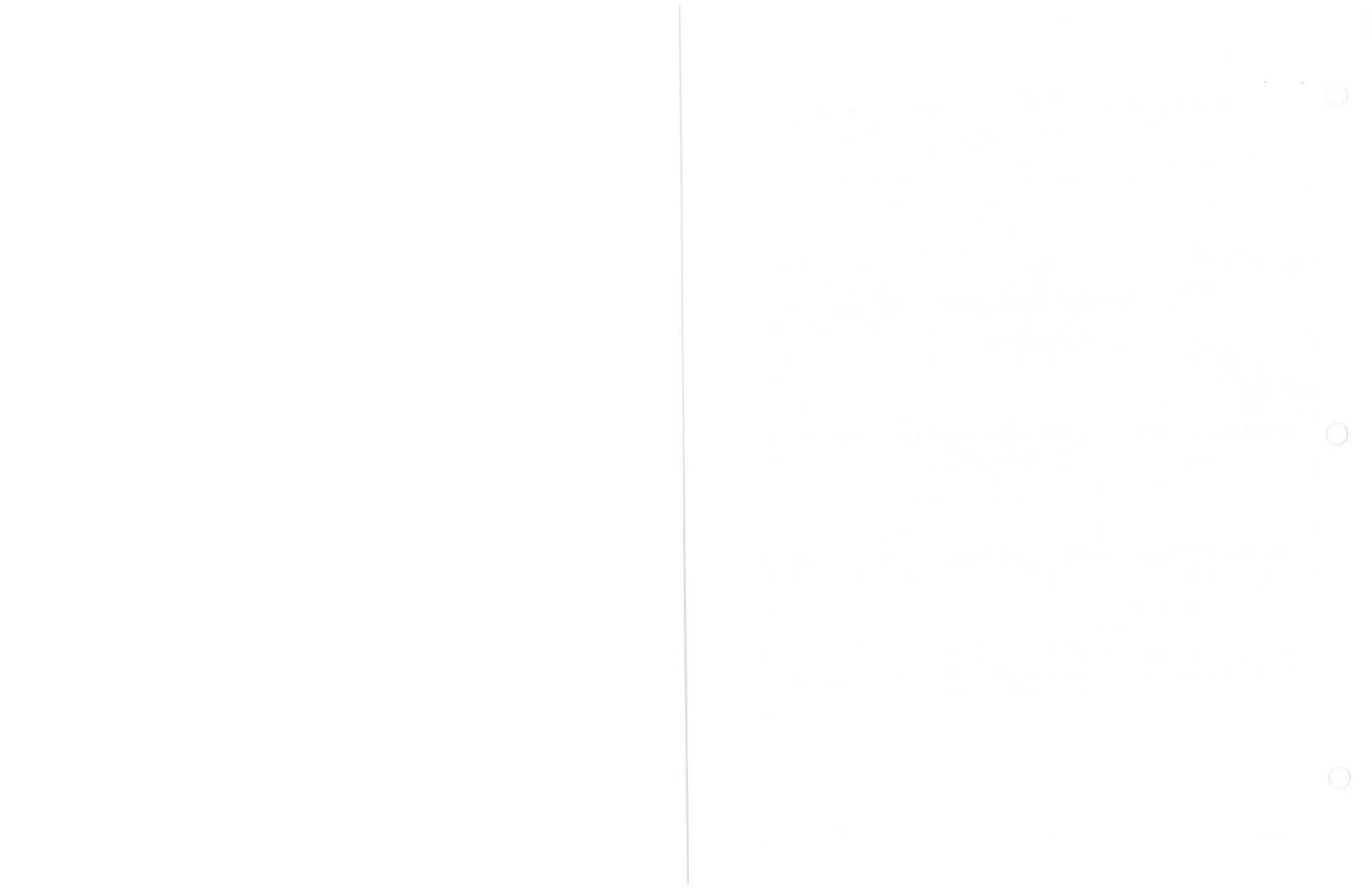
1 Final equipment selection has not yet occurred but will be similar in design to specifications shown.

Trinity Consultants
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File:Enviva Hamlet Forms v3
Sheet:C1 (ES-PMFS-BV)





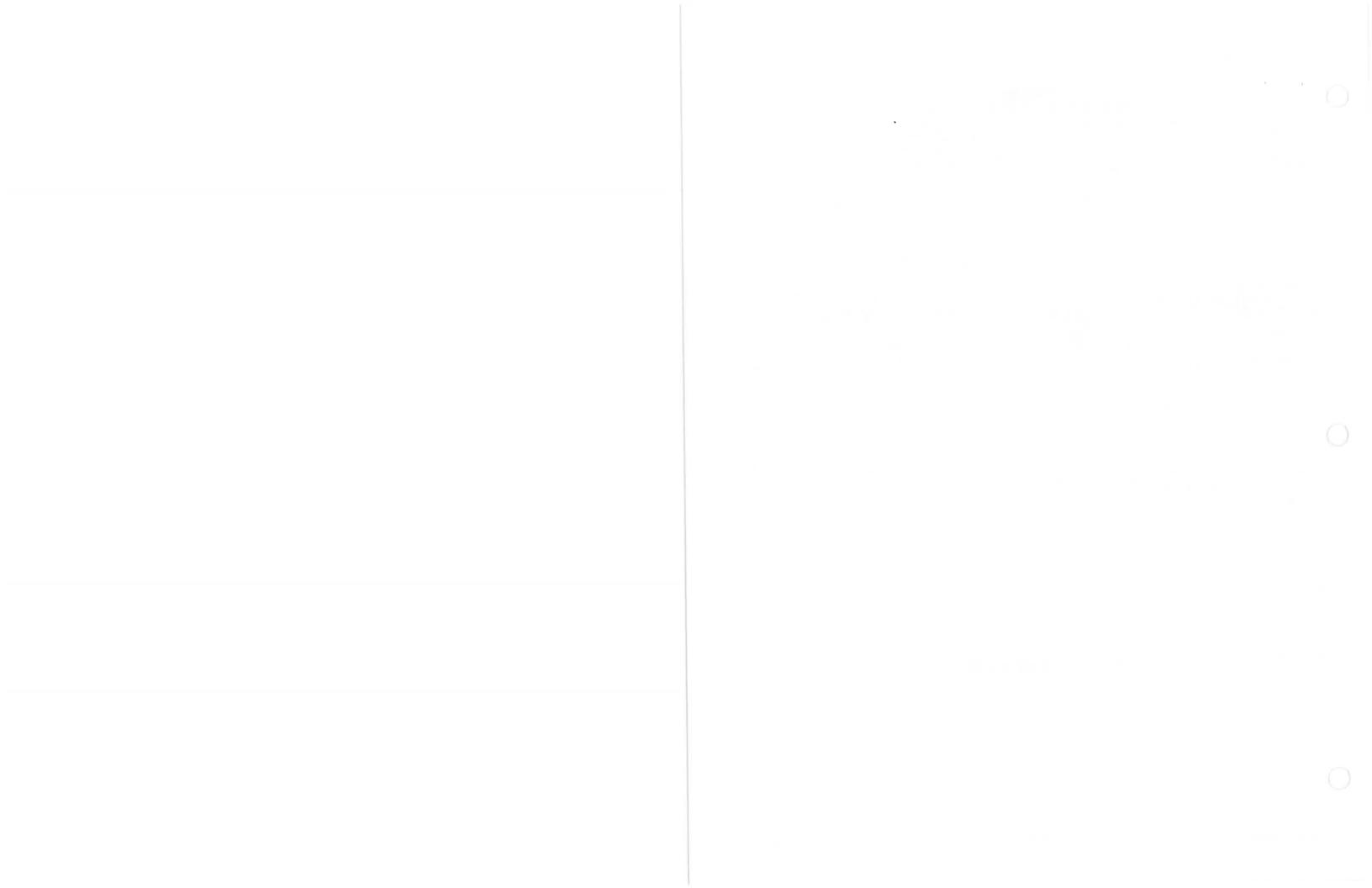
	4 0								
	* <u>N</u>								
V	1		F	ORM E	3				
F	SPECIFIC EMISSION NO.	ONS SOUP	<b>RCE INFO</b>	RMATIO	N (REQU	IRED FO	R ALL SC	OURCES)	
E	MISSION SOURCE DESCRIPTION:	DENR/Division	or Air Quality	- Application	EMISSION	SOURCE ID I	NO:	ES-PFB	В
1	PERATING SCENARIO 1	OF	1		EMICCION	DEVICE ID N POINT (STAC	O(S): CK) ID NO(S):	CD-PFB-BV EP-7	
F	ESCRIBE IN DETAILTHE EMISSION SOI ine pellet material from hammermill poll in vent filter.	URCE PROCES: lution control sy	S (ATTACH FL	OW DIAGRA reening opera	M)-				rolled by a
- 10	TYPE OF EMISSION SOU  Coal,wood,oil, gas, other burner (Form Int.combustion engine/generator (Form E	B1) ∐ Woodw 32) ☐ Coating	orking (Form E I/finishing/print	B4) ting (Form B5)	Manufa	ct of chemica	le/coatinge/inke	G PAGES): s (Form B7)	
8	TART CONSTRUCTION DATE: TBD	Storage	silos/bins (Fo	rm B6)	Other (F	Form B9)		TBD	
M	ANUFACTURER / MODEL NO.: THIS SOURCE SUBJECT TO? NSPS (S	TBD		EXPECTED HAP (SUBPA	OP. SCHEDU	JLE: <u>24</u> HI	R/DAY _7	DAY/WK	52 WK/YR
P	ERCENTAGE ANNUAL THROUGHPUT (S EXPECTED ANNUAL HOURS OF OPERAT	%): DEC-FEB	25% MAR-	-MAY 25%	JUN-AU	G 25%	(SUBPART?):_ SEP-NOV	25%	
	CRITERIA /	AIR POLLUT	ani emiss	ouns in eq	OKMATION	ORMAL OPE	RATION: <2	0 % OPAC	CITY
			SOURCE OF	FEXPECT	ED ACTUAL ITROLS / LIMITS)			EMSSIONS	
	R POLLUTANT EMITTED ARTICULATE MATTER (PM)		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	(AFTER CONT	ROLS / LIMITS) tons/yr
P	ARTICULATE MATTER<10 MICRONS (PM <sub>10</sub> ) ARTICULATE MATTER<2.5 MICRONS (PM <sub>2</sub> )	)	our cansaic	on calculatio	ui Append	IIX D			
S	JLFUR DIOXIDE (SO2)	5/							
C	TROGEN OXIDES (NOx) ARBON MONOXIDE (CO)								
LI	DLATILE ORGANIC COMPOUNDS (VOC)								
	THER	Wall-M-T-Venk	A. 8 45-25 - 27 1/-						
F	HAZARDOUS	villed (C) equi	SOURCE OF	EXPECTE	FORMATIO ED ACTUAL	në fotoril		. EMSSIONS	<b>TANKET TANK</b>
Н	AZARDOUS AIR POLLUTANT AND CAS	NO.	EMISSION FACTOR		TROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONTI	
N	A			10/11	toris/yi	IO/III	tons/yr	lb/hr	tons/yr
F									
100	TOXICAL	RPOLLUTAN	TEMISSIO	NSINEOP	MATIONE	AP TUIS S	AURCE		Notice of the last
Tr	INDICATE AND CAS NO.	ATE EXPECTED	ACTUAL EMIS	SSIONS AFTI	ER CONTROL	S/LIMITATIO	NS		外国际外国际
N/			EF SOURCE	lb	o/hr	lb/	day	lb/	'yr
F									
F									
Att	achments: (1) emissions calculations and support	ng documentation;	(2) indicate all red	quested state ar	nd federal enforc	eable permit limi	its (e.g. hours of o	operation, emissi	ion rates) and
	cribe how these are monitored and with what freq	MPLETE AN	D ATTACH	APPROPI	uges, or test port	s for this source.			
		Attach A	Additional	Sheets A	S Necess	ary			
Tri	nity Consultants		Page	e 40 of 51			File:F	Enviva Haml Sheet	
Tri	nity Consultants		Page	e 40 of 51			File:F		et Forms v3 B (ES-PFB)



## FORM B6 EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 12/01/01		NCDENR/Div	ision of Air Quai	ity - Applicat	ion for A	Ir Permit to C	onstruct	/Operate			B6
EMISSION SOURCE D	ESCRIPTION:	Pellet Fines E	Bin			EMISSION S	OURCE	ID NO:		ES-PFB	
ODERATING COENIAS	10					CONTROL D				CD-PFB-BV	
OPERATING SCENAR DESCRIBE IN DETAIL		1		1		EMISSION P	OINT(ST	ACK) ID NO(	S):	EP-7	
		nmermill pollutio		m and screen	ing ope	ration is colle	cted in t	he pellet fine	es bin w	nich is contro	elled by a bin
MATERIAL STORED:	Fine pellet i	material			DENS	ITY OF MATER	IAI /I D	/ET2)-	40		
CAPACITY	CUB	IC FEET:	2200		TONS		UNL (LD)	r 13).	40	_	
DIMENSIONS (FE	ET) HEIG	HT:	DIAMETER:	12 (OR)			WIDTH	J. [	JEICHT.		
ANNUAL PRODUC			ACTUAL:	12 (3.1)	122,10	MAXIMUM DE			HEIGHT:		
PNEUMATIC	ALLY FILLED	a king to be a few or a few of the few of th		ANICALLY F	ILLED	INIXXIIVIOIVI DE	SIGN C		6 tph	FROM	CO-200EE00-511mGE
BLOWER		1 0	SCREW CONVE		Attaches to the	A STATE OF THE STA	1 0		ICCE	O FROM	学的特別的分表
<b>♦</b> COMPRESSOR		Ce .	BELT CONVEY		1	OTOR HP:	1 8	RAILCAR TRÚCK			
OTHER:		4	BUCKET ELEVA			OTORTII.	ď	STORAGE	DII E		
		ð	OTHER:				6	OTHER:		A	
NO. FILL TUBES:	TBC						0	OTHER:		Conveyor	
MAXIMUM ACFM:	TBD										
BY WHAT METHOD IS											
MAXIMUM DESIGN UNI											
COMMENTS:											
		-	Attach Addit	ional She	ets A	s Necessa	ry	-			

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Sheet:B6 (ES-PFB)



FORM C1
CONTROL DEVICE (FABRIC FILTER)

REVISED 12/01/01 NCDENR/Division of Air	r Quality - Application for Air Per	mit to Construct/Operate	
CONTROL DEVICE ID NO: CD-PFB-BV CONTROLS I	EMISSIONS FROM WHICH EMISS	SION SOLIDOE ID MOVOL	
EMISSION POINT (STACK) ID NO(S): EP-7 POSITION IN	SERIES OF CONTROLS	NO.	S-PFB
MANUFACTURER: Aircon	MODEL NO: 36-6	NO.	1 OF 1 UNITS
DATE MANUFACTURED: TBD	PROPOSED OPERATION	DATE: 2Q2014	
OPERATING SCENARIO:	PROPOSED START CON		BD
1OF1_	P.E. SEAL REQUIRED (PE	R 2Q .0112)?	
DESCRIBE CONTROL SYSTEM:  A bin vent baghouse collects dust from when wood enters or exits			
POLLUTANT(S) COLLECTED:	PM P	M <sub>10</sub> PM <sub>2.5</sub>	
BEFORE CONTROL EMISSION RATE (LB/HR):		2.0	
CAPTURE EFFICIENCY:	See calculations in Appen		
CONTROL DEVICE EFFICIENCY:	<del>%</del>	<del>-99</del> % <del>-99</del> %	%
	%	%%	%
CORRESPONDING OVERALL EFFICIENCY:	%	% %	%
EFFICIENCY DETERMINATION CODE:			
TOTAL EMISSION RATE (LB/HR):	See calculations in Appen	fix R	
PRESSURE DROP (IN, H <sub>2</sub> 0): MIN: TBD MAX: TBD GAI	UGE? ( YES) NO		
BULK PARTICLE DENSITY (LB/FT³): 1.43E-05	INLET TEMPERATURE (°F)		(YES 1)NO
POLLUTANT LOADING RATE: 0.1 & LB/HR & GR/PT	OUTLET TEMPERATURE (		
INLET AIR FLOW RATE (ACFM): 3,600	FILTER MAX OPERATING	F): Ambient	
NO. OF COMPARTMENTS TBD NO. OF BAGS PER COMPARTME	NT: TBD	TEMP. (°F): N/A  LENGTH OF BAG (IN.	
DIAMETER OF BAG (IN.): DRAFT:		FILTER SURFACE AR	
AIR TO CLOTH RATIO: 11.08 FILTER MATERIAL:	1011025/1 00.	WOVEN	EA (FT*): 325
DESCRIBE CLEANING PROCEDURES:			E SIZE DISTRIBUTION
# AIR PULSE # SONIC		A 100	WEIGHT % CUMULATIVE
REVERSE FLOW SIMPLE BAG	G COLLAPSE	(MICRONS)	OF TOTAL %
MECHANICAL/SHAKER RING BAG	COLLAPSE	0-1	
OTHER		1-10	
DESCRIBE INCOMING AIR STREAM:		10-25	
he air stream will contain wood dust particles		25-50	
		50-100	
		>100	
NETHOD FOR DETERMINING WHEN TO CLEAN:			TOTAL = 100
AUTOMATIC & TIMED & MANUAL			
METHOD FOR DETERMINING WHEN TO REPLACE THE BAGS:			
ALARM INTERNAL INSPECTION VISIBLE EMI	SSION # OTHER		
PECIAL CONDITIONS:	SOION & OTHER		
MOISTURE BLINDING GENERAL RESISTIVITY EXPLAIN:	d OTHER		
ESCRIBE MAINTENANCE PROCEDURES:			
er manufacturer recommendations or common industry practices.			
N A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP	OF THE CONTROL DEVICE TO	ITS EMISSION SOURCE	
Attach Additi	ional Sheets As Necessa	Arv	

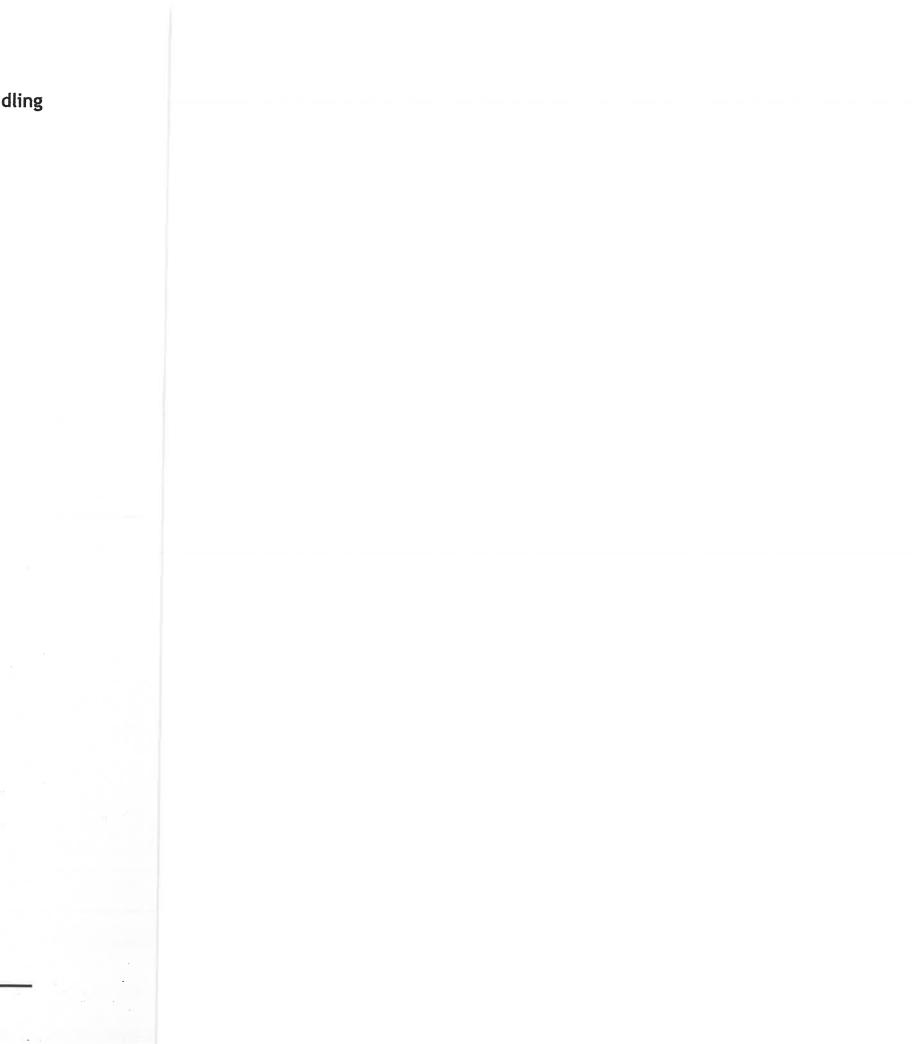
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Specific Forms - Final Product Handling

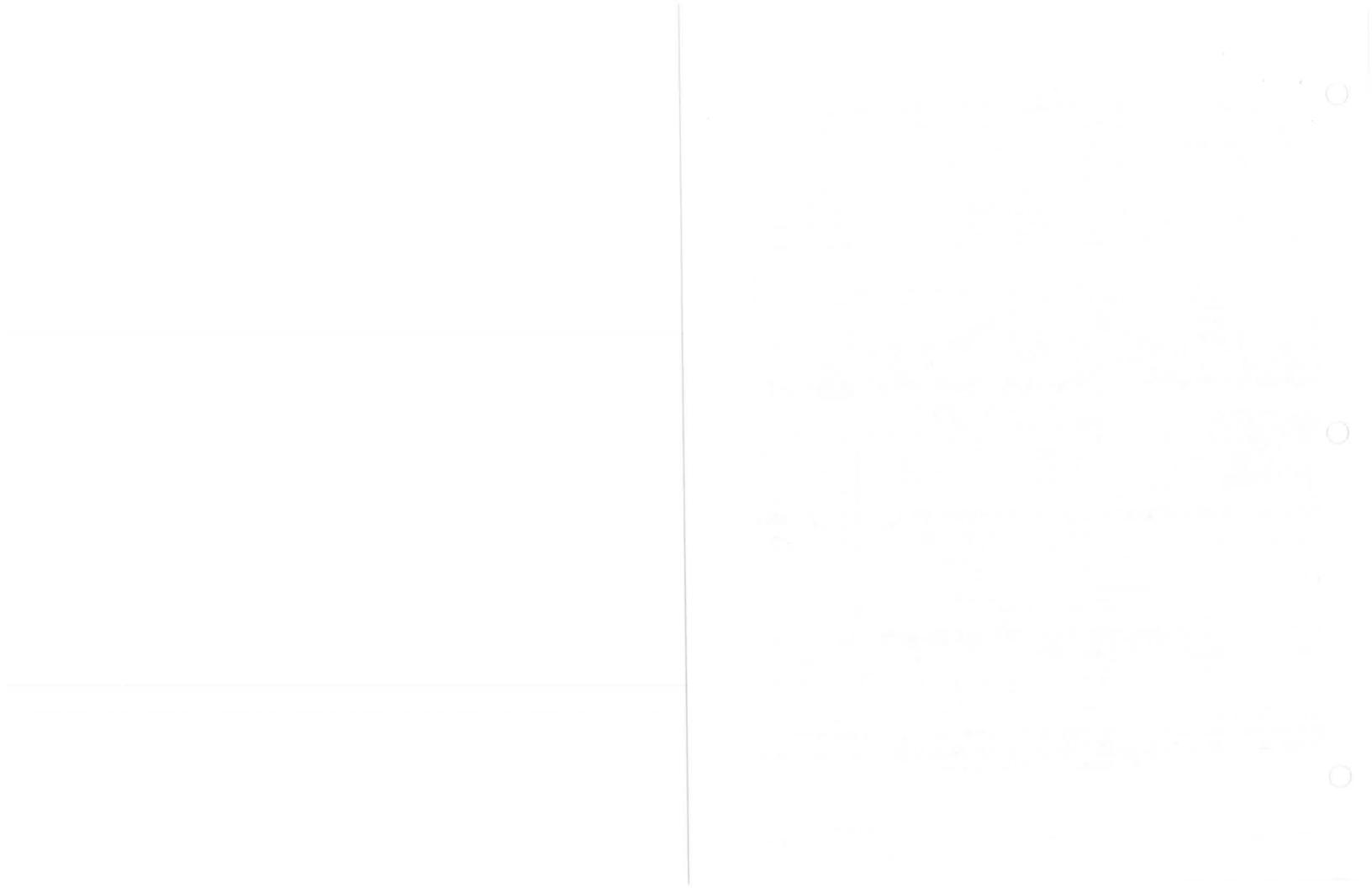


FORM B

REVISED 12/01/01 NCDENR/Division						OURCES)	
REVISED 12/01/01 NCDENR/Division  EMISSION SOURCE DESCRIPTION:	of Air Quality	- Application	for Air Permi	t to Construc	:t/Operate		В
Finished Product Handling/ Pellet Loadout Bins / Pellet	Loadout		EMISSION	SOURCE ID I	NO:	ES-FPH, ES- PL	PB1 & 2, ES
OPERATING SCENARIO 1 OF	1		CONTROL	DEVICE ID N	O(S):	CD-FPH-BF	
			JEMISSION	POINT (STAC	K) ID NO(S):	EP-8	
DESCRIBE IN DETAILTHE EMISSION SOURCE PROCE: Pelletized product is conveyed to the pellet loadout bin (ES-PL). Emissions from the Pellet Loadout Bins are co or railcars through a covered shoot to prevent emission because dried wood fines have been removed in the pel measure to prevent any buildup of dust on surfaces with exhausts to the same bagfilter that controls minor dust after loading.  TYPE OF EMISSION SOURCE (CHECK	s (PB-1 & 2) the partrolled by a bis. Although erilet coolers, a sin the building emissions from	at feed the pe agfilter. Pelle nissions to th light negative j. The slight r n loading of the	llet railcar op et Loadout is e atmospher pressure is i negative pres ne pellet pres	accomplisher e from conve maintained in sure is produ s bins. Truci	d by gravity fe syance from th I the loadout b Iced via an inc ks and railcars	eed of the pelle ne storage bins puilding a fire p duced draft far s are covered i	ets into truck are minim prevention
Wood	working (Form E	34)	Manufac	t. of chemical	s/coatings/inks	(Form B7)	
☐ Int.combustion engine/generator (Form B2) ☐ Coatin	g/finishing/printi	ng (Form B5)	☐ Incinera	tion (Form B8)	)	(	
Liquid storage tanks (Form B3) Storage	silos/bins (Forr	n B6)	Other (F		,		
START CONSTRUCTION DATE: TBD OPERATION	ON DATE:	1Q2014		FACTURED:		TBD	
MANUFACTURER / MODEL NO.: TBD			OP. SCHEDU				2 WK/YR
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?):	NESH	AP (SUBPAR	(T?):		SUBPART?):_	DATIVIT 32	AAMIK
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB	25% MAR-	MAY 25%	JUN-AUC	25%	SED-NOV	25%	
EXPECTED ANNUAL HOURS OF OPERATION 8,70	VISIBLE ST	ACK EMISSIO	NO LINDED N	ODMAL ODE	DATION		ITV
CRITERIA AIR POLLU	ANT EMISS	SIONS INFO	DRMATION	FOR THIS	SOURCE	O A OFAC	MAN MANAGEMENT
	SOURCE OF	EXPECTE	D ACTUAL			L EMSSIONS	1000年11日日日日日日日日日日日日日日日日日日日日日日日日日日日日日日日日
	EMISSION		ROLS / LIMITS)	/BEEODE CON	TROLS / LIMITS)		
AIR POLLUTANT EMITTED	FACTOR	lb/hr	tons/yr	Ib/hr		(AFTER CONTI	
PARTICULATE MATTER (PM)		n Calculation	s in Annandi	D ID/III	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER<10 MICRONS (PM <sub>10</sub> )		- Guidalation	a III Appendi	N B			
PARTICULATE MATTER<2.5 MICRONS (PM. c)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							
HAZARDOUS AIR POLLU	ITANT EMIS	SCIONSINI	ODMATIC	N COD TH	IC COLUDA		
	SOURCE OF	EVEN OF	URMATIC	NFURIH	IS SOURCE	E-控制的路排列。	NAME OF THE PARTY
	EMISSION					EMSSIONS	
HAZARDOUS AIR POLLUTANT AND CAS NO.	FACTOR	(AFTER CONTE			ROLS/LIMITS)	(AFTER CONTR	ROLS / LIMITS)
N/A	TACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
	1						
	_						
TOXIC AIR POLLUTA	NTEMISSIO	NSINEAD	MATIONE	OD TUIN	AUDA		
INDICATE EXPECTE	DACTUAL EN	COLONIC AL	MATIONE	UK IHIS S	OURCE		<b>最后的对于</b>
TOXIC AIR POLLUTANT AND CAS NO.	EF SOURCE						
V/A	EF SOURCE	ib/	nr	lb/c	lay	lb/s	yr
	+						
	t.						
	1						
	1						
attachments: (1) emissions calculations and supporting de	(0) 1 . 11						
Attachments: (1) emissions calculations and supporting documentation lescribe how these are monitored and with what frequency; and (3) do	; (2) indicate all re	quested state a	nd federal enforce	eable permit lin	nits (e.g. hours of	f operation, emiss	sion rates) and
COMPLETE THIS FORM AND COMPLETE AT	Additional	Sheete A	RIATE B17	HKOUGH	B9 FORM	OR EACH	SOURCE

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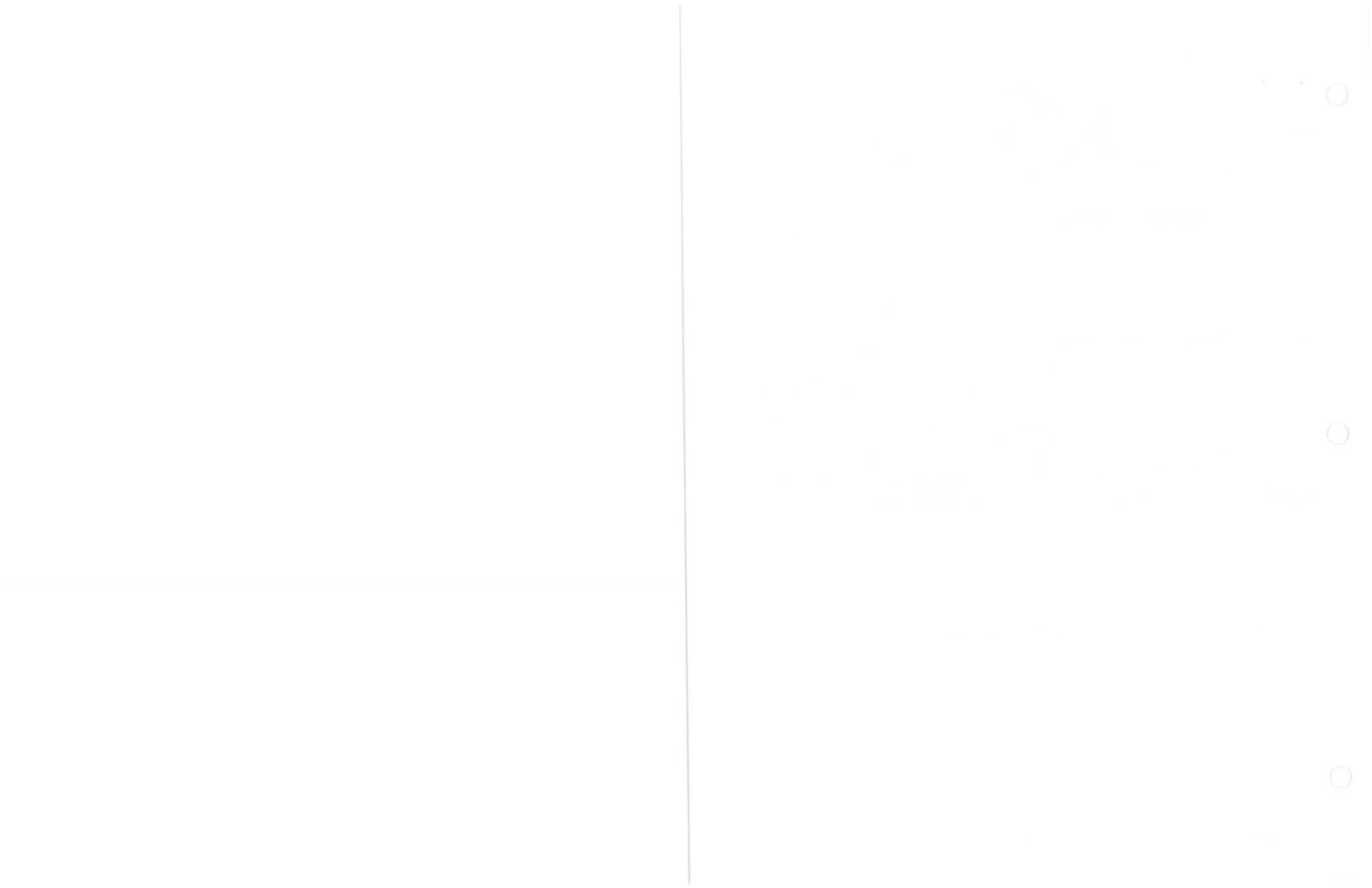
## FORM B9 EMISSION SOURCE (OTHER)

EMISSION SOURCE DESCRIPTION:	CDENK/Division of Air Quali	ty - Applicati	on for Air Permit to Construct/Oper	rate	B9
EMISSION SOURCE DESCRIPTION:	Finished Product Hand	lling			
OPERATING SCENARIO: 1	OF 1		CONTROL DEVICE ID NO(S):	CD-FPH-BF	
DESCRIBE IN DETAIL THE PROCESS (AT			EMISSION POINT (STACK) ID NO	O(S): <b>EP-8</b>	
Collection of transfer points, pel	let screening operations, and	d pellet conv	eying.		
MATERIALS ENTERING PRO	CESS - CONTINUOUS PROCE	22	MAX. DESIGN	DECUEST	
TYPE		UNITS	CAPACITY (UNIT/HR)	1	ED CAPACITY
Dried Wood		ODT	74.94	LIMITATIO	N(UNIT/HR)
		- ODI	14.94		
			+		
			<del> </del>		
			+		
			-		
MATERIAL'S ENTERING OR	OCESS - BATCH OPERATIO	N I THE RESIDENCE OF THE PARTY			
TYPE	CESS - BATCH OPERATIO			REQUESTE	D CAPACITY
11/5		UNITS	CAPACITY (UNIT/BATCH)	Limitation (	UNIT/BATCH)
AXIMUM DESIGN (BATCHES / HOUR):					
EQUESTED LIMITATION (BATCHES / HO	UR):	(BATCHES/Y	R):		
JEL USED: N/A			MUM FIRING RATE (MILLION BTU/	IR): N/A	
AX. CAPACITY HOURLY FUEL USE:	N/A	REQUESTED	CAPACITY ANNUAL FUEL USE:	N/A	
OMMENTS:				N/A	
	Attach Additio	mal Ob			

Attach Additional Sheets as Necessary

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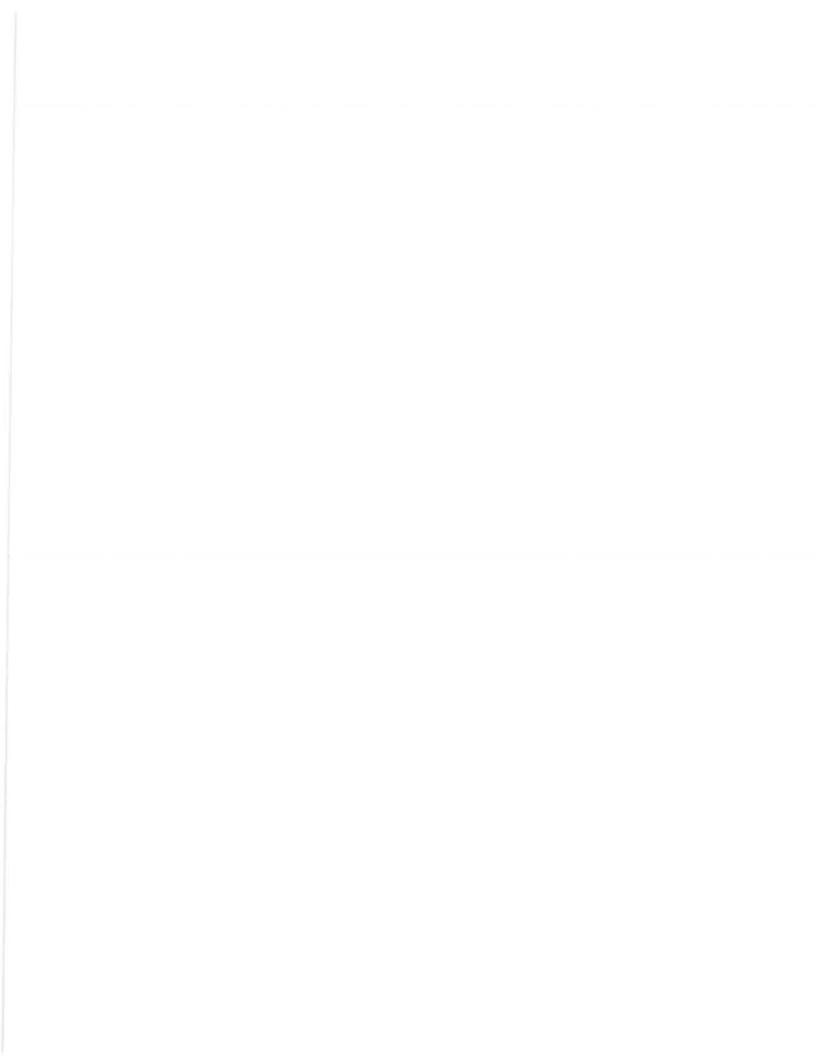


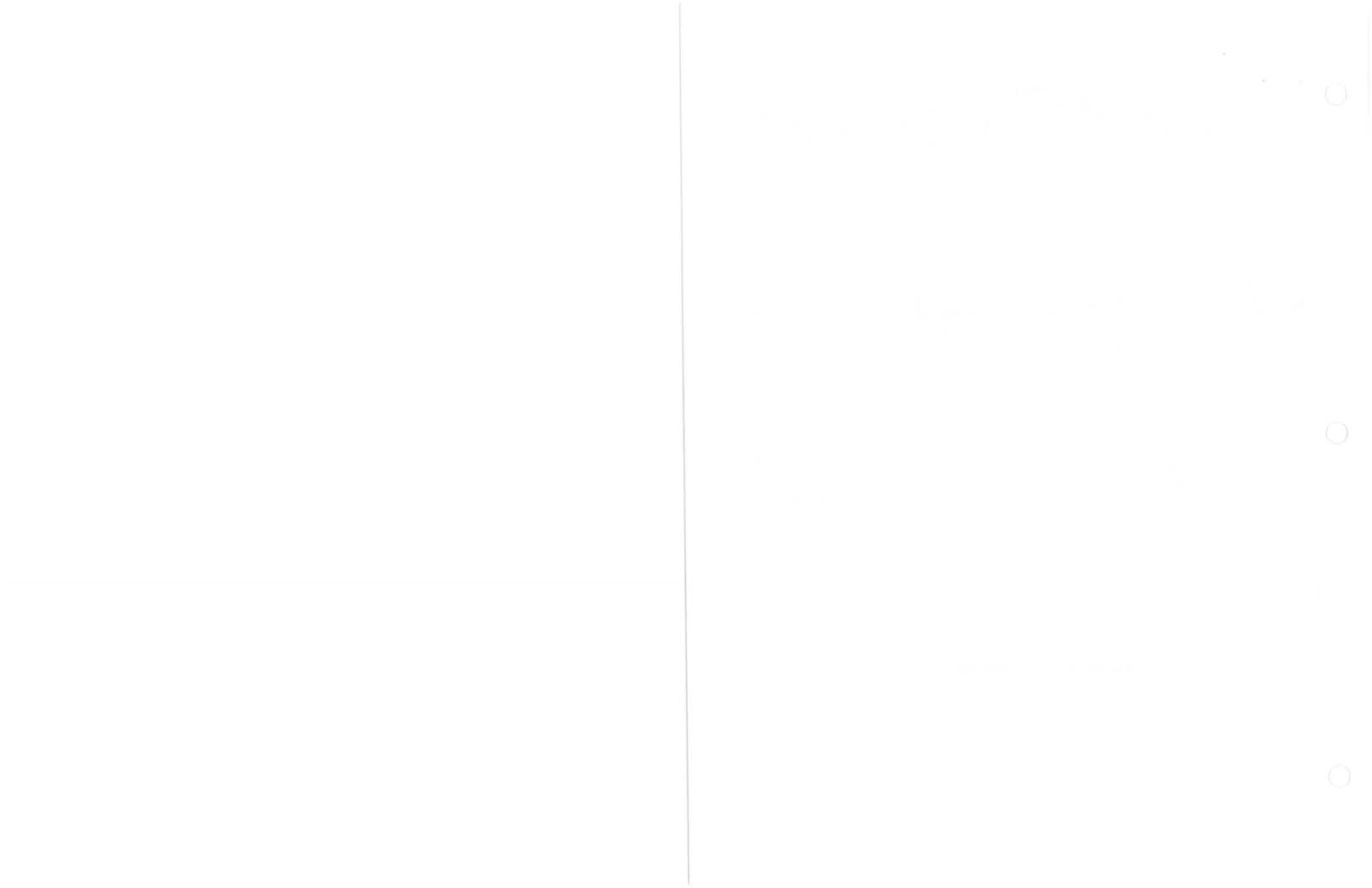


## FORM B6 EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 12/01/01	NCDENR/Div	ision of Air Q	uality - Applicati	on for Air Permit to C	onstruct/Operate	B
EMISSION SOURCE DESCRIPTION	ON: Pellet Loado	ut Bins		EMISSION S	OURCE ID NO:	ES-PB1 & 2
ODER LINE COLUMN				CONTROL D	EVICE ID NO(S):	CD-FPH-BF
OPERATING SCENARIO:	1	OF	_1		OINT(STACK) ID NO(S):	EP-8
DESCRIBE IN DETAIL THE PROC Pellet loadout bins are us The bins will be used for	sed to store pellets	for shipping	Pellets are the	n loaded from the bin	s into trucks/train in the	three peliet loadout area
MATERIAL STORED: Pellet Pe	roduct			DENSITY OF MATER	PIAL /I B/ET?)-	40
CAPACITY	UBIC FEET:			TONS:	VIAL (COIT 13).	40
	EIGHT:	DIAMETER:	12 (OR)	LENGTH:	WIDTH: HEIC	NUT.
ANNUAL PRODUCT THROU	GHPUT (TONS)	ACTUAL:			SIGN CAPACITY:	71.19 ODT/hr
PNEUMATICALLY FILL	The state of the s	*	CHANICALLY F	LLED		ED FROM
● BLOWER ● COMPRESSOR ● OTHER:	0	SCREW COI BELT CONV BUCKET ELI OTHER:	EYOR	MOTOR HP:	RAILCAR TRUCK STORAGE PIL	
NO. FILL TUBES:		OTTICIN.			OTHER:	Conveyor
MAXIMUM ACFM: 750 each						
BY WHAT METHOD IS MATERIAL	UNLOADED FROM	I SILO?				
MAXIMUM DESIGN FILLING RATE	OF MATERIAL (TO	NS/HR):				
MAXIMUM DESIGN UNLOADING F						
COMMENTS:						
	A	ttach Add	itional Shee	ts As Necessary	/	

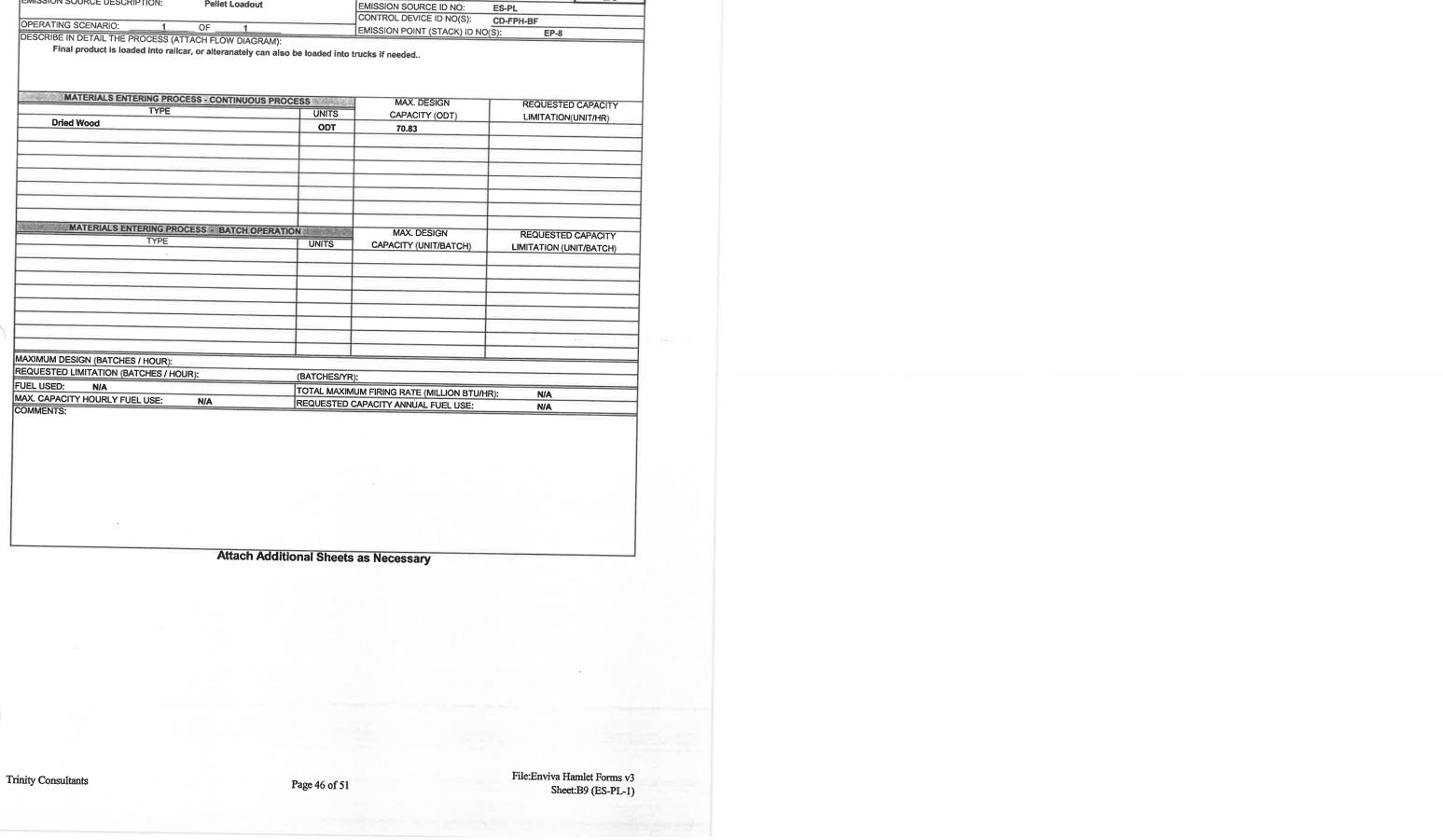
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Sheet:B6 (ES-PB-1 2)





## FORM B9 EMISSION SOURCE (OTHER)

REVISED: 12/01/01 NCDENR/Division of Air Qua		n for Air Permit to Construct/Ope	rata	DO.
EMISSION SOURCE DESCRIPTION: Pellet Loadout	у тфритаци	EMISSION SOURCE ID NO:	B9	
	CONTROL DEVICE ID NO(S):	ES-PL CD-FPH-BF		
OPERATING SCENARIO: 1 OF 1		EMISSION POINT (STACK) ID NO	O(S): EP-8	
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):			5(5). EF-6	
Final product is loaded into railcar, or alteranately can also	be loaded into	trucks if needed		
MATERIALS ENTERING PROCESS - CONTINUOUS PROC	CESS	MAX. DESIGN	PEOUECTE	CARACITI
TYPE	UNITS	CAPACITY (ODT)	REQUESTED	
Dried Wood	ODT	70.83	LIMITATION	UNIT/HR)
	OBI	70.83	<del> </del>	
	_		-	
	-			
	-			
	-			
MATERIALS ENTERING PROCESS - BATCH OPERATIO				
TYPE		MAX. DESIGN	REQUESTED	
11110	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (U	NIT/BATCH)
MAXIMUM DESIGN (BATCHES / HOUR):				
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR	():		
FUEL USED: N/A	TOTAL MAXIM	IUM FIRING RATE (MILLION BTU/I	HR): N/A	
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED	CAPACITY ANNUAL FUEL USE:	N/A	
COMMENTS:			IVA	
		0		
Attack Addition				
Altach Addition	onai Sneets	as Necessary		



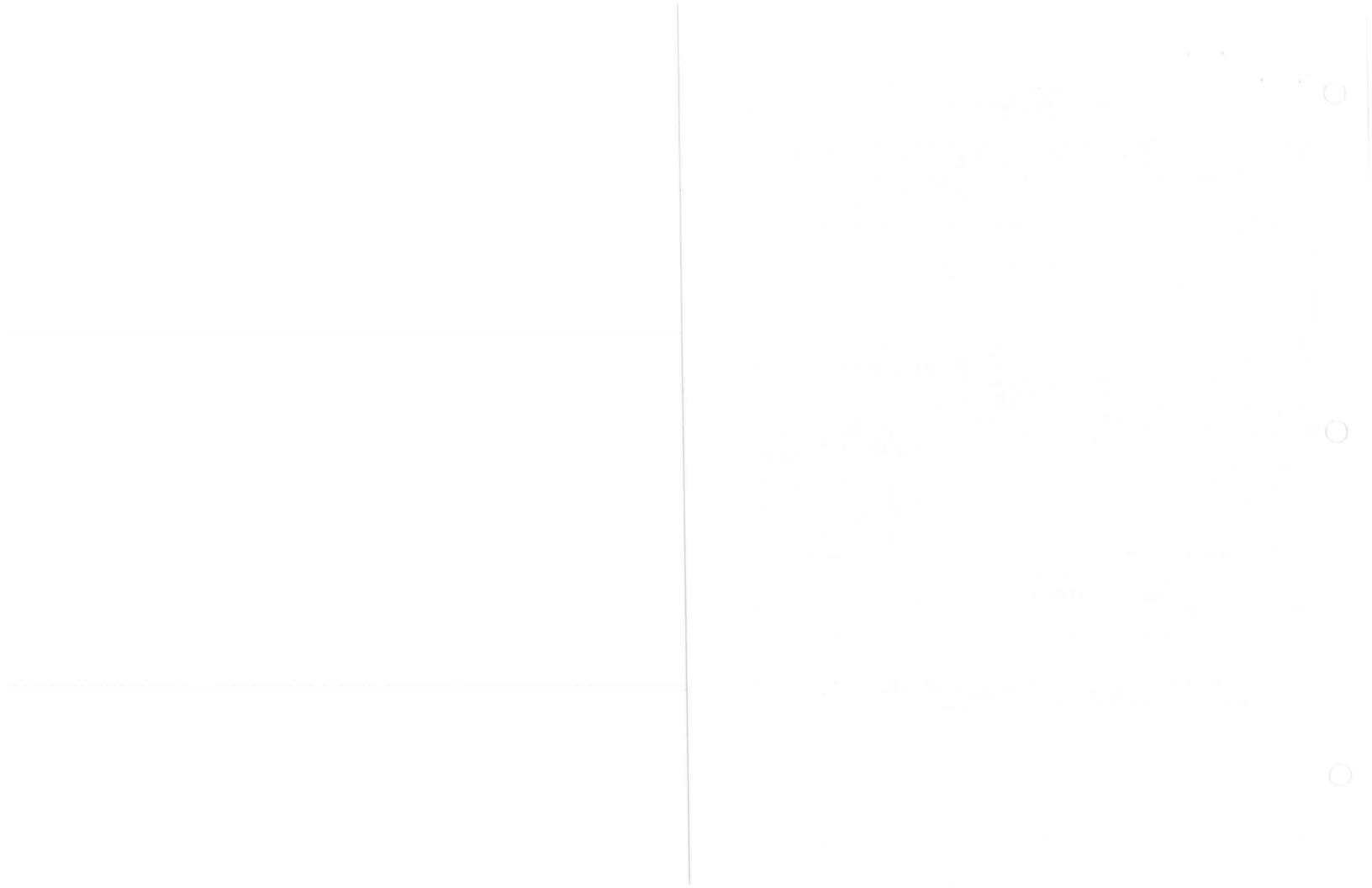
	CON.		RM C1 CE (FABRIC F	II TED\			
REVISED 12/01/01	NCDENR/Divi	ision of Air Quality	- Application for Air	TLI⊑K) r Permit to Co	nstruct/Onerate		C
CONTROL DEVICE ID NO: CD-FBH-		1					10
EMISSION DON'T JOTA OLS IS ALS	BF EP-8	POSITION IN SE	SSIONS FROM WHIC RIES OF CONTROLS	CH EMISSION			PB-1 & 2, ES-PL
MANUFACTURER: Aircon		Tr COTTION IN SE	MODEL NO:		N	O. 1 OF	1 UNITS
DATE MANUFACTURED: TBD			PROPOSED OPER	TBD			
OPERATING SCEN	ARIO:	Name of the Partie of the	PROPOSED STAR	T CONSTRUC	ZQ2014	TBD	
1_OF1_			P.E. SEAL REQUIP				é NO
DESCRIBE CONTROL SYSTEM:			-		7	TES	9 110
This bagfilter will be utilized to control particulate loading finished product from the bins into the rail	form the finished cars or trucks.	f product handling	j pellet coπveyers ar	nd screens, as	well as the pellet lo	ad out operation	1 consisting of
POLLUTANT(S) COLLECTED:			PM	PM-10	DM 0.5		
BEFORE CONTROL EMISSION RATE (LB/HR):					PM-2.5		_
CAPTURE EFFICIENCY:			See calculations in	Appendix B			_
CONTROL DEVICE EFFICIENCY:			<del></del>	~99.9	99.9	9 %	_%
			%		_%	%	_ %
CORRESPONDING OVERALL EFFICIENCY:			%		%	_%	%
EFFICIENCY DETERMINATION CODE:					=?		_
TOTAL EMISSION RATE (LB/HR):			See calculations in	Appendix B			_
PRESSURE DROP (IN. H <sub>2</sub> 0): MiN: MAX: 6"		GAUGE?			ARNING ALARM?	d(ven )	-
BULK PARTICLE DENSITY (LB/FT <sup>3</sup> ):	1.43E-05		INLET TEMPERATU			YES	NO
POLLUTANT LOADING RATE: 0.10	d LB/HR	d GRAP3	OUTLET TEMPERA				
INLET AIR FLOW RATE (ACFM): 35,500	0		FILTER MAX OPER	ATING TEMP	°F): N/A		
NO. OF COMPARTMENTS:	NO. OF BAGS	PER COMPARTME	NT:	THIT TENIN ,	LENGTH OF BAG (	IN.): 144	
DIAMETER OF BAG (IN.): 5.75	DRAFT:	<b>₫</b> INDUCED/NE		POS	FILTER SURFACE		4,842
AIR TO CLOTH RATIO: 7.30 DESCRIBE CLEANING PROCEDURES:	FILTER MATER	RIAL: Polyester or	equivalent		€ WOVEN	d FELTI	
# AIR PULSE						E SIZE DISTRIE	SUTION
d REVERSE FLOW		SONIC			SIZE	WEIGHT %	CUMULATIVE
MECHANICAL/SHAKER		SIMPLE BAG C			(MICRONS)	OF TOTAL	%
OTHER		RING BAG CO	ELAPSE		0-1	Unk	nown
DESCRIBE INCOMING AIR STREAM:					1-10		
he air stream will contain wood dust particles.					10-25		
		i			25-50		
					50-100		
					>100	TOTA	L = 100
METHOD FOR DETERMINING WHEN TO CLEAN:						1017	.2 = 100
AUTOMATIO & TIMED	d MANUAL						
ETHOD FOR DETERMINING WHEN TO REPLACE T							
PECIAL CONDITIONS: None	N	VISIBLE EMISSI	ON & OTH	IER			
MOISTURE BLINDING CHEMICAL EXPLAIN:			€ OTHER				
ESCRIBE MAINTENANCE PROCEDURES: Per man	ufacturer recomi	mendations					
N A SEPARATE PAGE, ATTACH A DIAGRAM SHOW	ING THE RELAT	IONSHIP OF THE	CONTROL DEVICE T	TO ITS EMISSIO	ON SOURCE(S):		

Attach Additional Sheets As Necessary

Trinal equipment selection has not yet occurred but will be similar in design to specifications shown.

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File:Enviva Hamlet Forms v3 Sheet:C1 (ES-FBH-BF)



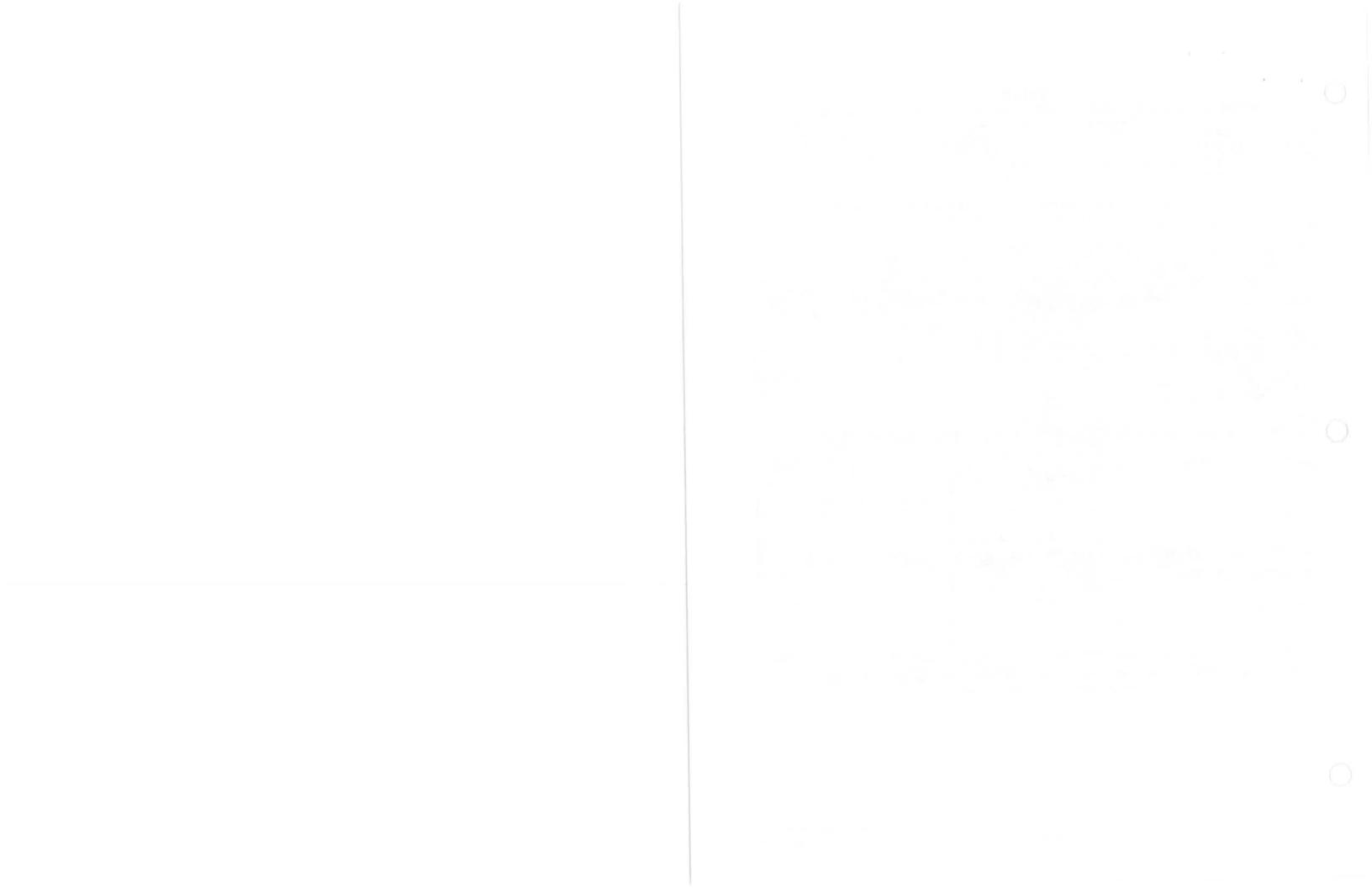
Source Specific Forms - Emergency Generator & Fire pump

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Y.	
v.	
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FORM B
SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 NCDENR/Division	of Air Quality	Annlication	for Air Bormi	tto Construe	K ALL SC	JUKCES)	
EMISSION SOURCE DESCRIPTION:		Application					В
Emergency Generator (250 bhp)			CONTROL	SOURCE ID N	10:	ES-EG	
OPERATING SCENARIO 1 OF	1		CHUCOLONI	DEVICE ID NO	)(S):	N/A	
DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS	S (ATTACH EL	OW DIACRAI	41.	POINT (STAC	K) ID NO(S):	EP-4	
Diesel-fired internal combustion generator to provide po	wer in the cas	e of an emer	n).				
	043	c or all elliers	Jency.				
TYPE OF EMISSION SOURCE (CHECK A	ND COMPLET	E APPROPRI	ATE FORM E	1 DO ON THE	E EOL L OWING	D DAGES	
ILI Codi, 1100d, Oil, gas, Other Duffler (FOITH BT)   TWOODW	orkina (Form B	4)	Manufac	of obemise	s/coatings/ink	FAGES):	
Int.combustion engine/generator (Form B2) Coating	/finishing/printi	na (Form B5)	Incinere	tion (Form B8	s/coaungs/ink	s (Form B/)	
	silos/bins (For	m B6)	Other (F		,		
START CONSTRUCTION DATE: TBD OPERATION		TBD					
MANUFACTURER / MODEL NO.: TRD			OP. SCHEDU	JFACTURED:	2/2/11/	TBD	
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?): IIII	NESHAR	(SUBPART?	OP. SCHEDU		VDAY 7	DAY/WK5	2 WK/YR
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB	25% MAR-I		JUN-AUC	3 25%	JBPART?): Z		
EXPECTED ANNUAL HOURS OF OPERATION 500	VISIBLE STA	CK EMISSION	IS HAIDED N	ODMAL ODE	SEP-NOV	-470	D. Comp. d
CRITERIA AIR POLLUTA	INT EMISSI	ONS INFO	RMATION	FOR THIS	RATION: <2	20 % OPAC	HY
	SOURCE OF	FYPECTE	DACTUAL				
	EMISSION	(AFTER CONTI		/BEEODE CON	TROLS / LIMITS)	EMSSIONS	
AIR POLLUTANT EMITTED	FACTOR	lb/hr	tons/yr	/b/hr	tons/yr		ROLS / LIMITS)
PARTICULATE MATTER (PM)	See Emission	n Calculation	s in Appendi	x B	toris/yr	lb/hr	tons/yr
PARTICULATE MATTER<10 MICRONS (PM <sub>10</sub> )			- mr quiremen				
PARTICULATE MATTER<2.5 MICRONS (PM2.5)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
OTHER							
HAZARDOUS AIR POLLU	ANT EMISS	SIONS INF	ORMATIO	V FOR THI	SSOURCE	ATTICATION OF THE	THE REAL PROPERTY.
	SOURCE OF	EXPECTED			POTENTIAL	EMSSIONS	
HAZARDOUS AIR POLLUTANT AND CAS NO.	EMISSION	(AFTER CONTR		(BEFORE CONT		(AFTER CONTR	ROLS / LIMITS)
THE STATE OF THE S	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
	See Emission	Calculations	in Appendi	(B			
TOXIC AIR POLLUTAN	TEMISSION	IS INFORM	ATION FO	R THIS SC	HPCE	SOURCE AND ADDRESS	TAUNSTON
INDICATE EXPECTED.	ACTUAL EMISS	SIONS AFTER	CONTROLS	/ IMITATIO	VC	ACCOUNT OF THE PARTY OF THE PAR	以中国的特别下至50mm(1)和
OAIC AIR POLLUTANT AND CAS NO.	EF SOURCE	lb/h	or I	lb/d		lb.6	100
	See Emission	Calculations	in Appendix	В	ay	lb/y	/T
Hachmente: (1) emissions coloulations and							
ttachments: (1) emissions calculations and supporting documentation; (7) escribe how these are monitored and with what frequency; and (3) describe	2) indicate all requ	ested state and	federal enforce	able permit limit	(e.g. hours of o	peration, emission	on rates) and
escribe how these are monitored and with what frequency; and (3) describe how these are monitored and with what frequency; and (3) describe how these are monitored and with what frequency; and (3) describe how these are monitored and with what frequency; and (3) describe how these are monitored and with what frequency; and (3) describe how these are monitored and with what frequency; and (3) describe how these are monitored and with what frequency; and (3) describe how these are monitored and with what frequency; and (3) describe how these are monitored and with what frequency; and (3) describe how these are monitored and with what frequency; and (3) describe how the fr	noe any monitorin	g devices, gaug	es, or test ports	for this source.			
COMPLETE THIS FORM AND COMPLETE AND	dditional 9	arrkurki	AIE B1 TI	HKUUGH E	9 FORM F	OR EACH S	SOURCE
Augen A	MALAILICHTAL :	STIMOTE AC	NACACCA	1873.7			

File:Enviva Hamlet Forms v3 **Trinity Consultants** Page 48 of 51 Sheet:B (ES-GN)



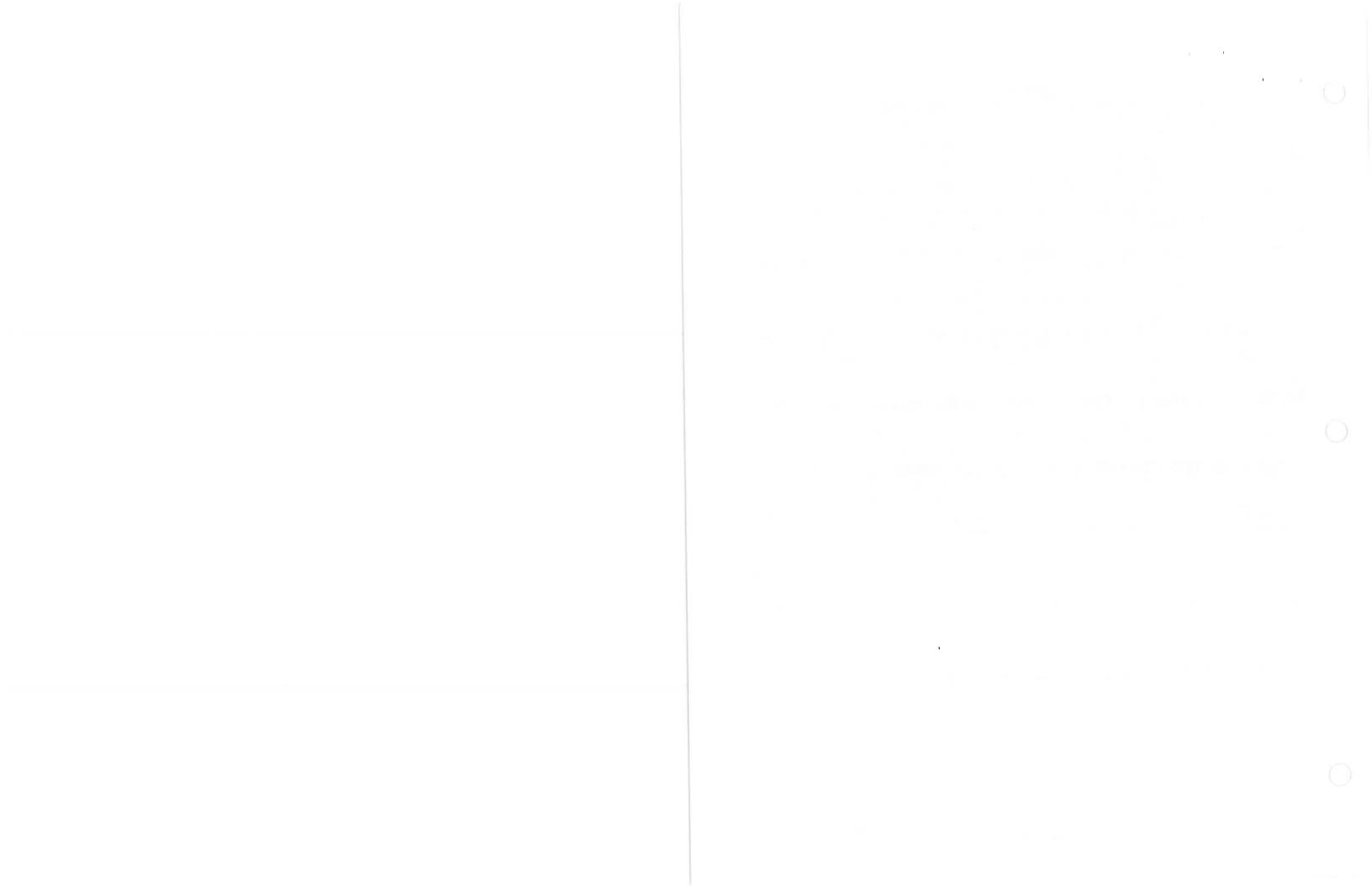
### FORM B2 EMISSION SOURCE (INTERNAL COMBUSTION ENGINES/GENERATOR

REVISED 12/01/01	NCDENR/Division of	Air Qual	ity - Application for Air Per	N ENGINES/GE	NERATORS)		
EMISSION SOURCE DESCRIPTION	: Emergency Generator (	250 bhp	A Approach to All Fer				B2
		Loo biip	<b>,</b>	EMISSION SOURCE I		ES-GN	
OPERATING SCENARIO:	1 OF	1		CONTROL DEVICE ID		N/A	
CHECK ALL THAT APPLY	EMERGENCY	> e	SPACE HEAT	EMISSION POINT (ST	ACK) ID NO(S):	EP-4	
<u> </u>	PEAK SHAVER		OTHER (DESCRIBE):				
GENERATOR OUTPUT (KW):		ANTICIP	ATED ACTUAL HOURS OF	OPERATION AS PEAK	SHAVER (HRS/YR)		
TYPE ICE: GASOLINE ENGIN							
TYPE ICE: GASOLINE ENGIN		SINE UP	TO 600 HP DIESI	L ENGINE GREATER	PROPERTY OF THE PROPERTY OF	DUAL FUEL	ENGINE
ENGINE TYPE RICH BUF EMISSION REDUCTION MODIFICAT	IONS UEAN BURN		N/A ) G RETARD ₫ PREIG	(complete below		OTHER.	
OR STATIONARY GAS TUR	BINE (complete below)		NATURAL GAS PIPELINE	COMPRESSOR OF THE	MBUSTION 0	OTHER	
FUEL: MATURAL GAS		ENGINE	TYPE: 2-CYCLE LE	AN RIPN ACV	CLE LEAN	(OW)	A CONTRACTOR
OTHER (DESCRIBE):			4-CYCLE RI		ER (DESCRIBE):	TURBINE	
CYCLE: COGENERATION		CONTRO		ON MODIFICATIONS (D	PSCRIBE):		
REGENERATIVE		NONS	SELECTIVE CATALYTIC REI	DUCTION & SELE	CTIVE CATALYTIC	REDUCTION	
	TEAM INJECTION	d CLEA	N BURN AND PRECOMBUS	TION CHAMBER	UNCONTROL		
UNCONTROLLED	LEAN-PREMIX						
	FUEL US	AGE (II	CEUDE STARTUP/BA	ACKUP FUEL)		NAME OF STREET	Translate (
FUEL TYPE	UNITS		MAXIMUM DESIGN		REQUESTED CAR	PACITY	
No. 2 Fuel Oil		_	CAPACITY (UNIT/HR	)	LIMITATION (UN	IT/HR)	
NO. 21 del On	gal		6.55		6.55		
SSA BUT WILLIAM TO ME TO THE PROPERTY TO	FUEL CHARACTER	ISTICS	(COMPLETE ALL TH	AT ADE ADDITION	VIII-VIII-VIII-VIII-VIII-VIII-VIII-VII		
			TOOMI LETE ALL TH	AT ARE APPLICAL		<b>安全是一个</b>	
FUEL TYPE	BTU/UNIT	- 1	UNITS		SULFUR CON		
No. 2 Fuel Oil	19,300		lb		(% BY WEIGHT)		
			10		<15 ppmw		
ATTEMPT ATTEMP	MANUFACTURER'S	S SPEC	CIFIC EMISSION FACT	ORS (IF AVAILAB	F) seed here	<b>以在2000年月</b> 日	NEW YORK
POLLUTANT	NOX	C	O PM	PM10	VOC	ГОТ	HER
EMISSION FACTOR LB/UNIT						-	That Y
UNIT							
DESCRIBE METHODS TO MINIM	IZE VISIBLE EMISSION	S DURI	NG IDLING, OR LOW LO	AD OPERATIONS:			
Periodic equipment maintenance will	minimize opacity by folio	wing ma	Inufacturers specification	of Common industry or	acticae		
				or deminion industry pr	actices.		
				:			
COMMENTS:							
CANATALIA (2)							
							1
	Asc >	A . T . 17 :					
	Attach	Addit	ional Sheets As Nec	essarv			

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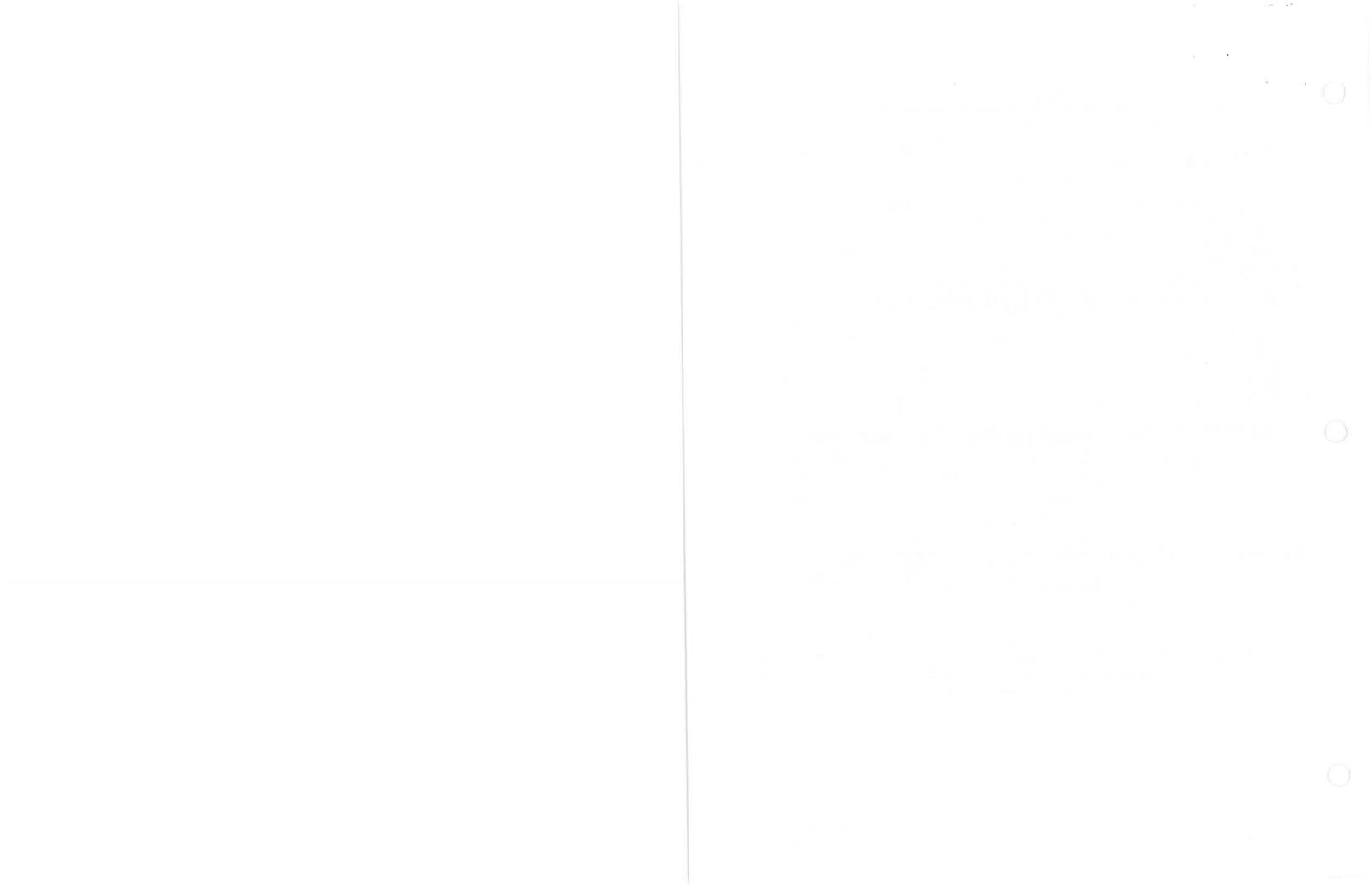


FORM B
SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 NCDENR/Division of	of Air Quality -			to Construc		OKCES)	В
EMISSION SOURCE DESCRIPTION:				SOURCE ID N		EC EWD	Ь
Fire Water Pump (250 bhp)				DEVICE ID NO		ES-FWP	
OPERATING SCENARIO 1 OF	1		EMISSION			N/A	
DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS	(ATTACH EL	DW DIACDAR	IEMISSION I	POINT (STAC	K) ID NO(S):	EP-5	
Diesel-fired internal combustion pump to provide water in	the case of a	Siro amazza	ny:				
parties provide nater a	tilo case of a	i ine emerge	ncy.				
TYPE OF EMISSION SOURCE (CHECK A	NO COMPLET	FADDDODDI	ATE EODIN D	4 DO ON THE	- 501 1 0144116		
Coal,wood,oil, gas, other burner (Form B1) Woodw	orking (Form B	A)	Manufac	1-DS ON INC	FULLOWING	PAGES):	
Int.combustion engine/generator (Form B2) Coating	finishing/printir	+) (5 DE)	Manurad		s/coatings/inks	s (Form B7)	
	niciisaing/printir	ng (rorm 85)		tion (Form B8	) .		
	silos/bins (For		Other (F				
	V DATE:	TBD		FACTURED:		TBD	
MANUFACTURER / MODEL NO.: TBD IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?): IIII		EXPECTED	OP. SCHEDU				52 WK/YR
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB	NESHAF	(SUBPART?			JBPART?):_ <b>Z</b> Z	77	
EXPECTED ANNUAL HOURS OF OPERATION 100	25% MAR-	MAY 25%	JUN-AUC	25%	SEP-NOV	25%	
EXPECTED ANNOAL HOURS OF OPERATION 100	VISIBLE STA	CK EMISSIOI	NS UNDER N	ORMAL OPE	RATION: <2	0 % OPA	CITY
CRITERIA AIR POLLUT	INT EMISSI	ONS INFO	RMATION	Foreils	SOURCE		ALTERNATION OF
	SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	<b>EMSSIONS</b>	
AIR POLLUTANT EMITTED	EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	TROLS / LIMITS)
PARTICULATE MATTER (PM)	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM) PARTICULATE MATTER (10 MICRONS (PM <sub>10</sub> )	See Emission	n Calculation	s in Appendi	xВ			
PARTICULATE MATTER (10 MICRONS (PM <sub>10</sub> )							
PARTICULATE MATTER<2.5 MICRONS (PM <sub>2.5</sub> ) SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							
HAZARDOUS AIR POLLU		SIONS INF	ORMATIO	NEO: THE	SSOURCE		12 CONT. SHO
	SOURCE OF	EXPECTED	ACTUAL		POTENTIAL		
HATABARIA AIR AIR AIR AIR AIR AIR AIR AIR AIR	EMISSION (AFTER CONTROLS / LI		ROLS / LIMITS)	(BEFORE CONT	ROLS / LIMITS)		ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT AND CAS NO.	FACTOR	- lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
	See Emission	Calculation	s in Appendi	сВ			15.16.7.
			_				
TOXIC AIR POLLUTAN	T EMISSION	VS INFORM	NATION FO	R THIS SC	DURCE	Section 1	LABORATE HALL
INDICATE EXPECTED	ACTUAL EMIS	SIONS AFTE	R CONTROLS	S/LIMITATIO	NS		
TOXIC AIR POLLUTANT AND CAS NO.	EF SOURCE	lb/l		lb/c	lay T	lb/	vr
	See Emission	Calculations	In Appendix	В			<i>y</i> -
Attachments: (1) emissions calculations and supporting documentation; (i	2) indicate all requ	uested state and	federal enforce	able permit limit	s (e.a. hours of o	peration emise	ion rates) and
COMPLETE THIS FORM AND COMPLETE AND	ATTACH	APPROPR	ATE B1 T	HROUGH E	39 FORM F	OR EACH	SOURCE
Attach A	Additional !	Sheets As	Necess	PV			

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-	4 444	u.	, CO1	our	wiiw



FORM B2
EMISSION SOURCE (INTERNAL COMBUSTION ENGINES/GENERATORS)

REVISED 12/01/01	NCDENR/Division of Air Qu	ality - Application	on for Air Permi	t to Construct/Operat	le	B2
EMISSION SOURCE DESCRIPTION: Fire Water Pump (250 bhp)				MISSION SOURCE ID		ES-FWP
				CONTROL DEVICE ID		N/A
OPERATING SCENARIO:	1OF1			MISSION POINT (STA		EP-5
CHECK ALL THAT APPLY	PEAK SHAVER	SPACE HEAT OTHER (DES	Τ	ELECTRICAL G		LITS
GENERATOR OUTPUT (KW):	ANTIC	PATED ACTUAL	L HOURS OF O	PERATION AS PEAK	SHAVER (HRS/YR)	
ENGINE OUTPUT (HP):					siawen jintorny.	
TYPE ICE: J. GASOLINE ENGIN	)B):	AND THE RESERVE	DIESEL	ENGINE GREATER T		DUAL FUEL ENGINE
ENGINE TYPE RICH BUF		N/A)				
EMISSION REDUCTION MODIFICAT			PREIGNI	ITION CHAMBER COM	IBUSTION &	OTHER
OR STATIONARY GAS TUR		NATURAL GA	AS PIPELINE CO	MPRESSOR OF TUE	BINE (complete bel	iow)
FUEL: NATURAL GAS OTHER (DESCRIBE):	● OIL ENGIN	IE TYPE:	2-CYCLE LEA			TURBINE
CYCLE: COGENERATION	SIMPLE CONTI		4-CYCLE RICE	H BURN 🖞 OTHE	R (DESCRIBE):	
REGENERATIVE		ROLS:	COMBUSTION	MODIFICATIONS (D	ESCRIBE):	
	TEAM INJECTION	NSELECTIVE CA	TALYTIC REDU	JCTION & SELE	CTIVE CATALYTIC	
UNCONTROLLED	LEAN-PREMIX	EAN BURN AND F	PRECOMBUSTI	ON CHAMBER	Ø UNCONTROL	LED
White the state of	FUEL USAGE	INCHINE ST		NUD FUELD		
	I DEL OGAGE			KUP FUEL)	FORMALING LIM	MATERIAL STREET, STREE
FUEL TYPE	UNITS		NUM DESIGN		REQUESTED CAP	
No. 2 Fuel Oil		CAFACI	ITY (UNIT/HR)	T/HR) LIMITATION (		IT/HR)
110. 21 del Oil	gal		6.55		6.55	
CONTRACTOR AND A PROPERTY OF THE PARTY OF TH	FUEL CHARACTERISTIC	25/COMPLE	TT ALL OT CA	Tienellen	VII IV	
A CONTRACTOR OF THE PROPERTY O	I OLL CHARACTERISTR	STOWPLE	IE ALL IHA	I ARE APPLICAE		是MEDITED TO
FUEL TYPE	BTU/UNIT	1	UNITS		SULFUR CON	
No. 2 Fuel Oil	19,300				(% BY WEIGH	iT)
7701 11 11 11 11 11	19,300	- lb			<15 ppmw	
<b>加克斯尔马斯克尔</b> 斯尔斯克	MANUFACTURER'S SP	ECIEIC EMISS	SIGN EACTO	DOVIDANAHIADI	Providence and the second	
POLLUTANT	NOX	CO LWIS	PM			
EMISSION FACTOR LB/UNIT	HOX	-	PM	PM10	VOC	OTHER
UNIT						
DESCRIBE METHODS TO MINIM	IZE VISIBLE EMISSIONS DU	RING IDLING, (	OR LOW LOAI	D OPERATIONS:		
Periodic equipment maintenance wil	I minimize opacity by following	manufacturers s	specification or	common industry pra	actices.	
,						
COMMENTS:						
	Attach Adv	ditional Shor	oto Ao Nas-			

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APPENDIX B - EMISSIONS CALCULATIONS

## TABLE B-1 PSD APPLICABILITY SUMMARY ENVIVA PELLET HAMLET, LLC

Source	Unit	00	NOX	TSP	PM-10	PM-2.5	802	VOC	Po	Ó	CO <sub>2e blomass</sub>
Description	<b>a</b>	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	deterral (tpy)
Dryer System	ES-DRYER	73.29	160.37	33.03	33.03	33.03	17.57	1.030.69	0.00	162 119	3 341
Emergency Generator	ES-EG	0.36	0.41	0.02	0.02	0.02	0.0002	0.41	, '	67	75
Fire water Fump	ES-FWP	0.36	0.41	0.02	0.02	0.02	0.0002	0.41	,	67	6 6
Backup Chipper	ES-CHIP-2	1.87	3.42	0.11	0.11	0.11	0.001	3.42	,	347	347
Hammermills/ Hammermill Area	ES-HM-1 thru 8/ ES-HMA	1	ţ	15.20	15.20	15.20	1	204.08	•	•	
Pellet Mill Feed Silo	ES-PMFS	1	t	0.28	0.28	0.28		,	1		
Pellet Mill Fines Bin	ES-PFB	1	,	0.41	0.41	0.41	1			•	•
Pellet Presses and Coolers	ES-CLR1 thru -6	1	1	94.61	16.56	1.89	' '	- 25 099	+ 1	•	•
Log Bark Hog	ES-BARKHOG							0.40		•	1
Log Chipping	ES-CHIP-1	4	ı	•	•	•		7.7			
Green Wood Hammermills	ES-GHM-1, ES-GHM-2	•	'	25.86	1,81	0.21	ī	316.25		•	'
Finished Product Handling/ Pellet Loadout Bins/ Pellet Loadout Area	ES-FPH/ ES-PL/ ES-PB-1 & 2	•	,	4.00	3.64	2.20	1			( t	1 1
Paved Roads		,	•	1 38	000	100					
Unpaved Roads		•		3 11	0 0	70.0	,	ı			•
Green Wood Sizing & Handling	IES-GWH	1		0.014	67.0	0.00		1		•	1
Green Wood Storage Piles	IES-GWSP1 & 2	•	,	0.010	0.000	0.001	ŀ	•	4	1	ı
Diesel Storage Tanks	TK1, TK2, & TK3	•	1 1	14:1	7.0		l i	1.11 7.57E-03			
	Project Emissions	75.88	164.61	179.46	72.86	53.62	Т	2 210	98	123 600	
PSD S	PSD Significant Emission Rate	100	40	25	15	10	40	4	0.60	75.000	278,5
	PSD Review Required	ž	Yes	Yes	Yes	Yes	°Z	Yes	Z	Voe	2000

1.  $CO_{2e}$  does not include  $CO_2$  from biomass combustion.

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Enviva Hamlet, Richmond County Emission Calculations and BACT v6 submittal to DAQ PSD Permitting

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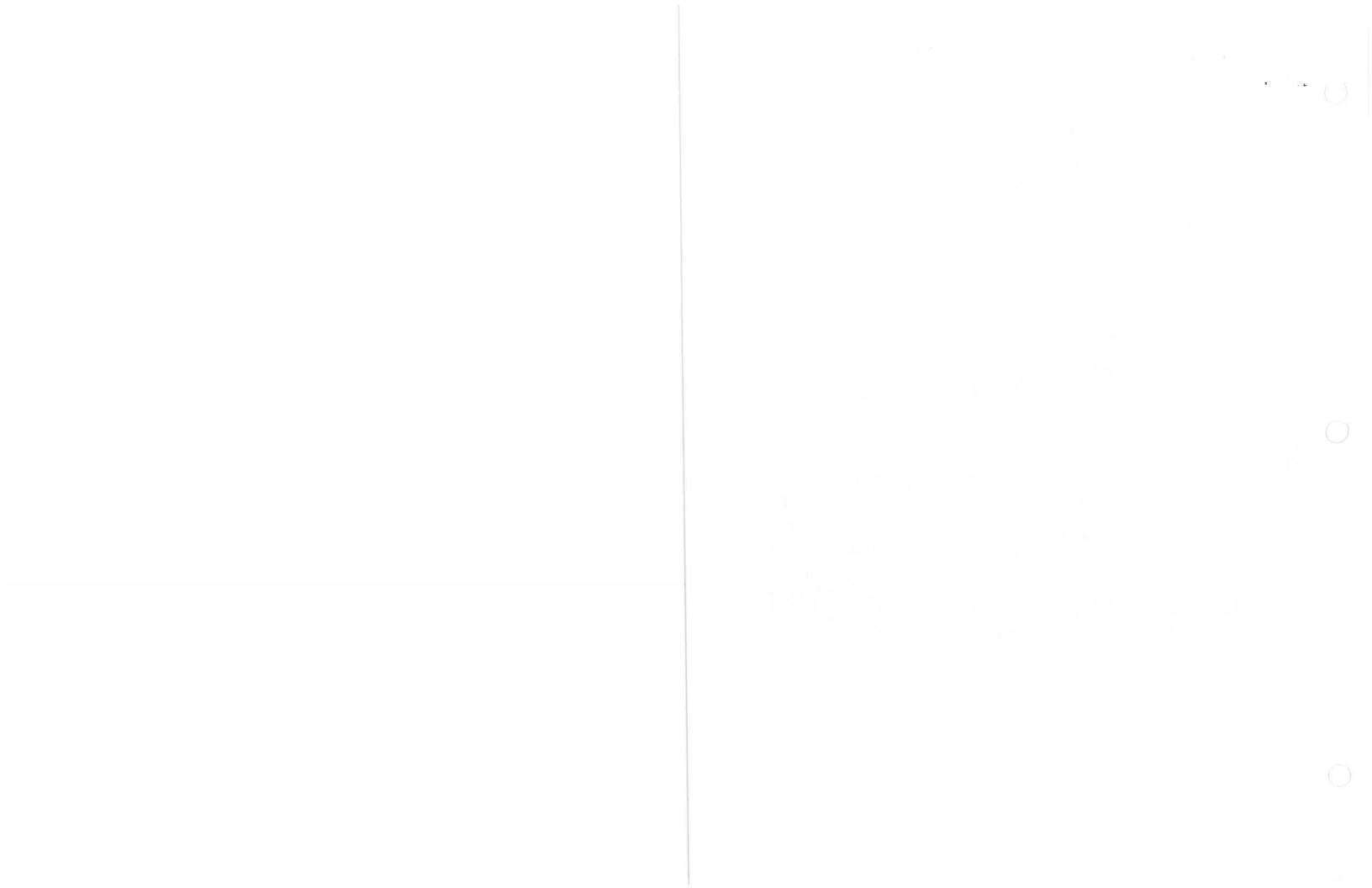
# TABLE B-2 FACILITYWIDE HAP EMISSIONS SUMMARY ENVIVA PRI I FTS HAMI PT 11 C

Description	ES-DRYER	23-63	TALL ALL	through 7	through 6	ES-BARKHOG	T ESCHIP-I		Total
	(tpy)	(tpy)	(фу)	(tpy)	(tpy)	(tpy)	(tpy)	7 (AD)	(tov)
1,3-Butadiene		1.71E-05	1,71E-05	,	(3				
Acetaldehyde	1.64E+01	3.36E-04	1 36F-04	2715100	0 10E-00				0.00
Acetophenone	1.40E-08			20100	9,100,100	1		٠	27.26
Acrolein	5.04E+00	4.05E-05	4.05E-05	8 31F-01	3.4915-00	-		,	0.00
Antimony & Compounds	4.40E-04		,		20.70				8.36
Arsenic & Compounds	1.22E-03		•				1		0.00
	1.67E+00	4.08E-04	4.08E-04	2.75E-01	8 21E.03				00:00
Beryllium metal (un-reacted) (Also include in BEC)	6.12E-05				COLUMN				1.95
Cadmium Metal (clemental un-reacted)(Add w/CDC)	2.28E-04	ľ				•			0.00
Carbon tetrachloride	3,46E-02							ı	0.00
Chlorine									0.03
Chloroberzene					•				0.61
Chromium-Other computs (add w/chrom acid to per CRC)	9 74E-04						,		0.03
Cobalt commonade	1628.04				24	•		,	0.00
Chlomfirm	2 10E 02		-		*		-		0.00
Cumone	4 300.01	1		3.61E-03	1.08E-02	,			0.04
Dinitroperol 24	1 305 04			7.23E-02	2.16E-01				0.73
Ditz-ethelberedhabehelste (DELD)	1,300-04		-						00.0
Child San County of the County	3,015-03				٠		9		000
Phylame diplomids at a state of	2.38E-02			•					000
tanying diamonde (1,2-dichlorochane)	2.23E-02		•						0.02
Transportation of the state of	3.07E+01	S.16E-04	S.16E-04	5.06E+00	1.51E+01				50.02
nywogen calonde (nydroculone acid)	1.46E+00					O#			1 46
Lead and Lead compounts	2.67E-03	1							04.1
m-p-Xylene	1.05E+00	1.25E-04	1.25E-04	1.74E-01	5.19E-01				0.00
Manganese & compounds	8.91E-02	•							1.74
Mercury, vapor (include in Mercury&Compds)	2.69E-03								0.09
Methanol	2.41E+01			3.98	1.88	800	, 000		00.0
Methyl bromide (bromomethane)	1.15E-02					000	0.29	2.10	42.45
Methyl chloride (chloromethane)	1.77E-02								0.0
Methyl chloroform (1,1,1 trichlorochane)	2.38E-02								0.05
Methyl ethyl ketone	4.15E-03					1		1	0.02
Methyl isobutyl ketone	1.51E+00			. 10 000 0	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				0.00
Methylene chloride	3,95E-01			2 61E 00	1.42E-01				2.51
Nickel metal (Component of Nickel & Compounds)	2.53E-02			0.215-02	1.946-01				0.65
Nitrophenol, 4-	8.45E-05							•	0.03
o-Xylane	9 87F-07					•	•		0.00
Pentachloronhenol	3 97F-05			1.655-02	4.86E-02	•	٠		0.16
Perchloroethylene (tetrachloroethylene)	2 07E-02					•			0.00
	6 14E+00					•			0.03
Phombons Metal. Yellow or White	2075.00		1	1.01E+00	3.03E+00	•			10.18
Polychlorinated hinhernis	6.26E.06								0.02
Pronousidehyle	2 85E+00								00.0
Propylene dichloride (1.2 dichloratoname)	2 SAE-02			4.70E-01	1.40E+00				4.73
Selenium compounds	2.15R-03				1			٠	0,03
Shrane	7.89E-02						·		00:0
Tetrachlorodiberzo-p-dioxin, 2, 1, 2, 8-	6 60B-00			1.305-02	3.89E-02			*	0.13
Tollier	2 85ELOO	1 202.0						•	0.00
Total PAH (POM)	O KOE OO	7.265.06	1.795-04	4.70E-01	1.40E+00			٠	4.73
Trichlometholese	2 30E-02	7.335-03	7.35E-05					٠	0.10
Trichlorophenol. 2.4.6-	1 69P-05								0.02
Vim choride	1 38F-02								0.00
	20-70-7		0.				907	,	0.01
TOTAL HAPS	95.98	1.69E-03	1.69E-03	15.40	45.21	80.0	0.29	2.10	149.07
MAX INDIVIDUAL HAP	Formaldehyde	Formaldehyde	Formaldehyde	Methanol	Methanol	Mathanol	Mathanal	Т	
MAX INDIVIDUAL HAP VALITE	20.00				101111111111111111111111111111111111111	MACHABIO	TOHRITISTAL	Methanol	Methano
		4 16E-04	6 1Cm n.					1	

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iamlet, Richmond County Emission Calculations and BACT v6 submittal to DAI Total HA



## TABLE B-3 DETERMINATION OF POLLUTANTS SUBJECT TO AIR TOXICS PERMITTING ENVIVA PELLETS HAMLET, LLC

## TAP Emission

Description			Dryer			Hammermills			Pellet Cooler	s		Portable Chipp	ar	P								
Pollutant	CAS Number	(lb/hr)	(lb/day)	(lb/yr)	(lb/hr)	(lb/day)	(lb/yr)	(lb/hr)	(lb/day)	(lb/vr)	(lb/hr)	(lb/day)	(lb/yr)	(lb/hr)	mergency Gene		+	Fire Water Pur	-		Total	
1,3-Butadiene	106-99-0								(4.00)	(001)11	3.56E-04	8.54E-03			(lb/day)	(lh/yr)	(lb/hr)	(lb/day)	(lb/yr)	(lb/hr)	(lb/day)	(lb/yr)
Acetaldehyde	75-07-0	5.38E+00	1.29E+02	3.29E+04	8.87E-01	2.13E+01	5.42E+03	2.65E+00	6,36E+01	1.62E+04	6.98E-03		1.78E-01	6.84E-05	1.64E-03	3.42E-02	6.84E-05	1.64E-03	3.42E-02	4.93E-04	1.18E-02	2,46E-01
Acrolein	107-02-8	1.65E+00	3.96E+01	1.01E+04	2.72E-01	6.52E+00		8.13E-01	1.95E+01		8.42E-04	1.68E-01	3.49E+00	1.34E-03	3.22E-02	6.71E-01	1.34E-03	3.22E-02	6.71E-01	8.92E+00	2.14E+02	5.45E+04
Arsenic		2.80E-04	6.71E-03	2.45E+00		0.000 00	1.002.05	0.152-01	1.936+01	4.976=03	8.42E-04	2.02E-02	4.21E-01	1.62E-04	3.89E-03	8.09E-02	1.62E-04	3.89E-03	8.09E-02	2.73E+00	6.56E+01	1.67E+04
Benzene	71-43-2	5.45E-01	1.31E+01	3.33E+03	8.98E-02	2.16E+00	5.49E+02	2.69E-03	6.44E-02	1.64E+01	0.405.02	0.045.04		-						2.80E-04	6.71E-03	2,45E+00
Вепло(а)рутепе	50-32-8	4.56E-04	1.09E-02	3.99E+00			3,172.02	2.09[2-03	0,44E-02	1.046+01	8.49E-03	2.04E-01	4.25E+00	1.63E-03	3.92E-02	8.16E-01	1.63E-03	3.92E-02	8.16E-01	6.49E-01	1.56E+01	3.91E+03
Beryllium		1.40E-05	3.36E-04	1,22E-01				-	-	_	1.71E-06	4.11E-05	8.55E-04	3.29E-07	7.90E-06	1.65E-04	3.29E-07	7.90E-06	1.65E-04	4.58E-04	1.10E-02	3.99E+00
Cadmium		5.21E-05	1.25E-03	4,56E-01				_	-											1,40E-05	3.36E-04	1.22E-01
Carbon Tetrachloride		7.89E-03	1.89E-01	6.91E+01				_	-											5.21E-05	1.25E-03	4.56E-01
Chlorine		1.38E-01	3.32E+00	1.21E+03				_												7.89E-03	1.89E-01	6.91E+01
Chlorobenzene		5.78E-03	1.39E-01	5.07E+01				_												1.38E-01	3.32E+00	1.21E+03
Chloroform	67-66-3	7.17E-03	1.72E-01	4.39E+01	2.36E-02	5 67E 01	1.45E+02	2.530.05												5.78E-03	1.39E-01	5.07E+01
Chromic acid (Chromium VI)	7738-94-5	4,45E-05	1.07E-03	3.90E-01	2.301.702	J.07E-01	1.43E+UZ	3.53E-03	8.48E-02	2.16E+01				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0,00E+00	3.43E-02	8.24E-01	2.10E+02
Di(2-ethylhexyl)phthalate (DEHP)		8.24E-06	1.98E-04	7.22E-02					-											4.45E-05	1.07E-03	3.90E-01
Ethylene dichloride (1,2-dichloroethane)		5.08E-03	1.22E-01	4.45E+01																8,24E-06	1.98E-04	7.22E-02
Formaldehyde	50-00-0	1.00E+01	2.41E+02	6.14E+04	1.65E+00	3.97E+01	1.01E+04	1000 00												5.08E-03	1.22E-01	4,45E+01
Hexachlorodibenzo-p-dioxin 1.2.3.6.7.8		2.80E-04	6.73E-03	2,46E+00	1.03E+00	3.97E+01	1.01E+04	4.95E+00	1.19E+02	3.03E+04	1.07E-02	2.58E-01	5.37E+00	2.07E-03	4.96E-02	1.03E+00	2.07E-03	4.96E-02	1.03E+00	1.67E+01	4.00E+02	1.02E+05
Hydrogen chloride (hydrochloric acid)	1	3.33E-01	7.99E+00	2.92E+03															1100200	2.80E-04	6.73E-03	2.46E+00
Manganese & compounds		2.03E-02	4.88E-01	1.78E+02																3.33E-01	7.99E+00	2.92E+03
Mercury, vapor (Include in Mercury&Compds)		6.14E-04	1.47E-02	5.37E+00														T		2.03E-02	4,88E-01	1.78E+02
Methyl chloroform (1,1,1 trichloroethane)		5.43E-03	1.30E-01	4.76E+01	_			_												6.14E-04	1.47E-02	5.37E+00
Methyl ethyl ketone		9.47E-04	2.27E-02	8.29E+00	_															5.43E-03	1.30E-01	4.76E+01
Xylene	1330-20-7	3,44E-01	8.26E+00	2.11E+03	6.21E-02	1 4077 00	0.000.00													9.47E-04	2.27E-02	8.29E+00
Methyl isobutyl ketone	108-10-1	4.95E-01	1.19E+01	3.03E+03	8.16E-02		3.80E+02	1.85E-01	4.45E+00	111025.05	2.59E-03	6.22E-02	1.30E+00	4.99E-04	1.20E-02	2.49E-01	4.99E-04	1.20E-02	2.49E-01	5.95E-01	1.43E+01	3.62E+03
Methylene chloride	75-09-2	1.29E-01	3.10E+00	7.89E+02	2.13E-02		4.99E+02	2.44E-01	5.85E+00					0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.20E-01	1.43E+01	5.02E+03
Nickel metal (Component of Nickel & Compounds)	15072	5.78E-03	1.39E-01	5.07E+01	2.13E-02	5.11E-01	1.30E+02	6.36E-02	1.53E+00	3.89E+02				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.14E-01	5.13E+00	1.31E+03
Pentachlorophenol		8.94E-06	2.15E-04	7.83E-02															0.000	5.78E-03	1.39E-01	5.07E+01
Perchloroethylene (tetrachloroethylene)		6.66E-03	1.60E-01	5.84E+01	-															8.94E-06	2.15E-04	7.83E-02
Phenol	108-95-2	2.01E+00	4.82E+01	1.23E+04	3.31E-01															6.66E-03	1.60E-01	5.84E+01
Polychlorinated biphenyls	100-73-2	1.43E-06	3.43E-05	1.25E-02	3.31E-01	7.94E+00	2.02E+03	9.89E-01	2.375+01	6.05E+03				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.33E+00	7.99E+01	2.04E+04
Styrene	100-42-5	2.58E-02	6.20E-01	1.25E-02 1.58E+02	1000.00													0.002.00	0.002100	1.43E-06	3.43E-05	
Tetrachlorodibenzo-p-dioxin, 2.3.7.8-	100-42-3	1.51E-09	3.62E-08	1.32E-05	4.26E-03	1.02E-01	2.60E+01	1.27E-02	3.05E-01	7.78E+01				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.28E-02	1.03E+00	1.25E-02 2.62E+02
Toluene	108-88-3	9.32E-01	2.24E+01	5.70E+03	1.545.01	A (02												5.552.00	0.00E100	1.51E-09	3.62E-08	
Trichloroethylene	100-00-3	5.26E-03	1.26E-01		1.54E-01	3.69E+00	9.40E+02	4.59E-01	1.10E+01	2.81E+03	2.59E-03	6.22E-02	1.30E+00	7.16E-04	1.72E-02	-3.58E-01	7.16E-04	1.72E-02	3.58E-01	1.55E+00	3.62E-08 3.72E+01	1.32E-05
Trichlorofluoromethane (CFC 111)		7.19E-03		4.61E+01															J.J0L-V1	5.26E-03		9.45E+03
Vinyl chloride		3.16E-03	1.72E-01	6.30E+01						L											1.26E-01	4.61E+01
		3.10E-03	7.57E-02	2.76E+01																7.19E-03 3.16E-03	1.72E-01 7.57E-02	6.30E+01 2.76E+01

## TPER Comparison Table

D. H			Total	//		TPER (2Q .071	11)	Modeling
Pollutant	CAS Number	(lb/hr)	(lb/day)	(lb/yr)	(lb/hr)	(lb/day)	(lb/yr)	Required
1,3-Butadiene	106-99-0			2.46E-01			1.10E+01	No
Acetaldehyde	75-07-0	8.92E+00			6.80E+00			Yes
Acrolein	107-02-8	2.73E+00			2.00E-02			Yes
Arsenic				2.45E+00			1.60E-02	Yes
Benzene	71-43-2			3.91E+03			8.10E+00	Yes
Benzo(a)pyrene	50-32-8			3.99E+00			2.20E+00	Yes
Beryllium				1,22E-01			2.80E-01	No
Cadmium				4.56E-01			3.70E-01	Yes
Carbon Tetrachloride				6.91E+01			4.60E+02	No
Chlorine		1.38E-01	3,32E+00		2.30E-01	7.90E-01	4.0005102	Yes
Chlorobenzene			1.39E-01		2.501701	4.60E+01		No
Chloroform	67-66-3			2.10E+02		4.00L101	2.90E+02	
Chromic acid (Chromium VI)	7738-94-5		1.07E-03	5.102.02		1.30E-02	2.9015102	No
Di(2-ethylhexyl)phthalate (DEHP)	1100710		1.98E-04	<del>                                     </del>		6.30E-02		No
Ethylene dichloride (1,2-dichloroethane)			1.702-04	4.45E+01		0.302-01	2.700.00	No
Formaldehyde	50-00-0	1.67E+01		4.43ET01	4.00E-02		2.60E+02	No
Hexachlorodibenzo-p-dioxin 1.2.3.6.7.8	30-00-0	1.0715.01		2.46E+00	4.00E-02			Yes
Hydrogen chloride (hydrochloric acid)		3.33E-01		2,40E+00	1.000.01		5.10E-03	Yes
Manganese & compounds		3.331.701	4.88E-01		1.80E-01	( 00m At		Yes
Mercury, vapor (include in Mercury&Compds)			1.47E-02			6.30E-01		No
Methyl chloroform (1,1,1 trichloroethane)		5.43E-03	1.47E-02 1.30E-01			1.30E-02		Yes
Methyl ethyl ketone		9.47E-04		-	6.40E+01	2.50E+02		No
Xylene	1330-20-7	5.95E-01	2.27E-02		2.24E+01	7.80E+01		No
Methyl isobutyl ketone	108-10-1	8.20E-01	1.43E+01		1.64E+01	5.70E+01		No
Methylene chloride			1.97E+01		7.60E+00	5.20E+01		No
Nickel metal (Component of Nickel & Compounds)	75-09-2	2.14E-01		1.31E+03	3.90E-01		1.60E+03	No
Pentachlorophenol		0.045.04	1.39E-01			1.30E-01		Yes
Perchloroethylene (tetrachloroethylene)		8.94E-06	2.15E-04		6.40E-03	6.30E-02		No
Phenol	100.04.4			5.84E+01			1.30E+04	No
Polychlorinated biphenyls	108-95-2	3.33E+00			2.40E-01			Yes
Styrene Styrene	100.10			1.25E-02			5.60E+00	No
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	100-42-5	4.28E-02			2.70E+00			No
Tolucie Tolucie				1.32E-05			2.00E-04	No
Trichloroethylene	108-88-3		3.72E+01			9.80E+01		No
	4			4.61E+01			4.00E+03	No
Trichlorofluoromethane (CFC 111)		7.19E-03			1.40E+02			No
Vinyl chloride	4			2.76E+01			2.60E+01	Yes

## TABLE B-4 ROTARY DRYER-CRITERIA POLLUTANT EMISSIONS ENVIVA PELLET HAMLET, LLC

## Dryer Inputs

Dryer Throughput (@ Dryer Exit)	649,750 tons/year @ 13% moisture
Annual Dried Wood Throughput of Dryer	575,000 ODT/year
Max. Hourly Dried Wood Throughput of Dryer	71.71 ODT/hr
Flow rate =	120,000 ACFM
Annual Utilization Factor	92%
Burner Heat Input	175.3 MMBtu/hr
Amual Burner Heat Input at Annual Utilization	1,405,626.8 MMBtu/yr
Percent Hardwood	25%
Percent Softwood	75%

		Baseline Emission Factors	actors	Propo	Proposed BACT Emission Factor	Factor				
Pollutant	Uncontrolled Biomass	Units		Controlled Biomass	Units	Emission Factor	Baseline	Baseline Emissions	Total Contro	Total Controlled Potential Emissions
8	Emission Factor	-	Emission Factor Source	Emission Factor		Source	(Ib/br)	(tpy)	(lb/hr)	(tov)
3	0.104	lb/MMBtu	Note 1	0.104	lb/MMBtu	Baseline	18.28	73.3	18.28	73.3
NO <sub>x</sub>	0.228	lb/MMBtu	Calculated from Buettner 3-23-12 Dryer Guarantee 5	0.228	lb/MMBtu	Calculated from Buettner 3-23-12	40.00	160.4	40.00	160.4
PM/PM <sub>10</sub> /PM <sub>2,5</sub> Condensible Fraction	0.017	lb/MMBtu	AP-42 Section 1.6	0.01.7	lb/MMBtu	AP-42 Section 1.6	2.98	11.9	2.98	11.9
TSP (Filterable)	2.092	lb/opr	Calculated from Buettner 3-23-12 Dryer Guarantee 5	0.030	lb/MMBtu	NSPS emission limit	150.00	601.4	5.26	21.1
Total TSP (Filterable + Condensible)							152.98	613.3	8.24	33.0
PM <sub>10</sub> (Filterable)	2.092	lb/ODT	Calculated from Buettner 3-23-12 Dryer Guarantee <sup>5</sup>	0.030	lb/MMBtu	NSPS emission limit	150.00	601.4	5.26	21.1
Total PM <sub>10</sub> (Filterable + Condensible)							152.98	613.3	8.24	33.0
PM <sub>2,5</sub> (Filterable)	2.092	lb/ODT	Calculated from Buettner 3-23-12 Dryer Guarantee 5	0.030	lb/MMBtu	NSPS emission limit	150.00	601.4	5.26	21.1
Total PM <sub>2.5</sub> (Filterable + Condensible)							152.98	613.3	8.24	33.0
SO <sub>2</sub>	0.025	lb/MMBtu	AP-42, Section 1.6 <sup>3</sup>	0.025	Ib/MMBtu	AP-42 Section 1 6 3	4 18	17.6	4 30	761
VOC	3.59	Ib/ODT	Note 2	3.59	Ib/ODT	Baseline	257.08	1030 7	35.7.08	1,031
Lead	00:00	N/A	N/A	00:0	N/A	N/A	0.00	00	000	150,1

- Note:

  1 CO emissions are based on stack testing conducted at Absokie, NC facility on June 7, 2012 with 100% safety margin on CO due to the significant variability that is possible with this pollutant.

  2 VOC emissions emission factor based on AP-42, Table 10.6.2-3. Factor derived by multiplying direct-fired rotary dryer factors for softwoods and hardwoods by the fraction of each species on 1 (4.7 Ib/ODT \* 75% SW) + (0.24 \* 25% HW) = 3.59 Ib/ODT.

  3 Although the vender estimated emissions to include condensibles, additional condensibles from wood combustion
  AP-42, Section 1.6 were included. The vender only provided the filterable fraction of particulate matter in the emission factors.

  Briven has conservatively calculated the condensible fraction based upon the heat input of the dryer burners
  using an emission factor for wood combustion from AP-42, Section 1.6.

  4 No emission factor is provided in AP-42, Section 1.6.

  4 No emission factor is provided in AP-42, Section 1.6.

  5 Controlled filterable particulate matter emissions based on NSPS Subpart Db limit of 0.03 lb/MMBlu.

  6 Controlled filterable particulate matter emissions after cyclone control were provided by the dryer system vendor. The PM<sub>23</sub> filterable emission factor is assumed to be the same as PM and PM 10.

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ns and BACT v6 submittal to DAQ Dryer System Criteria Emissions

# TABLE B-S ROTARY DRYER-HAP AND TAP PROCESS EMISSIONS ENVIVA PELLET HAMLET, LLC

## Calculation Inputs:

Dryer Inroughput (10n/yr)	047,720	
RTO VOC Control Efficiency	%0	
ODT/yr	575,000	
ODT/hr	71.71	
Hardwood Composition	25%	
Softwood Composition	75%	

## HAP & TAP Emission Calculation

								Green, I	Green, Direct wood-fired (inlet	red (inlet				
								moisture c	moisture content >50%, dry basis),	dry basis),				
					Direct	Direct wood-fired, hardwood	rdwood		softwood 1		MAY	MAYIMITM	NA A SA	200
	CAS				Emission			Emission			INCONTROL I	TOUR TOUR	CONTEN	MAAIMUM
HAP/TAP Pollutant	Number	HAP	NC TAP	VOC	Factor 2	Emiss	Emissions 3	Factor	Emiss	Emissions 3	EMIS	EMISSIONS	EMIS	EMISSIONS
		(res/No)	(xes/No)	(Xes/No)	(ID/ODIL)	(lb/hr)	(tpy)	(Ib/ODT)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Acetaldehyde	75-07-0	Yes	Yes	Yes	3.83E-03	2.75E-01	2.75E-01	7.50E-02	5.38E+00	1.62E+01	5 38E+00	1 645+01	5 20E+00	1 645:01
Acrolein	107-02-8	Yes	Yes	Yes	1.17E-03	8.42E-02	8.44E-02	2.30E-02	1 65E+00	4 96E±00	1 655+00	S OVE TOO	1,550.00	1.045+01
Benzene	71-43-2	Yes	Yes	Yes	3.88E-04	2.78E-02	2.79F-02	7 KOE-03	\$ 45E-01	1 64E±00	5 ASE 01	1 675.00	1.03E+00	3.04E+00
Chloroform	67-66-3	Yes	Xes	Yes	\$.11E-06	3 66E-04	3 67E-04	1 00E 04	7 175 03	2.155.00	2,435-01	1.0/E+00	5.45E-01	1.6/E+00
Cumene	08-82-8	Vae	Mo	Vac	1 0000	2000	20,000	I.OUL-UP	/.1/E-03	70-D01-7	7.17E-U3	7.19E-02	7.17E-03	2.19E-02
Towns 13-1-13	0-70-02	1.03	ON	res	1.02E-04	7.52E-03	7.34E-03	2.00E-03	1.43E-01	4.31E-01	1.43E-01	4.39E-01	1.43E-01	4.39E-01
	0-00-05	Yes	Yes	Yes	7.15E-03	\$.13E-01	5.14E-01	1.40E-01	1.00E+01	3.02E+01	1.00E+01	3.07E+01	1 00E+01	3 07E±01
m-,p-Xylene	1330-20-7	Yes	Yes	Yes	2.45E-04	1.76E-02	1.76E-02	4.80E-03	3.44F-01	1 04F+00	3 44E-01	1 055.00	2 445 01	10/12/01
Methanol	67-56-1	Yes	No	Yes	5.62E-03	4.03E-01	4 04F-01	1 10E-01	7 80E+00	2 275-01	7 000 100	3 415.01	2.445-01	1.05E+00
Methyl isobutyl ketone	108-10-1	Yes	Yes	Yes	3.52E-04	2 53E-02	2 53E-02	6 00E 02	A DEE 01	1 400 00	7.69E+00	2.41E+01	7.89E+00	2.41E+01
Methylene chloride	75-09-2	Yes	Yes	S.	9.19E-05	6 59F-03	6 61E-03	1 POE 03	1 205 01	1.49E+00	4.93E-01	1.512+00	4.95E-01	1.51E+00
o-Xvlene	95-47-6	Vee	2	Voe	2 300 05	1 660 03	1 650 00	4.60E-03	1.295-01	3.885-01	1,29E-01	3.95E-01	1.29E-01	3.95E-01
Diversi	100 05 0		;	2 2	2.3VE-03	1.03E-03	1.03E-U3	4.30E-04	5.23E-02	9.70E-02	3.23E-02	9.87E-02	3.23E-02	9.87E-02
Lucion	108-93-2	xes	Xes	Xes	1.43E-03	1.03E-01	1.03E-01	2.80E-02	2.01E+00	6.04E+00	2.01E+00	6.14F+00	2 01F+00	6 14E±00
Propionaldehyde	123-38-6	Yes	No No	Yes	6.64E-04	4.76E-02	4.77E-02	1,30E-02	9.32E-01	2.80E+00	0 17F.01	2 85E+00	0 225 01	00011100
Styrene	100-42-5	Yes	Yes	Yes	1.84E-05	1.32E-03	1.32E-03	3.60E-04	2.58E-02	7.76F-02	2 58E-02	7 805 00	2,522-01	7 000 00
Toluene	108-88-3	Yes	Yes	Yes	6.64E-04	4.76E-02	4.77E-02	1.30E-02	9.32E-01	2.80F+00	0 32E.01	20-70-02	2.30E-02	7.69E-02
									7	2007.00	7.32L-VI	2.07E+00	7.32E-01	7.83E+UU

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ons and BACT v6 submittal to DAQ Dryer System HAP & TAP

Note:

HAP & TAP emission factors for "green, direct wood-fired (inlet moisture content >50%, dry basis" softwood were obtained from AP-42, Section 10.6.2, Table 10.6.2-3.

To account for hardwood HAP & TAP emissions, factors were conservatively calculated by taking the AP-42 HAP factors for 100% softwood (green) and multiplying by the ratio of the total listed VOC emission factors for hardwood and softwood (0.24 / 4.7).

Short-term HAP & TAP emissions were calculated based upon a worst-case scenario of 100% hardwood or softwood firing.

# TABLE B-6 ROTARY DRYER -HAP AND TAP WOOD COMBUSTION EMISSIONS ENVIVA FELLET HAMILET, LLC

Calculation Inputs:

175.30 8,760 1,535,628 0% 92.75% 90.00%

HAP & TAP Emission Calcula

				Emission Factors	tors	r				Emi	Emissions			
	HAP/TAP?	VOC?		Blomass			Biomass	1858	Maxim	Maximum Uncontrolled Total	ed Total	Maxi	Maximum Controlled Total	Total
Pollutant			lb/mmBta Uncontrolled	Control Efficiency	lb/mmBtu Controlled	Ref.	Ib/hr Uncontrolled	Controlled	lb/hr	lb/yr	tpy	lb/hr	lb/yr	tpy
Acetophenone	HAP	VOC	3,20E-09	%0	3,20E-09	-	5.61E-07	3.20E-09	5.61E-07	4.91E-03	2.46E-06	3.20E-09	2.80E-05	1.40E-08
Antimony & Compounds	HAP		7.90E-06	92.75%	5.73E-07	1,2	1.38E-03	1.00E-04	1.38E-03	1.21E+01	6.07E-03	1.00E-04	8.80E-01	4 40E-04
Arsenic	TAP/HAP		2.20E-05	92.75%	1.60E-06	1,2	3.86E-03	2.80E-04	3.86E-03	3.38E+01	1.69E-02	2.80E-04	2.45E+00	1.22E-03
Benzo(a)pyrene	TAP/HAP	200	2.60E-06	%0	2.60E-06	-	4.56E-04	4.56E-04	4.56E-04	3.99E+00	2.00E-03	4.56E-04	3,99E+00	2.00E-03
Beryllium	TAP/HAP		1.10E-06	92.75%	7,98E-08	1,2	1.93E-04	1.40E-05	1.93E-04	1.69E+00	8,45E-04	1.40E-05	1.22E-01	6.12E-05
Cadmium	TAP/HAP		4.10E-06	92.75%	2.97E-07	1,2	7.19E-04	5.21E-05	7.19E-04	6.30E+00	3.15E-03	\$21E-05	4 S6F-01	2 28E-04
Carbon tetrachloride	TAP/HAP	VOC	4.50E-05	%0	4.50E-05		7.89E-03	7.89E-03	7.89E-03	6.91E+01	3.46E-02	7 89E-03	6918401	3 46E-02
Chlorine	TAP/HAP		7.90E-04		7.90E-04	-	1.38E-01	1.38E-01	1.38E-01	1218403	6 07E-01	1 18E-01	1215-01	50-20-C
Chlorobenzene	TAP/HAP	70C	3.30E-05	%0	3.30E-05	-1	5.78E-03	5.78E-03	5.78E-03	5.07E+01	2.53E-02	5.78E-03	5 07F+01	2 53E-02
Chromic acid (Chromium VI)	TAP4		3,50E-06	92.75%	2.54E-07	1.2	6.14E-04	4 45F-05	6 14F.04	5 375400	2 60E 03	4 450 05	2 000 01	1 0672 04
Chromium-Other compds (add w/chrom acid to get CRC)	HAP		1.75E-05	92.75%	1.27E-06	1,2	3.07E-03	2,22E-04	3.07E-03	2.69E+01	1.34E-02	2.22E-02	1 05E+00	0.745-04
Cobalt compounds	HAP		6.50E-06	92.75%	4.71E-07	1,2	1.14E-03	8.26E-05	1.14E-03	9 98F+00	4 99F-03	8 26E-05	7.24E-01	2,675,04
Dinitrophenol, 2,4-	HAP	Voc	1.80E-07	%0	1.80E-07	1	3.16E-05	3.16E-05	3,16E-05	2.76E-01	1.38E-04	3 16E-05	2 76E-01	3.02E-04
Di(2-ethylhexyl)phthalate (DEHP)	TAP/HAP	Voc	4.70E-08	%0	4.70E-08	-	8.24E-06	8.24E-06	8.24E-06	7.22E-02	3.61E-05	8.24F-06	7.22E-02	3.61E.05
Ethyl berzene	HAP	VOC	3.10E-05	%0	3.10E-05		5.43E-03	5.43E-03	5.43E-03	4.76E+01	2.38E-02	5.43E-03	4 76F+01	2.38E-02
Ethylene dichloride (1,2-dichloroethane)	TAP/HAP	VOC	2.90E-05	%0	2.90E-05	-	5.08E-03	5.08E-03	5.08E-03	4.45E+01	2,23E-02	5.08E-03	4 45E+01	2 23F-02
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8	TAP	NOC	1.60E-06	%0	1.60E-06	-	2.80E-04	2.80E-04	2.80E-04	2.46E+00	1.23E-03	2,80E-04	2.46E+00	1.23E-03
Hydrogen chlonde (hydrochlonc acid)	TAP/HAP		1.90E-02	%00.06	1.90E-03	1,3	3.33E+00	3.33E-01	3.33E+00	2.92E+04	1.46E+01	3.33E-01	2.92E+03	1.46E+00
Lead and Lead compounds	HAP		4.80E-05	92.75%	3.48E-06	1,2	8.41E-03	6.10E-04	8.41E-03	7.37E+01	3.69E-02	6.10E-04	5.34E+00	2.67E-03
Manganese & compounds	TAP/HAP		1.60E-03	92.75%	1.16E-04	1,2	2.80E-01	2.03E-02	2.80E-01	2.46E+03	1.23E+00	2.03E-02	1.78E+02	8.91E-02
Mercury, vapor (Include in Mercury&Compds)	TAP/HAP		3.50E-06	92.75%	2.54E-07	1,2	6.14E-04	4.45E-05	6.14E-04	5.37E+00	2.69E-03	6.14E-04	5.37E+00	2.69E-03
Metryl promide (promomethane)	HAP	VOC	1.50E-05	%0	1.50E-05	-	2.63E-03	2.63E-03	2.63E-03	2.30E+01	1.15E-02	2.63E-03	2.30E+01	1.15E-02
Metryl chloride (chloromethane)	HAP	NOC	2.30E-05	%0	2.30E-05	_	4.03E-03	4.03E-03	4.03E-03	3.53E+01	1.77E-02	4.03E-03	3.53E+01	1.77E-02
Metrys chorotorm (1,1,1 trichloroethane)	TAP/HAP		3.10E-05		3.10E-05	_	5.43E-03	5.43E-03	5.43E-03	4.76E+01	2.38E-02	5.43E-03	4.76E+01	2.38E-02
Methyl chyl ketone	IAP/HAP	200	5.40E-06	%0	5.40E-06		9.47E-04	9.47E-04	9.47E-04	8.29E+00	4.15E-03	9.47E-04	8.29E+00	4.15E-03
Naphunatene	HAP	200	9.70E-05	%0	9.70E-05	_ ;	1.70E-02	1.70E-02	1.70E-02	1.49E+02	7.45E-02	1.70E-02	1.49E+02	7.45E-02
Mickel interal (Component of Mickel & Compounds)	IAP/HAP	-	3.30E-05	92.75%	2.39E-06	1,2	5.78E-03	4.19E-04	5.78E-03	S.07E+01	2.53E-02	5.78E-03	5.07E+01	2.53E-02
Postsold and bearing	TATA	2	1.10E-07	%0	1.105-07		1.93E-05	1.93E-05	1.93E-05	1.69E-01	8.45E-05	1.93E-05	1.69E-01	8.45E-05
Describionach Jones (telm of formath from	TADATA		3.10E-08		3.10E-08		8.94E-06	8.94E-06	8.94E-06	7.83E-02	3.92E-05	8.94E-06	7.83E-02	3.92E-05
Dhombon Main Valler at Whis	יייייי		3.60E-03	,000	3.805-03	;	0.00E-03	6.66E-03	6.66E-03	5.84E+01	2.92E-02	6.66E-03	5.84E+01	2.92E-02
Debrokloniers of histories	TANATAN	901	2. /UE-05	92.75%	1.965-06	1,2	4.73E-03	3.43E-04	4.73E-03	4.15E+01	2.07E-02	4.73E-03	4.15E+01	2.07E-02
Defending Committee Defending	LAPHAP	2	8.135-09	%0	8.15E-09		1.43E-06	1.43E-06	1.43E-06	1.25E-02	6.26E-06	1.43E-06	1.25E-02	6.26E-06
Downloan dishlanda (1.2 dishlannana)	HAF	001	1.25E-04	,00	1,25E-04		2.19E-02	2.19E-02	2.19E-02	1.92E+02	9.60E-02	2.19E-02	1.92E+02	9.60E-02
Salanium commente (1,2 dictionognoparie)	HAL	3	3.30E-03	0%0	3,30E-03	- ·	5.78E-03	5.78E-03	5.78E-03	5.07E+01	2.53E-02	5.78E-03	5.07E+01	2.53E-02
Townshipmedihame dines 2270	TABILIAN	901	2.50E-00	92.75%	Z.03E-U7	1,2	4.91E-04	3.56E-05	4.91E-04	4.30E+00	2.15E-03	4.91E-04	4.30E+00	2.15E-03
Trichlonostratene	TAB/RAP	200	3.000	88	8.00E-12	-, -	1.51E-09	1.51E-09	1.51E-09	1.32E-05	6.60E-09	1.51E-09	1.32E-05	6.60E-09
Tricklonoffinomashnas (ORO 111)	TANT	3 0	3.00E-03	860	3.00E-03	-	3.20E-03	5.26E-03	5.26E-03	4.61E+01	2.30E-02	5.26E-03	4.61E+01	2.30E-02
Trichlorophenol 2 4 6-	HAD	200	4.10E-05	0%0 0%0	4.10E-05		7.19E-03	7.19E-03	7.19E-03	6.30E+01	3.15E-02	7.19E-03	6.30E+01	3.15E-02
Vinyl chloride	TAP/HAP	200	1.80E-05	%0	1.80E-05		3.16E-03	3.16E-03	3.16E-03	3.38E-02 2.76E+01	1.09E-05	3.86E-06 3.16E-03	3.38E-02 2.76E+01	1.69E-05
- F		١	100											
lotat	No.						3.89E+00	5.99E-01	3.89E+00	3.40E+04	17.02	6.10E-01	5,34E+03	2.67

<sup>1</sup> Uncontrolled and controlled emission factors (criteria and HAP/TAP) for wood combustion in a stoker boiler from NCDAQ Wood waste Combustion Spreadsheet/AP.42; Compilation of Air Pollutant Emission Factors Vol. 1 - Station USEPA, 5th ed. Section 1.6, 90/3

<sup>2</sup> The control efficiency of the wet electrostatic precipilator (WESP) for filterable particulate matter is applied to all metal hazardous and toxic pollutants. Actual design filterable efficiency is estimated to 96.4%, but 92.75% is assumed

<sup>3</sup> The WESP employs a caustic solution in its operation in which hydrochloric acid will have high water solubility. This caustic solution will neutralize the acid and effectively control it by 90%, per conversation on 10./18.2011

with Steven A. Jaasund, P.B. of Lundberg Associates, a manufacturer of WESPs.

<sup>4</sup> Chromic acid is a subset of chrome compounds, which is accounted for seperately as a HAP. As such, chromic acid is only calculated as a TAP.

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and BACT v6 submittal to DAQ Dryer Comb HAP & TAP Calcs

# TABLE B-7 HAMMERMILLS - VOC, HAP, AND TAP EMISSIONS ENVIVA PELLET HAMLET, LLC

## Calculation Inputs:

Throughput ODT/yr	575,000
ODT/hr	71.71
Hardwood Composition	25%
Softwood Composition	75%

## Emission Calculations:

								Croon Divoor	Cross Divort mond Good (inlet mail			
								Green, Direct	woon-lired (In	let moisture		
		HAP	NCTAP	VOC	Direct	Direct wood-fired, hardwood	poowp.	content >5(	content >50%, dry basis), softwood 1	softwood 1		
: 6	CAS	(Yes/No)	(Yes/No)	(Ves/No)	Emission			Emission			MAXIMU	MAXIMUM TOTAL
Foliutant	Number				Factor 2	Emis	Emissions	Factor	Emis	Emissions	EMISSIONS 3	IONS 3
					(Ib/ODT)	(lb/hr)	(tpy)	(Ib/ODT)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
VOC⁴	N/A	N/A	N/A	N/A	4.75E-02	3.41E+00	3.42E+00	9.31E-01	6 67F±01	2 01E±02	6 67E±01	20412.00
Acetaldehyde	75-07-0	Yes	Yes	Yes	6.31E-04	4.53E-02	4.54E-02	1.24E-02	8 87F-01	2 67E+00	0.07E.01	2.04E+02
Acrolein	107-02-8	Yes	Yes	Yes	1.94E-04	1,39E-02	1.39E-02	3.79E-03	2.72E-01	8 17E-01	2.57E-01	6.71E+00
Benzene	71-43-2	Yes	Yes	Yes	6.40E-05	4.59E-03	4.60E-03	1.25E-03	8.98E-02	2.70E-01	8 98E-02	9.51E-01
Chloroform	67-66-3	Yes	Yes	Yes	8.42E-07	6.04E-05	6.05E-05	1.65E-05	1.18E-03	3.55E-03	1.18E-03	3.61E-03
Currene	98-82-8	Yes	ž	Yes	1.68E-05	1.21E-03	1.21E-03	3.30E-04	2,36E-02	7.11E-02	2.36E-02	7.23E-02
Formaldehyde	20-00-0	Yes	Yes	Yes	1.18E-03	8.45E-02	8.47E-02	2.31E-02	1.65E+00	4.98E+00	1.65E+00	\$.06E+00
m-,p-Xylene	1330-20-7	Yes	Yes	Yes	4.04E-05	2.90E-03	2.90E-03	7.91E-04	5.67E-02	1.71E-01	5.67E-02	1.74E-01
Medical	67-56-1	Yes	Ž į	Yes	9.26E-04	6.64E-02	6.65E-02	1.81E-02	1.30E+00	3.91E+00	1.30E+00	3.98E+00
Methyl Isobutyl ketone	108-10-1	Xes	Yes	Yes	5.81E-05	4.16E-03	4.17E-03	1.14E-03	8.16E-02	2.45E-01	8.16E-02	2.49E-01
wentylene chloride	7-60-67	Yes	Yes	o Z	1.52E-05	1.09E-03	1.09E-03	2.97E-04	2.13E-02	6.40E-02	2.13E-02	6.51E-02
0-Aylene	92-47-6	Xes	o N	Yes	3.79E-06	2.72E-04	2.72E-04	7.42E-05	5.32E-03	1.60E-02	5.32E-03	1.63E-02
Friend	108-95-2	Yes	Yes	Yes	2.36E-04	1.69E-02	1.69E-02	4.62E-03	3.31E-01	9.95E-01	3.31E-01	1 01E+00
Propionaldehyde	123-38-6	Yes	°Z	Yes	1.09E-04	8.21E-05	7.86E-03	2.14E-03	1.61E-03	4.62E-01	1.61E-03	4 70F-01
Styrene	100-42-5	Yes	Yes	Yes	3.03E-06	2.17E-04	2.18E-04	5.93E-05	4.26E-03	1.28E-02	4 26F-03	1 30E-02
Toluene	108-88-3	Yes	Yes	Yes	1.09E-04	7.85E-03	7.86E-03	2.14E-03	1.54E-01	4.62E-01	1 54E-01	4 70E-01
Total								- 0177 hours			95	15.40

Note:

1 HAP & TAP emission factors for "green, direct wood-fired (inlet moisture content >50%, dry basis" softwood were obtained from AP-42, Section 10.6.2, Table 10.6.2-3.

2 To account for hardwood emissions, factors were conservatively calculated by taking the ratio of AP-42 Section 10.6.2-3 HAP factors for hardwood tryong (0.244.7).

These factors were next adjusted by the ratio of the VOC from hammermills to dryers based on engineering testing conducted at the Enviva Wiggins facility (16.5%). This is conconservative because the test values from engineering testing for HAPs/TAPs were actually less than the values presented above.

3 Short-term emissions were calculated based upon a worst-case scenario of 100% hardwood or softwood fring (in which case, softwood is always the overall worst case).

Annual emissions were calculated based on the Hardwood and Softwood Composition.

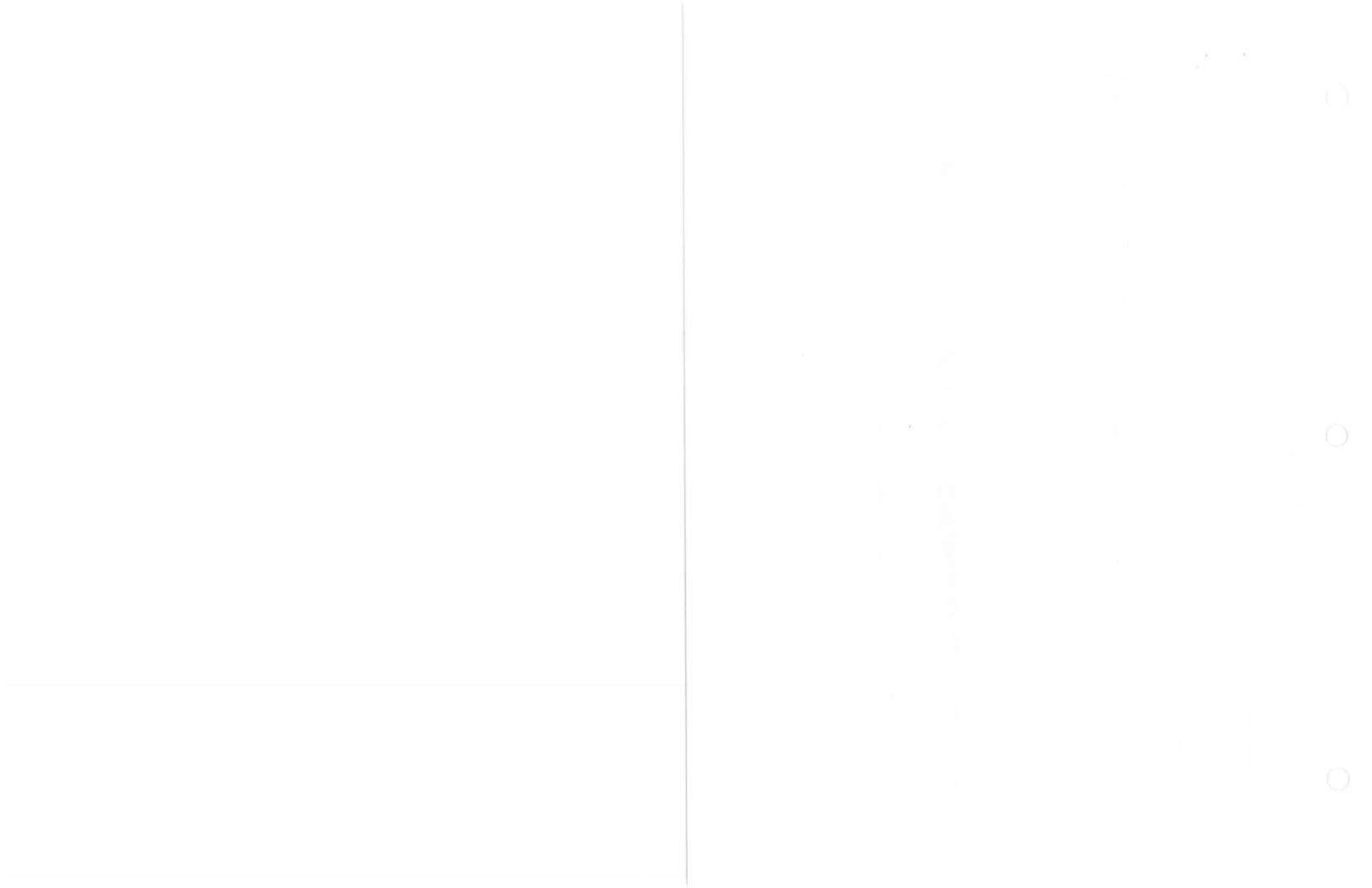
4 VOC emissions emission factors based on average AP-42 factors for softwood and hardwood drying (4.7 and 0.24 lb/ODT, respectively) plus a margin of safety of 20%.

These factors were next adjusted by the ratio of the VOC from hammermills to dryers based on engineering testing conducted at the Enviva Wiggins facility (16.5%).

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Enviva Hamlet, Richmond County Emission Calculations and BACT v6 submittal to DAQ Hammermills



## TABLE B-8 BAGFILTER AND CYCLONE EMISSIONS ENVIVA PELLET HAMLET, LLC

		Eliter Ventant		Pollutant	Annual					Potential Emissions	missions		
	Emission		Flowrate1	Loading2	Operation	% PM that is	hat is	PM		PM <sub>10</sub> <sup>3</sup>	103	PM <sub>2.5</sub>	8.3
Fortecton Thit	Source ID	А	(cfm)	(gr/cf)	(hours)	$PM_{10}$	PM <sub>2.5</sub>	(lb/hr)	(tpy)	(lþ/hr)	(tpy)	(lb/hr)	(tpy)
Green Wood Hammermille Curlone	2-ME-2	CD-GHM-CY	27,554	0.025	8,760	7.00%	%08.0	5.90	25.86	0.41	1.81	0.047	0.21
Hammermille Bacfilter 1		CD-HM-BF1	45,000	0.003	8,760	100%	100%	1.16	5.07	1.16	5.07	1.157	5.07
Hammermills Bagfilter 2	ES-HM-4 through 6	CD-HM-BF2	45,000	0.003	8,760	100%	100%	1.16	2.07	1.16	2.07	1.157	5.67
Hammermills Bagfilter 3	ES-HM-7 and 8, ES-HMA	CD-HM-BF3	45,000	0.003	8,760	100%	%001	1.16	5.07	1.16	5.07	1.157	5.07
Pellet Mill Feed Silo Bin Vent Baghouse	ES-PMFS	CD-PMFS-BV	2,500	0.003	8,760	100%	100%	90.0	0.28	0.00	0.28	0.064	0.28
Pellet Mill Fines Bin Bin Vent	ES-PFB	CD-PFB-BV	3,600	0.003	8,760	100%	100%	60.0	0.41	60.0	0.41	0.093	0.41
Delle Colon Colone 1	FS-CI B-1	CD-CLR-1	21,000	0.02	8,760	17.5%	2.0%	3.60	15.77	0.63	2.76	0.072	0.32
Pollet Coolers Cyclone 1	PS_CIR_2	CD-CLR-2	21,000	0.02	8,760	17.5%	2.0%	3.60	15.77	0.63	2.76	0.072	0.32
Dellet Coolers Cyclone 3	ES-CLR-3	CD-CLR-3	21,000	0.02	8,760	17.5%	2.0%	3.60	15.77	0.63	2.76	0.072	0.32
Pellet Coolers Cyclone 4	ES-CLR-4	CD-CLR-4	21,000	0.02	8,760	17.5%	2.0%	3.60	15.77	0.63	2.76	0.072	0.32
Pellet Coolers Cyclone 5	ES-CLR-5	CD-CLR-5	21,000	0.02	8,760	17.5%	2.0%	3.60	15.77	0.63	2.76	0.072	0.32
Pellet Coolers Cyclone 6	ES-CLR-6	CD-CLR-6	21,000	0.02	8,760	17.5%	2.0%	3.60	15.77	0.63	2.76	0.072	0.32
Finished Product Handling Bagfilter	ES-FPH, ES-PL, ES-PB-1	CD-FPH-BF	35,500	0.003	8,760	%16	25%	0.91	4.00	0.83	3.64	0.502	2.20
	4						TOTAL	32.05	40,36	8.65	37.90	4.61	20.19

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and BACT v6 submittal to DAQ Baghouses and Cyclones

eering firm (Mid-South Engineering Co.).

Note:

Pilter, Vent, and Cyclone inlet flow rate (cfin) provided by design engineering firm (Mid-South Engineering Co. Pollutant Loading (gr/cf) provided by Aircon, a control device vendor.

Pollutant Loading (gr/cf) provided by Aircon, a control device vendor.

Pellet cooler cyclone speciation based on AP-42 factors for wet wood combustion (Section 1.6) controlled by a secoler is anticipated to be larger than flyash, this factor is believed to be a conservative indicator of speciation.

# TABLE B-9 PELLET PRESSES AND COOLERS - VOC, HAP, AND TAP EMISSIONS ENVIVA PELLET HAMLET, LLC

## Calculation Inputs:

## Emission Calculations:

								Green, Direc	Green, Direct wood-fired (inlet moisture	let moisture		
		HAP	NC TAP	VOC	Direct	Direct wood-fired, hardwood	dwood	content >50	content >50%, dry basis), softwood	softwood 1		
:	CAS	(Yes/No)	(Ves/No)	(Yes/No)	Emission			Emission			MAXIMU	MAXIMUM TOTAL
Pollutant	Number				Factor 2	Emissions	ions	Factor	Emissions	sions	EMISS	EMISSIONS 3
					(ID/ODT)	(lb/hr)	(tby)	(Ib/ODT)	(lp/hr)	(tpy)	(lþ/hr)	(tpy)
VOC <sup>4</sup>	N/A	N/A	N/A	N/A	1.54E-01	7.76E-01	1.11E+01	3.01E+00	2.16F+02	6 50F±02	2 16E±03	K K1 E±00
Acetaldehyde	75-07-0	Yes	Yes	Yes	1.89E-03	1.35E-01	1.36E-01	3.70E-02	2,65E+00	7.97E+00	2.15E-02	8.10F±00
Acrolein	107-02-8	Yes	Yes	Yes	5.79E-04	4.15E-02	4.16E-02	1.13E-02	8.13E-01	2.44E+00	8.13E-01	2.48E+00
Benzene	71-43-2	Yes	Yes	Yes	1.91E-06	1.37E-04	1.37E-04	3.74E-05	2.69E-03	8.07E-03	2.69E-03	8.21E-03
Chlorotorm	67-66-3	Yes	Yes	Yes	2.52E-06	1.80E-04	1.81E-04	4.93E-05	3.53E-03	1.06E-02	3.53E-03	1.08E-02
Cumene	98-82-8	Yes	°Z	Yes	5.03E-05	3.61E-03	3.62E-03	9.85E-04	7.07E-02	2.12E-01	7,07E-02	2.16E-01
Formaldehyde	20-00-0	Yes	Yes	Yes	3.52E-03	2.53E-01	2.53E-01	6.90E-02	4.95E+00	1.49E+01	4.95E+00	1.51F+01
m-,p-Aylene	1330-20-7	Yes	Yes	Yes	1.21E-04	8.66E-03	8.68E-03	2.36E-03	1.70E-01	5.10E-01	1.70E-01	5.19E-01
Methanol	67-56-1	Yes	å	Yes	2.77E-03	1.98E-01	1.99E-01	5.42E-02	3.89E+00	1.17E+01	3.89E+00	1.19E+01
Methyl isobutyl ketone	108-10-1	Yes	Yes	Yes	1.74E-04	1.24E-02	1.25E-02	3.40E-03	2.44E-01	7.33E-01	2.44E-01	7.45E-01
Methylene chlorade	75-09-2	Yes	Yes	°Z	4.53E-05	3.25E-03	3.25E-03	8.87E-04	6.36E-02	1.91E-01	6.36E-02	1.94E-01
o-Aylene microsi	95-47-6	Yes	°N	Yes	1.13E-05	8.12E-04	8.14E-04	2.22E-04	1.59E-02	4.78E-02	1.59E-02	4.86E-02
rienoi	7-56-801	Yes	Yes	Yes	7.04E-04	5.05E-02	5.06E-02	1.38E-02	9.89E-01	2.97E+00	9.89E-01	3.03E+00
Fropionaldenyde	123-38-6	Yes	ž	Yes	3.27E-04	2.45E-04	2.35E-02	6.40E-03	4.80E-03	1.38E+00	4.80E-03	1.40E+00
Styrene	100-42-5	Yes	Yes	Yes	9.06E-06	6,49E-04	6.51E-04	1.77E-04	1.27E-02	3.82E-02	1.27E-02	3 89F-02
Loluene	108-88-3	Yes	Yes	Yes	3.27E-04	2.35E-02	2.35E-02	6.40E-03	4.59E-01	1.38E+00	4.59E-01	1.40F±00
Total											14.33	45.21

- Note:

  1 HAP & TAP emission factors for "green, direct wood-fired (inlet moisture content >50%, dry basis" softwood were obtained from AP-42, Section 10.6.2, Table 10.6.2-3.

  2 To account for hardwood emissions, factors were conservatively calculated by taking the ratio of AP-42 Section 10.6.2-3 HAP factors for hardwood to softwood drying (0.244.7).

  These factors were next adjusted by the ratio of the VOC from Pellet Coolers to dryers based on engineering testing conducted at the Enviva Wiggins facility (49.3%). This is considere conservative because the tests values from engineering testing for HAPs/TAPs were actually less than the values presented above.

  3 Short-term emissions were calculated based upon a worst-case scenario of 100% hardwood or softwood firing (in which case, softwood is always the overall worst case).

  Annual emissions were calculated based on the Hardwood and Softwood Composition.

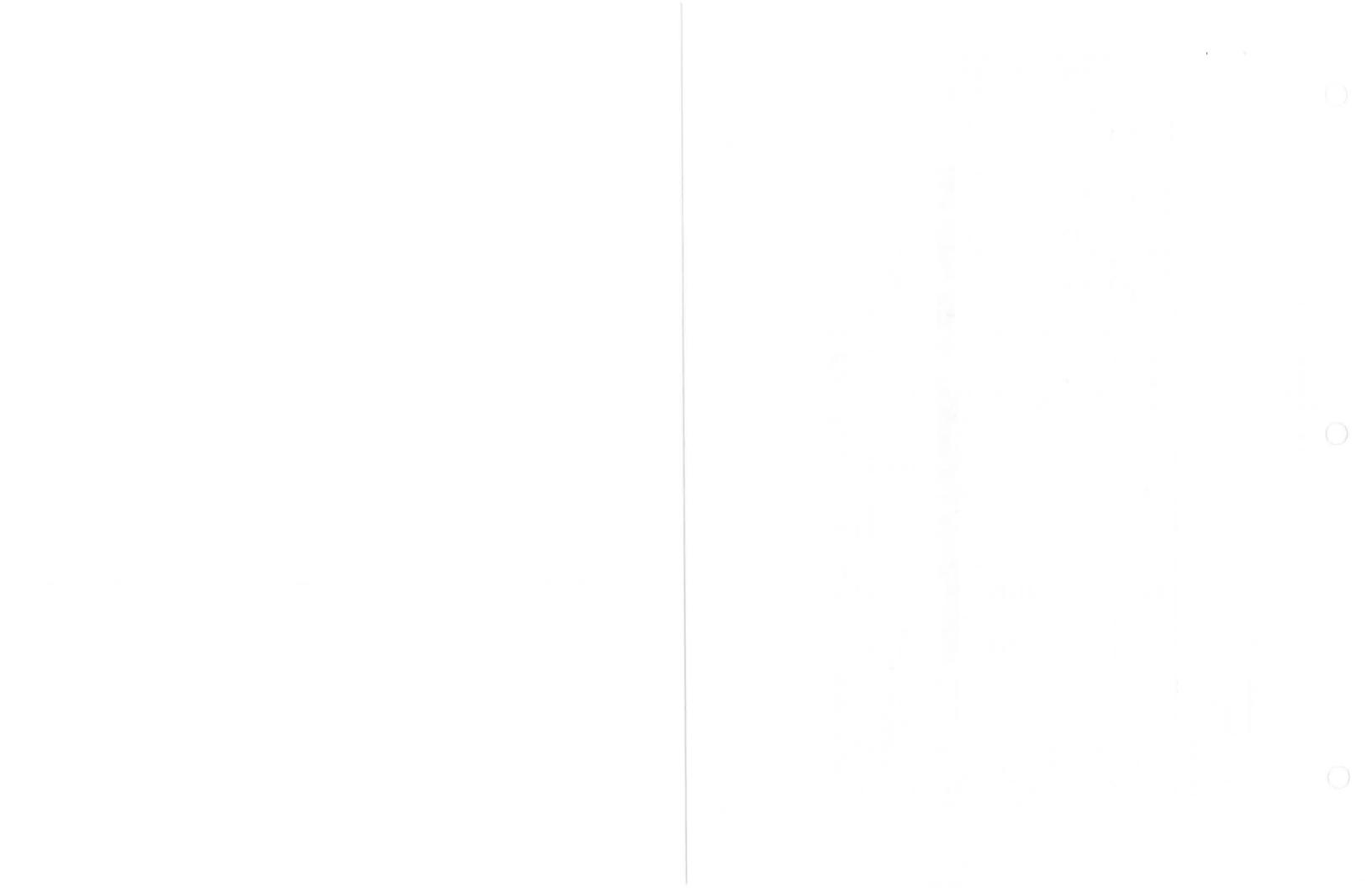
  4 VOC emissions emission factors based on average AP-42 factors for softwood and hardwood drying (4.7 and 0.24 Ib/ODT, respectively) plus a margin of safety of 30%.

  These factors were next adjusted by the ratio of the VOC from pellet cooler aspiration system to dryers based on engineering testing conducted at the Enviva Wiggins facility (49.3%).

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nty Emission Calculations and BACT v6 submittal to DAQ Pellet Cooler Enviva Hamlet, Richn



# TABLE B-10 ELECTRIC POWERED CHIPPER EMISSIONS ENVIVA PELLET HAMLET, LLC

Chipper Throughput

575,000

tons dry wood

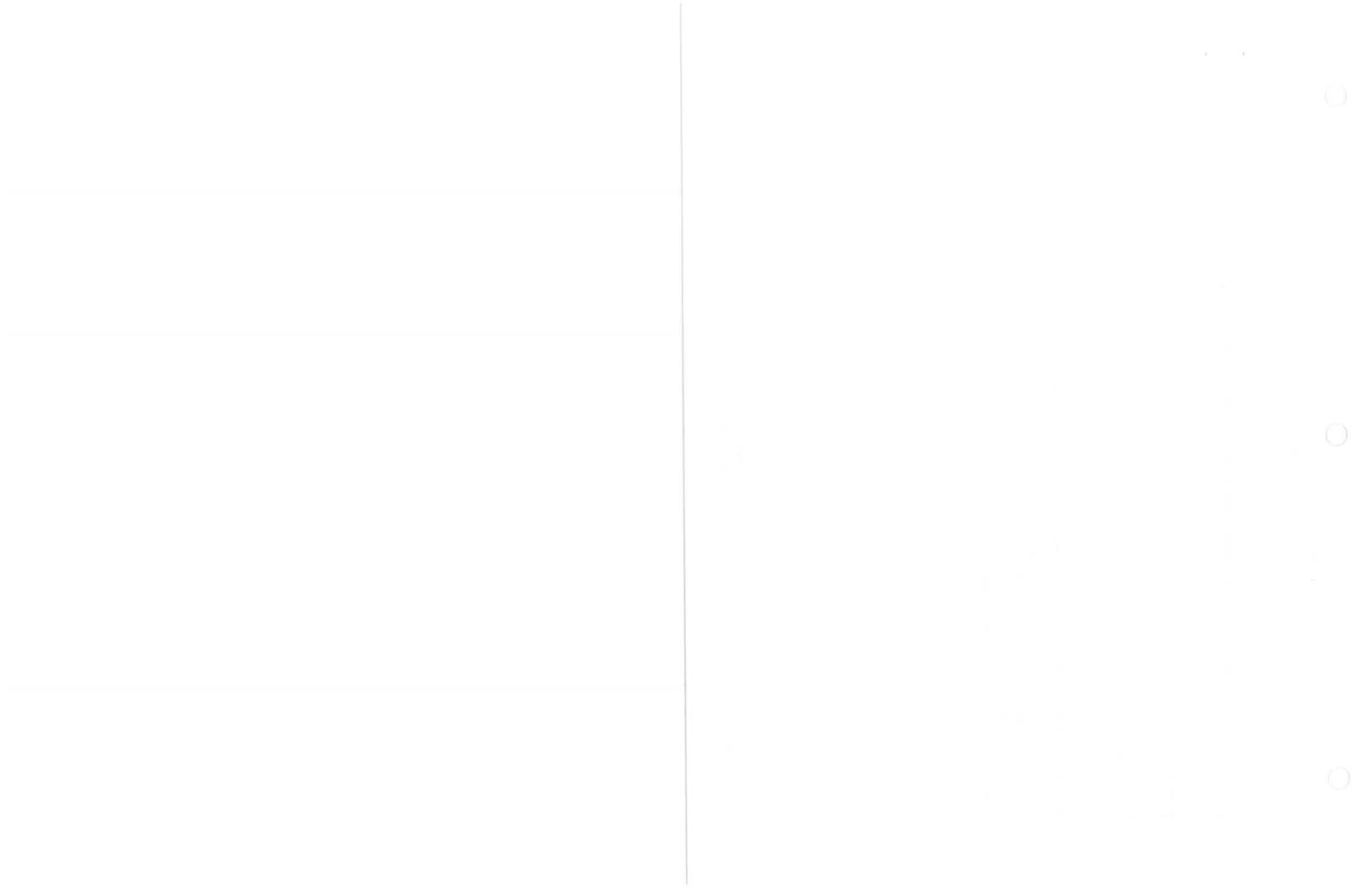
	Emission Factors	Emis	Emissions <sup>3</sup>
Pollutant	(lb/dry wood tons)	(lb/yr)	(tpy)
$ m PM^3$	N/A	0.00E+00	0.00
THC as Carbon¹ THC as propane²	0.0041	2.36E+03 2.89E+03	1.18
Methanol <sup>1</sup>	0.0010	5.75E+02	0.29

Emission factor obtained from available emissions factors for chippers in AP-42 Section 10.6.3, Table 7
 and Section 10.6.4, Tables 7 and 9. Emission factors for THC and Methanol are the same across all three tables.
 Emission factor converted from as carbon to as propane by multiplying by 1.225.

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 $<sup>^{3}</sup>$  PM emission factor is not applicable as emissions are routed downward to the ground.



# TABLE B-11 ELECTRIC POWERED BARKHOG EMISSIONS ENVIVA PELLET HAMLET, LLC

Hog Throughput

157,680

tons dry wood

	Emission Factors	Emis	Emissions <sup>3</sup>
Pollutant	(lb/dry wood tons)	(lb/yr)	(tpy)
$ m PM^3$	N/A	0.00E+00	00:00
THC as Carbon <sup>1</sup> THC as propane <sup>2</sup>	0.0041	6.46E+02 7.92E+02	0.32
Methanol <sup>1</sup>	0.0010	1.58E+02	0.08

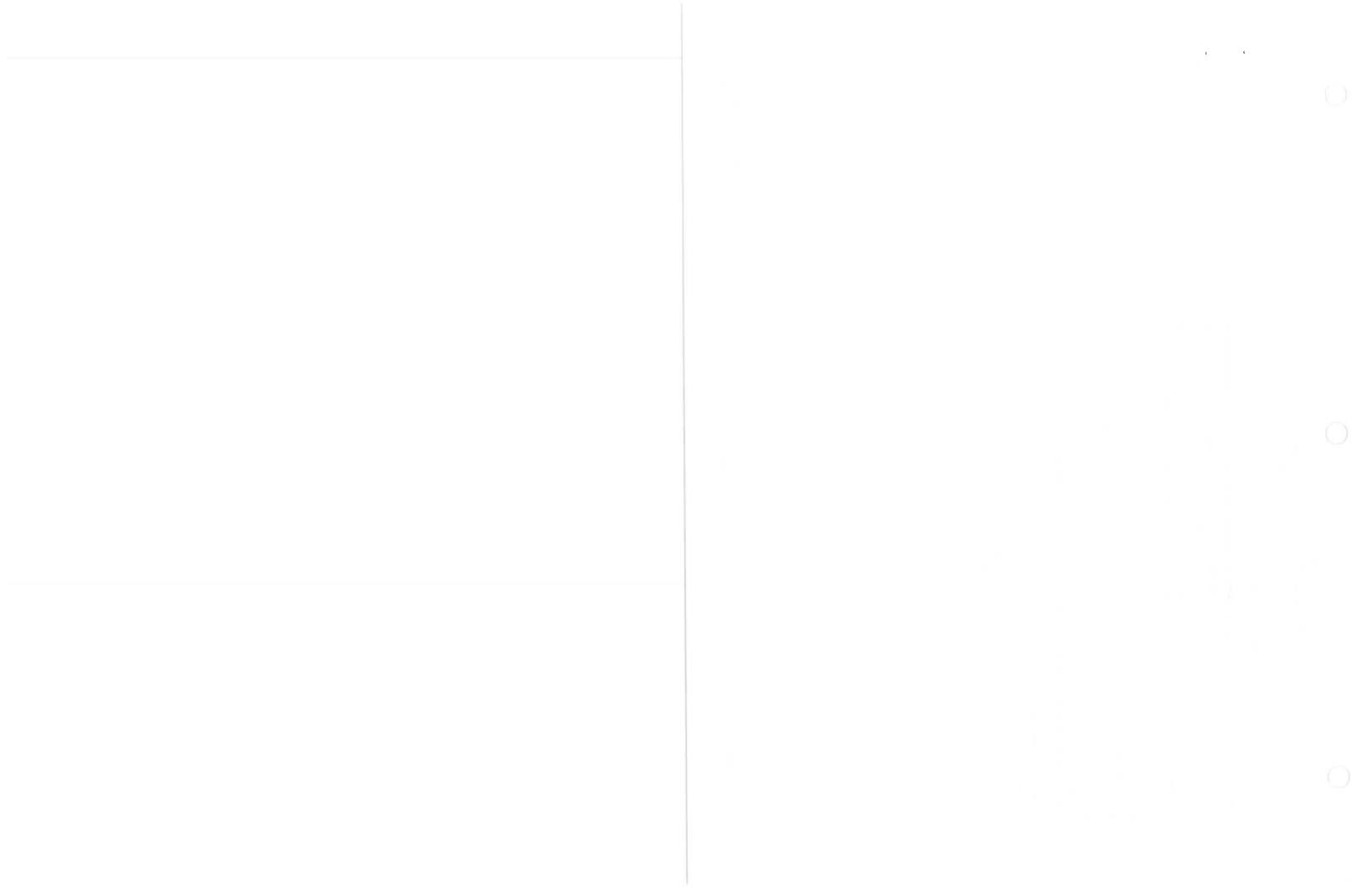
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Envi**Applemali**etBRichmond County Emission Calculations and BACT v6 submittal to DAQ Page 11 of 21 BarkHog

<sup>&</sup>lt;sup>1</sup> Emission factor obtained from available emissions factors for chippers in AP-42 Section 10.6.3, Table 7 and Section 10.6.4, Tables 7 and 9. Emission factors for THC and Methanol are the same across all three tables.

<sup>2</sup> Emission factor converted from as carbon to as propane by multiplying by 1.225.

<sup>3</sup> PM emission factor is not applicable as emissions are routed downward to the ground.



# TABLE B-12 GREEN WOOD HAMMERMILLS EMISSIONS ENVIVA PELLET HAMLET, LLC

Hammermill Throughput

575,000

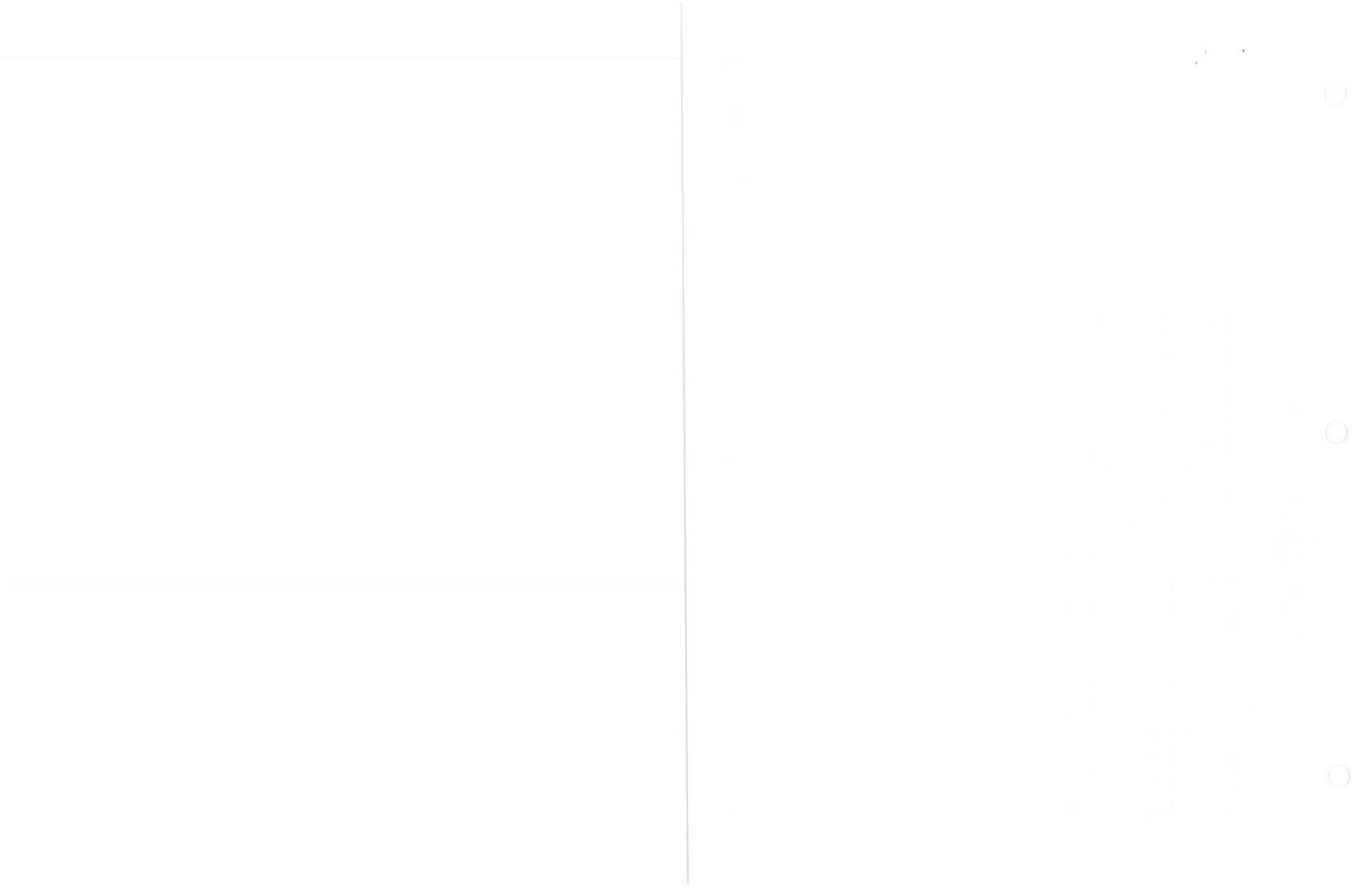
tons dry softwood

	Emission Factors	Emi	Emissions
Pollutant	(lb/dry wood tons)	(lb/yr)	(фу)
THC as propane¹	1.10	632,500	316
$\mathit{HAPs}$ $Methanol^1$	0.0073	4,198	2.10

 $<sup>^{1}</sup>$  Emission factor obtained from available emissions factors AP-42 Section 10.6.2, Table 7.

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## TABLE B-13 EMERGENCY GENERATOR AND FIRE PUMP EMISSIONS ENVIVA PELLET HAMLET, LLC

## Emergency Generator Emissions (ES-EG)

**Equipment and Fuel Characteristics** 

Engine Output	0.19	MW
Engine Power	250	hp (brake)
Hours of Operation	500	hr/yr¹
Heating Value of Diesel	19,300	Btu/lb
Power Conversion	2,545	Btu/hr/hp

## Criteria Pollutant Emissions

				Potential	Emissions
Pollutant	Category	Emission Factor	Units	lb/hr	tpy
TSP	PSD	0.20	g/KW-hr	0.08	0.02
$PM_{10}$	PSD	0.20	g/KW-hr	0.08	0.02
PM <sub>2.5</sub>	PSD	0.20	g/KW-hr	0.08	0.02
NO <sub>x</sub>	PSD	4.00	g/KW-hr	1.64	0.41
SO <sub>2</sub>	PSD	15.00	ppmw (3)	9.89E-04	2.47E-04
CO	PSD	3.50	g/KW-hr	1.44E+00	3.59E-01
VOC (NMHC)	PSD	4.00	g/KW-hr	1.64E+00	4.11E-01
Acetaldehyde Acrolein	HAP/TAP	5.37E-06	1b/hp-hr (4)	1.34E-03	3.36E-04
•	1		, ,,	1.34E-03	3.36E-04
	HAP/TAP	6.48E-07	lb/hp-hr (4)	1.62E-04	4.05E-05
Benzene	HAP/TAP	6.53E-06	lb/hp-hr (4)	1.63E-03	4.08E-04
Benzo(a)pyrene <sup>6</sup>	HAP/TAP	1.32E-09	lb/hp-hr (4)	3.29E-07	8.23E-08
1,3-Butadiene	HAP/TAP	2.74E-07	lb/hp-hr (4)	6.84E-05	1.71E-05
Formaldehyde	HAP/TAP	8.26E-06	lb/hp-hr (4)	2.07E-03	5.16E-04
Total PAH (POM)	HAP	1.18E-06	lb/hp-hr (4)	2.94E-04	7.35E-05
Toluene	HAP/TAP	2.86E-06	lb/hp-hr (4)	7.16E-04	1.79E-04
Xylene	HAP/TAP	2.00E-06	lb/hp-hr (4)	4.99E-04	1.25E-04
Highest HAP (Formaldehyde)		8.26E-06	1b/hp-hr (4)	2.07E-03	5.16E-04
Total HAPs				6.78E-03	1.69E-03

## Note:

Appervida: Bamlet, Richmond County Emission Calculations and BACT v6 submittal to DAQ Page 13 of 21 ES-EG, ES-FWP

<sup>&</sup>lt;sup>1</sup> NSPS allows for only 100 hrs/yr of non-emergency operation of these engines (not the 500 hours shown). The PTE for the emergency generator is based on 500 hr/yr, though, because the regs allow non-emergency operation and EPA guidance is 500 hr/yr for emergency generators.

<sup>&</sup>lt;sup>2</sup> Emissions factors from NSPS Subpart IIII (or 40 CFR 89.112 where applicable) in compliance with post-2010 construction.

<sup>&</sup>lt;sup>3</sup> Sulfur content in accordance with Year 2013 standards of 40 CFR 80.510(a) as required by NSPS Subpart IIII.

<sup>&</sup>lt;sup>4</sup> Emission factor obtained from AP-42 Section 3.3, Tables 3.3-1 Table 3.3-2.

<sup>&</sup>lt;sup>5</sup> Emission factor for NOx is listed as NOx and NMHC (Non-Methane Hydrocarbons or VOC) in Table 4 of NSPS Subpart IIII. Conservatively assumed entire limit attributable to NOx and VOC.

<sup>&</sup>lt;sup>6</sup> Benzo(a)pyrene is included as a HAP in Total PAH.

## TABLE B-13 EMERGENCY GENERATOR AND FIRE PUMP EMISSIONS ENVIVA PELLET HAMLET, LLC

## Firewater Pump Emissions (ES-FWP)

**Equipment and Fuel Characteristics** 

-1-1		
Engine Output	0.19	MW
Engine Power	250	hp
Hours of Operation	500	hr/yr <sup>1</sup>
Heating Value of Diesel	19,300	Btu/lb
Power Conversion	2,545	Btu/hr/hp

## Criteria Pollutant Emissions

			Potential En	issions
	Emission Factor	Units	lb/hr	tpy
PSD	0.20	g/KW-hr	0.08	0.02
PSD	0.20	g/KW-hr	0.08	0.02
PSD	0.20	g/KW-hr	0.08	0.02
PSD	4.00	g/KW-hr	1.64	0.41
PSD	15.00	ppmw (3)	9.89E-04	2.47E-04
PSD	3.50	g/KW-hr	1.44E+00	3.59E-01
PSD	4.00	g/KW-hr	1.64E+00	4.11E-01
			1.34E-03	3.36E-04
HAP/TAP	5.37E-06	lb/hp-hr (4)	1 34E-03	3 36F-04
HAP/TAP	6.48E-07	lb/hp-hr (4)	1.62E-04	4.05E-05
HAP/TAP	6.53E-06	lb/hp-hr (4)	1.63E-03	4.08E-04
HAP/TAP	1.32E-09	lb/hp-hr (4)	3.29E-07	8.23E-08
HAP/TAP	2.74E-07			1.71E-05
HAP/TAP	8.26E-06			5.16E-04
HAP	1.18E-06	" ' '		7.35E-05
HAP/TAP	1	* ` '		1.79E-04
HAP/TAP	1			1.79E-04 1.25E-04
	0.202-00	totapent (4)		5.16E-04 1.69E-03
	PSD PSD PSD PSD PSD PSD  MAP/TAP HAP/TAP HAP/TAP HAP/TAP HAP/TAP HAP/TAP HAP/TAP	PSD 0.20 PSD 0.20 PSD 0.20 PSD 0.20 PSD 1.00 PSD 15.00 PSD 3.50 PSD 4.00 PSD 4.00 PSD 4.00 PSD 15.00 PSD 1	PSD 0.20 g/KW-hr PSD 15.00 ppmw (3) PSD 3.50 g/KW-hr PSD 3.50 g/KW-hr PSD 4.00 g/KW-hr PSD 15.00 ppmw (4) PSD 15.00 ppmw (4) PSD 15.00 ppmw (5) PSD 15.00 ppmw (6) PSD 15.00 ppmw (7) PSD 15.00 ppmw (8) PSD 15.00 ppmw (8) PSD 15.00 ppmw (9) PSD 15.00 ppmw (10)	Category   Emission Factor   Units   Ib/hr

## Note:

Approvided Barnlet, Richmond County Emission Calculations and BACT v6 submittal to DAQ Page 14 of 21 ES-EG, ES-FWP

Tri	nity	Co	ทรเ	ılta	nts

<sup>&</sup>lt;sup>1</sup> NSPS allows for only 100 hrs/yr of non-emergency operation of these engines (not the 500 hours shown). The PTE for the emergency generator is based on 500 hr/yr, though, because the regs allow non-emergency operation and EPA guidance is 500 hr/yr for emergency generators.

<sup>&</sup>lt;sup>2</sup> Emissions factors from NSPS Subpart IIII (or 40 CFR 89.112 where applicable) in compliance with post-2009 construction.

<sup>&</sup>lt;sup>3</sup> Sulfur content in accordance with Year 2010 standards of 40 CFR 80.510(a) as required by NSPS Subpart IIII.

<sup>&</sup>lt;sup>4</sup> Emission factor obtained from AP-42 Section 3.3, Tables 3.3-1 Table 3.3-2.

<sup>&</sup>lt;sup>5</sup> Emission factor for NOx is listed as NOx and NMHC (Non-Methane Hydrocarbons or VOC) in Table 4 of NSPS Subpart IIII. Conservatively assumed entire limit attributable to NOx and VOC.

<sup>&</sup>lt;sup>6</sup> Benzo(a)pyrene is included as a HAP in Total PAH.

## TABLE B-14 PORTABLE CHIPPER ENGINE EMISSIONS ENVIVA PELLET HAMLET, LLC

## Portable Chipper (ES-CHIP-2)

**Equipment and Fuel Characteristics** 

Engine Output	0.97	MW
Engine Power	1,300	hp
Hours of Operation	500	hr/yr
Heating Value of Diesel	19,300	Btu/lb
Power Conversion	2,545	Btu/hr/hp

## Criteria Pollutant Emissions

				Potential En	issions
Pollutant	Category	Emission Factor	Units	lb/hr	tpy
TSP	PSD	0.20	g/KW-hr	0.43	0.11
$PM_{10}$	PSD	0.20	g/KW-hr	0.43	0.11
PM <sub>2,5</sub>	PSD	0.20	g/KW-hr	0.43	0.11
NO <sub>x</sub>	PSD	6.4	g/KW-hr	13.67	3,42
SO <sub>2</sub>	PSD	15	ppmw (3)	0.0051	1.29E-03
CO	PSD	3.50	g/KW-hr	7.47	1.87E+00
VOC (NMHC)	PSD	6.4	g/KW-hr	13.67	3.42E+00
Acetaldehyde	HAP/TAP	5.37E-06	lb/hp-hr (4)	6.98E-03	1.74E-03
Acrolein	HAP/TAP	6.48E-07	Ib/hp-hr (4)		
Benzene	HAP/TAP	6.53E-06		8.42E-04	2.10E-04
Benzo(a)pyrene <sup>5</sup>			lb/hp-hr (4)	8.49E-03	2.12E-03
	HAP/TAP	1.32E-09	lb/hp-hr (4)	1.71E-06	4.28E-07
1,3-Butadiene	HAP/TAP	2.74E-07	lb/hp-hr (4)	3.56E-04	8.90E-05
Formaldehyde	НАР/ТАР	8.26E-06	lb/hp-hr (4)	1.07E-02	2.68E-03
Total PAH (POM)	HAP	1.18E-06	lb/hp-hr (4)	1.53E-03	3.82E-04
Toluene	HAP/TAP	2.86E-06	lb/hp-hr (4)	3.72E-03	9.30E-04
Xylene	HAP/TAP	2.00E-06	lb/hp-hr (4)	2.59E-03	6.48E-04
Highest HAP (Formaldehyde)		8.26E-06	lb/hp-hr (4)	1.07E-02	2.68E-03

ACT v6 submittal to DAQ Portable Chipper

	Apperviols: Hamlet, Richmond County Emission Calculations and BA
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<sup>&</sup>lt;sup>1</sup> Emissions factors from NSPS Subpart IIII (or 40 CFR 89.112 where applicable) in compliance with post-2010 construction.

<sup>&</sup>lt;sup>2</sup> Use of ultra low sulfur disel at 15 ppmw.

<sup>&</sup>lt;sup>3</sup> Emission factor obtained from AP-42 Section 3.3, Tables 3.3-1 Table 3.3-2.

<sup>&</sup>lt;sup>4</sup> Emission factor for NOx is listed as NOx and NMHC (Non-Methane Hydrocarbons or VOC) in Table 4 of NSPS Subpart IIII. Conservatively assumed entire limit attributable to NOx and VOC.

<sup>&</sup>lt;sup>5</sup> Benzo(a)pyrene is included as a HAP in Total PAH.

<sup>&</sup>lt;sup>6</sup> Enviva has two options in backup Chippers either a 700HP Tier 3 Engine or a 1050hp Tier 2 engine. Since the 1050hp Tier 2 Engine will produce greater emissions, Enviva has used emissions for the 1050hp Tier 2 engine for the emission calculations for consevatism.

Emission Source Group	Transfer Activity	Type of Operation	Number of Drop Points	PM Particle Size Muttiplier (dimensionless) (d	PM <sub>18</sub> Particle Size Multiplier (dimensionless)	PM <sub>2.5</sub> Particle Size Multiplier (dimensionless)	Mean Wind Speed (U) (mph)	Material Moisture Content (M)	PM Emission Factor <sup>3</sup>	PM <sub>10</sub> Emission Factor <sup>2</sup>	PM <sub>1,5</sub> Emission Factor <sup>2</sup>	Potential Throughput	Potential PM Emissions	Potential PM <sub>16</sub> Emissions	Potential PM <sub>2.9</sub> Emissions
FS-CWIZ	Burchased Dark Thursday As C. 1								(Inchication)	(Invitati)	(ID/ton)	(tds)	(tby)	(tpy)	(tpy)
1111000	r metasson pears transfer to Outdoor Storage Area	Batch Drop	-	0.74	0.35	0.053	10	100%	407506	4444					
ES-GWH	Drop Points via Conveying from Bark Pile to Driver	Ratch Person	,	0.00		2000	1.2	4078	4.9/E-US	Z.35H-05	3.56E-06	13,733	8.63E-05	4.08E-05	6.18E-06
ES-OWH	Transfer Purchased Wood China West to Outdoor St.	doug truck		0.74	0.35	0.053	7.9	42%	5.92E-05	2.80E-05	4.24E-06	13 733	4118.04	1 045 04	20000
Die ditality	The state of the s	Datch Lyop	-	0.74	0.35	0.053	2.9	49%	4 78E.05	275006	2 470.00	000 011		**************************************	4.73E-U3
DACIWII	Litter Points via Conveying from Chip Pile to Dryer	Batch Drop	•	0.74	0.36	0.000			20.000	CO.CO. 7	3.4.5.40	140,000	8.50E-04	4.02E-04	6.08E-05
					65.0	0.00	0.0	41%	4.36E-05	2.06E-05	3.12E-06	530,451	1.46E-02	6.917-03	1 05E.02

0.74 0.35 0.053

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## TABL. GREEN WOOD STORAGE PILES FUGITIVE EMISSIONS ENVIVA PELLET HAMLET, LLC

P.M. Emissions   P.M.   Emissions   P.M.   Emissions   Clark   Clark	のいるというないのできているという	ないのでは、							Surface					がでは					1000
7E-06         3.60         3.44E-06         100         400         10         60,000         0.322         1,410         0.161         0.705         0.0242         0.106         0.21           7F-06         3.60         3.44E-06         200         400         10         110,400         0.593         2.595         0.296         1.298         0.0444         0.195         0.38           0.322         1.410         0.161         0.765         0.0444         0.195         0.38	нори	TSP Emissi (lb/dav/acre)	on Flector <sup>1</sup> (Ib/far (t <sup>2</sup> )	VOC Emissi (fb/day/acre)	ion Factor <sup>7</sup> (tb.hr/ft <sup>2</sup> )	Width	Health (6)	Height (n)	Area of Storage Pile (#2)	PM Emi	selons (tpy)	PM <sub>10</sub> Em	besions (TOV)	PM <sub>1,8</sub> Emi	silons (fmv)	VOC as C Emissio		VOC as Propa Emissions*	1
7E-06         3.60         3.44E-06         100         400         10         60,000         0.322         1.410         0.161         0.705         0.0242         0.106         0.21           7E-06         3.60         3.44E-06         200         400         10         110,400         0.593         2.595         0.296         1.298         0.0444         0.195         0.38           0.22         1.410         0.161         0.705         1.410         0.161         0.705         0.104         0.195         0.31														SAME THE PARTY.	,,,,,,	Marie 12	1000	(novar)	((da)
TB-06         3.60         3.44E-06         200         400         10         110,400         0.593         2.595         0.296         1.298         0.0444         0.195         0.318           0.322         1.410         0.161         0.705         0.165         0.105         0.105         0.105	Wood Pile No. 1	5.61	5.37E-06	3.60	3.44E-06	001	400	9	000 09	0.322	1 410	1710	0 00						
3.00 3.44E-06 200 400 10 110,400 0.593 2.595 0.296 1.298 0.0444 0.195 0.38 0.38 0.322 1.410 0.161 0.705 0.705 0.105	Wood Pile No 2	\$ K1	\$ 37E 06					}	20,5	777	OIF.	0.101	0.705	0.0242	0.106	0.21	06.0	0.25	1.1
0.322 1.410 0.161 0.705 0.104 0.104		1000	00-0755	3.00	3.44E-U6	200	400	9	110,400	0.593	2.595	0.296	1.298	0.0444	0 105	0.38	1.67	4	100
0.322 1.410 0.161 0.705 0.032 0.03															2000	0.00	/0.1	4.0	7.04
0000	65-p) \ f \mathcal{h}_0, \daggers,									0.322	1.410	0.161	0.705	0.0242	0.106	0.21	08.0	26.0	Ī

7 1.5 235 15 (1b/day/ac

when white or days with rainfall greater than 0.0 i inch:

f (time that wind exceeds 5.36 ms - 12 mph) (%):

PM<sub>W</sub>/TSP ratio.

where:

1 3 - silt content(%) Re turbor sawmills (minimum), from AP-42 Table 13.2.2.1

1 20 Based on AP-42, Section 13.2.2, Figure 13.2.1.2.

1 4.8 Based on arctecorlogical data averaged for 2007-2011 for Sampson, NC.

ratio: 50%, PMs, is sammed to equal 50% of TSP based on U.S. EPA Control of Open Fligitive Du. Septiember 198s.

PMs1s assumed to equal 7.5 % of TSP U.S. EPA Background Decument for Revisions 2006.

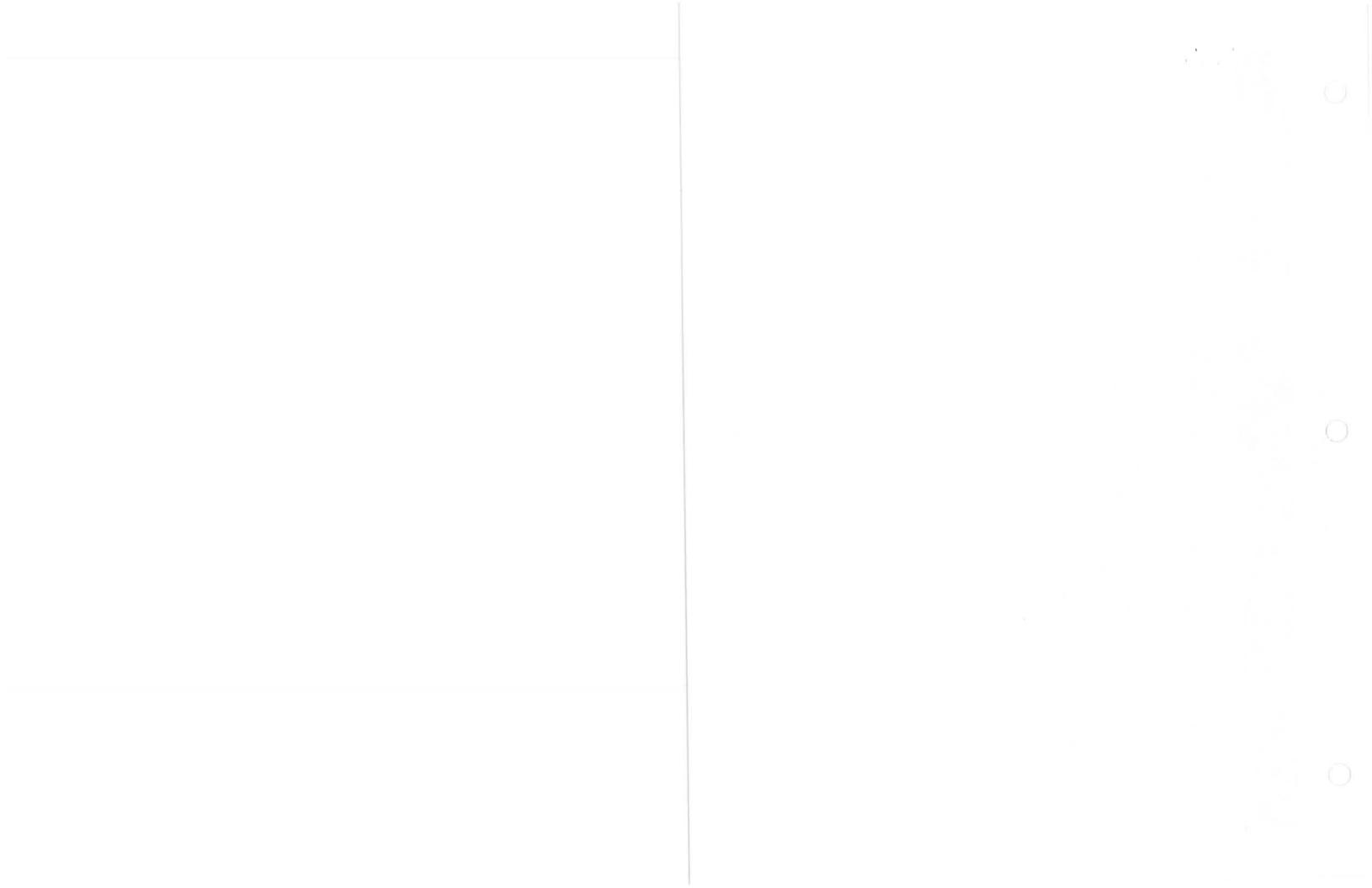
PM<sub>1,2</sub>71SP ratio: idated as [2\*ff\*L+2\*W/\*H+L\*W] + 20% to consider t

Bmission factors obtained from NCASI document provided by SC DHEC for the calculation of fugitive VOC emissions from Do;
 Britisdons are calculated in tors of carbon per year by the following formals:
 Inner Cheer = 3 carus \* 365 days \* 1,6 lb Clear-day / 2000 lb/lon
 Emission factor converted from as carbon to as propene by multiplying by 1,225.

Trinity Consultants Date: 1/13/2014

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ns and BACT v6 submittal to DAQ Green Wood Storage Piles



## TABLE B-17 TANKS EMISSIONS ENVIVA PELLET HAMLET, LLC

			Tank D	Tank Dimensions				TANE	TANKS 4.0
		Volume <sup>1</sup>	Diameter	Height/Length	Orientation	Thronghant Turnovers	Turnovers	VOC Emissions	niecione
Tank ID	Tank Description	(gal)	(#)	(#)		(gal/vr)		(lh/vr)	(thuy)
TK01	Emergency Generator Fuel Oil Tank <sup>2</sup>	2,500	9	12	Vertical	12 000	4 80	0.27	2 575 02
						25,000	1.00	75.0	3.27E-U3
1K02	Fire Water Pump Fuel Oil Tank	1,000	5	6	Horizontal	10 300	10.30	70 0	1 20E 04
202	Math 12					000601	UC.DI	00.0	4.30E-04
1K03	Woolle Equipment Fuel Oil Tank	2,500	9	12	Vertical	12,000	4.80	0.37	3.57E-03
							TOTAL	1.60	7.57E-03

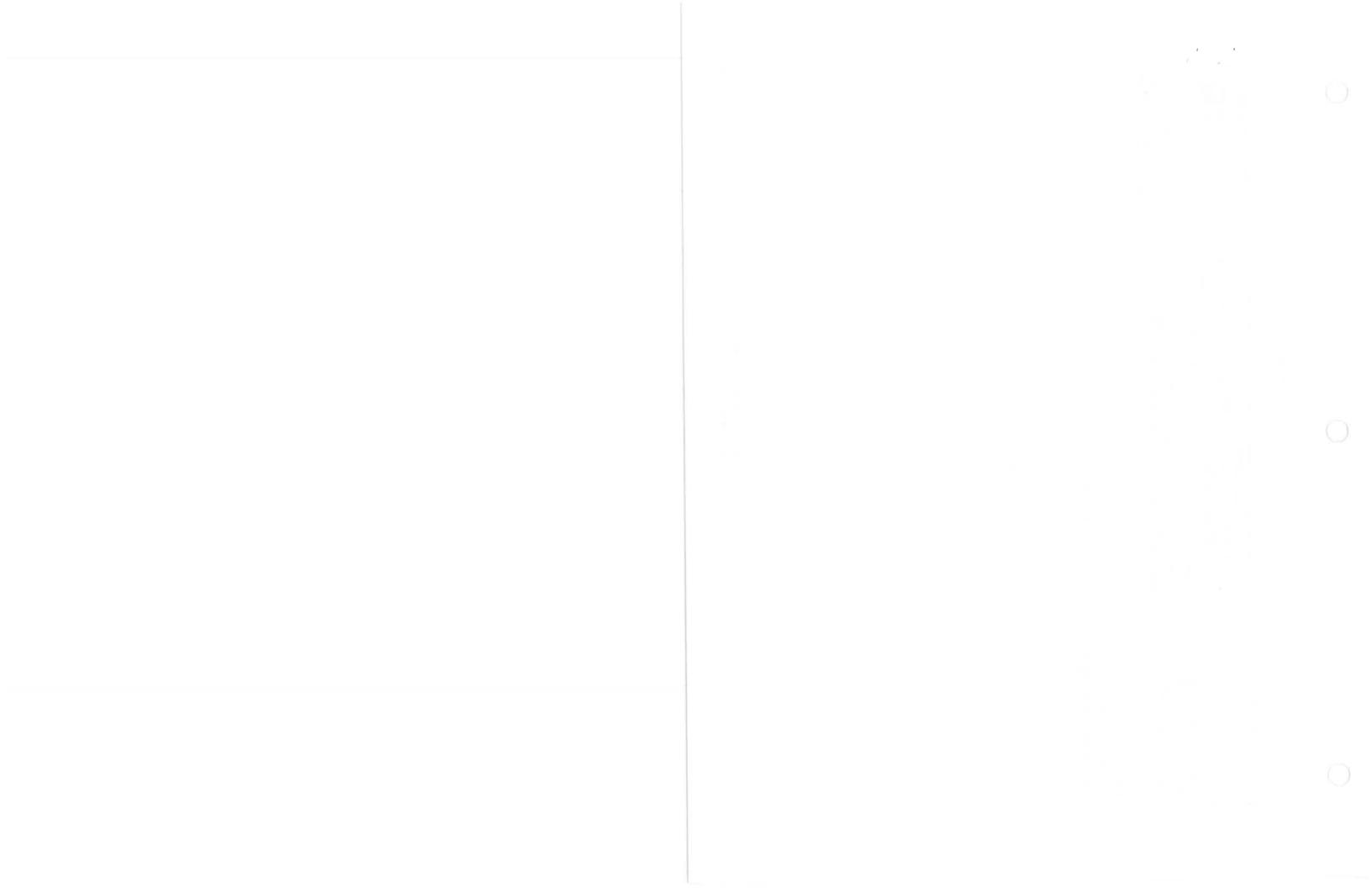
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Note:

Conservative design specifications.

Throughput based on fuel consumption and 500 hours of operation per year.



## TABLE B-18 UNPAVED ROAD POTENTIAL FUGITIVE PM EMISSIONS ENVIVA PELLET HAMLET, LLC

Transfer Activity	Distrance Traveled Miles Per Round Trapi Tripi Tripi Tripi Trips Per per Day P. (ft) Day (VMT/day)	Trips Per Day	Miles Traveled per Day (VMT/day)	Events Per Year (Days)	Truck Weight (Empty)	Truck Weight (Loaded)	Average Weight (W) (tons)	Vehicle Miles Traveled (VMT/yr)	Eml PM	Emission Factor <sup>2</sup> (lb/VMT) PM <sub>14</sub> P	F.W.	Poten (lb/hr)	Potential Emissions <sup>3</sup> PM (BM) (fby) (fby)	- a â	Potent (Jb/hr.)	Potential Emissions <sup>3</sup> PM <sub>10</sub> Pr <sub>1</sub>		Potent	Potential Emissions <sup>3</sup> PM <sub>2.8</sub>	- 1	
Loss Deliverate Coult Los Steman Anna							l	Ī			1					(6	(64)	(10)(11)	(in)(an)	(dds)	
Pellet Truck Delivery to Bellet I packed America	2,700	31	15.86	365	40480	102540	35.8	5,790	5.28	1.35	0.135	0.70	16.76	3.06	0.18		0.78	000	64.0	9	*
ייייי בייייי בייייי בייייי בייייי בייייי בייייי בייייי ביייייי	200	2	0.34	300	40480	102540	35.8	102	5.28	1.35	0.135	0.02	0.36	500	000		200	70.00	Ct-YO	0.0	
Total Unpayed Road Emisetons											t				0.00	1	410.0	0.0004	0.009	0.001	
												0.71	17.17	3.11	910	200	0 000				
														2177			2			900	

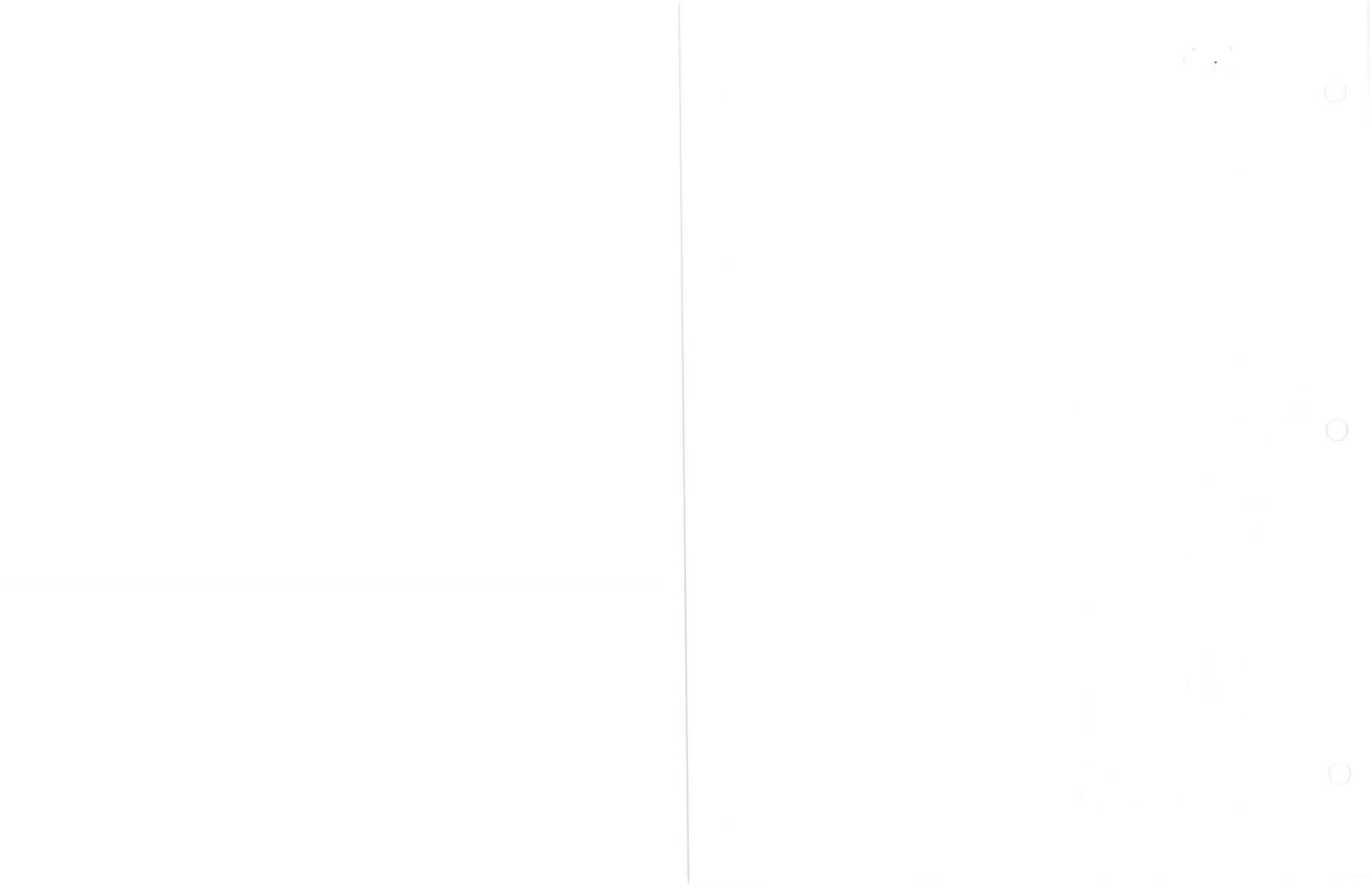
i. Detection threshold per round this was estimated based out that round mas now arrows. It. Unperved treat factors based on minimize submarition equation from A.P.-42, Fifth Edition, St. Where:  $E = \left[ k \left( \frac{s}{12} \right)^{\alpha} \left( \frac{W}{3} \right)^{\beta} \right] \left[ \frac{365 - P}{365} \right] \quad (1b/VMT)$ 

PMs.s 0.9 0.45 0.15

PM<sub>10</sub> 0.9 0.45 1.5

0.7 0.45 4.9 4.8

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## TABLE B-19 PAVED ROAD POTENTIAL FUGITIVE PM EMISSIONS ENVIVA PELLET HÄMLET, LLC

Transfac Activity	Distance Traveled per Round Trip <sup>1</sup>	. 15	Miles Traveled per Day	Events Per Year	Truck Weight (Empty) (	Truck Weight (Loaded)	Average Welght (W)	Vehicle Mites Traveled	2	Emission Factor <sup>2</sup> (lb/VMT)	J.	Potential Emissions <sup>3</sup> PM	nissions <sup>3</sup>	Potential Emissions	misstons <sup>3</sup>	Potential Emissions	missions <sup>3</sup>
ANATONI PAGINIT	E	Day	_	- 1	- 1	SQ.	(tons)	(VMT/yr)	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	(lb/hr)	(tpy)	(Ib/hr)	(tpy)	(lb/hr)	(tpy)
Logs Delivery to South Log Storage Area	6,000	31	52.88	365	40480	102540	35.8	19,299	0.24	0.05	0.012	0.05	0.24	0.01	0.05	2 6R-03	1.2E.03
Logs Lenvery to Crane Storage Area	000'6	47	80.11	365	40480	102540	35.8	29,241	0.24	0.05	0.012	0.08	0.36	0.02	0.07	4.0E-03	1.7F-02
Chins/Horfiel Delivery	8,475	4 3	22.63	365	40480	102540	35.8	8,261	0.24	0.05	0.012	0.02	0.10	0.00	0.02	1.1E-03	4.9E-03
Pollet Truck Delivery to Pellet Loadout Area	8,475	\$ S	150.88	365	40960	101440	35.6	120,53	0.24	0.05	0.012	0.15	19.0	3.0E-02	1.3E-01	7.5E-03	3,3E-02
Employee Car Parking	570%	9 5	103.13	0 1	40480	102540	35.8	1,031	0.24	0.05	0.012	0.10	0.01	0.02	0.00	5.1E-03	6.2E-04
		2	32.0	365	4000	4000	2.0	11,665	0.01	0.00	0.001	0.00	0.01	0.00	00.0	8.4E-05	3.7E-04
Total Paved Road Emissions												0.42	1.38	0.08	0.28	0.02	0.07

1. Distance traveled per round trip was estimated based on track route and site lavout.

Distance traveled per round trip was estimated based on track route and site layout.
 Paved road emission fledors based on emission estimation Rounten 2 from AP-47 Section 17 2 1 1/1/11 to contents.

E= $\left[K(sL)^{0.91}(W)^{1.02}\right]\left[1-\frac{P}{4*365}\right]$  (1b/VMT)

E – particulate cansiston factor (DeVART)

1. Particle sice multiplier from AP-42 Table 13.2.1-1

1. at. - road surface sit looking from AP-42 Table 13.2.1-2 for ADT <500

1. A. mean vehicle weight (ton)

1. No. days with reinfall greater than 0.01 inch, Per AP-42, Section 13.2.1, Figure 13.2.1-2 (Richmond County, NC).

3. Potential emissions calculated from appropriate emission factor times vehicle miles traveled with control efficiency of 90%.

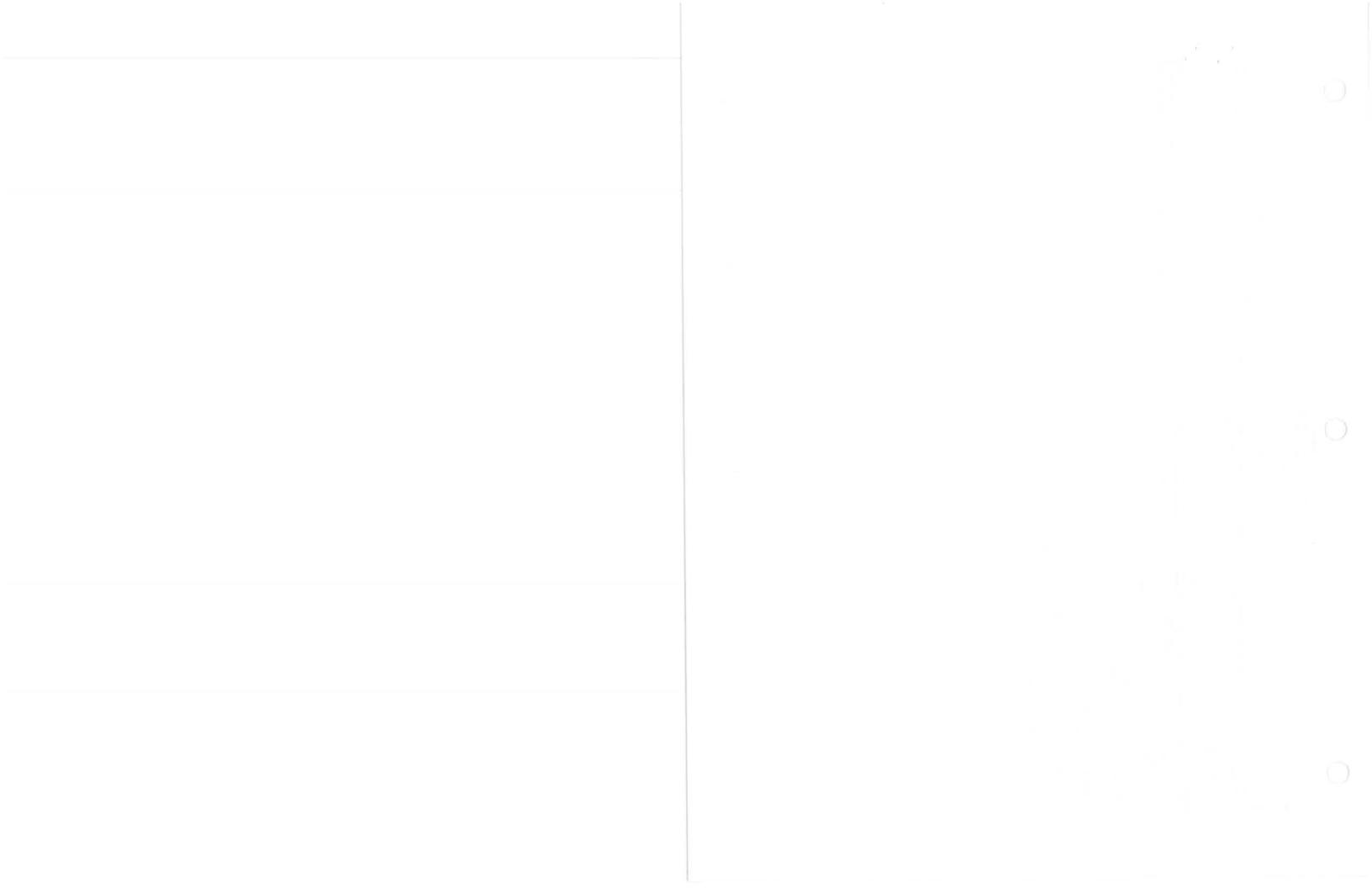
PM<sub>2.5</sub>

PM<sub>10</sub> 0.0022

> For 19bie 5 m Chapter 4 of the Air Pollution Engineering Manual, Air and Waste Management Association, pag Control efficiency (%) = 96-0.263\*V, where V is the number of vehicle passes since application of water.

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Envive Hamlet, Richmond County Emission Calculations and BACT v6 submittal to



## TABLE B-20 POTENTIAL GHG EMISSIONS FROM COMBUSTION SOURCES ENVIVA PELLET HAMLET, LLC

### Potential GHG Emissions

### Operating Data:

250 bhp 500 hrs/yr 11.9 gal/hr<sup>1</sup> 1.630 MMBtu/hr<sup>2</sup> 250 bhp 500 hrs/yr 11.9 gal/hr<sup>1</sup> 1.630 MMBtu/hr<sup>2</sup> 175.30 MMBtu/hr 8,760 hrs/yr Fire Water Pump Output Operating Schedule No. 2 Fuel Input Energy Input No. 2 Fuel Input Energy Input Dryer Heat Input Operating Schedule Emergency Generator Output Operating Schedule

Backup Chipper Pump Output Operating Schedule No. 2 Fuel Input Energy Input

1,300 bhp 500 hrs/yr 61.9 gal/hr<sup>1</sup> 8.478 MMBtu/hr<sup>2</sup>

		Umission Do	ofour from Thells O 4	d menimus 3					
Emission Unit ID	Fuel Type	Elmission Fa	Emission ractors from Table C-1 (kg/M/MBtu)	(kg/MMBtu)		Em	Emissions (metric tons)	ric tons)	
		C02	CH4	NZO	CO2	CH4	OCN	Total CO3.	8 0000
ES DRYED	Wood and Wood					- I		Total COZE	Total COze
ES-DATER	Residuals	9.38E+01	3.20E-02	4.20E-03	158777.3934	54	7	162,119	3.341
	No 2 Finel Oil								
ES-GN	(Pietilleta)	7.40E+01	3.00E-03	6.00E-04	99	2 70E 03 5 20E 04	5 10E 04	67	Ş
	Distillate				3	10000	7.27.77	/0	/0
FC-FW/D	No. 2 Fuel Oil	100	3.5						
TAN I-CO	(Distillate)	/.40E+01	3.00E-03	6.00E-04	99	2.70E-03   5.39E-04	5.39E-04	29	29
	No 2 Finel Oil								
ES-CHIP-2	110:21 00:01	7 405-101	2000.00	1000					
	(Distillate)	וטייבטדיי	3.00E-03	6.00E-04	346	1.40E-02   2.80E-03	2.80E-03	347	347

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Enviva Hamlet, Richmond County Emission Calculations and BACT v6 submittal to DAQ GHGs

Fuel consumption calculated using a factor of 0.0476 gal/hr-hp. Advanced Environmental Interface, Inc. (1998).

General Permits for Emergency Engines. INSIGHTS, 98-2, 3.

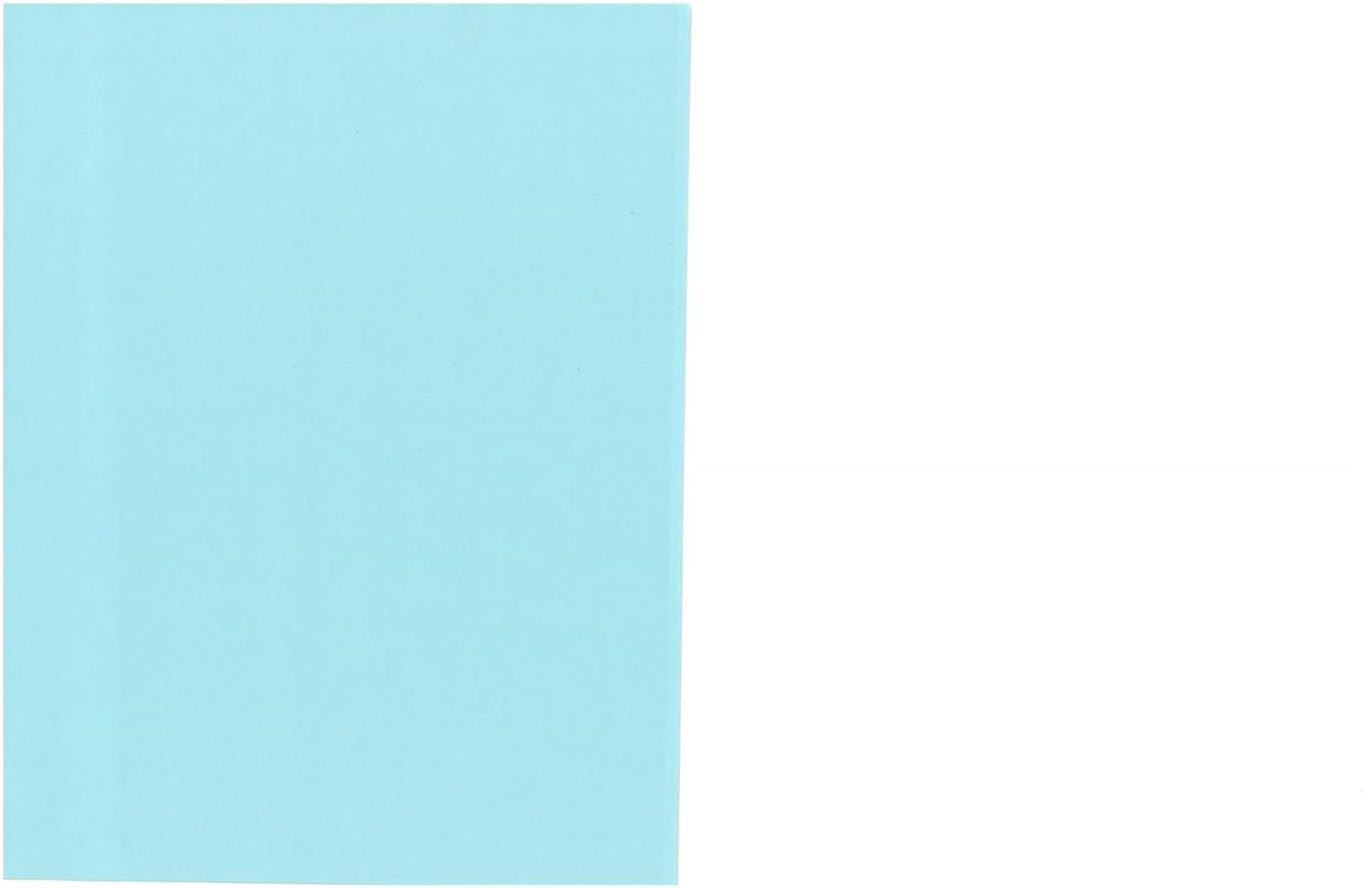
Energy calculated on a fuel consumption basis, using an energy factor of 0.137 MIMBtu/gal.

Emission factors from Table C-1 and C-2 of GHG Reporting Rule. Emission factors for methane and N2O already multiplied by their respective GWPs of 21 and 310.

As per NC DAQ Biomass Deferral Rule 15A NCAC 02D. 0544, CO2 emissions from bioenergy and other biogeneis sources are not applicable towards PSD and Title V permitting.

CO<sub>20</sub> reflects the biomass defferral which does not add in CO<sub>2</sub> from biomass combustion.

32 H 25 K		



### APPENDIX C - LOCAL ZONING CONSISTENCY DETERMINATION

	· · · · · · · · · · · · · · · · · · ·	

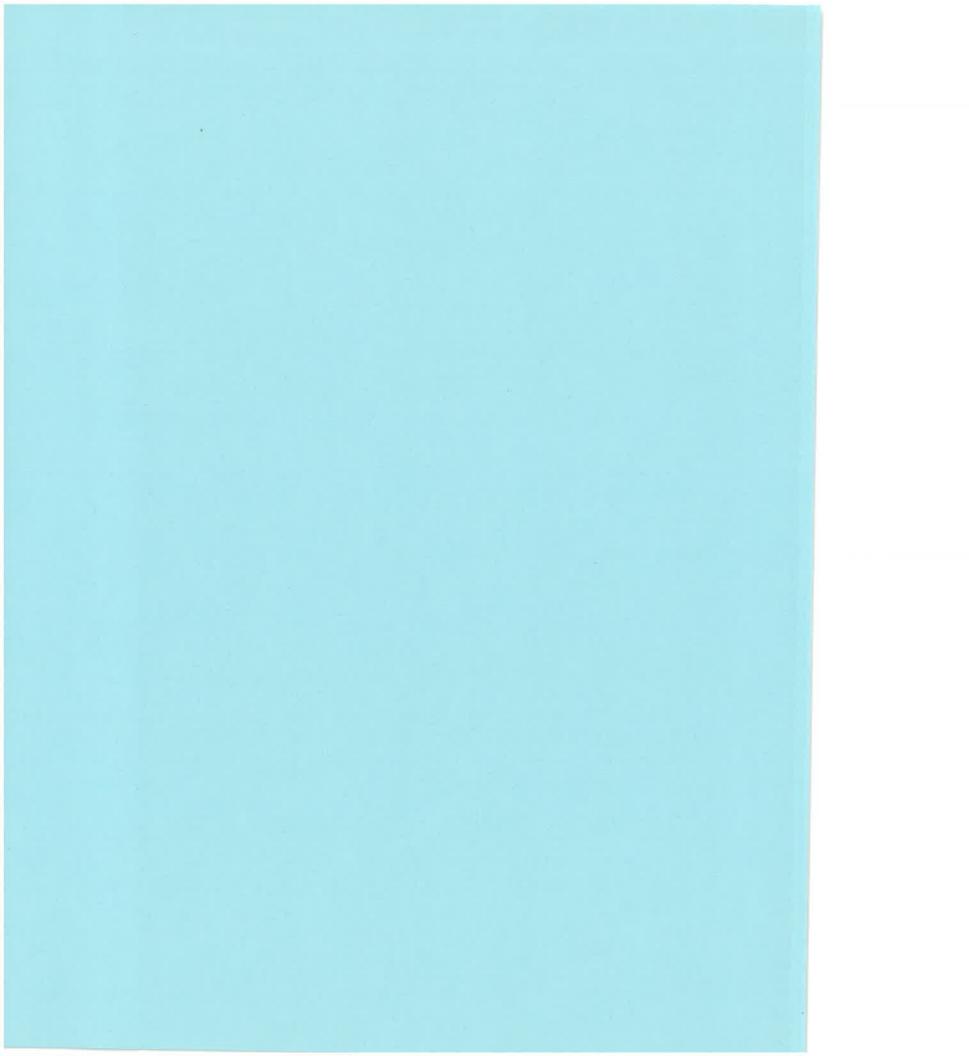
01/07/2014 16:34 RC GIS/Inspections (FAX)9109978206 P.002/002

Zo	ning Consistency Determination	
Facility Name	Enviva Pellets Hamlet, LLC  US Highway 117 (Street Number TBD)	LOV
Facility Street Address	US Highway 117 (Street Number TBD)	
Facility City	Hamlet	- 4v
Description of Process	Wood pellet manufacturing facility	
SIC Code/NAICS	SIC - 2499 ; NAICS - 321999	
Facility Contact	Joe Harrell	
Phone Number	(252) 209-6032	
Mailing Address	142 NC Route 561 East	<del></del>
Mailing City, State Zip	Ahoskie, NC 27910	
Based on the information give	en above:	
☑ I have received a copy of	the air permit application (draft or final) AND	
☐ There are no applicable zo	ning and subdivision ordinances for this facility at this time	
The proposed operation Is	S consistent with applicable zoning and subdivision ordinances	
	NOT consistent with applicable zoning and subdivision ordinances	
	of the rules in the package sent to the air quality office)  ng further information and can not be made at this time	8
Other:		
Agency	Richmond Coon & Flanny	
Name of Designated Official	JAMES Armstrong	
Title of Designated Official	Durador of Planning & GD Services.	
Signature	Janes Senthon	
Date	117/14	

Please forward to the mailing address listed above and the air quality office at the appropriate address as checked on the back of this form.

Courtesy of the Small Business Assistance Program toll free at 1-877-623-6748 or on the web at www.envhelp.org/sb

0		

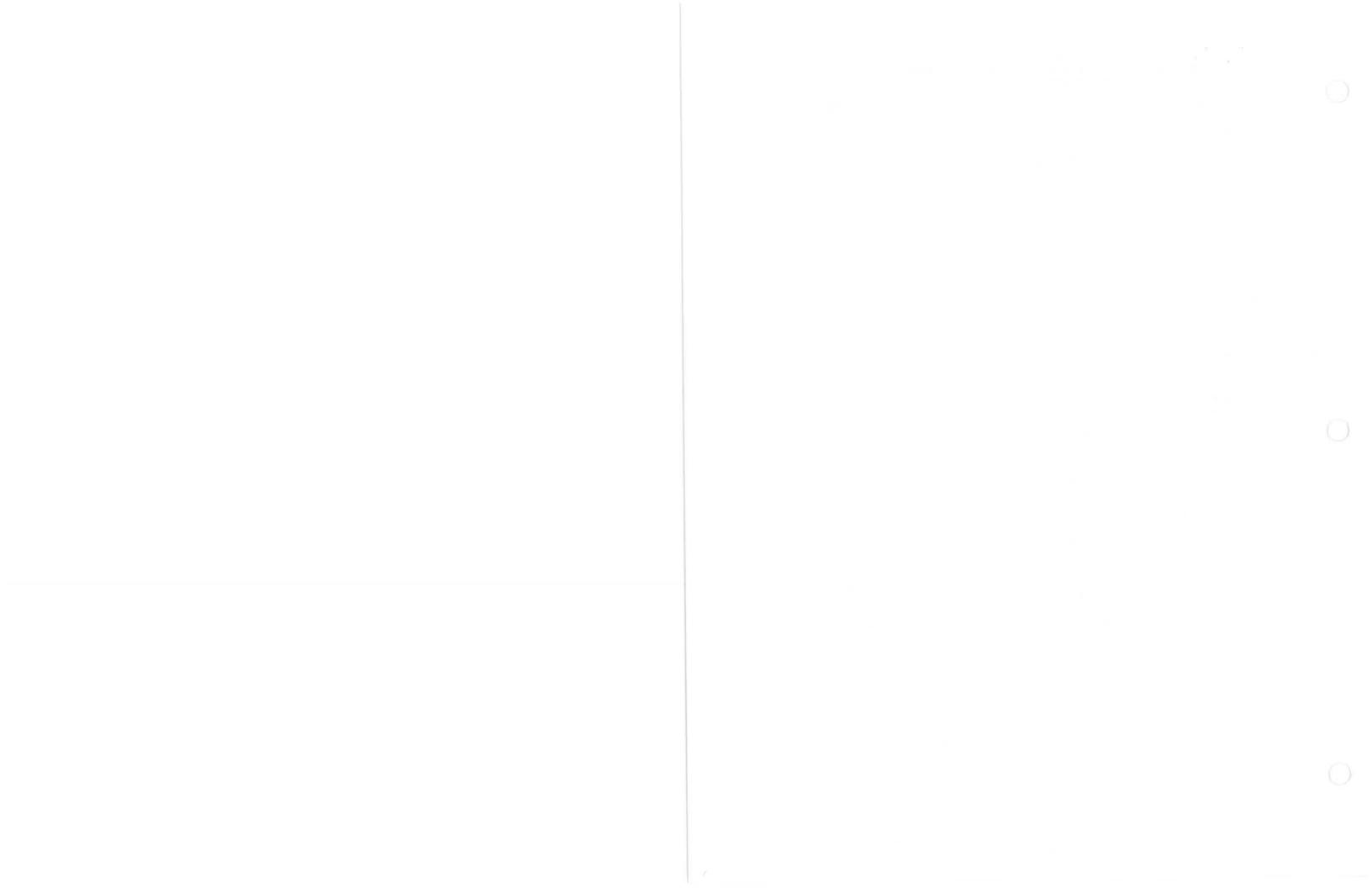


### APPENDIX D - BACT TABLES

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### TABLE D-1 REGENERATIVE SELECTIVE CATALYTIC REDUCTION COST ANALYSIS ENVIVA PELLETS HAMLET, LLC

Capital Cost		Notes	References
Direct Capital Costs			
Total Equipment Cost + Freight	\$3,381,348		2(a), 8
Sales Taxes	\$101,440	0.03 EC	
Total Direct Capital Costs	\$3,482,788	A	3(a)
Indirect Installation Costs			
General Facilities	\$174,139	0.05A	l(a)
Engineering and Home Office Fees	\$348,279	0.10A	l(a)
Process Contingencies	\$174,139	0.05A	l(a)
Start-Up	\$69,656	0.02A	6
Performance Testing	\$34,828	0.01A	6
Total Indirect Installation Costs	\$801,041	В	1(a)
Project Contingency	\$642,574	$C = 0.15 \times (A + B)$	1(a)
Total Plant Cost	\$4,926,404	D = A + B + C	1(a)
Other Costs			
Preproduction Costs	\$98,528	$E = 0.02 \times (D)$	l(a)
Inventory Capital*	\$3,579	F=Vol <sub>reag</sub> (gal)*Cost <sub>reag</sub> (\$/gal)	I(a), 2 (d)
Initial Catalyst and Chemicals	0	G	1(a)
Total Capital Investment	\$5,028,510	TCI = D + E + F + G	1(a)
Operating Cost			
			-
Operation and Maintenance Costs			1
Operating and Maintenance Cost	\$75,428	0.015TCI	I(b)
Total	\$75,428		-(0)
Reagent Costs (19% Aqueous Ammonia)			
Reagent Consumption	11.36	gal/hr	2(4) 2(4) 10
Unit cost	1.50	\$/gal	2(c), 2(d), 10
Total	\$149,269	w But	2(d)
	\$147,207		
Electricity			
Combustion Air Fan	14.10	HP	2(a), 9
Hydraulic Power unit	2.51	HP	2(a), 10
Ammonia Pumps	0.19	HP	2(a), 10
Misc./Instruments, Hydraulic Heaters	3.87	KW	2(a), 10
Fan Power to Overcome Catalyst Pressure	407	HP (14 iwc), Assumed 65% Efficiency	2(c), 5(a)
Total Power Requirement	320	KW	~
Unit cost	\$0.070	\$/kW-hr	7
Total	\$196,000	44 47 11 111	4(b)
	4170,000		
Fuel			
Natural Gas or fuel	0.46	MMBTU/hr	2(a), 9
Cost	\$6.88	\$/1000 ft <sup>3</sup>	7
Conversion	1020	Btu/ft <sup>3</sup>	
Total	\$26,912		1



Compressed Air			
Requirement	15.28	SCFM	2(a), 10
Cost	\$0.31	\$/1000 ft <sup>3</sup> air	4(a)
Total	\$2,490		
Catalyst Costs		1	1
Catalyst Cost (Present Value)	\$335,064		2(b), 9
Catalyst Life	2.00		2(b)
Catalyst Cost (Future Value)	\$358,853	F/P, 3.5%, 2 years	2(0)
Catalyst Cost (Annualized) Total	\$170,886	A/F, 10%, 2 years	
Total Direct Annual Costs	\$620,984	DAC	
Indirect Annual Costs			
		1	
Administrative Charges	\$100,570	2% of TCI	1(c)
Property tax	\$50,285	1% of TCI	1(c)
Insurance	\$50,285	1% of TCI	1(c)
Annual Interest Rate	10%		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
Economic life of RSCR	20		
Capital Recovery Factor	0.117		
Total Capital Recovery Cost	\$590,647		
Total Indirect Annual Costs	\$791,787		
Total Annual Cost	\$1,412,772	TAC = DAC + IDAC	

<sup>1.</sup> U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), October 2000, Section 4.2, Chapter 2.

<sup>c</sup> Taxes, Insurance, Admin applies (OAQPS 2-48)

- 2. Hertford Renewable Energy PSD Application (Hertford, North Carolina). Submitted 2008, Approved 2009, a RSCR Price/Quote of \$6,226,436 scaled from Hertford August 2008 Permit Application
- a RSCR PTICE/QUOIS OF \$0,220,450 Scaled from Figure August 2006 Feature Application
  b Hertford Application detailing catalyst costs and life
  c Ammonia consumption of \$8.72 gal/hr and 14 iwc for pressure drop across catalyst
  d Volume of initial ammonia fill, price per gallon, and density of ammonia (7.83 lb/gal)
- \$1.50/gallon for ammonia provided from vendor.
- U.S. EPA and Office of Air Quality Planning and Standards (OAQPS), EPA Air Pollution Control Cost Manual, 6th Ed. (EPA 452/B-02-001), Research Triangle Park, NC, Jan 2002. Section 1. Chapter 2, Cost Estimation: Concepts and Methodology
  - a Table 2.4; Cost Ranges for Freight, Sales Tax, and Instrumentation; no sales tax and low end of range for freight (OAQPS 2-27)
- 4. Taken from Methodology for Estimating Control Costs for Industrial, Commercial, Institutional Boilers and Process Heaters Nation Emissions Standards for Hazardous Air Pollutants - Major Source ERG Memo April 2010.
- a Electricity and Compressed Air Cost from Memo
- 5. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), July 2002, Section 6, Chapter 2.
- a Equation 2.40 for fan HP (OAQPS 2.42)

  6. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), September 2000, Section 3, Chapter 2.
  - Table 2.8: Capital Cost Factors for Thermal and Catalytic Incinerators (OAQPS 2-42) were used
- because factors were not in SCR section

1/13/2014

- 7. Energy Information Administration highest price for industrial natural gas between November 09 through April 10. http://www.eia.gov/dnav/ng/ng\_pri\_sun

- 8. Scale-up capital cost factor from Ulrich, Gael D. Chemical Engineering Process Design and Economics, 2004 (C1\*(S2/S1)<sup>0.6</sup>) where S1 is Hertford Biomass Boiler (Wood Chips) flow rate of 331,969 acfin from Hertford August 2008 Application and S2 is Enviva dryer flow rate of 120,000 ACFM.

  9. Scaled Direct Annual Costs linearly based on Hertford flow rate of 331,969 ACFM and Enviva flow rate of 120,000 ACFM. The resulting Qnew/Qinitial = 0.361

  10. Scaled Hertford August 2008 reagent consumption, electricity, and compressed air based on NOx emissions reduction at 715.2 MMBTU/hr versus the Enviva basis of 175.3 MMBfu/hr. Hertford Application specified NOx reduction from 0.25 lb/MMBTU to 0.075 lb/MMBTU with heat input of 715.2 MMBTU/hr or 125.1 lb/hr reduction. Enviva is assuming reduction from 0.228 lb/MMBtu to 0.077 lb/MMBtu or lb/hr reduction of = 24.2

  Thus, multiply Hertford cost by 23.1/125.1 = 0.193

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Sheet: RSCR Cost

<sup>&</sup>lt;sup>a</sup> Table 2.5: Capital Cost Factors for an SCR Application (OAQPS 2-44)

<sup>&</sup>lt;sup>b</sup> Equation 2.46 for maintenance (OAQPS 2-45)

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TABLE D-2 CONVENTIONAL SELECTIVE CATALYTIC REDUCTION COST ANALYSIS ENVIVA PELLETS HAMLET, LLC

Capital Cost	Boiler	OAQPS Notation <sup>1</sup>
Purchased Equipment Costs		
Total Equipment Cost <sup>2,3</sup>	3,103,027	A
Instrumentation <sup>4</sup>	310,303	0.10 × A
Sales Tax <sup>4</sup>	93,091	0.03 × A
Freight <sup>4</sup>	155,151	0.05 × A
Total Purchased Equipment Costs	3.661,572	$B = I.18 \times A$
Direct Installation Costs 6		
Foundations and Supports	366,157	0.10 × B
Handling and Erection	1,464,629	0.40 × B
Electrical	146,463	0.04 × B
Piping	73,231	0.04 × B
Insulation	36,616	0.02 × B
Painting	36,616	0.01 × B
Site Preparation (Site Specific)	219,694	0.01 × B
Total Direct Installation Costs	2,343,406	$C = 0.64 \times B$
Indirect Installation Costs		
General Facilities <sup>6</sup>	1,200,996	0.20 × (B + C)
Engineering and Home Office Fees	600,498	, ,
Process Contingencies	300,249	$0.10 \times (B + C)$ $0.05 \times (B + C)$
Construction Management <sup>6</sup>	900,747	' '
Owner's Cost <sup>6</sup>	300,249	0.15 × (B + C)
Total Indirect Installation Costs	3.302.738	0.05 × (B + C)
		$D = 0.55 \times (B+C)$
Project Contingency <sup>6</sup>	1,861,543	$E = 0.20 \times (B + C + D)$
Total Plant Cost	11,169,260	$\mathbf{F} = \mathbf{B} + \mathbf{C} + \mathbf{D} + \mathbf{E}$
Allowance for Funds During Construction <sup>5</sup>	781,848	$G = 0.07 \times F$
Royalty Allowance	0	H
Preproduction Costs	239,022	$I = 0.02 \times (F + G)$
Inventory Capital <sup>7,3</sup>	3,838	J 🔻
Initial Catalyst and Chemicals	0	K
Total Capital Investment	12,193,968	TCI = F + G + H + I + J + K
Operating Cost	D. 11	
	Boiler	OAQPS Notation
Direct Annual Costs	44.4.4	
Operating and Supervisory Labor	64,549	L
Maintenance Cost	182,910	$\mathbf{M} = 0.015 \times \mathbf{TCI}$
Reagent Consumption <sup>10</sup>	51,421	N
Electricity <sup>10</sup>	105,007	o
Catalyst Replacement <sup>8, 10</sup>	162,819	P
Catalyst Regeneration 6, 10	78,754	Q
otal Direct Annual Costs	645,460	DAC = L + M + N + O + P + O

Trinity Consultants File: Enviva Hamlet, Richmond County Emission Calculations and BACT v5 Sheet: HD SCR Cost

Total Annual Cost	2,077,759	TAC = DAC + IDAC
Total Indirect Annual Costs	1,920,078	IDAC = R + S
Capital Recovery <sup>9</sup>	1,432,299	S
Economic life of "Hot" SCR	20	
Annual Interest Rate	10%	
Overhead, Taxes, Insurance, Administration	487,759	R
Indirect Annual Costs		

- 1. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), January 2002, Section 4.2, Chapter 2. Adjustments to lettering made as PEC and direct installation costs were broken out for this analysis.
- 2. Direct Capital Costs are based on an Oglethorpe Power Corporation (Baxley, Georgia) PSD Application Submitted 2009, which includes High Dust SCR, Ammonia Unloading and Storage, ID Fans, Flue Gas Handling System, Ash Handling System, and Extra Charge of Catalyst.
- 3. Scale-up capital cost factor from Ulrich, Gael D. Chemical Engineering Process Design and Economics, 2004 (C1\*(S2/S1) 0.6) where S1 is Olgethorpe Biomass Boiler (Wood Chips) Capacity of 1,282 MMBtu/hr, S2 is Enviva dryer heat input of 175.3 MMBtu/hr, and C1 is
- 4. Based on general OAQPS costs as presented on page 2-27 of Section 1, Chapter 2 of OAQPS Manual.
- 5. Estimates based on engineering knowledge and evaluation of costs for other equipment as specified in OAQPS Manual.

  6. Costs were not included in OAQPS calculation or underestimated by OAQPS based on vendor data and experience. Costs have been
- 7. Inventory capital is the cost to fill the reagent tank(s) for the first time, OAQPS Manual, Section 4.2, Chapter 2, page 2-44.
- 8. Catalyst replacement is calculated based on Future Worth Factor in Equations 2.51 and 2.52 of OAQPS Manual, Section 4.2, Chapter 2, page 2-47.
- 9. Capital Recovery calculated based on Equations 2.54 and 2.55 of OAQPS Manual, Section 4.2, Chapter 2, pages 2-48 and 2-49.
- 10. Scaled Olgethorpe reagent consumption, electricity, and catalyst based on NOx emissions reduction at 1282 MMBTU/hr versus the Enviva basis of 175.3 MMBtu/hr. Oglethorpe Application specified NOx reduction from 0.18 lb/MMBTU to 0.07 lb/MMBTU with heat input of 1,282 MMBTU/hr or 140.9 lb/hr reduction. Enviva is assuming reduction from 0.228 lb/MMBtu to 0.077 lb/MMBtu or lb/hr reduction =
- 24.20 lbs/hr Thus, multiply Olgethorpe cost by the ratio of NOx reduction = 0.172

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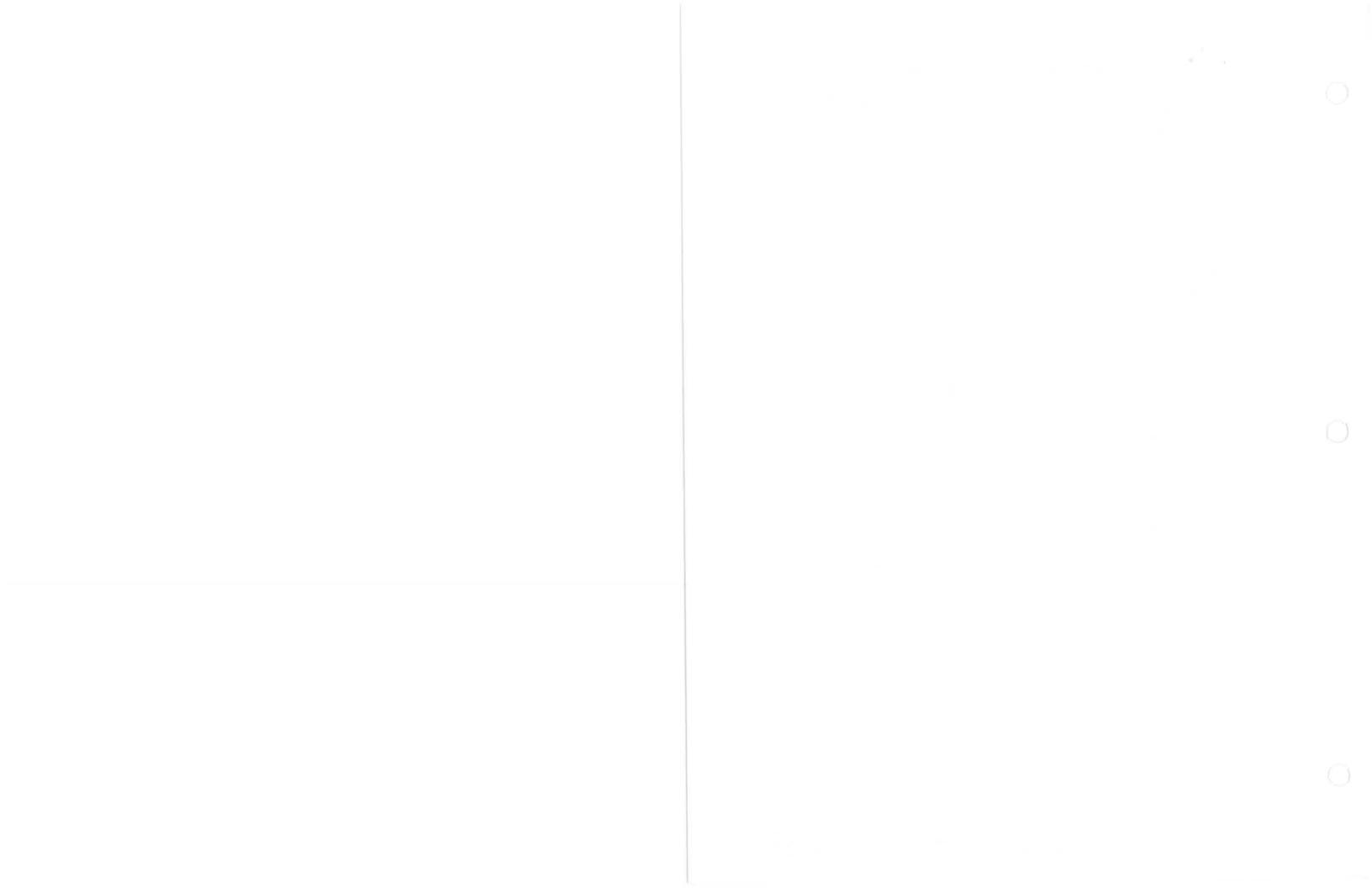
Sheet: HD SCR Cost

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### TABLE D-3 SELECTIVE NON-CATALYTIC REACTOR COST ANALYSIS ENVIVA PELLETS HAMLET, LLC

Cost Item		Notes	Reference
Direct Capital Costs			
Installed Capital Cost	\$162,919		2(a), 4
Total Capital Investment	\$162,919		2(0), 4
Operating Cost			
Direct Annual Costs			
Capacity Factor For Direct Annual Costs	100.0%		3(a)
Operation and Maintenance Costs	\$25,000		2(c)
Reagent Costs (50% Urea Solution)			
Reagent Consumption	9.01	gph	2(d), 5
Reagent Cost	\$2.00	(\$/gal)	2(d), 3 2(d)
Total	\$157,845	(0.8=)	2(0)
Compressed Air			
Compressed Air	46	scfm	2(e), 5
Air Price	\$0.15	\$/1000 ft <sup>3</sup> air	2(0), 5
Total	\$3,596		
Water Consumption			
Water	179	gph	2(f), 5
Water Price	\$1.65	\$/1000 gallons	3(b)
Total	\$2,581	Table 8   1	
Electricity			
Power	3.20	kW	3(c), 5
Unit Cost	\$0.070	\$/kWh	- (-//-
Total	\$1,963		
otal Direct Annual Costs	\$190,984		
ndirect Annual Costs			
Administrative Charges	\$3,258	2% of TCI	
Property tax	\$1,629	1% of TCI	
Insurance	\$1,629	1% of TCI	
Annual Interest Rate	10%		
Economic life of SNCR	15		
Capital Recovery Factor	0.131		1(b)
Total Capital Recovery Cost	\$21,420		1(0)
otal Indirect Annual Costs	\$27,936		
otal Annual Cost	\$218,921		

Trinity Consultants File: Enviva Hamlet, Richmond County Emission Calculations and BACT v5 Sheet: SNCR Cost-Fuel Tech



- 1. U.S. EPA OAQPS, #PA Air Pollution Control Cost Manual (6th Edition), March 2003, Section 4.2, Chapter 2.
  - <sup>a</sup> No taxes, Insurance, Admin applies (OAQPS 1-37)

Sequence (Nation applies (ON(PS 1-37))

Equation 1.34 for CPT (OAQPS 1-38)

2. Verbal quote provided by Chris Culpepper for Factory sales on 3-27-2012 for Capital cost. Other costs provided from Hertford Renewable Energy PSD Application (Hertford, North Carolina). Submitted 2008, Approved 2009.

- a Cost of SNCR System \$300,000
- b BOP Interface Design Engineering and Erection Assumes Install = 1.25 x Mat7 & Engineering
- c Estimated Value, Parts and Labor
- d Reagent Consumption (gph) and Cost (\$/gal) from vendor-90% Capacity
- e Plant air + instrument air, based on \$0.15 per 1000 cubic feet of air
- f Assumes 1 gpm per injector total flow and \$2.50 per 1000 gallons filtered water
- 3 Sources as follows:
- sources as sonows;

  a Capacity factor calculated as 8760 times the average hourly annual throughput divided by maximum hourly throughput (71.71 ODT/hr)

  b Base water price from Hertford Renewable Energy PSD Application (Hertford, North Carolina). Submitted 2008, Approved 2009.

  c Base electricity price from Hertford Renewable Energy PSD Application (Hertford, North Carolina). Submitted 2008, Approved 2009.

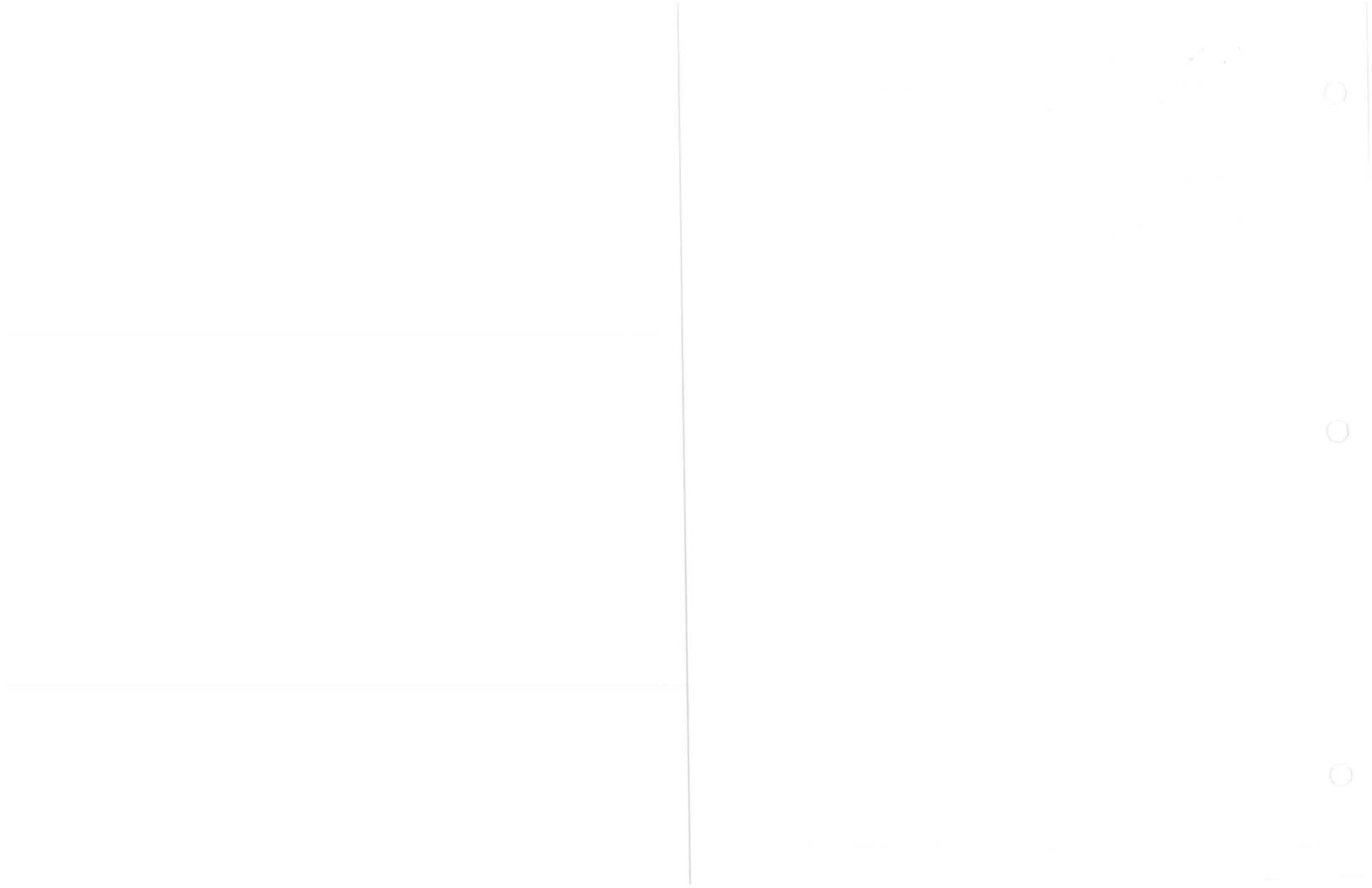
- 4. Scale-up capital cost factor from Ulrich, Gael D. Chemical Engineering Process Design and Economics, 2004 (C1\*(S2/S1)<sup>0.5</sup>) where S1 is

Hertford Biomass Boiler (Wood Chips) flow rate of 331,969 ACFM and S2 is the flow rate of 120000 ACFM

- 5. Scaled original quoted reagent consumption based on the Herford NOx emissions reduction at 762.5 MMBTU/hr versus the Enviva dryer heat input rating of 175 MMBRu/hr. Herford had a reduction from a NOx reduction from 0.30 lb/MMBTU to 0.15 lb/MMBTU at 762.5 MMBTU/hr or
- 114.4 lb/hr reduction. The dryer will have a NOx reduction of 0.22 lb/mmBtu to 0.114 lb/mmBtu or 18.31 lbs/hr reduction.
- Thus, multiply the Hertford quote by 18.31/114.4, which is equal to

Electricity, Water, and Compressed air were also scaled accordingly

**Trinity Consultants** File: Enviva Hamlet, Richmond County Emission Calculations and BACT  $\,$  v5 Sheet: SNCR Cost-Fuel Tech

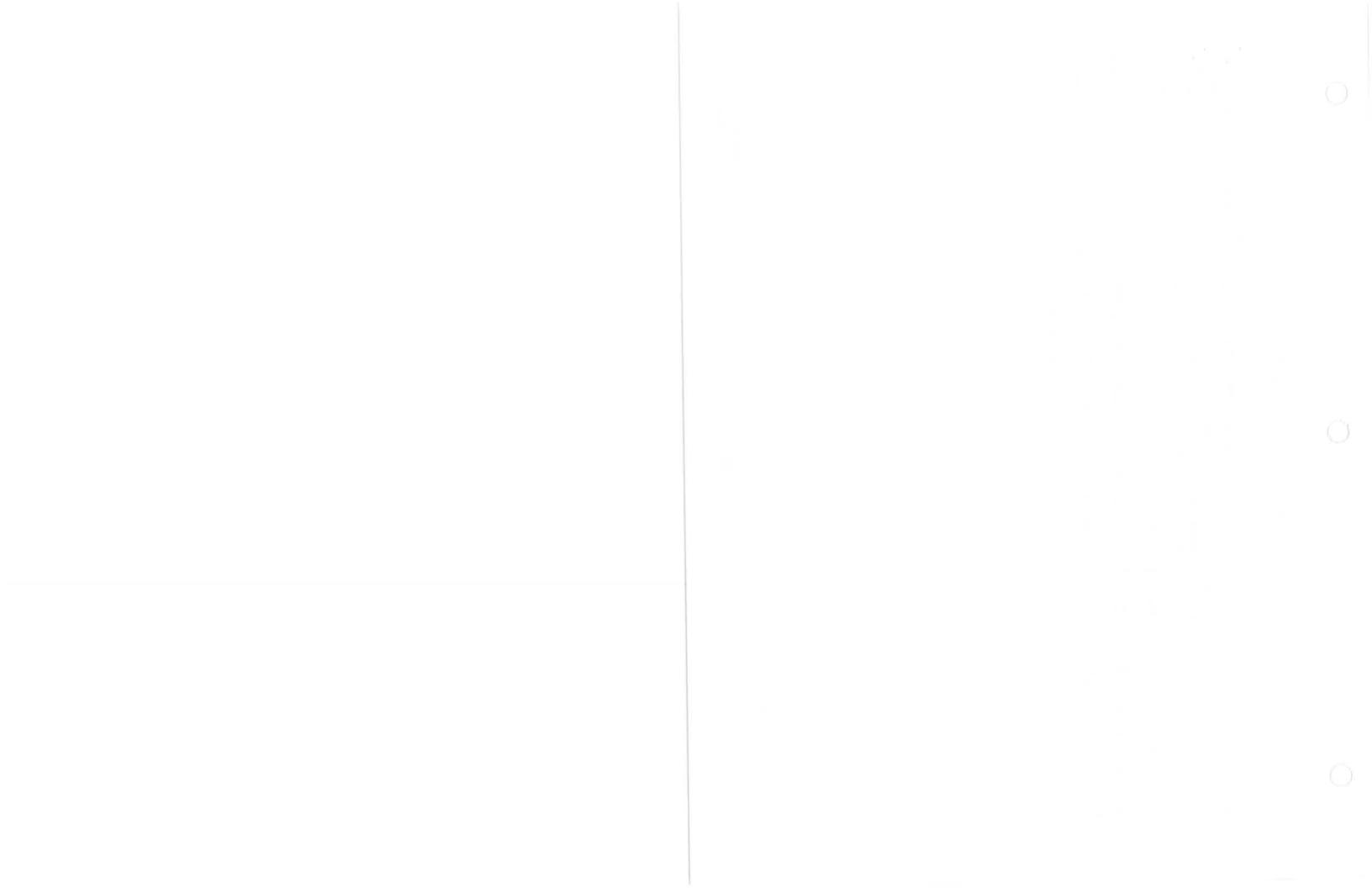


### TABLE D-4 NOx BACT IMPACTS SUMMARY ENVIVA PELLETS RICHMOND, LLC

					Economic Impacts	s.	Energy Impacts	Environmental Impacts
Control Options (lb/MMBTU)	Baseline Emissions (tons/yr)	Control	Emissions Reduction (tons/year)	Total Capital Cost (\$)	Annual Cost (\$/year)	Cost Effectiveness (\$/ton)	Increase Over Baseline (kW*hr/yr)	Adverse Environmental Impacts? (Yes/No)
0.077 (RSCR)	160.37	66.1%	106.0	\$5,028,510	\$1,412,772	\$13.328	2 80F+06	
0.077 (HD SCR)	160.37	%1 99	106.0	\$12.102.020	i t			ONT
			2001	412,173,900	\$2,077,739	\$19,601	1.61E+07	No
0.114 (SNCR)	160.37	20.0%	80.2	\$162,919	\$218,921	\$2,730	2 80F±04	Ž
0.228 (Baseline)	160.37	Z.	N/A	A/N	NIA	77.6	1007	ONT

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File: Enviva Hamlet, Richmond County Emission Calculations and BACT v5
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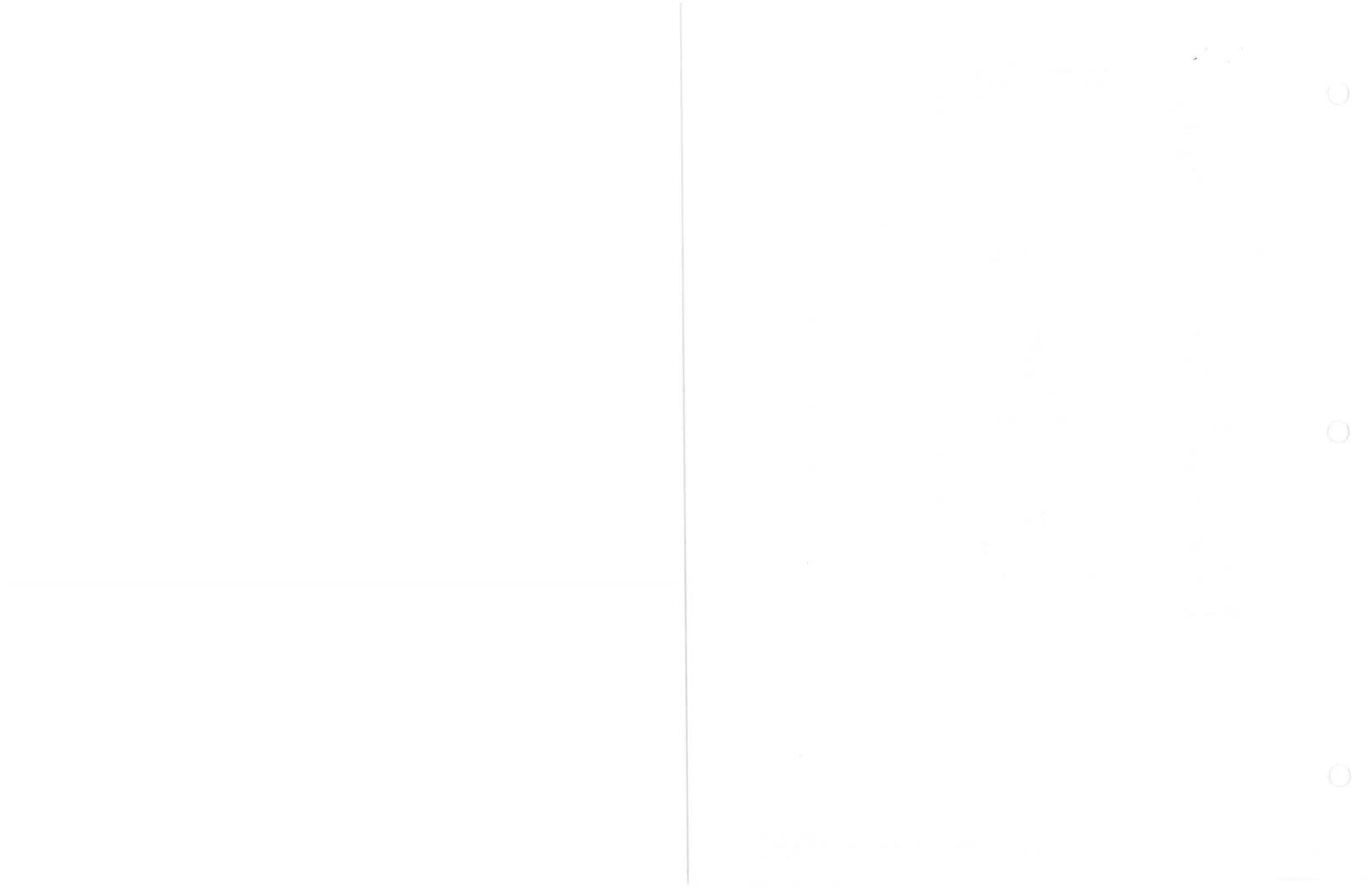
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### TABLE D-5 WET ESP ECONOMICS IMPACTS EVALUATION ENVIVA PELLETS HAMLET, LLC

Capital Cost		Notes	Ref.
tal Capital Investment			
Direct Costs			
Purchased Equipment Costs			1
WESP	\$2,451,446	A	
Freight Estimate		A	1,11
Instrumentation	\$89,143	10.404	l(a), 11
Sales Tax	\$245,145	0.10A	2
	\$73,543	0.03A	2
Purchased Equipment Cost, PEC	\$2,859,277	В	
Direct Installation Costs			
Foundations and Support	\$114,371	0.04B	
Handling & Erection			2
Electrical	\$1,429,639	0.50B	2
Piping	\$228,742	0.08B	2
	\$28,593	0.01B	2
Insulation for ductwork	\$57,186	0.02B	2
Painting	\$57,186	0.02B	2
Total	\$1,915,716	1	_
Total Direct Costs, DC	\$4,774,993	DC = B + 0.67 * B	1
	04,774,273	DC - B 1 0.07 · B	
Indirect Costs (Installation)			
Engineering	\$571,855	0.20B	2
Construction and field expenses	\$571,855	0.20B	2
Contractor Fees	\$285,928	0.10B	
Start-up	\$28,593		2
Performance test		0.01B	2
Model study	\$28,593	0.01B	2
	\$57,186	0.02B	2
Contingencies	\$85,778	0.03B	2
Total Indirect Costs, IC	\$1,629,788	IC = 0.57 * B	
Total Capital Investment	\$6,404,781	TCI = DC + IC	
Operating Cost			
Direct Annual Costs			
Operating Labor			
Operator	\$56,130	2 hu/4 to 4 ho to 651 20%	
Supervisor		3 hr/d * d/y * \$51.26/hr	3(a), 5
Coordinator	\$8,419	15% of operator	3(b)
	\$18,710	1/3 of operator	3(c)
Total	\$83,259		
Maintenance		I i	
Labor	\$1,675	0.825*ESP Plate Area (ft2)	4, 11
Material	\$28,593		3(d)
Total	\$30,268		
Electricity Costs		1	
Requirement	152	kw/HR	
Unit cost			6(a), 9, 11
Total	\$0.070 <b>\$93,409</b>	\$/kW-hr	9
Water Costs	#FJ9#UJ		
Wastewater Disposal	**-**		1
	\$1,703		6(b), 7
Municipal Water Usage	\$284	1	6(h). 8
	\$284 <b>\$1,987</b>		6(b), 8

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File: Enviva Hamlet, Richmond County Emission Calculations and BACT v5
Sheet: WESP Cost



Overhead  Administrative Charges Property tax Insurance Annual Interest Rate Economic life of ESP Capital Recovery Factor Total Capital Recovery Cost	\$68,116 \$128,096 \$64,048 \$64,048 10.0% 15 0.131 \$842,061	60% * (operating labor + maintenance) 2% of TCI 1% of TCI 1% of TCI	3(e) 3(e) 3(e) 3(e) 10 10
Annual Cost	\$1,375,291	$TAC \approx DAC + IDAC$	

- 1. Quote of \$3,300,000 provided by TurboSonic (6/22/2010) for a 130 MMBtu/hr Wood-fired Boiler achieving similar performance levels.

  a Email from Rod Pennington (TurboSonic) to Joe Sullivan (Trinity) June 26, 2010 that stated
  - additional freight costs no included. Freight cost \$120,000.
- additional freight costs no included. Freight cost \$120,000.

  2. Direct and Indirect capital costs associated with the purchase of the ESP determined in accordance with EPA OAQPS APCCM Sec.6, Ch.3, Table 3.16

  3. EPA OAQPS APCCM Sec.6, Ch.3, Table 3.21

- 3. EPA OAQPS APCCM Sec.6, Ch.3, Table 3.21

  (a) Operator costs calculated @ 3 hr per day and 175.30 days of operation

  (b) Supervisor labor costs calculated @ 15% of operator cost as per APCCM guidance

  (c) Coordinator costs calculated @ 173 of operator costs as per APCCM guidance

  (d) Maintenance material(s) calculated @ 1% of purchased equipment cost as per APCCM guidance

  (e) Indirect annual costs calculated in accordance with APCCM guidance

  4. EPA OAQPS APCCM Sec.6, Ch.3, Equation 3.45 for Maintenance Materials

  5. LIS Dept. of Labor. Pursuance of the Sec. 1 for Sec. 1 for Maintenance Materials

  1. Sec. 1 for Maintenance Materials

  1. Sec. 1 for Maintenance Materials

  1. Sec. 1 for Maintenance Materials

  1. Sec. 1 for Maintenance Materials
- US Dept. of Labor Bureau of Labor Statistics \$51.26/hr (Stationary Engineers and Boiler Operators, 2008 dollars)
- 6. Provided by TurboSonic, ESP supplier/vendor
- (a) Electrical power requirements
  (b) Wastewater blowdown rate (0.6 gallons / minute); assumes water usage (blowdown rate +
- 7. Waste water disposal cost \$0.0054/gal provided by Air Compliance Advisor User Guide -Version 7.5
- Municipal water usage cost \$0.0006 /gal provided by Electric Power Research Institute
   Electricity unit cost provided by the Energy Information Administration
- Capital recovery calculated assuming 15 years of equipment life @ a recovery rate of 10% Capital Recovery Factor (CRF)
   = (IR\*(1+IR)^n)/((1+IR)^n 1)
- Scale-up capital cost factor from Ulrich, Gael D. Chemical Engineering Process Design and Economics, 2004 (C1\*(S2/S1)<sup>0.6</sup>) where S1 is basis flow rate of 196,940 ACFM from a NC wood products facility and S2 is Enviva dryer flow rate of 120,000 ACFM.

**Trinity Consultants** File: Enviva Hamlet, Richmond County Emission Calculations and BACT v5 Sheet: WESP Cost

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# TABLE D-6 PM BACT IMPACTS SUMMARY FOR ROTARY DRYER ENVIVA PELLETS RICHMOND, LLC

								Environmental
					Economic Impacts		Energy Impacts	Impacts
Control Options (lb/ODT)	Baseline Emissions (tons/yr)	Control	Emissions Reduction (tons/year)	Total Capital Cost (\$)	Annual Cost (\$/year)	Cost Effectiveness (\$/ton)	Increase Over Baseline (kW*hr/yr)	Adverse Environmental Impacts? (Yes/No)
0.073 (WESP)	601.38	%96	580.3	\$6,404,781	\$1.375.291	\$2 370	1 33 12 10 6	14
							0013551	ONI
2.092 (Baseline, Cyclone)	601.38	N/A	N/A	V/V	A/N	V/A	4714	;
Filtership reduction of DM to 0.072 th/ODE contests the contest of the contests of the contest	0.072 15/ODT	The state of the s	20.00	,		TALL	TA/AI	ON.

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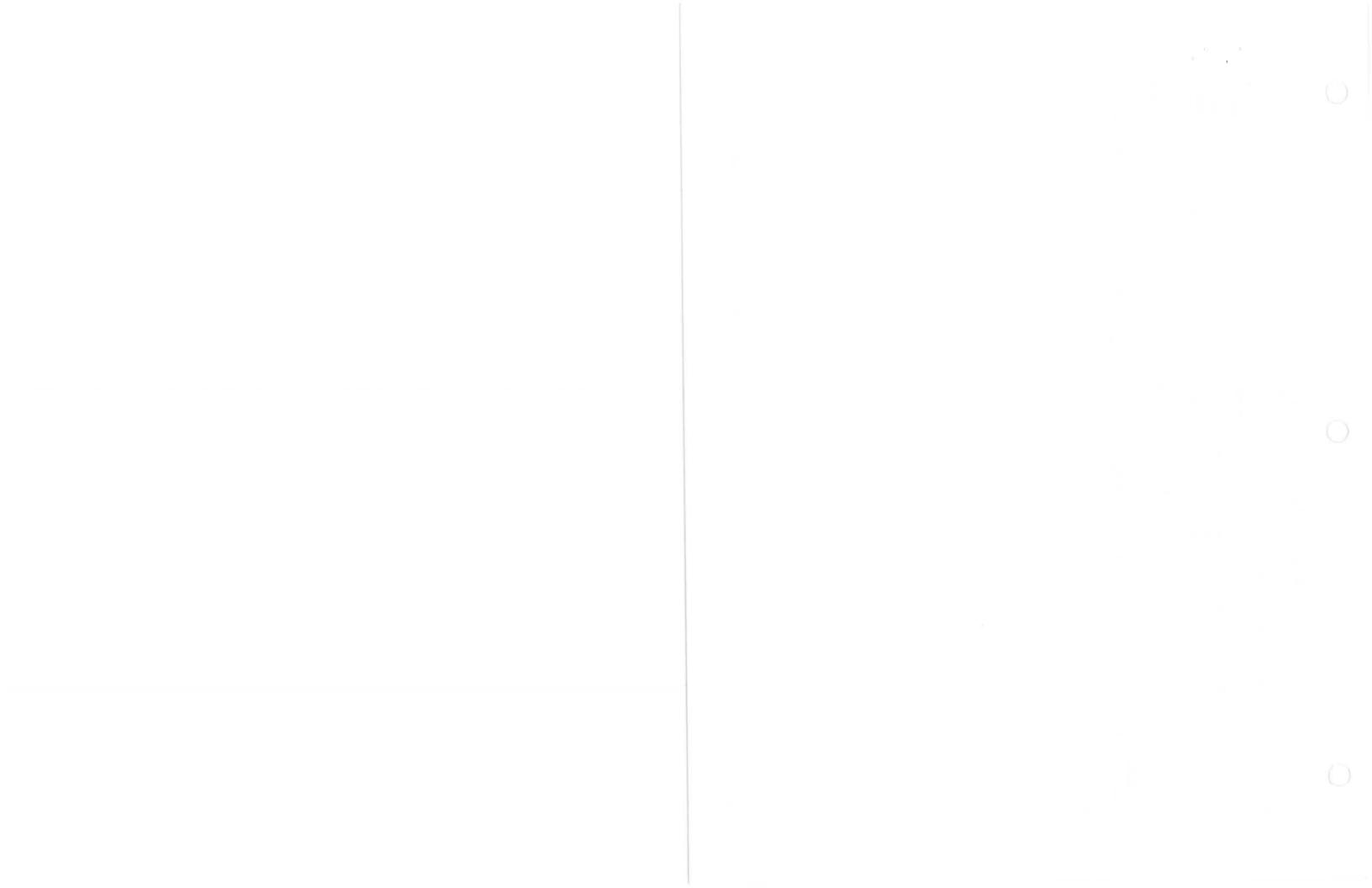


TABLE D-7
REGENERATIVE THERMAL OXIDATION COST ANALYSIS FOR ROTARY DRYER
ENVIVA PELLETS HAMLET, LLC

Capital Cost		Notes	Reference
Direct Costs			
Purchased Equipment Costs			
RTO Price+ Freight+Instrumentation	\$2,700,000	A	
95% Sales Tax	\$81,000	0.03A	2(a)
Purchased Equipment Cost, PEC	\$2,781,000	B	1(a)
Direct Installation Costs			
Foundations and Support	0000 100		
Handling & Erection	\$222,480	0.08B	1(a)
Electrical	\$389,340	0.14B	I(a)
Piping	\$111,240	0.04B	l(a)
Insulation for ductwork	\$55,620 \$27,810	0.02B	1(a)
Painting	\$27,810	0.01B 0.01B	l(a)
Direct Installation Costs	\$834,300	0.018	1(a)
otal Direct Costs. DC	\$3,615,300		
direct Costs (L. H. d. )	95,015,500		
direct Costs (Installation)			
Engineering	\$278,100	0.10B	1(a)
Construction and field expenses Contractor Fees	\$139,050	0.05B	I(a)
Contractor Fees Start-up	\$278,100	0.108	I (a)
Performance test	\$55,620	0.02B	1(a)
Contingencies	\$27,810	0.01B	1(a)
otal i 1.64	\$83,430 \$862,110	0.03B	1(a)
otal Capital Investment	\$4,477,410	TCI = DC + IC	
Operating Cost			
Capacity Factor For Direct Annual Costs	88.2%	used to establish hours/yr of operation	
Operating Labor		- J. V. Operation	
Operator	\$24,753	0.5 hr/s, 3 s/d, d/yr, \$51.26/hr, CF	100 200
Supervisor	\$3,713		1(b), 3(a)
Total	\$28,466	1.5% of operator	I(b)
Maintenance	920,400		
Labor	***		
Labor Material	\$24,753	0.5 hr/s, 3 s/d, d/yr, \$51.26/hr, CF	1(b), 3(a)
	\$24,753	100% of maintenance labor	1(b)
Total	\$49,506		
Electricity			
Total Requirement	595	KW	2(c)
Unit cost	\$0.070	\$/kW-hr	2(c)
Total	\$321,930		2(0)
Fuel			
Natural Gas	9,99	MMBTU/hr	3(a)
Cost	\$6.00	\$/MMBtu	2(b)
Total	\$525,000		2(0)

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	0

\$954,558		
ery Cost \$728,678		
ctor 0.163	1	
0 10		
10%		1(0)
\$44,774	4 1% of TCI	1(b)
\$44,774	1% of TCI	1(Б)
ges \$89,548	2% of TCI	1(b)
\$46,784	60% of operating labor + maintenance	1(b)
\$924,90	93	
(	\$46,784 \$89,548 \$44,774 \$44,774 10% 0 10 etor 0.163 ry Cost \$728,678	\$89,548 2% of TCI \$44,774 1% of TCI \$44,774 10% 0 10 tor 0.163 ry Cost \$728,678

- U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), September 2000, Section 3, Chapter 2.
   Table 2.8: Capital Cost Factors for Thermal and Catalytic Incinerators (OAQPS 2-42); Vendor quote usually includes instrumentation.

- Table 2.8: Capital Cost Factors for Thermal and Catalytic Incinerators (OAQPS 2-42); Vendor quote usually includes instrumentation

   Table 2.10: Annual Costs for Thermal and Catalytic Incinerators Example Problem (OAQPS 2-45)

   Provided to Wallace Lasonde of Enviva by Steve Jassund from GEOENERGY Division of A.H. Lundberg Associates, Inc on March 21, 2011.

   a RTO Price/Quote
   b Natural Gas Cost and usage.
   c Electricity cost and power requirement.

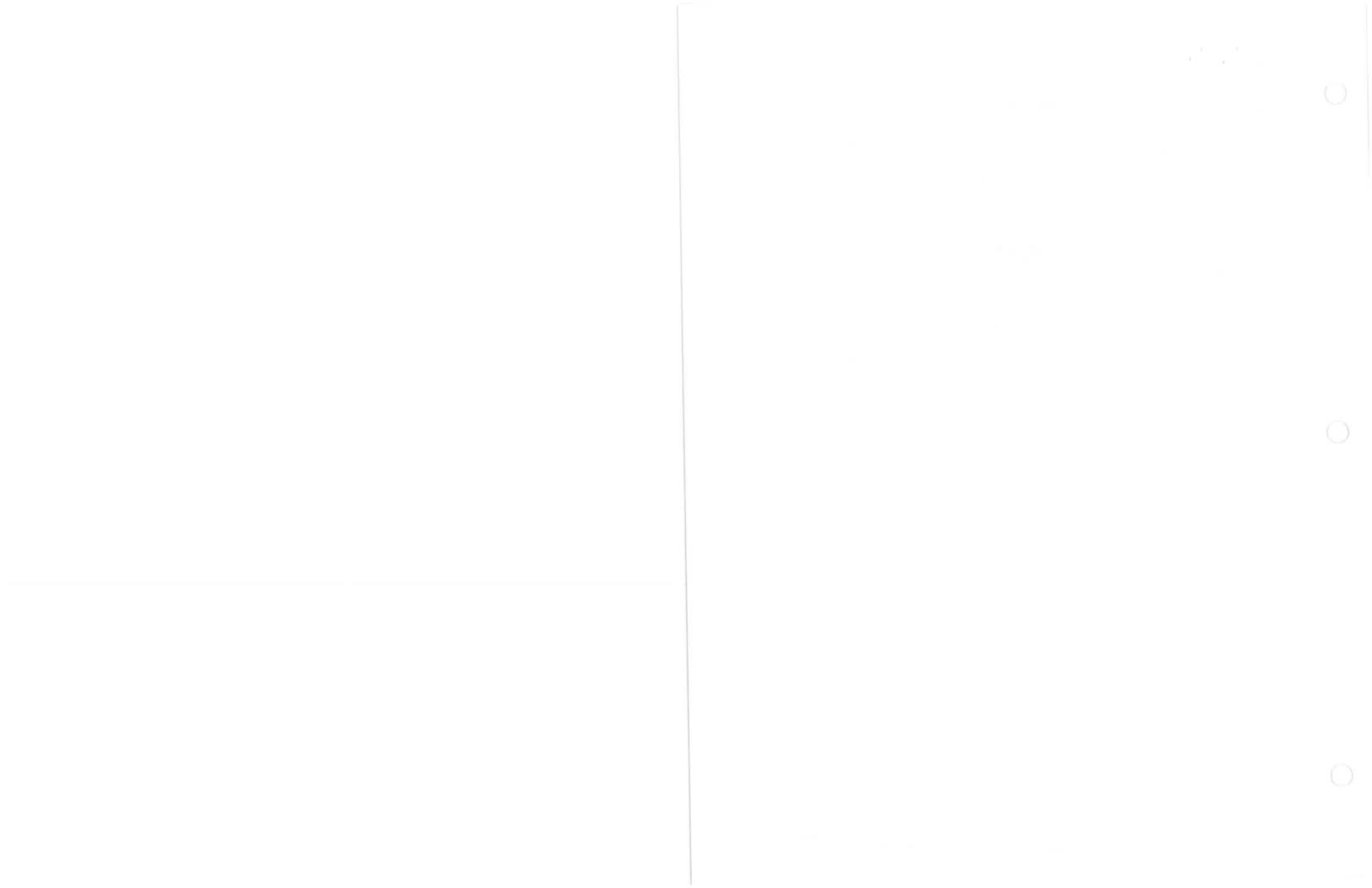
   Taken from Methodology for Estimating Control Costs for Industrial, Commercial, Institutional Boilers and Process Heaters Nation Emissions Standards for Hazardous Air Pollutants Major Source ERG Memo April 2010.
   a Conservative estimate of loaded hourly wage
   b Compressed Air Cost from Memo
- a Conservative estimate or loaded nourry wage
  b Compressed Air Cost from Memo
  4. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), July 2002, Section 6, Chapter 2.
  a Equation 2.40 for fan HP (OAQPS 2-42)

Trinity Consultants File: Enviva Hamlet, Richmond County Emission Calculations and BACT v5

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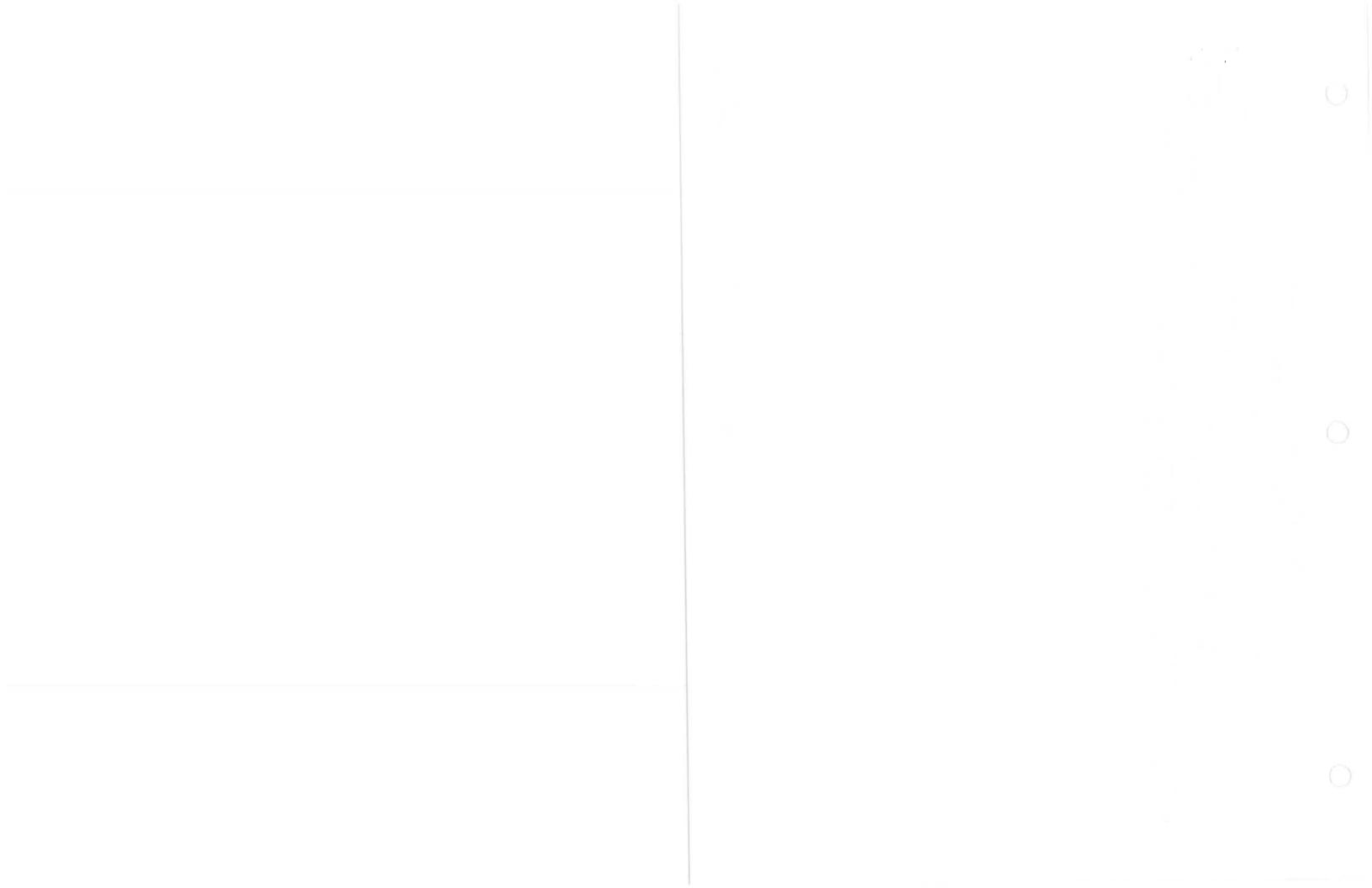
Sheet: RTO Cost



## TABLE D-8 VOC BACT IMPACTS SUMMARY FOR ROTARY DRYER ENVIVA PELLETS RICHMOND, LLC

						Environmental
			Economic Impacts		Energy Impacts	Impacts
Control	Emissions	Total Capital	Annual	100	\(\frac{1}{2}\)	Adverse
Efficiency	Reduction	Coet	Cost	1802	Increase Over	Environmental
	(tone/soon)	(9)	1800	Ellectiveness	Baseline	Impacts?
	(tons/year)	(e)	(3/year)	(\$/ton)	(kW*hr/yr)	(Yes/No)
%06	927.6	\$4,477,410	\$1 870 AKD	200 03	70.14.0	
ATT/4		1	00167 10610	#4,020	5.21E+06	°Z
N/A	N/A	N/A	N/A	A/N	V/V	N.
				7 44 2		

Trinity Consultants File: Enviva Hamlet, Richmond County Emission Calculations and BACT v5 Page 13 of 30



### BACT INPUT PARAMETERS AND EMISSIONS ESTIMATES FOR GREEN WOOD HAMMERMILLS ENVIVA PELLETS HAMLET, LLC TABLE D-9

#### Operating Assumptions:

65 ft/sec 3 feet Green Hammermill Stack Velocity = Stack Diameter =

27,554 ACFM; =Pi\*D²/4\*Stack Velocity (ft/s)\*60 (sec/min) 332.59 deg K
24,285.79 SCFM
1.10 Enviva test data+ 40% safety factor 575,000 ODT/yr
8,760 hrs/yr Stack Flow Rate =
Exit Temperature =
Standard flow rate =
Ib/ODT Factor =
Production Rate =
Operating hours and days =

RTO Capital Cost = \$ 683,112 Estimated from RTO manufacturer using scfm Estimated RTO Operating Cost (fuel and electricity) = \$ 197,950 Estimated from RTO manufacturer using scfm

#### VOC Emissions Summary:

_		_	1
	GREEN HAMMERMILL	(tpy)	316.25
	Pollutant		VOC

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File: Enviva Hamlet, Richmond County Emission Calculations and BACT v5
Page 14 of 30
Sheet: GHM BACT Basis

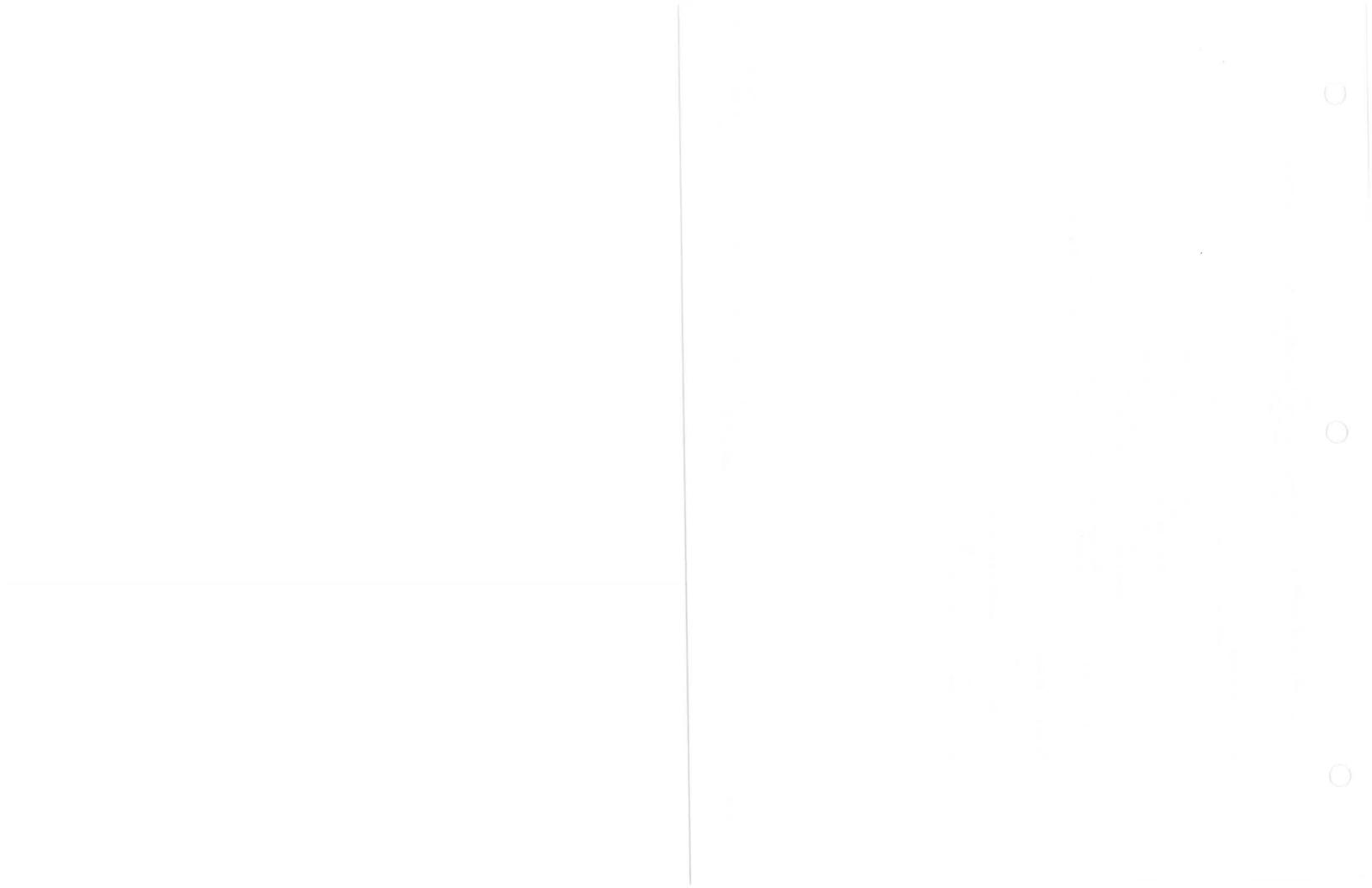


TABLE D-10
FABRIC FILTER ECONOMICS IMPACTS EVALUATION FOR GREEN WOOD HAMMERMILLS
ENVIVA PELLETS HAMLET, LLC

Capital Cost		Notes	Ref.
otal Capital Investment			
Direct Costs			
Purchased Equipment Costs			
Bagfilter with Ductwork	\$80,337	A	
Freight Estimate			1,8
Instrumentation	\$4,017	0.05A	2
Sales Tax	\$8,034	0.10A	2
	\$2,410	0.03A	2
Purchased Equipment Cost, PEC	\$94,797	В	
Direct Installation Costs			
Foundations and Support	63 703	0.04B	
Handling & Erection	\$3,792		2
Electrical	\$47,399	0.50B	2
Piping	\$7,584	0.08B	2
	\$0	0.01B	1
Insulation for ductwork	\$1,896	0.02B	1 1
Painting	\$1,896	0.02B	2
Total	\$62,566		1
Total Direct Costs, DC	\$157,363	DC = B + 0.67 * B	1
Indirect Costs (Installation)			
Engineering	\$9,480	0.10B	2
Construction and field expenses	\$18,959	0.20B	2
Contractor Fees	\$9,480	0.10B	2
Start-up	\$948	0.01B	2
Performance test	\$948	0.01B	
Contingencies	\$2,844	0.03B	2 2
Total Indirect Costs, IC	\$42,659	IC = 0.57 * B	
Total Capital Investment	\$200,022	TCI = DC + IC	
Operating Cost			
Direct Annual Costs			
Operating Labor		1	
		L	
Operator	\$112,259	6 hr/d * 365 d/y * \$51.26/hr	3(a), 5
Supervisor	\$16,839	15% of operator	3(b)
Total	\$129,098		- \- '
Maintenance			
Labor	\$56,130	3 hr/d * 365 d/y * \$51.26/hr	3( c)
Material	\$56,130		1
Total	-		3(d)
	\$112,259		
Replacement parts (bag replacement, \$390,673,			
every 3 years per GE, 3% interest)	\$138,103		3
Electricity Costs			
Requirement	262,000	law/s/D	1
Unit cost		kw/yR	3(e)
Total	\$0.070	\$/kW-hr	6
a stat	\$18,340		
Compressed Air	7,000		260
F			3(e)
	\$7,000		
Total Direct Annual Costs	\$404,800	1	1

File: Enviva Hamlet, Richmond County Emission Calculations and BACT v5
Sheet: GHM Bagfilter

tal Annual Cost	\$583,914	TAC = DAC + IDAC	
Total Indirect Annual Costs	\$179,113		
Total Capital Recovery Cost	\$26,298		
Administrative Charges Property tax Insurance Annual Interest Rate Economic life of Bagfilter Capital Recovery Factor	\$144,814.63 \$4,000 \$2,000 \$2,000 10.0% 15 0.131	maintenance) 2% of TCI 1% of TCI 1% of TCI	3(e) 3(e) 3(e) 3(e)
Indirect Annual Costs Overhead	\$144,814.63	60% * (operating labor +	7(.)

- 1. Quote provided by Bruce Westerman on 8/12/2013 estimate for bagfilter including ductwork.

  2. Direct and Indirect capital costs associated with the purchase of the Fabric filter determined in accordance with EPA OAQPS APCCM Sec.6, Ch.1, Table 1.9

  3. EPA OAQPS APCCM Sec.6, Ch.1, Table 1.11

  (a) Operator costs calculated @ 2 hr per shift 3 shifts per day day and 365 days of operation (b) Supervisor labor costs calculated @ 15% of operator cost as per APCCM guidance (c) Maintenance labor of 1 hour per shift 3 shifts per day (d) Maintenance material(s) calculated @ 100% of labor (e) Indirect annual costs calculated in accordance with APCCM guidance

  4. EPA OAQPS APCCM Sec.6, Ch.1, Table 1.11

  5. US Dept. of Labor Bureau of Labor Statistics \$51.26/hr (Stationary Engineers and Boiler Operators, 2008 dollars)

  6. Electricity unit cost provided by the Energy Information Administration

  7. Capital recovery calculated assuming 15 years of equipment life @ a recovery rate of 10% Capital Recovery Factor (CRF) = (IR\*(1+IR)^n)/((1+IR)^n 1)

  8. Scale-up capital cost factor from Ulrich, Gael D. Chemical Engineering Process Design and Economics, 2004 (C1\*(S2/S1)<sup>0.6</sup>)

- S. Scale-up capital cost factor from Ulrich, Gael D. Chemical Engineering Process Design and Economics, 2004 (C1\*(S2/S1)<sup>0.6</sup>) where S1 is Pellet coolers flow rate of S2 is the Enviva green hammermill flow rate

  The resulting Qnew/Qinitial = 0.22

**Trinity Consultants** File: Enviva Hamlet, Richmond County Emission Calculations and BACT v5 Sheet: GHM Bagfilter

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TABLE D-11
CYCLONE ECONOMICS IMPACTS EVALUATION FOR GREEN WOOD HAMMERMILLS
ENVIVA PELLETS HAMLET, LLC

Capital Cost		Notes	Ref.
otal Capital Investment			
Direct Costs			
Purchased Equipment Costs			
Cyclone	\$4.419		
Freight Estimate		A	1
Instrumentation	\$221	0.05A	2
Sales Tax	\$442	0.10A	2
Purchased Equipment Cost, PEC	\$133	0.03A	2
r dichased Equipment Cost, PEC	\$5,214	В	
Direct Installation Costs			
Foundations and Support	\$209	0.04B	2
Handling & Erection	\$2,607	0.50B	2
Electrical	\$417	0.08B	
Piping	\$52	0.01B	2
Insulation for ductwork	\$104	0.02B	1
Painting	\$104		1
Total	\$104 \$3,493	0.02B	2
•			
Total Direct Costs, DC	\$8,707	DC = B + 0.67 * B	1
Indirect Costs (Installation)		1	
Engineering	\$521	0.10B	2
Construction and field expenses	\$1,043	0.20B	
Contractor Fees	\$521	0.10B	2
Start-up	\$521	0.01B	2
Performance test	\$52 \$52		2
Contingencies	\$156	0.01B 0.03B	2
Total Indirect Costs, IC	\$2,346	IC = 0.57 * B	2
Total Capital Investment	\$11,053	TCI = DC + IC	
Operating Cost		Ter-be-re	<u> </u>
Direct Annual Costs			
Operating Labor			
Operator	\$0	0 hr/d * 365 d/y * \$51,26/hr	3(a), 5
Supervisor	\$0	15% of operator	3(b)
Total	\$0		3(0)
Maintenance			
Labor	\$0	3 hr/d * 365 d/y * \$51.26/hr	3(c)
Material	\$0		3(d)
Total	\$0		3(4)
Electricity Costs			1
Requirement	262,000	law/vP	1
Unit cost	\$0.070	kw/yR	3(e)
Total	\$0.070 \$18,340	\$/kW-hr	6
Compagned Air			
Compressed Air	7,000		3(e)
	\$7,000	1	1
Total Direct Annual Costs	\$25,340	1	

Trinity Consultants
File: Enviva Hamlet, Richmond County Emission Calculations and BACT v5
Sheet: GHM Cyclone

			0

Total Indirect Annua	I Cooks	\$2,241		
Total Cap	oital Recovery Cost	\$1,799		
Property Insuranc Annual I Economi	trative Charges tax	\$0.00 \$221 \$111 \$111 10.0% 10 0.163	60% * (operating labor + maintenance) 2% of TCI 1% of TCI 1% of TCI	3(e) 3(e) 3(e) 3(e)

- 1. Quote provided by Bruce Westerman on 8/12/2013 estimate from Aircon Corporation.
  2. Direct and Indirect capital costs associated with the purchase of the cyclone determined in accordance with EPA OAQPS APCCM Sec.6, Ch.1, Table 1.9
  3. EPA OAQPS APCCM Sec.6, Ch.1, Table 1.11

  (a) Assumed no operator cost required for simple cyclone.
  (b) Assumed no supervisor cost required for simple cyclone.
  (c) Maintenance labor of I hour per shift 3 shifts per day
  (d) Maintenance material(s) calculated @ 100% of labor
  (e) Indirect annual costs calculated in accordance with APCCM guidance.
  4. EPA OAQPS APCCM Sec.6, Ch.1, Table 1.11
  5. US Dept. of Labor Bureau of Labor Statistics \$51.26/hr (Stationary Engineers and Boiler Operators, 2008 dollars)
  6. Electricity unit cost provided by the Energy Information Administration

- Electricity unit cost provided by the Energy Information Administration
   Capital recovery calculated assuming 15 years of equipment life @ a recovery rate of 10%
   Capital Recovery Factor (CRF)
- $= (IR*(1+IR)^n)/((1+IR)^n 1)$
- 8. Scale-up capital cost factor from Ulrich, Gael D. Chemical Engineering Process Design and Economics, 2004 (C1\*(S2/S1)<sup>0,6</sup>) where S1 is Pellet coolers flow rate of S2 is the Enviva green hammermill flow rate

  The resulting Qnew/Qinitial = 0.22 0.22

**Trinity Consultants** File: Enviva Hamlet, Richmond County Emission Calculations and BACT v5 Sheet: GHM Cyclone

## TABLE D-12a PM BACT IMPACTS SUMMARY FOR GREEN WOOD HAMMERMILLS ENVIVA PELLETS RICHMOND, LLC

					Econom	Economic Impacts		Energy Impacts	Environmental Impacts
Control Options (gr/scf)	Baseline Emissions (tons/yr)	Control Efficiency	Emissions Reduction (tons/year)	Total Capital Cost (\$)	Annual Cost CD-GHM-CYC	Cost Effectiveness (\$/ton)	Incremental Cost Effectiveness (\$/ton)	Increase Over Baseline (kW*hr/yr)	Adverse Environmental Impacts? (Yes/No)
0.0075 (Bagfilter)	258.61	%16	250.9	\$200,022	\$583,914	\$2,328	\$30,732	2.62E+05	Š
0.025 (Cyclone)	258.61	%06	232.7	\$11,053	\$27,581	\$119	8118	2.62E+05	No
0.25 (Baseline)	258.61	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N

#### TABLE D-12b PM10 BACT IMPACTS SUMMARY FOR GREEN HAMMERMILL ENVIVA PELLETS RICHMOND, LLC

									Environmental
					Есоноп	Economic Impacts		Energy Impacts	Impacts
	i								
Control	Baseline	Control	Emissions	Total Capital	Annual	Cost	Incremental Cost	Increase Over	Adverse Environmental
Options	Emissions	Efficiency	Reduction	Cost	Cost	Effectiveness	Effectiveness	Baseline	Impacts?
(gr/scf)	(tons/yr)		(tons/year)	(\$)	(S/year)	(\$/ton)	(\$/ton)	(kW*hr/yr)	(Yes/No)
The second	5	o de							
U.UUU53 (Bagriller)	18.62	91%	18.1	\$200,022	\$583,914	\$32,311	\$423,474	2.62E+05	No
0.0018 (Cyclone)	18.62	%06	16.8	\$11,053	\$27,581	\$1,646	\$1,646	2.62E+05	No
0.018 (Baseline)	18.62	N/A	N/A	N/A	N/A	N/A	N/A	N/A	°N

#### PM2.5 BACT IMPACTS SUMMARY FOR GREEN HAMMERMILL ENVIVA PELLETS RICHMOND, LLC

Adverse Environm Impacts? (Yes/No) Energy Impacts Increase Over Baseline (kW\*hr/yr) Incremental Cost Effectiveness \$3,841,514 \$14,813 N/A (\$/ton) Cost Effectiveness (\$/ton) \$290,966 \$14,813 N/A Annual (S/year) Total Capital Cost 8 Emissions Reduction Control Baseline Emissions (tons/yr) Control Options (gr/scf)

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Trinity Consultants File: Enviva Hamlet, Richmond County Emission Calculations and BACT v5 Sheet: GHM PM Summary

ests: PM = 100% and PM-10 = 7% PM2.5 = 0.8%.

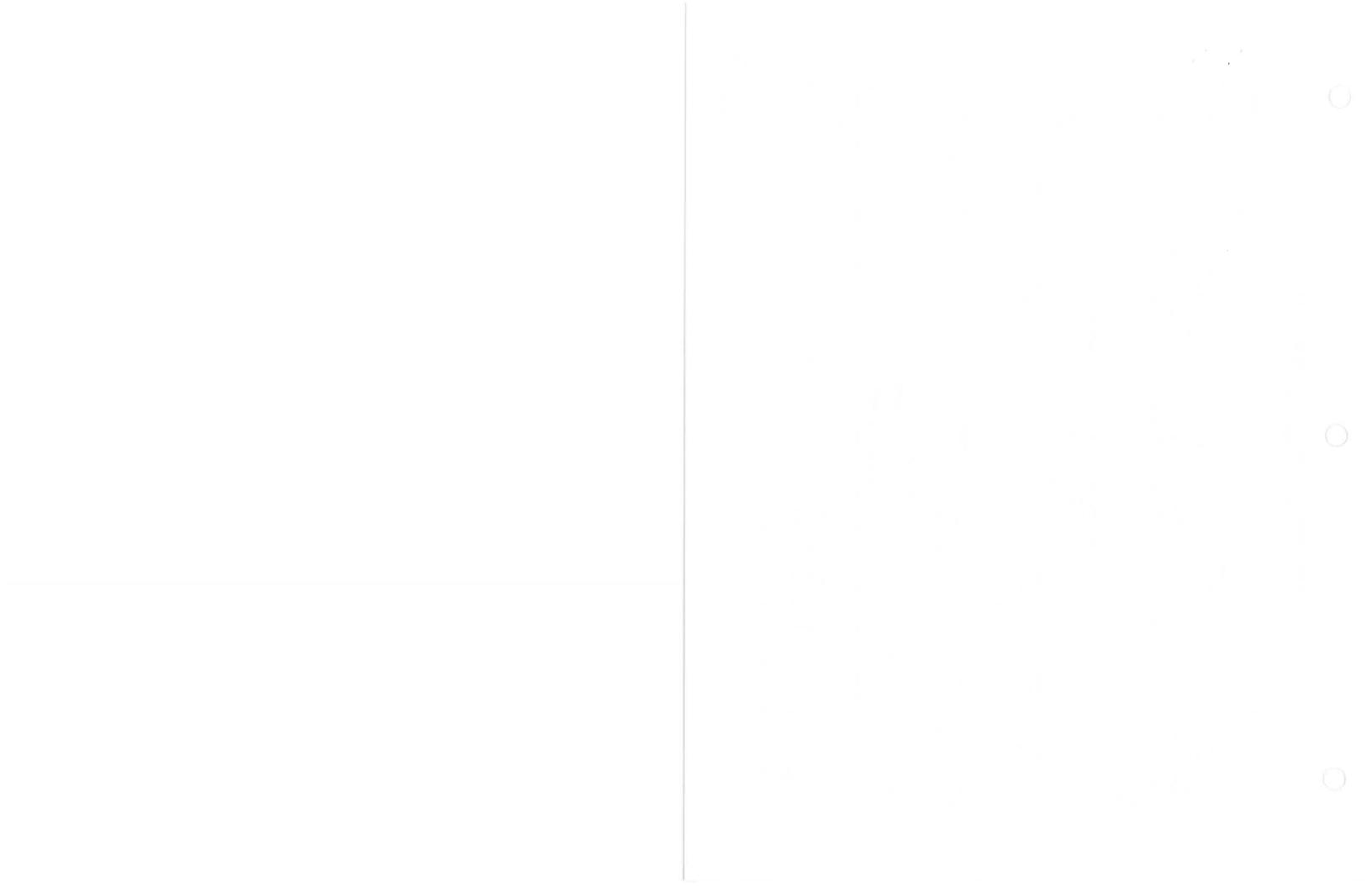


TABLE D-13
REGENERATIVE THERMAL OXIDATION COST ANALYSIS - GREEN WOOD HAMMERMILLS
ENVIVA PELLETS HAMLET, LLC

Capital Cost		Notes	Reference	
Direct Costs				
Purchased Equipment Costs		1		
RTO Price+ Freight+Instrumentation	\$683,112	A	34-1	
Sales Tax	\$20,493	0.03A	2(a)	
Purchased Equipment Cost, PEC		0.03A B	l(a)	
i monasca equipment cost, i EC	\$703,605	В		
Direct Installation Costs				
Foundations and Support	\$56,288	0.08B	1(a)	
Handling & Erection	\$98,505	0.14B	1(a)	
Electrical	\$28,144	0.04B	1(a)	
Piping	\$14,072	0.02B	l(a)	
Insulation for ductwork	\$7,036	0.01B	I(a)	
Painting	\$7,036	0.01B	l(a)	
Direct Installation Costs	\$211,081			
Total Direct Costs, DC	\$914,686			
Indirect Costs (Installation)				
Engineering	\$70,360	0.10B	l(a)	
Construction and field expenses	\$35,180	0.05B	1(a)	
Contractor Fees	\$70,360	0.10B	l(a)	
Start-up	\$14,072	0.02B	I(a)	
Performance test	\$7,036	0.01B		
Contingencies	\$21,108	0.03B	l(a) l(a)	
Total Indirect Costs, IC	\$218,118		1(a)	
Total Capital Investment	\$1,132,804	TCI = DC + IC		
Operating Cost				
Operating Labor				
Operator	\$28,065	0.5 hr/s, 3 s/d, d/yr, \$\$1.26/hr, CF	1(b), 3(a)	
Supervisor	\$4,210	15% of operator		
Total	\$32,275	12 % Of obergrot.	1(b)	
Maintenauce	ل 7 غوغده			
Labor	\$28,065	0.5 hr/s, 3 s/d, d/yr, \$51.26/hr, CF	100 20-1	
Material			1(b), 3(a)	
	\$28,065	100% of maintenance labor	l(b)	
Total	\$56,130			
Electricity				
Total Requirement	129.13	KW	2(c)	
Unit cost	\$0.070	\$/kW-hr	2(c)	
Total	\$79,180			
Fuel				
Natural Gas	2.26	MMBTU/hr	3(a)	
Cost	\$6.00	\$/MMBtu	2(b)	
Total	\$118,770	1	4(0)	

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File: Enviva Hamlet, Richmond County Emission Calculations and BACT v5
Sheet: GHM RTO Cost

Total Direct Annual Costs	\$286,354	1	
Indirect Annual Costs			
Overhead  Administrative Charges	\$53,043	60% of operating labor + maintenance	1(b)
Property tax	\$22,656 \$11,328	2% of TCI 1% of TCI	1(b) 1(b)
Insurance Annual Interest Rate	\$11,328 7%	1% of TCI	1(b)
Economic life of RTO	15		
Capital Recovery Factor	0.110		
Total Capital Recovery Cost	\$124,376		
Total Indirect Annual Costs	\$222,730		
Total Annual Cost	\$509,085	TAC = DAC + IDAC	

- 1. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), September 2000, Section 3, Chapter 2.
  - <sup>a</sup> Table 2.8: Capital Cost Factors for Thermal and Catalytic Incinerators (OAQPS 2-42); Vendor quote usually includes instrumentation

- Table 2.8: Capital Cost Factors for Thermal and Catalytic Incinerators (OAQPS 2-42); Vendor quote usually includes instrumentation
   Table 2.10: Annual Costs for Thermal and Catalytic Incinerators Example Problem (OAQPS 2-45)
   Provided to Waslace Lasonde of Enviva by Steve Jaasund from GEOENERGY Division of A.H. Lundberg Associates, Inc on March 21, 2011.
   a RTO Price/Quote
   b Natural Gas Cost and usage.
   c Electricity cost and power requirement.
   Taken from Methodology for Estimating Control Costs for Industrial, Commercial, Institutional Boilers and Process Heaters Nation Emissions Standards for Hazardous Air Pollutants Major Source ERG Memo April 2010.
   a Conservative estimate of loaded hourly wage
  - a Conservative estimate of loaded hourly wage
- b Compressed Air Cost from Memo
   U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), July 2002, Section 6, Chapter 2.
   a Equation 2.40 for fan HP (OAQPS 2-42)

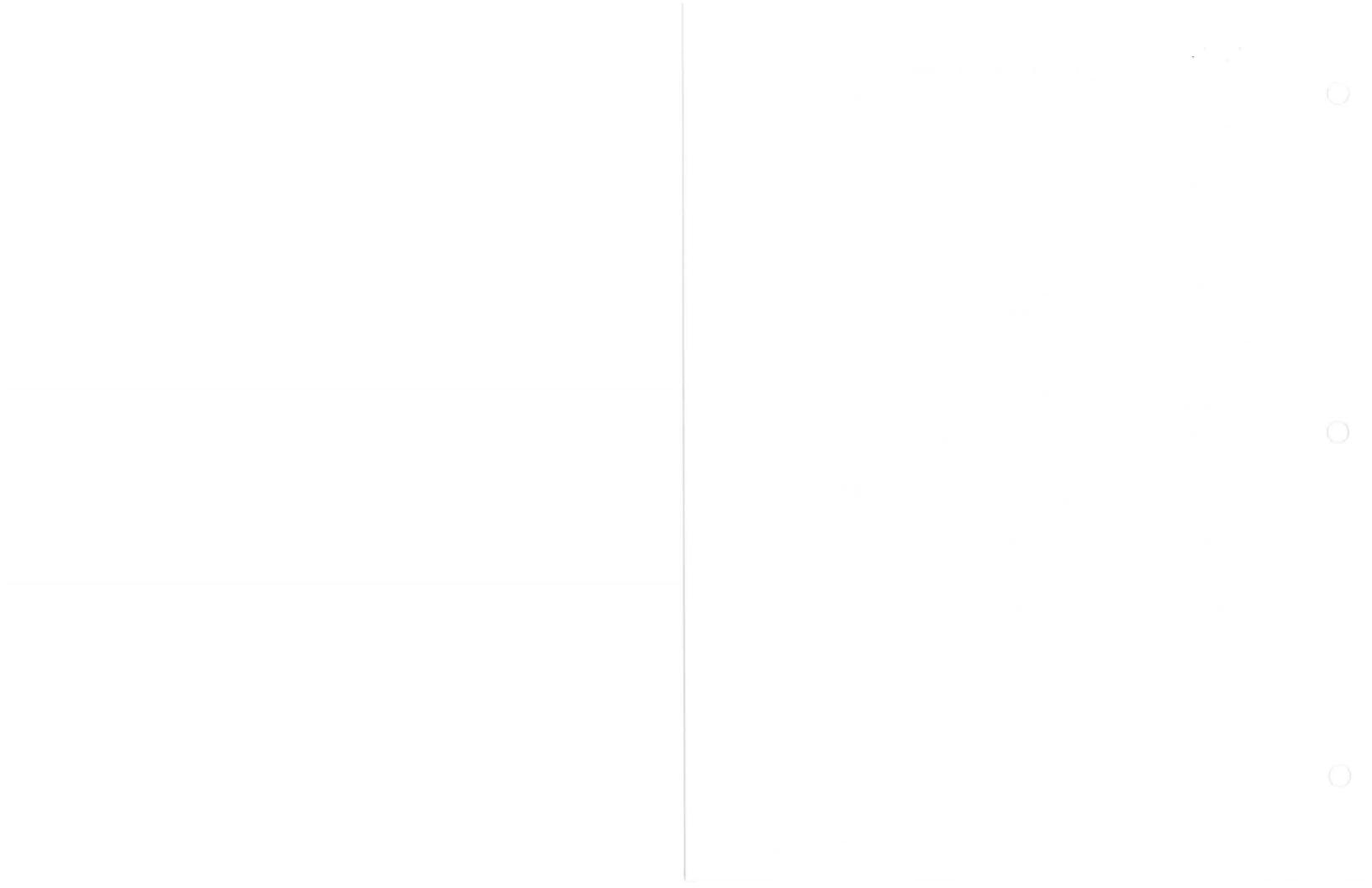
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#### TABLE D-14 PELLET COOLER ASPIRATION SYSTEM - GREEN WOOD HAMMERMILLS ENVIVA PELLETS HAMLET, LLC

Capital Cost		Notes	Reference	
Direct Costs			1	
Purchased Equipment Costs				
RCO Price + auxiliary equipment + freight	\$1,280,331	A	2(a), 6	
Sales Tax	\$38,410	0.03A	1(a)	
Purchased Equipment Cost, PEC	\$1,318,741		1(a)	
		II.		
Direct Installation Costs		1		
Foundations and Support	\$105,499	0.08B	1(a)	
Handling & Erection	\$184,624	0.14B	I(a)	
Electrical	\$52,750	0.04B	1(a)	
Piping	\$26,375	0.02B	1(a)	
Insulation for ductwork	\$13,187	0.01B	1(a)	
Painting	\$13,187	0.01B	1(a)	
Direct Installation Costs	\$395,622		- (-)	
Total Direct Costs, DC	\$1,714,364			
Indirect Costs (Installation)				
Engineering	\$131,874	0.10B	l(a)	
Construction and field expenses	\$65,937	0.05B	1(a) 1(a)	
Contractor Fees	\$131,874	0.10B		
Start-up	\$26,375	0.10B 0.02B	1(a)	
Performance test	\$13,187	0.02B 0.01B	1(a)	
Contingencies	\$39,562	0.01B 0.03B	1(a) 1(a)	
Total Indirect Costs, IC	\$408,810		1(a)	
Fotal Capital Investment	\$2,123,173	TCI = DC + IC		
Operating Cost				
Operating Labor			1	
Operator	\$28,065	0.5 hr/s, 3 s/d, d/yr, \$51.26/hr, CF	l(b), 4(a)	
Supervisor	\$4,210	15% of operator	1(b)	
Total	\$32,275		1(0)	
Maintenance	402,270			
Labor	E20 065	0.51 ( 2.41 ) 4. 651 055 050	441	
	\$28,065	0.5 lu/s, 3 s/d, d/yr, \$51.26/hr, CF	1(b), 4(a)	
Material	\$28,065	100% of maintenance labor	1(b)	
Total	\$56,130		1	
Electricity		1		
Total Requirement	37	kw	Lundberg	
Unit cost	\$0.070	\$/kW-hr		
Total	\$22,650	W. W. TV-III	3(b)	
Fuel				
Fuel Natural Gas or fuel	0.1	MBTU/hr	263.7	
Cost	\$6.00		3(a), 7	
	*	\$/MMBtu	6	
Conversion	1020	Btu/ft <sup>3</sup>		
Total	\$6,091			
Compressed Air				
Requirement	6	SCFM	2(4) 4(4) 7	
Cost			2(a), 4(b), 7	
Cost Total	\$0.31	\$/1000 ft <sup>3</sup> air	4(b)	
10121	\$963		1	

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File: Enviva Hamlet, Richmond County Emission Calculations and BACT v5
Sheet: GHM RCO Cost



Catalyst Costs  Catalyst Cost (Present Value)  Catalyst Life  Catalyst Cost (Future Value)  Catalyst Cost (Annualized) Total		F/P, 3.5%, 2 years A/F, 10%, 2 years	2(b), 7 2(b)
Total Direct Annual Costs	\$151,972		
Indirect Annual Costs			
Overhead	\$53,043	60% of operating labor + maintenance	1(b)
Administrative Charges	\$42,463	2% of TCI	1(b)
Property tax	\$21,232	1% of TCI	1(b)
Insurance	\$21,232	1% of TCI	1(b)
Annual Interest Rate	10%		
Economic life of RCO	15		
Capital Recovery Factor	0.131		
Total Capital Recovery Cost	\$279,142		
Total Indirect Annual Costs	\$417,111		
Totał Annual Cost	\$569,083	TAC = DAC + IDAC	

- 1. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), September 2000, Section 3, Chapter 2.
  - <sup>a</sup> Table 2.8: Capital Cost Factors for Thermal and Catalytic Incinerators (OAQPS 2-42); Vendor quote usually includes instrumentation
  - <sup>b</sup> Table 2.10: Annual Costs for Thermal and Catalytic Incinerators Example Problem (OAQPS 2-45)
- 2. Hertford Renewable Energy PSD Application (Hertford, North Carolina). Submitted 2008, Approved 2009.
- a RCO Price/Quote \$5,143,578

- b Catalyst costs and life
  c Fuel Requirement was 2.5 MBTU/hr
  d 14 iwo for pressure drop and RCO electricity and utility usage were similar to RSCR
- 3. Enviva Vendor
  - a Natural Gas Cost
- a Natural Uses Cost
   b Electricity cost
   Taken from Methodology for Estimating Control Costs for Industrial, Commercial, Institutional Boilers and Process Heaters Nation Emissions Standards for Hazardous Air Pollutants Major Source ERG Memo April 2010.
   a Conservative estimate of loaded hourly wage
- b Electricity and Compressed Air Cost from Memo
  5. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), July 2002, Section 6, Chapter 2.
- a Equation 2.40 for fan HP (OAQPS 2-42)
- a Equation 2-70 for that fit (UNLYS 2-2-2)

  6. Scale-up capital cost factor from Ulrich, Gael D. Chemical Engineering Process Design and Economics, 2004 (C1\*(S2/S1)<sup>0.6</sup>) where S1 is Hertford boiler flow rate of 279,736 ACFM and S2 is the Enviva green hammermill flow rate of 102,600 ACFM

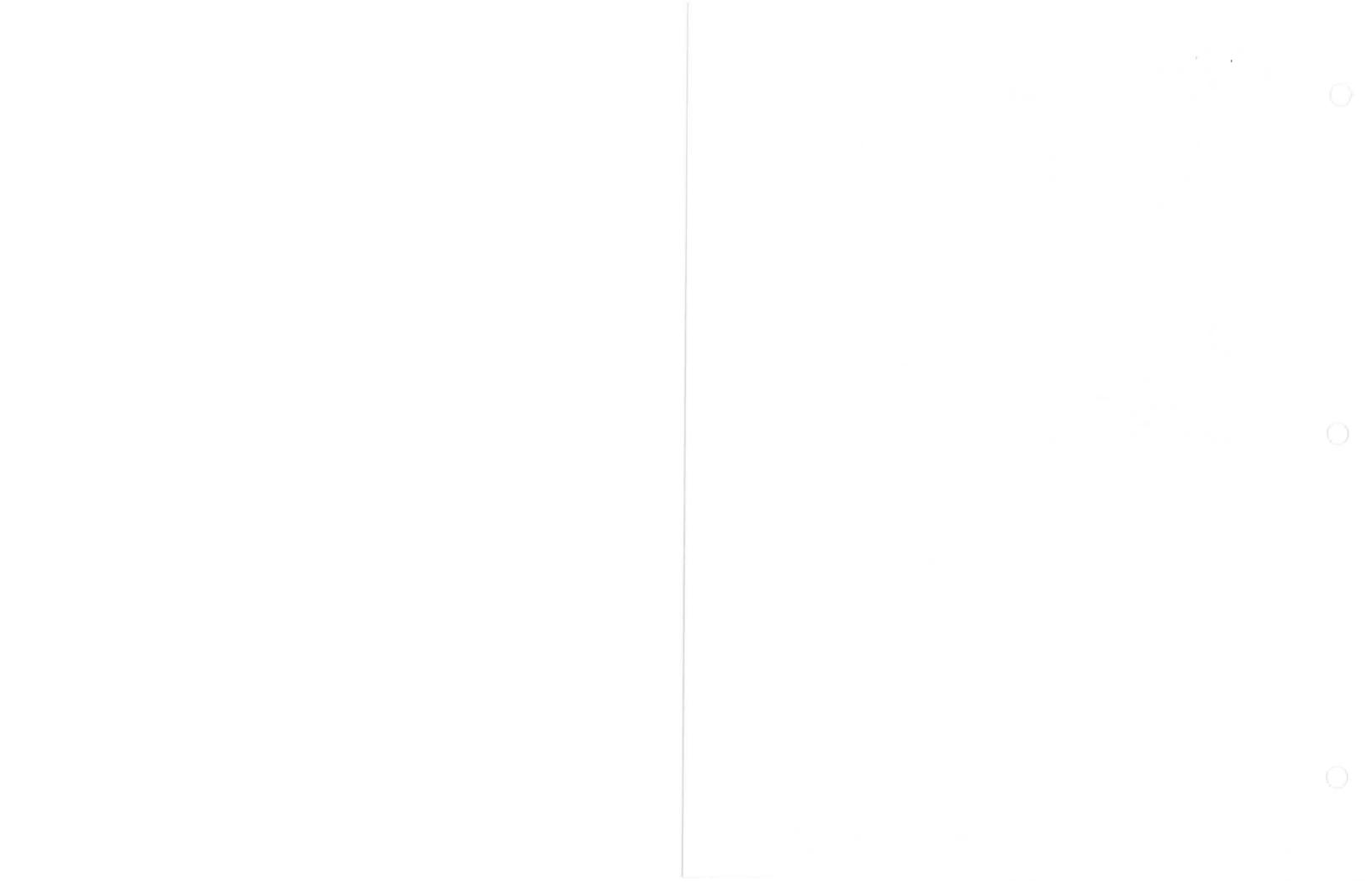
  7. Scaled up Direct Annual Costs linearly based on Hertford Application boiler flow rate of 279,736 ACFM and Enviva flow rate of 072,553 ACFM. The resulting Qnew/Qinitial = 0.10

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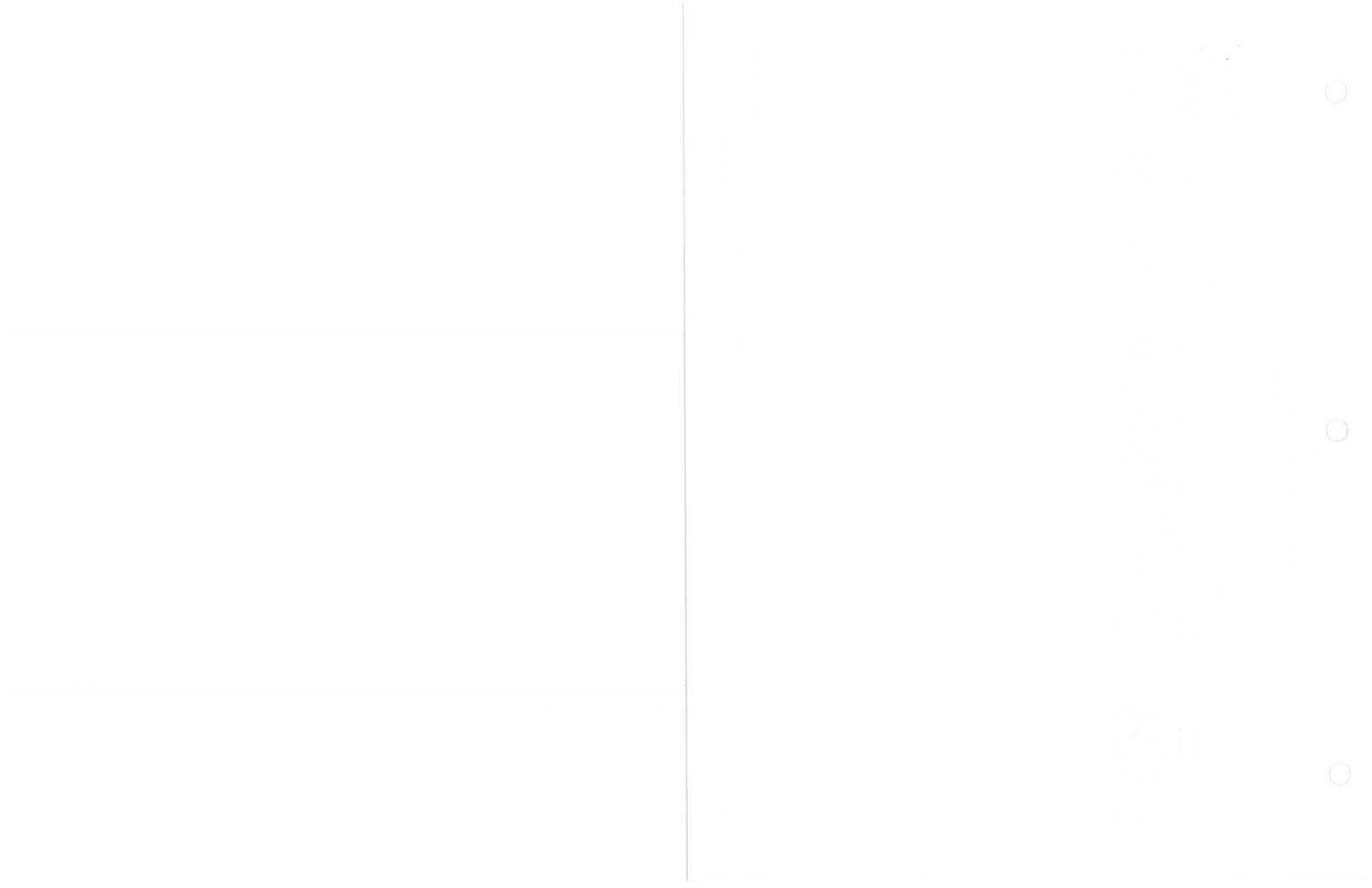
Sheet: GHM RCO Cost



# TABLE D-15 VOC BACT IMPACTS SUMMARY - GREEN WOOD HAMMERMILLS ENVIVA PELLETS RICHMOND, LLC

- E	Energy impacts Impacts	Adverse nerease Over Environmental			1.13E+06 No		N/A No
		Cost	Effectiveness	(\$/ton)	\$1.789	\$1.999	N/A
Hoonomic Improved	Economic turbacts	Annual	Cost	(\$/year)	\$509,085	\$569,083	N/A
		Total Capital	Cost	(\$)	\$1,132,804	\$2,123,173	N/A
		Emissions	Reduction	(tons/year)	284.6	284.6	N/A
		Control	Efficiency		%06	%06	N/A
		Uncontrolled	Emissions	(tons/yr)	316.25	316.25	316.25
		Control	Options	(lb/ODT)	0.110 (RTO)	0.110 (RCO)	1.10 (Baseline)

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File: Enviva Hamlet, Richmond County Emission Calculations and BACT v5
Page 24 of 30
Sheet: GHM VOC Summary



# TABLE D-16 BACT INPUT PARAMETERS AND EMISSIONS ESTIMATES FOR HAMMERMILLS ENVIVA PELLETS HAMLET, LLC

Hammermill Operating Assumptions:

Hammermill Stack Velocity =

Hammermill Stack Diameter =

20.32 meters/sec 1.85 meters 1.85 meters 1.25,000.00 ACFM; =Pi\*D²/4\*Stack Velocity (m/s)\*35.3147 (ft³/ m³)\*60 (sec/min) Estimated from Enviva Northhampton Stack Parameters Hammermill Stack Flow Rate

Pellet Cooler Exit Temperature =
Standard flow rate =
Ib/ODT Factor =
Production Rate =
Operating hours and days =

311.00 deg K 117,825.56 SCFM 0.710 average annual emission factor 575,000 ODT/yr 8,760 hrs/yr

RTO Capital Cost = Estimated RTO Operating Cost (fuel and electricity) =

<del>%</del> %

2,574,594 Estimated from RTO manufacturer using sofm 804,766

VOC Emissions Summary:

Hammermill VOC	(tpy)	204.1
Pollutant		VOC

Trinity Consultants File: Enviva Hamlet, Richmond County Emission Calculations and BACT v5 Page 25 of 30 Sheet: HM BACT Basis

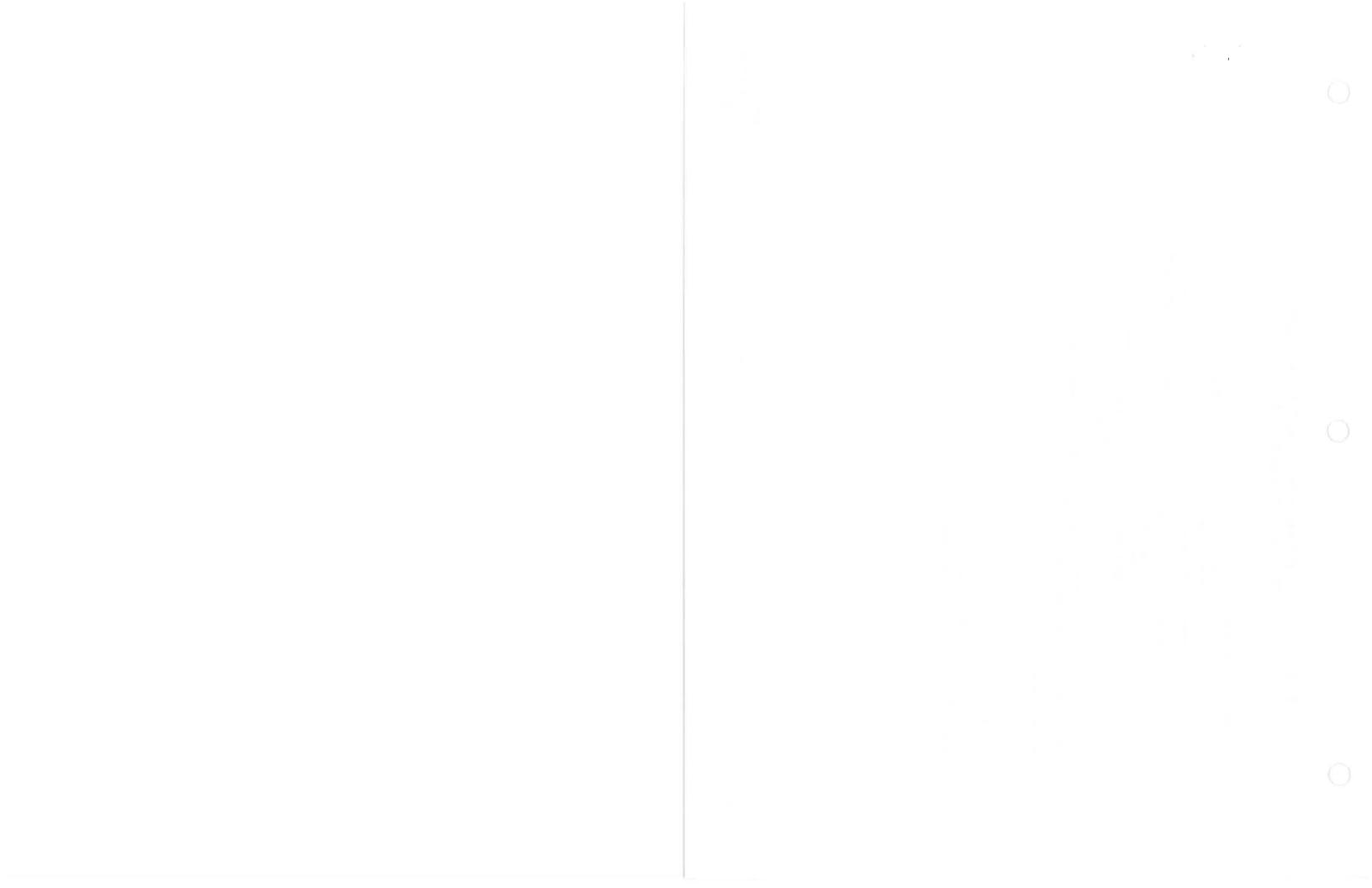
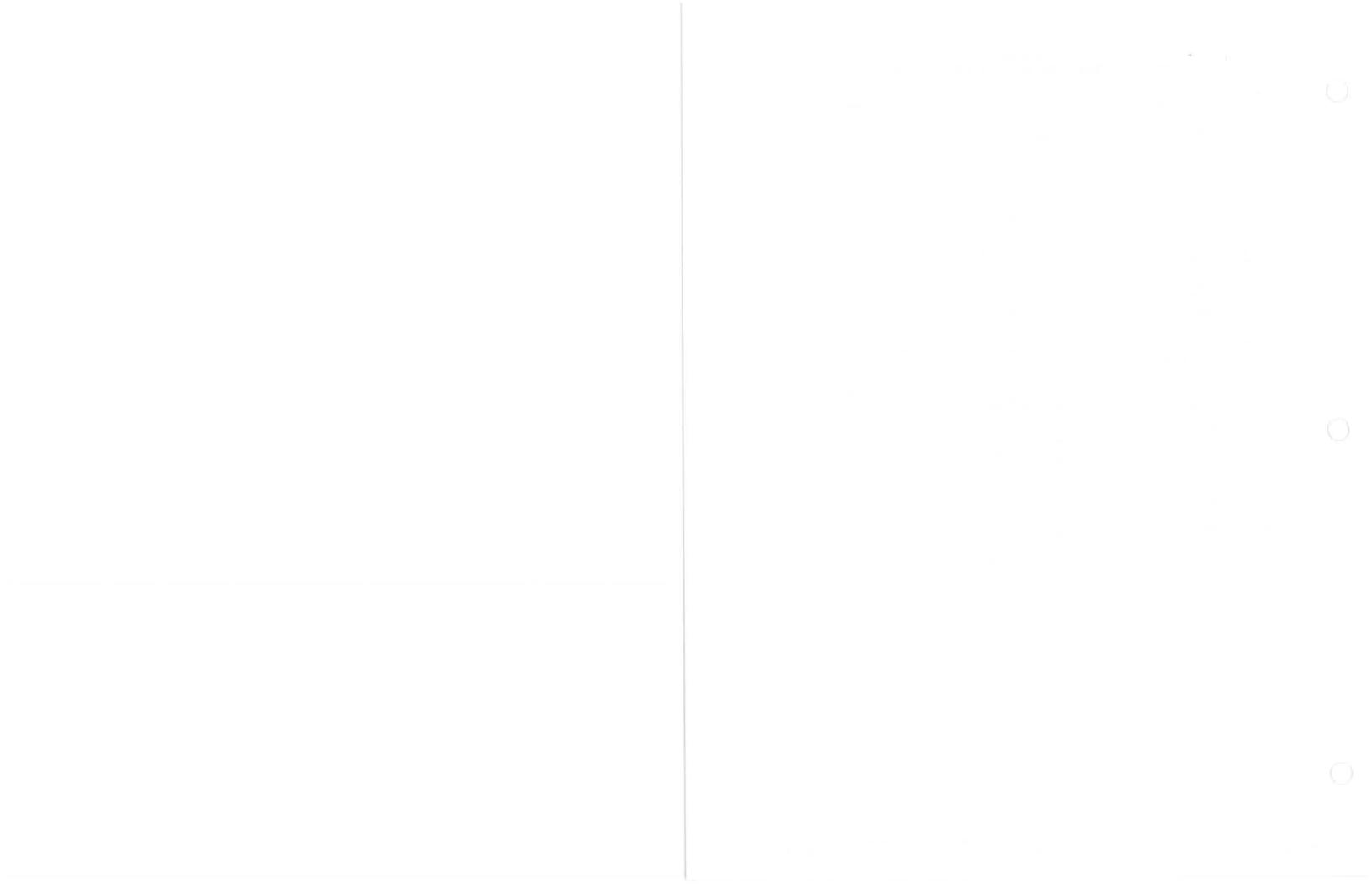


TABLE D-17
REGENERATIVE THERMAL OXIDATION COST ANALYSIS - HAMMERMILL
ENVIVA PELLETS HAMLET, LLC

Capital Cost		Notes	Reference
Direct Costs			
Purchased Equipment Costs			
RTO Price+ Freight+Instrumentation	\$2,574,594	A	2(a)
Sales Tax	\$77,238	0.03A	l(a)
Purchased Equipment Cost, PEC	\$2,651,832	В	1(a)
Direct Installation Costs			
Foundations and Support	\$212,147	0.08B	143
Handling & Erection	\$371,256	0.14B	1(a)
Electrical	\$106,073	0.04B	I(a)
Piping	\$53,037	0.02B	1(a) 1(a)
Insulation for ductwork	\$26,518	0.01B	1(a)
Painting	\$26,518	0.01B	1(a)
Direct Installation Costs	\$795,549	0.012	1(a)
Total Direct Costs, DC	\$3,447,381		
indirect Costs (Installation)			
Engineering	\$265,183	0.10B	1(a)
Construction and field expenses	\$132,592	0.05B	1(a)
Contractor Fees	\$265,183	0.10B	1(a)
Start-up	\$53,037	0.02B	1(a)
Performance test	\$26,518	0.01B	1(a)
Contingencies	\$79,555	0.03B	1(a)
Total Indirect Costs, IC	\$822,068		
Total Capital Investment	\$4,269,449	TCI = DC + IC	
Operating Cost			
Operating Labor			
Operator	\$28,065	0.5 hr/s, 3 s/d, d/yr, \$51.26/hr, CF	1(b), 3(a)
Supervisor	\$4,210	15% of operator	1
Total	\$32,275	1374 Of Opticator	1(b)
Maintenance			
Labor	\$28,065	0.5 hr/s, 3 s/d, d/yr, \$51.26/hr, CF	i(b), 3(a)
Material	\$28,065	100% of maintenance labor	
Total	\$56,130	100% of maintenance labor	1(b)
Electricity	930,130		
•		L	
Total Requirement	524.96	KW	2(c)
Unit cost Total	\$0.070	\$/kW-hr	2(c)
Total	\$321,906	l .	
Fuel			
Natural Gas	9.19	MMBTU/hr	3(a)
Cost	\$6.00	\$/MMBtu	2(b)
Total	\$482,859	I	Ι

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File: Enviva Hamlet, Richmond County Emission Calculations and BACT v5
Sheet: HM RTO Cost



tal Recovery Factor Capital Recovery Cost ual Costs	0.110 \$468,763 \$692,583		
-			
tal Recovery Factor	0.110		
omic life of RTO	15		
ıal Interest Rate	7%		
ance	\$42,694	1% of TCI	1(b)
erty tax	\$42,694	1% of TCI	1(b)
inistrative Charges	\$85,389	2% of TCI	1(b)
head	\$53,043	60% of operating labor + maintenance	1(b)
osts			
al Costs	\$893,170		
	nead inistrative Charges erty tax ance al Interest Rate	bists head \$53,043 inistrative Charges \$85,389 erty tax \$42,694 ance \$42,694 al Interest Rate 7%	S53,043   60% of operating labor + maintenance   1

- U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), September 2000, Section 3, Chapter 2.
   Table 2.8: Capital Cost Factors for Thermal and Catalytic Incinerators (OAQPS 2-42); Vendor quote usually includes instrumentation.

- Table 2.8: Capital Cost Factors for Thermal and Catalytic Incinerators (OAQPS 2-42); Vendor quote usually includes instrumentation
   Table 2.10: Annual Costs for Thermal and Catalytic Incinerators Example Problem (OAQPS 2-45)
   Provided toWaalace Lasonde of Enviva by Steve Jaasund from GEOENERGY Division of A.H. Lundberg Assoicates, Inc on March 21, 2011.

   a RTO Price/Quote
   b Natural Gas Cost and usage.
   c Electricity cost and power requirement.

   Taken from Methodology for Estimating Control Costs for Industrial, Commercial, Institutional Boilers and Process Heaters Nation Emissions Standards for Hazardous Air Pollutants Major Source ERG Memo April 2010.

   a Conservative estimate of loaded hourly wage
   b Compressed Air Cost from Memo
- b Compressed Air Cost from Memo
  4. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), July 2002, Section 6, Chapter 2.
  a Equation 2.40 for fan HP (OAQPS 2-42)

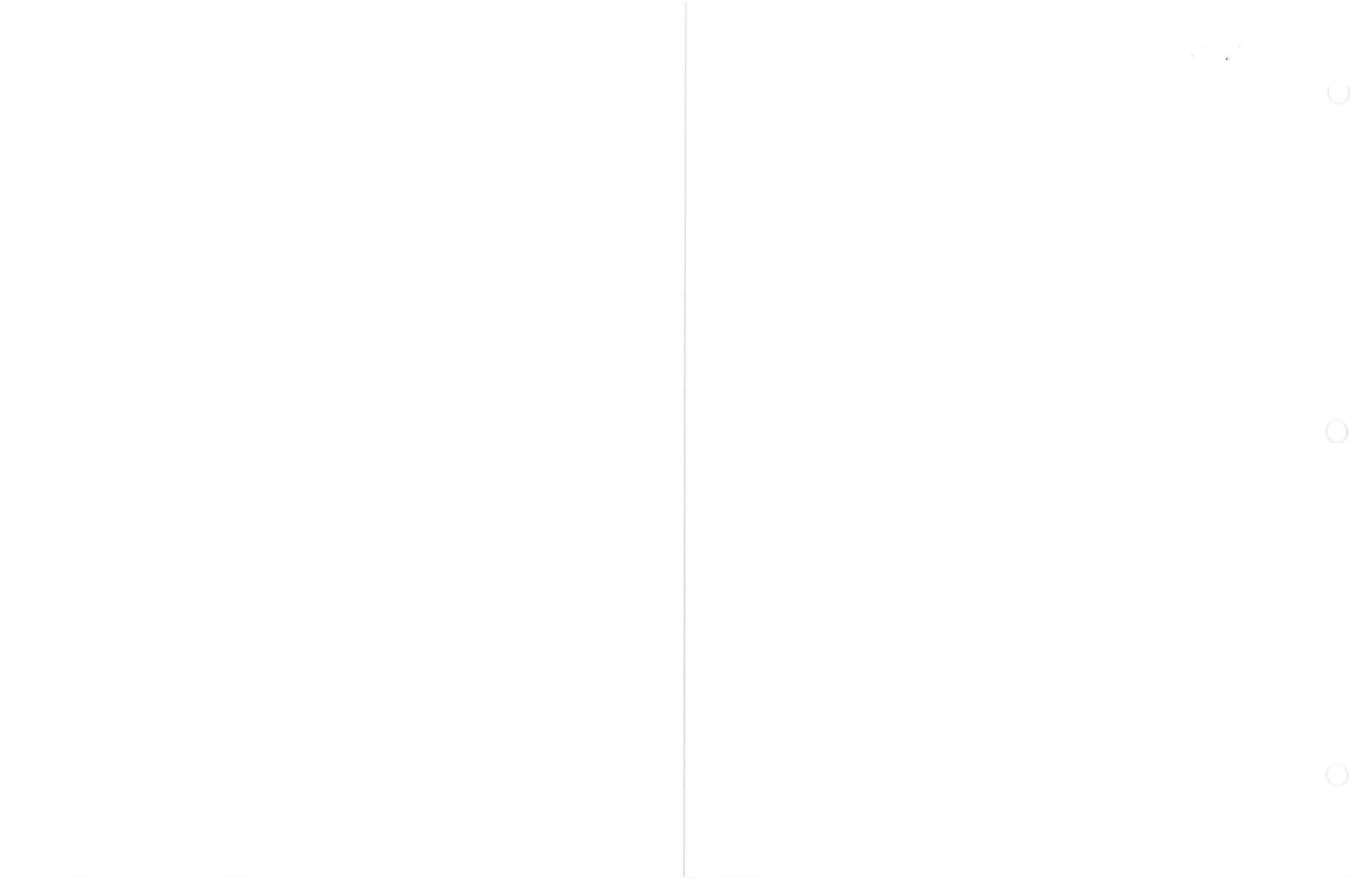
**Trinity Consultants** File: Enviva Hamlet, Richmond County Emission Calculations and BACT v5 Sheet: HM RTO Cost

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TABLE D-18
HAMMERMILL - REGENERATIVE CATALYTIC OXIDATION COST ANALYSIS
ENVIVA PELLETS HAMLET, LLC

Capital Cost		Notes	Reference
Direct Costs			
Purchased Equipment Costs			(II)
RCO Price + auxiliary equipment + freight	\$3,172,213	A	2(a), 6
Sales Tax	\$95,166	0.03A	l(a)
Purchased Equipment Cost, PEC	\$3,267,379	В	1
Direct Installation Costs			
Foundations and Support	\$261,390	0.08B	1(a)
Handling & Erection	\$457,433	0.14B	1(a)
Electrical	\$130,695	0.04B	1(a)
Piping	\$65,348	0.02B	1(a)
Insulation for ductwork	\$32,674	0.01B	l(a)
Painting	\$32,674	0.01B	1(a)
Direct Installation Costs	\$980,214	0.015	I(a)
Total Direct Costs, DC	\$4,247,593	1	
	#T,2773		
Indirect Costs (Installation) Engineering	\$326,738	0.10B	1(a)
Construction and field expenses	\$163,369	0.05B	l(a)
Contractor Fees	\$326,738	0.10B	
Start-up	\$65,348	0.02B	1(a)
Performance test	\$32,674	0.01B	1(a)
Contingencies	\$98,021	0.03B	1(a) 1(a)
Total Indirect Costs, IC	\$1,012,888		1(a)
Total Capital Investment	\$5,260,481	TCI = DC + IC	
Operating Cost			
One metition I observe			
Operating Labor			
Operator	\$28,065	0.5 hr/s, 3 s/d, d/yr, \$51.26/hr, CF	1(b), 4(a)
Supervisor	\$4,210	15% of operator	1(b)
Total	\$32,275		
Maintenance			
Labor	\$28,065	0.5 hr/s, 3 s/d, d/yr, \$51.26/hr, CF	1(b), 4(a)
Material	\$28,065	100% of maintenance labor	1(b)
Total	\$56,130	AND AN INTERNATIONAL SERVICE	1,00
Electricity			
Total Requirement	168	KW	Lundharr
Unit cost	\$0.070		Lundberg
Total	\$0.070 \$102,753	\$/kW-hr	3(b)
Fuel			
Natural Gas or fuel	0.5	MBTU/hr	2/2) 7
Cost	\$6.00	S/MMBtu	3(a), 7
			0
Conversion Total	1020 \$27,631	Btu/ft <sup>3</sup>	
Compressed Air			
Requirement	27	SCFM	2(a), 4(b), 7
Cost	\$0.31	\$/1000 ft <sup>3</sup> air	4(b)
	WALL TO A		.(%)

Trinity Consultants
File: Enviva Hamlet, Richmond County Emission Calculations and BACT v5
Sheet: HM RCO Cost



Catalyst Costs  Catalyst Cost (Present Value)  Catalyst Life  Catalyst Cost (Future Value)  Catalyst Cost (Annualized) Total	\$301,233 2 \$322,621 \$153,632	F/P, 3.5%, 2 years A/F, 10%, 2 years	2(b), 7 2(b)
Total Direct Annual Costs	\$376,789		
Indirect Annual Costs			
Overhead	\$53,043	60% of operating labor + maintenance	1(b)
Administrative Charges	\$105,210	2% of TCI	1(b)
Property tax	\$52,605	1% of TCI	1(b)
Insurance	\$52,605	I% of TCI	1(b)
Annual Interest Rate	10%		
Economic life of RCO	15		
Capital Recovery Factor	0.131		
Total Capital Recovery Cost	\$691,615		
Total Indirect Annual Costs	\$955,077		
Total Annual Cost	\$1,331,866	TAC = DAC + IDAC	

- U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), September 2000, Section 3, Chapter 2.
   Table 2.8: Capital Cost Factors for Thermal and Catalytic Incinerators (OAQPS 2-42); Vendor quote usually includes instrumentation.
- b Table 2.10: Annual Costs for Thermal and Catalytic Incinerators Example Problem (OAQPS 2-45)
   Hertford Renewable Energy PSD Application (Hertford, North Carolina). Submitted 2008, Approved 2009.
  - a RCO Price/Quote \$5,143,578
  - b Catalyst costs and life
- Fuel Requirement was 2.5 MBTU/tr
   d 14 iwe for pressure drop and RCO electricity and utility usage were similar to RSCR
- 3. Enviva Vendor
- a Natural Gas Cost

- b Electricity cost

  4. Taken from Methodology for Estimating Control Costs for Industrial, Commercial, Institutional Boilers and Process Heaters Nation Emissions Standards for Hazardous Air Pollutants Major Source ERG Memo April 2010.
  - a Conservative estimate of loaded hourly wage
- b Electricity and Compressed Air Cost from Memo

  5. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), July 2002, Section 6, Chapter 2.
- a Equation 2.40 for fan HP (OAQPS 2-42)

- a Equation L-10 for fain fr (OAQFS 2-4)

  6. Scale-up capital cost factor from Ulrich, Gael D. Chemical Engineering Process Design and Economics, 2004 (C1\*(S2/S1)<sup>0.6</sup>) where S1 is Hertford boiler flow rate of 279,736ACFM and S2 is the Enviva hammermill flow rate of 120,000 ACFM

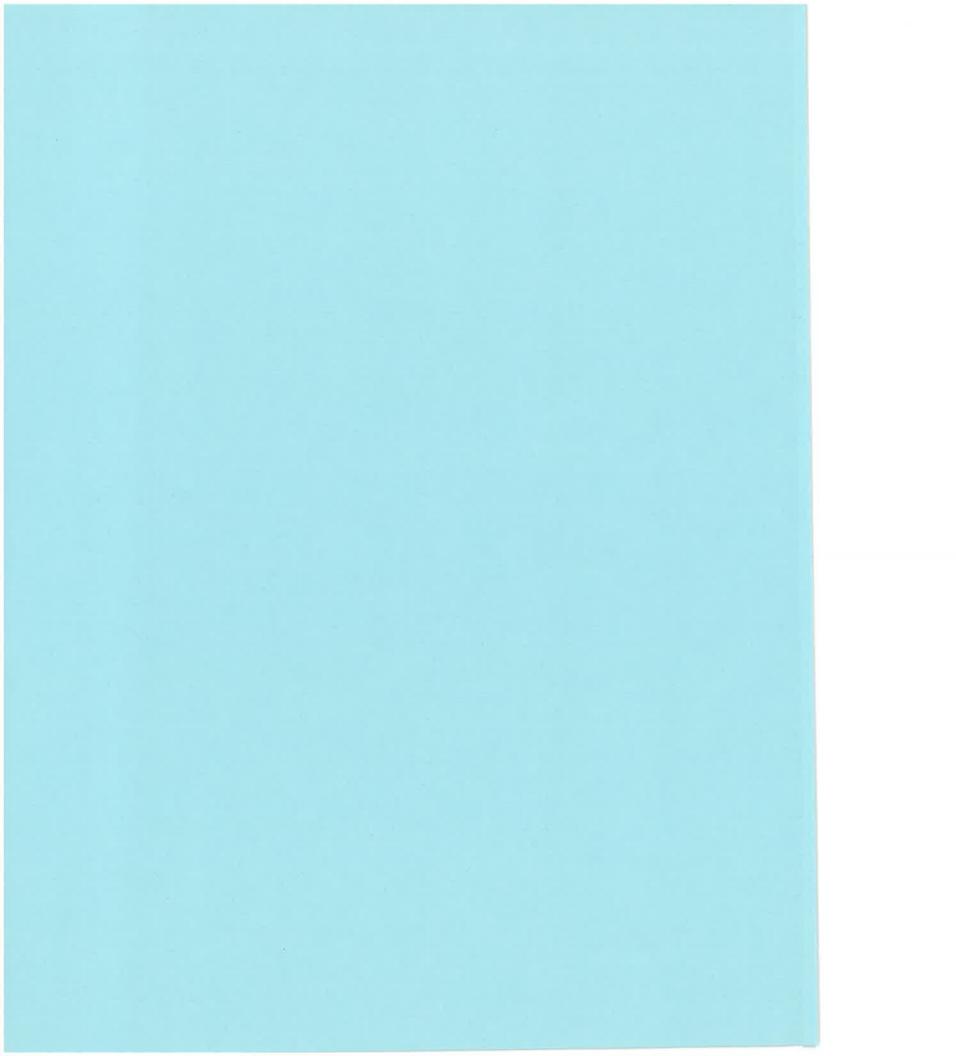
  7. Scaled up Direct Annual Costs linearly based on Hertford Application boiler flow rate of 279,736 ACFM and Enviva flow rate of 120,000 ACFM. The resulting Qnew/Qinitial = 0.45

Trinity Consultants File: Enviva Hamlet, Richmond County Emission Calculations and BACT v5 Sheet: HM RCO Cost

### VOC BACT IMPACTS SUMMARY - HAMMERMILL ENVIVA PELLETS RICHMOND, LLC

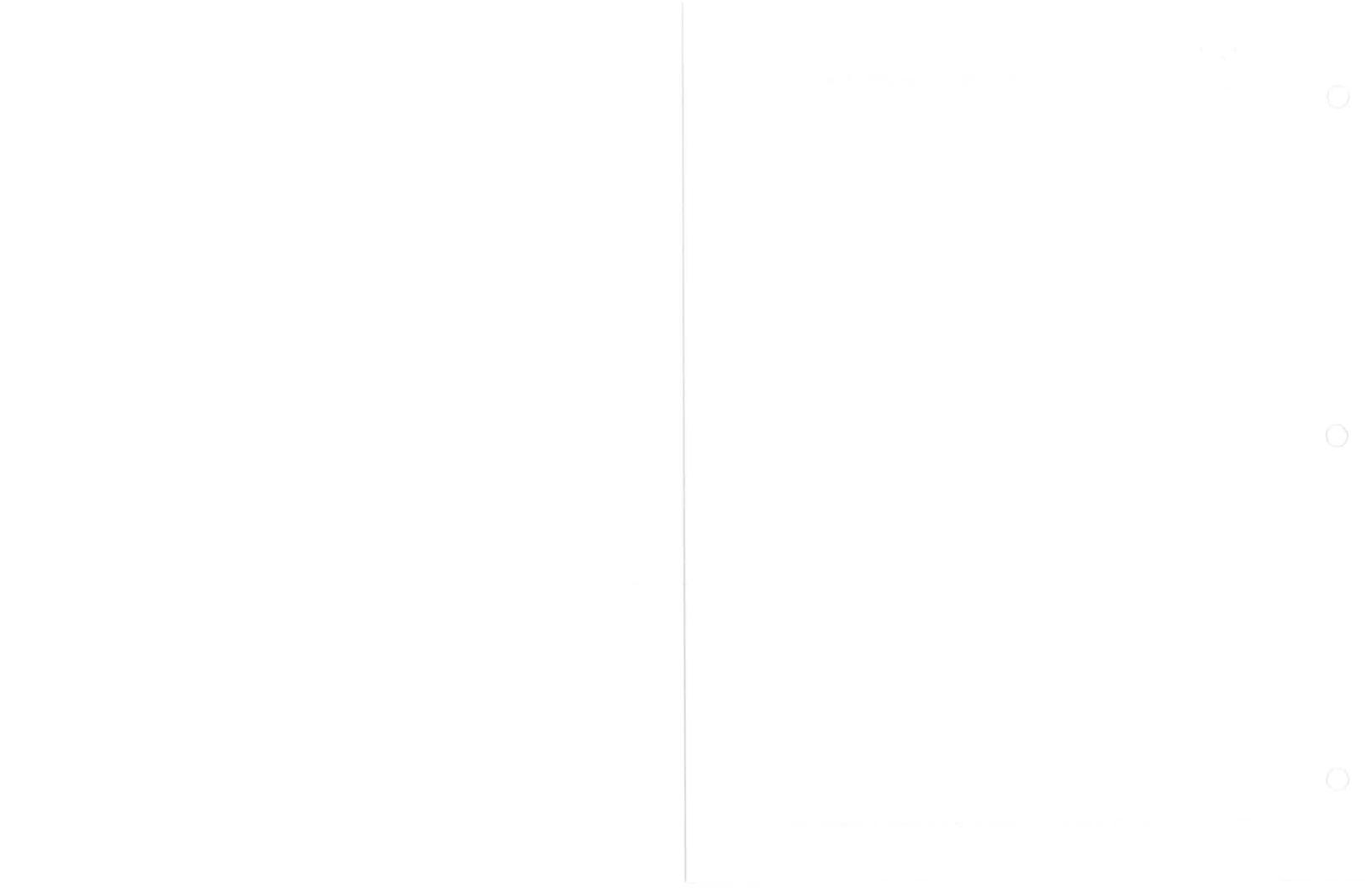
								Environmental
					Economic Impacts		Energy Impacts	Impacts
								Adverse
Control	Uncontrolled	Control	Emissions	Total Capital	Annual	Cost	Increase Over	Environmental
Options	Emissions	Efficiency	Reduction	Cost	Cost	Effectiveness	Baseline	Impacts?
(Ib/ODT)	(tons/yr)		(tons/year)	(\$)	(\$/year)	(\$/ton)	(kW*hr/yr)	(Xes/No)
0.0710 (RTO)	204.08	%06	183.7	\$4,269,449	\$1,585,753	\$8,634	4.60E+06	No
0.0710 (RCO)	204.08	%06	183.7	\$5,260,481	\$1,331,866	\$7,251	1.47E+06	No
0.710 (Baseline)	204.08	N/A	N/A	N/A	N/A	N/A	N/A	No

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File: Enviva Hamlet, Richmond County Emission Calculations and BACT v5
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## APPENDIX E - MODELING PLOTS

DELING PLOTS
DELING FLOTS
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3,870,000 3,869,000-UTM Northing (Zone 17, NAD83 m) 3,866,000 Enviva Famlet Fenceline 3,865,000 3,864,000 3,863,000 622,000 623,000 624,000 625,000 626,000 627,000

UTM Easting (Zone 17, NAD83 m)

Figure E-1. Topographic Map of Enviva Hamlet Area

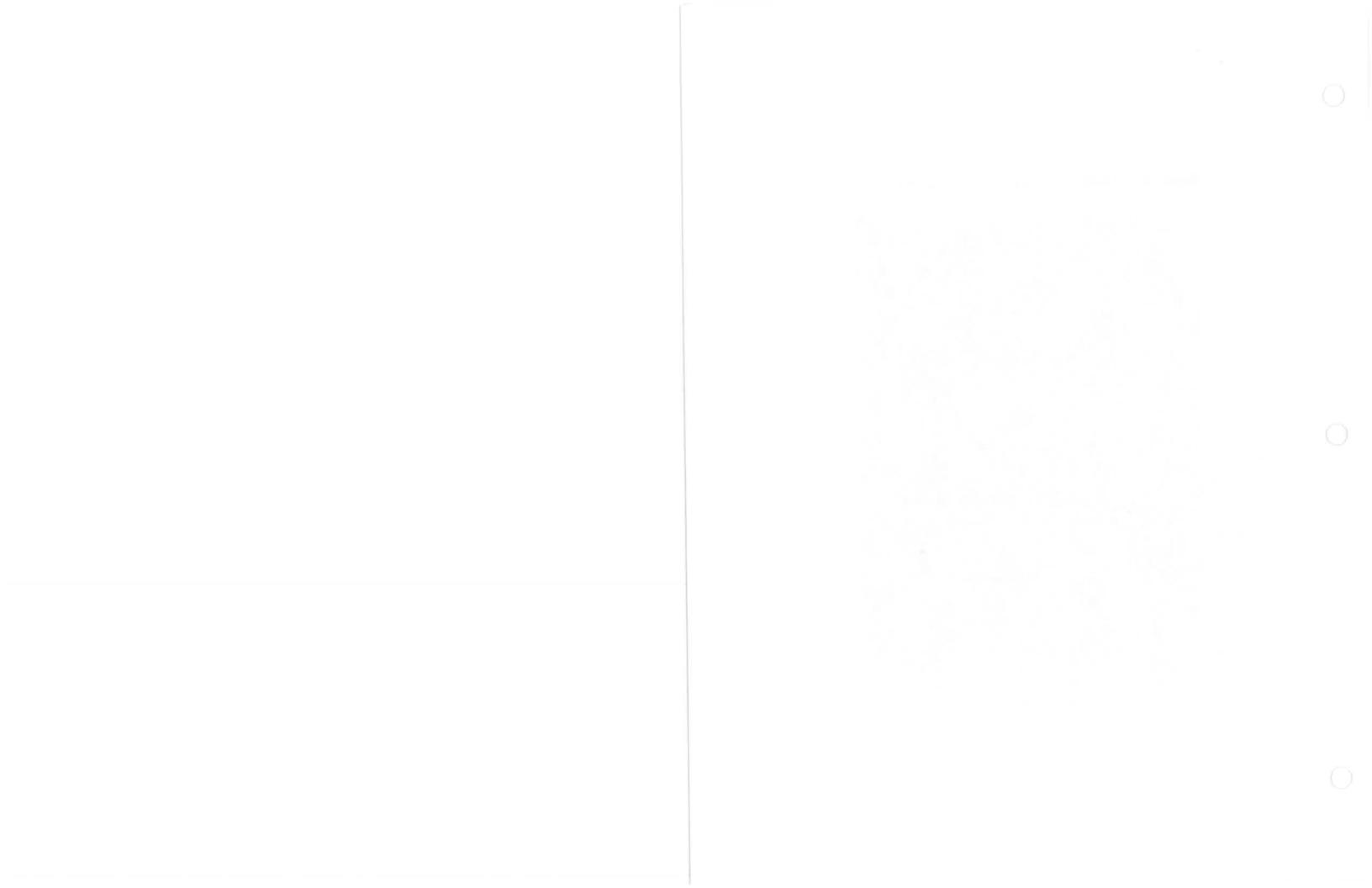
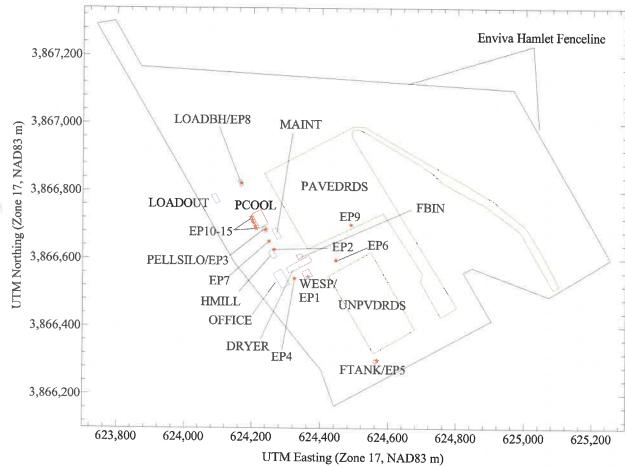
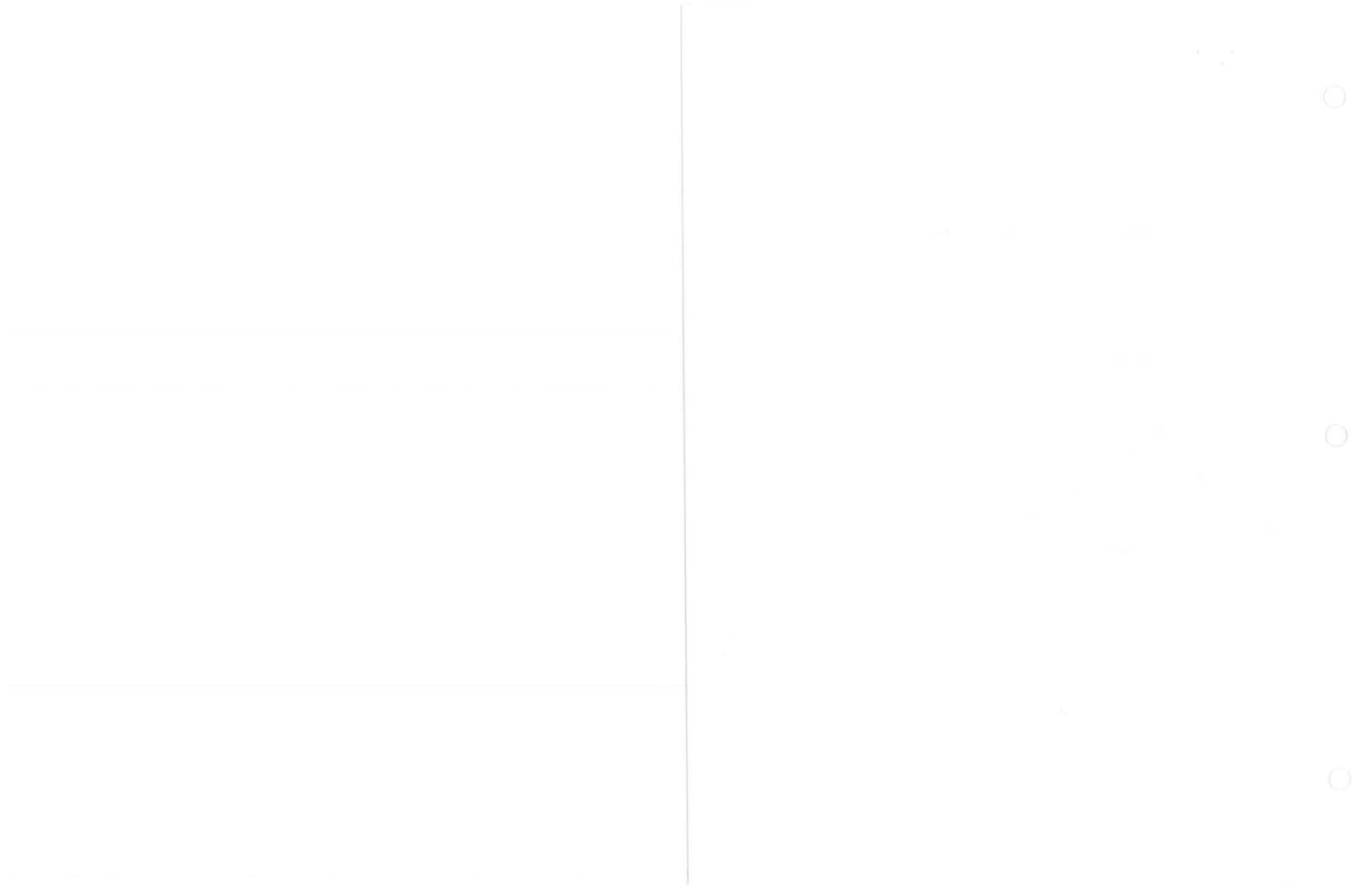


Figure E-2. Enviva Hamlet Site Layout

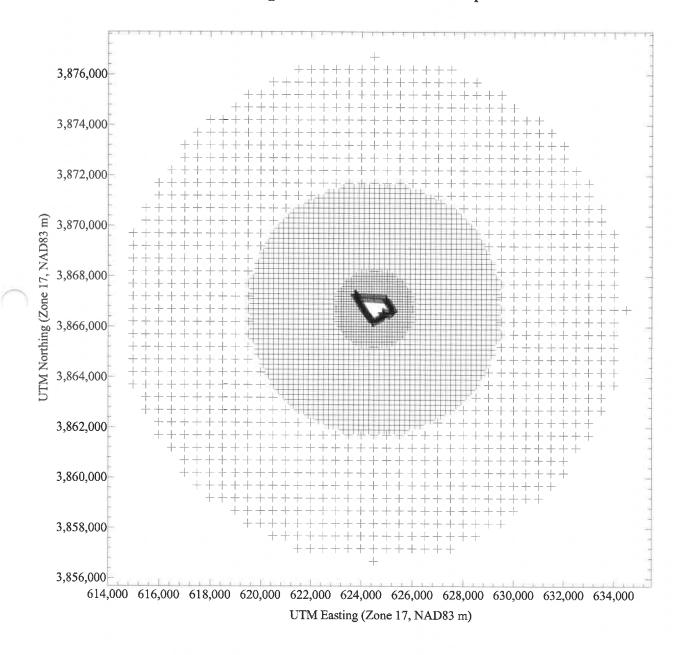




3,920,000 3,910,000 3,900,000 3,890,000 OTM Northing (Zone 17, NAD83 m) 3,880,000 3,880,000 3,860,000 Enviva Hamlet 3,840,000 3,830,000 3,820,000 570,000 580,000 590,000 600,000 610,000 620,000 630,000 640,000 650,000 660,000 670,000 UTM Easting (Zone 17, NAD83 m)

Figure E-3. Class I SIL Receptors

Figure E-4. Class II SIL Receptors



3,890,000 3,880,000 OTM Northing (Zone 17, NAD83 m) 3\*\*820,000 3\*\*860,000 3,850,000 3,840,000 600,000 610,000 620,000 630,000 640,000 650,000

UTM Easting (Zone 17, NAD83 m)

Figure E-5. 1-Hour NO2 SIL Receptors

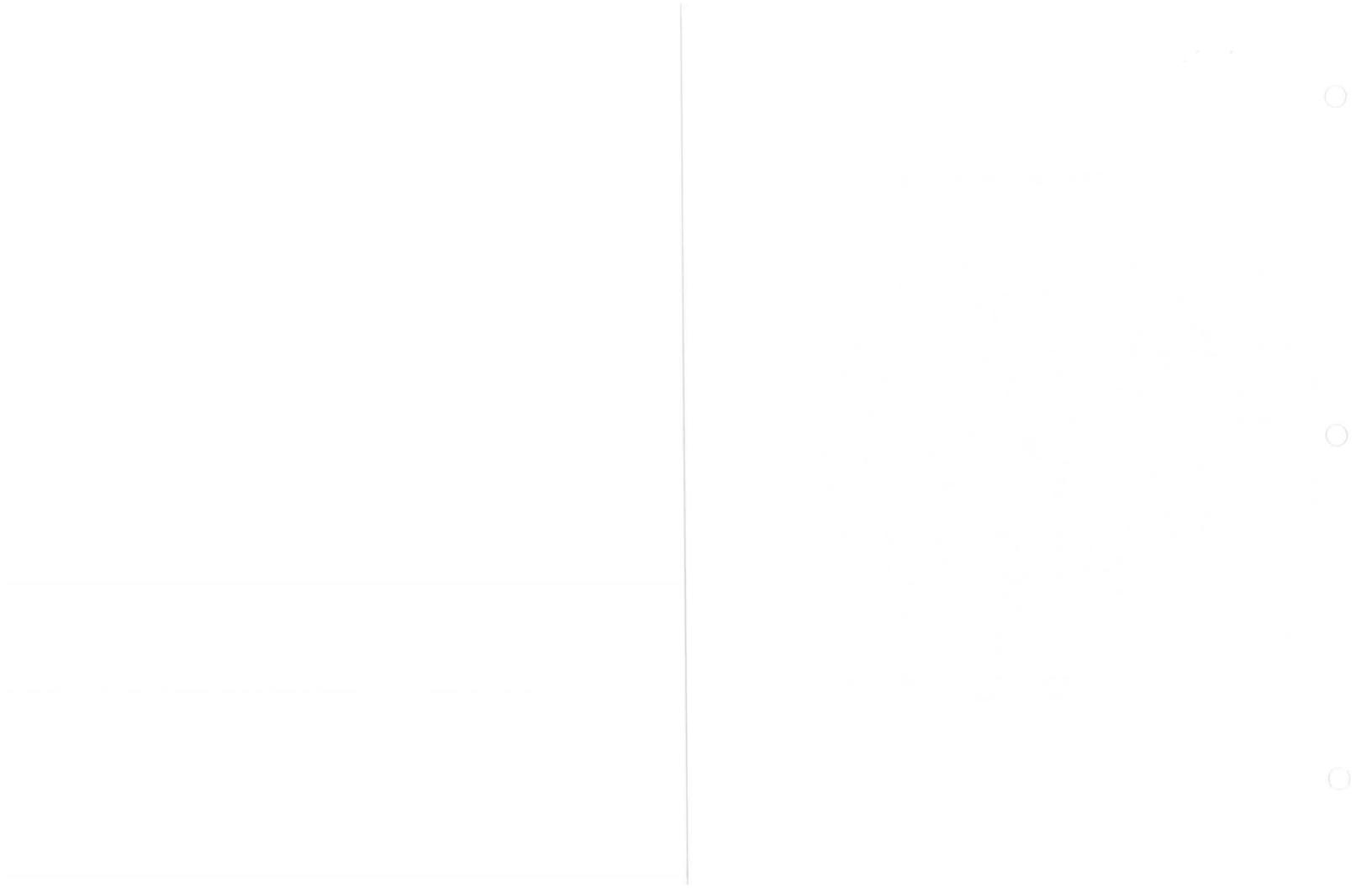


Figure E-6. NAAQS Modeling Grid

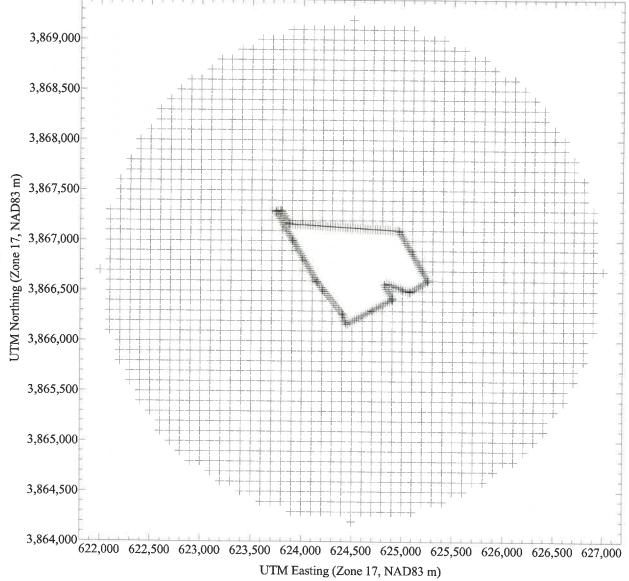
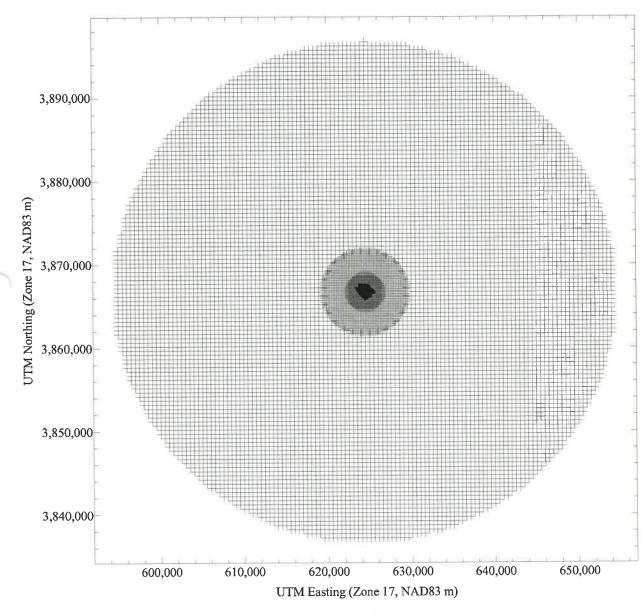


Figure E-7. 1-Hour NO2 NAAQS Modeling Grid



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Figure E-8. TAP Modeling Grid

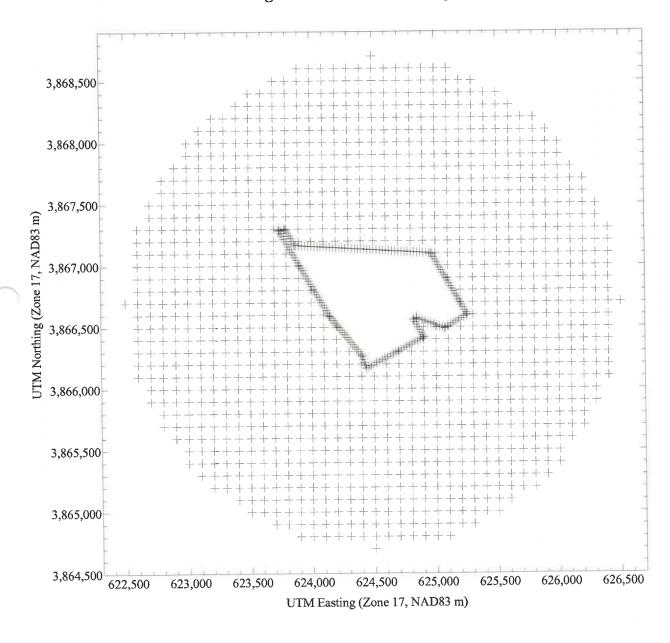
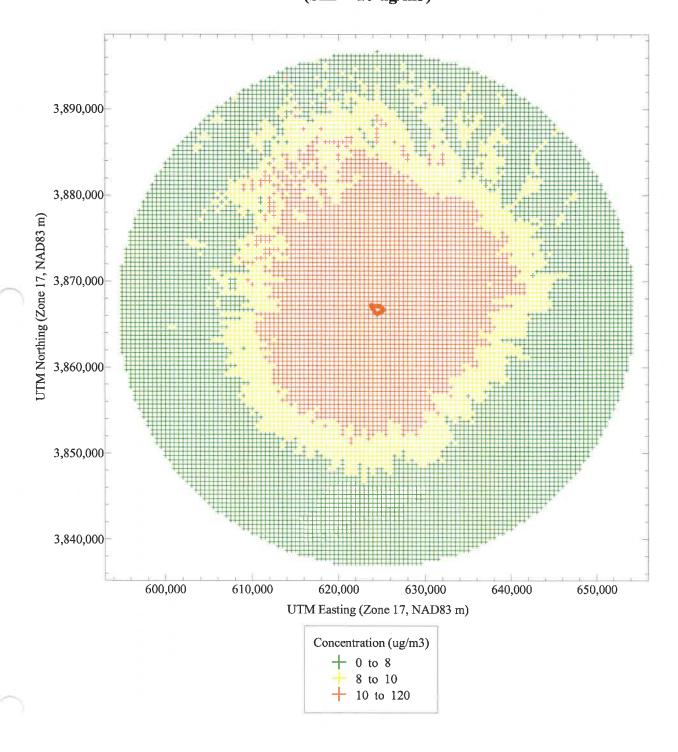


Figure E-9. 1-Hour NO2 SIL Results (SIL = 10 ug/m3)





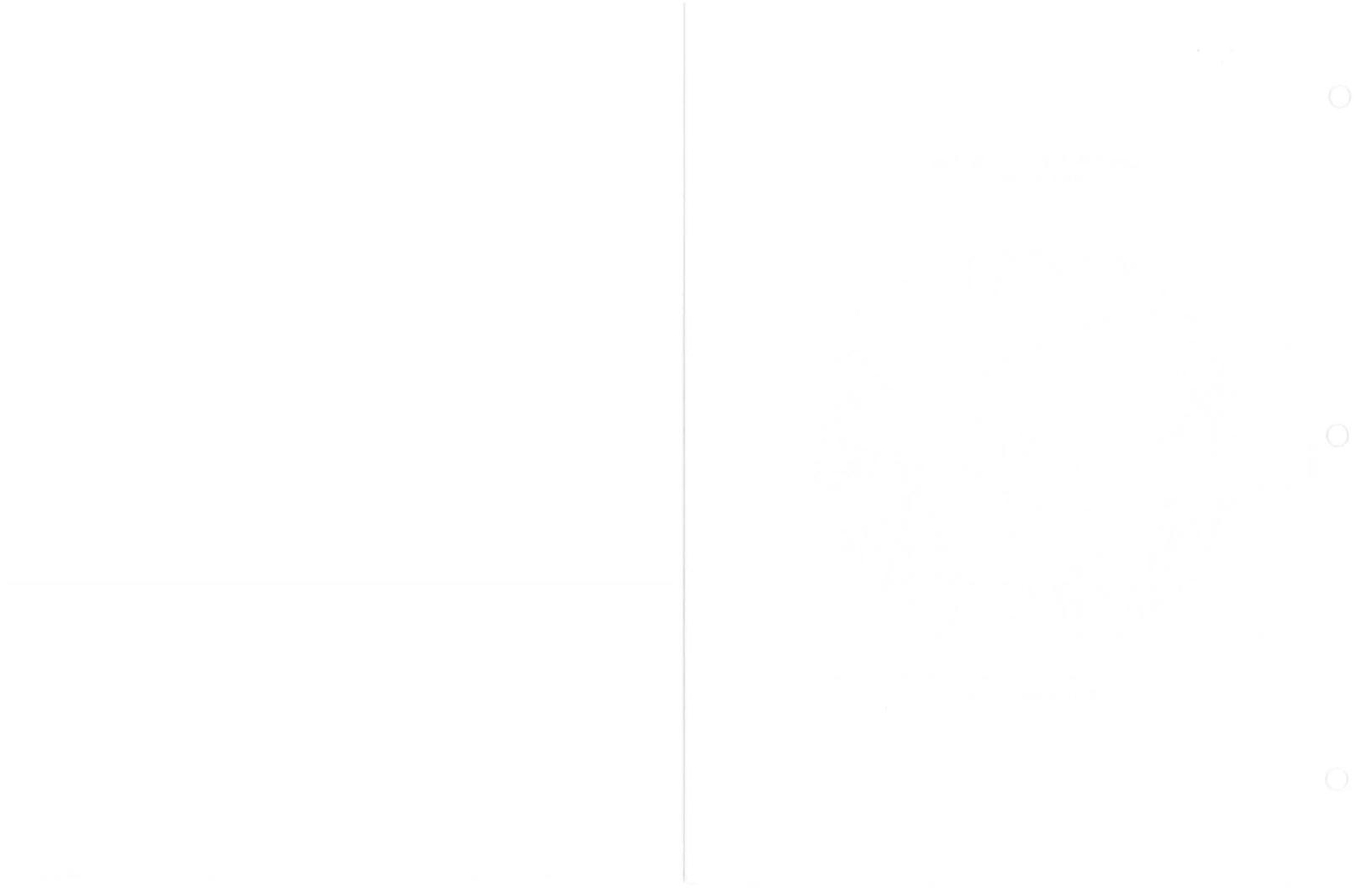


Figure E-10. Annual NO2 SIL Results (SIL = 1 ug/m3)

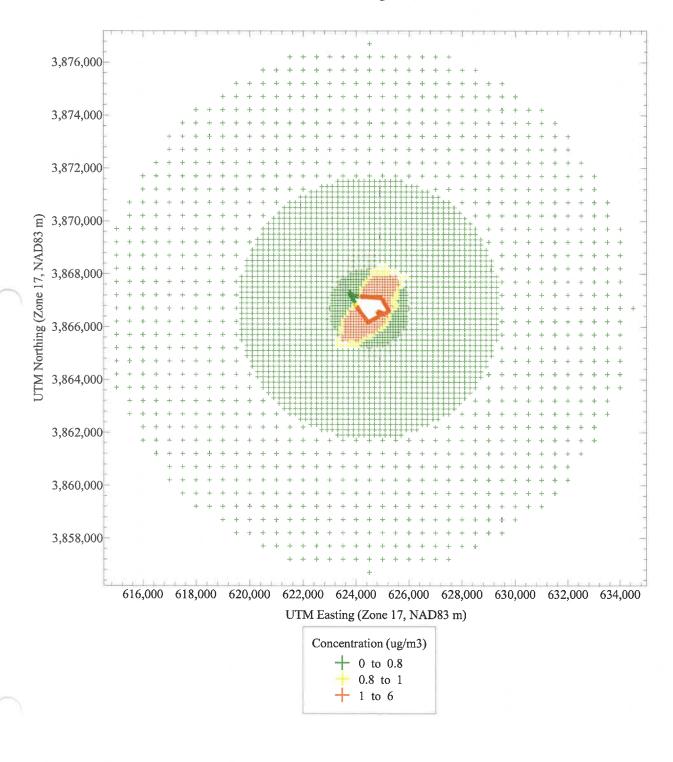
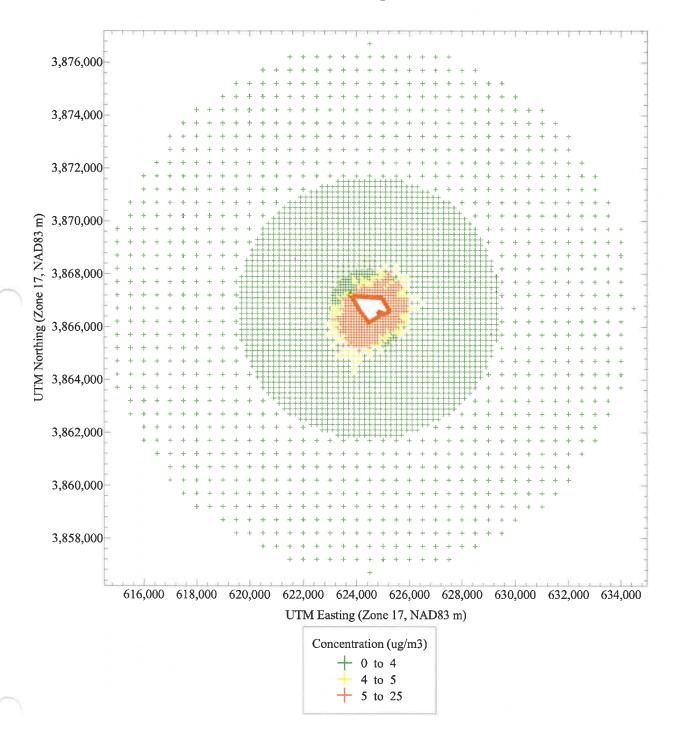


Figure E-11. 24-Hour PM10 SIL Results (SIL = 5 ug/m3)



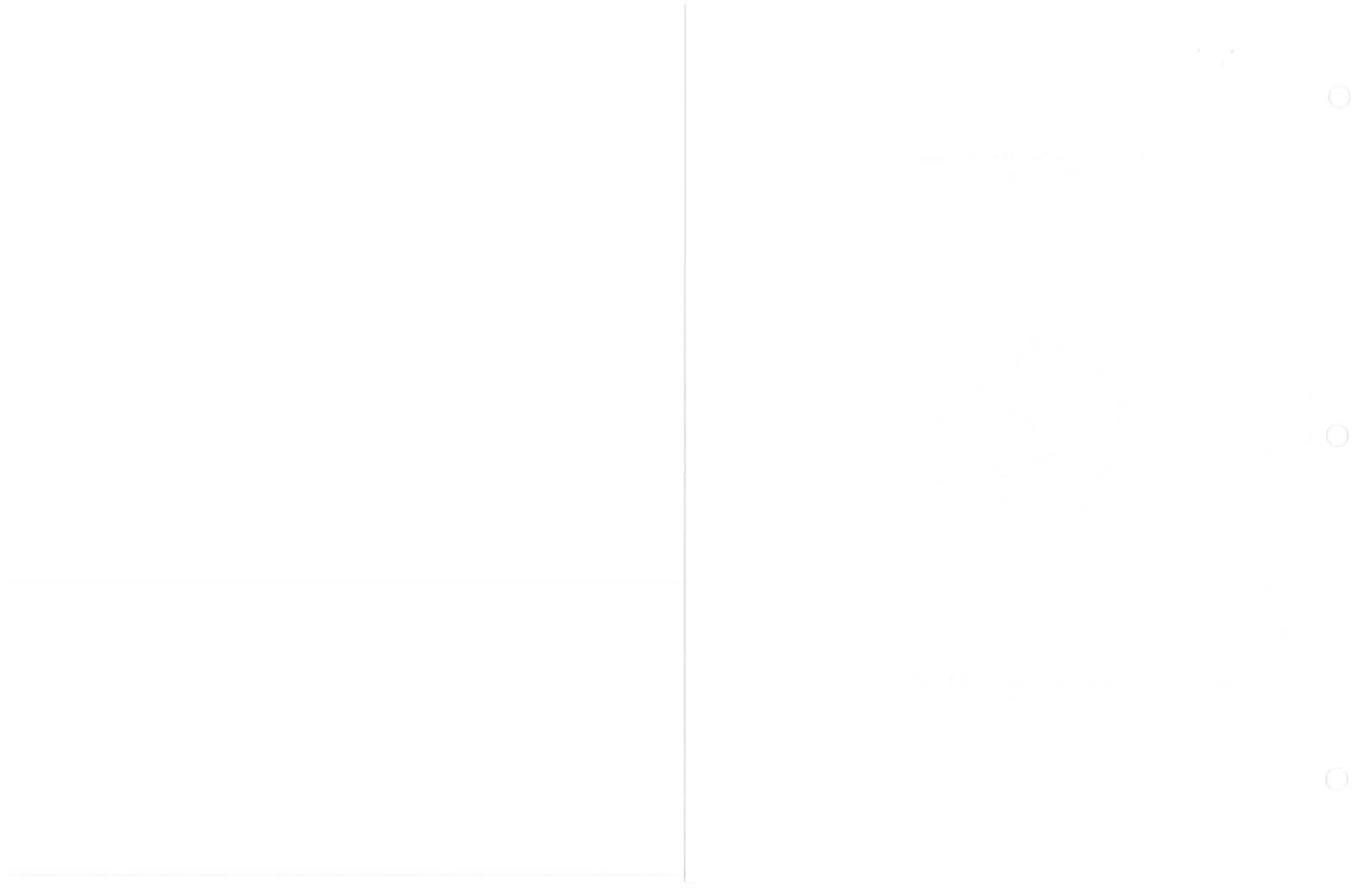
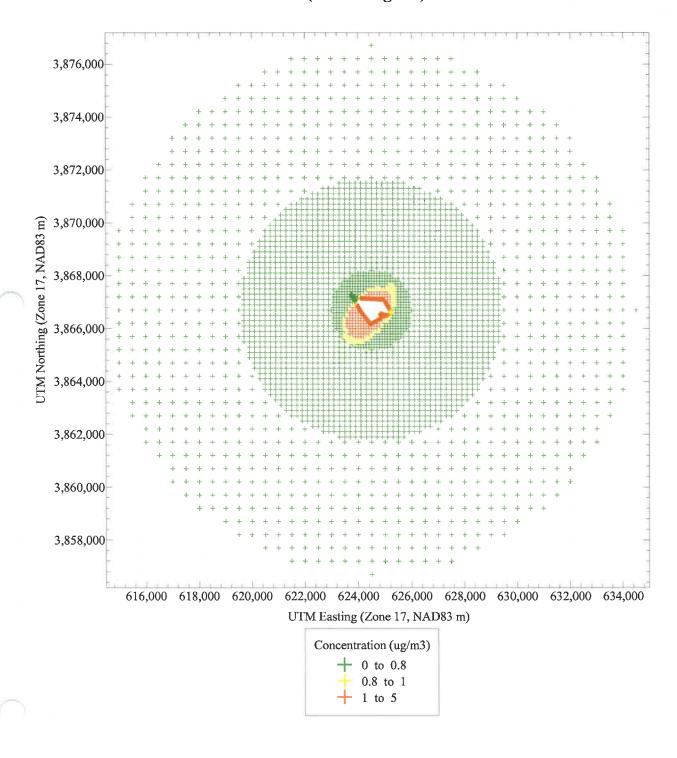


Figure E-12. Annual PM10 SIL Results (SIL = 1 ug/m3)





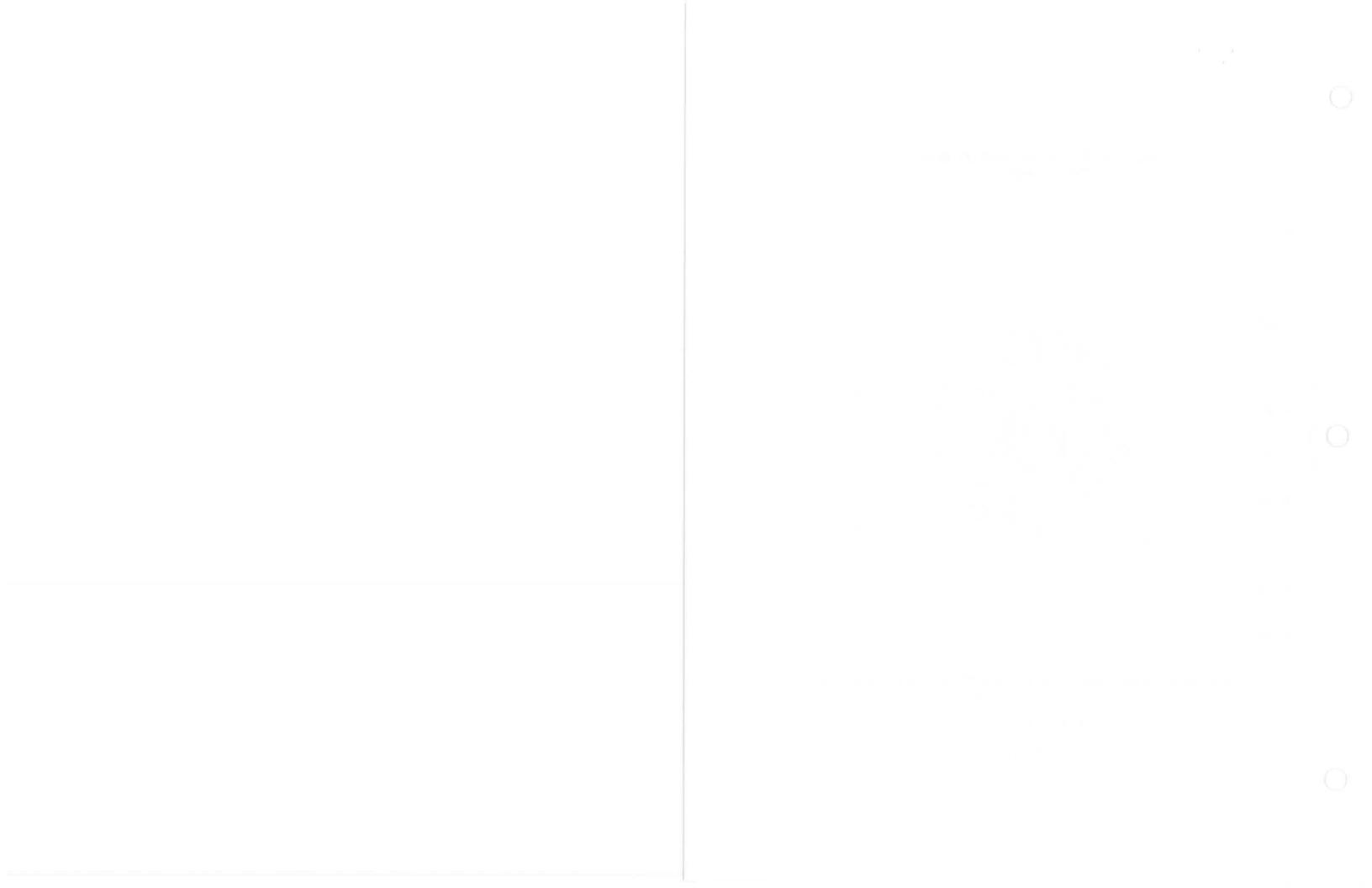


Figure E-13. 24-Hour PM2.5 SIL Results (SIL = 1.2 ug/m3)

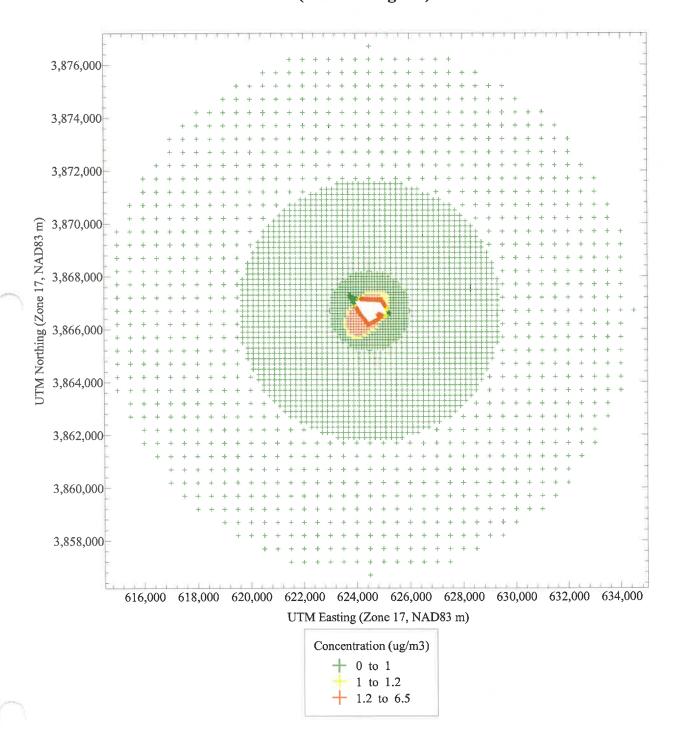
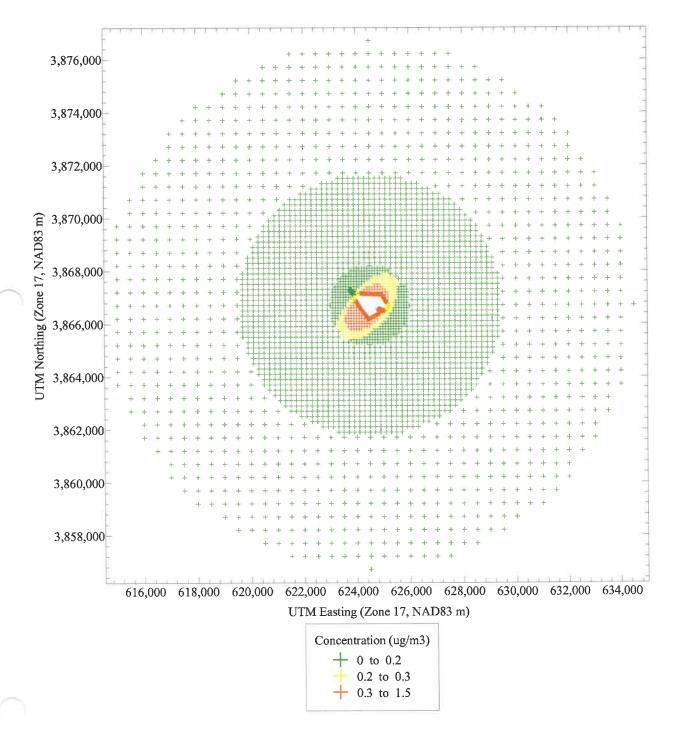
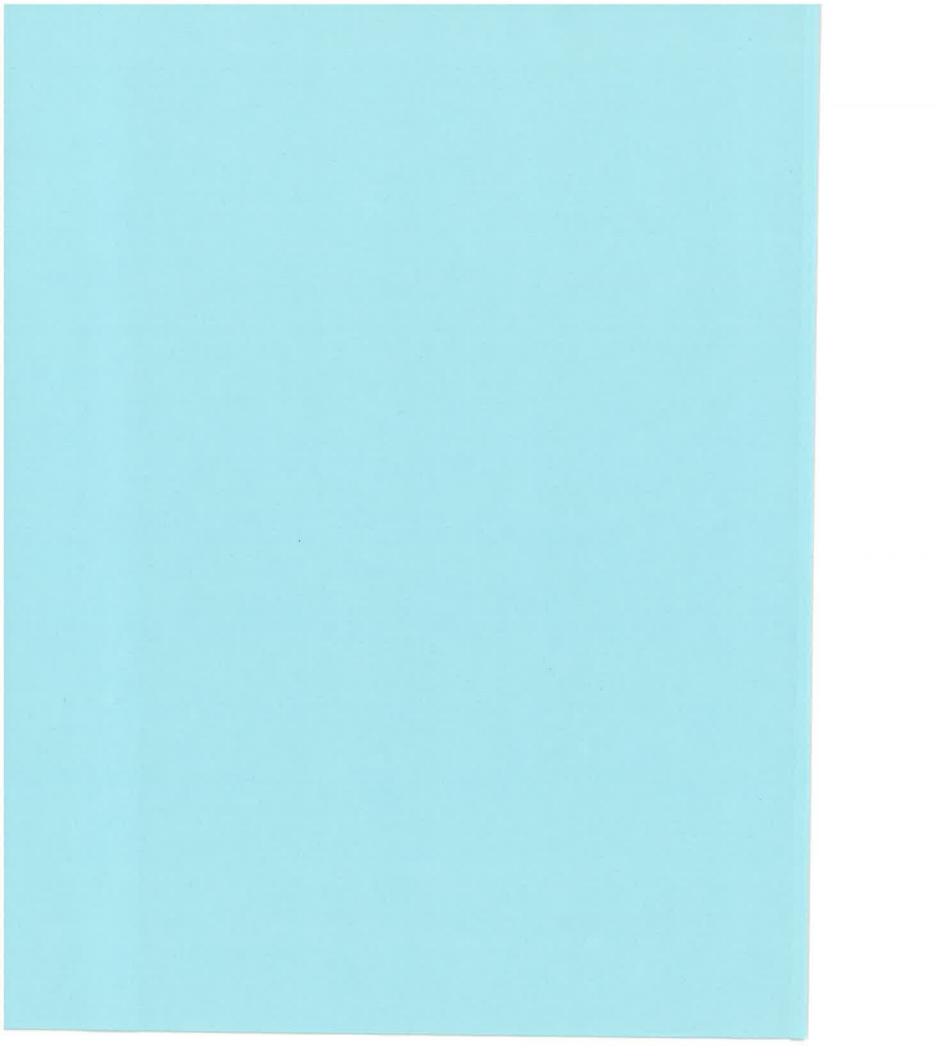
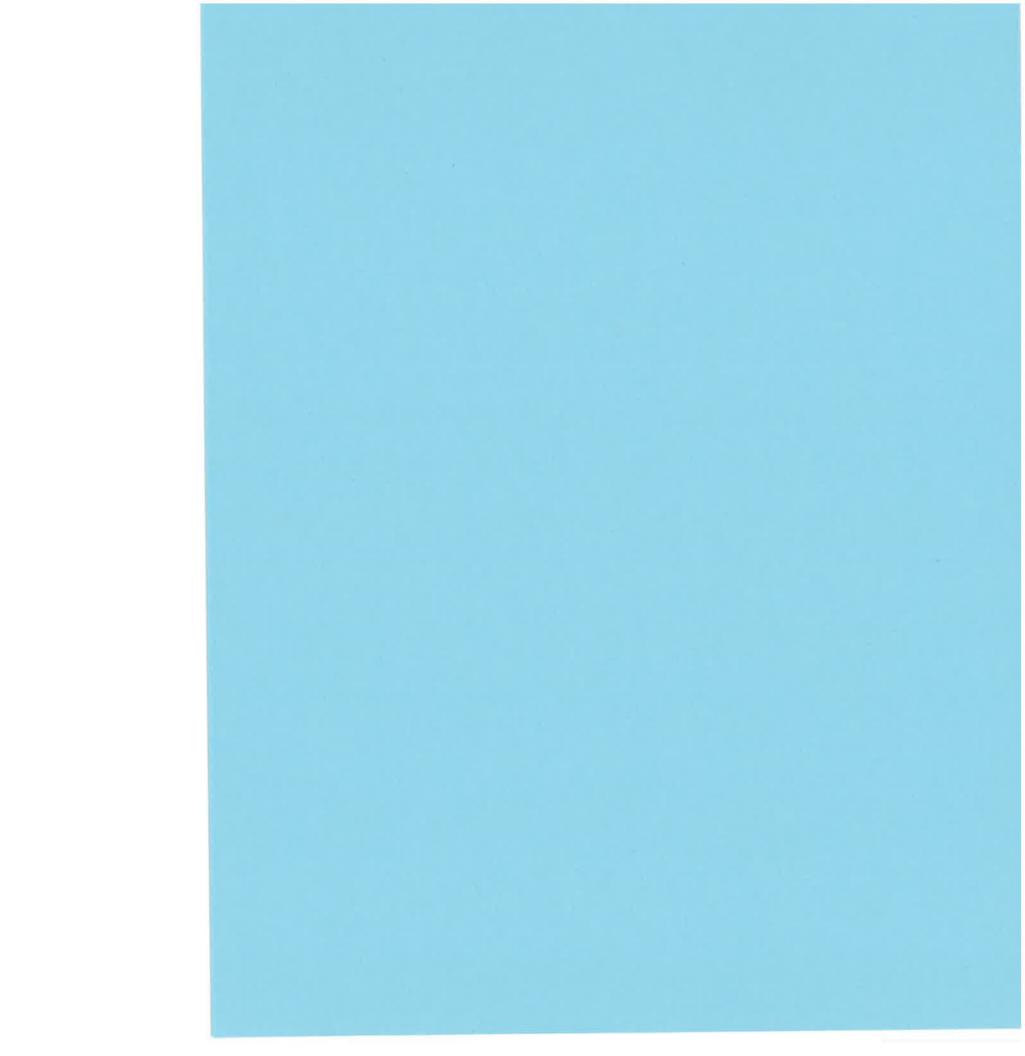




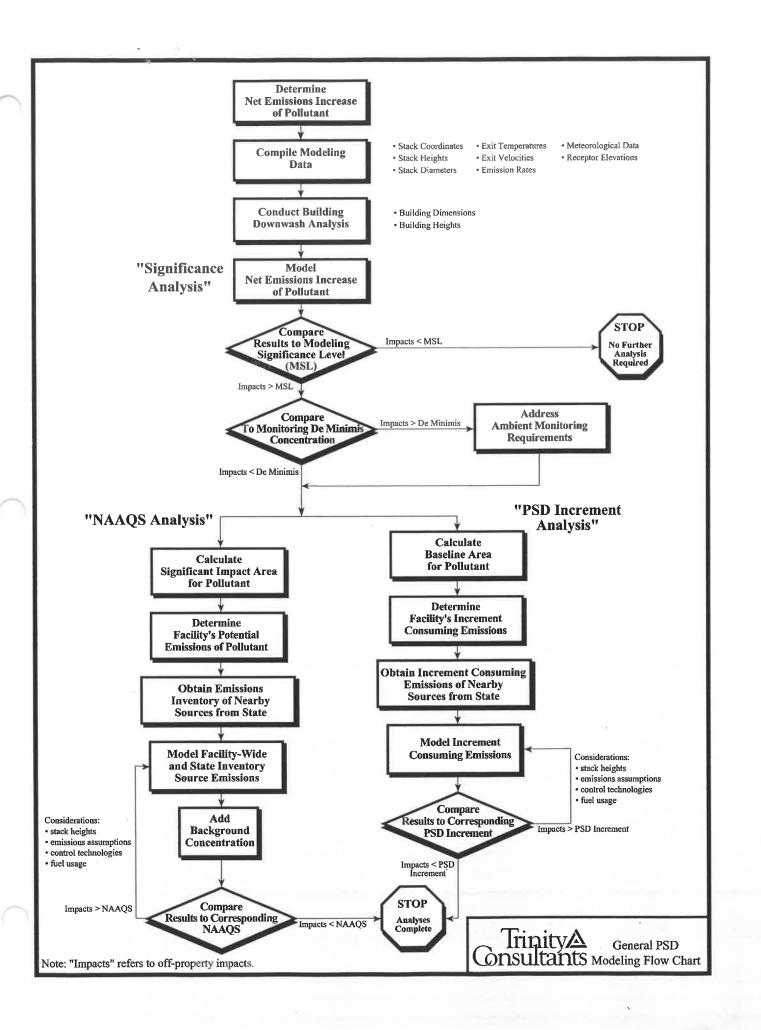
Figure E-14. Annual PM2.5 SIL Results (SIL = 0.3 ug/m3)







## APPENDIX F - PSD MODELING FLOWCHART



## APPENDIX G - ELECTRONIC MODELING FILES

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