### STATE OF MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION





March 1, 2019

Michael Martunas Dragon Products Company, LLC PO Box 191 Thomaston, ME 04861

RE: Dragon Products Company LLC Application for Chapter 115 Minor Modification

Dear Mr. Martunas:

Your application for an air emission license has been received by the Department of Environmental Protection. The following application tracking number(s) have been assigned to this application: 579769. This application is expected to be addressed in license number A-326-77-12-A.

If you have any questions concerning your application, write or call Benjamin Goundie, the project manager for your application. Our main office number is (207) 287-7688. Prior to final issuance you will receive a copy of your draft air emission license for your review.

Your application has been accepted for processing. However, if materials that have been submitted are incomplete or additional materials are deemed necessary by the Department, processing of the application will be stopped until the required information has been submitted. This application was considered acceptable for processing on March 1, 2019.

Sincerely,

Jane Gilbert, P.E.

Gare E. Gilbert

Bureau of Air Quality

Pc: Air Licensing File



### **Application Review Status**

Form No.	A-L-0018
Effective Date	6/29/09
Revision No.	03
Last Revision Date	3/24/14
	Page 1 of 1

Draft Air License # (including type code: 70-71-	75-77) <u># <b>A-</b>326-77-12-A</u>				
Facility Legal Name: <u>Dragon Products Con</u>					
Project Manager: Benjamin Goundie	Application Tracking Number(s): 574766				
Received on: <u>2/25/2019</u>	App. Signed on: <u>2/22/2019</u>				
After the Fact	Jurisdiction: Dept. Dept. Board				
Application Description: Minor mod to inclu	ude recycled asphalt shingles, recycled post-				
consumer carpet and padding, and recycled	plastics as alternative fuels.				
This application has been reviewed and tl	ne status is:				
Accepted as Complete on: 3/1/2019  Not Accepted on:	Waiting on Additional Info as of: Hold as of: (Written agreement is required to stop the clock.)				
Technical Review was added in EFIS by the	e OAII with a due date of: 2/28/20				
Please check all applicable boxes:  Ch115 Major Modification (A)  Ch115 Minor Modification (A)  Ch115 Minor Revision (M)  Ch115 New Major Source (N)  Ch115 New Minor Source (N)  Ch115 Renewal (R or N)  Ch115 Transfer (T)  Ch156 CO2 Budget Source (N)	☐ Tax Exemption (X) ☐ Part 70 502(B)(10) Change (A) ☐ Part 70 Admin Revision (A) ☐ Part 70 Initial License (A) ☐ Part 70 Minor Modification (A) ☐ Part 70 Renewal (R) ☐ Part 70 Significant Mod (A) ☐ Part 70 Transfer (T)				
Proposed implementation date for change	es (if provided by applicant):				
Accepted letters sent on:	Not Accepted letter(s) sent on:				
Name & Address to send Acceptance Letter	to:				
Michael Martunas Dragon Products Company, LLC P.O. Box 191 Thomaston, ME 04861					
Please send a Copy to:					
Additional Comments from the PM:					



#### Certified Mail Receipt No. 7014 2120 0000 8201 5199

February 22, 2018

Mr. Benjamin Goundie
Maine Department of Environmental Protection
Bureau of Air Quality
17 State House Station
Augusta, Maine 04333

Re: Dragon Products Company, LLC

Application for New Source Review Minor Modification

A-326-70-E-R/A

Dear Mr. Goundie:

Dragon Products Company, LLC (Dragon) is submitting to the Maine Department of Environmental Protection (Department) an application for a new source review minor modification to include recycled asphalt shingles, recycled post-consumer carpet and carpet foam padding, recycled high density polyethylene (No. 2) plastics, and other recycled plastics (No.s 1, 2, 3, 4, 5, & 7) as acceptable materials for beneficial fuel substitution for the manufacture of portland cement. Dragon conducted successful trials of these materials from July 2018 through October 2018, pursuant to the trial description provided to the Department in a Letter of Intent submitted on May 21, 2018. A report summary of the trial is included with this submittal.

A copy of the application and supporting documentation has been filed at the Thomaston Town Office.

If you have any questions regarding Dragon's minor modification application or the alternative fuels trial results please contact me at (207)-593-0147.

Sincerely,

Michael Martunas

**Environmental Manager** 

Dragon Products Company, LLC

c.c. Stephen P. Holt, P.E. (Dragon)

Thomaston Town Office





Form No.	A-L-0006
Effective Date	12/2005
Revision No.	10
Last Revision Date	2/1/16
	Page 1 of 13

#### CHAPTER 115 AIR EMISSION LICENSE APPLICATION FORM

State of Maine
Department of Environmental Protection
Bureau of Air Quality
17 State House Station
Augusta, Maine 04333-0017
Phone: (207) 287-7688 Fax: (207) 287-7641

#### Section A: FACILITY INFORMATION

Facility Site Name: Dragon Products			
Facility Site Address (Physical, no po	st office boxes):	107 New Count	y Rd. (U.S. Rt. 1)
City/Town: Thomaston	Zip Code:	04861	County: Knox
Facility Description: Cement Manufa	cturing		
Application Description:			
to include recycled asphalt shingles, re (No.s 1, 2, 3, 4, 5, & 7) as acceptable n cement. A report summary of the trial i	cycled post-cons naterials for bene	sumer carpet and eficial fuel substi	or a new source review minor modification discarpet foam padding, and recycled plastics tution for the manufacture of portland
urrent License #: A- 326 - 70	E	R/A	
Sheck When Done: All Sources		Additional l	Requirements for New Sources
Application Completed			construction or installation of equipmen
Copy Sent to Town (date sent:			or Interest (e.g. copy of deed or lease)
Copy Sell to Town (date sell.		Check for Fe	ee
	2/7/19		
Public Notice Published	2/7/19		Requirements for New Major Source
Public Notice Published paper name & date: Courier Gazette,	2/7/19	and Major I	Modifications
Public Notice Published paper name & date: Courier Gazette, Enclosed Public Notice Tear Sheet	2/7/19	and Major I	
Public Notice Published paper name & date: Courier Gazette, Enclosed Public Notice Tear Sheet		and Major I	Modifications

#### Facility Contact:

Name: Michael Martunas	Title: Environmental Manager
Company: Dragon Products Company, LLC	
Mailing Address: Dragon Products Company, LLC	
P.O Box 191	
City/Town: Thomaston	State: ME Zip Code: 04861
Phone: (207) 593-0147	Fax: (207) 593-0150
e-mail: mmartunas@elementia.com	6
Application Contact:	
Name: Michael Martunas	Title: Environmental Manager
Company: Dragon Products Company, LLC	
Mailing Address: Dragon Products Company, LLC	
P.O. Box 191	
City/Town: Thomaston	State: ME Zip Code: 04861
Phone: (207) 593-0147	Fax: (207) 593-0150
e-mail: mmartunas@elementia.com	
Billing Contact:	
Name: Deb Cyr	Title: Accounting Manager
Company: Dragon Products Company, LLC	
Mailing Address: Dragon Products Company, LLC	
57 Atlantic Pl.	
City/Town: South Portland	State: ME Zip Code: 01406
Phone: (207) 553-7402	Fax: (207) 761-5694
e-mail: DebCyr@elementia.com	

#### Section B1: STATIONARY FUEL BURNING EQUIPMENT

(List equipment such as boilers, hot water heaters, etc.)

Emission Unit ID	Type of Equipment (boiler, water heater, etc.)	Maximum Design Capacity	Maximum Firing Rate	Fuel Type	% Sulfur	Date of Manufacture	Date of Installation	Stack #
Boiler #1 (Example)	asphalt heater (Example)	5.0 MMBtu/hr (Example)	35.7 gal/hr (Example)	#2 fuel oil (Example)	0.35% (Example)	1984 (Example)	1990 (Example)	#1 (Example)
U804	Cement kiln system	440.0 MMBtu/hr*	14.35 tph*	petroleum coke	4.5	1969	1969	1
		*nominal capacity	*nominal firing rate					
					-			

#### **Section B2: INTERNAL COMBUSTION ENGINES**

(List equipment such as generators, diesel drive units, fire pumps, etc. Do not list wheeled mobile equipment such as loaders, backhoes, trucks, etc.)

Emission Unit ID	Serial Number	Maximum Design Heat Input Capacity (MMBtu/hr)	Maximum Output Capacity (kW or Hp)	Maximum Firing Rate	Fuel Type	% Sulfur	Date of Manf	Date of Installation	Portable	Stationary	2-Stroke Hags	ark I ark I	Rich Burn of s	Lean Burn di
Generator #1	123ABC456	5.0 MMBtw/hr	512 kW	35.7 gal/hr	Diesel	0.0015%	1984 (Example)	1990 (Example)	X			X	X	
(Example)	(Example)	(Example)	(Example)	(Example)	(Example)	(Example)	(Example)	(Example)	Н	$\overline{\nabla}$		X	-	$\overline{}$
Not Applicable											L			$\triangle$
													***************************************	
									П					
									H					
									-	L.			_	
										L				
									Г					
									<u>_</u>			H	_	
									F		- I			$\overline{}$
								-					-	
										L	L			
													and a	

Does your facility participate in a Demand Response program in which the generator(s) may be operated for more than 15 hours per calendar year?
If yes, what units?

#### Chapter 115 Air Emission License Application

State of Maine DEP - Bureau of Air Quality

Control Equipment for Fuel Burning Equipment

If applicable, indicate the types of required/operated add-on pollution control equipment, including baghouses, cyclones/multiclones, SCR, SNCR, etc.

Emission Unit	Type of Control	Pollutant Controlled	Control Efficience
Boiler #1	Cyclone	PM	90%
(Example)	(Example)	(Example)	(Example)
Not Applicable			

Monitors for Fuel Burning Equipment:

If applicable, indicate types of required/operated monitors, including Continuous Emission Monitors (CEM), Continuous Opacity Monitors (COM), parameter monitors for operational purposes, etc.

Emission Unit	Type of Monitor	Data Measured
	CEM	NO <sub>r</sub>
Boiler #1		
(Example)	(Example)	(Example)
Boiler #1	Parameter – operational	Temperature
(Example)	(Example)	(Example)
U804	CEM	NOx, SO2, CO
U804	CEM	CO2
U804	CEM	HCI
U804	CEM	THC
U804	CEM	Hg
U804	CPMS	Particulate Matter

#### **Section C: INCINERATORS**

	Incinerator Unit 1	Incinerator Unit 2
Incinerator Type (medical waste, municipal, etc.)	Not Applicable	
Waste Type		
Make (Shenandoah, Crawford, etc.)		
Model Number		
Date of Manufacture		
Date of Installation		
Number of Chambers		
Max. Initial Charge	lb	lb
Max. Design Combustion Rate	lb/hr	lb/hr
Heat Recovery? (Yes or No)		
Retention Time of Exhaust Gases	seconds	seconds
Automatic Feeder? (Yes or No)		
Temperature Range Primary	to °F	to °F
Secondary	to °F	to °F
Auxiliary Burner - Primary Chamber max. rating (MMBtu/hr)		
type of fuel used		
Auxiliary Burner - Secondary Chamber max. rating (MMBtu/hr)	22.44	
type of fuel used		
Annual Waste Combusted for(yr)		
Pollution Control Equipment (if any)		
Stack Number		
Monitors (ie - temperature recorder)		

#### Section D: PROCESS EQUIPMENT

			Maximum				
		Maximum Raw	Finished				
		Material Process	Material				
Emission	Type of	Rate	Process Rate	Date of	Date of		
Unit ID	Equipment	(name and rate)	(name and rate)	Manufacture	Installation	Stack #	Control Device
Kilns	Drying Kilns	N/A	25 MMBF/year	1990	1990	fugitive	none
(Example)	(Example)	(Example)	(Example)	(Example)	(Example)	(Ex.)	(Example)
PB#1	Paint Booth	10 gal/hr	N/A	2001	2001	#4	Paper Filters
(Example)	(Example)	(Example)	(Example)	(Example	(Example)	(Ex.)	(Example)
U804	Cement Kiln	1,274,690 tons/yr	766,500 tons/yr	1969	1969	1	Bag House & SNCR

#### Solvent Cleaners

(Also known as Parts Washers and/or Solvent Degreasers)

Emission Unit ID	Capacity (gallons)	Solvent Used	Solvent % VOC
Degreaser #1 (Example)	15 (Example)	Kerosene (Example)	100% (Example)
Not Applicable			

#### **Chapter 115 Air Emission License Application**

State of Maine DEP - Bureau of Air Quality

#### PROCESS EQUIPMENT (section D cont'd)

#### Chemical Usage

Note: Complete this section for any chemicals integral to your process, for example, a cementing process for outersoles, dyes, surface coating, printing, cleaning, etc. Attach additional pages or MSDS sheets as needed.

Process	Chemical substance used in process	Actual Usage (gal or lb for yr)	Hazardous chemical(s) in substance	Percent VOC¹ (%)	Percent HAP <sup>2</sup> (%)	Total VOC emitted (lb/year)	Total HAP emitted (lb/year)
Not Applicable							

<sup>&</sup>lt;sup>1</sup> Volatile Organic Compounds <sup>2</sup> Hazardous Air Pollutants

Describe method of record keeping (ie. monthly calculations from purchase records, flow monitors on solvent tanks, etc.)

Not Applicable

Describe methods used to calculate VOC/HAP emitted (ie – test results, if control equipment was taken into account; if conditions exist where solvents remain in the substrate rather than complete volatilization, etc.)

Not Applicable

#### Section E: STACK DATA

Stack #	Height Above Ground (ft)	Inside Diameter (ft)	Exit Temperature °F	Exhaust Flow Rate (ft <sup>3</sup> /s) [indicate actual or standard]
1	404	7	<400	~160 KSCFM

#### Section F: ANNUAL FACILITY FUEL USE

Avg % sulfur (oil) Avg % moisture (wood) (circle one: gal, tons, scf)	Avg % sulfur (oil) Avg % moisture (wood) _ (circle one: gal, tons, scf)
(circle one: gal, tons, scf)	Tairala ana gal tong soft
	(Circle one: gar, tons, scr)
( <u></u> y	
-	
<del></del>	
-	
-	
<del></del>	
-	

#### Chapter 115 Air Emission License Application

State of Maine DEP - Bureau of Air Quality

#### Section G: LIQUID ORGANIC MATERIAL STORAGE

Tank #	Not	Applicable		
Capacity (gallons)				
Materials Stored				
Reid Vapor Pressure (RVP)				
Annual Throughput				
Above or Below Ground?				
Tank Type (floating or fixed, riveted or bolted, etc.)				
Physical Description – year installed				
Physical Description – color				
Dimensions - height (ft)				
Dimensions - Diameter (ft)				
Construction Material				
Control Device				

#### Section H: MISCELLANEOUS

Note: Use this section to describe any equipment, activities, or other air emission sources that did not fit in any of the above categories. Include descriptions of the associated emissions. Attach additional pages if necessary.

Not Applicable.

#### Chapter 115 Air Emission License Application

State of Maine DEP - Bureau of Air Quality

#### Section I: BPT/BACT AND OTHER ATTACHMENTS

#### BPT/BACT Analysis:

For a license renewal for existing equipment, the applicant is required to submit a Best Practical Treatment (BPT) analysis to the Department. A BPT analysis establishes what equipment or requirements are appropriate for control or reduction of emissions of regulated pollutants to the lowest possible level considering the existing state of technology, the effectiveness of available alternatives, and the economic feasibility.

For a new license or the addition of new equipment to an existing license, the applicant is required to submit a Best Available Control Technology (BACT) analysis. A BACT analysis is a top-down approach to selecting air emission controls. It is done on a case-by-case basis and develops emission limits based on the maximum degree of reduction for each pollutant emitted taking into account economic, environmental and energy impacts.

Z	I certi	fy th	at,	to	the	best	of	my	knowledge,	the	control	equipment,	fuel	limitations,	and	process
	constra	ints	outl	ine	d in	this a	ppli	icati	on represent	BPT	/BACT	for the equi	pmen	t and process	ses lis	sted.

OR

☐ I have attached a separate BPT / BACT analysis to this application.

#### Other Attachments:

Please list any other attachments included with this application.

Attachment #1 - Alternative Fuels Trial Summary Report

Attachment #2 - Public Notice of Intent

#### **Section J: APPLICABLE RULES**

Please indicate any rules you believe may be applicable to your facility by checking the associated box.

	Citation	Title											
✓	06-096 CMR 101	Visible Emissions											
	06-096 CMR 103	Fuel Burning Equipment Particulate Emission Standard											
	06-096 CMR 104	Incinerator Particulate Emission Standard											
	06-096 CMR 105	General Process Source particulate Emission Standard											
	06-096 CMR 106	Low Sulfur Fuel Regulation											
П	06-096 CMR 111	Petroleum Liquid Storage Vapor Control											
	06-096 CMR 112	Bulk Terminal Petroleum Liquid Transfer Requirements											
1	06-096 CMR 117	Source Surveillance											
Ť	06-096 CMR 118	Gasoline Dispensing Facilities Vapor Control											
	06-096 CMR 121	Emission Limitations and Emission Testing of Resource Recovery Facilities											
	06-096 CMR 123	Paper Coating Regulation											
Т	06-096 CMR 124	Total Reduced Sulfur Control from Kraft Mills											
	06-096 CMR 125	Perchloroethylene Dry Cleaner Regulation											
	06-096 CMR 126	Capture Efficiency Test Proceedures											
	06-096 CMR 129	Surface Coating Facilities											
	06-096 CMR 130	Solvent Degreasers											
	06-096 CMR 131	Cutback Asphalt and Emulsified Asphalt											
	06-096 CMR 132	Graphic Arts – Rotogravure and Flexography											
	06-096 CMR 133	Petroleum Liquids Transfer Vapor Recovery at Bulk Gasoline Plants											
	06-096 CMR 134	Reasonably Available Control Technology for Facilities That Emit Volatile											
		Organic Compounds											
1	06-096 CMR 137	Emission Statements											
Ť	06-096 CMR 138	Reasonably Available Control Technology for Facilities That Emit Nitrogen											
		Oxides											
1	06-096 CMR 140	Part 70 Air Emission License Regulations											
	06-096 CMR 145	NOx Control Program											
	06-096 CMR 153	Mobile Equipment Repair and Refinishing											
	06-096 CMR 159	Control of Volatile Organic Compounds from Adhesives and Sealants											
	06-096 CMR 161	Graphic Arts – Offset Lithography and Letterpress Printing											
1	40 CFR Part 60	New Source Performance Standards (NSPS)											
ľ		(please list Subpart(s): IIII											
1	40 CFR Part 63	National Emission Standards for Hazardous Air Pollutants (NESHAP)											
		(please list Subpart(s): LLL											
	Other (list)												
	Other (list)												

#### Chapter 115 Air Emission License Application

State of Maine DEP - Bureau of Air Quality

#### Section K:SIGNATORY REQUIREMENT

Each application submitted to the Department must include the following certification signed by a Responsible Official\*:

"I certify under penalty of law that, based on information and belief formed after reasonable inquiry, I believe the information included in the attached document is true, complete, and accurate."

	2/22/19
Responsible Official Signature	Date
Martin Turecky	Plant Manager
Responsible Official (Printed or Typed)	Title

- \* A Responsible Official is defined by MEDEP Rule, Chapter 100 as:
  - A. For a corporation: a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and either:
    - (1) The facilities employ more than 250 persons or have gross annual sales or expenditures exceeding \$25 million (in second quarter 1980 dollars); or
    - (2) The delegation of authority to such representatives is approved in advance by the permitting authority;
  - B. For a partnership or sole proprietorship: a general partner or the proprietor, respectively;
  - C. For a municipality, State, Federal, or other public agency: Either a principal executive officer or ranking elected official. For the purposes of this part, a principal executive officer of a Federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., a Regional Administrator of EPA).

re you are in good

insured. Please cont me at 785-4537 of 642-4537. My email is havebroom53(4) maduinnes com

FMI go ta www.

Both with heat, water, woster water, waster water, lawreare included Upper High Street, one with Bay views the other not... 5950.00 ino view 207-931-4442 jimmysrentals/207/gimal com E.

JIMMY'S / Rockland / 2-BDRM All New SouthEnd second floor t year lease, security deposit, and last month's rent, no pets and non smoking 207-236-4381 JIMMY'S / 2- BDRM / Heated Gay St Rockland, Second floor, Newly relatioished sunny very nice locations a short stroll to Downtown and Shore. \$ 1,000 no Monthy 207-691-4442 pmmysientals207@ gmail.com = Jimmy's / 2- Bedroom All New Rockland well appointed second floor and totally remodeled . 51,125.00 / 38 Pleasant 5t 207-691-4442 =

Jimmy's / Belfast 2- One Bedrooms

cabinets, tiled shower and more. \$1,100 Mo HW, Laundry, Trash , plowing, lawncare included. No pets 207-691-4442 jitntnystentals 207/e gmail com ©

bay windows. Brig and sunny, W/D \$1,100/mo every

including WiFi but electric Centrally located, walking distance to everyt Payson Properties

207-691-7659

ROCKLAND, 67-4: 2nd 1-1/2BA. H Park Street, Rockland 2 Bedroom Apartment, for stack-able W/D

Hardwood & marble floors. Stainless steel appliances. \$3,050/mo. plus electric. Payson Properties. 207-542-0719

ROCKLAND, 67-1: 1st ROCKLAND: 2nd floo Rock large, spacious 188. Hardwood floors & Fine architectural detail through-out, decenative fireplace, Clean & Quiet. No pets. Non-smoking, \$650/ mo, plus security & references 207-593-

ROCKLAND: Spacious 3rd floor, 18R, oceanview. No pets, non smoking. Security, references required \$800/munth, plus utilities. No text Jimmy's 207-691-4-immysrentals207@ gmail.com = messages. 207-975-

SO, THOMASTON VILLAGE: 5750/month, garage space. First, last, security Call for application and to view 207-594-4027

Heated First floor

UNFURNISHED ROCKLAND -SPECTACULAR RENTAL, Opposite Farnsworth Park, 28 DUPLEXES meated First floor private enterance, tenants pays electric Beech St, Rockland \$775-00, non-smoking, no-pets 207-691-5442 Elm St Newly painted

are a Full Service

Homes, Condos, Apts. Belfast & Area.

Management, www. hometownre.org 207-338-3949 same?

hometownre.org

living/dining room. full kitchen and ROCKLAND: Spacious, 2 BR, quiet neighborhood, walk to town, W. D hookups. \$1,100/month, 1st, last and sec. No pets, Non-smoking. 207-230-0669 edwardlkoenig@ gallery, protessional practice or office) \$1,450/mo. plus utilities 207-542-5750 blake@ tidewater.net

UNFURNISHED Stockton Springs, Small 2 BR House 2 BR, W\D, Monitor heater. View from In deck.\$950 1st and last to move in No Pets 207-338-4008 hands professionally

(vs) Services ADULT CARE

(ucation coming spen, if you're looking for a fully staffed professional Real Estate Management Company please call Jimmy's 207-691-4442 Private Caregiving Service I am a compassionate and professional female who is well trained in healthy cooking and elderly care I ans recently certifies in Geroni plogy and have 5 years Hospice

receive assistance, I am available to travel and can provide references and recent experiences in my field Character Lincolnville Antique Cape 4 bedroom, 25 baths rental available Feb 1st. \$1,875/mo, 1st, last, and security up front, Call 207-691and qualification references are avail Call Francesca (207) 701-1485 (207-701-1485 Jandandseach ndseachel-i gmail.com

CLEANING available by dialing PROFESSIONAL 855-537-4000, access code 992552159#. We adhere to strict rules o confidentiality CLEANING, Have Broom Will Travel is a professional cleaning service that AL-ANON MEETINGS. MONDAY 7:00pm-8:00pm Thomaston has been serving the Mid-Curst for over 20 years I specialize in Residential and Commercial cleaning, Property Management, Office/ Management, Office/ Home Organizing 1 offer friendly, reliable, trustworthy service.

Fpascapal Church
1UESDAY. #:00pm8:00pm Our Lady of
Good Hope, 7 Union St
Camden (downstairs)
Step medicar Step meeting SATURDAY Pen Bay

My rates are affordable and my reforences are excellent. No job too big or to small flest in Damariscotta Weds-9AM-Faith Baptist Church, M Church, Boothbay Harbor Friday-9AM-St Andrew's Church, Newcastle Friends & Relative hurch Parish off

villagesoup.com and click on Biz search 93 Friendship St FMI 832-2062 Hor Line, 24 Hrs 1-800-498-1844 CHILD CARE Leaps and Bounds Daycare, Union openings 6 weeks to: years old. Call or text Stact 691-4673 BELFAST support group for victims and survivors of domestic violence sponsored by New Hope for Women. For more information, s 6 weeks to S COMMUNITY call 338-6569

ACA 12 STEP SUPPORT GROUP: (Adult children CARE NET PREGNANCY CONSULTATION (Aciult children of actholic or disfunctional families) Wednesday evenings 6:30-8:00pm, Pen Bay Medical Ctt, ground floor conference room adultchildren.org CENTER, An Net is prepared Net is prepared to help you in an atmosphere where you can find support and information as you face the difficult decision surrounding your pregnancy. We provide 24-hour help ADDICTION RECOVERY PROGRAM: Phone-in participation

by appointment only

Intervention Project provides free breast health education and information about screening and diagnostic services Call 594-6889 Wednesday, 11am-12 30pm, Unitarian Church, Hyler St ROCKI AND, Saturday, FOOD ADDICTS HEALTH CARE SAFETY from 6 to 9PM to assis

people with medical needs. The clinic is located in the Bok Medical Arts Building your pregnancy. We provide 24-hours believed to the pregnancy tests, unformation on pregnancy, parenting, adoption and post-abortow helps All services confidential Care Net PC 4-d 200 ded under Nead, Rockland helps Inte (207) 5-des que do de County Road, Rockland helps Inte (207) 5-des que do de County Road, Rockland helps Inte (207) 5-des que do de County Road, Rockland helps Inte (207) 5-des que do de County Road, Rockland helps Inte (207) 5-des que do de County Road, Road (201) 6-des (201) HELP FOR CHILDREN

#### PUBLIC NOTICE: NOTICE OF INTENT TO FILE

Please take notice that Ambrew Holms (24) Spince Street. Philadelphia, PA 19 106) is intending to file a Natural Resource Protection Act Application with the Maine Department of Environmental Protection pursuant in the provisions of 38 M.R.S.A. 33 481–490 on or about February 5, 2019.

The application is for a residential pier project. The property is located at 69 Ginn Point Road, Owls Head, Maine,

A request for a public hearing or a request that the Board of Environmental Protection assume jurisdiction over this another us imisdiction over this application any transmental tratection assume justification over this application must be received by the Department, in writing, no later than 20 days after the application is found by the Department to be complete and is accepted for processing. A public beauting may or may not be field of the discretion of the Cummissioner or

Board of Environmental Protection, Public comment on the application will be accepted throughout the processing of the

The application will be filed for public inspection at the Depart of Environmental Protection's of the control are application with or filed for public inspection at the Departure of Environmental Protection's office in Augusta during normal working thous. A cupy of the application may also be seen at the municipal office in Owls Head, Maine.

Written public comments may be sent to the Department of Environmental Protection, Bureau of Land and Water Quality, State House Station 17, Augusta, Maine 04334-0017.

WALDO COUNTY

#### STATE OF MAINE

PROBATE COURT NOTICE TO CREDITORS

The following Personal Representatives have been appointed in the estates note. The first publication date of his notice is February 7, 2019. If you see a crisider can estall helde below you trust present your claim within four months of the first publication date of this Notice to Creditors or be lorseer barred. led in the estates note:

real processor case or after recreate the detected of the blader betted. You may recently used calcifully false a variety active and the project form with the Register of Probite of this Court or by dethering or casing to the Personal Representative to lead below at the softers pushed only the easier active content of the claims incidently the base financiary of the court of the country of th

Bay Illay provide, Soit Te-A MACASIA, Species.
7018-0291 SANDRA A, GEORGE, Date of Montville, deceased.
Diana G, Chapin. 523 North Ridge Road, Montville, Maine 04941, appointed Personal Representative.

appointed retained representative ANKETELL KELLEY, doors Justin Kelley, 153 Indian Meadow Drive, Rentihoro, MA 015, and Erian Kelley, 61 Fact Temple Street, Boylston, MA 01505 appointed Personal Co-Representatives.

2018-0289 JAMES W. GRADY, late of Palermo, deposed Rotert P. Potter, 500 Jones Road, Palermo Man appointed Personal Representative.

2018-0292 JOEL K. FRODING, late of Winterport, decreased, Janet B. Froding, 538 North Main Street, Winterport, Maine 04496 appointed Personal Representative.

2018-0266 NELLIE L. WOODBURY, Tale of Bellant, decassed, Korry Woodbury, 14 Warren Drive, Deditam: Maine 01429, appointed Personal Representative.

7619-0601 VERNON L. THOMPSOM JR., late of Library, oncessed. Arthur Greenlaw, 132 New Jeroey Street, Mullimocket, Mainer 04462, appointed Personal Representative.

2019-0004 JESSIE J. WHITE, late of Bellast decreased. William Charles White, 23 Claire's Way, Bellast, Maine 04915.

Appointed February Representative, canoning the appointed February Representative, canoning the analysis of the control of the 33411 and Robert Thomas Tallberg, Jr., 368 Calderwood Road, Washington, Maine 04574, appointen Parsonal Co-Represental

2019-0005 RODNEY DENSMORE, late of Winterport, deceased. Daryl Donnmore. 131 Elm Street Newport, Maine 04953

2019-6007 ALLAN M. SHUTE, SR., fate of Burnham, deceased, Andrew Stute, 32 Whilten Road, Burnham, Maine 0/922, s Shute, 32 Whilten Road ted Personal Representa

2019-0008 SHARON ANN SIBLEY, late of Winterport, deceased, Teresa J, Sutherland, 2 Park Drive, Apt. 106, Winterport, Mains 04496

2018-0276 CATHY EVA BROWN 8/k/2 CATHY EVA HARDING BROWN 2019-0009 ELIZABETH MAE BROWN LITTLEFIELD, late of Brooks

dectased. Andrea Littlefield Lucien, 47 Colonial Drive, Old Town. Maine 04468, appointed Personal Representative.

610 ELIZABETH M. LOONEY, fale of Thrond/ike, deceased. Susan J. Sprague 10 Cider Mill. Road. Brookline. hit 03035, appointed Personal Representative. 2019-0011 WALTER F. DEMMONS, SR., late of Winlarport, deceased Walter F. Demmons Ut., 23 Tallwood Drive, Millord, Marrie 0

2019-0012 GLENN D. MAYNARD 2/4/8 GLENN MAYNARD. Alle of Stockins Springs, dereased, Eleabeth R. Marnard, 499 Broatway, Bangor, Maine 04401 (Mailing), 88 Rocky Portl Rd. Stockin Springs, Maine 04931 (Legal).

appained retronal representative.

WODDROW M. CARTER, late of Mirrill, deceases.

Penny W. Fourtiagne and Jon H. Fountaine, 146 Weymouth Road.

Morrill, Maine 04952, appointed Personal Co-Representatives.

GARY A. WOOD, late of Winterport, deceased. Debta C. Wood, 559 Stream Road, Winterport, Maine 04496.

appointed resource representations.

Suesan Marite Packer, like of Stockton Springs deceared.

Peter Russell Rainville, 1044 Cape Jellison Road. Stockton Springs
Idame 04981, appointed Personal Representative.

2019-0018 NANCY LEE FIELD, lale of Searsport, deceased, Franklin A, Field IV, 33 Main Street, Northport, Maine 048-9 appointed Personal Representative.

2019-0021 MARJORIE C. THOMSON, late of Ballast, deceased, Abri Gibson, 45 Edgesomic Rd., Reltast Maine CHB15, appointed Personal Representative.

(s.: Sharon W. Peayey Sharon W. Peavey, Repister of Probate

### 2010

2019
CAMDEN HARBOR
WAITING LIST RENEWAL APPLICATIONS
Waiting lair enewals are due bafore February 1, 2019. A LATE
FEE of \$50,00 with be due on any payments made inon February
1, 2019 into March 1, 2019. Applicants with have not renewal
as of March 1, 2019 will be delated from the waiting fac. NO

If you have any questions please contact Liz Knauer at 236-3353 X7118 or at knauer@camdenmaine.gov

#### NOTICE OF INTENT TO FILE

Please take notice that:

Maine Media Workshops 70 Cainden St., Rockport, ME 64886 (207) 236,7034

is intending on filing an application for an ABBREVIATED LICENSED RENEWAL. with the Manie Department of Environmental Protection (DEP) principal to the provisions of Tible 8 M.R.S.A., Section 139IL et veq. For Peccusa Metal Recovery Unit on February 8, 2019, The application is for:

Precious Metal Recovery License Renewal At 7a Canden St. in Rockport, ME

A request for public hearing or a request that the Board of Emissionnestal Protection assume jurisdiction on this application into the secretal depth of Department, in sorting, in lefter than 20 days after the application is accepted by the Department as complete for processing. Public comment on the application will be screpted thoughout the possessing of this application.

The application and supporting documentation are available for revi-at the Department office in Augusta, for ared in the Ray Building the AMHI Complex oil Hospital Street during merital works hours. A copy of the application and supporting documentation it also be seen at the minimpy of offices in Rockgott, Maine.

Written public comments may be sent to: Cherne E. Plummer at the Mane Department of Environmental Protection, Burges of Remethation and Water Management 17 State House Station, Augusta, ME 04533-0017

#### NOTICE OF PUBLIC SALE OF REAL ESTATE PURSUANT TO 14 M.R.S. § 6323

r Unavasurs 1 to 14 m.H.-b. 9 05.65

Foredosum and Sea Observations with the Judgment of Foredosum and Sea Observations with the Judgment of Foredosum and Sea Observation and Sea Observation Sea Observation

March 4, 2019 at 11:00 a.m. EST, at the law offices of Vertill Dana, One Portland Square, Portland, Maine

Varill Daria, One Portland Square, Portland, Maho
The property is located at 147 School Street, Town of Unity,
Waldo County, Maine, as described in the Mortgage (the
Property). The safe will be by public accitor. All orders
for the Property). The safe will be by public accitor. All orders
for the Property is 15,000,001 in certified funds or bank chacks
at the time of the public safe mede payable to Verrill Dane,
which deposit is non-relundable as to the highest bidder (the
Pluchaser). The Purchaser must also sign a purchase and
safe agreement with the Bank, calling for a cleaning within timity
(30) days of the public safe, at which time the balance will be
all agreement funds or brank check spayled to the Bank.
31 Main time the Education of the State Spayled to the Bank.
32 Main time to the State State Spayled to the Bank.
33 Main time to the State Spayled to the Bank.
34 Michael State State Spayled to the Bank.
35 Passis, without warranties of a very kind and subject to (a)
any condition that a title search would reveal; (b) any unpaid
and satatal taxes or saver assessments: and (c) any frest that
an inspection or survey of the premises might snow.

In the event a representative of the Mortgages is not present at the time and place stated in this notice, no sale shall be deemed to have occurred and if nights to reschedule subsequent able are exerved. If the sale is set added for any reason, the Purchaser at the sale shall be entitled only to a roun of the deposit paid. The Purchaser shall have no further recourse signars it the Mortgage of the Mortgage or the Mortgage or

Additional terms will be announced at the public sale. For information regarding the Property, please contact Stephe Segal, Esq., at (207) 774-4000 or ssegal@verrilldana.com.

Meredith Village Savings B By its attorneys, Stephen B. Segal John P. Gittune Vertill Dans, LLP One Portland Square Portland, ME 01101-4054 (207) 774-4000 Meredith Village Savings Bank

#### TOWN OF CAMPEN PUBLIC HEARING NOTICE

FUDILLE THEAHING NOTICE

Notice is hereby given that the Camiden Select Board will hold a PUBLIC HEARINGS on Tuesday, Fabruary 12, 2019 at 630 p.m. at the French Conference Roam regarding the following: Bamdog's Readince lenc, dith's Camiden Windown House at 6 High Stroot for a renewal Class V Bed & Breaklast Liquor License Camiden Windows 100 p.m. of the Camiden Windows 100 p.m. Carnden Whilehall Corp. d/b/s Whilehall at 52 High Street for a renewal Hotel Class

#### PUBLIC NOTICE OF INTENT TO FILE

PUBLIC NOTICE OF INTERT TO FILE
Please take notice that Dragen Products Company, 14C (Pt. 1) in Thomasticn, Males, (207) 803-107 New Company, 14C (Pt. 1) in Thomasticn, Males, (207) 803-1070.

Thomasticn of the Product of the Produ

Written public comments may be sent to Mr. Benjamin Goundie at the Bureau of Air Quality, State House Station #17, Augusta, Maine 04333.

#### Town of Rockport REQUEST FOR PROPOSAL #2 Heating Fuel

The Town of Rackport, Mains Is requesting unpossible #2 healing fuel for the liscal year ending June 30, 2020. The purpose of this process is to obtain a competitive price for healing fuel and to guarantee a fixed price for the tath of the purpose of the process is to obtain a competitive price for healing fuel and to guarantee a fixed price for the 12-month period beginning July 1, 2019.

the 12-month period beginning July 1, 2018.
A complete RFP packet is available from the Finance Department at the Town Office Building located at 101 Main Street, Rockport, by phone at 230-0180 oxt. 6, or by e-mail at mbracket@lown.rockport.ma.us. The RFP is also available on the Town's website at www.town.rockport.ma.us.

www.town.rockport.me.us.
Saalad bida must be submitted in a sealed envelope marked 'Healing Fuel Bid' no later (han 2:00 p.m. on Wordnesday, March 13, 2019 at which time bids will be opened to Town Manager Richard C. Bates, Healing Fuel Bids, Town of Rockport, 101 Main Street, Rockport, Maino 4455.

Maine 04856. Questions or requests for clarification may be directed to Finance Director Megan A. Brackett, at (207):230-0180 ext. 5, or email at hinbackettighown.cockport.me.us.

The Town of Rockport reserves the right to reject any or all bids, or to accept the bid that is in the best interest of the Town.

STATE OF MAINE WALDO COUNTY PROBATE COURT 39A Spring Street, Belfast, Maine

NOTICE OF PETITION FOR CHANGE OF NAME

TO ALL PERSONS INTERESTED IN ANY OF THE FOLLOWING PETITIONS:

Notice is hereby given by the respective petitioners) that they have titled a pention for change of name, as follows: This matter will be heard at 1200 PM or as soon thereafor as it may be, on the nineteent day of February, A.D., 200 °, The requested change of timen may be granted on or after the hearing date. If no sulfavient objection be hear

2018-0290 HANNAH JEAN NADEAU of Bellaw, adult. Petnion to change uame to HANNAH JEAN CLARKE, presented by Hanna lean Nadeau, petitioner.

2019-1802 COLLEEN PATRICIA GOLGANO of M change name to COLLEEN PATRICIA SULLIVAN. by Culleen Patricia Gulgano, peritioner.

Petition to change name to CAMILLE ROSE PERRIN, presented by Camille Rose Giglio, petitioner. 2019-0015 CAMILLE ROSE GIGLIO of Thomdike, adult

Date: January 25, 2019

fsi Sharon W. Peavey Register of Probate- Sharon W. Peavey

# Alternative Fuel Trial Results

Recycled asphalt shingles
Recycled post-consumer carpet
Recycled post-consumer carpet foam padding
Recycled high-density polyethylene (HDPE) plastics (No. 2)
Recycled Plastics (RP) (No.'s 1, 3, 4, 5, and 7)

Dragon Products Company, LLC February 2019

#### **PURPOSE**

Dragon Product Company, LLC (Dragon) is a manufacturer of portland cement, located in Thomaston, Maine. The cement making process begins with raw feedstock of calcium carbonate bearing rock and other materials including sand (silica) and iron. The calcium carbonate bearing rock is quarried from the onsite limestone quarry in Thomaston, Maine. The limestone is pulverized and mixed with sand and iron to make the raw feedstock. The raw feed is then introduced into the kiln system, where it is heated to near liquid phase in the rotary kiln then cooled quickly to produce clinker, the main ingredient in portland cement. Dragon currently uses petroleum coke (petcoke) as a primary fuel for the thermal energy required to heat the raw feed material. Dragon consumes approximately 10 tons per hour of petcoke in two (2) locations within the kiln system. Approximately five (5) tons per hour is consumed in the rotary kiln and an additional five (5) tons per hour is consumed in the calciner. Dragon is currently licensed (#S-02851-WV-X-N) to use tire chips (tire-derived fuel (TDF)) and recycled carpet material as alternative fuels, which are fired directly in the calciner.

On May 21, 2018, Dragon submitted a Letter of Intent to the Maine Department of Environmental Protection (Department) to conduct alternative fuels trials of the following materials:

- 1. Recycled asphalt shingles;
- 2. Recycled post-consumer carpet;
- 3. Recycled post-consumer carpet foam padding;
- 4. Recycled high-density polyethylene (HDPE) plastics (No. 2);
- 5. Recycled Plastics (RP) (No.'s 1, 3, 4, 5, and 7);
- 6. Recycled conveyor belt material;
- 7. Fiberform® graphite and carbon material;
- 8. Coal-tar pitch;
- 9. Coal-tar pitch coke; and
- 10. Earthlife® bio-solids.

The purpose of the trials was to fully evaluate the beneficial use and potential limitations of the materials as alternative fuels. Each proposed alternative fuel was trialed separately to evaluate material handling characteristics, impacts to air emission quality, and impacts to clinker chemistry.

The results of the trials indicate the following five (5) materials are acceptable as beneficial fuel substitutes under Dragon's current alternative fuel system:

- 1. Recycled Asphalt Shingles
- 2. Recycled post-consumer carpet
- 3. Recycled post-consumer carpet foam padding
- 4. Recycled high-density polyethylene (HDPE) plastics (No. 2)
- 5. Recycled Plastics (RP) (No.'s 1, 3, 4, 5, and 7)

The details of the successful trials are provided in the following sections. Clinker chemistry data and air emissions summaries are included as Attachments.

A separate report detailing the trial results for the materials deemed unsuccessful is included as Attachment No. 7.

#### TRIAL SUMMARIES

#### Section 1 – Recycled Asphalt Shingles

Dragon conducted a two-stage trial of the recycled asphalt shingles material to fully evaluate the process handling, clinker chemistry, and air emission impacts to the cement manufacturing process. The first stage of the trial examined the material handling of the product and the efficiency of introducing it into the kiln system, and the second stage of the trial examined clinker chemistry and air emission impacts. As detailed in Dragon's Letter of Intent, the recycled asphalt shingles are processed into flakes or chips by recycling companies prior to being transported to Dragon. The material was stored on site in the same manner and location as approved under Fuel Substitution License S-02851-WV-X-N and the facility's Alternative Fuel Operation's Manual. The material was introduced through the existing tire chip conveying system to the calciner. No modifications to the existing system were required to process the asphalt shingles material.

Dragon processed approximately 22 tons of recycled asphalt shingles. Dragon introduced the asphalt shingle material at a nominal feed rate of 2.4 tons per hour (tph) through the TDF feeder system. The first stage of the trial was approximately 9 hours in length. Strict adherence to air emissions quality and emissions limits were maintained during this stage of the trial.

During the first stage of the trial, Dragon monitored applicable process data to evaluate the thermal benefit of the recycled asphalt shingles, and determine potential impacts (if any) to process conditions while introducing the material into the calciner. The existing TDF conveying system processed the asphalt shingle material without incident and at the desired federate. Prior to entering the Calciner portion of the kiln system the material passes through a series of steel gates designed to reduce false air (i.e., ambient air) into the process and serve as a safety barrier in the event of a process shutdown. Due to the extreme temperatures of the Calciner the steel gates get very hot and Dragon observed some melting and buildup of the asphalt material on the gates. Periodic monitoring and cleaning of the gates will be required when processing asphalt shingles.

The second stage of the trial immediately followed the first, and Dragon processed an additional 22 tons at a feed rate of approximately 2.4 tons per hour. When combined with the first stage, the second stage of the trial processed a sufficient amount of the asphalt shingles to obtain valid air emissions and process data to adequately evaluate the

Alternative Fuels Trial Results

material. In addition, Dragon evaluated the clinker chemistry during the second stage of the trial to observe potential impacts.

#### **Chemistry and Air Emission Results**

#### Standards

Dragon's onsite Quality Control laboratory analyzed and evaluated any potential changes in clinker chemistry during the asphalt shingle trial. Results were compared to average non-trial clinker chemistry data collected in July 2018. A successful fuel trial results in no adverse impacts to air emissions quality, and clinker chemistry remains consistent with typical daily production quality.

#### **Clinker Chemistry Quality**

Laboratory results of the clinker produced during the trial proved to be within normal production specifications. Dragon observed no adverse impact to clinker chemistry quality as a result of combusting the asphalt shingles. A comparative chemical analysis of the clinker chemistry produced during the asphalt shingle trial compared to the average clinker chemistry for July 2018 is included in Attachment No. 1.

#### **Air Emissions**

Dragon continuously monitored air emissions during the asphalt shingle trial. Dragon currently operates a Continuous Emission Monitoring Systems (CEMS) for CO, CO<sub>2</sub>, NOx, SOx, THC, HCl, and Hg to confirm that emissions do not exceed limits established in Dragon's current Title V air emission license (A-326-70-E-R/A). No adverse impacts to air emission quality were observed during the trial, and all emissions remained within licensed limits. Included in Attachment No. 2 is the emissions data collected during both stages of the asphalt shingle trial.

#### Conclusion

The two-stage trial of asphalt shingle material demonstrated the material is a viable fuel substitute in the manufacture of portland cement. Dragon has determined the trial of asphalt shingles to be successful based on the following:

- the material handling characteristics allowed for sufficient processing and introduction of the asphalt shingles into the process without modification of the existing system,
- no adverse impacts to air emission quality were observed, and
- no adverse impacts to clinker chemistry quality were observed.

# Section 2 – Recycled Post-Consumer Carpet & Recycled Post-Consumer Foam Padding Trial

Dragon conducted a single stage trial of recycled post-consumer carpet and foam padding material to evaluate the process handling, clinker chemistry, and air emission impacts to the cement manufacturing process. The trial examined the material handling of the product and the efficiency of introducing it into the kiln system, and evaluated the clinker chemistry and air emission impacts. As detailed in Dragon's Letter of Intent, the recycled post-consumer carpet and foam padding was collected and processed by recycling companies prior to being transported to Dragon. The material was stored on site in the same manner and location as approved under Fuel Substitution License S-02851-WV-X-N and the facility's Alternative Fuel Operation's Manual.

Dragon processed approximately 11 tons of recycled post-consumer carpet and foam padding. Both materials were introduced into the kiln system through the existing shredding and conveying system as a single, co-mingled, stream. No modifications to the existing system were required to process the post-consumer carpet or foam padding material. Dragon introduced the carpet and foam padding material at an average feed rate of 0.25 - 0.50 tons per hour (tph). Strict adherence to air emissions quality and emissions limits were maintained during the trial.

Dragon's CEMS monitored CO, CO2, NOx, SOx, THC, HCl, and Hg to ensure that emissions were not adversely impacted during the trial. Dragon also monitored applicable process data to evaluate the thermal benefit of the recycled post-consumer carpet and foam padding and observe potential impacts to process conditions.

#### **Chemistry and Air Emission Results**

#### Standards

Dragon's onsite Quality Control laboratory analyzed and evaluated any potential changes in clinker chemistry during the recycled carpet and foam padding trial. Results were compared to average non-trial clinker chemistry data collected in July 2018. The fuel trials would be deemed successful if no negative impacts to air emission quality are observed and clinker chemistry remains consistent with average daily production quality.

#### **Clinker Chemistry Quality**

Laboratory results of the clinker produced during this trial were within normal production specifications. No adverse impact to clinker chemistry quality as a result of combusting the post consumer carpet and foam padding was observed. A comparative chemical analysis of the clinker chemistry produced during the recycled carpet trial compared to the average clinker chemistry for July 2018 is included in Attachment No. 3.

#### **Air Emissions**

Dragon continuously monitored air emissions during the asphalt shingle trial. Dragon currently operates a CEMS for CO, CO<sub>2</sub>, NOx, SOx, THC, HCl, and Hg to confirm that emissions do not exceed limits established in Dragon's current Title V air emission license (A-326-70-E-R/A). No adverse impacts to air emissions quality were observed during the trial, and all emissions remained within licensed limits. Included in Attachment No. 4 is the emissions data collected during the recycled carpet and foam padding trial.

#### **Conclusions**

The two-stage trial of the post consumer carpet and foam padding material demonstrated the materials are a viable fuel substitute in the manufacture of portland cement. Dragon has determined the trial of post consumer carpet and foam padding to be successful based on the following:

- the material handling characteristics allowed for sufficient processing and introduction of the post consumer carpet and foam padding into the process without modification of the existing system,
- no adverse impacts to air emission quality were observed, and
- no adverse impacts to clinker chemistry quality were observed.

# Section 3 – Recycled High Density Polyethylene (HDPE) Plastics (No. 2) and Recycled Plastics (RP) (No. 1, 3, 4, 5 and 7) Trial

Dragon conducted a two-stage trial of recycled high-density polyethylene (HDPE) plastic and a second two-stage trial for recycled plastics (RP) (No.'s 1, 3, 4, 5, and 7) to fully evaluate the process handling, clinker chemistry, and air emission impacts to the cement manufacturing process. The first stage of each trial examined the material handling of the products and the efficiency of introducing them into the kiln system. The second stage of each trial examined clinker chemistry and air emission impacts. As detailed in Dragon's Letter of Intent, the recycled plastics are sourced from solid waste recycling facilities where it is sorted and compressed into bales before being transported to Dragon. The material was stored on site in the same manner and location as approved under Fuel Substitution License S-02851-WV-X-N and the facility's Alternative Fuel Operation's Manual. The materials were introduced into the kiln system through the existing shredding and conveying system to the calciner. No modifications to the existing system were required to process the HDPE and RP materials.

Dragon processed a total of approximately 29 tons of recycled plastics. Dragon introduced the plastics at an average feed rate of 0.5 tons per hour (tph) through the shredder system. Strict adherence to air emissions quality and emissions limits were maintained during this stage of the trial.

During the first stage of each trial, Dragon processed approximately 1.5 tons of plastics through the shredding and conveying system. As detailed in Dragon's Letter of Intent, the first stage of the trial was to determine if the existing shredding system could process the plastic materials. Dragon monitored the shredding and conveying system and determined no adverse impacts to the system occurred with either the HDPE or the RP materials. Dragon did observe a buildup or "bridging" of material in the shredder feed hopper during the RP trial. Periodic monitoring and cleaning of the shredder hopper will be required to ensure material feeds consistently into the shredder when processing RP material. In addition, a large piece of steel was inadvertently introduced into the shredder with the HDPE material. The shredder was shut down and the steel removed. Dragon will work with HDPE material suppliers to ensure proper screening of the material occurs to eliminate the introduction of improper materials.

The second stage of both trials occurred from October 15, 2018 until October 26, 2018, and Dragon processed approximately 13 tons of HDPE material and 16 tons of the RP material. A sufficient amount of both the HDPE and the RP materials were consumed to evaluate the impact on air emissions and process data and determine if any negative impacts to clinker chemistry occurred. Dragon also monitored applicable process data to evaluate the thermal benefit and determine potential impacts to process conditions when introducing the material into the calciner.

#### **Chemistry and Air Emissions Results**

#### Standards

Dragon's onsite Quality Control laboratory analyzed and evaluated any potential changes in clinker chemistry during the HDPE and RP trials. Results were compared to average non-trial clinker chemistry data collected in July 2018. A successful fuel trialresults in no adverse impacts to air emission quality and clinker chemistry remains consistent with daily production quality.

#### **Clinker Chemistry Quality**

Laboratory results of the clinker produced during the trial proved to be within normal production specifications. No adverse impact to clinker chemistry quality as a result of combusting the HDPE and RP was observed. A comparative chemical analysis of the clinker chemistry produced during the HDPE and RP trials compared to the average clinker chemistry for July 2018 is included in Attachment No. 5.

#### **Air Emissions**

Dragon continuously monitored air emissions during the HDPE and RP trials. Dragon currently operates a CEMS for CO, CO<sub>2</sub>, NOx, SOx, THC, HCl, and Hg to confirm that emissions do not exceed limits set forth by Dragon's current air emission license. No adverse impacts to air emissions quality were observed during the trial, and air emissions remained within licensed limits. Attachment No. 6 is the emissions data collected during both stages of the HDPE and RP trials.

#### **Conclusions**

The trials of the recycled materials (HDPE and RP) demonstrated the materials are a viable fuel substitute in the manufacture of portland cement. Dragon has determined the trial of recycled plastics to be a success based on the following:

- the material handling characteristics allowed for sufficient processing and introduction of the plastics into the process without modification of the existing system,
- no adverse impacts to air emission quality were observed, and
- no adverse impacts to clinker chemistry quality were observed.

#### TRIAL CONCLUSIONS

The alternative fuels trials of recycled asphalt shingles, recycled post-consumer carpet and foam padding, recycled HDPE (No. 2) plastics, and Recycled Plastics (No.'s 1, 3, 4, 5, and 7demonstrated that the materials are viable fuel substitutes in the manufacture of cement. Based on the data contained in this report, Dragon confirms that the trials of

## Page 8 Alternative Fuels Trial Results

asphalt shingles, recycled post-consumer carpet and foam padding, recycled HDPE (No. 2) plastics, and Recycled Plastics (No.'s 1, 3, 4, 5, and 7were successful. The evaluation of clinker chemistry and air emission quality during the trials confirms the materials pose no adverse impacts to production or air quality. Accordingly, Dragon is requesting the Department include recycled asphalt shingles, recycled post-consumer carpet and foam padding, recycled HDPE (No. 2) plastics, and Recycled Plastics (No.'s 1, 3, 4, 5, and 7as acceptable and permissible fuels under Dragon's Fuel Substitution License S-02851-WV-X-N.

**ATTACHMENT No. 1** 

Clinker Chemistry Analysis – Recycled Asphalt Shingles Trial

# Dragon Products Company, LLC Thomaston, Maine Cement Laboratory

	Clinker		Clinker	
	Asphalt Shingle Trial Average		July 2018 Average	
	Average	StdDev	Average	StdDev
Si	21.27	0.31	21.42	0.34
Al	3.60	0.10	3.83	0.56
Fe	3.25	0.08	3.31	0.08
Ca	63.17	0.40	64.18	0.84
Mg	3.27	0.14	3.35	0.19
S	1.17	0.19	1.40	0.16
K	1.23	0.10	1.22	0.14
Na	0.35	0.01	0.32	0.03
P	0.05	0.01	0.05	0.01
Ti	0.26	0.01	0.24	0.02
Cl			0.01	0.01
LOI	0.15	0.00	0.76	2.18
Total	97.75	0.46	100.07	2.18
C3S	63.31	2.61	63.73	6.40
C2S	13.23	2.56	13.33	4.87
СЗА	4.05	0.19	4.56	1.52
C4AF	9.88	0.24	10.06	0.25
S/R	3.11	0.08	3.02	0.20
Al/Fe	1.11	0.02	1.16	0.18
LSF	95.83	1.19	96.32	1.72
% Liq	21.70	0.47	22.48	1.76
AlkEq	1.16	0.08	1.13	0.10
Sulfur:Alkali	0.77	0.08	0.99	0.11
Wet Fr CaO	0.77	0.14	0.90	0.14

Page 10 Alternative Fuels Trial Results

#### ATTACHMENT No. 2

Air Emission Quality - Recycled Asphalt Shingle Trial

			07.	/12/2018			07/13/2018					
Hour	SO2	NOX	со	ТНС	Hg	HCL	SO2	NOX	со	ТНС	Hg	HCL
	(PPH)	(PPH)	(PPH)	(PPMVD @7% O2)	(Lb/Mm ton)	(PPMVD @7%O2)	(PPH)	(РРН)	(РРН)	(PPMVD @7% O2)	(Lb/Mm ton)	(PPMVD @7%O2)
00:00	1.2	149.3	53.2	3.21	17.082	0	1.1	138.9	122.4	7.29	12.192	0
01:00	1.2	151	30.4	2.49	19.134	0	1	116.5	30.4	2.2	12.14	0
02:00	1.2	150.9	30.7	2.4	18.616	0	1	121.6	37.2	2.65	10.495	0
03:00	1.4	158.4	41.2	3.07	21.812	0	1	121.3	24	2.36	12.644	0
04:00	1.2	154.6	37.4	1.91	22.3	0	1.2	128.3	32.1	1.9	11.473	0
05:00	1.2	154.5	46.5	1.3	23.364	0	1	122.2	44,4	1.48	10.626	0
06:00	1.2	152.2	43.5	2.75	25.35	0	1	123	44.7	3.25	11.765	0
07:00	1.2	154.3	52.3	3.07	23.248	0	1	123.7	40.4	2.53	11.577	0
08:00	1.2	153.1	74.6	3.95	21.487	0	1	123.7	57	4.18	9.302	0
09:00	1.2	156	63.9	2.79	19.954	0	1.5	126.8	59.9	3.6	111.681	0
10:00	1.2	150.9	67.1	3.6	20.118	0	2	130.4	49.9	3.4	104.888	0
11:00	1.2	150.8	64.2	3.53	19.617	0	1.3	154.1	20.6	3	37.074	0
12:00	1.2	149	102.3	5.76	25.031	0	2.1	132.8	43.8	3.49	115.299	0
13:00	1.2	149.2	117.9	7.8	25.93	0	2.2	143.8	43.3	3.4	96.747	0
14:00	1.2	149.6	93.9	6.32	19.059	0	1.9	128.7	41.2	3.58	69.803	0
15:00	1.2	151.2	106	6.73	15.7	0	1	131.2	43.5	3.36	9.202	0
16:00	1.2	144.8	76.3	5.09	12.255	0	1.1	135.2	65.5	6.16	8.753	0
17:00	1.1	146.5	88.4	6.25	12.01	0	1	134.5	57.9	3.7	8.957	0
18:00	1.2	145.8	91.2	6.33	11.765	0	0.9	126.1	55.7	3.81	10.043	0
19:00	1.1	147.7	89.7	6.09	11.383	0	1.3	124.8	51.4	3.72	59.626	0
20:00	1.2	143.3	84.5	4.75	11.902	0	0.9	124.5	82.1	4.78	11.207	0
21:00	1.1	134.8	70.2	4.35	11.835	0	0.9	125.9	75.4	4.5	11.494	0
22:00	1.2	133.6	96.9	5.52	11.995	0	0.9	124.5	80.3	4.6	10.345	0
23:00	1	136.5	111.4	8.05	12.016	0	0.9	126.3	65.7	3.97	10.057	0

<sup>-</sup> Highlighted cells indicate trial data

**ATTACHMENT No. 3** 

Clinker Chemistry Analysis – Recycled Post-Consumer Carpet and Foam Padding Trial

Dragon Products Company, LLC	
Thomaston, Maine	
Cement Laboratory	

	Clinker		Clinker	
	Carpet and Foam Padding Trial Average		July 2018 Average	
	Average	StdDev	Average	StdDev
Si	21.70	0.56	21.42	0.34
Al	3.76	0.22	3.83	0.56
Fe	3.20	0.15	3.31	0.08
Ca	64.48	0.35	64.18	0.84
Mg	3.30	0.33	3.35	0.19
S	1.50	0.11	1.40	0.16
K	1.31	0.12	1.22	0.14
Na	0.31	0.03	0.32	0.03
P	0.06	0.00	0.05	0.01
Ti	0.25	0.01	0.24	0.02
Cl	0.01	0.00	0.01	0.01
LOI	0.15	0.00	0.76	2.18
Total	100.01	0.04	100.07	2.18
C3S	63.49	5.74	63.73	6.40
C2S	14.31	5.86	13.33	4.87
C3A	4.56	0.71	4.56	1.52
C4AF	9.73	0.45	10.06	0.25
S/R	3.12	0.13	3.02	0.20
Al/Fe	1.18	0.10	1.16	0.18
LSF	95.92	2.68	96.32	1.72
% Liq	22.09	0.69	22.48	1.76
AlkEq	1.17	0.08	1.13	0.10
Sulfur:Alkali	1.00	0.08	0.99	0.11
Wet Fr CaO	1.00	0.38	0.90	0.14

Page 12 Alternative Fuels Trial Results

# ATTACHMENT No. 4 Air Emission Quality – Recycled Post-Consumer Carpet and Foam Padding Trial

			08/	/08/2018	,		08/09/2018							
Hour	SO2	NOX	СО	ТНС	Hg	HCL	SO2	NOX	со	ТНС	Hg	HCL		
	(РРН)	(РРН)	(PPH)	(PPMVD @7% O2)	(Lb/Mm ton)	(PPMVD @7%O2)	(PPH)	(РРН)	(РРН)	(PPMVD @7% O2)	(Lb/Mm ton)	(PPMVD @7%O2)		
00:00	0	0	0	0.42	0	19.9123	0	54.2	73.3	3.88	12.422	0		
01:00	0.9	256.2	14.9	1.75	88.417	11.14954	0	41.4	117.8	6.08	12.516	0		
02:00	1.4	370.9	58.8	5.85	21.305	0	0	67.5	117.2	5.7	14.058	0		
03:00	1.9	421.3	54.4	6.68	23.339	0	0	53.4	107.7	3.19	13.089	0		
04:00	0.2	58	47.3	4.27	17.203	0	0	54.5	72.9	2.14	12.887	0		
05:00	0	27.7	53.9	3.08	16.529	0	0	37.1	41.5	0.9	11.373	0		
06:00	0	17.5	46.7	5.93	119.088	0	0	61.3	34.8	1.82	28.816	0		
07:00	0	25.8	62.2	6.65	17.344	0	0.4	54.5	37.3	2.73	118.147	0		
08:00	0	25	43.1	2.75	39.787	0	0.6	46.1	58.3	4.2	74.236	0		
09:00	0	32.3	62.7	7	32.945	0.38949	11.2	152.3	168.7	11.12	20.31	0.95816		
10:00	0	43.6	72.2	7.61	12.283	0	0.8	76.6	70.6	9.17	21.806	0		
11:00	0	58.3	70.2	7.24	10.563	0	1.3	48	88.7	6.58	17.103	0		
12:00	0	43.9	56.6	5.89	9.655	0	0.2	48.6	85	4.97	65.136	0		
13:00	0	31	75.8	7.36	9.89	0	1.2	82.5	77.8	6.94	184.195	0		
14:00	0	28.8	78.1	7.22	11.86	0	1.1	73.6	94.4	8.76	152	0		
15:00	0	42.9	78.9	6.63	13.978	0	0.2	87.7	89.4	8.19	74.278	0		
16:00	0	53.3	76.5	7.08	14.801	0	0	82.4	72	6.04	20.339	0		
17:00	0	64.5	79.2	6.29	13.493	0	0	107	79.8	7.03	19.67	0		
18:00	0	92.1	74.9	5.82	10.314	0	0	145.1	75.2	7.32	23.407	0		
19:00	0	73.7	76.9	4.66	11.264	0	0.3	188.5	71.9	8.07	25.882	0		
20:00	0	67.1	74.8	5.1	12.25	0	0.2	167.9	68.2	7.37	27.424	0		
21:00	0	60.9	92.2	4.22	13.54	0	0.2	133.4	49	6.12	30.702	0		
22:00	0	63.8	110.4	5.93	14.552	0	0.2	142.1	43	6.13	27.939	0		
23:00	0	31.1	105.7	5.19	14.534	0.	0.2	157.3	61.1	7.34	26.438	0		

<sup>-</sup> Highlighted cells indicate trial data

Page 13 Alternative Fuels Trial Results  $( \hbox{Attachment No. 4-cont.} )$  Air Emission Quality — Recycled Post-Consumer Carpet and Foam Padding Trial

			08	/14/2018			08/15/2018							
Hour	SO2	NOX	СО	ТНС	Hg	HCL	SO2	NOX	co	ТНС	Hg	HCL		
	(РРН)	(РРН)	(РРН)	(PPMVD @7% O2)	(Lb/Mm ton)	(PPMVD @7%O2)	(РРН)	(PPH)	(РРН)	(PPMVD @7% O2)	(Lb/Mm ton)	(PPMVD @7%O2)		
00:00	0	71.2	96.2	4.91	16.393	0	0	119	77.5	6.43	18.275	0		
01:00	0	94.4	93.3	4.67	17.817	0	0	121.5	106.7	7.73	17.884	0		
02:00	0	87.2	78.3	3.67	18.882	0	0	106.7	96.7	7.36	16.645	0		
03:00	0	92.2	59.5	4.76	18.742	0	0	110	155.9	6.95	15.513	0		
04:00	0	91.5	95.8	3.17	19.853	0	0	100.5	119	5.91	16.23	0		
05:00	0	93.8	49.6	1.3	96.936	0.09961	0	97.3	84.9	2.87	17.06	0		
06:00	0	77.6	81.9	3.72	111.52	0	0	102.4	94.1	6.99	23.147	0		
07:00	0	49.9	108.2	4.7	106.821	0	0	109.7	121.5	7.78	23.444	0		
08:00	0	73.6	123.4	9.38	14.199	0	0	112.8	88.5	6.72	24.314	0		
09:00	0	77.3	88.4	4.44	17.291	0	0	128.4	129.5	9.4	24.254	0		
10:00	0	89.1	98.3	5.76	18.599	0	0	110	92.6	7.19	26.52	0		
11:00	0	60.1	249.2	9.96	16.22	0	0.7	118.2	108.1	7.94	111.067	0		
12:00	12.4	181.3	8	1.79	117.143	0	0.2	73	93.7	7.99	114.691	0		
13:00	11	542.1	113.1	12.6	106.947	0.15041	0.2	81.4	103.4	9.06	123.567	0		
14:00	0	144.2	101	7.01	18.266	0	0	103	89.6	8.12	50.381	0		
15:00	0	84.3	106.6	6.92	14.641	0	0	78.2	70.4	6.38	20.275	0		
16:00	0	95.7	95.7	6.25	15.957	0	0	74.9	112.6	6.25	18.905	0		
17:00	0	85	79.6	4.93	60.567	0	0	58.9	107.8	6.74	17.698	0		
18:00	0.2	97.8	85.3	6.83	109.794	0	0	68.6	121.7	6.28	17.684	0		
19:00	1.4	112.9	89.5	6.48	105.928	0	0	77.2	190.1	12.16	18.765	0		
20:00	0.2	106.5	80	6.51	86.376	0	0	87.9	111.9	6.84	21.208	0		
21:00	0	58.9	86.9	6.72	13.761	0	0	52.9	92.1	5.22	18.452	0		
22:00	0	92.3	92.6	6.04	12.585	0	0	51.1	140.4	6.08	20.712	0		
23:00	0	112.5	76.7	6.01	15.625	0	39.4	58.6	172.8	22.19	18.411	0		

<sup>-</sup> Highlighted cells indicate trial data

Alternative Fuels Trial Results

(Attachment No. 4 – cont.)

Air Emission Quality – Recycled Post-Consumer Carpet and Foam Padding Trial

08/24/2018 NOX THC HCL SO<sub>2</sub>  $\mathbf{CO}$ Hg Hour (PPMVD (Lb/Mm (PPMVD (PPH) (PPH) (PPH) @7% O2) ton) @7%O2) 0 00:00 0.4 150 63.7 1.76 17.912 01:00 0.4 154.4 70.3 2.68 18.17 0 02:00 151.8 74.5 2.12 18.323 0 0.4 03:00 1.5 185.2 112.8 4.07 24.356 0 0 0.9 215.1 79 2.44 24.613 04:00 19.459 0.10722 05:00 0.4 151.5 93.9 1.4 0 64.9 32.216 06:00 0.4 156.3 1.81 0 2.28 27.706 07:00 0.4 163.8 73.2 08:00 0.4 146.4 72.8 2.3 22.384 0 0.36 11.621 0 09:00 0.3 131.2 23 8.174 0 149.1 36.1 0.69 10:00 0.5 2.26 6.333 0 11:00 0.8 151.9 54.2 12:00 167.7 52.8 2.37 20.685 0 0.8 13:00 3.3 200.3 94.3 4.81 118.703 144 6.25 115.796 14:00 3.5 227.2 15:00 3.5 231.1 111.2 4.22 111.314 0 1 117.8 3.7 9.329 0 220.7 16:00 8.077 0 0.7 183.3 128.9 5.45 17:00 0.7 71.4 2.78 7.503 0 18:00 168.4 4.27 8.575 0 0.7 155.5 96 19:00 20:00 0.7 167 99.6 4.03 9.618 0 10.902 21:00 0.7 157.2 119.5 7.29 0 22:00 0.5 160.1 115.8 8.75 10.507 0 23:00 0.7 156.2 76.6 3.06 10.559 0

Page 14

<sup>-</sup> Highlighted cells indicate trial data

#### **ATTACHMENT No. 5**

Clinker Chemistry Analysis – Recycled High-Density Polyethylene (HDPE) Plastics (No.2) and Recycled Plastics (RP) (No.'s 1, 3, 4, 5 and 7)

Dragon Products Company, LLC	
Thomaston, Maine	
Cement Laboratory	

	Clinker		Clinker	
	Recycled Plastics Trial		July 2018	
	Average		Average	
	Average	StdDev	Average	StdDev
Si	21.35	0.32	21.42	0.34
Al	3.86	0.18	3.83	0.56
Fe	3.27	0.12	3.31	0.08
Ca	64.69	0.55	64.18	0.84
Mg	3.55	0.23	3.35	0.19
S	1.53	0.24	1.40	0.16
K	1.02	0.12	1.22	0.14
Na	0.29	0.03	0.32	0.03
P	0.05	0.01	0.05	0.01
Ti	0.22	0.02	0.24	0.02
Cl	0.01	0.00	0.01	0.01
LOI	0.15	0.02	0.76	2.18
Total	99.97	0.38	100.07	2.18
C3S	66.18	4.21	63.73	6.40
C2S	11.27	3.81	13.33	4.87
C3A	4.69	0.45	4.56	1.52
C4AF	9.94	0.37	10.06	0.25
S/R	3.00	0.12	3.02	0.20
Al/Fe	1.18	0.06	1.16	0.18
LSF	97.39	1.83	96.32	1.72
% Liq	22.23	0.72	22.48	1.76
AlkEq	0.96	0.09	1.13	0.10
Sulfur:Alkali	1.23	0.13	0.99	0.11
Wet Fr CaO	0.95	0.31	0.90	0.14

Page 16 Alternative Fuels Trial Results

#### **ATTACHMENT No. 6**

Air Emission Quality – Recycled High-Density Polyethylene (HDPE) Plastics (No.2) and Recycled Plastics (RP) (No.'s 1, 3, 4, 5 and 7)

			10,	/15/2018			10/16/2018							
Hour	SO2	NOX	CO	ТНС	Hg	HCL	SO2	NOX	со	ТНС	Hg	HCL		
	(PPH)	(РРН)	(PPH)	(PPMVD @7% O2)	(Lb/Mm ton)	(PPMVD @7%O2)	(PPH)	(РРН)	(РРН)	(PPMVD @7% O2)	(Lb/Mm ton)	(PPMVD @7%O2)		
00:00	1.7	162.4	23	2.64	6.375	0	10	142.3	36.9	1.67	10.932	0		
01:00	1.3	143.9	10.4	2.13	7.714	0	35.5	114.1	47.3	3.95	144.631	1.79209		
02:00	1.8	161.1	11.5	2.29	8.493	0	21.5	111.8	12.6	1.4	112.704	6.255		
03:00	2.7	156.6	14.8	2.41	10.847	0	1.2	106	14.4	1.15	8.272	0		
04:00	1.5	165.3	16	1.69	9.185	0	1.1	124	12.3	0.75	7.072	0		
05:00	1.2	154.1	10.3	0.87	8.828	0	1.1	130.1	13.2	0.45	5.793	0		
06:00	1.4	153	10.3	2.11	8.828	0.16794	1.3	140.1	15.4	0.84	6.72	0		
07:00	1.5	148.8	14.4	2.08	8.545	0	1.4	134.3	17.9	0.95	7.227	0		
08:00	1.7	147.8	13.3	2.06	8.499	0	3.3	133.1	36.4	1.01	7.848	0		
09:00	1.6	149.1	11.4	2.14	10.818	0	3.1	131.5	34.4	0.88	8.82	0		
10:00	1.4	146.3	13.3	2.15	10.43	0	1.9	131.9	38.1	0.73	8.005	0		
11:00	1.7	151.6	18.6	2.13	11.598	0	2.6	130.6	35	0.44	7.925	0		
12:00	2.1	153.4	29.6	2.63	9.536	0	2.9	138.4	44.9	0.73	9.814	0		
13:00	2	156	49.7	3.24	9.278	0	2.4	132.5	62.3	0.86	10.559	0		
14:00	2	149.8	10.2	0.96	9.278	0	2	142.6	55.1	0.87	10.794	0		
15:00	1.9	153.9	13.6	0.91	7.959	0	2.3	138	106.2	3.85	11.7	0		
16:00	2.1	172.9	17.5	1	7.809	0	2	149.8	58.5	0.71	10.662	0		
17:00	2.6	167.7	19.4	1.03	6.801	0	1.7	133.1	62.7	0.73	10.741	0		
18:00	3.9	168.6	16.5	0.91	9.332	0	1.8	147.8	49.5	0.58	11.816	0		
19:00	3.8	172.3	18	1.07	9.068	0	2	147.8	61.6	0.73	13.772	0		
20:00	3.4	163.5	11.3	0.75	9.079	0	1.8	154.5	48.5	0.58	12.716	0		
21:00	3.5	148	16.6	0.91	8.978	0	1.7	149.4	45.7	0.58	16.564	0		
22:00	3.1	165	16.8	0.91	8.933	0	2.1	170.2	39.3	0.58	21.368	0		
23:00	4	161.7	20.7	0.74	7.843	0	2.6	165.7	37.7	0.58	18.37	0		

<sup>-</sup> Highlighted cells indicate trial data

Page 17
Alternative Fuels Trial Results

(Attachment No. 6 – cont.)

Air Emission Quality – Recycled High-Density Polyethylene (HDPE) Plastics (No.2) and Recycled Plastics (RP) (No.'s 1, 3, 4, 5 and 7)

			10	/17/2018			10/18/2018							
Hour	SO2	NOX	СО	ТНС	Hg	HCL	SO2	NOX	СО	ТНС	Hg	HCL		
	(РРН)	(РРН)	(РРН)	(PPMVD @7% O2)	(Lb/Mm ton)	(PPMVD @7%O2)	(РРН)	(PPH)	(РРН)	(PPMVD @7% O2)	(Lb/Mm ton)	(PPMVD @7%O2)		
00:00	2.9	169.8	39.2	0.57	17.312	0	3	139.6	66.8	2.18	23.077	0		
01:00	3.4	166.5	40.8	0.43	17.229	0	2.9	139.6	65.1	2.04	22.995	0		
02:00	3.7	167.6	77.3	1.72	16.11	0	3	138.2	63.7	2.02	22.941	0		
03:00	3.6	182	49.4	0.59	16.627	0	2.5	135.6	69.5	2.33	21.948	0		
04:00	1.2	146.6	34.3	0.66	12.5	0	2.9	142.1	132.8	4.36	20.794	0		
05:00	1.5	178.2	33.5	0.32	10.323	0	3.7	137.9	71	0.84	22.78	0		
06:00	1.5	161.8	34.7	0.35	11.193	2.51617	3	139.1	64.9	1.87	21.612	0		
07:00	2.8	159	46.5	0.61	10.407	0	10	111.4	50.4	2.92	95.297	0		
08:00	4.3	172.7	56.1	0.74	10.345	0	30	123.2	17.7	2.97	201.395	2.97424		
09:00	5.1	156.9	56.8	0.78	11.372	0	56.6	133.7	52.7	2.32	214.452	6.06432		
10:00	3.7	159.2	164	11.04	13.785	0	59.1	156.9	49.3	1.83	181.054	5.87954		
11:00	4	168.9	80.3	1.37	15.771	0	54.8	164.3	51.1	1.86	138.528	4.03887		
12:00	4.6	161.1	64.9	1.04	15.771	0	12.5	153.4	67.6	2.68	36.518	1.00989		
13:00	5.3	162.3	69.1	0.91	15.771	0	5.3	143.9	72.4	2.64	16.747	0		
14:00	5.7	156.9	66.3	0.9	14.836	0	6	147.2	131.2	3.6	17.351	0		
15:00	9.4	155	84.6	1.17	14.836	0	7.2	141.2	100.5	3.48	19.645	0		
16:00	13	141.6	169.3	4.94	14.72	0	3.6	148.6	90.8	4.19	22.128	0		
17:00	10.4	140.2	124.4	1.77	16.589	0	2	146.5	79.2	4.41	18.863	0		
18:00	8.2	138.9	105.8	1.81	19.393	0	1.5	148.7	75.5	4.1	18.863	0		
19:00	7.9	138.2	86.4	1.5	20.495	0	1.5	143.2	83.6	3.91	18.863	0		
20:00	4.5	136.3	74.7	1.83	23,242	0	1.7	146.8	76.8	3.56	18.841	0		
21:00	4.1	140.2	83.4	2.77	25.149	0	1.5	139.4	102.1	3.67	19.355	0		
22:00	4	135.1	72	2.79	25.089	0	1.7	169.3	73.9	3.54	20.398	0		
23:00	4.1	142.1	68.5	2.06	25.089	0	0.3	182	101.8	3.84	19.048	0		

<sup>-</sup> Highlighted cells indicate trial data

Page 18 Alternative Fuels Trial Results

# (Attachment No. 6 – cont.) Air Emission Quality – Recycled High-Density Polyethylene (HDPE) Plastics (No.2) and Recycled Plastics (RP) (No.'s 1, 3, 4, 5 and 7)

			10	/19/2018			10/20/2018							
Hour	SO2	NOX	СО	ТНС	Hg	HCL	SO2	NOX	СО	тнс	Hg	HCL		
	(PPH)	(PPH)	(PPH)	(PPMVD @7% O2)	(Lb/Mm ton)	(PPMVD @7%O2)	(РРН)	(РРН)	(РРН)	(PPMVD @7% O2)	(Lb/Mm ton)	(PPMVD @7%O2)		
00:00	0	0	0	4.61	0	0	0.9	135.3	30	2.62	9.959	0		
01:00	0	0	0	3.66	0	0	1.1	144.5	31.3	3.02	11.892	0		
02:00	0	0	0	3.66	0	0	1.1	144.9	35.7	3.11	12.766	0		
03:00	0	0	0	10.32	0	0	1.1	142.6	43.1	3.08	11.503	0		
04:00	0	0	0	0.77	0	0	1.1	147.2	37.1	2.35	13.29	0		
05:00	0	0	0	0.25	0	7.40456	1.1	147.4	47.4	1.6	21.456	0		
06:00	0	0	0	0.64	0	21.68947	1.1	144.5	37.1	3.44	26.024	0		
07:00	30.7	80.7	4.3	0.82	920	20.77527	1	141.7	35.8	2.99	21.551	0		
08:00	21.4	213.6	44.8	17.29	120	6.35279	3.6	144.5	38.5	3.09	49.805	0		
09:00	14.8	161	63.7	10.33	122.686	0.61527	1.1	144.5	44.2	3.32	21.926	0		
10:00	3.7	91.5	15.5	5.9	95.845	0	1.1	143.8	52.3	2.92	20.781	0		
11:00	0.3	17	1	4.8	200	0	1.1	143.5	51.1	2.79	19.647	0		
12:00	0	4.6	0.7	1.3	180	0	1.2	147.8	58.6	2.74	22.573	0		
13:00	14.1	17.8	0	0.67	270	9.93314	1.5	153.4	57.5	2.64	19.27	0		
14:00	0.8	240.7	0.9	1.89	209.091	15.97628	1.7	171.5	54.9	2.5	19.054	0		
15:00	14	307.3	24.7	3.06	181.424	3.16838	1.4	167.8	23.9	2.7	19.502	0		
16:00	22.7	148.2	52.9	3.83	183.462	1.41898	1.3	166.4	22.8	2.43	15.223	0		
17:00	6.8	165.9	24.1	2.86	54.074	0.95293	6.1	157.9	55.2	6.94	15.006	0.27279		
18:00	0.9	137.2	28.5	2.48	6.628	0	2.1	157.8	57.7	3.83	13.969	0		
19:00	0.9	145.9	39.8	2.41	7.616	0	1.8	159.8	50	2.63	14.484	0		
20:00	0.9	144.9	75.5	3.43	7.49	0	1.4	145.1	39.6	2.39	13.753	0		
21:00	0.9	143.8	55.4	2.52	7.397	0	1.6	144.3	51.2	1.98	13.753	0		
22:00	1.1	147.5	105.6	3.87	8.345	0	1.6	159.2	42.1	1.99	13.806	0		
23:00	1.1	142.3	73.5	2.77	9.626	0	1.4	154.3	43.9	1.99	16	0		

<sup>-</sup> Highlighted cells indicate trial data

Page 19 Alternative Fuels Trial Results

# (Attachment No. 6 – cont.) Air Emission Quality – Recycled High-Density Polyethylene (HDPE) Plastics (No.2) and Recycled Plastics (RP) (No.'s 1, 3, 4, 5 and 7)

			10	/21/2018			10/22/2018							
Hour	SO2	NOX	CO	ТНС	Hg	HCL	SO2	NOX	со	ТНС	Hg	HCL		
	(PPH)	(РРН)	(PPH)	(PPMVD @7% O2)	(Lb/Mm ton)	(PPMVD @7%O2)	(PPH)	(PPH)	(PPH)	(PPMVD @7% O2)	(Lb/Mm ton)	(PPMVD @7%O2)		
00:00	1.6	157.2	35.8	2.01	17.165	0	2.3	107.4	18.5	1.91	14.744	0		
01:00	2.1	161.4	49.9	1.98	17.076	0	5.8	111.3	22.9	1.92	17.519	0		
02:00	3.8	159.2	55.9	2.09	19.565	0	10.8	117.9	36.3	1.84	19.697	0		
03:00	2.4	127.5	63.7	3.39	17.062	0	17.7	119.9	31.5	1.8	22.911	0		
04:00	1.6	144.3	26	1.51	13.872	0	13.5	132.6	25.2	1.52	24.282	0		
05:00	1.7	137.6	27	1.02	11.887	0	13.3	124	32.5	0.92	22.747	0		
06:00	1.4	134.8	23.3	2.12	13.373	0	66	134	34	2	220.588	1.43899		
07:00	1.1	113.9	21.6	2.13	13.522	0	65.1	149.2	37.7	2.19	207.724	4.16299		
08:00	1	115.1	23.8	2.3	12.596	0	5.7	124.7	62.5	2.2	11.628	0.13377		
09:00	0.9	113.8	35.2	3.41	11.111	0	35	126.9	72.2	2.29	55.191	0		
10:00	1.3	115.5	45.1	3.13	8.498	0	19.9	136.6	72.1	1.96	20.774	0		
11:00	3.2	121.1	50.2	2.65	9.677	0	20.8	137.2	62.8	2.12	20.619	0		
12:00	3.8	124.1	45.2	2.17	9.663	0	7.5	104.4	81.3	2.11	21.319	0		
13:00	1.8	117.1	29.3	2.08	9.807	0	4.3	133.6	36.7	1.82	16.089	0		
14:00	5.5	125.9	44.6	2	9.483	0	5.3	129.6	63.4	5.22	13.154	0.28055		
15:00	15.4	120.8	60	2.24	10.379	0	5.5	132.8	55.7	2.31	13.856	0		
16:00	17.3	126.8	60.4	2.26	11.31	0	4.2	140.1	55	2.43	16.387	0		
17:00	3.7	110.2	57.8	3.7	11.315	0	5.1	141.9	57.1	2.36	17.526	0		
18:00	2.1	107.6	52.8	3.83	8.682	0	5.6	141.9	53.4	2.21	17.526	0		
19:00	9.8	103.3	55.9	3.15	8.64	0	6.8	146.1	49.4	2.17	19.974	0		
20:00	19.1	111.8	67.8	2.12	10.143	0	10.8	140.8	62.4	2.17	26.82	0		
21:00	2.5	106.4	21.7	1.85	11.52	0	9.6	149.9	78.3	2.07	21.855	0		
22:00	2.2	115.6	28.5	2.08	13.102	0	9	153.3	71.3	2.07	20.839	0		
23:00	1.4	108.9	12.9	1.87	13.826	0	7.7	172.4	72.9	2.09	21.527	0		

<sup>-</sup> Highlighted cells indicate trial data

Page 20 Alternative Fuels Trial Results

 $(Attachment\ No.\ 6-cont.)$  Air Emission Quality – Recycled High-Density Polyethylene (HDPE) Plastics (No.2) and Recycled Plastics (RP) (No.'s 1, 3, 4, 5 and 7)

			10	/23/2018			10/24/2018							
Hour	SO2	NOX	СО	THC	Hg	HCL	SO2	NOX	co	ТНС	Hg	HCL		
	(PPH)	(PPH)	(PPH)	(PPMVD @7% O2)	(Lb/Mm ton)	(PPMVD @7%O2)	(РРН)	(РРН)	(РРН)	(PPMVD @7% O2)	(Lb/Mm ton)	(PPMVD @7%O2)		
00:00	6.2	173	67.7	2.09	21.652	0	2.5	191.5	88.7	4.71	30.113	0.14303		
01:00	4.9	157.4	61.5	2.09	21.652	0	9.3	141.2	88	3.03	87.768	0		
02:00	5.3	161.8	47.6	2.05	22.609	0	31.4	157.3	80.9	2.7	297.332	0		
03:00	5.2	152.9	49.7	1.93	25.802	0	36.5	157.6	82.1	2.7	241.89	0		
04:00	5.4	167.6	63.7	1.73	25.802	0	33.6	154.3	104.4	3.34	187.245	0		
05:00	6.7	157.3	67.9	1.02	26.683	0	9.4	220	53.2	1.68	55.703	0		
06:00	26.2	184.4	72.8	2.09	27.702	0	1.4	133.2	50.8	3.99	14.939	0		
07:00	9.3	154.2	92.3	2.05	30.617	0	1.1	132.1	55.5	3.29	17.131	0		
08:00	14.6	158.3	143.3	2.24	28.642	0	1.1	134.7	63	3.25	18.254	0		
09:00	24.5	148.9	166.2	2.22	28.571	0	1.1	137.4	132.6	3.56	18.444	0		
10:00	21.7	158.4	131.4	2.27	31.197	0	1.3	142.8	170.6	5.74	18.408	0		
11:00	20.8	155.2	125.6	2.38	31.923	0	1.2	138.8	165.9	3.4	19.083	0		
12:00	14.7	148.1	100.8	2.56	29.988	0	1.4	138.7	132.9	3.68	18.08	0		
13:00	9.8	147.3	105.9	2.39	25.03	0	1.1	131.8	55.1	4.2	17.928	0		
14:00	9.4	149.6	128.7	2.57	29.075	0	1.2	131.9	55.7	4.43	17.928	0		
15:00	19.8	141.2	177.4	2.91	77.643	0	1.1	133.2	44.7	3.79	17.096	0		
16:00	2.6	162	166.8	3.29	25.998	0	1.2	127.1	44.3	3.51	17.517	0		
17:00	2.4	160.2	210.3	3.38	28.053	0	1.2	130.2	57.2	3.51	16.757	0		
18:00	2.6	160.9	200.4	3.5	27.251	0	19.7	135.5	91.5	3.69	152.918	0		
19:00	1.9	151.7	152.8	3.48	29.975	0	27.5	141.6	144.8	4.49	148.755	0		
20:00	1.6	157.6	144.3	3.2	28.589	0	10.8	109.9	34.4	4.66	142.966	0		
21:00	1.9	144.8	113.9	2.99	30.175	0	6.4	108.6	26	4.37	133.904	0		
22:00	7.7	159	65.5	2.91	74.333	0	3.6	96.1	17.1	3.24	126.519	0		
23:00	2.3	167.1	60	2.77	31.512	0	3.2	98.6	19.1	3.27	131.734	0		

<sup>-</sup> Highlighted cells indicate trial data

Alternative Fuels Trial Results

(Attachment No. 6 – cont.)

Attachment No. 6 – cont.)

Air Emission Quality – Recycled High-Density Polyethylene (HDPE) Plastics (No.2) and Recycled Plastics (RP) (No.'s 1, 3, 4, 5 and 7)

			10	/25/2018			10/26/2018							
Hour	SO2	NOX	СО	THC	Hg	HCL	SO2	NOX	со	ТНС	Hg	HCL		
	(РРН)	(РРН)	(РРН)	(PPMVD @7% O2)	(Lb/Mm ton)	(PPMVD @7%O2)	(РРН)	(РРН)	(РРН)	(PPMVD @7% O2)	(Lb/Mm ton)	(PPMVD @7%O2)		
00:00	1.2	96.6	16.2	3.61	52.399	0	1.5	194.9	71.9	7.57	12.651	0		
01:00	0.6	96.9	14	4.24	7.143	0	1.7	196.7	93.3	7.97	13.368	0		
02:00	0.6	102.2	22.5	5.29	6.431	0	1.2	152.3	68.7	7.79	13.595	0		
03:00	0.8	104.2	25	6.36	9.164	0	1	127.6	30.3	7.78	15.53	0		
04:00	0.8	104.3	15.6	4.04	7.878	0	0.9	103.7	36.4	4.96	15.75	0		
05:00	0.8	102.5	17.3	2.21	7.878	0	5.8	125.9	41.7	3.59	57.305	0		
06:00	0.6	103.7	18.4	5.97	9.164	2.11039	0.1	10.2	0.3	4.02	270	0.80474		
07:00	0.8	104	30.8	1.53	10.078	0.27089	0	6.8	0.2	1.08	170	4.24187		
08:00	0.9	107.2	79.8	7.87	10.847	0	0	4.8	0.4	1.4	170	9.38972		
09:00	1.1	111.5	70.6	7.83	11.739	0	0	0	0	2.21	0	0.22753		
10:00	1.3	110.6	130.1	9.61	12.899	0	0	0	0	7.02	0	0		
11:00	1.3	129.2	132.2	9.77	12.813	0	0	0.5	0.3	6.95	150	0		
12:00	1	101.1	141.1	10.17	12.69	0	0	0	0	38.85	0	0		
13:00	0.8	85.5	119	10.47	13.793	0	0	0	0	5.84	0	0		
14:00	1	116.2	94.4	8.89	13.793	0	0	0	0	1.99	0	0		
15:00	0.8	93	84.5	8.14	13.755	0	0	0	0	1.2	0	5.39858		
16:00	0.8	101.3	118	8.78	13.957	0	0	0	0	0.9	0	17.98824		
17:00	1	118.7	52.4	8.65	14.069	0	0	0	0	0.74	0	14.66095		
18:00	1.5	181.7	48.4	9.08	13.973	0	0	0	0	0.61	0	15.17523		
19:00	1.5	192.9	53.5	9.5	13.477	0	0	0	0	0.74	0	14.98377		
20:00	1.5	188.7	65.4	8.32	12.264	0	0.4	317.7	19.2	2.34	139.216	15.8514		
21:00	1.8	217.3	61.7	7.76	13.351	0	18.5	394.2	67.8	6.54	211.084	3.82216		
22:00	1.6	196.8	50.2	7.6	13.543	0	9.3	517.1	24.5	5.19	180.874	3.55723		
23:00	2	244.7	77.1	7.71	13.193	0	8	590.7	37.5	7.36	81.043	1.14376		

<sup>-</sup> Highlighted cells indicate trial data

Page 21

# ATTACHMENT No.7

# Alternative Fuel Trial Results

Recycled conveyor belt material
Earthlife® bio-solids
FiberForm® graphite and carbon material
Coal-tar pitch
Coal-tar pitch coke

Dragon Products Company, LLC February 2019

#### **PURPOSE**

Dragon Product Company, LLC (Dragon) is a manufacturer of portland cement, located in Thomaston, Maine. The cement making process begins with raw feedstock of calcium carbonate bearing rock and other materials including sand (silica) and iron. The calcium carbonate bearing rock is quarried from the onsite limestone quarry in Thomaston, Maine. The limestone is pulverized and mixed with sand and iron to make the raw feedstock. The raw feed is then introduced into the kiln system, where it is heated to near liquid phase in the rotary kiln then cooled quickly to produce clinker, the main ingredient in portland cement. Dragon currently uses petroleum coke (petcoke) as a primary fuel for the thermal energy required to heat the raw feed material. Dragon consumes approximately 10 tons per hour of petcoke in two (2) locations within the kiln system. Approximately five (5) tons per hour is consumed in the rotary kiln and an additional five (5) tons per hour is consumed in the calciner. Dragon is currently licensed (#S-02851-WV-X-N) to use tire chips (tire-derived fuel (TDF)) and recycled carpet material as alternative fuels, which are fired directly in the calciner.

On May 21, 2018, Dragon submitted a Letter of Intent to the Maine Department of Environmental Protection (Department) to conduct alternative fuels trials of the following materials:

- 1. Recycled asphalt shingles;
- 2. Recycled post-consumer carpet;
- 3. Recycled post-consumer carpet foam padding;
- 4. Recycled high-density polyethylene (HDPE) plastics (No. 2);
- 5. Recycled Plastics (RP) (No.'s 1, 3, 4, 5, and 7);
- 6. Recycled conveyor belt material;
- 7. FiberForm® graphite and carbon material;
- 8. Coal-tar pitch;
- 9. Coal-tar pitch coke; and
- 10. Earthlife® bio-solids.

The purpose of the trials was to fully evaluate the beneficial use and potential limitations of the materials as alternative fuels. Each proposed alternative fuel was trialed separately to evaluate material handling characteristics, impacts to air emission quality, and impacts to clinker chemistry.

The results of the trials demonstrated the following two (2) materials are unacceptable as beneficial fuel substitutes under Dragon's current alternative fuel system:

- 1. Recycled Conveyor Belting
- 2. Earthlife® Bio-Solids

The evaluation of the recycled conveyor belt material and the Earthlife® bio-solids trials indicated these materials are not viable fuels using Dragon's current alternative fuels

handling systems. The details of the recycled conveyor belt material and bio-solids trials are provided in the following sections.

The trials of the FiberForm® graphite and carbon material, coal-tar pitch and coal-tar pitch coke were inconclusive. Dragon was not able to process the FiberForm® materials using the current alternative fuels handling system. However, Dragon believes the FiberForm® materials can be processed through the existing solid fuel handling system and used in conjunction with Dragon's primary fuel, petroleum coke. Dragon intends to submit an additional Notice of Intent to the Department to trial an alternative method of introducing the fuels into the process. In this report, the evaluation of the FiberForm® material as a viable alternative fuel is inconclusive, and additional trials are warranted.

#### TRIAL SUMMARIES

#### Section 1 - Recycled Conveyor Belt Material Trial

Dragon proposed a two-stage trial of the recycled conveyor belt material to fully evaluate the process handling, clinker chemistry, and air emission impacts to the cement manufacturing process. The first stage of the trial examined the material handling of the product and the efficiency of introducing it into the kiln system, and the second stage of the trial examined clinker chemistry and air emission impacts. As noted in Dragon's Letter of Intent, the recycled material was sourced from removed or replaced conveyor belts used in Dragon's manufacturing process. The material was stored on site in the same manner and location as approved under Fuel Substitution License S-02851-WV-X-N and the facility's Alternative Fuel Operation's Manual. The material was processed and introduced into the kiln system with the existing conveying and shredding system. No modifications to the existing system were necessary to process the recycled conveyor belt material. Dragon proposed to introduce the recycled conveyor belt material at a nominal feed rate.

The first stage of the trial was designed to evaluate the performance of Dragon's shredder and its ability to adequately process the conveyor belt material. Due to the durability and composition of the conveyor belt material, the shredder was unable to adequately process the belt. The belts caused the shredder system to bind, and the shredder failed to reduce the size of the material. Since the conveyor belt material could not be processed with the existing shredding system the trial was abandoned.

The first stage of the recycled conveyor belt trial was unsuccessful; therefore, Dragon did not conduct the second stage of the trial. Dragon processed less than 1 ton of recycled conveyor belt material. Dragon performed no further evaluation of the conveyor belt material.

#### Section 2 - Earthlife® Bio-Solids Trial

Dragon proposed a two-stage trial of the Earthlife® Bio-Solids material to evaluate the process handling, clinker chemistry, and air emission impacts to the cement

manufacturing process on July 30, 2018 and July 31, 2018. The first stage of the trial examined the material handling of the product and the efficiency of introducing it into the kiln system, and the second stage of the trial examined clinker chemistry and air emission impacts. As noted in Dragon's Letter of Intent, the bio-solids material is a heat-dried granulated material processed at New England Fertilizer Company's (NEFCO) plant prior to being transported to Dragon. The material was stored on site in the same manner and location as approved under Fuel Substitution License S-02851-WV-X-N and the facility's Alternative Fuel Operation's Manual. The material was processed and introduced into the kiln system with the existing tire chip conveying system. No modifications to the existing system were required to process the Earthlife® Bio-Solids material. Dragon introduced the bio-solids material at a nominal feed rate of 0.5 tons per hour (tph). Strict adherence to air emissions quality and emissions limits were maintained during this stage of the trial.

The first stage of the trial evaluated the processing of the Earthlife® Bio-Solids through Dragon's existing tire chip conveying system. Dragon monitored applicable process data to evaluate the potential impacts to process conditions while introducing the material into the calciner. The tire chip conveying system consists of a steel hopper equipped with a drag chain transport system that moves material from the hopper to the long conveyor belt that feeds material into the Calciner. Dragon determined that the size of the biosolids pellets were too small to be effectively transported through the tire chip conveying system, resulting in material spillage at the drag chain ingress and egress points. In addition, buildup of the bio-solids material resulted in "bridging" in the hopper, preventing effective transportation onto the long conveyor.

Strict adherence to air emissions quality and emissions limits were maintained during this stage of the trial. The emissions results for the first stage of the Earthlife® Bio-Solids trial are provided in Attachment No. 1

#### **Conclusions**

The trial of Earthlife® Bio-Solids material demonstrated that the material cannot be utilized as a viable fuel substitute using Dragon's existing alternative fuels handling system Dragon determined the trial of Earthlife® bio-solids to be unsuccessful based on the following;

- the material handling characteristics prevented sufficient transport of the material into the process; and
- an increase in mercury emissions raises concerns regarding the viability of the bio-solids material as a long term fuel source.

## Section 3 - FiberForm® Graphite and Carbon, Coal-tar Pitch, and Coal-tar Pitch Coke

Dragon proposed a two-stage trial of the Fiberform®, coal-tar pitch and coal-tar pitch coke material to fully evaluate the process handling, clinker chemistry, and air emission impacts to the cement manufacturing process on August 31, 2018. The first stage of the trial examined the material handling of the product and the efficiency of introducing it into the kiln system, and the second stage of the trial proposed to examine clinker chemistry and air emission impacts. As noted in Dragon's Letter of Intent, the materials were sourced from Fiber Materials, Inc. (FMI) in Biddeford, Maine. The material was stored on site in the same manner and location as approved under Fuel Substitution License S-02851-WV-X-N and the facility's Alternative Fuel Operation's Manual. The material was processed and introduced into the kiln system with the existing conveying and shredding system.

The first stage of the trial was designed to evaluate the performance of Dragon's shredder and its ability to adequately process the FiberForm® material. Dragon's shredding system adequately processed the FiberForm® material; however the process created a nuisance dust issue at the exit transfer point from the shredder. Potentially combustible dust created by the shredder is a significant safety concern, so the trial was immediately abandoned.

The first stage of the FiberForm® trial was deemed unsuccessful using Dragon's current alternative fuels system. Dragon did not conduct the second stage of the trial. Dragon processed less than 0.25 tons of material. Therefore, analysis of the clinker chemistry and evaluation of the air emissions were not performed.

However, as noted in Dragon's Letter of Intent, the FiberForm® materials are good candidates for fuel substitution. Laboratory analysis indicates sufficient thermal energy (14,000 – 16,000 Btu/lb) and low ash content. Dragon believes the FiberForm® materials can be processed through the existing solid fuel handling system that currently processes petroleum coke. Additional analysis of the material's hardness is required to determine if the material can be sufficiently processed through the solid fuel milling system. If the FiberForm® materials are adequate for processing through the milling system, Dragon will submit an amended Letter of Intent to conduct a trial utilizing the solid fuel feed system to evaluate the use of this material as an alternative fuel.

#### FiberForm® Conclusions

The trial of Fiberform®, coal-tar pitch and coal-tar pitch coke materials demonstrated that the material cannot be utilized using Dragon's existing alternative fuels handling system Dragon has determined the trial of these materials to be inconclusive, and intends to re-evaluate the material for introduction into the kiln process via an alternative method. Dragon will submit an amended Letter of Intent for additional trialing of these materials.

#### TRIAL CONCLUSIONS

The alternative fuels trials of recycled conveyor belting and Earthlife® Bio-Solids demonstrated that the materials cannot be utilized using Dragon's current alternative fuels handling systems. Based on the data contained in this report, Dragon confirms that the trials of recycled conveyor belting and Earthlife® Bio-Solids were unsuccessful. In addition, the trial of the FiberForm® materials was deemed inconclusive, and additional evaluation of the materials is warranted. FiberForm® If future modifications to Dragon's alternative fuels handling system provide the opportunity to adequately process these materials, Dragon may re-evaluate their use at the facility.

Page 7 Alternative Fuels Trial Results

#### ATTACHMENT No. 1

Air Emission Quality - Stage 1 Earthlife ® Bio-Solids

			07/	30/2018			07/31/2018							
Hour	SO2	NOX	СО	ТНС	Hg	HCL	SO2	NOX	со	ТНС	Hg	HCL		
Hour	(РРН)	(PPH)	(РРН)	(PPMVD @7% O2)	(Lb/Mmto n)	(PPM VD@7 %O2)	(РРН)	(PPH)	(РРН)	(PPMVD @7% O2)	(Lb/Mm ton)	(PPM VD@7 %O2)		
00:00	1.4	188	33.1	2.87	140	0	1.2	193.8	146.2	4.11	26.838	0		
01:00	1.4	198	40.3	2.89	41.793	0	1.1	185.1	124.3	2.68	33.701	0		
02:00	1	179.7	37.7	2.36	12.259	0	1.2	191.1	88.8	2.24	43.415	0		
03:00	1.2	161.7	30.9	2.58	15.467	0	1.6	212.9	99.5	2.56	51.812	0		
04:00	0.9	164.9	52.5	2.32	14.598	0	1.2	198.6	111.1	2.24	59.827	0		
05:00	0.9	159.7	25.7	1.02	13.517	0	1.4	217.7	69.8	1.08	72.661	0		
06:00	1	163.1	29.8	2.24	34.11	0	1.4	220.4	67.8	1.88	115.148	0		
07:00	0.9	160.7	45.1	2.63	14.678	0	1.6	220.2	53.4	2.37	139.255	0		
08:00	0.9	165.3	71.6	4.17	14.718	0	3.3	367.4	47.6	2.56	443.176	0		
09:00	0.9	160.3	52.4	3.61	11.93	0	2.6	284.4	86.2	4.14	463.12	0		
10:00	0.9	164	74.6	4.05	10.568	0	4.1	281.4	91.5	3.56	460.507	0		
11:00	1.1	173.3	54.7	3.1	11.648	0	4.8	258.2	79.4	3.06	468.478	0		
12:00	1.2	213.7	51.9	2.94	23.677	0	2.3	349.7	82.4	3.38	60.145	0		
13:00	1.4	229.5	63.7	3.41	34.124	0	1.6	249.5	77.3	3.16	70.609	0		
14:00	1.7	221	59.5	3.5	31.225	0	1.8	258.2	82.8	3.43	82.318	0		
15:00	1.4	225.9	50.3	2.82	37.789	0	1.8	274.1	60.3	2.64	67.152	0		
16:00	1.2	213	57.2	2.88	37.644	0	1.8	283.3	45.9	2.62	130.193	0		
17:00	1.4	211.9	44	2.39	38.039	0	1.8	272.9	48.4	2.5	56.28	0		
18:00	1.8	208.3	59.5	3.06	112.371	0	1.6	258.4	40.4	2.65	50.665	0		
19:00	3	235	103.9	4.54	378.055	0	1.5	219.7	45.5	2.74	47.153	0		
20:00	12.8	238.6	112.6	4.49	376.77	0	1.3	211.9	31.9	2.39	42.857	0		
21:00	15.1	247.1	123.4	5.3	389.312	0	1.3	204.6	50.9	3.41	38.529	0		
22:00	8.7	233.2	100.1	4.35	380.76	0	1.1	175.3	19.7	2.53	267.407	0		
23:00	4.3	216.3	125.3	4.43	153.922	0	1.3	197.9	21.8	2.38	45.481	0		

<sup>-</sup> Highlighted cells indicate trial data