Part D - South Coast AQMD BACT Determination

Source Type:	**Minor**
Application No.:	**649020 & 649856**
Equipment Category:	**Linear Generator**
Equipment Subcategory:	**Non-Emergency Electrical Generator, Natural Gas Fired**
Date:	**TBD**

1. EQUIPMENT INFORMATION

A. MANUFACTURER: Mainspring Energy	B. MODEL: MSE-230-NG
C. DESCRIPTION: The Mainspring Energy linear generator is a power generation technology that uses a thermochemical reaction to create linear motion that is directly converted into electricity. Each Mainspring Energy linear generator module consists of two identical cores (reaction zone and electrical generator). Each core includes an air-to-fuel ratio controller and is vented to an oxidation catalyst.	
D. FUNCTION: Mainspring linear generator uses a low-temperature reaction to produce electricity and is used as a stationary prime power source at this facility.	
E. SIZE/DIMENSIONS/CAPACITY: Each core is 120 kWe	
COMBUSTION SOURCES	
F. MAXIMUM HEAT INPUT:	
G. BURNER INFORMATION	

TYPE	INDIVIDUAL HEAT INPUT	NUMBER
N/A	N/A	N/A

H. PRIMARY FUEL: Natural gas*	I. OTHER FUEL: N/A
J. OPERATING SCHEDULE: 24 HRS/DAY 7 DAYS/WEEK 52 WKS/YR	
K. EQUIPMENT COST: N/A	
L. EQUIPMENT INFORMATION COMMENTS: * Per Rule 1110.3, Natural Gas means a mixture of gaseous hydrocarbons, with at least 80 percent methane by volume, and of pipeline quality, such as the gas sold or distributed by any utility company regulated by the California public utilities commission.	

2. COMPANY INFORMATION

A. COMPANY: Mainspring Energy, Incorporated	B. FAC ID: 189493
C. ADDRESS: 1150 N Pepper Ave CITY: Colton STATE: CA ZIP: 92324	D. NAICS CODE: 445110
E. CONTACT PERSON: Corrie Zupo	F. TITLE: Manager of Air Compliance
G. PHONE NO.: (424) 241-8959	H. EMAIL: corrie.zupo@mainspringenergy.com

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3. PERMIT INFORMATION

A. AGENCY: South Coast AQMD	B. APPLICATION TYPE: CHANGE OF CONDITIONS
C. SCAQMD ENGINEER: Kraig Morris	
D. PERMIT INFORMATION: PC ISSUANCE DATE: P/O NO.: G75824 & G75826 PO ISSUANCE DATE: 4/25/2024	
E. START-UP DATE: 2021	
F. OPERATIONAL TIME: > 1 year	

4. EMISSION INFORMATION

A. BACT EMISSION LIMITS AND AVERAGING TIMES:

	VOC	NOx	SOx	CO	PM OR PM_{10}	INORGANIC
BACT Limit	10 PPMVD	2.5 PPMVD		12 PPMVD		
Averaging Time	15 Minutes	15 Minutes		15 Minutes		
Correction	15% O_2	15% O_2		15% O_2		

B. OTHER BACT REQUIREMENTS: N/A

C. BASIS OF THE BACT/LAER DETERMINATION: Achieved in Practice/New Technology

D. EMISSION INFORMATION COMMENTS: N/A

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5. CONTROL TECHNOLOGY

A. MANUFACTURER: Johnson Matthey	B. MODEL: MC6T-6F-2
C. DESCRIPTION: Oxidation catalyst	
D. SIZE/DIMENSIONS/CAPACITY: N/A	
E. CONTROL EQUIPMENT PERMIT INFORMATION: N/A APPLICATION NO.: N/A PC ISSUANCE DATE: N/A PO NO.: N/A PO ISSUANCE DATE: N/A	
F. REQUIRED CONTROL EFFICIENCIES: N/A	

CONTAMINANT	OVERALL CONTROL EFFICIENCY	CONTROL DEVICE EFFICIENCY	COLLECTION EFFICIENCY
VOC	___%	___%	___%
NOx	___%	___%	___%
SOx	___%	___%	___%
CO	___%	___%	___%
PM	___%	___%	___%
PM_{10}	___%	___%	___%
INORGANIC	___%	___%	___%

G. CONTROL TECHNOLOGY COMMENTS:

Condition 7) This This equipment shall be equipped with an air-to-fuel ratio controller with an oxygen sensor.

Condition 8) This equipment shall not be operated unless its exhaust is vented to the oxidation catalyst which is in full operation, and which is in good operation condition at all times.

Condition 9) The owner or operator shall inspect the oxidation catalyst every six months of operations in accordance with the recommendation(s) of the oxidation catalyst manufacturer and determine if it needs to be cleaned or washed.

Condition 10) The operator shall wash the catalyst or replace the catalyst media at least after 12,000 hours of operation.

6. DEMONSTRATION OF COMPLIANCE

A. COMPLIANCE DEMONSTRATED BY: Source Test
B. DATE(S) OF SOURCE TEST: 2/21/2023
C. COLLECTION EFFICIENCY METHOD: N/A
D. COLLECTION EFFICIENCY PARAMETERS: N/A

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E. SOURCE TEST/PERFORMANCE DATA:

Parameter	Core 1			Core 2			Permit Limit
	Normal Load	Max. Load	Min. Load	Normal Load	Max. Load	Min. Load	
CO, PPM @ 15% O_2	2.51	2.49	<2.09*	2.24	<1.85*	<2.34*	**12**
NO_X, PPM @ 15% O_2	1.98	1.82	<1.05*	2.25	2.29	<1.17*	**2.5**
VOC, PPM @ 15% O_2	7.48	-	-	8.87	-	-	**10**

* Concentration is below 20% of analyzer range and reported at 20% range.

F. TEST OPERATING PARAMETERS AND CONDITIONS:

Condition 14.A) The test shall measure NOx, VOC, CO, CO2, oxygen content, moisture content, temperature, and exhaust flow rate at the exhaust of the equipment.

Condition 14.B) The test shall be conducted in accordance with the source testing requirements of Rule 1110.3.

G. TEST METHODS (SPECIFY AGENCY):

South Coast AQMD Method 100.1 for NOx, O_2, CO_2, and CO (3 runs, 24-36 mins each)
South Coast AQMD Method 2.3 for velocity (3 runs, 24 mins each)
South Coast AQMD Method 4.1 for moisture (3 runs, 24 mins each)
South Coast AQMD Method 25.3 for VOC (1 run (duplicate canisters), 30 mins)

H. MONITORING AND TESTING REQUIREMENTS:

Condition 13) The owner or operator shall conduct a source test once every five years from the date of the previous source test and not later than the last day of the calendar month that the test is due.

Condition 16) The owner or operator shall conduct diagnostic emissions checks by the use of a portable NOx, CO, and oxygen analyzer at least once every two years from the date of the previous emission check and not later than the last day of the calendar month that the test is due.

I. DEMONSTRATION OF COMPLIANCE COMMENTS: Each core is operated and tested independently.

7. ADDITIONAL SCAQMD REFERENCE DATA

A. BCAT: 040005	B. CCAT: -	C. APPLICATION TYPE CODE: 66
D. RECLAIM FAC? YES ☐ NO ☒	E. TITLE V FAC: YES ☐ NO ☒	F. SOURCE TEST ID(S): R24377
G. SCAQMD SOURCE SPECIFIC RULES: Rule 1110.3		
H. HEALTH RISK FOR PERMIT UNIT		

H1. MICR: -	H2. MICR DATE: -	H3. CANCER BURDEN: -	H4. CB DATE: -
H5: HIA: -	H6. HIA DATE: -	H7. HIC: -	H8. HIC DATE: -

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Equipment or Process: Linear Generator – Non-Emergency Electrical Generator

	Criteria Pollutants				
Subcategory/ Rating/Size	**VOC**	**NOx**	**SOx**	**CO**	**PM_{10}**
Natural Gas Fired	Compliance with Rule 1110.3 (xx-xx-2026)	Compliance with Rule 1110.3 (xx-xx-2026)		Compliance with Rule 1110.3 (xx-xx-2026)	

* Means those facilities that are not major polluting facilities as defined by Rule 1302 - Definitions

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
Best Available Control Technology (BACT) Guidelines for Non-Major Polluting Facilities*

2-2-2018 Rev. 0
xx-xx-2026 Rev. 1

Equipment or Process: Food Oven

		Criteria Pollutants					
Subcategory[1]	**Rating/ Size**	**VOC**	**NOx**	**SOx**	**CO**	**PM10**	**Inorganic**
Ribbon Burner	~~> 500°F~~		~~60~~ 30 ppmvd @ 3% O_2 ~~(2-2-2018)~~(xx-xx-2026)	Natural Gas (2-2-2018)	800 ppmvd @ 3% O_2 ~~Compliance with applicable Rules 407 or 1153.1 (2-2-2018)~~(xx-xx-2026)	Natural Gas (2-2-2018)	
	~~≤ 500°F~~		~~30 ppmvd @ 3% O_2 (2-2-2018)~~	~~Same as above~~	~~Same as above~~	~~Same as above~~	
Other Direct Fired Burner			30 ppmvd @ 3% O_2 (2-2-2018)	Same as above	Same as above	Same as above	
Indirect Fired Burner			30 ppmvd @ 3% O_2 (xx-xx-2026)				
Infrared Burner			~~30~~ 15 ppmvd @ 3% O_2 (2-2-2018)				

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SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
Best Available Control Technology (BACT) Guidelines for Non-Major Polluting Facilities*

		Criteria Pollutants					
Subcategory[1]	**Rating/ Size**	**VOC**	**NOx**	**SOx**	**CO**	**PM10**	**Inorganic**
Add-on Control for Bakery Oven processing yeast leavened products with emissions ≥ 30 lb VOC/day		~~Catalytic o~~Oxidizer with 95% overall control efficiency (mass basis); catalyst inlet temperature ≥ 600ºF; ceramic prefilter (2-2-2018)(xx-xx-2026)	Compliance with Rule 1147 at the time of applicability for Oxidizer (2-2-2018)(xx-xx-2026)				

[1]~~Indirect Fired units may be subject to Rules 1146 and 1146.1 and BACT for Process Heater.~~

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SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
Best Available Control Technology (BACT) Guidelines for Non-Major Polluting Facilities*

10-20-2000 Rev. 0
xx-xx-2026 Rev. 1

Equipment or Process: Storage Tanks - Liquid

	Criteria Pollutants					
Subcategory/ Rating/Size	**VOC**	**NOx**	**SOx**	**CO**	**PM_{10}**	**Inorganic**
Asphalt					Cool Gases to < 120 °F and Vent to a Fiberglass or Steel Wool Filter. (07-11-97)	
External Floating Roof, VP ≤ 11 psia	Category A Tank Seals and Compliance with Rule 463 (10-20-2000)					
Fixed Roof	Vapor Recovery System with an Overall System Efficiency of ≥ ~~95%~~98% and compliance with Rule 463 (7-11-97) (xx-xx-2026)					
Fuming Sulfuric Acid					Scrubber Followed by Fiber Mist Filter; or Water Spray Followed by Fiber Mist Filter (1988)	
Grease or Tallow					Maintain Temperature ≤ 140 °F (1988)	
Internal Floating Roof	Category A Tank Seals and Compliance with Rule 463 (10-20-2000)					
Sulfuric Acid			Caustic Scrubber and Mist Eliminator (1988)			

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	Criteria Pollutants					
Subcategory/ Rating/Size	**VOC**	**NOx**	**SOx**	**CO**	**PM_{10}**	**Inorganic**
Underground, > 250 Gallons	≥ 95% Removal Efficiency for VOC (1990)					

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