







**FUEL BURNING EQUIPMENT USED FOR INDIRECT HEATING  
ANNUAL EMISSION INVENTORY REPORT**  
NORTH DAKOTA DEPARTMENT OF HEALTH  
DIVISION OF AIR QUALITY  
SFN 8536 (11-10)

SK

**GENERAL**

Name of Firm or Organization <b>Otter Tail Power Company</b>	Permit to Operate Number <b>T5-F84011</b>	Year of Emissions <b>2014</b>	
Mailing Address <b>P.O. Box 496</b>	City <b>Fergus Falls</b>	State <b>MN</b>	Zip Code <b>56538-0496</b>
Facility Name <b>Coyote Station</b>	Facility Location <b>6240 13<sup>th</sup> Street SW Beulah, ND 58523</b>	Emission Unit Number <b>EUI 1</b>	

**EQUIPMENT INFORMATION**

Manufacturer of Unit <b>Babcock &amp; Wilcox</b>	Model Number <b>RBC 48/CY</b>	Maximum Heat Input (Btu/hr) <b>5,800 Million Btu/hr</b>
Boiler Type: <input type="checkbox"/> Pulverized Tangential <input checked="" type="checkbox"/> <b>Cyclone</b> <input type="checkbox"/> Spreader Stoker <input type="checkbox"/> Pulverized Wall Fired <input type="checkbox"/> Fluidized Bed <input type="checkbox"/> Other	Electricity Generated (MWe)* <b>2,916,151.28</b>	Actual Hours of Operation <b>7,641.3</b>

\*Electric utility only.

**FUELS USED**

		Primary Fuel	Standby Fuel	Other Fuel
Type (ex. lignite, natural gas, LPG No. 2 fuel oil, No. 6 fuel oil, etc.)		Lignite	No. 2 Fuel Oil	Used Oil
Quantity of Fuel per Year (Specify Units: ex. ton, gal, cu.ft., etc.)		2,248,483 tons	354,668 gallons	1,790 gallons
Percent Ash (Coal Only)	Maximum	8.73% (Expected Range	---	---
	Minimum	7.89% 7.0% to 13.0%)		
	Average	8.37%		
Percent Sulfur	Maximum	0.82% (Expected Range	0.0015% (estimate)	0.0015% (estimate)
	Minimum	0.68% 0.7% to 1.5%)		
	Average	0.74%		
Btu per Unit (Specify lb, ton, gal, etc.)	Maximum	6958 Btu/lb (Expected Range	140,000 Btu/gal	140,000 Btu/gal
	Minimum	6807 Btu/lb 6500 to 7200 Btu/lb)		
	Average	6888 Btu/lb		
Percent Sodium in Coal Ash Average		4.40% (Expected Range 2.0% to 7.0%)	---	---

(USE THE TABLE ABOVE FOR SINGLE FUEL USAGE; USE OTHER SIDE IF MULTIPLE FUELS ARE USED AND THEN SUMMARIZE THE TOTAL EMISSIONS PER YEAR ON THE FOLLOWING TABLE.)

**TOTAL STACK EMISSIONS**

Air Contaminant **	Emission Factor (Include Units)	Emission Factor Source (Include Test Date if Applicable)	Tons
Particulate - Total			193.19
PM <sub>10</sub> (Particulate < 10 microns)			183.53
PM <sub>2.5</sub> (Particulate < 2.5 microns)	0.07 tons/PM Total tons	EPA PM Calculator for PM2.5	13.52
Sulfur Dioxide			12,777.10
Nitrogen Oxides			11,374.50
Carbon Monoxide			675.44
Total Organic Compounds: Nonmethane			78.73
Mercury***			0.08
Ammonia***			33.73

\*\*Submit SFN 19839 for Hazardous Air Pollutants if applicable.

\*\*\*Title V units only.

I declare under the penalties of perjury that this report has been examined by me and to the best of my knowledge is a true, correct and complete report.

Print Name of Person Submitting Report <b>Mark Thoma</b>	Title <b>Manager, Environmental Services</b>	Email <b>mthoma@otpc.com</b>
Signature <i>Mark Thoma</i>	Telephone Number <b>(218) 739-8526</b>	Date <b>2/6/15</b>

Return completed form to:  
North Dakota Department of Health  
Division of Air Quality  
918 E Divide, 2nd Floor  
Bismarck, ND 58501-1947  
Telephone: (701)328-5188

**STACK EMISSIONS**

--- PRIMARY FUEL ---

FUEL TYPE: **Lignite**

Air Contaminant **	Emission Factor (Include Units)	Emission Factor Source (Include Test Date if Applicable)	Tons
Particulate – Total	0.012 lbs/MMBtu	Emissions Test 7/17/2013 – EIIP 7/2001	192.83 <sup>B</sup>
PM <sub>10</sub> (Particulate < 10 microns)	0.012 lbs/MMBtu <sup>C</sup>	Emissions Test 7/25/2007 – EIIP 7/2001	183.12 <sup>B</sup>
PM <sub>2.5</sub> (Particulate < 2.5 microns)	0.07 tons/PM Total tons	EPA PM Calculator	13.52
Sulfur Dioxide	0.79 lbs/MMBtu	CEMS – EIIP, July 2001 <sup>A</sup>	12,777.06 <sup>B</sup>
Nitrogen Oxides	0.71 lbs/MMBtu	CEMS – EIIP, July 2001 <sup>A</sup>	11,370.22 <sup>B</sup>
Carbon Monoxide	0.6 lbs/ton	EIIP July 2001, 1-01-003-03 <sup>A</sup>	674.54
Total Organic Compounds: Nonmethane	0.07 lbs/ton	AP-42, Table 1.7-1, 9/98	78.70
Mercury***	0.045 µg/g & 78% Emission Factor	Fuel analysis & 1999 ICR Stack Test	0.08
Ammonia***	0.030 lb/ton	EIIP, April 2004	33.73

**STACK EMISSIONS**

--- STANDBY FUEL ---

FUEL TYPE: **No. 2 Fuel Oil**

Air Contaminant **	Emission Factor (Include Units)	Emission Factor Source (Include Test Date if Applicable)	Tons
Particulate – Total	2 lbs/1000 gals	EIIP, July 2001, 1-01-005-01 <sup>A</sup>	0.35
PM <sub>10</sub> (Particulate < 10 microns)	2.3 lbs/1000 gals	EIIP, July 2001, 1-01-005-01 <sup>A</sup>	0.41
PM <sub>2.5</sub> (Particulate < 2.5 microns)			No Data
Sulfur Dioxide	143.6 (%S)/1000 gals	EIIP, July 2001, 1-01-005-01 <sup>A</sup>	0.04
Nitrogen Oxides	24 lbs/1000 gals	EIIP, July 2001, 1-01-005-01 <sup>A</sup>	4.26
Carbon Monoxide	5 lbs/1000 gals	EIIP, July 2001, 1-01-005-01 <sup>A</sup>	0.89
Total Organic Compounds: Nonmethane	0.2 lbs/1000 gals	EIIP, July 2001, 1-01-005-01 <sup>A</sup>	0.04
Mercury***			No Data
Ammonia***			No Data

**STACK EMISSIONS**

--- OTHER FUEL ---

FUEL TYPE: **Used Oil**

Air Contaminant **	Emission Factor (Include Units)	Emission Factor Source (Include Test Date if Applicable)	Tons
Particulate – Total	2 lbs/1000 gals	EIIP, July 2001, 1-01-005-01 <sup>A</sup>	0.00
PM <sub>10</sub> (Particulate < 10 microns)	2.3 lbs/1000 gals	EIIP, July 2001, 1-01-005-01 <sup>A</sup>	0.00
PM <sub>2.5</sub> (Particulate < 2.5 microns)			No Data
Sulfur Dioxide	143.6 (%S)/1000 gals	EIIP, July 2001, 1-01-005-01 <sup>A</sup>	0.00
Nitrogen Oxides	24 lbs/1000 gals	EIIP, July 2001, 1-01-005-01 <sup>A</sup>	0.02
Carbon Monoxide	5 lbs/1000 gals	EIIP, July 2001, 1-01-005-01 <sup>A</sup>	0.00
Total Organic Compounds: Nonmethane	0.2 lbs/1000 gals	EIIP, July 2001, 1-01-005-01 <sup>A</sup>	0.00
Mercury***			No Data
Ammonia***			No Data

\*\*Submit SFN 19839 for Hazardous Air Pollutants if applicable.

\*\*\*Title V units only.

Provide calculations for quantities listed above. Use additional sheets if necessary.

<sup>A</sup> Volume II Chapter 14 Uncontrolled Emission Factor Listing for Criteria Pollutants, July 2001, Emission Inventory Improvement Program, (EIIP)<sup>B</sup> Mass Balance Calculation for Particulate, PM-10, Sulfur Dioxide & Nitrous Oxide data from CEMS, less calculated Particulate, PM-10, Sulfur dioxide, and Nitrous Oxide from fuel oil and used oil.<sup>C</sup> PM10 Calculation per Ben Gress, ND DOH 2/8/07 = 95% of PM

See attachment for calculations.

# COYOTE STATION 2014 ANNUAL EMISSION INVENTORY WORK SHEET

Hours of Operation	7,641.30 # Hours
Gross Megawatts Generated	2,916,151.28 Gross MWH
Quantity of Fuel Coal	2,248,483 Tons Coal
Coal - Dry Basis Tons	1,449,372 Tons Coal Dry Basis
Average Heating Value Coal	6,888 As Rec Btu/lb Coal
	10,686 Dry Basis Btu/lb Coal
	35.54 % Moisture
	140,000 BTU/Gal. Oil
CEMS Heat Input	32,197,996 Million Btu/Year
Particulate Emission Rate- Emission Test Data 7/17/2013	0.012 lbs/MMBtu
PM10 calculation by ND DOH (Ben Gross 2/8/07) 95% of PM	0.0114 lbs/MMBtu
Sulfur Dioxide Emission Rate	0.794 lbs/MMBtu
Nitrogen Oxide Emission Rate	0.707 lbs/MMBtu
% Sulfur in Fuel Oil (Estimate)	0.0015 Percent

CEMS - Main boiler only \*C  
 SO2 = 12,777.10 Tons/Yr (incl. Coal & F.O.)  
 NOx = 11,374.50 Tons/Yr (incl. Coal & F.O.)

<b>Fuel Oil</b>	
EUI 1 Main Boiler Oil	354,668 Gallons Oil
EUI 1 Used Oil	1,790 Gallons Oil
<b>Total EUI 1</b>	<b>356,458 Gallons Oil</b>
EUI 2 Auxiliary Boiler	186,270 Gallons Oil
EUI 3 Heating Boiler - gone	
EUI 4 Emergency Diesel Generator	720 Gallons Oil
EUI 5 Emergency Fire Pump Engine	162 Gallons Oil
EUI 6 Scrubber Emergency Diesel Generator	1,341 Gallons Oil
<b>Total</b>	<b>544,951 Gallons Oil</b>

		EUI 1 Main Boiler (No. 2)		EUI 1 Main Boiler		TOTAL	
		FUEL OIL	USED OIL	USED OIL	USED OIL		
		(No. 2)					
		Particulate *A	Particulate *A	Particulate *A	Particulate *A		
		(((Gallons Oil)x(2lbs/1000))/2000	(((Gallons Oil)x(2lbs/1000))/2000	(((Gallons Oil)x(2lbs/1000))/2000	(((Gallons Oil)x(2lbs/1000))/2000		
		= 0.35	= 0.35	= 0.00	= 0.00		
		Tons/yr.	Tons/yr.	Tons/yr.	Tons/yr.		
		PM10 *A	PM10 *A	PM10 *A	PM10 *A		
		(Gallons Oil)x((1 + 1.3 lbs/1000)/2000	(Gallons Oil)x((1 + 1.3 lbs/1000)/2000	(Gallons Oil)x((1 + 1.3 lbs/1000)/2000	(Gallons Oil)x((1 + 1.3 lbs/1000)/2000		
		= 0.41	= 0.41	= 0.00	= 0.00		
		Tons/yr.	Tons/yr.	Tons/yr.	Tons/yr.		
		SO2 *A	SO2 *A	SO2 *A	SO2 *A		
		Main Boiler only	Main Boiler only	Main Boiler only	Main Boiler only		
		(((143.6 X % Sulfur)x(Gallons of Fuel/1000))/2000	(((143.6 X % Sulfur)x(Gallons of Fuel/1000))/2000	(((143.6 X % Sulfur)x(Gallons of Fuel/1000))/2000	(((143.6 X % Sulfur)x(Gallons of Fuel/1000))/2000		
		= 0.04	= 0.04	= 0.00	= 0.00		
		Tons/yr.	Tons/yr.	Tons/yr.	Tons/yr.		
		NOx *A	NOx *A	NOx *A	NOx *A		
		Main Boiler only	Main Boiler only	Main Boiler only	Main Boiler only		
		(24lbs/1000 Gal. x Gallons Oil ] / 2000	(24lbs/1000 Gal. x Gallons Oil ] / 2000	(24lbs/1000 Gal. x Gallons Oil ] / 2000	(24lbs/1000 Gal. x Gallons Oil ] / 2000		
		= 4.26	= 4.26	= 0.02	= 0.02		
		tons/yr.	tons/yr.	Tons/yr.	Tons/yr.		
		CO *A	CO *A	CO *A	CO *A		
		(5 lbs/1000 Gal. x Gallons Oil ] / 2000	(5 lbs/1000 Gal. x Gallons Oil ] / 2000	(5 lbs/1000 Gal. x Gallons Oil ] / 2000	(5 lbs/1000 Gal. x Gallons Oil ] / 2000		
		= 0.89	= 0.89	= 0.00	= 0.00		
		Tons/yr.	Tons/yr.	Tons/yr.	Tons/yr.		
		Total Nonmethane Organic Compounds - Nonmethane *A	Total Nonmethane Organic Compounds - Nonmethane *A	Total Organic Compounds - Nonmethane *A	Total Organic Compounds - Nonmethane *A		
		(0.2 lbs/1000 Gal. x Gallons Oil ] / 2000	(0.2 lbs/1000 Gal. x Gallons Oil ] / 2000	(0.2 lbs/1000 Gal. x Gallons Oil ] / 2000	(0.2 lbs/1000 Gal. x Gallons Oil ] / 2000		
		= 0.04	= 0.04	= 0.00	= 0.00		
		Tons/yr.	Tons/yr.	Tons/yr.	Tons/yr.		
		Hazardous Air Pollutants	Hazardous Air Pollutants	Hazardous Air Pollutants	Hazardous Air Pollutants		
		See Attachment	See Attachment	See Attachment	See Attachment		
Hours of Operation	7,641.30 # Hours	2,248,483 Tons Coal	354,668 gallons	1,790.00 gallons			
Gross Megawatts Generated	2,916,151.28 Gross MWH	Total Tons/yr.	= 0.35				
Quantity of Fuel Coal	2,248,483 Tons Coal	lbs./hr.					
Coal - Dry Basis Tons	1,449,372 Tons Coal Dry Basis	Lig tons/yr					
Average Heating Value Coal	6,888 As Rec Btu/lb Coal	193.188					
	10,686 Dry Basis Btu/lb Coal	= 50.56					
	35.54 % Moisture	192.83					
	140,000 BTU/Gal. Oil						
CEMS Heat Input	32,197,996 Million Btu/Year						
Particulate Emission Rate- Emission Test Data 7/17/2013	0.012 lbs/MMBtu						
PM10 calculation by ND DOH (Ben Gross 2/8/07) 95% of PM	0.0114 lbs/MMBtu						
Sulfur Dioxide Emission Rate	0.794 lbs/MMBtu						
Nitrogen Oxide Emission Rate	0.707 lbs/MMBtu						
% Sulfur in Fuel Oil (Estimate)	0.0015 Percent						
CEMS - Main boiler only *C							
SO2	= 12,777.10 Tons/Yr (incl. Coal & F.O.)						
NOx	= 11,374.50 Tons/Yr (incl. Coal & F.O.)						
EUI 1 Main Boiler							
COAL	2,248,483 Tons Coal						
Particulate *B							
(Emission Rate/MMBTU x CEMS Heat Rate)/2000							
(Tons per Year * 2000) / Hours of Operation							
Lignite only: 193.19 tons - 0.35 tons - 0.00 tons =							
PM10 (see note)							
(Emission Rate lb/MMBTU PM x CEMS Heat Rate)/2000 X 95%							
(Tons per Year * 2000) / Hours of Operation							
Lignite only: 183.53 tons - 0.41 tons - 0.00 tons =							
PM 2.5							
calculated with PM calculator							
SO2 - calculation - Lignite Only							
CEMS mass emiss.-calc.fuel oil for Main Boiler - used oil =							
(12,777.10 tons/yr - 0.04 tons/yr - 0.00 tons/yr) =							
Pounds per Year / Hours of Operation							
= 3,344.21 lbs/hr.							
0.79 Lbs/MMBTU							
NOx - calculation - Lignite Only							
CEMS mass emiss.-calc.fuel oil for Main Boiler - used oil =							
(11,374.50 tons/yr - 4.26 tons/yr - 0.02 tons/yr) =							
Pounds per Year / Hours of Operation							
= 2,975.99 lbs/hr.							
0.71 Lbs/MMBTU							
CO *A							
Tons of Coal x Emission Rate (0.6 lbs/Ton)							
Pounds per Year / Hours of Operation							
= 674.54 Tons/yr.							
= 176.55 lbs/hr.							
Total Nonmethane Organic Compounds (A-42, Table 1.7-1, 9/98)							
Tons of Coal x Emission Rate (0.07 lbs/Ton)							
Pounds per Year / Hours of Operation							
= 78.70 Tons/yr.							
= 20.60 lbs/hr.							
Hazardous Air Pollutants - See attachment							

Note: Ben Gross, ND DOH calculated PM10 based on 95% of the PM stack test results. The calculated PM10 uses this formula rather than the PM dry+ Method 202.  
 2/6/2015 10:16  
 Updated by Paul Vuikonich - Otter Tail Power Company

\*A : Per Vol. II Chp. 14, Uncontrolled Emission Factor Listing for Criteria Air Pollutants, July 2001  
 \*B : Per Emission Test Data 7/30/2003  
 \*C : Per CEMS Annual Emissions Average  
 \*D : Total SO2 & NOx = CEMs(includes main boiler & used oil) + F.O. Other than Main Boiler





Basis for quantities listed above; provide calculations (use additional sheets if necessary):

**See attached worksheet for calculations.**

**COYOTE STATION**

**2014 HAZARDOUS AIR POLLUTANT ANNUAL EMISSIONS INVENTORY REPORT**

EUI 1 - Cyclone Fired Boiler

**Hydrochloric Acid \*<sup>3</sup>**

<b>Coal</b>	=		
Heat Rate = Heat Input from Coal (Coal Ht) * (5.25E-05 lb HCl / mmBtu)	=	30,975,102	million Btu/year
HCl Lbs/year / 2000 lbs/ton =	=	1,626	lbs/year
	=	0.81	Tons/Year
<b>Oil</b>			
(0.347 lb/1000 gal of oil *(354,668 gals/ 1000) / 2000 lbs/ton) =	=	0.06	Tons/Year
<b>Combined</b>	Total	0.87	Tons/Year
(Tons of HCl/Year X 2000 lb/ton) /Hours of Operation	=	0.23	Lb/Hr

**Hydrofluoric Acid\*<sup>1</sup>**

<b>Coal</b>			
(56.9 ppm F <sup>-1</sup> / 10,686 Dry Basis Btu/lb. X 10 <sup>6</sup> x 1.05263158* <sup>2</sup> x 0.06)=	=	336.31	Lbs/ 10 <sup>12</sup> Btu
Heat Rate = CEMS Heat Rate	=	32.20	Trillion Btu/year
HFI Lbs/10 <sup>12</sup> Btu * 10 <sup>12</sup> Btu/yr / 2000 lbs/ton =	=	5.41	Tons/year
<b>Oil</b>			
(0.0373 lb/1000 gal of oil * (354,668 gal / 1000) / 2000 lbs/ton =	=	0.007	Tons/Year
<b>Combined</b>	Total	5.42	Tons/Year
(Tons of HFI/ Year X 2000 lb/Ton)/ Hours of Operation =	=	1.42	Lbs/Hour

**Ammonia - NH<sub>3</sub>\*<sup>4</sup>**

<b>Coal</b>			
0.030 lb/ton X 2,248,483 tons/ 2000 lbs per ton =		33.73	Tons/Year
		33.73	Tons/Year
(Tons of NH <sub>3</sub> /Year X 2000 lb/ton) / Hours of Operation =		8.83	Lbs/Hour

**Mercury**

<b>Coal</b>			
0.045 <sup>5</sup> µg/g /1,000,000 * 2000 =		0.00009	Lbs/Ton
0.00009 lb/ton Hg * 2,248,483 tons of coal * 78% emission factor <sup>6</sup> =		157.8	Lbs/Year
		0.08	Tons/Year
		157.84	Lbs/Year
		0.08	Tons/Year
(Lbs/Year / Hours of Operation) =		0.02	Lbs/Hour

**Lead<sup>7</sup>** per request by Ben Gress 3.10.09

<b>Coal</b>			
3.4 * (Concentration of metal in coal ppm dry basis / ash fraction dry * PM 10 <sup>6</sup> Btu) <sup>0.80</sup>		1.31	Lbs/ 10 <sup>12</sup> Btu
Heat Rate = CEMS Heat Rate		32.20	Trillion Btu/year
Ash % As Received / ( 1-%Moist/100) = Dry Basis		12.98%	
PISCES Data: composition of Northern Great Plains Lignite Coal		3.3	mg/kg
	Tons of Lead in Coal	0.02	Tons/Year
(Lbs/Year / Hours of Operation) =		0.006	Lbs/Hour

\*<sup>1</sup> Emission Factor is from EPRI Emissions Factors Handbook, Nov 1995 (with 1998 Addendum), FGD Systems, page 2-16

\*<sup>2</sup> Corrected from F to HF (20/19)= 1.05263158

\*<sup>3</sup> Emission Factor of 5.35E-05 lb HCl/mmBtu from 2012 stack test conducted by GE on August 9, 2012

\*<sup>4</sup> EIIP - Estimating Ammonia Emissions from Anthropogenic Nonagricultural Sources - Draft Final Report, April 2004.

\*<sup>5</sup> Average mercury in coal for 2014 is 0.045 µg/g.

\*<sup>6</sup> Emission factor based on 1999 stack testing as part of the EPA ICR.

\*<sup>7</sup> AP-42 Table 1.7-12, page 1.7-20, 9/98





**FUEL BURNING EQUIPMENT USED FOR INDIRECT HEATING  
ANNUAL EMISSION INVENTORY REPORT**  
NORTH DAKOTA DEPARTMENT OF HEALTH  
DIVISION OF AIR QUALITY  
SFN 8536 (11-10)

SK

**GENERAL**

Name of Firm or Organization <b>Otter Tail Power Company</b>	Permit to Operate Number <b>T5-F84011</b>	Year of Emissions <b>2014</b>	
Mailing Address <b>P.O. Box 496</b>	City <b>Fergus Falls</b>	State <b>MN</b>	Zip Code <b>56538-0496</b>
Facility Name <b>Coyote Station</b>	Facility Location <b>6240 13<sup>th</sup> Street SW Beulah, ND 58523</b>	Emission Unit Number <b>EUI 2</b>	

**EQUIPMENT INFORMATION**

Manufacturer of Unit <b>Combustion Engineering</b>	Model Number <b>31-A-14</b>	Maximum Heat Input (Btu/hr) <b>202 Million Btu/hr</b>
Boiler Type: <input type="checkbox"/> Pulverized Tangential <input type="checkbox"/> Cyclone <input type="checkbox"/> Spreader Stoker <input type="checkbox"/> Pulverized Wall Fired <input type="checkbox"/> Fluidized Bed <input checked="" type="checkbox"/> <b>Other – Horizontally Fired Boiler</b>	Electricity Generated (MWe)*	Actual Hours of Operation <b>339.1</b>

\*Electric utility only.

**FUELS USED**

Type (ex. lignite, natural gas, LPG No. 2 fuel oil, No. 6 fuel oil, etc.)	Primary Fuel	Standby Fuel	Other Fuel
	<b>No. 2 Fuel Oil</b>		
Quantity of Fuel per Year (Specify Units: ex. ton, gal, cu.ft., etc.)	<b>186,270 gallons</b>		
Percent Ash (Coal Only)			
Maximum Minimum Average	<b>-----</b>		
Percent Sulfur	<b>0.0015% (estimate)</b>		
Maximum Minimum Average			
Btu per Unit (Specify lb, ton, gal, etc.)	<b>140,000 Btu/gal</b>		
Maximum Minimum Average			
Percent Sodium in Coal Ash Average	<b>-----</b>	<b>---</b>	<b>---</b>

(USE THE TABLE ABOVE FOR SINGLE FUEL USAGE; USE OTHER SIDE IF MULTIPLE FUELS ARE USED AND THEN SUMMARIZE THE TOTAL EMISSIONS PER YEAR ON THE FOLLOWING TABLE.)

**TOTAL STACK EMISSIONS**

Air Contaminant **	Emission Factor (Include Units)	Emission Factor Source (Include Test Date if Applicable)	Tons
Particulate – Total	<b>2 lbs/1000 gals</b>	<b>EIIP, July 2001, 1-01-005-01<sup>A</sup></b>	<b>0.19</b>
PM <sub>10</sub> (Particulate < 10 microns)	<b>2.3 lbs/1000 gals</b>	<b>EIIP, July 2001, 1-01-005-01<sup>A</sup></b>	<b>0.21</b>
PM <sub>2.5</sub> (Particulate < 2.5 microns)			
Sulfur Dioxide	<b>143.6 (%S)/1000 gals</b>	<b>EIIP, July 2001, 1-01-005-01<sup>A</sup></b>	<b>0.02</b>
Nitrogen Oxides	<b>24 lbs/1000 gals</b>	<b>EIIP, July 2001, 1-01-005-01<sup>A</sup></b>	<b>2.24</b>
Carbon Monoxide	<b>5 lbs/1000 gals</b>	<b>EIIP, July 2001, 1-01-005-01<sup>A</sup></b>	<b>0.47</b>
Total Organic Compounds: Nonmethane	<b>0.2 lbs/1000 gals</b>	<b>EIIP, July 2001, 1-01-005-01<sup>A</sup></b>	<b>0.02</b>
Mercury***			
Ammonia***			

\*\*Submit SFN 19839 for Hazardous Air Pollutants if applicable.

\*\*\*Title V units only.

I declare under the penalties of perjury that this report has been examined by me and to the best of my knowledge is a true, correct and complete report.

Print Name of Person Submitting Report <b>Mark Thoma</b>	Title <b>Manager, Environmental Services</b>	Email <b>mthoma@otpc.com</b>
Signature <i>Mark Thoma</i>	Telephone Number <b>(218) 739-8526</b>	Date <b>2/6/15</b>

Return completed form to:  
North Dakota Department of Health  
Division of Air Quality  
918 E Divide, 2nd Floor  
Bismarck, ND 58501-1947  
Telephone: (701)328-5188

<sup>A</sup>Footnote on page 2

**STACK EMISSIONS**

--- PRIMARY FUEL ---

FUEL TYPE:

Air Contaminant **	Emission Factor (Include Units)	Emission Factor Source (Include Test Date if Applicable)	Tons
Particulate – Total			
PM <sub>10</sub> (Particulate < 10 microns)			
PM <sub>2.5</sub> (Particulate < 2.5 microns)			
Sulfur Dioxide			
Nitrogen Oxides			
Carbon Monoxide			
Total Organic Compounds: Nonmethane			
Mercury***			
Ammonia***			

**STACK EMISSIONS**

--- STANDBY FUEL ---

FUEL TYPE:

Air Contaminant **	Emission Factor (Include Units)	Emission Factor Source (Include Test Date if Applicable)	Tons
Particulate – Total			
PM <sub>10</sub> (Particulate < 10 microns)			
PM <sub>2.5</sub> (Particulate < 2.5 microns)			
Sulfur Dioxide			
Nitrogen Oxides			
Carbon Monoxide			
Total Organic Compounds: Nonmethane			
Mercury***			
Ammonia***			

**STACK EMISSIONS**

--- OTHER FUEL ---

FUEL TYPE:

Air Contaminant **	Emission Factor (Include Units)	Emission Factor Source (Include Test Date if Applicable)	Tons
Particulate – Total			
PM <sub>10</sub> (Particulate < 10 microns)			
PM <sub>2.5</sub> (Particulate < 2.5 microns)			
Sulfur Dioxide			
Nitrogen Oxides			
Carbon Monoxide			
Total Organic Compounds: Nonmethane			
Mercury***			
Ammonia***			

\*\*Submit SFN 19839 for Hazardous Air Pollutants if applicable.

\*\*\*Title V units only.

Provide calculations for quantities listed above. Use additional sheets if necessary.

<sup>A</sup> Volume II Chapter 14 Uncontrolled Emission Factor Listing for Criteria Pollutants, July 2001, Emission Inventory Improvement Program, (EIIP)

See attachment for calculations.



# HAZARDOUS AIR POLLUTANT ANNUAL EMISSIONS INVENTORY REPORT

NORTH DAKOTA DEPARTMENT OF HEALTH  
DIVISION OF AIR QUALITY  
SFN 19839 (11-11) (AP-317)

fk

Name of Firm or Organization <b>Otter Tail Power Company</b>		Permit to Operate Number <b>T5-F84011</b>	Year of Emissions <b>2014</b>	
Mailing Address <b>P.O. Box 496</b>		City <b>Fergus Falls</b>	State <b>MN</b>	Zip Code <b>56538-0496</b>
Facility Name <b>Coyote Station</b>		Facility Location <b>6240 13<sup>th</sup> Street SW, Beulah, ND 58523</b>		Emission Unit Number <b>EUI 2</b>
Amount of Material Processed (material used, etc.) <b>186,270 gallons No. 2 fuel oil</b>				
Hours of Operation: <b>339.1</b>	Air Pollution Control Equipment: <b>None</b>			

### HAZARDOUS AIR POLLUTANT EMISSIONS:

CHEMICAL EMITTED TO AIR	CAS NUMBER	EMISSIONS QUANTITY	
		EMISSIONS FACTOR (Include Units)	TONS
Organic HAPS			0.004
Metal HAPS			0.0006

I declare under the penalties of perjury that this report has been examined by me and to the best of my knowledge is a true, correct and complete report.

Print Name of Person Submitting Report <b>Mark Thoma</b>	Title <b>Manager, Environmental Services</b>	Email <b>mthoma@otpc.com</b>
Signature <i>Mark Thoma</i>	Telephone Number <b>(218) 739-8526</b>	Date <b>2/6/15</b>

Return completed form to: North Dakota Department of Health  
Division of Air Quality  
918 E Divide, 2nd Floor  
Bismarck, ND 58501-1947  
Telephone: (701)328-5188

Basis for quantities listed above; provide calculations (use additional sheets if necessary):

Organic HAPS

AP-42, 1.3, Table 1.3-9, 9/98

Sum of table of emission factors for speciated organic compounds from fuel oil combustion = 0.0410 lbs/gal fuel oil.

$$0.0410 \text{ lbs/gal} * (186,270 \text{ gals/1000}) / 2000 \text{ lbs/ton} = 0.004 \text{ tons/year}$$

Metal HAPS

AP-42, 1.3, Table 1.3-10, 9/98

Sum of table of emission factors for trace elements from distillate fuel oil combustion sources, with the exception of copper and zinc, which are not HAPS = 0.000049 lb/MMBtu

$$(0.000049 \text{ lb/MMBtu} * (186,270 \text{ gals} * 140,000 \text{ Btu/gal}/1,000,000)) / 2000 \text{ lbs/ton} = 0.0006 \text{ tons/year}$$

**COYOTE STATION  
2014 ANNUAL EMISSION INVENTORY WORK SHEET**

<b>EUI 2</b>			
<b>Auxiliary Boiler</b>		339.1 hours	
<b>FUEL OIL - No. 2</b>		186,270 gallons	
<b>Aux Boiler</b>		26,078 MM Btu	
<b>Particulate *A</b>			
$((\text{Gallons Oil}) \times (2 \text{ lbs}/1000)) / 2000$	=	0.19	Tons/yr.
<b>P1M10 *A</b>			
$(\text{Gallons Oil}) \times ((1 + 1.3 \text{ lbs})/1000) / 2000$	=	0.21	Tons/yr.
<b>SO2 *A</b>			
$[(143.6 \times \% \text{ Sulfur}) \times (\text{Gallons of Fuel}/1000)] / 2000$	=	0.02	Tons/yr.
<b>NOx *A</b>			
$[24 \text{ lbs}/1000 \text{ Gal.} \times \text{Gallons Oil}] / 2000$	=	2.24	Tons/yr.
<b>CO *A</b>			
$[5 \text{ lbs}/1000 \text{ Gal.} \times \text{Gallons Oil}] / 2000$	=	0.47	Tons/yr.
<b>Total Organic Compounds - Nonmethane *A</b>			
$[0.2 \text{ lbs}/1000 \text{ Gal.} \times \text{Gallons Oil}] / 2000$	=	0.02	Tons/yr.
<b>Hazardous Air Pollutants</b>			
Organic HAPs - AP-42, 1.3, Table 1.3-9, 9/98, 0.0410 lbs./1,000 gals.	=	0.004	Tons/yr.
Metal HAPs - AP-42, 1.3, Table 1.3-10, 9/98, 0.000049 lbs/MM Btu	=	0.0006	Tons/yr.
<b>Total EUI 2</b>		<b>3.14</b>	<b>Tons/yr.</b>

\*A : Per Vol. II Chp. 14, Uncontrolled Emission Factor Listing for Criteria Air Pollutants, 1-01-005-01, July 2001  
Emission Inventory Improvement Program, ([www.epa.gov/ttn/chieff/ep/techreport/volume2/index.html](http://www.epa.gov/ttn/chieff/ep/techreport/volume2/index.html))





**COMPRESSOR/INDUSTRIAL ENGINES  
ANNUAL EMISSIONS INVENTORY REPORT**  
NORTH DAKOTA DEPARTMENT OF HEALTH  
DIVISION OF AIR QUALITY  
SFN 11829 (11-10)

810

**GENERAL**

Name of Firm or Organization <b>Otter Tail Power Company</b>	Permit to Operate Number <b>T5-F84011</b>	Year of Emissions <b>2014</b>	
Mailing Address <b>P.O. Box 496</b>	City <b>Fergus Falls</b>	State <b>MN</b>	Zip Code <b>56538-0496</b>
Facility Name <b>Coyote Station</b>	Facility Location <b>6240 13<sup>th</sup> Street SW Beulah, ND 58523</b>	Emission Unit Number <b>EUI 4</b>	

**EQUIPMENT INFORMATION**

<input type="checkbox"/> Stationary Gas Turbine	<input type="checkbox"/> Reciprocating Engine <input type="checkbox"/> 2-Stroke Lean Burn	<input type="checkbox"/> Dual Fuel Engine	<input type="checkbox"/> Spark Ignition
<input type="checkbox"/> Stationary Large Bore Diesel	<input type="checkbox"/> 4-Stroke Lean Burn <input type="checkbox"/> 4-Stroke Rich Burn	<input checked="" type="checkbox"/> Other, Specify <b>Emergency Diesel Generator</b>	<input type="checkbox"/> Compression Ignition
Manufacturer of Unit <b>Waukesha Power Systems</b>	Model Number <b>VHP 5790 DSIU</b>	Actual Hours of Operation <b>18.0</b>	
Maximum Rating BHP at RPM	Design Capacity <b>1440</b> BHP at RPM		

**FUELS USED**

Natural Gas (if applicable)	Thousand Cu. Ft.	Btu/Cu. Ft.	Percent H <sub>2</sub> S
Diesel (if applicable)	Gallons	Btu/Gal	
	<b>720</b>	<b>140,000</b>	
LP Gas (if applicable)	Gallons	Btu/Gal	
Other (Specify)	Specify	Btu/Unit	

**COMPRESSOR STATION FLARE STACK EMISSIONS**

Quantity Flared <b>NA</b> Thousand Cu. Ft./Yr	Average H <sub>2</sub> S Content <b>NA</b>	SO <sub>2</sub> Emissions <b>NA</b> Tons/Yr
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**TOTAL STACK EMISSIONS**

(USE THIS TABLE FOR SINGLE FUEL USAGE. USE OTHER SIDE IF MULTIPLE FUELS ARE USED AND SUMMARIZE THE TOTAL TONS ON THIS TABLE.)

Air Contaminant	Emission Factor (Include Units)	Emission Factor Source (Include Test Date if Applicable)	Tons
Particulate - Total	0.1 lb/MMBtu	AP-42 3.4-5, Table 3.4-1, 10/96	0.005
PM <sub>10</sub> (Particulate < 10 microns)	0.0573 lb/MMBtu	AP-42 3.4-6, Table 3.4-2, 10/96	0.003
PM <sub>2.5</sub> (Particulate < 2.5 microns)			
Sulfur Dioxide	1.01 (%S) lb/MMBtu	AP-42 3.4-5, Table 3.4-1, 10/96	0.000
Nitrogen Oxides	3.2 lb/MMBtu	AP-42 3.4-5, Table 3.4-1, 10/96	0.161
Carbon Monoxide	0.85 lb/MMBtu	AP-42 3.4-5, Table 3.4-1, 10/96	0.043
Total Organic Compounds: Nonmethane	0.09 lb/MMBtu	AP-42 3.4-5, Table 3.4-1, 10/96	0.005
Hazardous Air Pollutants	You must also submit SFN 19839 for Hazardous Air Pollutants (include formaldehyde and total hazardous air pollutant emissions.)		

I declare under the penalties of perjury that this report has been examined by me and to the best of my knowledge is a true, correct and complete report.

Print Name of Person Submitting Report <b>Mark Thoma</b>	Title <b>Manager, Environmental Services</b>	Email <b>mthoma@otpc.com</b>
Signature 	Telephone Number <b>(218) 739-8526</b>	Date <b>2/6/15</b>

**STACK EMISSIONS**

**FUEL TYPE:**

Air Contaminant	Emission Factor (Include Units)	Emission Factor Source (Include Test Date if Applicable)	Tons
Particulate – Total			
PM <sub>10</sub> (Particulate < 10 microns)			
PM <sub>2.5</sub> (Particulate < 2.5 microns)			
Sulfur Dioxide			
Nitrogen Oxides			
Carbon Monoxide			
Total Organic Compounds: Nonmethane			
Hazardous Air Pollutants	You must also submit SFN 19839 for Hazardous Air Pollutants (include formaldehyde and total hazardous air pollutant emissions.)		

**STACK EMISSIONS**

**FUEL TYPE:**

Air Contaminant	Emission Factor (Include Units)	Emission Factor Source (Include Test Date if Applicable)	Tons
Particulate – Total			
PM <sub>10</sub> (Particulate < 10 microns)			
PM <sub>2.5</sub> (Particulate < 2.5 microns)			
Sulfur Dioxide			
Nitrogen Oxides			
Carbon Monoxide			
Total Organic Compounds: Nonmethane			
Hazardous Air Pollutants	You must also submit SFN 19839 for Hazardous Air Pollutants (include formaldehyde and total hazardous air pollutant emissions.)		

Provide calculations for quantities listed above. Use additional sheets if necessary.

**See attached for calculations.**

Return completed form to:  
 North Dakota Department of Health  
 Division of Air Quality  
 918 E Divide, 2nd Floor  
 Bismarck, ND 58501-1947  
 Telephone: (701)328-5188



Basis for quantities listed above; provide calculations (use additional sheets if necessary):

**HAPS**

Organic HAPS

AP-42, 3.4, Table 3.4-3, 10/96

Sum of table of emission factors for speciated organic compound emission factors for large uncontrolled stationary diesel engines = **0.00415198 lb/MMBtu**

PAH HAPS

AP-42, 3.4, Table 3.4-4, 10/96

Sum of table of emission factors for large uncontrolled stationary diesel engines = **0.000212 lb/MMBtu**

**$(0.004152 \text{ lb/MMBtu} + 0.000212 \text{ lb/MMBtu}) * (720 \text{ gals} * 140,000 \text{ Btu/gal} / 1,000,000) / 2000 \text{ lbs/ton} = 0.0002 \text{ tons/year}$**



**COMPRESSOR/INDUSTRIAL ENGINES  
ANNUAL EMISSIONS INVENTORY REPORT**  
NORTH DAKOTA DEPARTMENT OF HEALTH  
DIVISION OF AIR QUALITY  
SFN 11829 (11-10)

BK

**GENERAL**

Name of Firm or Organization <b>Otter Tail Power Company</b>	Permit to Operate Number <b>T5-F84011</b>	Year of Emissions <b>2014</b>	
Mailing Address <b>P.O. Box 496</b>	City <b>Fergus Falls</b>	State <b>MN</b>	Zip Code <b>56538-0496</b>
Facility Name <b>Coyote Station</b>	Facility Location <b>6240 13<sup>th</sup> Street SW Beulah, ND 58523</b>	Emission Unit Number <b>EUI 5</b>	

**EQUIPMENT INFORMATION**

<input type="checkbox"/> Stationary Gas Turbine	<input type="checkbox"/> Reciprocating Engine <input type="checkbox"/> 2-Stroke Lean Burn	<input type="checkbox"/> Dual Fuel Engine	<input type="checkbox"/> Spark Ignition
<input type="checkbox"/> Stationary Large Bore Diesel	<input type="checkbox"/> 4-Stroke Lean Burn <input type="checkbox"/> 4-Stroke Rich Burn	<input checked="" type="checkbox"/> Other, Specify <b>Emergency Fire Pump Engine</b>	<input type="checkbox"/> Compression Ignition
Manufacturer of Unit <b>Cummins</b>	Model Number <b>NT-855-F2</b>	Actual Hours of Operation <b>20.2</b>	
Maximum Rating <b>BHP at RPM</b>	Design Capacity <b>225 BHP at RPM</b>		

**FUELS USED**

Natural Gas (if applicable)	Thousand Cu. Ft.	Btu/Cu. Ft.	Percent H <sub>2</sub> S
Diesel (if applicable)	Gallons	Btu/Gal	
	<b>161.6</b>	<b>140,000</b>	
LP Gas (if applicable)	Gallons	Btu/Gal	
Other (Specify)	Specify	Btu/Unit	

**COMPRESSOR STATION FLARE STACK EMISSIONS**

Quantity Flared <b>NA</b> Thousand Cu. Ft./Yr	Average H <sub>2</sub> S Content <b>NA</b>	SO <sub>2</sub> Emissions <b>NA</b> Tons/Yr
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**TOTAL STACK EMISSIONS**

(USE THIS TABLE FOR SINGLE FUEL USAGE. USE OTHER SIDE IF MULTIPLE FUELS ARE USED AND SUMMARIZE THE TOTAL TONS ON THIS TABLE.)

Air Contaminant	Emission Factor (Include Units)	Emission Factor Source (Include Test Date if Applicable)	Tons
Particulate - Total	0.31 lb/MMBtu	AP-42 3.3-6, Table 3.3-1, 10/96	0.004
PM <sub>10</sub> (Particulate < 10 microns)	0.031 lb/MMBtu	AP-42 3.3-6, Table 3.3-1, 10/96	0.004
PM <sub>2.5</sub> (Particulate < 2.5 microns)			
Sulfur Dioxide	0.29 lb/MMBtu	AP-42 3.3-6, Table 3.3-1, 10/96	0.003
Nitrogen Oxides	4.41 lb/MMBtu	AP-42 3.3-6, Table 3.3-1, 10/96	0.050
Carbon Monoxide	0.95 lb/MMBtu	AP-42 3.3-6, Table 3.3-1, 10/96	0.011
Total Organic Compounds: Nonmethane	0.35 lb/MMBtu	AP-42 3.3-6, Table 3.3-1, 10/96	0.004
Hazardous Air Pollutants	You must also submit SFN 19839 for Hazardous Air Pollutants (include formaldehyde and total hazardous air pollutant emissions.)		

I declare under the penalties of perjury that this report has been examined by me and to the best of my knowledge is a true, correct and complete report.

Print Name of Person Submitting Report <b>Mark Thoma</b>	Title <b>Manager, Environmental Services</b>	Email <b>mthoma@otpco.com</b>
Signature 	Telephone Number <b>(218) 739-8526</b>	Date <b>2/6/15</b>

**STACK EMISSIONS**

**FUEL TYPE:**

Air Contaminant	Emission Factor (Include Units)	Emission Factor Source (Include Test Date if Applicable)	Tons
Particulate – Total			
PM <sub>10</sub> (Particulate < 10 microns)			
PM <sub>2.5</sub> (Particulate < 2.5 microns)			
Sulfur Dioxide			
Nitrogen Oxides			
Carbon Monoxide			
Total Organic Compounds: Nonmethane			
Hazardous Air Pollutants	You must also submit SFN 19839 for Hazardous Air Pollutants (include formaldehyde and total hazardous air pollutant emissions.)		

**STACK EMISSIONS**

**FUEL TYPE:**

Air Contaminant	Emission Factor (Include Units)	Emission Factor Source (Include Test Date if Applicable)	Tons
Particulate – Total			
PM <sub>10</sub> (Particulate < 10 microns)			
PM <sub>2.5</sub> (Particulate < 2.5 microns)			
Sulfur Dioxide			
Nitrogen Oxides			
Carbon Monoxide			
Total Organic Compounds: Nonmethane			
Hazardous Air Pollutants	You must also submit SFN 19839 for Hazardous Air Pollutants (include formaldehyde and total hazardous air pollutant emissions.)		

Provide calculations for quantities listed above. Use additional sheets if necessary.

**See attached for calculations.**

Return completed form to:  
 North Dakota Department of Health  
 Division of Air Quality  
 918 E Divide, 2nd Floor  
 Bismarck, ND 58501-1947  
 Telephone: (701)328-5188



Basis for quantities listed above; provide calculations (use additional sheets if necessary):

HAPS

Organic HAPS

AP-42, 3.3, Table 3.3-2, 10/96

Sum of table of emission factors for speciated organic compound emission factors for uncontrolled stationary diesel engines less than 600 hp = **0.000168 lb/MMBtu**

$$(0.000168 \text{ lb/MMBtu} * 161.6 \text{ gals} * 140,000 \text{ Btu/gal} / 1,000,000) / 2000 \text{ lbs/ton} = 0.000002 \text{ tons/year}$$



**COMPRESSOR/INDUSTRIAL ENGINES  
ANNUAL EMISSIONS INVENTORY REPORT**  
NORTH DAKOTA DEPARTMENT OF HEALTH  
DIVISION OF AIR QUALITY  
SFN 11829 (11-10)

8K

**GENERAL**

Name of Firm or Organization <b>Otter Tail Power Company</b>	Permit to Operate Number <b>T5-F84011</b>	Year of Emissions <b>2014</b>	
Mailing Address <b>P.O. Box 496</b>	City <b>Fergus Falls</b>	State <b>MN</b>	Zip Code <b>56538-0496</b>
Facility Name <b>Coyote Station</b>	Facility Location <b>6240 13<sup>th</sup> Street SW Beulah, ND 58523</b>	Emission Unit Number <b>EUI 6</b>	

**EQUIPMENT INFORMATION**

<input type="checkbox"/> Stationary Gas Turbine	<input type="checkbox"/> Reciprocating Engine <input type="checkbox"/> 2-Stroke Lean Burn	<input type="checkbox"/> Dual Fuel Engine	<input type="checkbox"/> Spark Ignition
<input type="checkbox"/> Stationary Large Bore Diesel	<input type="checkbox"/> 4-Stroke Lean Burn <input type="checkbox"/> 4-Stroke Rich Burn	<input checked="" type="checkbox"/> Other, Specify <b>Scrubber Emergency Diesel Generator</b>	<input type="checkbox"/> Compression Ignition
Manufacturer of Unit <b>Kohler</b>	Model Number <b>900 ROZD</b>	Actual Hours of Operation <b>44.7</b>	
Maximum Rating BHP at RPM	Design Capacity <b>1375</b> BHP at RPM		

**FUELS USED**

Natural Gas (if applicable)	Thousand Cu. Ft.	Btu/Cu. Ft.	Percent H <sub>2</sub> S
Diesel (if applicable)	Gallons <b>1,341</b>	Btu/Gal <b>140,000</b>	
LP Gas (if applicable)	Gallons	Btu/Gal	
Other (Specify)	Specify	Btu/Unit	

**COMPRESSOR STATION FLARE STACK EMISSIONS**

Quantity Flared <b>NA</b> Thousand Cu. Ft./Yr	Average H <sub>2</sub> S Content <b>NA</b>	SO <sub>2</sub> Emissions <b>NA</b> Tons/Yr
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(USE THIS TABLE FOR SINGLE FUEL USAGE. USE OTHER SIDE IF MULTIPLE FUELS ARE USED AND SUMMARIZE THE TOTAL TONS ON THIS TABLE.)

**TOTAL STACK EMISSIONS**

Air Contaminant	Emission Factor (Include Units)	Emission Factor Source (Include Test Date if Applicable)	Tons
Particulate - Total	0.1 lb/MMBtu	AP-42 3.4-5, Table 3.4-1, 10/96	0.009
PM <sub>10</sub> (Particulate < 10 microns)	0.0573 lb/MMBtu	AP-42 3.4-6, Table 3.4-2, 10/96	0.005
PM <sub>2.5</sub> (Particulate < 2.5 microns)			
Sulfur Dioxide	1.01 (%S) lb/MMBtu	AP-42 3.4-5, Table 3.4-1, 10/96	0.000
Nitrogen Oxides	3.2 lb/MMBtu	AP-42 3.4-5, Table 3.4-1, 10/96	0.300
Carbon Monoxide	0.85 lb/MMBtu	AP-42 3.4-5, Table 3.4-1, 10/96	0.080
Total Organic Compounds: Nonmethane	0.09 lb/MMBtu	AP-42 3.4-5, Table 3.4-1, 10/96	0.008
Hazardous Air Pollutants	You must also submit SFN 19839 for Hazardous Air Pollutants (include formaldehyde and total hazardous air pollutant emissions.)		

I declare under the penalties of perjury that this report has been examined by me and to the best of my knowledge is a true, correct and complete report.

Print Name of Person Submitting Report <b>Mark Thoma</b>	Title <b>Manager, Environmental Services</b>	Email <b>mthoma@otpc.com</b>
Signature <i>Mark Thoma</i>	Telephone Number <b>(218) 739-8526</b>	Date <b>2/6/15</b>

**STACK EMISSIONS**

**FUEL TYPE:**

Air Contaminant	Emission Factor (Include Units)	Emission Factor Source (Include Test Date if Applicable)	Tons
Particulate – Total			
PM <sub>10</sub> (Particulate < 10 microns)			
PM <sub>2.5</sub> (Particulate < 2.5 microns)			
Sulfur Dioxide			
Nitrogen Oxides			
Carbon Monoxide			
Total Organic Compounds: Nonmethane			
Hazardous Air Pollutants	You must also submit SFN 19839 for Hazardous Air Pollutants (include formaldehyde and total hazardous air pollutant emissions.)		

**STACK EMISSIONS**

**FUEL TYPE:**

Air Contaminant	Emission Factor (Include Units)	Emission Factor Source (Include Test Date if Applicable)	Tons
Particulate – Total			
PM <sub>10</sub> (Particulate < 10 microns)			
PM <sub>2.5</sub> (Particulate < 2.5 microns)			
Sulfur Dioxide			
Nitrogen Oxides			
Carbon Monoxide			
Total Organic Compounds: Nonmethane			
Hazardous Air Pollutants	You must also submit SFN 19839 for Hazardous Air Pollutants (include formaldehyde and total hazardous air pollutant emissions.)		

Provide calculations for quantities listed above. Use additional sheets if necessary.

**See attached for calculations.**

Return completed form to:  
 North Dakota Department of Health  
 Division of Air Quality  
 918 E Divide, 2nd Floor  
 Bismarck, ND 58501-1947  
 Telephone: (701)328-5188



Basis for quantities listed above; provide calculations (use additional sheets if necessary):

HAPS

Organic HAPS

AP-42, 3.4, Table 3.4-3, 10/96

Sum of table of emission factors for speciated organic compound emission factors for large uncontrolled stationary diesel engines = **0.00415198 lb/MMBtu**

PAH HAPS

AP-42, 3.4, Table 3.4-4, 10/96

Sum of table of emission factors for large uncontrolled stationary diesel engines = **0.000212 lb/MMBtu**

**(0.004152 lb/MMBtu + 0.000212 lb/MMBtu) \* (1,341 gals \* 140,000 Btu/gal/1,000,000) / 2000 lbs/ton = 0.00041 tons/year**

**COYOTE STATION  
2014 ANNUAL EMISSION INVENTORY WORK SHEET**

EUI 4	EUI 5	EUI 6
<b>Emergency Diesel Generator</b> Fuel - #2 F.O. 1440 hp 18 hours 720 gallons 101 MMBtu	<b>Emergency Fire Pump Engine</b> #2 F.O. 225 HP 20.2 161.6 gallons 23 MMBtu	<b>Scrubber Emergency Diesel Generator</b> 1375 HP #2 F.O. 44.7 hours 1,341 gallons 188 MMBtu
<b>Particulate</b> 0.1 lb/MM Btu (AP-42, 3.4-5 Table 3.4-1, 10/96)	= 0.005 Tons/yr. 0.31 lb/MM Btu (AP-42, 3.3-6 Table 3.3-1, 10/96)	= 0.004 Tons/yr. 0.1 lb/MM Btu (AP-42, 3.4-5 Table 3.4-1, 10/96)
<b>PM10</b> 0.0573 lb/MMBtu (AP-42, 3.4-6 Table 3.4-2, 10/96)	= 0.003 Tons/yr. 0.31 lb/MM Btu (AP-42, 3.3-6 Table 3.3-1, 10/96)	= 0.004 Tons/yr. 0.0573 lb/MMBtu (AP-42, 3.4-6 Table 3.4-2, 10/96)
<b>Sulfur Dioxide</b> 1.01 (%S) lb/MMBtu (AP-42, 3.4-5 Table 3.4-1, 10/96)	= 0.000 Tons/yr. 0.29 lb/MMBtu (AP-42, 3.3-6 Table 3.3-1, 10/96)	= 0.003 Tons/yr. 1.01 (%S) lb/MMBtu (AP-42, 3.4-5 Table 3.4-1, 10/96)
<b>Nitrogen Oxide</b> 3.2 lb/MMBtu (AP-42, 3.4-5 Table 3.4-1, 10/96)	= 0.161 Tons/yr. 4.41 lb/MMBtu (AP-42, 3.3-6 Table 3.3-1, 10/96)	= 0.050 Tons/yr. 3.2 lb/MMBtu (AP-42, 3.4-5 Table 3.4-1, 10/96)
<b>Carbon Monoxide</b> 0.85 lb/MMBtu (AP-42, 3.4-5 Table 3.4-1, 10-96)	= 0.043 Tons/yr. 0.95 lb/MMBtu (AP-42, 3.3-6 Table 3.3-1, 10/96)	= 0.011 Tons/yr. 0.85 lb/MMBtu (AP-42, 3.4-5 Table 3.4-1, 10-96)
<b>Total Organic Compounds - non-methane</b> 0.09 lb/MMBtu (AP-42, 3.4-5 Table 3.4-1, 10/96)	= 0.005 Tons/yr. 0.35 lb/MMBtu (AP-42, 3.3-6 Table 3.3-1, 10/96)	= 0.004 Tons/yr. Total Organic Compounds - non-methane 0.09 lb/MMBtu (AP-42, 3.4-5 Table 3.4-1, 10/96)
<b>Hazardous Air Pollutants</b> 0.004364 lbs/MMBtu (AP-42, Organic HAPS, 3.4, 10/96)	= 0.0002 Tons/yr. Hazardous Air Pollutants 0.000169 lbs/MMBtu (PAHs) (AP-42, 3.3-7, Table 3.3-2, 10/96)	= 0.000002 Tons/yr. Hazardous Air Pollutants 0.004364 lbs/MMBtu (Organic HAPs)
<b>Total EUI 4</b> 0.217 Tons/yr.	<b>Total EUI 5</b> 0.075 Tons/yr.	<b>Total EUI 6</b> 0.404 Tons/yr.



**EUI 4****EUI 6**

>600 hp	<b>Diesel HAPs</b>	7.76E-04
	Organic HAPs, AP-42 3.4, Table 3.4-3	2.81E-04
		1.93E-04
		2.79E-03
		7.89E-05
		2.52E-05
		7.88E-06
sub total		0.004152
	PAH AP-42 3.4, Table 3.4-4	2.12E-04
<b>Total</b>		<b>0.004364 Lb/MMBtu</b>

**EUI 5**

< 600hp	<b>Diesel HAPS</b>	
	PAH AP-42, 3.3, Table 3.3-2.	1.68E-04
<b>Total</b>		<b>0.000168 Lb/MMBtu</b>

**EUI 2 - Aux Boiler**

Oil Fired Boilers - AP-42, 1.3-21, Table 1.3-9	LBS/1000 GALS
Organic Cmpds - HAPS	2.14E-04
	6.36E-05
	3.30E-02
	1.13E-03
	2.36E-04
	6.20E-03
	1.09E-04
	2.11E-05
	2.53E-07
	1.22E-06
	4.01E-06
	1.48E-06
	2.26E-06
	2.38E-06
	1.67E-06
	4.84E-06
	4.47E-06
	2.14E-06
	1.05E-05
	4.25E-06
	3.10E-09
<b>TOTAL</b>	<b>0.0410 LBS/1000 GALS</b>

## Oil Fired Boilers - AP-42 1.3-22, Table 1.3-10 Metal HAPS

As	4	
Be	3	
Cd	3	
Cr	3	
Cu - not a HAP		6
Pb	9	
Hg	3	
Mn	6	
Ni	3	
Se	15	
Zn - not a HAP		4
		49 lbs/10 <sup>12</sup> Btu
<b>Total</b>	<b>0.000049 lbs/MM Btu</b>	





**MANUFACTURING OR PROCESSING EQUIPMENT  
ANNUAL EMISSION INVENTORY REPORT**  
NORTH DAKOTA DEPARTMENT OF HEALTH  
DIVISION OF AIR QUALITY  
SFN 8537 (11-10)

bc

**GENERAL**

Name of Firm or Organization <b>Otter Tail Power Company</b>	Permit to Operate Number <b>T5-F84011</b>	Year of Emissions <b>2014</b>	
Mailing Address <b>P.O. Box 496</b>	City <b>Fergus Falls</b>	State <b>MN</b>	Zip Code <b>56538-0496</b>
Facility Name <b>Coyote Station</b>	Facility Location <b>6204 13<sup>th</sup> Street SW, Beulah, ND 58523</b>	Actual Hours of Operation <b>8760</b>	
Source Unit Description <b>M2 (Transfer House), M3 (N Distribution Building), M4 (S Distribution Building), M5 (Lime Storage Silo), M6 (Recycle Fly Ash Silo), M7 (Fly Ash Silo), M9 (Lime Unloading Bin Vent Filter)</b>		Emission Unit Number <b>M2, M3, M4, M5, M6, M7, M9</b>	

**RAW MATERIAL INFORMATION**

Raw Materials Introduced into Process	Quantity (Specify Units)
M2 - Coal M3 - Coal M4 - Coal M5 - Lime M6 - Recycle Fly Ash M7 - Fly Ash M9 - Lime	NA

**FUELS USED**

Type (ex. lignite, natural gas, LPG No. 2 fuel oil, No. 6 fuel oil. etc.)	Primary Fuel	Auxiliary Fuel
	NA	NA
Quantity of Fuel per Year (Specify Units: ex. ton, gal, cu.ft., etc.)		
Percent Sulfur Maximum Minimum Average		
Btu per Unit (Specify lb, ton, gal, etc.) Maximum Minimum Average		

**STACK EMISSIONS**

Air Contaminant *	Emission Factor (Include Units)	Emission Factor Source (Include Test Date if Applicable)	Tons
Particulate - Total		See Attachment	Total Sources M2 - M7 & M9 <b>33.8</b>
PM <sub>10</sub> (Particulate < 10 microns)			
PM <sub>2.5</sub> (Particulate < 2.5 microns)			
Sulfur Dioxide			
Nitrogen Oxides			
Carbon Monoxide			
Total Organic Compounds: Nonmethane			

\* Submit SFN 19839 for Hazardous Air Pollutants if applicable.

I declare under the penalties of perjury that this report has been examined by me and to the best of my knowledge is a true, correct and complete report.

Print Name of Person Submitting Report <b>Mark Thoma</b>	Title <b>Manager, Environmental Services</b>	Email <b>mthoma@otpc.com</b>
Signature <i>Mark Thoma</i>	Telephone Number <b>(218) 739-8526</b>	Date <b>2/6/15</b>

Return completed form to:  
North Dakota Department of Health  
Division of Air Quality  
918 E Divide, 2nd Floor  
Bismarck, ND 58501-1947  
Telephone: (701)328-5188

Basis for quantities listed above; provide calculations (use additional sheets as necessary):

**See attachment for calculations.**

Coyote Station  
2014 Air Emission Inventory  
Ancillary Source Emissions

EUI	Emission Unit	Air Pollution Control Equipment	Manufacturer & Model No.	Annual Hours of Operation *	Stack Flow Rate ACFM	Control Efficiency	Source	Inlet gr/acf	Source of emission rate	Outlet gr/acf with control efficiency	Pounds per Hour	PM tons per year
M2	Transfer House Northside	Baghouse	DCE, Inc. - V18/15F (2 collectors but run one at a time)	8760	1050	99.99%	Manufacturer		Manufacturer	0.0088	0.079	0.3
M3	distribution building Southside	Baghouse	Ray-Jet 8MW-40	8760	18900	99.60%	Manufacturer	5	Manufacturer	0.02	3.24	14.2
M4	distribution building	Baghouse	Ray-Jet 8MW-35	8760	13600	99.60%	Manufacturer	3	Manufacturer	0.012	1.40	6.1
M5	Lime storage silo	Baghouse	Mikropul Env Sys 81S10	8760	4000	99.60%	Manufacturer	5	Estimate*	0.02	0.69	3.0
M6	Recycle fly ash silo	Baghouse	Mikropul Env Sys 100S-10-20B	8760	3160	99.60%	Manufacturer	5	Estimate*	0.02	0.54	2.4
M7	Fly ash silo	Baghouse	Mikro-Pulvaire 320S-10-20TR	8760	7960	99.60%	Manufacturer	5	Estimate*	0.02	1.36	6.0
M9	Lime unloading bin vent filter	Baghouse	Flex-Kleen 84-CT-54-11	8760	2400	99.60%	Manufacturer	5	Estimate*	0.02	0.41	1.8

\* M5 - M9 - used 5 grains/acf inlet grain loading. Approved by Ben Gress, ND Dept. of Health, 3/17/06.

Total	33.8 Tons/Year
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215 South Cascade Street  
 PO Box 496  
 Fergus Falls, Minnesota 56538-0496  
 218 739-8200  
 www.otpco.com

February 6, 2015

Mr. Terry L. O'Clair  
 North Dakota Department of Health  
 Division of Air Quality  
 918 East Divide Avenue, 2<sup>nd</sup> Floor  
 Bismarck, ND 58501-1947



Dear Mr. O'Clair:

Subject: OTTER TAIL POWER COMPANY  
 COYOTE STATION  
 TITLE V PERMIT TO OPERATE – NO. T5-F84011

Enclosed is the 2014 annual emissions inventory for the Coyote Station. Also attached are worksheets that detail the calculations used. The survey is divided by emission source.

For EU1, PM10 will be reported as 95% of total PM (particulate matter), as this is what the Department of Health is using for other facilities. PM2.5 is also reported as requested in a letter from the Department of Health on January 5, 2015. Ammonia and mercury emissions are reported for coal use only, and not oil as directed by the Department of Health.

Condensable PM10 and PM2.5 for EU1 is shown below as requested in a letter from the Department of Health on January 5, 2015. Please note that Otter Tail is uncertain how to differentiate between condensable PM10 and condensable PM2.5. However, Otter Tail notes that section 3.1 of Method 202 which became effective January 1, 2011 states all condensable PM is assumed to be in the PM2.5 range. In that case, the emission rates for condensable PM<sub>10</sub> and condensable PM<sub>2.5</sub> would be equal. ?

Coyote Station Condensable PM 2014		
Heat Input - CEMS	32,197,996	Million Btu/Year
Method 202 Wet Catch <sup>1</sup>	0.020	Lb/Million Btu
Stack Test July 25, 2007	<hr/>	
	<b>321.98</b>	tons in 2014

<sup>1</sup>Method 202 wet catch results are not to be used in determining compliance status with state or federal guidelines

Also enclosed is the continuous emission monitoring (CEM) systems hourly SO<sub>2</sub> and NO<sub>x</sub> emission data and associated parameters as requested in the Department of Health letter dated January 5, 2015.



To the best of my knowledge, the items included in this report are true, accurate, and complete.

If you have any questions, please call me at (218) 739-8526 or [mthoma@otpc.com](mailto:mthoma@otpc.com) or contact Paul Vukonich at (218) 739-8349 or [pvukonich@otpc.com](mailto:pvukonich@otpc.com) if I am not available.

Sincerely,

A handwritten signature in cursive script that reads "Mark Thoma".

Mark Thoma, Manager  
Environmental Services

Enclosure

C: NorthWestern Energy - Dennis Wagner  
Montana-Dakota Utilities Co. - Alan Welte  
Minnkota Power Cooperative, Inc. – Gerry Pfau

