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DRAFT TECHNICAL SUPPORT DOCUMENT
For
DRAFT AIR EMISSION PERMIT NO. 12300736-001

This technical support document is for all the interested parties of the draft permit. The purpose of this document is to set forth the legal and factual basis for the draft permit conditions, including references to the applicable statutory or regulatory provisions.

1. General Information

1.1. Applicant and Stationary Source Location:

Owner and Operator Address and Phone Number (list both if different)	Facility Address (SIC Code: 4953)
Minnesota Pollution Control Agency 520 Lafayette Road North St. Paul, Minnesota 55155 Stephen Lee, 651-297-8610	Mobile source Statewide

1.2. Description of the facility

1.2.1 Site Description.

The facility is a trench-burner version of an air curtain incinerator. It is a portable source that also contains a diesel engine to run the air curtain blower. Truck traffic and fuel loading equipment are fugitive sources.

1.3 Description of any changes allowed with this permit issuance

This permit authorizes installation and operation of an air curtain incinerator at locations across the state, as allowed by permit.

1.4 Description of all amendments issued since the issuance of the last total facility permit and to be included in the Part 70 Permit.

None. This is a new facility.

1.5. Facility Emissions:

Table 1. Total Facility Potential to Emit Summary:

EU #	SV#	Emission Unit Description	PM tpy	PM10 tpy	SO2 tpy	NOx tpy	CO tpy	VOC tpy	Pb tpy	Single HAP tpy	All HAPs tpy
001	001	Diesel Engine	0.03	0.03	0.03	0.45	0.10	0.04	neg.	neg.	neg.

FS #	SV #	Fugitive Source Description	PM tpy	PM10 tpy	SO2 tpy	NOx tpy	CO tpy	VOC tpy	Pb tpy	Single HAP tpy	All HAPs tpy
001	---	Air Curtain Incinerator	51.41	19.53	0.40	15.82	94.90	75.13	0.003	1.20	2.42
002	---	Vehicle traffic	2.11	0.45	---	---	---	---	---	---	---

	PM tpy	PM10 tpy	SO2 tpy	NOx tpy	CO tpy	VOC tpy	Pb tpy	Single HAP tpy	All HAPs tpy
Total Facility Limited Potential Emissions*	53.55	20.01	0.42	16.26	95.00	75.17	0.003	1.20	2.42

*These are the limited potential emissions from column 3 in GI-07 from Delta. They may differ from those in the permit application sent by the State in that they have been verified and corrected as need be by MPCA staff. These are the potential emissions that would appear in a public notice.

Table 2. Facility(TF) and Permit Classification

Classification (put x in appropriate box)	Major/Affected Source	*Synthetic Minor	*Minor
PSD (list pollutant)		PM, PM-10, NOx, VOC, CO	SO2, Lead
NAAR (list pollutant)		N/A	N/A
Part 70 Permit Program (list pollutant)	**	PM-10, NOx, VOC, CO, Single HAP, All HAPs	SO2, Lead

* Refers to potential emissions that are less than those specified as major by 40 CFR § 52.21, 40 CFR pt. 51 Appendix S, and 40 CFR pt. 70.

** This stationary source category is required to obtain a part 70 operating permit under Sec. 129 of the Clean Air Act (Waste Combustion).

2. Regulatory and/or Statutory Basis

Summary Regulatory and/or Statutory Basis of the Emission or Operational Limit

New Source Review

The facility has accepted limits on hours of operation such that it is a non-major source under New Source Review regulations.

Part 70 Permit Program

The facility is a major source under the Part 70 permit program.

New Source Performance Standards (NSPS)

The air curtain incinerator is subject to the following New Source Performance Standards:

- 40 CFR pt. 60, subp. CCCC—Standards of Performance for Commercial and Industrial Solid Waste Incineration Units for Which Construction Is Commenced After November 30, 1999 or for Which Modification or Reconstruction Is Commenced on or After June 1, 2001.
- 40 CFR pt. 60, subp. A—General Provisions

National Emission Standards for Hazardous Air Pollutants (NESHAP)

The facility has accepted limits on hours of operation such that it is a non-major source under 40 CFR pt. 63. Also, no NESHAPs have been promulgated for the facility's emission sources. Thus, no NESHAPs apply.

No 40 CFR pt. 61 NESHAPs apply.

Minnesota State Rules

The facility is subject to the standard rules applicable to all Minnesota facilities, as listed in the instructions for permit application Form GI-09.

The internal combustion engine is subject to the following Minnesota Standards of Performance:

- Minn. R. 7011.2300 Standards of Performance for Stationary Internal Combustion Engines

Regulatory Overview of Facility

*EU, GRP, FS, or SV #	Applicable Regulations	**Comments:
EU 001 FS 001	Minn. R. 7009.0200	Minnesota Ambient Air Quality Standards: The modeled SCREEN3 emission rates were compared to the MAAQS.
EU 001	Minn. R. 7011.2300	Standards of Performance for Stationary Internal

		Combustion Engines. (The engine powers the blower for the Air Curtain Incinerator.)
FS 001	40 CFR pt. 60, subp. CCCC	Standards of Performance for Commercial and Industrial Solid Waste Incineration Units for Which Construction Is Commenced After November 30, 1999 or for Which Modification or Reconstruction Is Commenced on or After June 1, 2001
FS 001	40 CFR pt. 60, subp. Eb	Standards of Performance for Hospital/Medical/Infectious Waste Incinerators for Which Construction Is Commenced After June 20, 1996 (Permittee is largely exempt from this rule, provided it complies with certain recordkeeping requirements.)
FS 001	40 CFR pt. 60, subp. A	General Provisions

* Insert the number that identifies the level the limit was set on.

** Comments column is for name of the regulation, citations that need further explanation, and to include essential data used to determine the applicability of that particular regulations, standard or permit condition. Most rows should not have any further explanation needed and will contain only the name of the regulation.

3. Technical Information

3.1. Function of the facility

The air curtain incinerator was purchased by the MPCA for the “Emergency Response And Large Facility Cleanup” Unit. The intended use is to operate it in response to disasters, such as tornado damage. The unit will be temporarily installed at the site of a disaster and used to incinerate trees, limbs, and other debris that fits the federal definitions of “Wood waste” and “Clean lumber”.

The air curtain incinerator was also purchased for animal carcass disposal. For example, Minnesota may face an outbreak of Chronic Wasting Disease (CWD) or Bovine Spongiform Encephalopathy (BSE, a.k.a., Mad Cow Disease), resulting in deaths or euthanasia of infected animals. To prevent further spread of the disease, MPCA would bring the air curtain incineration equipment to the outbreak location and incinerate the carcasses on site. Limited experimental evidence, to date, indicates that complete destruction of malformed prions requires that tissue be exposed to a sustained temperature of at least 1,800 Fahrenheit. As time passes, methods of disposal other than air curtain incineration may be favored. If reconnaissance of Minnesota deer, elk or cattle herds indicates the presence of CWD, SBE, or other malformed prion-based disease, the Permittee should consult with MPCA management before using the air-curtain incineration method to dispose of tissue from animals known to be infected with that disease.

3.2. New Source Review

The facility has been permitted as a non-major (synthetic minor) facility under New Source Review. New Source Review does not apply.

3.3. Federal definitions and applicability of performance standards

The facility is an Air Curtain Incinerator as defined in the Commercial and Industrial Solid Waste Incineration (CISWI) rule for new units by 40 CFR § 60.2265:

“Air curtain incinerator means an incinerator that operates by forcefully projecting a curtain of air across an open chamber or pit in which combustion occurs. Incinerators of this type can be constructed above or below ground and with or without refractory walls and floor. (Air curtain incinerators are not to be confused with conventional combustion devices with enclosed fireboxes and controlled air technology such as mass burn, modular, and fluidized bed combustors.)”

This definition appears elsewhere in federal rule, with or without the parenthetical text. The Permittee’s unit is the “pit” variety, below ground and without refractory walls and floor. The Permittee is permitted to operate throughout the state, and may operate on farms or other commercial property. The Permittee may be reimbursed for operation. For these reasons, the incinerator is subject to the CISWI rule.

40 CFR § 60.2555(i)¹ provides a substantial exemption from the CISWI rules for air curtain incinerators that combust only wood waste, clean lumber, and yard waste. The Permittee could not operate economically without this exemption. For the air curtain incinerator, the only fuels allowed by the permit are clean lumber, wood waste, yard waste, and pathological waste. Distillate oil is allowed for unit start-up.

Likewise, exemptions under both 40 CFR § 60.2020(a)² of the CISWI rule and 40 CFR § 60.50c(b)³ of the Hospital/Medical/Infectious Waste Incinerators (HMIWI) rule provide a

¹ 40 CFR 60.2020(i) Air curtain incinerators. Air curtain incinerators that burn only the materials listed in paragraphs (i)(1) through (3) of this section are only required to meet the requirements under “Air Curtain Incinerators” (Secs. 60.2245 through 60.2260).

- (1) 100 percent wood waste.
- (2) 100 percent clean lumber.
- (3) 100 percent mixture of only wood waste, clean lumber, and/or yard waste.

² 40 CFR 60.2020(a) Pathological waste incineration units. Incineration units burning 90 percent or more by weight (on a calendar quarter basis and excluding the weight of auxiliary fuel and combustion air) of pathological waste, low-level radioactive waste, and/or chemotherapeutic waste as defined in Sec. 60.2265 are not subject to this subpart if you meet the two requirements specified in paragraphs (a)(1) and (2) of this section.

- (1) Notify the Administrator that the unit meets these criteria.
- (2) Keep records on a calendar quarter basis of the weight of pathological waste, low-level radioactive waste, and/or chemotherapeutic waste burned, and the weight of all other fuels and wastes burned in the unit.

substantial exemption from federal rules for incinerators (not just air curtain incinerators) that limit their operation to pathological incineration. And as above, the air curtain incinerator could not operate economically without this exemption.

Federal rules collide when the Permittee wishes to operate the unit as both a pathological waste incinerator and a waste wood/clean lumber/yard waste incinerator. According to CISWI rule 40 CFR § 60.2555(a), the pathological waste incineration exemption requires burning 90 percent or more by weight on a calendar quarter basis (and excluding the weight of auxiliary fuel). If, at a disaster site, the Permittee burns storm debris, the Permittee will be unable to meet the required 90 percent pathological waste minimum.

MPCA staff had dialogue with EPA Region V regarding operation of the unit under two distinct scenarios:

- (1) burning wood waste/clean lumber/yard waste; or
- (2) burning carcasses, with wood waste and/or clean lumber as the auxiliary fuel.

Region V had no objection to MPCA understanding that the “minimum 90% pathological waste” requirement applied only when the unit was operating as a pathological waste incinerator. When the unit operated under the “burning only wood waste and clean lumber” exemption, the quantity of material burned in the unit would not count against the pathological waste totals.

The Permittee cannot burn any additional fuels (such as municipal waste, tires, or treated railroad ties) without being subject to further federal regulation. Compliance with these further regulations would be impractical, if not impossible, for the Permittee.

3.4. Minnesota definitions and applicability of performance standards

As long as the air curtain incinerator burns primarily wood, it does not fall under the state definition of “waste combustor” pursuant to Minn. R. 7011.1201, subp. 46:

"Waste combustor" means any emissions unit or emission facility where mixed municipal solid waste, solid waste, or refuse-derived fuel is combusted, and includes incinerators, energy recovery facilities, or other combustion devices. A metals recovery incinerator is a waste combustor. A combustion device combusting primarily wood, or at least 70 percent fossil fuel and wood in combination with up to 30 percent papermill wastewater treatment plant sludge, is not a waste combustor. A soil treatment facility, paint burn-off oven, wood heater, or residential fireplace is not a waste combustor.

³ 40 CFR 60.50c(b) A combustor is not subject to this subpart during periods when only pathological waste, low-level radioactive waste, and/or chemotherapeutic waste (all defined in Sec. 60.51c) is burned, provided the owner or operator of the combustor:

- (1) Notifies the Administrator of an exemption claim; and
- (2) Keeps records on a calendar quarter basis of the periods of time when only pathological waste, low-level radioactivewaste and/or chemotherapeutic waste is burned.

The permit requires the Permittee to burn “primarily wood” at all times. “Wood”, as defined in Minn. R. 7011.1201, subp. 48, is:

"Wood" means wood, wood residue, bark, or any derivative fuel or residue thereof, in any form, including sawdust, sander dust, wood chips, wood scraps, slabs, millings, shavings, and processed pellets made from wood and other forest residues.

The federal definitions of “wood waste” and “clean lumber” fall into this definition.

3.5. Fuel quantities

As discussed above, the incinerator is only permitted to burn clean lumber, wood waste, yard waste, and pathological waste. (Distillate oil is allowed as startup fuel.)

The design capacity of the incinerator is 14 tons of wood per hour average throughput, pursuant to vendor specifications. For New Source Review “synthetic minor” purposes, the air curtain incinerator is limited in its hours of operation, and a worst-case scenario of 14 tons of wood per hour is assumed.

To comply for the exemption from the federal HMIWI rule, the facility is required to record the weight of fuels burned (including wood and distillate oil). In the field, the MPCA operators have said that the most practical method of measuring wood is in units of cord (rather than cubic yards or tons). The permit provides a reasonable cords-to-tons conversion factor. The permit contains similar conditions for distillate oil.

3.6. Ambient Air Quality Modeling

The air curtain incinerator operates in a trench, and therefore had a stack height of zero. This means that pollutants are emitted directly to the ambient air.

SCREEN3 modeling was performed under the guidance of MPCA modeling staff. The results are included in [Attachment 1](#).

PM-10 was the limiting pollutant. Dispersion results showed that ambient air concentrations drop below regulatory thresholds at 500 meters distance from the air curtain incinerator. The permit requires that the facility be located no closer than 500 meters to an inhabited place (homes, schools, etc.) or any regularly-used recreational area (campgrounds, playgrounds, etc.)

3.7. Operation in more than one location.

The facility must comply with the notification requirements of Minn. R. 7007.0800, subp. 12, when it relocates. The facility is a non-major source (synthetic minor) under New Source Review, so it could at this time operate anywhere in the state. At the time of permit issuance, no non-attainment areas existed in Minnesota. However, because of the uncertainty of future non-

attainment areas, the permit prohibits operating in non-attainment areas if such operation violates any non-attainment-related requirements.

3.8. Environmental Review

The facility is permitted to limit potential emissions of all pollutants to less than 100 tons per year. Environmental review is not required.

3.9. Title V Modeling

Title V Computer Dispersion Modeling is not required for this facility because the Potential-to-Emit does not exceed 100 tons per year for PM-10, SO₂, or NO_x.

3.10. Insignificant Activities Required to be Listed

No Insignificant Activities are present at this facility.

3.11. Periodic monitoring

The NSPS regulating this facility was promulgated in the year 2000. Periodic monitoring is inherently included in the NSPS requirements contained in this permit.

3.12. Emissions Calculations

The total facility is permitted as a “synthetic minor” source for New Source Review and for Environmental Review. The calculations are included as [Attachment 3](#).

3.13. Annotated CD-01

Some of the conditions in this permit have some history behind them that would be helpful for a reader or a future permit writer to know. Those permit conditions are contained in an annotated form of CD-01, which is attached to this document. This attachment does not contain all of the permit's conditions, but does include those conditions (and citations) where an explanation is useful. For example, 40 CFR § 60, Subpart WWW does allow approved alternatives to its requirements. These alternatives are called out in the annotated CD-01 in [Attachment 4](#).

3.14. Deviations from Delta Norms

The **DRAFT** permit and this TSD are written in accordance with the norms established for Delta permits and TSD with the following exception. Rule citations of federal regulations do not always contain the word “section.” The norm is to write the citations as “40 CFR Section 62.15160. Given the frequency and length of the citations in the **DRAFT** permit, the “section” was omitted.

3.15. Comments Received

If comments were received during the public notice period from the public or if comments are received from EPA, they should be described briefly here, as well as any changes made to the permit as a result of the comments. Generally, the comment letters should also be provided as attachments to the TSD.

4. Conclusion

Based on the information provided by [staff of the MPCA](#), the MPCA has reasonable assurance that the proposed operation of the emission facility, as described in the Air Emission Permit No. 12300736-001 and this technical support document, will not cause or contribute to a violation of applicable federal regulations and Minnesota Rules.

Staff Members on Permit Team: [Peter Torkelson \(engineer\)](#), [Cary Hernandez \(enforcement\)](#), [John Chikkala \(Peer Review\)](#), [Sarah Kilgriff \(compliance\)](#), [Barbara Conti \(Environmental Review\)](#)

Attachment: (1) TSD: SCREEN3 Modeling Results
(2) TSD: Selected Federal Regulations
(3) TSD: Calculations
(4) TSD: Annotated CD-01

TSD: Attachment 1 - SCREEN3 Modeling Results

07/03/03
11:45:11

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

MPCA Portable Air Curtain Incinerator - PM-10

SIMPLE TERRAIN INPUTS:

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SOURCE TYPE           =          POINT
EMISSION RATE (G/S)   =          8.72000
STACK HEIGHT (M)      =           .0000
STK INSIDE DIAM (M)   =          3.7800
STK EXIT VELOCITY (M/S) =         1.0000
STK GAS EXIT TEMP (K) =         419.0000
AMBIENT AIR TEMP (K)  =         293.0000
RECEPTOR HEIGHT (M) =           .0000
URBAN/RURAL OPTION    =          RURAL
BUILDING HEIGHT (M)   =           .3000
MIN HORIZ BLDG DIM (M) =           .3000
MAX HORIZ BLDG DIM (M) =         12.1900
    
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THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 10.534 M**4/S**3; MOM. FLUX = 2.498 M**4/S**2.

*** FULL METEOROLOGY ***

*** SCREEN AUTOMATED DISTANCES ***

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	
DWASH									
100.	2989.	4	15.0	15.0	4800.0	4.57	8.20	4.74	SS
200.	941.0	4	15.0	15.0	4800.0	7.55	15.56	8.58	SS
300.	615.1	4	10.0	10.0	3200.0	12.10	22.61	12.12	SS
400.	468.4	4	8.0	8.0	2560.0	15.25	29.45	15.30	SS
500.	370.4	4	8.0	8.0	2560.0	15.25	36.15	18.32	SS
600.	311.1	4	5.0	5.0	1600.0	24.70	42.72	21.24	SS
700.	276.9	4	5.0	5.0	1600.0	24.70	49.19	24.06	SS
800.	244.6	4	4.5	4.5	1440.0	27.50	55.57	26.81	SS
900.	218.8	4	4.0	4.0	1280.0	31.00	61.88	29.49	SS
1000.	199.0	4	4.0	4.0	1280.0	31.00	68.13	32.09	SS
1100.	182.0	4	3.5	3.5	1120.0	35.50	74.31	34.12	SS
1200.	168.4	4	3.5	3.5	1120.0	35.50	80.44	36.09	SS
1300.	155.9	4	3.5	3.5	1120.0	35.50	86.52	38.00	SS
1400.	161.9	6	1.0	1.0	10000.0	54.07	48.57	23.16	NO
1500.	170.1	6	1.0	1.0	10000.0	54.07	51.41	23.74	NO

1600.	177.7	6	1.0	1.0	10000.0	54.07	54.24	24.32	NO
1700.	184.6	6	1.0	1.0	10000.0	54.07	57.07	24.89	NO
1800.	190.8	6	1.0	1.0	10000.0	54.07	59.89	25.46	NO
1900.	196.4	6	1.0	1.0	10000.0	54.07	62.71	26.02	NO
2000.	201.3	6	1.0	1.0	10000.0	54.07	65.52	26.58	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 100. M:
 100. 2989. 4 15.0 15.0 4800.0 4.57 8.20 4.74 SS

DWASH= MEANS NO CALC MADE (CONC = 0.0)
 DWASH=NO MEANS NO BUILDING DOWNWASH USED
 DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
 DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
 DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

 *** REGULATORY (Default) ***
 PERFORMING CAVITY CALCULATIONS
 WITH ORIGINAL SCREEN CAVITY MODEL
 (BRODE, 1988)

*** CAVITY CALCULATION - 1 ***	*** CAVITY CALCULATION - 2 ***
CONC (UG/M**3) = .1229E+07	CONC (UG/M**3) = .3776E+08
CRIT WS @10M (M/S) = 2.59	CRIT WS @10M (M/S) = 3.42
CRIT WS @ HS (M/S) = 2.59	CRIT WS @ HS (M/S) = 3.42
DILUTION WS (M/S) = 1.29	DILUTION WS (M/S) = 1.71
CAVITY HT (M) = .43	CAVITY HT (M) = .30
CAVITY LENGTH (M) = 2.84	CAVITY LENGTH (M) = .42
ALONGWIND DIM (M) = .30	ALONGWIND DIM (M) = 12.19

 END OF CAVITY CALCULATIONS

 *** SUMMARY OF SCREEN MODEL RESULTS ***

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	2989.	100.	0.
BLDG. CAVITY-1	.1229E+07	3.	-- (DIST = CAVITY LENGTH)
BLDG. CAVITY-2	.3776E+08	0.	-- (DIST = CAVITY LENGTH)

 ** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **

TSD: Attachment 2 - Selected Federal Regulations

Large Municipal Waste Combustors.

The following rule excerpt shows that a trench burner of greater than 250 ton/day that burns municipal solid waste is subject to the requirements of 40 CFR 60, Subpart Eb.

Subpart Eb--Standards of Performance for Municipal Waste Combustors for Which Construction is Commenced After September 20, 1994

Sec. 60.50b Applicability and delegation of authority.

(a) The affected facility to which this subpart applies is each municipal waste combustor unit located within a municipal waste combustor plant with an aggregate municipal waste combustor plant capacity greater than 35 megagrams per day of municipal solid waste for which construction is commenced after September 20, 1994 or for which modification or reconstruction is commenced after June 19, 1996.

...

(k) Air curtain incinerators, as defined under Sec. 60.51b, located at a plant that meet the capacity specifications in paragraph (a) of this section and that combust a fuel stream composed of 100 percent yard waste are exempt from all provisions of this subpart except the opacity limit under Sec. 60.56b, the testing procedures under Sec. 60.58b(1), and the reporting and recordkeeping provisions under Sec. 60.59b (e) and (i).

(l) Air curtain incinerators located at plants that meet the capacity specifications in paragraph (a) of this section combusting municipal solid waste other than yard waste are subject to all provisions of this subpart.