



Meliadine Incinerator Construction Summary Report

In Accordance with Water License 2AM-MEL1631 (Part D, item 3)

Prepared by:
Agnico Eagle Mines Limited – Meliadine Division

May 2018

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1 INTRODUCTION

Agnico Eagle Mines Limited (Agnico Eagle) is developing the Meliadine Project (the Project), a gold mine located approximately 25 km north from Rankin Inlet, and 80 km southwest from Chesterfield Inlet in the Kivalliq Region of Nunavut. Situated on the western shore of Hudson Bay, the Project site is located on a peninsula between the east, south, and west basins of Meliadine Lake (63°1'23.8" N, 92°13'6.42"W) on Inuit Owned Land. The area is accessible from the all-weather gravel road linking the existing exploration camp with Rankin Inlet.

As required by Water License A No. 2AM-MEL1631 – Agnico Eagle Mines Limited for the Meliadine Gold Project (Part D, Item 3), this report summarizes the construction work of the incinerator. Included in this report:

- Summary of the construction
- Summary of field decisions and mitigation measures implemented during construction (including list of deficiencies detected during construction)
- Photographs of the infrastructure
- Drawings

2 SUMMARY OF THE CONSTRUCTION

2.1 Site Location Plan

The incinerator is located in its own building on the south end of the infrastructure pad, downwind of other mine infrastructures. Figure 1 shows the location of the incinerator.

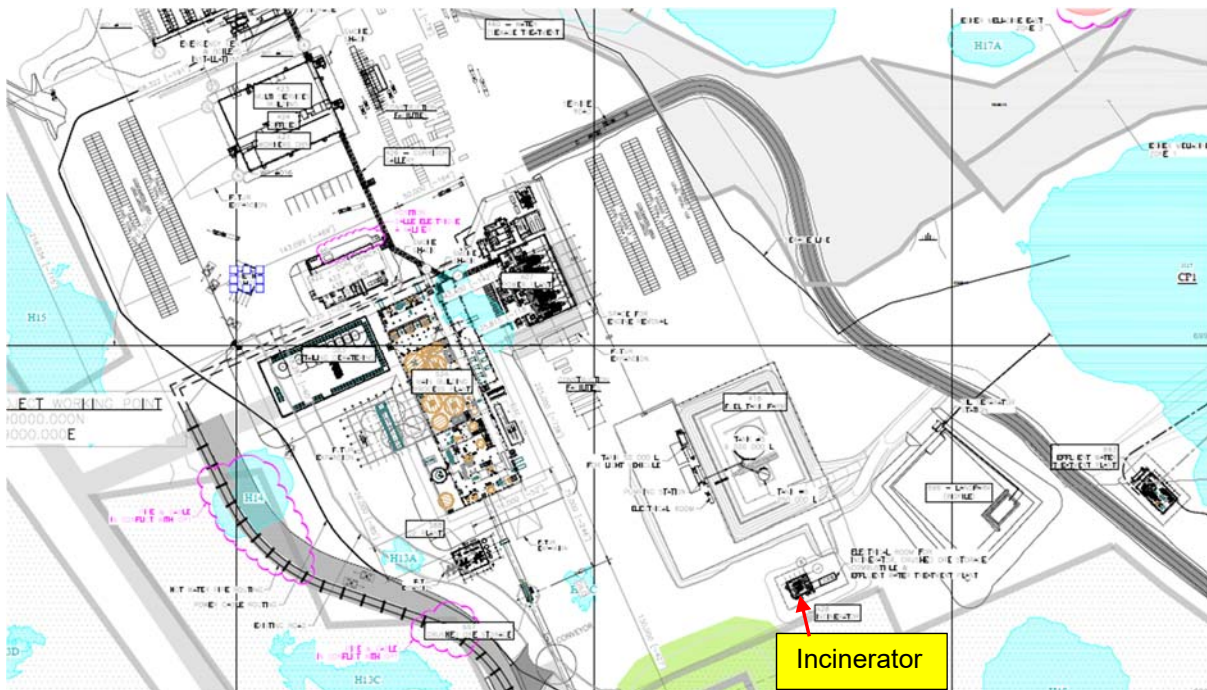


Figure 1 –Location of Meliadine incinerator

2.2 Incinerator general description

The ECO 1.75 TN 1PVC100L Incinerator system consists of a Primary Chamber and a Secondary Chamber. Both chambers are vessels constructed of steel with a special insulating liner known as refractory. Incinerator components are presented at Appendix C, including the primary and secondary chambers, main control panel, diesel fuel (4,500L) and used oil (5,000L) tanks.

2.3 Construction Schedule

Construction activities at the Meliadine incinerator were conducted between June 2017 and February 2018.

Construction was completed according to the milestones dates shown in Table 2.1.

Table 2.1: Construction milestones for the incinerator

Items	Date
Site preparation	June 5 th to June 30 th 2017
Piling and beams welding	July 10 th to July 28 th 2017
Backfill prior to concreting	July 31 st to August 4 th 2017
Concrete slab and curing	August 4 th to August 18 th 2017
Electrical work	September 3 rd to October 31 st 2017
Erect building (shell and insulation)	September 11 th to September 23 rd 2017
Install incinerator and mechanical work	September 24 th to October 27 th 2017
Piping	September 24 th to October 27 th 2017
Instrumentation and controls	October 24 th to October 30 th 2017
Pre-commissioning	October 30 th 2017 to November 3 rd 2017
Commissioning	November 3 rd 2017 to November 10 th 2017
HVAC	January 31 st 2018 to February 7 th 2018

2.4 Field Decisions

During and after construction, some minor deficiencies were noted and addressed. The complete list of deficiencies and action plan is presented in Appendix A. None of these affect the performance of the incinerator.

A minor modification was made to the structure in order to facilitate air quality monitoring on the secondary chamber's stack (segment beneath building's ceiling). This modification does not affect the performance of the incinerator.

3 PHOTOGRAPHS AND DRAWINGS

Pictures are available in Appendix B and show the incinerator once construction was completed.
Drawings are available at Appendix C.

Appendix A: List of deficiencies and action plan



No.	Area	Description	Discipline	Category	Priority	Problem Description	Suggested Solution	Revised by	Picture of Deficiencie	Responsable	Target End Date	Status	Picture after completed	Completed Date
229	428	Incinerator E-house	E	D	5	Fire panel breaker not painted red		PJ/JCL		Paul Julien	2017-11-19	Done		2017-11-25
230	428	Incinerator E-house	E	D	5	The breaker feeding the fire panel is write cct 6 on there supply cable but in the reality the breaker is cct12		PJ/JCL		Promec temporaire	2017-11-19	Done		2017-12-08
231	428	Incinerator E-house	E	B	5	Under e-room, on cable tray the 4/0 need to be finish inside the building		PJ/JCL		Paul Julien	2017-11-19	Done		2017-11-25
232	428	Incinerator E-house	E	C	5	Bad voltage reading on the SEL		M.Gravel		Paul Julien	2018-06-01	In progress		
233	428	Incinerator E-house	E	C	5	Tension indicator ont the switchgear not working well		M.Gravel		Paul Julien	2018-06-01	In progress		
234	428	Incinerator	E	B	5	Primary burner is not ground		PJ/JCL		Paul Julien	2017-11-19	Done		2017-11-25
235	428	Incinerator	E	D	5	Secondary burner need to be ground	Follow cable tray from top to bottom and attached on burner leg	PJ/JCL		Paul Julien	2017-11-19	Done		2017-11-25
236	428	Incinerator	E	D	5	PLC panel is not ground	Used #6 AWG wire to connect to the building ground	PJ/JCL		Paul Julien	2017-11-19	Done		2017-11-25
238	428	Incinerator	P	C	5	Propane supply line feeding the regulator need to be change for a flexible one.		PJ/JCL	428-238-Q	René Fillion	2017-11-19	In progress		
239	428	Incinerator	E	D	5	Heat trace for the both garage doors are badly installed. East side are not connected yet	The heat trace cable used is not the good one. Change it for a autoregulant. The temperature probe need to be install outside in a GF box.	PJ/JCL		Paul Julien	2017-11-19	Done		2017-11-25
240	428	Incinerator	E	B	5	K Marker missing in oil room		PJ/JCL		Paul Julien	2017-11-19	Done		2017-11-25
241	428	Incinerator	E	D	5	The spill pan for the waste pumps system to be attach to the buiding ground		PJ/JCL		Paul Julien	2017-11-19	Done		2017-11-25
242	428	Incinerator	E	B	5	All outlet inside the incinerator building are labeled cct 22. But on drawing it's write cct 2 .	Find the proper answer and don't forget to modified the K-Marker on all cables.	PJ/JCL		Paul Julien	2017-11-19	Done		2017-11-25
243	428	Incinerator	E	B	5	Fire system to be finalized inside the operation building		PJ/JCL		Paul Julien	2017-11-19	Done		2017-11-25
244	428	Incinerator	E	D	5	Weightbridge cable between the unit and the bridge to be attach properly	Fix the cable with metal strap on the wall. Look with MP for the real installation we supposed to install there. We are not sure for the description found on drawing. True or not for an another heating system.	PJ/JCL		Paul Julien	2017-11-19	Done		2017-11-25
245	428	Incinerator	E	B	5	Fresh air heating coil are not installed		PJ/JCL		Paul Julien	2017-11-19	Done		2017-11-25
246	428	Incinerator	E	B	5	Many lamicoid are missing on disconect switch and Panel		PJ/JCL		Paul Julien	2017-11-19	Done		2017-11-25
247	428	Incinerator	I	D	5	Smoke detector cable are to short. The installation look bad.		PJ/JCL		Paul Julien	2017-11-19	Done		2017-11-25
248	428	Incinerator	E	B	5	Smoke detector supply with captire cable. It will be change for a sealtight conduit. The captire is not allowed to feed permanent installation.		PJ/JCL		Paul Julien	2017-11-19	Done		2017-11-25
249	428	Incinerator	E	B	5	K Marker on PLC missing		PJ/JCL		Paul Julien	2017-11-19	Done		2017-11-25
250	428	Incinerator	E	B	5	Many surplus material need to be retrive fron this area and store away. Cable reel, 12" tray, channel etc.		PJ/JCL		Paul Julien	2017-11-19	Done		2017-11-25
251	428	Incinerator	E	B	5	120 VAC outlet are front plate missing		PJ/JCL		Paul Julien	2017-11-19	Done		2017-11-25
252	428	Incinerator	E	B	5	The waste oil tank need to be ground on this back leg		PJ/JCL		Paul Julien	2017-11-19	Done		2017-11-25
253	428	Incinerator	E	C	5	The wall need to be finalized		PJ/JCL		Paul Julien	2017-11-19	Done		2017-11-25
254	428	Incinerator	E	D	5	Inside the PLC panel the CAT 5 cable need to be organized properly		PJ/JCL		Paul Julien	2017-11-19	Done		2017-11-25
255	428	Incinerator	E	B	5	Behind the primary burner a cable is wound in the tray. Find the usage or try to organize properly		PJ/JCL		Paul Julien	2017-11-19	Done		2017-11-25
256	428	Incinerator	E	B	5	Pass trough the wall with this manner look fuzzy.		PJ/JCL		Paul Julien	2017-11-19	Done		2017-11-25
257	428	Incinerator	M	D	5	The guard around the outgoing cable tray need to be painted yellow		PJ/JCL	428-257-Q	Sylvain Chartier	2018-06-01	In progress		
258	428	Incinerator	E	D	5	The GFI outside outlet near the stair is not fonctionnal		PJ/JCL		Promec temporaire	2017-11-19	Done		2017-12-08
259	428	Incinerator	E	B	5	Garage door are not connected.		PJ/JCL		Paul Julien	2017-11-19	Done		2017-11-25
260	428	Incinerator	P	C	6	Fitting on exterior fuel tank (EcoWaste error)	Change the part	B.Roy		René Fillion	2017-12-31	In progress		
261	428	Incinerator	C	B	5	Insulated and closed the building for the cable tray opening (Honco).	Finish the installation	B.Roy		Mark Long	2017-11-30	Done	428-261-C	2018-03-04
262	428	Incinerator	P	M	6	Installed relief valve for propane.	Suggested by commissioning team	B.Roy		René Fillion		In progress		
263	428	Incinerator	P	M	6	Installed propane storage	Suggested by commissioning team	B.Roy		René Fillion		Done	428-263-C	2018-03-02
264	428	Incinerator	C	B	5	Install doors between incinerator area and tanks area	Finish the installation	B.Roy		Mark Long	2017-11-30	Done	428-264-C	2018-03-04
265	428	Incinerator	C	B	5	Install flashings in the sealing		B.Roy		Mark Long	2017-11-30	Done	428-265-C	2018-03-04
266	428	Incinerator	M	C	6	Waste oil delivery pumping skid	EcoWaste to supply the skid as show on their GA	B.Roy		Sylvain Chartier		In progress		
267	428	Incinerator	M	B	4	Thermos missings in the man doors (4)	install thermos	B.Roy		Sylvain Chartier	2018-01-30	Done	428-267-C	2018-03-04
268	428	Incinerator	M	B	4	Flashings missings on man door	Install flashings	B.Roy		Sylvain Chartier	2018-01-30	In progress		
269	428	Incinerator	M	B	4	No shock on the man door south side	Install the shock	B.Roy		Sylvain Chartier	2018-01-30	Done	428-269-C	2018-03-04
270	428	Incinerator	P	C	6	Incinerator 2, the regular need to be at 12in max from the center (EcoWaste error)	Suggested by EcoWaste worker (Commissioning)	B.Roy		René Fillion		In progress		

Appendix B: Incinerator photographs



Photo 1 View of incinerator building



Photo 2 View of incinerator building and electrical room



Photo 3 Incinerator's primary chamber (right) and secondary chamber (left)



Photo 4 Incinerator's secondary chamber and control panel



Photo 5 Incinerator's secondary chamber



Photo 6 Incinerator's secondary chamber including stack



Photo 7 Incinerator's used oil tank

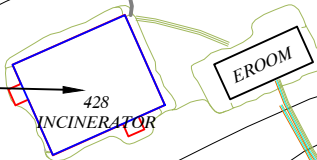


Photo 8 Incinerator's used oil tank plate

Appendix C: Incinerator Drawings

AGNICO

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E 539392.91



Système de Coord.:

NAD83 UTM15

Echelle:

n.t.s.

No plan:

65-428-142-200-R0-ABD

65-428-142-200-R0_ABD

Date des travaux :

2017

Dessine par:

Y.HAMEL

Approuve par:

Hamel Arp.

Date d'envoi :

2018-05-21



Ref. 151-06440-X

NOTES GÉNÉRALES / GENERAL NOTES

REF. TO DRAWING
ECO 1.75TN-1PVC100L-00C REV. 0

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TITRE / TITLE	# DWG
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AGNICO EAGLE

0	2017-04-21	ISSUED FOR CONSTRUCTION	T.G.	B.F.	
REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT

REVISIONS

TITRE / TITLE
AGNICO EAGLE - MELIADINE DIVISION
428 - INCINERATOR
200 - PROCESS
FLOWSHEET

DESSINÉ PAR DRAWN BY	THIERRY GEMME	DATE 2017-04-20
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VERIFIÉ PAR
CHECKED BY

APPROUVÉ PAR APPROVED BY	BERTRAND FORTIN, P. Eng.	2017-04-27
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ÉCHELLE SCALE	INDICATED	DATE	2017-04-21
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NO. DESSIN DRAWING NO.	65-428-200-200
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NO. PROJ. PROJECT NO.	REVISION	FEUILLE / SHEET
	0	1 / 1

VENDOR PACKAGE

STREAM NAME AND NUMBER PROPERTY OR COMPONENT	UNITS	①
		SOLID WASTE
FEED RATE	KG/Batch (LB/Batch)	1750 (3858)
ESTIMATED BULK DENSITY	KG/M ³ (LB/CF)	192 (12)
ESTIMATED HIGHER HEAT VALUE	MJ/KG (BTU/LB)	11.5 (4950)
MOISTURE CONTENT	%W	43
COMBUSTBLE	%W	49.5
NON-COMBUSTBLE	%W	7.5

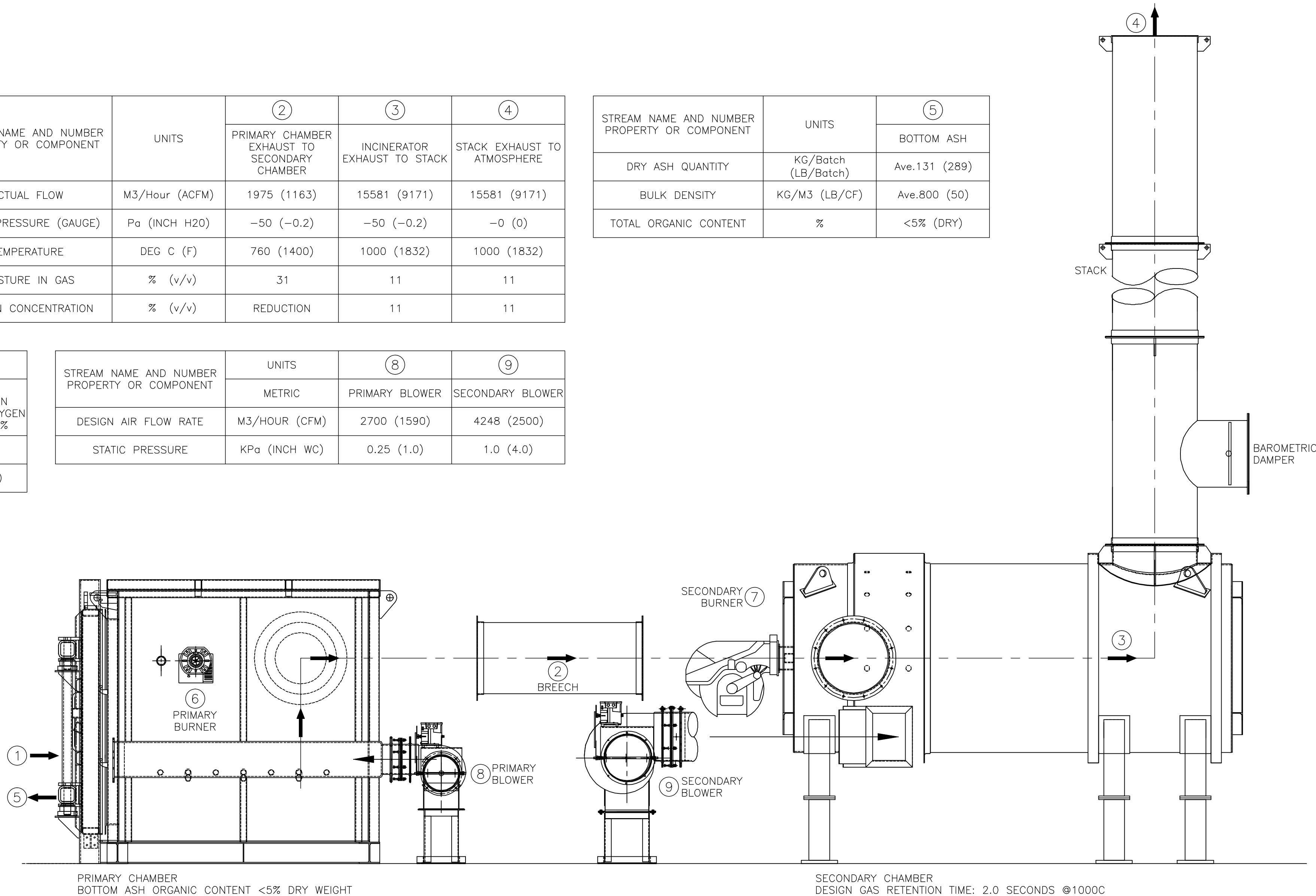
STREAM NAME AND NUMBER PROPERTY OR COMPONENT	UNITS	②	③	④
		PRIMARY CHAMBER EXHAUST TO SECONDARY CHAMBER	INCINERATOR EXHAUST TO STACK	STACK EXHAUST TO ATMOSPHERE
ACTUAL FLOW	M3/Hour (ACFM)	1975 (1163)	15581 (9171)	15581 (9171)
STATIC PRESSURE (GAUGE)	Pa (INCH H2O)	-50 (-0.2)	-50 (-0.2)	-0 (0)
TEMPERATURE	DEG C (F)	760 (1400)	1000 (1832)	1000 (1832)
MOISTURE IN GAS	% (v/v)	31	11	11
OXYGEN CONCENTRATION	% (v/v)	REDUCTION	11	11

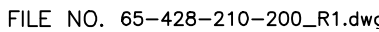
STREAM NAME AND NUMBER PROPERTY OR COMPONENT	UNITS	⑤
		BOTTOM ASH
DRY ASH QUANTITY	KG/Batch (LB/Batch)	Ave.131 (289)
BULK DENSITY	KG/M3 (LB/CF)	Ave.800 (50)
TOTAL ORGANIC CONTENT	%	<5% (DRY)

STREAM NAME AND NUMBER PROPERTY OR COMPONENT	UNITS	⑥	⑦
		DIESEL CONSUMPTION ⑥FLUE GAS OXYGEN CONTENT 11%	WASTE OIL CONSUMPTION ⑦FLUE GAS OXYGEN CONTENT 11%
FLOW RATE	LITER/HOUR (GPH)	Ave.10 (2.64)	98 (26)
DIESEL HIGHER HEAT VALUE	MJ/KG (BTU/LB)	42 (18000)	40 (17000)

STREAM NAME AND NUMBER PROPERTY OR COMPONENT	UNITS	⑧	⑨
	METRIC	PRIMARY BLOWER	SECONDARY BLOWER
DESIGN AIR FLOW RATE	M3/HOUR (CFM)	2700 (1590)	4248 (2500)
STATIC PRESSURE	KPa (INCH WC)	0.25 (1.0)	1.0 (4.0)

NOTE:
IN-LINE LAYOUT OF PROCESS DIAGRAM IS NOT THE ACTUAL EQUIPMENT LAYOUT.





H

G

F

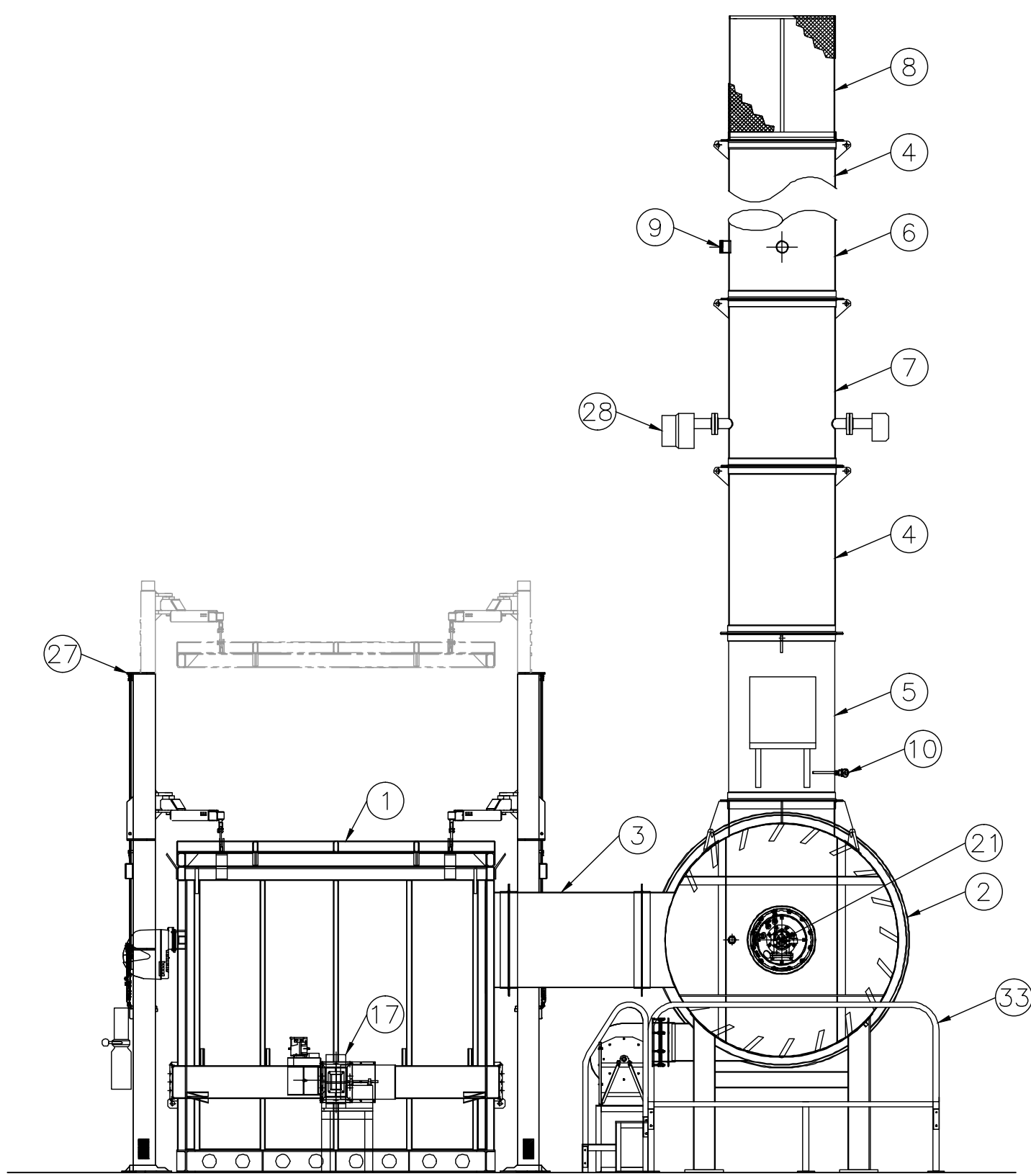
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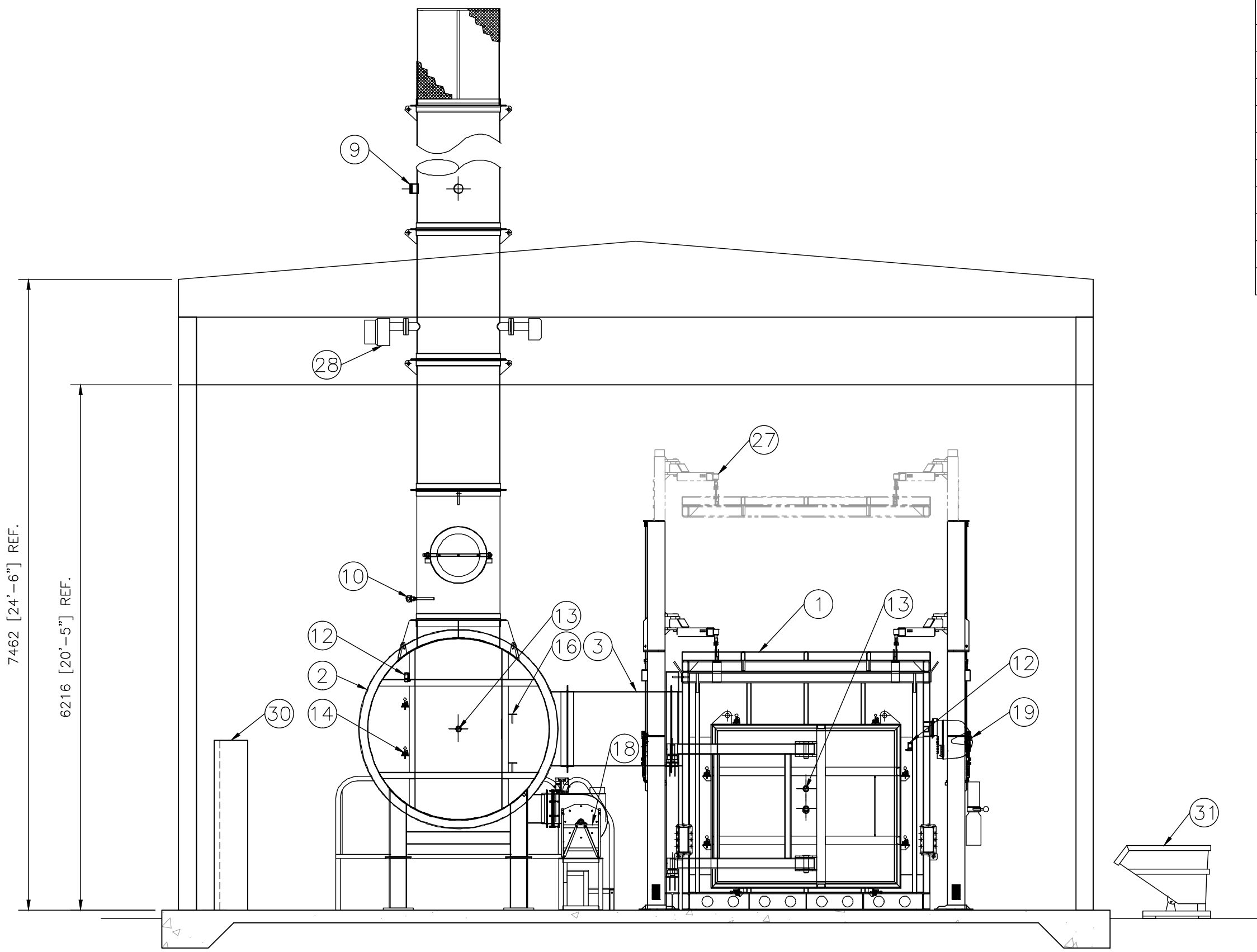
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B

A



SECTION
SCL: 1:50



SECTION
SCL: 1:50



ITEM	DESCRIPTION
1	PRIMARY CHAMBER
2	SECONDARY CHAMBER
3	BREECH
4	STACK SECTION
5	STACK SECTION WITH BAROMETRIC DAMPER
6	STACK SECTION WITH AIR EMISSION PORTS
7	STACK SECTION WITH OPACITY MONITOR
8	SPARK ARRESTOR
9	4" AIR EMISSION TEST PORT W/ CAP
10	THERMOCOUPLE (WITH PROTECTION TUBE)
11	PRIMARY CHAMBER DRAFT TRANSMITTER
12	PRIMARY/SECONDARY CHAMBER DOOR LIMIT SWITCH
13	2" VIEW PORT (2" NPT SIGHT GLASS)
14	TOGGLE CLAMP
15	PRIMARY CHAMBER DOOR BEARING
16	SECONDARY CHAMBER DOOR BEARING
17	PRIMARY CHAMBER BLOWER ASSEMBLY
18	SECONDARY CHAMBER BLOWER ASSEMBLY
19	PRIMARY CHAMBER BURNER ASSEMBLY
20	DIESEL TANK ASSEMBLY
21	SECONDARY CHAMBER BURNER ASSEMBLY
22	WASTE OIL SUPPLY PUMPING SKID
23	WASTE OIL DELIVERY PUMPING SKID
24	WASTE OIL TANK ASSEMBLY
25	275 GALLON WASTE OIL TOTE
26	95 GALLON UNIVERSIAL DRUM SPILL KIT
27	HYDRAULIC LID LIFTER
28	OPACITY MONITOR
29	WEIGHT SCALE WITH DIGITAL INDICATOR (4'x4')
30	CONTROL PANEL
31	2.5 YARD METAL ASH BIN
32	ASH CLEAN OUT KIT
33	SECONDARY BURNER PLATFORM

PLAN CLÉ
KEY PLAN

1075, 3^e AVENUE EST
VAL-D'OR (QUÉBEC) CANADA J9P 6J7
TÉL. : 819 825-4274 | TÉLÉC. : 819 824-1514 | WWW.WSPGROUP.COM
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NOTES GÉNÉRALES / GENERAL NOTES

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DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS	
TITRE / TITLE	# DWG
GENERAL ARRANGEMENT ECO 1.75TNPVC100L (REV. 1)	6515-5-265-208-210-200-201a02_1004

REV.	DATE	DESCRIPTION	PAR/ÉV.	APP.	CLIENT
1	2017-04-21	ISSUED FOR CONSTRUCTION	T.G.	O.P.	
0	2016-12-13	ISSUED FOR TENDER	L.G.	O.P.	

REVISIONS

TITRE / TITLE
AGNICO EAGLE - MELIADINE DIVISION
428 - INCINERATOR
210 - GENERAL ARRANGEMENT
SECTION

DESSINÉ PAR DRAWN BY	CAROLINE GAGNON	DATE 2016-07-11
VÉRIFIÉ PAR CHECKED BY	JEAN-PHILIPPE GRENIER, ing.	2016-07-11
APPROUVÉ PAR APPROVED BY	OLIVIER PERREAULT, P. Eng.	2016-12-13

ÉCHELLE SCALE	INDICATED	DATE 2016-07-11
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NO. DESSIN
DRAWING NO.
65-428-210-201

NO. PROJET PROJECT NO.	REVISION	FEUILLE / SHEET
6515	1	1 / 1