



7/29/2014

Certified Mail

Mr. Ben Fogle
GM Defiance Casting Operations
26427 State Route 281 East
Defiance, OH 43512

RE: DRAFT AIR POLLUTION PERMIT-TO-INSTALL
Facility ID: 0320010001
Permit Number: P0117030
Permit Type: Administrative Modification
County: Defiance

Yes	TOXIC REVIEW
Yes	PSD
Yes	SYNTHETIC MINOR TO AVOID MAJOR NSR
No	CEMS
No	MACT/GACT
No	NSPS
No	NESHAPS
Yes	NETTING
No	MAJOR NON-ATTAINMENT
Yes	MODELING SUBMITTED
No	MAJOR GHG
No	SYNTHETIC MINOR TO AVOID MAJOR GHG

Dear Permit Holder:

A draft of the Ohio Administrative Code (OAC) Chapter 3745-31 Air Pollution Permit-to-Install for the referenced facility has been issued for the emissions unit(s) listed in the Authorization section of the enclosed draft permit. This draft action is not an authorization to begin construction or modification of your emissions unit(s). The purpose of this draft is to solicit public comments on the permit. A public notice will appear in the Ohio Environmental Protection Agency (EPA) Weekly Review and the local newspaper, Crescent-News. A copy of the public notice and the draft permit are enclosed. This permit can be accessed electronically on the Division of Air Pollution Control (DAPC) Web page, www.epa.ohio.gov/dapc by clicking the "Search for Permits" link under the Permitting topic on the Programs tab. Comments will be accepted as a marked-up copy of the draft permit or in narrative format. Any comments must be sent to the following:

Andrew Hall
Permit Review/Development Section
Ohio EPA, DAPC
50 West Town Street, Suite 700
P.O. Box 1049
Columbus, Ohio 43216-1049

and Ohio EPA DAPC, Northwest District Office
347 North Dunbridge Road
Bowling Green, OH 43402

Comments and/or a request for a public hearing will be accepted within 30 days of the date the notice is published in the newspaper. You will be notified in writing if a public hearing is scheduled. A decision on issuing a final permit-to-install will be made after consideration of comments received and oral testimony if a public hearing is conducted. Any permit fee that will be due upon issuance of a final Permit-to-Install is indicated in the Authorization section. Please do not submit any payment now. If you have any questions, please contact Ohio EPA DAPC, Northwest District Office at (419)352-8461.

Sincerely,

Michael W. Ahern, Manager
Permit Issuance and Data Management Section, DAPC

Cc: U.S. EPA Region 5 - Via E-Mail Notification
Ohio EPA-NWDO; Michigan; Indiana

PUBLIC NOTICE
Issuance of Draft Air Pollution Permit-To-Install
GM Defiance Casting Operations

Issue Date: 7/29/2014
Permit Number: P0117030
Permit Type: Administrative Modification
Permit Description: This is an administrative modification to PTI P0106622, issued 12/20/2010 and PTI P0110399, issued 09/26/2012. This permit is being issued to modify the attrition mill emission factor from 0.08 lb VOC/ton to 0.10 lb VOC/ton. The permit will also modify the core machine sand mixing emission factor from 0.10 to 0.22 lb VOC/ton and increase the core making emission factor from 0.6 lb VOC/ton to 1.0 lb VOC/ton. The change in emission factors will require a change in the annual emission limitations established. As part of the administrative modification, BAT will be updated to reflect that VOC emissions are greater than 10 TPY from each core machine.

Facility ID: 0320010001
Facility Location: GM Defiance Casting Operations
State Route 281 East,
Defiance, OH 43512

Facility Description: Iron Foundries

The Director of the Ohio Environmental Protection Agency issued the draft permit above. The permit and complete instructions for requesting information or submitting comments may be obtained at: <http://epa.ohio.gov/dapc/permitsonline.aspx> by entering the permit # or: Alyse Johnson, Ohio EPA DAPC, Northwest District Office, 347 North Dunbridge Road, Bowling Green, OH 43402. Ph: (419)352-8461

Permit To Install: P0117030

This is an administrative modification to Permit to Install P0106622, issued 12/20/2010 to address a change in VOC emission factors. The increase in emission factors will result in a net increase in the annual limitation. As such, Ohio EPA has reviewed the BACT requirements and the associated five step top down approach has been reevaluated. The review did not result in any changes to the original BACT determination. Please refer below to the original BACT determination with updated VOC net emission increases. No other criteria pollutants will be modified through this permitting action.

STAFF DETERMINATION FOR THE APPLICATION TO CONSTRUCT UNDER THE PREVENTION OF SIGNIFICANT DETERIORATION REGULATIONS FOR THE DEFIANCE CASTINGS OPERATION, GM LLC - DEFIANCE FOUNDRY DEFIANCE COUNTY, OHIO PTI NUMBER P0106622

The Clean Air Act and regulations promulgated thereunder require that major air pollution sources undergoing construction or modification comply with all applicable Prevention of Significant Deterioration (PSD) provisions and nonattainment area New Source Review requirements. The federal PSD rules govern emission increases in attainment areas for major sources, which are sources with the potential to emit 250 tons per year or more of any pollutant regulated under the Clean Air Act, or 100 tons per year or more if the source is included in one of 28 source categories. In nonattainment areas, the definition of a major source is one having at least 100 tons per year potential emissions. A major modification is one resulting in a contemporaneous increase in emissions which exceeds the significance level of one or more pollutants. Any changes in actual emissions within a five-year period are considered to be contemporaneous. In addition, Ohio now has incorporated the PSD and NSR requirements by rule under OAC 3745-31.

Both PSD and nonattainment rules require that certain analyses be performed before a facility can obtain a permit authorizing construction of a new source or major modification to a major source. The principal requirements of the PSD regulations are as follows:

- 1) Best Available Control Technology (BACT) review - A detailed engineering review must be performed to ensure that BACT is being installed for the pollutants for which the new source is a major source.
- 2) Ambient Air Quality Review - An analysis must be completed to ensure the continued maintenance of the National Ambient Air Quality Standards (NAAQS) and that any increases in ambient air pollutant concentrations do not exceed the incremental values set pursuant to the Clean Air Act.

For nonattainment areas, the requirements are:

- 1) Lowest Achievable Emissions Rate (LAER) - New major sources must install controls that represent the lowest emission levels (highest control efficiency) that have been achieved in practice.
- 2) The emissions from the new major source must be offset by a reduction of existing emissions of the same pollutant by at least the same amount, and a demonstration must be made that the resulting air quality shows a net air quality benefit. This is more completely described in the Emission Offset Interpretative Ruling as found in Appendix S of 40 CFR Part 51.
- 3) The facility must certify that all major sources owned or operated in the state by the same entity are either in compliance with the existing State Implementation Plan (SIP) or are on an approved schedule resulting in full compliance with the SIP.

For rural ozone nonattainment areas, the requirements are:

- 1) LAER - New major sources must install controls that represent the lowest emissions levels (highest control efficiency) that have been achieved in practice.
- 2) The facility must certify that all major sources owned or operated in the state by the same entity are either in compliance with the existing SIP or are on an approved schedule resulting in full compliance with the SIP.

Finally, New Source Performance Standards (NSPS), SIP emission standards and public participation requirements must be followed in all cases.

Site/Facility Description

Defiance Castings Operations (GM Defiance) facility is a Major PSD facility for NOx, PM, PM10 & VOC. Defiance County is classified as attainment for all pollutants

GM Defiance is a manufacturer of automobile parts. GM Defiance has proposed to install three precision sand aluminum casting lines. The permit also includes a modification to the first precision sand aluminum casting line permitted under PTIOs P0106013 and P0105362.

Project Description

GM Defiance is proposing the following:

- 1) the shutdown and removal of two lost foam lines (lines 3 & 4);
 - 2) the installation a new precision sand aluminum casting research & development pilot for the mold pouring process;
 - 3) the installation of three new precision sand aluminum casting production process;
- A.
- 4) the modification of module#1 precision sand aluminum casting production process;
 - 5) the reuse of the current lost foam aluminum reverberatory furnaces and the associated baghouses and regenerative thermal oxidizers (RTOs) for the precision sand aluminum casting process; and
- B.
- 6) the modification of the precision sand aluminum casting research and development pilot for the mold fill pouring.

Process Description

The precision sand process consists of the following activities:

Molten Aluminum - Two aluminum reverberatory furnaces that serviced Lost Foam Castlines #3 and #4 will be reused in the Precision Sand process in Modules #1 and #2. A "launder" system, a series of refractory lined and electrically heated troughs in which molten aluminum can flow, will allow one furnace to feed both Modules #1 and #2 concurrently while the remaining furnace will serve as a backup. These furnaces, denoted as receiving furnaces for purposes of this project, will be used in the same way that they were described in the Lost Foam permit application. However, they will likely have their burner size increased from 9.6 mmBtu/hr to 18.0 mmBtu/hr resulting in a potential emission increase and necessitating revising the operating restrictions in permits P424 and P427. If the Plant decides against the burner upgrade for the reverberatory furnaces for Modules #1 and #2 then both furnaces will be operated as they are currently permitted.

A stack melter will be used as the melt source for Modules #3 and #4 of the Precision Sand process. The stack melter operates by dumping clean scrap into the top of the melter where 4 burners modulate, as needed, to melt the clean charge material. The molten aluminum flows into a holding bath at the bottom of the stack melter until it is ready to be distributed to the laundering system. Two burners will be operated in the holding sump to maintain adequate molten temperature. Each stack melter will be abated by a dust collector that is exhausted to the atmosphere.

A salt of chlorine and/or fluorine is added to the molten aluminum either by injection below the metal surfaces or by distributing it on top of the molten metal. This is called fluxing and its purpose is to help extend the life of the furnace refractory and keep the furnace walls clean and remove metal impurities. The waste formed by fluxing is called dross (floats to the top) and is skimmed from the furnace in a process called Drossing.

In addition, hydrogen gas is removed from the molten metal (usually in the Laundering system and the Leveling furnace) before casting. Argon or nitrogen is injected into the molten metal for degassing purposes.

Core Room Activities - The core room activities include sand delivery and transport, core-making, core machine maintenance, core assembly, cylinder liner cleaning, and final mold assembly.

The Precision Sand process employs only core sand. Sand will be delivered via rail or truck and sent, initially, to a receiving station containing 2, 35-ton hoppers. The hoppers will feed a large silo and 2, 60-ton storage bins. The sand in the storage containers will be directed to a 20-ton bin. The sand from the 20-ton bin will be directed into 2, 70-ton sand bins, which will feed the sand mixers located at the core machines.

There will be 6 core machines per module using sand, resins, and a catalyst to manufacture cores. The Cores will be made using "Cold Box" technology, where sand is first mixed with a 2-part resin. The machines will have the flexibility to employ two different core resins and catalysts for the manufacturing of cores. In the Isocure, di-methyl iso-propyl amine (DMIPA) is used and in the Iso-set process, sulfur dioxide (SO₂) is used as a catalyst (for resin hardening) for manufacturing the cores. After the cores are made, they will then be placed on a conveyor to be taken to storage racks. About 13 to 16 individual cores are used to assemble the final mold, which resembles a cube or box-shaped structure.

Cleaned cast iron cylinder liners (they provide the appropriate wear surface between the piston outside diameter and the cylinder bore inside diameter) are inserted into the partially assembled core packages. Next, a bottom steel or cast iron chill (to produce rapid cooling of aluminum) is added to the partially assembled core package. Finally, the large cover core is applied to complete the mold.

Cast Line Operations - Molten aluminum is pumped from the Pump well into the mold. The mold is then set into a cooling conveyor to allow the molten metal to solidify. The mold then enters a shakeout enclosure, where 95% of the core sand is removed.

The castings then move into the Casting Cooling Tunnel. The castings will then be routed to new equipment called the Hershel Hammer & Swing Master. This equipment will remove additional sand using mechanical hammering followed by a rotating and shaking activity. The castings will then be moved to a shot blasting unit. Finally, the aluminum gating system associated with the castings will be removed, after which, the castings are packaged and sent-off site as a product.

Waste Sand Handling - Waste sand will be generated at several places in the process, but mainly at the shakeout. The waste sand will be conveyed to a sand crusher. The crusher will break up the large sand cores into smaller pieces. The crushed waste sand will either be taken off-site for disposal or recycling activity or it will be taken to the plant's landfill for disposal.

Makeup Air Houses - Natural gas-fired make-up air houses will be installed to supply the necessary air for the precision sand area.

Applicable Regulations

There are no 40 CFR Part 60 or 61 rules that might apply to any of the emissions units that are part of this project. Also, 40 CFR Part 63, Subpart RRR, which applies to Secondary Aluminum Production, is not applicable. Pursuant to 40 CFR 63.1503, aluminum die casting, aluminum foundries, and aluminum extrusion facilities are not considered secondary aluminum production facilities if the only materials they melt are clean charge (includes molten aluminum), customer return, or internal scrap, and if they do not operate sweat furnaces, thermal chip dryers, or scrap dryers/delacquering kilns/decoating kilns. Therefore, this facility is not subject to 40 CFR Part 63, Subpart RRR.

PSD Applicability

GM Defiance is currently classified as a PSD “major” stationary source with potential PE, PM₁₀, VOC, NO_x and SO₂ emissions exceeding the PSD significance levels. Any “major” stationary source which is proposing emissions of a regulated pollutant in excess of PSD significance levels will be required to undergo a PSD analysis for that particular pollutant. This project will meet the definition of major modification for PE, PM₁₀, VOC, NO_x and SO₂ emissions. However, the net emissions increase for PE and PM₁₀ is below the significance level of 25 and 15 tons per year, respectively and, therefore, this project is not considered a major modification for PE and PM₁₀. On the other hand, the net emissions increase for VOC, NO_x and SO₂ emissions are above the significance level of 40 tons per year. Therefore, this project is considered a major modification for VOC.

Table I shows the Net emissions increase from the proposed project.

Table I

<u>Pollutant</u>	<u>Tons per Year Increases</u>	<u>Netting Emissions</u>	<u>PSD Trigger</u>
VOC	645.54	+562.52	40
PM ₁₀	97.39	-89.89	15
PE	71.22	-134.37	25
NO _x	70.09	95.25	40
CO	62.56	62.56	100
SO ₂	50.02	56.75	40

Based upon the information above, a PSD review is required for VOC, NO_x and SO₂.

Best Available Control Technology (BACT) analysis

BACT Review

The GM Defiance facility is subject to PSD regulations that mandate a case-by-case BACT analysis be performed for each proposed new or modified emissions unit at which a net increase of VOC will occur (see Table II below). The application used a “top-down” approach to determine an appropriate level of control.

As part of the application for any emissions unit regulated under the PSD requirements, an analysis must be conducted that demonstrates that Best Available Control Technology (BACT) will be employed for every affected pollutant.

Table II

C. Precision Sand Sources Requiring BACT Emission Sources Requiring BACT	
D. Emissions Sources	E. Pollutants
F. Receiving Furn./Stack Melter	G. VOC, SO ₂ , NO _x
H. Sand Hoppers & Mixers	I. VOC
J. Core-Making & Maintenance	K. VOC, SO ₂
L. Core Storage & Assembly	M. VOC, SO ₂
N. Pouring (main and pilot)	O. VOC
P. Mold Cooling	Q. VOC, NO _x
R. Shakeout	S. VOC, NO _x
T. Cooling Tunnel	U. VOC
V. DeFlash, DeGate, DeCore	W. VOC
X. Attrition Mill	Y. VOC
Z. Waste Sand Loadout Station	AA.VOC
BB.Waste Sand Disposal	CC. VOC
DD. Air House	EE.VOC, SO ₂ , NO _x

Summary of BACT Requirements

BACT is defined as an emission limitation for new or modified sources to be achievable on a case-by-case basis while considering the following three factors:

- 1) Environmental Impact;
- 2) Energy Impact; and
- 3) Economic Impact.

BACT analysis includes air pollution control technologies with the potential to be applied to the emission source for the pollutant under consideration. It is pertinent to point out that BACT must be no less stringent than limitations defined by the standard of a State Implementation Plan, a National Emission Standard for Hazardous Air Pollutants, or a New Source Performance Standard.

The BACT analysis requires a "Top-Down" approach (*NSR Workshop Manual*), which evaluates the control technology with highest efficiency first, and arrives at the final controls in a 5-step process:

- 1) Identifying All Applicable Control Technologies;
- 2) Eliminating Technically Infeasible Control Technologies;
- 3) Ranking Remaining Control Technologies by Control Effectiveness;
- 4) Evaluating Cost Effectiveness of Controls and Document Results; and
- 5) Selecting BACT.

As can be seen from the list above, the final stage of the analysis is the actual selection of the most cost effective air pollution control device. The permitting authority generally sets levels for cost effectiveness. Once a cost-effective control device has been identified for a particular source, that device will be selected as BACT and will be implemented as part of the overall project for that source. If no control systems are deemed to be cost effective, BACT will be no abatement.

PROJECT BACT ANALYSIS/ The 5-step BACT process

Step #1 -- Identify All Applicable Control Technologies

The controls Identified for the emissions units that comprise this project are listed below, in the order of highest to lowest control efficiency:

For VOC:

- 1) Thermal Oxidation (non-catalytic) (TO)
- 2) Activated Carbon Adsorption
- 3) Wet Scrubbing
- 4) Refrigeration/Condensation

For SO₂:

- 1) Wet Scrubbing
- 2) Dry Scrubbing

For NO_x:

- 1) Low NO_x Burners (LNB)
- 2) Selective Catalytic Reduction (SCR)
- 3) Selective Non-catalytic Reduction (SNCR)

These control devices have been identified as potentially applicable BACT technologies by researching RACT/BACT/LAER Clearinghouse and EPA's NEET Clean Air Technologies Databases, and in-house engineering experience. Each option was evaluated taking into account the source's physical and chemical characteristics of the gas stream to be controlled.

Step #2 – Eliminate Technically Infeasible Options

Stack melters - Only source of VOC emissions is natural gas combustion. Because of the elevated temperatures of the exhaust gas stream, carbon adsorption, wet scrubbing, and condensation are not feasible. Also, thermal oxidation is not feasible as a combustion source since it will also generate VOC and NO_x (ozone precursor). (**BACT is the use of natural gas as fuel.**)

SO₂ emissions are a result of natural gas combustion. At these extremely low concentrations of SO₂ in the natural gas exhaust from these sources, no controls are technically feasible. Since there are no feasible add-on control technologies, BACT for these sources is the use of natural gas fuel. No further analysis is necessary for these sources.

NO_x emissions are a result of combustion of natural gas and do not include process related emissions. The size of these combustion units is less than 20 MMBtu/hr. Application of LNB to these sources is feasible and will be evaluated further.

Sand mixing - Low VOC concentration (~20 ppmw) renders the use of carbon adsorption, condensation, and wet scrubbing technically infeasible. TO is technically feasible for this source.

Core Making - The presence of particulate matter in the exhaust gas stream would result in plugging of the carbon bed. Carbon adsorption is technically infeasible for Core mixing. Low VOC concentration (~300 ppmw) results in unreasonably low requirement for condensation temperature, making the use of the condensation technology technically infeasible. Wet scrubbing and thermal oxidation are technically feasible.

SO₂: The enclosure surrounding each core machine allows 100% capture of the SO₂ emissions from core-making. Both wet and dry scrubbing systems are technically feasible for SO₂ control from the core making operations.

Core Machine Metal Cleaner - High volume of air (>300,000 SCFM) and low concentration (~ 3 ppmw) make this source not conducive to add-on controls. (**BACT is no controls.**)

Core Box Cleaning Tank- Low VOC concentration (~ 1 ppmw) makes this source not conducive to add-on controls. (**BACT is no controls.**)

Core Storage & Assembly - High volume of air (~150,000 SCFM) and low VOC concentration (~ 20 ppmw) make this source not conducive to add-on controls. Thermal oxidation is technically feasible for VOC control.

SO₂: During transfer via conveyor belt to the assembly area, some residual SO₂ off-gassing may occur. These emissions are released into the general in-plant air. In order to capture and control these emissions, hoods would need to be constructed over the conveyor belt to capture the SO₂ emissions and duct them to a control device. The airflow necessary to capture the SO₂ emissions from this area is estimated to be ~ 150,000 scfm. This would result in an extremely high-volume of air with very low SO₂ concentration (~2 ppm). The low SO₂ concentration renders the use of wet or dry scrubbing technically infeasible for this source. BACT for this source is no control for SO₂ emissions. No further analysis is necessary for this source.

Cylinder Liner Cleaning Oven - Only source of VOC emissions is natural gas combustion. Because of the elevated temperatures of the oven exhaust gas stream, carbon adsorption, wet scrubbing, and condensation are not technically feasible. Also, thermal oxidation is not feasible as a combustion source since it will also generate VOC and NO_x emissions (ozone precursor). **(BACT is the use of natural gas as fuel.)**

Pouring - Low VOC concentration (~ 30 ppmw) renders the use of carbon adsorption, condensation, and wet scrubbing technically infeasible. Thermal oxidation is technically feasible for this source.

Cooling - Thermal oxidation will be employed in this source (has the highest abatement efficiency of all technologies).

NO_x: A thermal oxidation system (13.5 MMBtu/h) is proposed as BACT for VOC emissions from mold cooling and shakeout. LNB for reducing NO_x emissions from this source is feasible and will be evaluated further in the BACT analysis.

Shakeout - Thermal oxidation will be employed in this source (has the highest abatement efficiency of all technologies).

NO_x: A thermal oxidation system (13.5 MMBtu/h) is proposed as BACT for VOC emissions from mold cooling and shakeout. LNB for reducing NO_x emissions from this source is feasible and will be evaluated further in the BACT analysis.

Cooling Tunnel - Low VOC concentration (~ 22 ppmw) renders the use of carbon adsorption, condensation, and wet scrubbing technically infeasible. Thermal oxidation is technically feasible for this source.

Hershel Hammer & Swing Master - Low VOC concentration (~ 180 ppmw) renders the use of carbon adsorption, condensation, and wet scrubbing technically infeasible. Thermal oxidation is technically feasible for this source.

DeFlash, DeGate, DeCore - Low VOC concentration (~ 70 ppmw) renders the use of carbon adsorption, condensation, and wet scrubbing technically infeasible. Thermal oxidation is technically feasible for this source.

Attrition mill - Low VOC concentration (<30 ppmw) and elevated exhaust temperature (~ 160 F) render the use of carbon adsorption, condensation, and wet scrubbing technically infeasible. Thermal oxidation is technically feasible for this source.

Waste Sand Handling - High volume of air (>300,000 SCFM) and low VOC concentration make this source not conducive to add-on controls. **(BACT is no controls.)**

Air House - Only source of VOC emissions is natural gas combustion. Because of the elevated temperatures of the oven exhaust gas stream, carbon adsorption, wet scrubbing, and condensation are not feasible. Also, thermal oxidation is not feasible as a combustion source since it will also generate VOC and NO_x (ozone

precursor). (**BACT is the use of natural gas as fuel.**)

NO_x emissions are a result of combustion of natural gas and do not include process related emissions. The size of these combustion units is less than 20 MMBtu/hr. Application of LNB to these sources is feasible and will be evaluated further.

Step #3 -- Rank Remaining Control Technologies by Control Effectiveness

FF. VOC

GG. Thermal oxidation and wet scrubbing (when using Isocure/DMIPA) are technically feasible for control of VOC emissions from core making and maintenance and will be described below. Thermal oxidation is the only remaining VOC control technology that is technically feasible for pouring; cooling tunnel; deflash, degate, decore; attrition mill; and waste sand loadout station.

HH. II. For thermal oxidation, the exact control efficiency depends on the characteristics of the stream to be controlled, and detailed engineering analyses or stack testing is usually needed to determine the precise control efficiency provided by a technology for a given stream. For example, a stream with a high concentration of easily combustible material can be controlled to over 98%. However, very low VOC concentration streams, such as those discussed above, cannot be controlled by thermal oxidation to quite this level of control. Based on in-house data and vendor information, GM estimates that thermal oxidation will achieve 95% control of VOC emissions.

JJ. For control of VOC emissions when using the DMIPA catalyst, the wet scrubber uses a low pH, sulfuric acid and water, solution to absorb the DMIPA from the exhaust gas stream. The acid scrubber is expected to remove about 99% of incoming DMIPA, however, the scrubber is not expected to control emission of other organics from the core making resin, therefore, an overall VOC (i.e. DMIPA and other organics) control efficiency of 78% is expected for wet scrubbing.

KK. SO₂

LL. Wet and dry scrubbing are the only two remaining technologies that are technically feasible for core making. Wet scrubbing can technically achieve higher control effectiveness for SO₂ than dry scrubbing; therefore, it is the highest ranking control technology. The exact control efficiency depends on the characteristics of the stream to be controlled, and a detailed engineering analyses or stack test is usually needed to determine the precise control efficiency provided by a technology for a given stream. Based on in-house data and vendor information, GM is assuming that the caustic wet scrubber will achieve 98.5% reduction efficiency for SO₂ emissions (dry scrubbing is estimated to provide 80% reduction efficiency of SO₂ emissions).

MM.

NN. NO_x

OO. The use of LNB technology is the only feasible add on control system for NO_x emissions from the receiving furnaces, stack melters, air handlers, and cooling and shakeout thermal oxidizer sources. Because LNB is the only technically feasible add on control technology, it is the highest performing control and a ranking is not necessary.

Step #4 -- Evaluate Most Effective Controls and Document Results

VOC

Thermal Oxidation - Normally, thermal oxidizers are capable of achieving up to 95% control efficiency and can recover upwards of 95% of the heat of combustion. Resin material, however, may contribute to fouling of the heat sink beds of the oxidizer, which will require capabilities to clean off the fouling material. This will increase the capital cost and reduce the thermal efficiency of the oxidizer.

Wet scrubbing - The scrubber uses a low pH, sulfuric acid and water, solution to absorb VOC from the exhaust gas steam. The efficiency of absorption for removing pollutants from a gaseous mixture is dependent on the solubility of the pollutant in the absorption solvent.

Core Making - Abatement of di-methyl iso - propyl amine (DMIPA) using oxidation results in creation of large quantities of NO_x emissions (37 lbs/hr or 107 tons/year). The overall control efficiency for VOC is expected to be 95%, by weight.

The acid scrubber removes about 99% of the DMIPA from the exhaust gas stream. However, it will only remove a small amount of other VOCs present in the gas steam (30- 40%). The overall control efficiency for VOC is 78%, by weight. It is estimated that employing TO over wet scrubbing will result in a further VOC reduction of 35 tons/year.

A combination of wet scrubbing and TO will also be considered as an option for VOC control.

SO₂
Wet scrubbing is the most effective SO₂ control for the core making operation. It provides higher reduction efficiency for SO₂ removal from the core making exhaust.

NO_x
GM Defiance is proposing to install LNB technology for NO_x combustion emissions control on the air handlers, the stack melters, and the cooling and shakeout thermal oxidizers. Because this is the top performing technically feasible control technology and there are no adverse environmental affects, GM is proposing to install this technology and no further analysis is necessary.

Step #5 -- Select BACT

VOC
PP. *Core Making*– The use of thermal oxidation to control VOC emissions from the core making process produces an overall negative effect versus wet scrubbing (via packed tower with countercurrent flow with a low pH, sulfuric acid and water, solution) for this particular source when employing the Isocure/DMIPA system due to the high amount of NO_x generated by the oxidation of DMIPA (~107 tpy NO_x). Although thermal oxidation control efficiency is slightly higher than wet scrubbing, the additional 35 tpy VOC control from thermal oxidation alone (vs wet scrubbing) is outweighed by the creation of 107 tpy of NO_x emissions and, therefore, thermal oxidation is rejected as a sole control technology for core making with the Isocure/DMIPA system.

QQ.
RR. The next most effective control technology for core making when employing the Isocure/DMIPA system is wet scrubbing. GM has employed wet scrubbing at the Saginaw facility on a similar process and wet scrubbing to control DMIPA emissions from core making is an industry standard. Wet scrubbing with a low pH, sulfuric acid and water, solution has been proposed to be used as part of this permit application.

SS.
TT. GM also investigated using thermal oxidation for the residual VOC emissions after the wet scrubber when employing the Isocure/DMIPA system. The incremental cost-effectiveness for this control option is presented in the table above. As the cost analysis shows, thermal oxidation for the residual VOC emissions is approximately \$8,000/ton of VOC emissions controlled and is considered not cost-effective. Therefore, wet scrubbing alone, which is proposed to be employed for abatement of DMIPA, is considered BACT for the core making operations when employing the Isocure/DMIPA system.

Similarly, as the cost analysis shows, when employing the Isoset/SO₂ system, thermal oxidation for abatement of VOC emissions is approximately \$10,200/ton of VOC emissions controlled and is considered not cost-effective. Table III below provides a summary of BACT for each one of the sources considered:

Table III

Summary of VOC BACT	
Stack melter	Use of natural gas
core machine sand hopper and mixer	no control
core making and maintenance (with acid scrubbing)	wet scrubbing (control of DMIPA). No additional control of resin VOC.
core storage and assembly	no control
pouring	no control
mold cooling	thermal oxidizer
shakeout	thermal oxidizer
cooling tunnel	no control
deflash, degate, decore	no control
attrition mill	no control
waste sand load out	no control
waste sand disposal	no control
air house	no control

SO₂
Core-Making & Maintenance– GM Defiance will employ a wet caustic scrubbing system on the core making process to remove SO₂ emissions associated with the use of SO₂ catalyst. Wet scrubbing has been identified as the highest achieving control technology that is feasible for this emissions source. Therefore, wet scrubbing, which is proposed to be employed, is considered BACT for the core-making operations.

NO_x
Stack melters, cooling and shakeout – GM Defiance will employ the use of natural gas, LNB and good combustion practices.

Modeling

Air dispersion modeling was performed for various emissions contained in this permit. Comparison and compliance with the Prevention of Significant Deterioration (PSD) Significant Impact or Class II PSD Incremental Impact for SO₂, the National Ambient Air Quality Standards (NAAQS) Impact for SO₂, and the Maximum Allowable Ground Level Concentration (MAGLC) for cumene, acetophenone, and alpha-Methylstyrene for the SO₂ catalyst scenario. In comparison, the DMIPA catalyst scenario included MAGLC evaluation for Naphthalene, m,p-Xylene, Phenol, Xylene, and Formaldehyde air toxics. The PSD Significant Impact for SO₂ was exceeded for all averaging periods (3-hour, 24-hour and annual) thereby creating the need to demonstrate compliance with the Class II PSD Incremental Impact for all PSD increment consuming sources in the area. The impact from all PSD increment consuming sources was determined to be below the Class II PSD Incremental Impact and the predicted ambient concentrations of air toxics results showed concentrations below the applicable pollutant specific MAGLC.

Conclusions

Based upon the analysis of the permit to install application and its supporting documentation provided by the GM Defiance, the Ohio EPA staff has determined that the proposed increase will comply with all applicable State and Federal environmental regulations and that the requirements for BACT are satisfied. Therefore, the Ohio EPA staff recommends that a permit to install be issued to the GM Defiance facility.



Permit Strategy Write-Up

1. Check all that apply:

Synthetic Minor Determination

Netting Determination

2. Source Description: Defiance Casting Operations (GM) in Defiance County is a manufacturer of automobile parts. The facility is a Major PSD facility. Please see additional notes for further detail.
3. Facility Emissions and Attainment Status: GM is a major PSD facility. Defiance County is classified as attainment for all pollutants.
4. Source Emissions: The facility is proposing to install three additional Precision Sand aluminum casting lines. Module #1 and the pilot line is currently under installation but will be included in this permit action for modification to the terms and conditions. GM is considering both the Module #1, pilot line and the three new lines to be one project for PSD purposes.

Project Increases

ID	Equipment Description	VOC	PM10	PE	SO2	NOx	CO
F007	MOD #1 & # 2 WASTE SAND LOAD-OUT	8.00	1.40	2.80	0.00	0.00	0.00
F013	MOD #3 & # 4 WASTE SAND LOAD-OUT	8.00	1.40	2.80	0.00	0.00	0.00
F008	MOD#1 MOLD FILL POURING	1.34	0.31	0.16	0.00	0.00	0.00
F009	PILOT LINE MOLD FILL POURING	0.11	0.02	0.01	0.00	0.00	0.00
F010	MOD #2 MOLD FILL POURING	1.34	0.25	0.13	0.00	0.00	0.00
F011	MOD #3 MOLD FILL POURING	1.34	0.25	0.13	0.00	0.00	0.00
F012	MOD #4 MOLD FILL POURING	1.34	0.25	0.13	0.00	0.00	0.00
P801	MOD #1 CORE STORAGE AND ASSEMBLY AREA	37.51	0.00	0.00	3.27	0.00	0.00
P802	MOD #2 CORE STORAGE AND ASSEMBLY AREA	37.51	0.00	0.00	3.27	0.00	0.00
P803	MOD #3 CORE STORAGE AND ASSEMBLY AREA	37.51	0.00	0.00	3.27	0.00	0.00
P804	MOD #4 CORE STORAGE AND ASSEMBLY AREA	37.51	0.00	0.00	3.27	0.00	0.00
P472	MOD #1 MOLD COOLING LINE	3.35	2.68	1.34	0.013	5.45	4.95
P521	MOD #2 MOLD COOLING LINE	3.35	2.68	1.34	0.013	5.45	4.95
P522	MOD #3 MOLD COOLING LINE	3.35	2.68	1.34	0.013	5.45	4.95
P523	MOD #4 MOLD COOLING LINE	3.35	2.68	1.34	0.013	5.45	4.95
P473	MOD #1 MOLD SHAKEOUT WITH DUCT BURNER	12.71	4.68	2.27	0.03	8.43	7.63
P518	MOD #2 MOLD SHAKEOUT WITH DUCT BURNER	12.71	4.68	2.27	0.03	8.43	7.63
P519	MOD #3 MOLD SHAKEOUT WITH DUCT BURNER	12.71	4.68	2.27	0.03	8.43	7.63
P520	MOD #4 MOLD SHAKEOUT WITH DUCT BURNER	12.71	4.68	2.27	0.03	8.43	7.63
P474	MOD #1 CASTING COOLING TUNNEL	10.04	2.27	1.20	0.00	0.00	0.00
P512	MOD #2 CASTING COOLING TUNNEL	10.04	2.27	1.20	0.00	0.00	0.00
P513	MOD #3 CASTING COOLING TUNNEL	10.04	2.27	1.20	0.00	0.00	0.00
P514	MOD #4 CASTING COOLING TUNNEL	10.04	2.27	1.20	0.00	0.00	0.00
P476	MOD #1 FINAL SHOT BLAST CABINET	0.00	0.27	0.27	0.00	0.00	0.00
P516	MOD #2 FINAL SHOT BLAST CABINET	0.00	0.27	0.27	0.00	0.00	0.00
P517	MOD #3 FINAL SHOT BLAST CABINET	0.00	0.27	0.27	0.00	0.00	0.00
P518	MOD #4 FINAL SHOT BLAST CABINET	0.00	0.27	0.27	0.00	0.00	0.00



ID	Equipment Description	VOC	PM10	PE	SO2	NOx	CO
P478	MOD #1 PAN CONVEYOR, ATTRITION MILL AND WASTE SAND CONVEYOR	5.73	4.59	2.29	0.00	0.00	0.00
P546	MOD #2 PAN CONVEYOR, ATTRITION MILL AND WASTE SAND CONVEYOR	5.73	4.59	2.29	0.00	0.00	0.00
P547	MOD #3 PAN CONVEYOR, ATTRITION MILL AND WASTE SAND CONVEYOR	5.73	4.59	2.29	0.00	0.00	0.00
P548	MOD #4 PAN CONVEYOR, ATTRITION MILL AND WASTE SAND CONVEYOR	5.73	4.59	2.29	0.00	0.00	0.00
P475	MOD #1 DEFLASH, DECORE, DEGATE PROCESS	5.04	0.41	0.41	0.00	0.00	0.00
P541	MOD #2 DEFLASH, DECORE, DEGATE PROCESS	5.04	0.41	0.41	0.00	0.00	0.00
P542	MOD #3 DEFLASH, DECORE, DEGATE PROCESS	5.04	0.41	0.41	0.00	0.00	0.00
P543	MOD #4 DEFLASH, DECORE, DEGATE PROCESS	5.04	0.41	0.41	0.00	0.00	0.00
P906	MOD #1 RECEIVING AND STORAGE	0.00	3.93	3.93	0.00	0.00	0.00
P907	MOD #2 RECEIVING AND STORAGE	0.00	3.93	3.93	0.00	0.00	0.00
P908	MOD #3 RECEIVING AND STORAGE	0.00	3.93	3.93	0.00	0.00	0.00
P909	MOD #4 RECEIVING AND STORAGE	0.00	3.93	3.93	0.00	0.00	0.00
P544	MOD #3 STACK MELTER	0.31	3.27	3.27	0.04	5.75	4.83
P545	MOD #4 STACK MELTER	0.31	3.27	3.27	0.04	5.75	4.83
P464	MOD #1 SAND CORE MACHINE #1 (COMBINED with 2-6)	81.44	2.67	2.67	9.18	0.00	0.00
P465	MOD #1 SAND CORE MACHINE #2	0.00	0.00	0.00	0.00	0.00	0.00
P466	MOD #1 SAND CORE MACHINE #3	0.00	0.00	0.00	0.00	0.00	0.00
P467	MOD #1 SAND CORE MACHINE #4	0.00	0.00	0.00	0.00	0.00	0.00
P468	MOD #1 SAND CORE MACHINE #5	0.00	0.00	0.00	0.00	0.00	0.00
P469	MOD #1 SAND CORE MACHINE #6	0.00	0.00	0.00	0.00	0.00	0.00
P524	Precision Sand Mod #2 Core Machine #1 (COMBINED with 2-5)	81.44	2.67	2.67	9.18	0.00	0.00
P527	Precision Sand Mod #2 Core Machine #2	0.00	0.00	0.00	0.00	0.00	0.00
P530	Precision Sand Mod #2 Core Machine #3	0.00	0.00	0.00	0.00	0.00	0.00
P533	Precision Sand Mod #2 Core Machine #4	0.00	0.00	0.00	0.00	0.00	0.00
P538	Precision Sand Mod #2 Core Machine #5	0.00	0.00	0.00	0.00	0.00	0.00
P525	Precision Sand Mod #3 Core Machine #1 (COMBINED with 2-6)	81.44	2.67	2.67	9.18	0.00	0.00
P528	Precision Sand Mod #3 Core Machine #2	0.00	0.00	0.00	0.00	0.00	0.00
P531	Precision Sand Mod #3 Core Machine #3	0.00	0.00	0.00	0.00	0.00	0.00
P534	Precision Sand Mod #3 Core Machine #4	0.00	0.00	0.00	0.00	0.00	0.00
P536	Precision Sand Mod #3 Core Machine #5	0.00	0.00	0.00	0.00	0.00	0.00
P539	Precision Sand Mod #3 Core Machine #6	0.00	0.00	0.00	0.00	0.00	0.00
P526	Precision Sand Mod #4 Core Machine #1 COMBINED with 2-6)	81.44	2.67	2.67	9.18	0.00	0.00
P529	Precision Sand Mod #4 Core Machine #2	0.00	0.00	0.00	0.00	0.00	0.00
P532	Precision Sand Mod #4 Core Machine #3	0.00	0.00	0.00	0.00	0.00	0.00
P535	Precision Sand Mod #4 Core Machine #4	0.00	0.00	0.00	0.00	0.00	0.00
P537	Precision Sand Mod #4 Core Machine #5	0.00	0.00	0.00	0.00	0.00	0.00
P540	Precision Sand Mod #4 Core Machine #6	0.00	0.00	0.00	0.00	0.00	0.00
P479	Precision sand Mod#1 Cylinder Liner Blast Cabinet	0.00	0.13	0.13	0.00	0.00	0.00
P549	Precision sand Mod#2 Cylinder Liner Blast Cabinet	0.00	0.13	0.13	0.00	0.00	0.00
P510	Precision sand Mod#3 Cylinder Liner Blast Cabinet	0.00	0.13	0.13	0.00	0.00	0.00
P511	Precision sand Mod#4 Cylinder Liner Blast Cabinet	0.00	0.13	0.13	0.00	0.00	0.00
	7 mmBtu/hr air make-up	0.17	0.23	0.23	0.02	3.07	2.58
	water blast	0.00	0.06	0.06	0.00	0.00	0.00
	water blast	0.00	0.06	0.06	0.00	0.00	0.00



ID	Equipment Description	VOC	PM10	PE	SO2	NOx	CO
	water blast	0.00	0.06	0.06	0.00	0.00	0.00
	water blast	0.00	0.06	0.06	0.00	0.00	0.00
	Project increase	645.54	97.39	71.22	50.02	70.09	62.56

Contemporaneous increases

Permit	Install Date	Emissions Unit	Description	VOC	PM10	PE	NOx	SO2
P0104240	02/01/08	P480	Precision sand pilot line	19.12	4.59	2.29	0.00	0.00
P0104235	10/31/09	P481	Family zero finishing line	0.49	13.47	13.47	0.00	0.00
03-16280	02/01/07	F006	malleable iron raw material conveyor	0.00	1.0	2.58	0.00	0.00
03-13280	02/01/07	P455	80 ton electric induction furnace	0.0	0.26	0.26	0.00	0.00
03-16280	02/01/07	P456-P460	malleable iron cold box core machines 1 through 5	28.99	5.63	5.63	0.00	6.55
03-16280	02/01/07	P902	malleable iron line 1	7.62	2.19	2.76	39.50	0.09
03-16280	02/01/07	P903	malleable iron line 2	7.62	2.19	2.76	0.00	0.09
03-16280	02/01/07	P905	malleable iron casting finishing operations	0.00	1.76	1.76	0.00	0.00
03-16320	06/01/05	P461	FN 4 east manipulator blast cabinet	0.00	8.30	8.30	0.00	0.00
03-16320	06/01/05	P462	FN4 West manipulator blast cabinet	0.00	8.30	8.30	0.00	0.00
03-16320	06/01/05	P463	FN4 shaker	0.00	0.13	0.13	0.00	0.00
			TOTAL	63.84	47.82	48.24	39.50	6.73

Contemporaneous decreases

ID	Description	shutdown date	VOC	PM10	PE	NOx	SO2
P006	ML7 Sort area	9/1/2010	0	8.34	8.34	0	0
P007	ML7 Mold facilities	9/1/2010	18	14.02	17.53	0	0
P011	ML7 Iron pour	9/1/2010	4	6.28	6	0	0
P015	ML7 Sand system	9/1/2010	0	45.13	45.13	0	0
P161	FN4 blast cabinet #6	4/1/2006	0	2.31	2.96	0	0
P164	ML7 SO & CC	9/1/2010	30	11.42	14.28	0	0
P165	Cupola #6W	3/1/2006	7.08	22.53	20.2	7.53	0
P196	FN1 BC #3	12/30/2009	0	16.03	17.53	0	0
P215	FN6 grinder N 11 B/C	12/31/2008	0	1.05	1.05	0	0
P236	FN1 Grinder E of BC #3	11/30/2009	0	2.39	2.57	0	0
P237	FN4 shaker - N 6 B/C	4/1/2006	0	0.62	0.8	0	0
P300	FN6 shaker N 11 B/C	12/31/2008	0	0.67	0.67	0	0
P301	FN6 shaker S 11 B/C	12/31/2008	0	0.67	0.67	0	0
P311	FN1 shaker S 3 B/C	11/30/2009	0	1.3	1.3	0	0
P318	Cupola #3	09/02/2010	5.43	7.14	7.59	4.67	0
P366	FN1 Shaker N BC #3	11/30/2009	0	0.62	0.73	0	0
P367	FN1 Grinder 6.2L HD	11/30/2009	0	1.23	1.42	0	0
P368	FN1 Grinder 4.3&5.0L	11/30/2009	0	1.39	1.63	0	0
P409	Bead pre-expander #3	8/1/2007	2.59	0	0	0	0
P410	Bead pre-expander #4	8/1/2007	3.23	0	0	0	0
P413	Castline cell #3	8/1/2007	0.32	0.78	0.78	1.49	0
P414	Castline cell #4	8/31/2007	0.02	0.04	0.04	0.09	0
P421	Sand reclaim #3	9/1/2008	0.52	0.41	0.41	0.53	0



ID	Description	shutdown date	VOC	PM10	PE	NOx	SO2
P422	Sand reclaim #4	9/1/2008	0.03	0.02	0.02	0.03	0
P141 P142 P149 P154 P248 P264	ML3 operational restriction established in PTI 03-17353 issued 06/10/08		75.64	90.71	102.18	0	0
	TOTAL		146.86	235.10	253.83	14.34	0

	SO ₂	VOC	PE	PM ₁₀	NOx
Project Increase (Precision sand)	50.02	645.54	71.22	97.39	70.09
Contemporaneous increases	6.73	63.84	48.24	47.82	39.50
Contemporaneous decreases	0	(146.86)	(253.83)	(235.10)	14.34
Net Change	56.75	562.52	(134.37)	(89.89)	95.25

5. Conclusion: Based on the results of the netting analysis VOC, NO_x and SO₂ emissions for this project exceed the PSD threshold of 40 tpy for each and as such this project is applicable to PSD requirements for VOC, NO_x and SO₂ emissions.

6. Please provide additional notes or comments as necessary:

This is an administrative modification to Permit to Install P0106622, issued 12/20/2010 to address a change in VOC emission factors for the core making machines and attrition mills. The increase in emission factors will result in a net increase in the annual VOC emission limitations. No other criteria pollutants will be modified through this permitting action. There will be two permit summary tables below. The first will be for the PSD project modification and the second will be specific to PTI P0117030.

7. Total Permit Allowable Emissions Summary (for informational purposes only):

PSD Emissions Summary

<u>Pollutant</u>	<u>Tons Per Year</u>
VOC	645.54
PM10	97.39
PE	71.22
SO ₂	50.02
NO _x	70.09
CO	62.56



Permit Strategy Write-Up
GM Defiance Casting Operations
Permit Number: P0117030
Facility ID: 0320010001

PTI P0117030 Administrative Modification Emissions Summary

<u>Pollutant</u>	<u>Tons Per Year</u>
VOC	356.68
PM10	28.40
PE	8.88
SO ₂	36.72
NO _x	0.00
CO	0.00



DRAFT

**Division of Air Pollution Control
Permit-to-Install
for
GM Defiance Casting Operations**

Facility ID:	0320010001
Permit Number:	P0117030
Permit Type:	Administrative Modification
Issued:	7/29/2014
Effective:	To be entered upon final issuance



Division of Air Pollution Control
Permit-to-Install
for
GM Defiance Casting Operations

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Authorization

Facility ID: 0320010001
Facility Description: Foundry
Application Number(s): A0050930
Permit Number: P0117030
Permit Description: This is an administrative modification to PTI P0106622, issued 12/20/2010 and PTI P0110399, issued 09/26/2012. This permit is being issued to modify the attrition mill emission factor from 0.08 lb VOC/ton to 0.10 lb VOC/ton. The permit will also modify the core machine sand mixing emission factor from 0.10 to 0.22 lb VOC/ton and increase the core making emission factor from 0.6 lb VOC/ton to 1.0 lb VOC/ton. The change in emission factors will require a change in the annual emission limitations established. As part of the administrative modification, BAT will be updated to reflect that VOC emissions are greater than 10 TPY from each core machine.
Permit Type: Administrative Modification
Permit Fee: \$13,500.00 *DO NOT send payment at this time, subject to change before final issuance*
Issue Date: 7/29/2014
Effective Date: To be entered upon final issuance

This document constitutes issuance to:

GM Defiance Casting Operations
State Route 281 East
Defiance, OH 43512

of a Permit-to-Install for the emissions unit(s) identified on the following page.

Ohio Environmental Protection Agency (EPA) District Office or local air agency responsible for processing and administering your permit:

Ohio EPA DAPC, Northwest District Office
347 North Dunbridge Road
Bowling Green, OH 43402
(419)352-8461

The above named entity is hereby granted a Permit-to-Install for the emissions unit(s) listed in this section pursuant to Chapter 3745-31 of the Ohio Administrative Code. Issuance of this permit does not constitute expressed or implied approval or agreement that, if constructed or modified in accordance with the plans included in the application, the emissions unit(s) of environmental pollutants will operate in compliance with applicable State and Federal laws and regulations, and does not constitute expressed or implied assurance that if constructed or modified in accordance with those plans and specifications, the above described emissions unit(s) of pollutants will be granted the necessary permits to operate (air) or NPDES permits as applicable.

This permit is granted subject to the conditions attached hereto.

Ohio Environmental Protection Agency

Craig W. Butler
Director



Authorization (continued)

Permit Number: P0117030
 Permit Description: This is an administrative modification to PTI P0106622, issued 12/20/2010 and PTI P0110399, issued 09/26/2012. This permit is being issued to modify the attrition mill emission factor from 0.08 lb VOC/ton to 0.10 lb VOC/ton. The permit will also modify the core machine sand mixing emission factor from 0.10 to 0.22 lb VOC/ton and increase the core making emission factor from 0.6 lb VOC/ton to 1.0 lb VOC/ton. The change in emission factors will require a change in the annual emission limitations established. As part of the administrative modification, BAT will be updated to reflect that VOC emissions are greater than 10 TPY from each core machine.

Permits for the following Emissions Unit(s) or groups of Emissions Units are in this document as indicated below:

Emissions Unit ID:	P911
Company Equipment ID:	PSand Mod #2 Attrition Mill and Waste Sand Conveyor
Superseded Permit Number:	P0110399
General Permit Category and Type:	Not Applicable

Group Name: PSand Attrition Mills

Emissions Unit ID:	P910
Company Equipment ID:	Precision Sand Mod #1 Attrition Mill and Waste Sand Conveyor
Superseded Permit Number:	P0110399
General Permit Category and Type:	Not Applicable
Emissions Unit ID:	P912
Company Equipment ID:	PSand Mod #3 Attrition Mill and Waste Sand Conveyor
Superseded Permit Number:	P0110399
General Permit Category and Type:	Not Applicable
Emissions Unit ID:	P913
Company Equipment ID:	PSand Mod #4 Attrition Mill and Waste Sand Conveyor
Superseded Permit Number:	P0110399
General Permit Category and Type:	Not Applicable

Group Name: PSand Mod#1 Core Machines

Emissions Unit ID:	P464
Company Equipment ID:	PSand Mod #1 Core Mach #200
Superseded Permit Number:	P0106622
General Permit Category and Type:	Not Applicable
Emissions Unit ID:	P465
Company Equipment ID:	PSand Mod #1 Core Mach #201
Superseded Permit Number:	P0106622
General Permit Category and Type:	Not Applicable
Emissions Unit ID:	P466
Company Equipment ID:	PSand Mod #1 Core Mach #202



Effective Date: To be entered upon final issuance

Superseded Permit Number:	P0106622
General Permit Category and Type:	Not Applicable
Emissions Unit ID:	P467
Company Equipment ID:	PSand Mod #1 Core Mach #203
Superseded Permit Number:	P0106622
General Permit Category and Type:	Not Applicable
Emissions Unit ID:	P468
Company Equipment ID:	PSand Mod #1 Core Mach #204
Superseded Permit Number:	P0106622
General Permit Category and Type:	Not Applicable
Emissions Unit ID:	P469
Company Equipment ID:	PSand Mod #1 Core Mach #205
Superseded Permit Number:	P0106622
General Permit Category and Type:	Not Applicable

Group Name: PSand Mod#2 Core Machines

Emissions Unit ID:	P524
Company Equipment ID:	PSand Core Mach Mod #2 Op 10
Superseded Permit Number:	P0106622
General Permit Category and Type:	Not Applicable
Emissions Unit ID:	P527
Company Equipment ID:	PSand Core Mach Mod #2 Op 30
Superseded Permit Number:	P0106622
General Permit Category and Type:	Not Applicable
Emissions Unit ID:	P530
Company Equipment ID:	PSand Core Mach Mod #2 Op 40
Superseded Permit Number:	P0106622
General Permit Category and Type:	Not Applicable
Emissions Unit ID:	P533
Company Equipment ID:	PSand Core Mach Mod #2 Op 50
Superseded Permit Number:	P0106622
General Permit Category and Type:	Not Applicable
Emissions Unit ID:	P538
Company Equipment ID:	PSand Core Mach Mod #2 Op 60
Superseded Permit Number:	P0106622
General Permit Category and Type:	Not Applicable

Group Name: PSand Mod#3 Core Machines

Emissions Unit ID:	P525
Company Equipment ID:	PSand Core Mach Mod #3 Op 10
Superseded Permit Number:	P0106622
General Permit Category and Type:	Not Applicable
Emissions Unit ID:	P528
Company Equipment ID:	PSand Core Mach Mod #3 Op 20
Superseded Permit Number:	P0106622
General Permit Category and Type:	Not Applicable
Emissions Unit ID:	P531



Effective Date: To be entered upon final issuance

Company Equipment ID:	PSand Core Mach Mod #3 Op 30
Superseded Permit Number:	P0106622
General Permit Category andType:	Not Applicable
Emissions Unit ID:	P534
Company Equipment ID:	PSand Core Mach Mod #3 Op 40
Superseded Permit Number:	P0106622
General Permit Category andType:	Not Applicable
Emissions Unit ID:	P536
Company Equipment ID:	PSand Core Mach Mod #3 Op 60
Superseded Permit Number:	P0106622
General Permit Category andType:	Not Applicable
Emissions Unit ID:	P539
Company Equipment ID:	PSand Core Mach Mod #3 Op 50
Superseded Permit Number:	P0106622
General Permit Category andType:	Not Applicable

Group Name: PSand Mod#4 Core Machines

Emissions Unit ID:	P526
Company Equipment ID:	PSand Core Mach Mod #4 Op 10
Superseded Permit Number:	P0106622
General Permit Category andType:	Not Applicable
Emissions Unit ID:	P529
Company Equipment ID:	PSand Core Mach Mod #4 Op #20
Superseded Permit Number:	P0106622
General Permit Category andType:	Not Applicable
Emissions Unit ID:	P532
Company Equipment ID:	PSand Core Mach Mod #4 Op 30
Superseded Permit Number:	P0106622
General Permit Category andType:	Not Applicable
Emissions Unit ID:	P535
Company Equipment ID:	PSand Core Mach Mod #4 Op 40
Superseded Permit Number:	P0106622
General Permit Category andType:	Not Applicable
Emissions Unit ID:	P537
Company Equipment ID:	PSand Core Mach Mod #4 Op #60
Superseded Permit Number:	P0106622
General Permit Category andType:	Not Applicable
Emissions Unit ID:	P540
Company Equipment ID:	PSand Core Mach Mod #4 Op #50
Superseded Permit Number:	P0106622
General Permit Category andType:	Not Applicable



Draft Permit-to-Install
GM Defiance Casting Operations
Permit Number: P0117030
Facility ID: 0320010001
Effective Date: To be entered upon final issuance

A. Standard Terms and Conditions



1. Federally Enforceable Standard Terms and Conditions

- a) All Standard Terms and Conditions are federally enforceable, with the exception of those listed below which are enforceable under State law only:
 - (1) Standard Term and Condition A.2.a), Severability Clause
 - (2) Standard Term and Condition A.3.c) through A. 3.e) General Requirements
 - (3) Standard Term and Condition A.6.c) and A. 6.d), Compliance Requirements
 - (4) Standard Term and Condition A.9., Reporting Requirements
 - (5) Standard Term and Condition A.10., Applicability
 - (6) Standard Term and Condition A.11.b) through A.11.e), Construction of New Source(s) and Authorization to Install
 - (7) Standard Term and Condition A.14., Public Disclosure
 - (8) Standard Term and Condition A.15., Additional Reporting Requirements When There Are No Deviations of Federally Enforceable Emission Limitations, Operational Restrictions, or Control Device Operating Parameter Limitations
 - (9) Standard Term and Condition A.16., Fees
 - (10) Standard Term and Condition A.17., Permit Transfers

2. Severability Clause

- a) A determination that any term or condition of this permit is invalid shall not invalidate the force or effect of any other term or condition thereof, except to the extent that any other term or condition depends in whole or in part for its operation or implementation upon the term or condition declared invalid.
- b) All terms and conditions designated in parts B and C of this permit are federally enforceable as a practical matter, if they are required under the Act, or any of its applicable requirements, including relevant provisions designed to limit the potential to emit of a source, are enforceable by the Administrator of the U.S. EPA and the State and by citizens (to the extent allowed by section 304 of the Act) under the Act. Terms and conditions in parts B and C of this permit shall not be federally enforceable and shall be enforceable under State law only, only if specifically identified in this permit as such.

3. General Requirements

- a) Any noncompliance with the federally enforceable terms and conditions of this permit constitutes a violation of the Act, and is grounds for enforcement action or for permit revocation, revocation and re-issuance, or modification.



- b) It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the federally enforceable terms and conditions of this permit.
- c) This permit may be modified, revoked, or revoked and reissued, for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or revocation, or of a notification of planned changes or anticipated noncompliance does not stay any term and condition of this permit.
- d) This permit does not convey any property rights of any sort, or any exclusive privilege.
- e) The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any information that may be requested to determine whether cause exists for modifying or revoking this permit or to determine compliance with this permit. Upon request, the permittee shall also furnish to the Director or an authorized representative of the Director, copies of records required to be kept by this permit. For information claimed to be confidential in the submittal to the Director, if the Administrator of the U.S. EPA requests such information, the permittee may furnish such records directly to the Administrator along with a claim of confidentiality.

4. Monitoring and Related Record Keeping and Reporting Requirements

- a) Except as may otherwise be provided in the terms and conditions for a specific emissions unit, the permittee shall maintain records that include the following, where applicable, for any required monitoring under this permit:
 - (1) The date, place (as defined in the permit), and time of sampling or measurements.
 - (2) The date(s) analyses were performed.
 - (3) The company or entity that performed the analyses.
 - (4) The analytical techniques or methods used.
 - (5) The results of such analyses.
 - (6) The operating conditions existing at the time of sampling or measurement.
- b) Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of five years from the date the record was created. Support information shall include, but not be limited to all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by this permit. Such records may be maintained in computerized form.
- c) Except as may otherwise be provided in the terms and conditions for a specific emissions unit, the permittee shall submit required reports in the following manner:
 - (1) Reports of any required monitoring and/or recordkeeping of federally enforceable information shall be submitted to the Ohio EPA DAPC, Northwest District Office.



- (2) Quarterly written reports of (i) any deviations from federally enforceable emission limitations, operational restrictions, and control device operating parameter limitations, excluding deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06, that have been detected by the testing, monitoring and recordkeeping requirements specified in this permit, (ii) the probable cause of such deviations, and (iii) any corrective actions or preventive measures taken, shall be made to the Ohio EPA DAPC, Northwest District Office. The written reports shall be submitted quarterly, by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. See A.15. below if no deviations occurred during the quarter.
 - (3) Written reports, which identify any deviations from the federally enforceable monitoring, recordkeeping, and reporting requirements contained in this permit shall be submitted to the Ohio EPA DAPC, Northwest District Office every six months, by January 31 and July 31 of each year for the previous six calendar months. If no deviations occurred during a six-month period, the permittee shall submit a semi-annual report, which states that no deviations occurred during that period.
 - (4) This permit is for an emissions unit located at a Title V facility. Each written report shall be signed by a responsible official certifying that, based on information and belief formed after reasonable inquiry, the statements and information in the report are true, accurate, and complete.
- d) The permittee shall report actual emissions pursuant to OAC Chapter 3745-78 for the purpose of collecting Air Pollution Control Fees.

5. Scheduled Maintenance/Malfunction Reporting

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction, i.e., upset, of any emissions units or any associated air pollution control system(s) shall be reported to the Ohio EPA DAPC, Northwest District Office in accordance with paragraph (B) of OAC rule 3745-15-06. (The definition of an upset condition shall be the same as that used in OAC rule 3745-15-06(B)(1) for a malfunction.) The verbal and written reports shall be submitted pursuant to OAC rule 3745-15-06.

Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of the emission unit(s) that is (are) served by such control system(s).

6. Compliance Requirements

- a) All applications, notifications or reports required by terms and conditions in this permit to be submitted or "reported in writing" are to be submitted to Ohio EPA through the Ohio EPA's eBusiness Center: Air Services web service ("Air Services"). Ohio EPA will accept hard copy submittals on an as-needed basis if the permittee cannot submit the required documents through the Ohio EPA eBusiness Center. In the event of an alternative hard copy submission in lieu of the eBusiness Center, the post-marked date or the date the document is delivered in person will be recognized as the date submitted. Electronic submission of applications, notifications or reports required to be submitted to Ohio EPA fulfills the requirement to submit the required information to the Director, the appropriate Ohio EPA District Office or contracted



local air agency, and/or any other individual or organization specifically identified as an additional recipient identified in this permit unless otherwise specified. Consistent with OAC rule 3745-15-03, the electronic signature date shall constitute the date that the required application, notification or report is considered to be "submitted". Any document requiring signature may be represented by entry of the personal identification number (PIN) by responsible official as part of the electronic submission process or by the scanned attestation document signed by the Authorized Representative that is attached to the electronically submitted written report.

Any document (including reports) required to be submitted and required by a federally applicable requirement in this permit shall include a certification by a Responsible Official that, based on information and belief formed after reasonable inquiry, the statements in the document are true, accurate, and complete

- b) Upon presentation of credentials and other documents as may be required by law, the permittee shall allow the Director of the Ohio EPA or an authorized representative of the Director to:
 - (1) At reasonable times, enter upon the permittee's premises where a source is located or the emissions-related activity is conducted, or where records must be kept under the conditions of this permit.
 - (2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit, subject to the protection from disclosure to the public of confidential information consistent with ORC section 3704.08.
 - (3) Inspect at reasonable times any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit.
 - (4) As authorized by the Act, sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with the permit and applicable requirements.
- c) The permittee shall submit progress reports to the Ohio EPA DAPC, Northwest District Office concerning any schedule of compliance for meeting an applicable requirement. Progress reports shall be submitted semiannually or more frequently if specified in the applicable requirement or by the Director of the Ohio EPA. Progress reports shall contain the following:
 - (1) Dates for achieving the activities, milestones, or compliance required in any schedule of compliance, and dates when such activities, milestones, or compliance were achieved.
 - (2) An explanation of why any dates in any schedule of compliance were not or will not be met, and any preventive or corrective measures adopted.

7. Best Available Technology

As specified in OAC Rule 3745-31-05, new sources that must employ Best Available Technology (BAT) shall comply with the Applicable Emission Limitations/Control Measures identified as BAT for each subject emissions unit.



8. Air Pollution Nuisance

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

9. Reporting Requirements

The permittee shall submit required reports in the following manner:

- a) Reports of any required monitoring and/or recordkeeping of state-only enforceable information shall be submitted to the Ohio EPA DAPC, Northwest District Office.
- b) Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quarterly written reports of (a) any deviations (excursions) from state-only required emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will be taken, shall be submitted to the Ohio EPA DAPC, Northwest District Office. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

10. Applicability

This Permit-to-Install is applicable only to the emissions unit(s) identified in the Permit-to-Install. Separate application must be made to the Director for the installation or modification of any other emissions unit(s) not exempt from the requirement to obtain a Permit-to-Install.

11. Construction of New Sources(s) and Authorization to Install

- a) This permit does not constitute an assurance that the proposed source will operate in compliance with all Ohio laws and regulations. This permit does not constitute expressed or implied assurance that the proposed facility has been constructed in accordance with the application and terms and conditions of this permit. The action of beginning and/or completing construction prior to obtaining the Director's approval constitutes a violation of OAC rule 3745-31-02. Furthermore, issuance of this permit does not constitute an assurance that the proposed source will operate in compliance with all Ohio laws and regulations. Issuance of this permit is not to be construed as a waiver of any rights that the Ohio Environmental Protection Agency (or other persons) may have against the applicant for starting construction prior to the effective date of the permit. Additional facilities shall be installed upon orders of the Ohio Environmental Protection Agency if the proposed facilities cannot meet the requirements of this permit or cannot meet applicable standards.
- b) If applicable, authorization to install any new emissions unit included in this permit shall terminate within eighteen months of the effective date of the permit if the owner or operator has not undertaken a continuing program of installation or has not entered into a binding contractual



obligation to undertake and complete within a reasonable time a continuing program of installation. This deadline may be extended by up to 12 months if application is made to the Director within a reasonable time before the termination date and the permittee shows good cause for any such extension.

- c) The permittee may notify Ohio EPA of any emissions unit that is permanently shut down (i.e., the emissions unit has been physically removed from service or has been altered in such a way that it can no longer operate without a subsequent "modification" or "installation" as defined in OAC Chapter 3745-31) by submitting a certification from the authorized official that identifies the date on which the emissions unit was permanently shut down. Authorization to operate the affected emissions unit shall cease upon the date certified by the authorized official that the emissions unit was permanently shut down. At a minimum, notification of permanent shut down shall be made or confirmed by marking the affected emissions unit(s) as "permanently shut down" in "Air Services" along with the date the emissions unit(s) was permanently removed and/or disabled. Submitting the facility profile update electronically will constitute notifying the Director of the permanent shutdown of the affected emissions unit(s).
- d) The provisions of this permit shall cease to be enforceable for each affected emissions unit after the date on which an emissions unit is permanently shut down (i.e., emissions unit has been physically removed from service or has been altered in such a way that it can no longer operate without a subsequent "modification" or "installation" as defined in OAC Chapter 3745-31). All records relating to any permanently shutdown emissions unit, generated while the emissions unit was in operation, must be maintained in accordance with law. All reports required by this permit must be submitted for any period an affected emissions unit operated prior to permanent shut down. At a minimum, the permit requirements must be evaluated as part of the reporting requirements identified in this permit covering the last period the emissions unit operated.

Unless otherwise exempted, no emissions unit certified by the responsible official as being permanently shut down may resume operation without first applying for and obtaining a permit pursuant to OAC Chapter 3745-31 and OAC Chapter 3745-77 if the restarted operation is subject to one or more applicable requirements.

- e) The permittee shall comply with any residual requirements related to this permit, such as the requirement to submit a deviation report, air fee emission report, or other any reporting required by this permit for the period the operating provisions of this permit were enforceable, or as required by regulation or law. All reports shall be submitted in a form and manner prescribed by the Director. All records relating to this permit must be maintained in accordance with law.

12. Permit-To-Operate Application

The permittee is required to apply for a Title V permit pursuant to OAC Chapter 3745-77. The permittee shall submit a complete Title V permit application or a complete Title V permit modification application within twelve (12) months after commencing operation of the emissions units covered by this permit. However, if operation of the proposed new or modified source(s) as authorized by this permit would be prohibited by the terms and conditions of an existing Title V permit, a Title V permit modification of such new or modified source(s) pursuant to OAC rule 3745-77-04(D) and OAC rule 3745-77-08(C)(3)(d) must be obtained before operating the source in a manner that would violate the existing Title V permit requirements.



13. Construction Compliance Certification

The applicant shall identify the following dates in the "Air Services" facility profile for each new emissions unit identified in this permit.

- a) Completion of initial installation date shall be entered upon completion of construction and prior to start-up.
- b) Commence operation after installation or latest modification date shall be entered within 90 days after commencing operation of the applicable emissions unit.

14. Public Disclosure

The facility is hereby notified that this permit, and all agency records concerning the operation of this permitted source, are subject to public disclosure in accordance with OAC rule 3745-49-03.

15. Additional Reporting Requirements When There Are No Deviations of Federally Enforceable Emission Limitations, Operational Restrictions, or Control Device Operating Parameter Limitations

If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters.

16. Fees

The permittee shall pay fees to the Director of the Ohio EPA in accordance with ORC section 3745.11 and OAC Chapter 3745-78. The permittee shall pay all applicable permit-to-install fees within 30 days after the issuance of any permit-to-install. The permittee shall pay all applicable permit-to-operate fees within thirty days of the issuance of the invoice.

17. Permit Transfers

Any transferee of this permit shall assume the responsibilities of the prior permit holder. The new owner must update and submit the ownership information via the "Owner/Contact Change" functionality in "Air Services" once the transfer is legally completed. The change must be submitted through "Air Services" within thirty days of the ownership transfer date.

18. Risk Management Plans

If the permittee is required to develop and register a risk management plan pursuant to section 112(r) of the Clean Air Act, as amended, 42 U.S.C. 7401 et seq. ("Act"), the permittee shall comply with the requirement to register such a plan.

19. Title IV Provisions



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If the permittee is subject to the requirements of 40 CFR Part 72 concerning acid rain, the permittee shall ensure that any affected emissions unit complies with those requirements. Emissions exceeding any allowances that are lawfully held under Title IV of the Act, or any regulations adopted thereunder, are prohibited.

B. Facility-Wide Terms and Conditions



1. All the following facility-wide terms and conditions are federally enforceable with the exception of those listed below which are enforceable under state law only:

a) B.2., B.3, B.4, B.5 and B.6.

2. The emissions units contained in PTI P0106622, issued 12/20/2010 were evaluated based on the actual materials and the design parameters of the emissions units' exhaust system, as specified by the permittee in the permit application. The Ohio EPA's "Toxic Air Contaminant Statute", ORC 3704.03(F), was applied to this/these emissions unit(s) for each toxic air contaminant listed in OAC rule 3745-114-01, using data from the permit application; and modeling was performed for each toxic air contaminant(s) emitted at over one ton per year using an air dispersion model such as SCREEN 3.0, AERMOD, or ISCST3, or other Ohio EPA approved model. The predicted 1-hour maximum ground-level concentration result(s) from the approved air dispersion model, was compared to the Maximum Acceptable Ground-Level Concentration (MAGLC), calculated as described in the Ohio EPA guidance document entitled "Review of New Sources of Air Toxic Emissions, Option A", as follows:

a) the exposure limit, expressed as a time-weighted average concentration for a conventional 8-hour workday and a 40-hour workweek, for each toxic compound emitted from the emissions units, (as determined from the raw materials processed and/or coatings or other materials applied) has been documented from one of the following sources and in the following order of preference (TLV was and shall be used, if the chemical is listed):

i. threshold limit value (TLV) from the American Conference of Governmental Industrial Hygienists' (ACGIH) "Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices"; or

ii. TEL (short term exposure limit) or the ceiling value from the American Conference of Governmental Industrial Hygienists' (ACGIH) "Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices"; the STEL or ceiling value is multiplied by 0.737 to convert the 15-minute exposure limit to an equivalent 8-hour TLV.

b) The TLV is divided by ten to adjust the standard from the working population to the general public (TLV/10).

c) This standard is/was then adjusted to account for the duration of the exposure or the operating hours of the emissions unit(s), i.e., "X" hours per day and "Y" days per week, from that of 8 hours per day and 5 days per week. The resulting calculation was (and shall be) used to determine the Maximum Acceptable Ground-Level Concentration (MAGLC).

d) The following summarizes the results of dispersion modeling for the significant toxic contaminants (emitted at 1 or more tons/year) or "worst case" toxic contaminant(s):

Toxic contaminant: formaldehyde

TLV (mg/m3): 0.368

Maximum Hourly Emission Rate (lbs/hr): 0.72

Predicted 1-Hour Maximum Ground-Level Concentration (ug/m3): 6.27

MAGLC (ug/m3): 6.46



Toxic contaminant: m,p-Xylene
TLV (mg/m3): 434
Maximum Hourly Emission Rate (lbs/hr): 4.62
Predicted 1-Hour Maximum Ground-Level Concentration (ug/m3): 61.19
MAGLC (ug/m3): 10,337

Toxic contaminant: phenol
TLV (mg/m3): 19
Maximum Hourly Emission Rate (lbs/hr): 4.92
Predicted 1-Hour Maximum Ground-Level Concentration (ug/m3): 53.73
MAGLC (ug/m3): 458.21

Toxic contaminant: naphthalene
TLV (mg/m3): 54
Maximum Hourly Emission Rate (lbs/hr): 2.17
Predicted 1-Hour Maximum Ground-Level Concentration (ug/m3): 28.49
MAGLC (ug/m3): 1,248.31

Toxic contaminant: o-xylene
TLV (mg/m3): 434
Maximum Hourly Emission Rate (lbs/hr): 0.43
Predicted 1-Hour Maximum Ground-Level Concentration (ug/m3): 4.94
MAGLC (ug/m3): 10,337.90

Toxic contaminant: cumene
TLV (mg/m3): 245
Maximum Hourly Emission Rate (lbs/hr): 8.98
Predicted 1-Hour Maximum Ground-Level Concentration (ug/m3): 141.7
MAGLC (ug/m3): 5852.07

Toxic contaminant: acetophenone
TLV (mg/m3): 49.141
Maximum Hourly Emission Rate (lbs/hr): 1.04
Predicted 1-Hour Maximum Ground-Level Concentration (ug/m3): 17.82
MAGLC (ug/m3): 1,170.02

Toxic contaminant: alpha-Methylstyrene
TLV (mg/m3): 241
Maximum Hourly Emission Rate (lbs/hr): 1.28
Predicted 1-Hour Maximum Ground-Level Concentration (ug/m3): 2.21
MAGLC (ug/m3): 5754.21

The permittee, has demonstrated that emissions of m,p-xylene, phenol, naphthalene, o-xylene, cumene, acetophenone and alpha-Methylstyrene, from the emissions units contained in PTI P0106622, issued 12/20/2010 are calculated to be less than eighty per cent of the maximum acceptable ground level concentration (MAGLC); any new raw material or processing agent shall not be applied without evaluating each component toxic contaminant in accordance with ORC 3704.03(F).



The permittee, having demonstrated that emissions of formaldehyde from the emissions units contained in PTI P0106622, issued 12/20/2010 is estimated to be equal or greater than eighty per cent, but less than 100 per cent of the maximum acceptable ground level concentration (MAGLC), shall not operate the emissions unit(s) at a rate that would exceed the daily emissions rate, process weight rate, and/or restricted hours of operations, as allowed in this permit; and any new raw material or processing agent shall not be applied without evaluating each component toxic air contaminant in accordance with the "Toxic Air Contaminant Statute", ORC 3704.03(F).

3. Prior to making any physical changes to or changes in the method of operation of the emissions unit(s), that could impact the parameters or values that were used in the predicted 1-hour maximum ground-level concentration", the permittee shall re-model the change(s) to demonstrate that the MAGLC has not been exceeded. Changes that can affect the parameters/values used in determining the 1-hour maximum ground-level concentration include, but are not limited to, the following:
 - a) changes in the composition of the materials used or the use of new materials, that would result in the emission of a new toxic air contaminant with a lower Threshold Limit Value (TLV) than the lowest TLV previously modeled;
 - b) changes in the composition of the materials, or use of new materials, that would result in an increase in emissions of any toxic air contaminant listed in OAC rule 3745-114-01, that was modeled from the initial (or last) application; and
 - c) physical changes to the emissions unit(s) or its/their exhaust parameters (e.g., increased/decreased exhaust flow, changes in stack height, changes in stack diameter, etc.).

If the permittee determines that the "Toxic Air Contaminant Statute" will be satisfied for the above changes, the Ohio EPA will not consider the change(s) to be a "modification" under OAC rule 3745-31-01 solely due to a non-restrictive change to a parameter or process operation, where compliance with the ORC 3704.03(F), the statute, has been documented. If the change(s) meet(s) the definition of a "modification" or the modeled toxic(s) is/are expected to exceed the previous modeled level(s), then the permittee shall apply for and obtain a final permit-to-install prior to the change. The Director may consider any significant departure from the operations of the emissions unit, described in the permit-to-install application, as a modification that results in greater emissions than the emissions rate modeled to determine the ground level concentration; and may require the permittee to submit a permit-to-install application for the increased emissions.

4. The permittee shall collect, record, and retain the following information for each toxic evaluation conducted to determine compliance with the "Toxic Air Contaminant Statute":
 - a) a description of the parameters/values used in each compliance demonstration and the parameters or values changed for any re-evaluation of the toxics modeled (the composition of materials, new toxic contaminants emitted, change in stack/exhaust parameters, etc.);
 - b) the Maximum Acceptable Ground-Level Concentration (MAGLC) for each significant toxic contaminant or worst-case contaminant, calculated in accordance with ORC 3704.03(F);
 - c) a copy of the computer model run(s), that established the predicted 1-hour maximum ground-level concentration that demonstrated the emissions unit(s) to be in compliance with ORC



3704.03(F), initially and for each change that requires re-evaluation of the toxic air contaminant emissions; and

- d) the documentation of the initial evaluation of compliance with ORC 3704.03(F) and documentation of any determination that was conducted to re-evaluate compliance due to a change made to the emissions units or the materials applied.
5. The permittee shall maintain a record of any change made to a parameter or value used in the dispersion model, used to demonstrate compliance with ORC 3704.03(F) through the predicted 1-hour maximum ground-level concentration. The record shall include the date and reason(s) for the change and if the change would increase the ground-level concentration.
6. The permittee shall submit quarterly reports to the appropriate Ohio EPA District Office or local air agency, documenting any changes made to a parameter or value used in the dispersion model, that was used to demonstrate compliance with the "Toxic Air Contaminant Statute", ORC 3704.03(F), through the predicted 1-hour maximum ground-level concentration. If no changes to the emissions, emissions unit(s), or the exhaust stack have been made, then the report shall include a statement to this effect. These quarterly reports shall be submitted by April 30, July 31, October 31, and January 31, and shall cover the records for the previous calendar quarters.



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C. Emissions Unit Terms and Conditions



1. P911, PSand Mod #2 Attrition Mill and Waste Sand Conveyor

Operations, Property and/or Equipment Description:

Precision Sand Mod #2 Pan Conveyor, Attrition Mill, and Waste Sand Conveyor

a) The following emissions unit terms and conditions are federally enforceable with the exception of those listed below which are enforceable under state law only:

(1) b)(1)f.

b) Applicable Emissions Limitations and/or Control Requirements

(1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	OAC rule 3745-31-10 through 20	<p><u>From the attrition mill:</u> Volatile organic compound (VOC) emissions shall not exceed 0.10 pound per ton (lb/ton) of aluminum and 5.73 tons per year (tpy), based upon a rolling, 12-month summation of the monthly emissions.</p> <p>See b)(2)a.</p>
b.	OAC rule 3745-31-05(D)	<p><u>Fugitive emissions (the fugitive portion of this emissions unit is the pan and waste sand conveyors):</u></p> <p>Fugitive particulate emissions (PE) shall not exceed 1.07 tpy based upon a rolling, 12-month summation of the monthly emissions.</p> <p>Fugitive particulate matter less than or equal to 10 microns in size (PM₁₀) shall not exceed 2.14 tpy based upon a rolling, 12-month summation of the monthly emissions.</p> <p><u>Stack emissions (the stack component of this emissions units is the attrition mill, which is controlled with a baghouse):</u></p>



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	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
		<p>PE shall not exceed 0.02 lb/ton of aluminum and 1.15 tpy based upon a rolling, 12-month summation of the monthly emissions.</p> <p>PM₁₀ shall not exceed 0.04 lb/ton and 2.29 tpy based upon a rolling, 12-month summation of the monthly emissions.</p> <p>Visible stack PE shall not exceed 10% opacity, as a six-minute average.</p> <p>See b)(2)b. and b)(2)e.</p>
c.	OAC rule 3745-17-07(A) OAC rule 3745-17-11(B)	The emission limitations specified by these rules are less stringent than the emission limitations established pursuant to OAC rule 3745-31-05(D).
d.	OAC rule 3745-31-05(A)(3), as effective 11/31/01	See b)(2)c.
e.	OAC rule 3745-31-05(A)(3), as effective 12/01/06	See b)(2)d.
f.	OAC rule 3745-114-01 ORC 3704.03(F)	See B.2. – Facility-Wide Terms and Conditions
g.	OAC rule 3745-17-07(B)	Visible fugitive PE shall not exceed 20% opacity as a three-minute average, except as provided by rule.
h.	OAC rule 3745-17-08(B)(3)	See b)(2)f.

(2) Additional Terms and Conditions

- a. Based on the "Prevention of Significant Deterioration" (PSD) analysis conducted to ensure the application of "Best Available Control Technology" (BACT), it has been determined that no control technologies for VOC were cost effective.
- b. This permit establishes the following federally enforceable emission limitations for the purpose of limiting the potentials to emit (PTE) for PE and PM₁₀. The PTE is being restricted such that the emission increase for PM₁₀ allowed for in PTI P0106622, issued 12/20/10, will be below the Prevention of Significant Deterioration (PSD) "significant threshold" applicability level of 25 (for PE) and 15 tpy (for PM₁₀). The federally enforceable emission limitations are based on the operational restrictions contained in c)(1) and c)(2), which require control equipment and process control:
 - i. Fugitive PE shall not exceed 1.07 tpy, based upon a rolling, 12-month summation of the monthly emissions;



- ii. Fugitive PM₁₀ emissions shall not exceed 2.14 tpy from the pan and waste sand conveyor, based upon a rolling, 12-month summation of the monthly emissions.
 - iii. Stack PE shall not exceed 0.02 lb/ton of aluminum and 1.15 tpy from the attrition mill, based upon a rolling, 12-month summation of the monthly emissions.
 - iv. Stack PM₁₀ shall not exceed 0.04 lb/ton and 2.29 tpy from attrition mill, based upon a rolling, 12-month summation of the monthly emissions.
- c. The requirements of this rule for VOC emissions are equivalent to the BACT requirements established pursuant to OAC rule 3745-31-05 through 20; therefore, the permittee has satisfied the Best Available Technology (BAT) requirements pursuant to OAC rule 3745-31-05(A)(3), as effective November 30, 2001, in this permit.

Best Available Technology (BAT) requirements for PM₁₀ emissions under OAC rule 3745-31-05(A)(3), as effective November 30, 2001 have been determined to be compliance with the combined annual emission limitation for PM₁₀ (for fugitive and stack emissions) as established pursuant to OAC rule 3745-31-05(D).

On December 1, 2006, paragraph (A)(3) of OAC rule 3745-31-05 was revised to conform to Ohio Revised Code (ORC) changes effective August 3, 2006 (Senate Bill 265 Changes), such that BAT is no longer required by State regulations for NAAQS pollutants less than ten tons per year. However, that rule revision has not yet been approved by U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). Therefore, until the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-31-05, the requirement to satisfy BAT still exists as part of the federally-approved SIP for Ohio. Once U.S. EPA approves the December 1, 2006 version of 3745-31-05, the requirements of 3745-31-05(A)(3) as effective November 30, 2001 will no longer apply.

It should be noted that the emission limitations and control requirements established pursuant to OAC rule 3745-31-05(D) will remain applicable after the above SIP revisions are approved by U.S. EPA.

- d. This paragraph applies once U.S. EPA approves the December 1, 2006 version of OAC rule 3745-31-05 as part of the State Implementation Plan.

Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3)(a), as effective December 1, 2006, do not apply to the VOC and PM₁₀ emissions from this air contaminant source since the controlled potential to emit (PTE) is less each than 10 tons per year taking into consideration federally enforceable requirements established under OAC rule 3745-31-05(D). BAT requirements under OAC rule 3745-31-05(A)(3)(a), as effective December 1, 2006, are not applicable to the particulate emissions emitted from this emissions unit. BAT is only applicable to emissions of an air contaminant or precursor of an air contaminant for which a national ambient air quality standard (NAAQS) has



been adopted under the Clean Air Act. Particulate emissions (also referred to as total suspended particulate or particulate matter) is an air contaminant that does not involve an established NAAQS.

- e. Prevention of Significant Deterioration (PSD) requirements for particulate matter equal to or less than 2.5 microns in size ($PM_{2.5}$) are being implemented through the PM_{10} Surrogate Policy issued by EPA in 1997. For purposes of demonstrating that PM_{10} is a reasonable surrogate for $PM_{2.5}$, all emissions of PM_{10} will be considered $PM_{2.5}$.
- f. The permittee shall utilize reasonable available control measures (RACM) that are sufficient to minimize or eliminate visible emissions of fugitive dust. In accordance with the permittee's permit application, the permittee has committed to perform the following control measure to ensure compliance:
 - i. Building enclosure.

Nothing in this paragraph shall prohibit the permittee from employing other equally-effective control measures to ensure compliance.

c) Operational Restrictions

- (1) The maximum annual sand usage unit shall not exceed 114,696 tons, based upon a rolling, 12-month summation of the monthly quantities of sand used.

Note: This is an administrative modification, as such this emissions unit has been in operation for more than 12 months and, as such, the permittee has existing records to generate the rolling, 12-month summation of the emissions, upon issuance of this permit.

- (2) The permittee shall operate the baghouses at all times when the attrition mills are in operation.

d) Monitoring and/or Recordkeeping Requirements

- (1) The permittee shall collect and record the following information each month for these emissions units, individually:
 - a. the amount of sand processed, in tons;
 - b. for the first 12 months of operation following the issuance of this permit, the cumulative quantity of sand processed, in tons; and
 - c. after the first 12 months of operation following the issuance of this permit, the rolling, 12-month summation of the monthly amount of sand processed.

*The amount of sand processed through this emissions unit is equivalent to the amount of sand received in emissions units P906, P907, P908 and P909, combined. The monitoring and record keeping associated with the sand processed in emissions units P906, P907, P908 and P909 can be used to fulfill the requirements in this section.



- (2) The permittee shall perform weekly* checks when these emissions units are in operation and when the weather conditions allow, for any visible particulate emissions from the stack(s) serving this emissions unit. The presence or absence of any visible emissions, excluding water vapor, shall be noted in an operations log. If visible emissions are observed, the permittee shall also note the following in the operations log:
- a. the date and time of the visible emission observation;
 - b. the identification of the stack observed;
 - c. the color of the emissions;
 - d. the total duration of any visible emission observation; and
 - e. the corrective actions, if any, taken to eliminate the visible emissions.

*once during each normal calendar week

- (3) The permittee shall perform weekly* checks, when the emissions unit is in operation and when the weather conditions allow, for any visible emissions of fugitive dust from the egress points (i.e., building windows, doors, roof monitors, etc.) serving this emissions unit. The presence or absence of any visible fugitive emissions shall be noted in an operations log. If visible emissions are observed, the permittee shall also note the following in the operations log:
- a. the location and color of the emissions;
 - b. whether the emissions are representative of normal operations;
 - c. if the emissions are not representative of normal operations, the cause of the abnormal emissions;
 - d. the total duration of any visible emissions incident; and
 - e. any corrective actions taken to minimize or eliminate the visible emissions.

*once during each normal calendar week

- (4) The permittee shall maintain records documenting any time periods when the attrition mills were in operation and the baghouses were not operating.

e) Reporting Requirements

- (1) The permittee shall submit quarterly deviation (excursion) reports, which identify all exceedances of the following:
- a. for the first 12 calendar months of operation following the issuance of this permit, the maximum allowable cumulative sand usage restriction; and
 - b. after the first 12 calendar months of operation following the issuance of this permit, the rolling, 12-month sand usage restriction.



These quarterly deviation reports shall be submitted in accordance with the Standard Terms and Conditions of this permit.

- (2) The permittee shall submit semiannual written reports that identify:
 - a. all days during which any visible particulate emissions, excluding water vapor, were observed from the stacks serving these emissions units; and
 - b. describe the corrective actions, if any, taken to eliminate the visible particulate emissions.

These reports shall be submitted to the Director (the Northwest District Office) by January 31 and July 31 of each year and shall cover the previous 6-month period.

- (3) The permittee shall submit semiannual written reports that identify:
 - a. all days during which any visible emissions of fugitive dust were observed from the egress points (i.e., building windows, doors, roof monitors, etc.) serving this emissions unit; and
 - b. any corrective actions taken to minimize or eliminate the visible emissions.

These reports shall be submitted to the Director (the Northwest District Office) by January 31 and July 31 of each year and shall cover the previous 6-month period.

- (4) The permittee shall submit deviation (excursion) reports that identify any time periods when the attrition mills were in operation and the baghouses were not operating. Each report shall be submitted within 30 days after the deviation occurs.

f) Testing Requirements

- (1) The permittee shall conduct, or have conducted, emission testing for all four (4) precision sand modules in accordance with the following requirements:
 - a. The emissions testing shall be conducted over four (4) consecutive years, beginning no later than 180 days after achieving the maximum production rate at which PSand module 1 (emissions units P910), PSand module 2 (emissions units P911), PSand module 3 (emissions units P912) or PSand module 4 (emissions units P913), will be operated, whichever comes first. The permittee shall test a minimum of one module per year.
 - b. The emission testing shall be conducted to demonstrate compliance with the following:
 - i. for VOC – 0.10 lb/ton of sand from the attrition mills of each of these emissions units. Modules 1, 3 and 4 are exhausted to an RTO, Module 2 exhaust through only a baghouse
 - c. The following test methods shall be employed to demonstrate compliance with the above emission limitations:



- i. For total VOC, Methods 1-4 and 18, 25 or 25A (as applicable) of 40 CFR Part 60, Appendix A. Appropriate methods shall be used in conjunction with the test methods and procedures specified in Methods 18, 25, or 25A (as applicable) of 40 CFR Part 60, Appendix A for determining total VOC mass emissions.

Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA, NWDO.

- d. The test methods and procedures selected shall be based on a consideration of the diversity of the organic species present and their total concentration, and on a consideration of the potential presence of interfering gases.
- e. The test(s) shall be conducted at a Maximum Source Operating Rate (MSOR), unless otherwise specified or approved by the appropriate Ohio EPA District Office or local air agency. MSOR is defined as the condition that is most likely to challenge the emission control measures with regards to meeting the applicable emission standard(s). Although it generally consists of operating the emissions unit at its maximum material input/production rates and results in the highest emission rate of the tested pollutant, there may be circumstances where a lower emissions loading is deemed the most challenging control scenario. Failure to test at the MSOR is justification for not accepting the test results as a demonstration of compliance.
- f. Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA, NWDO. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the test(s). Failure to submit such notification for review and approval prior to the test(s) may result in the Ohio EPA, NWDO's refusal to accept the results of the emission test(s).

Personnel from the Ohio EPA, NWDO shall be permitted to witness the test(s), examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment.

A comprehensive written report of the results of the emissions test(s) shall be signed by the person or persons responsible for the tests and submitted to the Ohio EPA, NWDO within 30 days following completion of the test(s). The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Ohio EPA, NWDO.

- (2) Compliance with the Emissions Limitations and/or Control Requirements specified in section b) of these terms and conditions shall be determined in accordance with the following methods:



a. Emission Limitations:

The maximum annual sand usage shall not exceed 114,696 tons per rolling, 12-month period.

Applicable Compliance Method:

Compliance with the annual emission limitation shall be demonstrated by the record keeping requirements specified in d)(1).

b. Emission Limitations:

VOC emissions shall not exceed 0.10 lb/ton of sand and 5.73 tpy, based upon a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method:

Compliance with the lb/ton emission limitation shall be demonstrated based on the results of the emission testing conducted in accordance with Methods 1-4 and 18, 25 or 25A (as applicable) of 40 CFR Part 60, Appendix A or as amended. Alternative or equivalent methods can be used with the approval of the director.

The annual emission limitation was established by multiplying the lb/ton of sand emission limitation by the annual sand restriction of 114,696 tons and dividing by 2000 lbs/ton. Therefore provided compliance is shown with the lb/ton emission limitation and the annual sand throughput, compliance with the annual limitation shall be demonstrated.

c. Emission Limitations:

Fugitive PE shall not exceed 1.07 tpy from the pan and waste sand conveyor, based on a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method:

The emission limitation was established by multiplying the company-supplied emission factor of 0.00867 lb/ton of sand (waste sand conveyor) and 0.01 lb/ton of sand (pan conveyor) by the annual sand restriction of 114,696 tons and dividing by 2000 lbs/ton. If required, compliance with the lb/ton emission limitation shall be demonstrated based on the results of the emission testing conducted in accordance with Methods 1-5 of 40 CFR Part 60, Appendix A. Alternative or equivalent methods can be used with the approval of the director.

The annual emission limitation was established by multiplying the lb/ton of sand emission limitation by the annual sand restriction of 114,696 tons and dividing by 2000 lbs/ton. Therefore provided compliance is shown with the lb/ton emission limitation and the annual sand throughput, compliance with the annual limitation shall be demonstrated.



d. Emission Limitations:

Stack PE shall not exceed 0.02 lb/ton and 1.15 tpy from the attrition mill, based on a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method:

If required, compliance with the lb/ton emission limitation shall be demonstrated based on the results of the emission testing conducted in accordance with Methods 1-5 of 40 CFR Part 60, Appendix A. Alternative or equivalent methods can be used with the approval of the director.

The annual emission limitation was established by multiplying the lb/ton of sand emission limitation by the annual sand restriction of 114,696 tons and dividing by 2000 lbs/ton. Therefore provided compliance is shown with the lb/ton emission limitation and the annual sand throughput, compliance with the annual limitation shall be demonstrated.

e. Emission Limitations:

Stack PM₁₀ shall not exceed 0.04 lb/ton and 2.29 tpy, from the attrition mill, based on a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method:

If required, compliance with the lb/ton emission limitation shall be demonstrated based on the results of the emission testing conducted in accordance with Methods 1-4 of 40 CFR Part 60, Appendix A and Methods 201/201A and 202, 40 CFR Part 51, Appendix M. Alternative or equivalent methods can be used with the approval of the director.

The annual emission limitation was established by multiplying the lb/ton of sand emission limitation by the annual sand restriction of 114,696 tons and dividing by 2000 lbs/ton. Therefore provided compliance is shown with the lb/ton emission limitation and the annual sand throughput, compliance with the annual limitation shall be demonstrated.

f. Emission Limitations:

Visible PE shall not exceed 10% opacity, as a six-minute average.

Applicable Compliance Method:

If required, compliance with the visible emission limitation shall be demonstrated in accordance with Test Method 9 as set forth in "Appendix on Test Methods" in 40 CFR, Part 60 ("Standards of Performance for New Stationary Sources").

g. Emission Limitations:

Visible fugitive PE shall not exceed 20% opacity, as a three-minute average.



Draft Permit-to-Install
GM Defiance Casting Operations
Permit Number: P0117030
Facility ID: 0320010001
Effective Date: To be entered upon final issuance

Applicable Compliance Method:

If required, compliance with the visible emission limitation shall be demonstrated in accordance OAC rule 3745-17-03(B)(3).

- g) Miscellaneous Requirements
 - (1) None.



2. Emissions Unit Group -PSand Attrition Mills: P910,P912,P913

EU ID	Operations, Property and/or Equipment Description
P910	Precision Sand Mod #1 Pan Conveyor, Attrition Mill, and Waste Sand Conveyor
P912	Precision Sand Mod #3 Pan Conveyor, Attrition Mill, and Waste Sand Conveyor
P913	Precision Sand Mod #4 Pan Conveyor, Attrition Mill, and Waste Sand Conveyor

a) The following emissions unit terms and conditions are federally enforceable with the exception of those listed below which are enforceable under state law only:

(1) b)(1)f.

b) Applicable Emissions Limitations and/or Control Requirements

(1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	OAC rule 3745-31-10 through 20	<p><u>From each emissions unit individually (attrition mills):</u> Volatile organic compound (VOC) emissions shall not exceed 0.10 pound per ton (lb/ton) of aluminum and 5.73 tons per year (tpy), based upon a rolling, 12-month summation of the monthly emissions.</p> <p>See b)(2)a.</p>
b.	OAC rule 3745-31-05(D)	<p><u>Fugitive emissions from each emissions unit individually (the fugitive portion of these emissions units are the pan and waste sand conveyors):</u></p> <p>Fugitive particulate emissions (PE) shall not exceed 1.07 tpy based upon a rolling, 12-month summation of the monthly emissions.</p> <p>Fugitive particulate matter less than or equal to 10 microns in size (PM₁₀) shall not exceed 2.14 tpy based upon a rolling, 12-month summation of the monthly emissions.</p>



	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
		<p><u>Stack emissions from each emissions unit individually (the stack component of these emissions units are the attrition mills, which are controlled with a baghouse and RTO):</u></p> <p>PE shall not exceed 0.02 lb/ton of aluminum and 1.15 tpy based upon a rolling, 12-month summation of the monthly emissions.</p> <p>PM₁₀ shall not exceed 0.04 lb/ton and 2.29 tpy based upon a rolling, 12-month summation of the monthly emissions.</p> <p>Visible stack PE shall not exceed 10% opacity, as a six-minute average.</p> <p>See b)(2)b. and b)(2)e.</p>
c.	OAC rule 3745-17-07(A) OAC rule 3745-17-11(B)	The emission limitations specified by these rules are less stringent than the emission limitations established pursuant to OAC rule 3745-31-05(D).
d.	OAC rule 3745-31-05(A)(3), as effective 11/31/01	See b)(2)c.
e.	OAC rule 3745-31-05(A)(3), as effective 12/01/06	See b)(2)d.
f.	OAC rule 3745-114-01 ORC 3704.03(F)	See B.2. – Facility-Wide Terms and Conditions
g.	OAC rule 3745-17-07(B)	Visible fugitive PE shall not exceed 20% opacity as a three-minute average, except as provided by rule.
h.	OAC rule 3745-17-08(B)(3)	See b)(2)f.

(2) Additional Terms and Conditions

- a. Based on the "Prevention of Significant Deterioration" (PSD) analysis conducted to ensure the application of "Best Available Control Technology" (BACT), it has been determined that no control technologies for VOC were cost effective.
- b. This permit establishes the following federally enforceable emission limitations for the purpose of limiting the potentials to emit (PTE) for PE and PM₁₀. The PTE is being restricted such that the emission increase for PM₁₀ allowed for in PTI P0106622, issued 12/20/10, will be below the Prevention of Significant Deterioration (PSD) "significant threshold" applicability level of 25 (for PE) and 15



tpy (for PM₁₀). The federally enforceable emission limitations are based on the operational restrictions contained in c)(1) and c)(2), which require control equipment and process control:

- i. Fugitive PE shall not exceed 1.07 tpy, based upon a rolling, 12-month summation of the monthly emissions;
 - ii. Fugitive PM₁₀ emissions shall not exceed 2.14 tpy from the pan and waste sand conveyor, based upon a rolling, 12-month summation of the monthly emissions.
 - iii. Stack PE shall not exceed 0.02 lb/ton of aluminum and 1.15 tpy from the attrition mill, based upon a rolling, 12-month summation of the monthly emissions.
 - iv. Stack PM₁₀ shall not exceed 0.04 lb/ton and 2.29 tpy from attrition mill, based upon a rolling, 12-month summation of the monthly emissions.
- c. The requirements of this rule for VOC emissions are equivalent to the BACT requirements established pursuant to OAC rule 3745-31-05(A)(3) through 20; therefore, the permittee has satisfied the Best Available Technology (BAT) requirements pursuant to OAC rule 3745-31-05(A)(3), as effective November 30, 2001, in this permit.

Best Available Technology (BAT) requirements for PM₁₀ emissions under OAC rule 3745-31-05(A)(3), as effective November 30, 2001 have been determined to be compliance with the combined annual emission limitation for PM₁₀ (for fugitive and stack emissions) as established pursuant to OAC rule 3745-31-05(D).

On December 1, 2006, paragraph (A)(3) of OAC rule 3745-31-05 was revised to conform to Ohio Revised Code (ORC) changes effective August 3, 2006 (Senate Bill 265 Changes), such that BAT is no longer required by State regulations for NAAQS pollutants less than ten tons per year. However, that rule revision has not yet been approved by U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). Therefore, until the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-31-05, the requirement to satisfy BAT still exists as part of the federally-approved SIP for Ohio. Once U.S. EPA approves the December 1, 2006 version of 3745-31-05, the requirements of 3745-31-05(A)(3) as effective November 30, 2001 will no longer apply.

It should be noted that the emission limitations and control requirements established pursuant to OAC rule 3745-31-05(D) will remain applicable after the above SIP revisions are approved by U.S. EPA.

- d. This paragraph applies once U.S. EPA approves the December 1, 2006 version of OAC rule 3745-31-05 as part of the State Implementation Plan.

Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3)(a), as effective December 1, 2006, do not apply to the VOC and



PM₁₀ emissions from this air contaminant source since the controlled potential to emit (PTE) is less each than 10 tons per year taking into consideration federally enforceable requirements established under OAC rule 3745-31-05(D). BAT requirements under OAC rule 3745-31-05(A)(3)(a), as effective December 1, 2006, are not applicable to the particulate emissions emitted from this emissions unit. BAT is only applicable to emissions of an air contaminant or precursor of an air contaminant for which a national ambient air quality standard (NAAQS) has been adopted under the Clean Air Act. Particulate emissions (also referred to as total suspended particulate or particulate matter) is an air contaminant that does not involve an established NAAQS.

- e. Prevention of Significant Deterioration (PSD) requirements for particulate matter equal to or less than 2.5 microns in size (PM_{2.5}) are being implemented through the PM₁₀ Surrogate Policy issued by EPA in 1997. For purposes of demonstrating that PM₁₀ is a reasonable surrogate for PM_{2.5}, all emissions of PM₁₀ will be considered PM_{2.5}.
- f. The permittee shall utilize reasonable available control measures (RACM) that are sufficient to minimize or eliminate visible emissions of fugitive dust. In accordance with the permittee's permit application, the permittee has committed to perform the following control measure to ensure compliance:
 - i. Building enclosure.

Nothing in this paragraph shall prohibit the permittee from employing other equally-effective control measures to ensure compliance.

c) Operational Restrictions

- (1) The maximum annual sand usage for each individual emissions unit shall not exceed 114,696 tons, based upon a rolling, 12-month summation of the monthly quantities of sand used.

Note: This is an administrative modification, as such these emissions units have been in operation for more than 12 months and, as such, the permittee has existing records to generate the rolling, 12-month summation of the emissions, upon issuance of this permit.

- (2) The permittee shall operate the baghouses at all times when the attrition mills are in operation.

d) Monitoring and/or Recordkeeping Requirements

- (1) The permittee shall collect and record the following information each month for these emissions units, individually:
 - a. the amount of sand processed, in tons;
 - b. for the first 12 months of operation following the issuance of this permit, the cumulative quantity of sand processed, in tons; and



- c. after the first 12 months of operation following the issuance of this permit, the rolling, 12-month summation of the monthly amount of sand processed.

*The amount of sand processed through this emissions unit is equivalent to the amount of sand received in emissions units P906, P907, P908 and P909, combined. The monitoring and record keeping associated with the sand processed in emissions units P906, P907, P908 and P909 can be used to fulfill the requirements in this section.

- (2) The permittee shall perform weekly* checks when these emissions units are in operation and when the weather conditions allow, for any visible particulate emissions from the stack(s) serving this emissions unit. The presence or absence of any visible emissions, excluding water vapor, shall be noted in an operations log. If visible emissions are observed, the permittee shall also note the following in the operations log:
 - a. the date and time of the visible emission observation;
 - b. the identification of the stack observed;
 - c. the color of the emissions;
 - d. the total duration of any visible emission observation; and
 - e. the corrective actions, if any, taken to eliminate the visible emissions.

*once during each normal calendar week

- (3) The permittee shall perform weekly* checks, when the emissions unit is in operation and when the weather conditions allow, for any visible emissions of fugitive dust from the egress points (i.e., building windows, doors, roof monitors, etc.) serving this emissions unit. The presence or absence of any visible fugitive emissions shall be noted in an operations log. If visible emissions are observed, the permittee shall also note the following in the operations log:
 - a. the location and color of the emissions;
 - b. whether the emissions are representative of normal operations;
 - c. if the emissions are not representative of normal operations, the cause of the abnormal emissions;
 - d. the total duration of any visible emissions incident; and
 - e. any corrective actions taken to minimize or eliminate the visible emissions.

*once during each normal calendar week

- (4) The permittee shall maintain records documenting any time periods when the attrition mills were in operation and the baghouses were not operating.
- (5) The permittee shall properly install, operate, and maintain a continuous temperature monitors and recorder(s) that measure and record(s) the combustion temperature within



the thermal oxidizer when the emissions unit(s) is/are in operation. The permittee shall record the combustion temperature on a continuous basis. The monitoring equipment shall be installed, calibrated, operated, and maintained in accordance with the manufacturer's recommendations, instructions, and the operating manual(s). The acceptable temperature setting shall be based upon the manufacturer's specifications until such time as any required emission testing is conducted and the appropriate temperature range is established to demonstrate compliance. These records shall be maintained at the facility for a period of no less than three years.

- (6) Whenever the monitored average combustion temperature within the thermal oxidizers deviate from the range/limit specified in this permit, the permittee shall promptly investigate the cause of the deviation. The permittee shall maintain records of the following information for each investigation:
- a. the date and time the deviation began;
 - b. the magnitude of the deviation at that time;
 - c. the date the investigation was conducted;
 - d. the name(s) of the personnel who conducted the investigation; and
 - e. the findings and recommendations.

In response to each required investigation to determine the cause of a deviation, the permittee shall take prompt corrective action to bring the operation of the control equipment within the acceptable range/limit specified in this permit, unless the permittee determines that corrective action is not necessary and documents the reasons for that determination and the date and time the deviation ended. The permittee shall maintain records of the following information for each corrective action taken:

- f. a description of the corrective action;
- g. the date corrective action was completed;
- h. the date and time the deviation ended;
- i. the total period of time (in minutes) during which there was a deviation;
- j. the temperature readings immediately after the corrective action was implemented; and
- k. the name(s) of the personnel who performed the work.

Investigation and records required by this paragraph do not eliminate the need to comply with the requirements of OAC rule 3745-15-06 if it is determined that a malfunction has occurred.

The temperature range/limit is effective for the duration of this permit, unless revisions are requested by the permittee and approved in writing by the appropriate Ohio EPA District Office or local air agency. The permittee may request revisions to the permitted



temperature range/limit based upon information obtained during future emission tests that demonstrate compliance with the allowable VOC emission rate for the controlled emissions unit(s). In addition, approved revisions to the temperature range/limit will not constitute a relaxation of the monitoring requirements of this permit and may be incorporated into this permit by means of administrative permit modification.

e) Reporting Requirements

- (1) The permittee shall submit quarterly deviation (excursion) reports, which identify all exceedances of the following:
 - a. for the first 12 calendar months of operation following the issuance of this permit, the maximum allowable cumulative sand usage restriction; and
 - b. after the first 12 calendar months of operation following the issuance of this permit, the rolling, 12-month sand usage restriction.

These quarterly deviation reports shall be submitted in accordance with the Standard Terms and Conditions of this permit.

- (2) The permittee shall submit semiannual written reports that identify:
 - a. all days during which any visible particulate emissions, excluding water vapor, were observed from the stacks serving these emissions units; and
 - b. describe the corrective actions, if any, taken to eliminate the visible particulate emissions.

These reports shall be submitted to the Director (the Northwest District Office) by January 31 and July 31 of each year and shall cover the previous 6-month period.

- (3) The permittee shall submit semiannual written reports that identify:
 - a. all days during which any visible emissions of fugitive dust were observed from the egress points (i.e., building windows, doors, roof monitors, etc.) serving this emissions unit; and
 - b. any corrective actions taken to minimize or eliminate the visible emissions.

These reports shall be submitted to the Director (the Northwest District Office) by January 31 and July 31 of each year and shall cover the previous 6-month period.

- (4) The permittee shall submit deviation (excursion) reports that identify any time periods when the attrition mills were in operation and the baghouses were not operating. Each report shall be submitted within 30 days after the deviation occurs.
- (5) The permittee shall submit quarterly deviation (excursion) reports that identify the following information concerning the operation of the thermal oxidizers during the operation of these emissions units:



- a. Each period of time (start time and date, and end time and date) when the average combustion temperature within the thermal oxidizers were outside of the range specified by the manufacturer and/or outside of the acceptable range following any required compliance demonstration;
- b. Each period of time (start time and date, and end time and date) when the emissions units were in operation and the process emissions were not vented to the thermal oxidizers;
- c. an identification of each incident of deviation described in "a." or "b." where prompt corrective action, that would bring the emissions units into compliance and/or the temperature within the thermal oxidizers into compliance with the acceptable range, was determined to be necessary and was not taken; and
- d. an identification of each incident of deviation described in "a." or "b." where proper records were not maintained for the investigation and/or the corrective action(s).

If no deviations /excursions occurred during a calendar quarter, the report shall so state that no deviations occurred during the reporting period.

The quarterly deviation reports shall be submitted in accordance with the reporting requirements of the Standard Terms and Conditions of this permit.

f) Testing Requirements

- (1) The permittee shall conduct, or have conducted, emission testing for all four (4) precision sand modules in accordance with the following requirements:
 - a. The emissions testing shall be conducted over four (4) consecutive years, beginning no later than 180 days after achieving the maximum production rate at which PSand module1 (emissions units P910), PSand module 2 (emissions units P911), PSand module 3 (emissions units P912) or PSand module 4 (emissions units P913), will be operated, whichever comes first. The permittee shall test a minimum of one module per year.
 - b. The emission testing shall be conducted to demonstrate compliance with the following:
 - i. for VOC – 0.10 lb/ton of sand from the attrition mills of each of these emissions units. Modules 1, 3 and 4 are exhausted to an RTO, Module 2 exhaust through only a baghouse
 - c. The following test methods shall be employed to demonstrate compliance with the above emission limitations:
 - i. For total VOC, Methods 1-4 and 18, 25 or 25A (as applicable) of 40 CFR Part 60, Appendix A. Appropriate methods shall be used in conjunction with the test methods and procedures specified in Methods 18, 25, or 25A



(as applicable) of 40 CFR Part 60, Appendix A for determining total VOC mass emissions.

Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA, NWDO.

- d. The test methods and procedures selected shall be based on a consideration of the diversity of the organic species present and their total concentration, and on a consideration of the potential presence of interfering gases.
- e. The test(s) shall be conducted at a Maximum Source Operating Rate (MSOR), unless otherwise specified or approved by the appropriate Ohio EPA District Office or local air agency. MSOR is defined as the condition that is most likely to challenge the emission control measures with regards to meeting the applicable emission standard(s). Although it generally consists of operating the emissions unit at its maximum material input/production rates and results in the highest emission rate of the tested pollutant, there may be circumstances where a lower emissions loading is deemed the most challenging control scenario. Failure to test at the MSOR is justification for not accepting the test results as a demonstration of compliance.
- f. Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA, NWDO. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the test(s). Failure to submit such notification for review and approval prior to the test(s) may result in the Ohio EPA, NWDO's refusal to accept the results of the emission test(s).

Personnel from the Ohio EPA, NWDO shall be permitted to witness the test(s), examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment.

A comprehensive written report of the results of the emissions test(s) shall be signed by the person or persons responsible for the tests and submitted to the Ohio EPA, NWDO within 30 days following completion of the test(s). The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Ohio EPA, NWDO.

- (2) Compliance with the Emissions Limitations and/or Control Requirements specified in section b) of these terms and conditions shall be determined in accordance with the following methods:

- a. Emission Limitations:

The maximum annual sand usage shall not exceed 114,696 tons per rolling, 12-month period.



Applicable Compliance Method:

Compliance with the annual emission limitation shall be demonstrated by the record keeping requirements specified in d)(1).

b. Emission Limitations:

VOC emissions shall not exceed 0.10 lb/ton of sand and 5.73 tpy, based upon a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method:

Compliance with the lb/ton emission limitation shall be demonstrated based on the results of the emission testing conducted in accordance with Methods 1-4 and 18, 25 or 25A (as applicable) of 40 CFR Part 60, Appendix A or as amended. Alternative or equivalent methods can be used with the approval of the director.

The annual emission limitation was established by multiplying the lb/ton of sand emission limitation by the annual sand restriction of 114,696 tons and dividing by 2000 lbs/ton. Therefore provided compliance is shown with the lb/ton emission limitation and the annual sand throughput, compliance with the annual limitation shall be demonstrated.

c. Emission Limitations:

Fugitive PE shall not exceed 1.07 tpy from the pan and waste sand conveyor, based on a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method:

The emission limitation was established by multiplying the company-supplied emission factor of 0.00867 lb/ton of sand (waste sand conveyor) and 0.01 lb/ton of sand (pan conveyor) by the annual sand restriction of 114,696 tons and dividing by 2000 lbs/ton. If required, compliance with the lb/ton emission limitation shall be demonstrated based on the results of the emission testing conducted in accordance with Methods 1-5 of 40 CFR Part 60, Appendix A. Alternative or equivalent methods can be used with the approval of the director.

The annual emission limitation was established by multiplying the lb/ton of sand emission limitation by the annual sand restriction of 114,696 tons and dividing by 2000 lbs/ton. Therefore provided compliance is shown with the lb/ton emission limitation and the annual sand throughput, compliance with the annual limitation shall be demonstrated.

d. Emission Limitations:

Stack PE shall not exceed 0.02 lb/ton and 1.15 tpy from the attrition mill, based on a rolling, 12-month summation of the monthly emissions.



Applicable Compliance Method:

If required, compliance with the lb/ton emission limitation shall be demonstrated based on the results of the emission testing conducted in accordance with Methods 1-5 of 40 CFR Part 60, Appendix A. Alternative or equivalent methods can be used with the approval of the director.

The annual emission limitation was established by multiplying the lb/ton of sand emission limitation by the annual sand restriction of 114,696 tons and dividing by 2000 lbs/ton. Therefore provided compliance is shown with the lb/ton emission limitation and the annual sand throughput, compliance with the annual limitation shall be demonstrated.

e. Emission Limitations:

Stack PM₁₀ shall not exceed 0.04 lb/ton and 2.29 tpy, from the attrition mill, based on a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method:

If required, compliance with the lb/ton emission limitation shall be demonstrated based on the results of the emission testing conducted in accordance with Methods 1-4 of 40 CFR Part 60, Appendix A and Methods 201/201A and 202, 40 CFR Part 51, Appendix M. Alternative or equivalent methods can be used with the approval of the director.

The annual emission limitation was established by multiplying the lb/ton of sand emission limitation by the annual sand restriction of 114,696 tons and dividing by 2000 lbs/ton. Therefore provided compliance is shown with the lb/ton emission limitation and the annual sand throughput, compliance with the annual limitation shall be demonstrated.

f. Emission Limitations:

Visible PE shall not exceed 10% opacity as a six-minute average.

Applicable Compliance Method:

If required, compliance with the visible emission limitation shall be demonstrated in accordance with Test Method 9 as set forth in "Appendix on Test Methods" in 40 CFR, Part 60 ("Standards of Performance for New Stationary Sources").

g. Emission Limitations:

Visible fugitive PE shall not exceed 20% opacity as a three-minute average.

Applicable Compliance Method:

If required, compliance with the visible emission limitation shall be demonstrated in accordance OAC rule 3745-17-03(B)(3).



Draft Permit-to-Install
GM Defiance Casting Operations

Permit Number: P0117030

Facility ID: 0320010001

Effective Date: To be entered upon final issuance

g) Miscellaneous Requirements

(1) None.



3. Emissions Unit Group -PSand Mod#1 Core Machines: P464,P465,P466,P467,P468,P469

EU ID	Operations, Property and/or Equipment Description
P464	Precision Sand Mod #1 Core Machine #1
P465	Precision Sand Mod #1 Core Machine #2
P466	Precision Sand Mod #1 Core Machine #3
P467	Precision Sand Mod #1 Core Machine #4
P468	Precision Sand Mod #1 Core Machine #5
P469	Precision Sand Mod #1 Core Machine #6

a) The following emissions unit terms and conditions are federally enforceable with the exception of those listed below which are enforceable under state law only:

(1) b)(2)g.

b) Applicable Emissions Limitations and/or Control Requirements

(1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	OAC rule 3745-31-10 through 20	<p>Volatile organic compound emissions (VOC) from emissions units P464, P465, P466, P467, P468 and P469, combined, shall not exceed 81.44 tons per year (tpy), based upon a rolling, 12-month summation of the monthly emissions.</p> <p><u>Receiving hopper and sand mixer (Stacks PSand3-1 and PSand4-1)</u> VOC emissions shall not exceed 0.22 pound per ton of sand processed.</p> <p><u>Core making (Stack PSandScr1)</u> VOC emissions shall not exceed 1.0 pound per ton of sand processed.</p> <p><u>Maintenance (metal cleaning of core machine – Stack PSandScr1)</u> VOC emissions shall not exceed 0.20 pound per ton of sand processed.</p> <p>Fugitive VOC emissions shall not exceed 2.0 tpy, based on a rolling, 12-month</p>



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	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
		<p>summation of the monthly emissions.</p> <p>Sulfur dioxide (SO₂) emissions from emissions units P464, P465, P466, P467, P468 and P469, combined, shall not exceed 9.18 tpy, based upon a rolling, 12-month summation of the monthly emissions.</p> <p><u>Core making (Stack PSandScr1)</u> SO₂ emissions shall not exceed 0.16 pound per ton of sand processed.</p> <p>See b)(2)a.</p>
b.	OAC rule 3745-31-05(D)	<p>Particulate matter less than or equal to 1-microns in size (PM₁₀) from emissions units P464, P465, P466, P467, P468 and P469, combined, shall not exceed 2.67 tpy, based upon a rolling, 12-month summation of the monthly emissions.</p> <p><u>Receiving hopper and sand mixer (Stacks PSand3-1 and PSand4-1)</u> PM₁₀ shall not exceed 0.0182 pound per ton of sand processed.</p> <p><u>Core making (Stack PSandScr1)</u> PM₁₀ shall not exceed 0.028 pound per ton of sand processed.</p> <p>Visible PE from the stacks serving this emissions unit shall not exceed 10% opacity, as a six-minute average.</p> <p>See b)(2)b., b)(2)c. and b)(2)d.</p>
c.	OAC rule 3745-17-07(A) OAC rule 3745-17-11(B) OAC rule 3745-18-06(E)	The emission limitations specified by these rules are less stringent than the emission limitations established pursuant to OAC rule 3745-31-05(D).
d.	ORC 3704.03(T)	See b)(2)e.
e.	OAC rule 3745-31-05(A)(3), as effective 11/30/01	See b)(2)f.
f.	OAC rule 3745-31-05(A)(3), as effective 12/01/06	See b)(2)g.
g.	OAC rule 3745-114-01 ORC 3704.03(F)	See B.2. – Facility-Wide Terms and Conditions



(2) Additional Terms and Conditions

- a. The permittee shall employ best available control technology (BAT) on this emissions unit for VOC and SO₂. BACT has been determined to be the uses of the following:
 - i. sand mixing – no control technologies were cost effective.
 - ii. core making – a packed tower wet scrubber. The wet scrubber shall achieve the following control efficiencies:
 - (a) dimethyl isopropyl amine (DMIPA) as catalyst: 99% for the DMIPA; and
 - (b) SO₂ as catalyst: 99% for SO₂.
- b. This permit establishes the following federally enforceable emission limitations for the purpose of limiting potential to emit (PTE) for PM₁₀. The PTE is being restricted such that the emission increase for PM₁₀ allowed for in Permit to Install (PTI) P0106622, issued 12/20/2010 will be below the Prevention of Significant Deterioration (PSD) “significant threshold” applicability level of 15 tpy (for PM₁₀). The federally enforceable emission limitations are based on the operational restrictions contained in c)(1) and c)(2), which require control equipment and process control:
 - i. PM₁₀ emissions shall not exceed:
 - (a) 0.0182 lb/ton of sand (receiving hopper and sand mixer),
 - (b) 0.028 lb/ton of sand (core making); and
 - (c) 2.67 tpy, based upon a rolling, 12-month summation of the monthly emissions.
- c. All emissions of particulate matter are PM₁₀.
- d. Prevention of Significant Deterioration (PSD) requirements for particulate matter equal to or less than 2.5 microns in size (PM_{2.5}) are being implemented through the PM₁₀ Surrogate Policy issued by EPA in 1997. For purposes of demonstrating that PM₁₀ is a reasonable surrogate for PM_{2.5}, all emissions of PM₁₀ will be considered PM_{2.5}.
- e. Best Available Technology (BAT) requirements for VOC emissions under ORC 3704.03(T) have been determined to be equivalent to BACT requirements established pursuant to OAC rule 3745-10 through 20.
- f. The Best Available Technology (BAT) requirements for SO₂ are equivalent to the BACT requirements established pursuant to OAC rule 3745-31-10 through 20; therefore, the permittee has satisfied the Best Available Technology (BAT) requirements pursuant to OAC rule 3745-31-05(A)(3), as effective November 30, 2001, in this permit.



The Best Available Technology (BAT) requirements for PM₁₀ under OAC rule 3745-31-05(A)(3), as effective November 30, 2001 have been determined to be compliance with the annual emission limitation for PM₁₀ as established pursuant to OAC rule 3745-31-05(D).

On December 1, 2006, paragraph (A)(3) of OAC rule 3745-31-05 was revised to conform to Ohio Revised Code (ORC) changes effective August 3, 2006 (Senate Bill 265 Changes), such that BAT is no longer required by State regulations for NAAQS pollutants less than ten tons per year. However, that rule revision has not yet been approved by U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). Therefore, until the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-31-05, the requirement to satisfy BAT still exists as part of the federally-approved SIP for Ohio. Once U.S. EPA approves the December 1, 2006 version of 3745-31-05, the requirements of 3745-31-05(A)(3) as effective November 30, 2001 will no longer apply.

It should be noted that the emission limitations and control requirements established pursuant to OAC rule 3745-31-05(D) will remain applicable after the above SIP revisions are approved by U.S. EPA.

- g. This rule paragraph applies once U.S. EPA approves the December 1, 2006 version of the OAC rule 3745-31-05 as part of the State Implementation Plan.

The Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3) do not apply to the emissions of PM₁₀ from this air contaminant source since the potential to emit is less than ten tons per year, taking into account the federally enforceable restriction on the amount of sand processed, the use of a baghouse and cyclone.

The Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3) do not apply to the emissions of SO₂ from this air contaminant source since the potential to emit for each is less than ten tons per year, taking into account the federally enforceable restriction on the amount of sand processed and the use of a wet scrubber.

c) Operational Restrictions

- (1) The maximum annual sand processed in emission units P464, P465, P466, P467, P468 and P469, combined, shall not exceed 114,696 tons, based upon a rolling, 12-month summation of sand processed.

Note: This is an administrative modification, as such these emissions units have been in operation for more than 12 months and, as such, the permittee has existing records to generate the rolling, 12-month summation of the emissions, upon issuance of this permit.

- (2) The permittee shall operate the baghouse at all times when any of the emissions units is in operation.



d) Monitoring and/or Recordkeeping Requirements

(1) The permittee shall collect and record the following information each month for emissions units P464, P465, P466, P467, P468 and P469, combined:

- a. the quantity of sand processed, in tons; and
- b. the quantity of sand processed, in tons, based on a rolling, 12-month summation of the monthly sand processed.

*The amount of sand processed through this emissions unit is equivalent to the amount of sand received in emissions units P906, P907, P908 and P909. The monitoring and record keeping associated with the sand received in emissions unit P906 can be used to fulfill the requirements in this section.

(2) The permittee shall properly operate and maintain equipment to continuously monitor the liquor pH and the scrubber liquor flow rate while the emissions unit is in operation. The monitoring devices and any recorders shall be calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

The permittee shall collect and record the following information each day:

- a. the catalyst gas scrubber liquor pH, on a once-per-shift basis;
- b. the catalyst gas scrubber liquor flow rate, in gallons per minute, on a once-per-shift basis; and
- c. the operating times for the capture (collection) system, control device, monitoring equipment, and the associated emissions unit.

Whenever the monitored values for the catalyst gas scrubber liquor pH and catalyst gas scrubber liquor flow rate deviate from the range specified below, the permittee shall promptly investigate the cause of the deviation. The permittee shall maintain records of the following information for each investigation: the date and time the deviation began and the magnitude of the deviation at that time, the date(s) the investigation was conducted, the names of the personnel who conducted the investigation, and the findings and recommendations.

In response to each required investigation to determine the cause of a deviation, the permittee shall take prompt corrective action to bring the operation of the control equipment within the acceptable ranges specified below, unless the permittee determines that corrective action is not necessary and documents the reasons for that determination and the date and time the deviation ended. The permittee shall maintain records of the following information for each corrective action taken: a description of the corrective action, the date it was completed, the date and time the deviation ended, the total period of time (in minutes) during which there was a deviation, the catalyst gas scrubber liquor pH and catalyst gas scrubber liquor flow rate immediately after the corrective action, and the names of the personnel who performed the work. Investigation and records required by



this paragraph does not eliminate the need to comply with the requirements of OAC rule 3745-15-06 if it is determined that a malfunction has occurred.

- d. The catalyst gas scrubber, utilizing the DMIPA, catalyst, recirculating liquor pH shall be continuously maintained at a value of less than or equal to 5 at all times while the emissions unit is in operation, or as established during the most recent performance test that demonstrated the emissions unit was in compliance. The caustic catalyst gas scrubber, utilizing the SO₂ catalyst, recirculating liquor pH shall be continuously maintained at a value of greater than or equal to 9 at all times while the emissions unit is in operation, or as established during the most recent performance test that demonstrated the emissions unit was in compliance.
- e. The catalyst gas scrubber liquor flow rate shall be continuously maintained at a value of not less than 3 gallons per minute per 1,000 cfm of gas flow at all times while the emissions unit is in operation, or as established during the most recent performance test that demonstrated the emissions unit was in compliance.

These ranges are effective for the duration of this permit, unless revisions are requested by the permittee and approved in writing by the appropriate Ohio EPA District Office or local air agency. The permittee may request revisions to the ranges based upon information obtained during future tests that demonstrate compliance with the allowable VOC emission rate for this emissions unit. In addition, approved revisions to the ranges will not constitute a relaxation of the monitoring requirements of this permit and may be incorporated into this permit by means of administrative modification.

- (3) The permittee shall maintain records documenting any time periods when any of the emissions units was in operation and the baghouse was not operating.
- (4) The permittee shall perform weekly* checks when the emissions unit is in operation and when the weather conditions allow, for any visible particulate emissions from the baghouse and from the cyclone serving this emissions unit. The presence or absence of any visible emissions, excluding water vapor, shall be noted in an operations log. If visible emissions are observed, the permittee shall also note the following in the operations log:
 - a. the date and time of the visible emission observation;
 - b. the identification of the stack observed;
 - c. the color of the emissions;
 - d. the total duration of any visible emission observation; and
 - e. the corrective actions, if any, taken to eliminate the visible emissions.

*once during each normal calendar week

- (5) The permittee shall collect and record the following information on a monthly basis for the metal cleaner applied in this emissions unit:



- a. the name and identification of each metal cleaner employed;
- b. the VOC content of each metal cleaner, in pounds per gallon;
- c. the number of gallons of each metal cleaner employed;
- d. the total VOC emission rate from all metal cleaners, i.e., the summation of the products of d)(5)b. x d)(5)c. for all metal cleaners employed, in pounds; and
- e. the pound per ton of VOC emissions from all metal cleaners employed [d)(5)d./d)(1)a].

e) Reporting Requirements

- (1) The permittee shall submit quarterly deviation (excursion) reports, which identify all exceedances of the following:

- a. the rolling, 12-month restriction on the quantity of sand processed.

These quarterly deviation reports shall be submitted in accordance with the Standard Terms and Conditions of this permit.

- (2) The permittee shall submit deviation (excursion) reports that identify the following:

- a. any time periods when the emissions unit was in operation and the baghouse(s) was not operating; and
- b. any exceedance of the 0.20 lb VOC/ton of sand emission limitation for the metal cleaner.

Each report shall be submitted within 30 days after the deviation occurs.

- (3) The permittee shall submit quarterly deviation (excursion) reports that identify the following information concerning the operation of the wet scrubber during the operation of the emissions unit(s):

- a. each period of time (start time and date, and end time and date) when the liquid flow rate or the liquid pH was outside of the appropriate range or limit specified by the manufacturer and outside of the acceptable range for each parameter following any required compliance demonstration;
- b. an identification of each incident of deviation described in (3)a. where a prompt investigation was not conducted;
- c. an identification of each incident of deviation described in (3)a. where prompt corrective action, that would bring the liquid flow rate or scrubber liquid pH into compliance with the acceptable range, was determined to be necessary and was not taken; and



- d. an identification of each incident of deviation described in (3)a. where proper records were not maintained for the investigation and/or the corrective action(s), as identified in the monitoring and record keeping requirements of this permit.

If no deviations/excursions occurred during a calendar quarter, the report shall so state that no deviations occurred during the reporting period.

The quarterly deviation reports shall be submitted in accordance with the reporting requirements of the Standard Terms and Conditions of this permit.

- (4) The permittee shall submit semiannual written reports that (a) identify all days during which any visible particulate emissions, excluding water vapor, were observed from the baghouse and from the cyclone serving this emissions unit and (b) describe the corrective actions, if any, taken to eliminate the visible particulate emissions. These reports shall be submitted to the Director (the Northwest District Office) by January 31 and July 31 of each year and shall cover the previous 6-month period.
- (5) The permittee shall submit annual reports to the appropriate Ohio EPA District Office or local air agency, documenting any changes made to a parameter or value used in the dispersion model, that was used to demonstrate compliance with ORC 3704.03(F) through the predicted 1-hour maximum ground-level concentration. If no changes to the emissions unit(s) or the exhaust stack have been made, then the report shall include a statement to this effect. This report shall be postmarked or delivered no later than January 31 following the end of each calendar year.

f) **Testing Requirements**

- (1) The permittee shall conduct, or have conducted, emission testing for all four (4) precision sand modules in accordance with the following requirements:
 - a. The emissions testing shall be conducted over four (4) consecutive years, beginning no later than 180 days after achieving the maximum production rate at which Psand module 1 (emissions units P464, P465, P466, P467, P468, P469) or Psand module 2 (emissions units P524, P527, P530, P533, P538, P638) or Psand module 3 (emissions units P525, P528, P531, P534, P536, P539) or Psand module 4 (emissions units P526, P529, P532, P535, P537, P540), will be operated, whichever comes first. The permittee shall test a minimum of one module per year.
 - b. The emission testing shall be conducted to demonstrate compliance with the following emission limitations involving DMIPA as the catalyst:
 - i. 1.0 lb of VOC per ton of sand, for core making.
 - c. When the emission unit first utilizes SO₂ as the catalyst for purposes other than research and development, the permittee shall conduct testing within 60 days after the initial use of SO₂ to demonstrate compliance with the following emission limitations when utilizing SO₂ as the catalyst:



- i. 0.16 lb of SO₂ per ton of sand, for core making; and
 - ii. The control efficiency for SO₂.
- d. The following test methods shall be employed to demonstrate compliance with the above emission limitations:
- i. for total VOC, Methods 1-4 and 18, 25 or 25A (as applicable) of 40 CFR Part 60, Appendix A. Appropriate methods shall be used in conjunction with the test methods and procedures specified in Methods 18, 25, or 25A (as applicable) of 40 CFR Part 60, Appendix A for determining total VOC mass emissions.
 - ii. for SO₂, Methods 1-4 and 6 of 40 CFR Part 60, Appendix A. Appropriate methods shall be used in conjunction with the test methods and procedures specified in Methods 6 of 40 CFR Part 60, Appendix A for determining SO₂ mass emissions.
- Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA, NWDO. The test method(s) which must be employed to demonstrate compliance with the control efficiencies are specified below.
- e. The test methods and procedures selected shall be based on a consideration of the diversity of the organic species present and their total concentration, and on a consideration of the potential presence of interfering gases."
 - f. The test(s) shall be conducted at a Maximum Source Operating Rate (MSOR), unless otherwise specified or approved by the appropriate Ohio EPA District Office or local air agency. MSOR is defined as the condition that is most likely to challenge the emission control measures with regards to meeting the applicable emission standard(s). Although it generally consists of operating the emissions unit at its maximum material input/production rates and results in the highest emission rate of the tested pollutant, there may be circumstances where a lower emissions loading is deemed the most challenging control scenario. Failure to test at the MSOR is justification for not accepting the test results as a demonstration of compliance.
 - g. During emission testing, the permittee shall also record the following information:
 - i. the pH range for the scrubbing liquid;
 - ii. the scrubber water flow rate, in gallons/minute; and
 - iii. the catalyst and resin used to make the cores.
 - h. Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA, NWDO. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of



the test(s), and the person(s) who will be conducting the test(s). Failure to submit such notification for review and approval prior to the test(s) may result in the Ohio EPA, NWDO's refusal to accept the results of the emission test(s).

Personnel from the Ohio EPA, NWDO shall be permitted to witness the test(s), examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment.

A comprehensive written report of the results of the emissions test(s) shall be signed by the person or persons responsible for the tests and submitted to the Ohio EPA, NWDO within 30 days following completion of the test(s). The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Ohio EPA, NWDO.

- (2) Compliance with the Emissions Limitations and/or Control Requirements specified in section b) of these terms and conditions shall be determined in accordance with the following methods:

a. Emission Limitation:

The maximum annual amount of sand processed for P464, P465, P466, P467, P468 and P469, combined shall not exceed 114,696 tons per rolling, 12-month period.

Applicable Compliance Method:

Compliance shall be demonstrated by the record keeping requirements specified in d)(1).

b. Emission Limitations:

1.0 lb of VOC per ton of sand (core making)

Applicable Compliance Method:

Compliance shall be demonstrated based on the results of emission testing conducted in accordance with Methods 1-4 and 18, 25 or 25A (as applicable) of 40 CFR Part 60, Appendix A or as amended. Alternative or equivalent methods can be used with the approval of the director.

c. Emission Limitations:

0.22 lb of VOC per ton of sand (hopper and mixing)

Applicable Compliance Method:

The lb/ton emission limitation was established based on Ohio Cast Metals Association (OCMA) stack test data.



If required, compliance shall be demonstrated based on the results of emission testing conducted in accordance with Methods 1-4 and 18, 25 or 25A (as applicable) of 40 CFR Part 60, Appendix A or as amended. Alternative or equivalent methods can be used with the approval of the director.

d. Emission Limitation:

0.20 lb of VOC per ton of sand (metal cleaning)

Applicable Compliance Method:

The lb/ton emission limitation was established based on the use of five 55 gallon drums of metal cleaner per month with a VOC content of 8.1 lbs per gallon with 85% captured by the scrubber [scrubber does not provide control during metal cleaning] and the use of 114,696 tons per year of sand. Compliance shall be demonstrated based on the record keeping requirements specified in d)(5).

If required, compliance shall be demonstrated based on the results of emission testing conducted in accordance with Methods 1-4 and 18, 25 or 25A (as applicable) of 40 CFR Part 60, Appendix A or as amended. Alternative or equivalent methods can be used with the approval of the director.

e. Emission Limitations:

PM₁₀ emissions shall not exceed 0.0182 lb/ton of sand (hopper and mixing)

PM₁₀ emissions shall not exceed 0.028 lb/ton of sand (core making)

Applicable Compliance Method:

If required, compliance with the company-established emission factors shall be demonstrated based on the results of emission testing conducted in accordance with Methods 1-4 of 40 CFR Part 60, Appendix A and Methods 201/201A and 202 of 40 CFR Part 51, Appendix M or as amended. Alternative or equivalent methods can be used with the approval of the director.

f. Emission Limitation:

VOC emissions from emission units P464, P465, P466, P467, P468 and P469, combined shall not exceed 81.44 tpy, based on a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method:

The annual emission limitation was established by adding the VOC emissions from hopper and mixing, core making, and metal cleaning. VOC emission from hopper and mixing, core making, and metal cleaning were established by multiplying the respective VOC emission limitations of 0.22 lb/ton, 1.0 lb/ton, and 0.20 lb/ton by the annual sand throughput restriction of 114,696 tons per rolling, 12-month period and dividing by 2000 lbs/ton. Therefore provided compliance is



shown with the lb/ton emission limitations and the annual sand throughput, compliance with the annual limitation shall also be demonstrated.

g. Emission Limitation:

Fugitive VOC emissions shall not exceed 2.0 tpy, based on a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method:

The emission limitation was established by multiplying the company-supplied emission factors of 0.035 lb of VOC per ton of sand by the annual sand restriction of 114,696 tons and dividing by 2000 lbs/ton.

h. Emission Limitation:

PM₁₀ emissions P464, P465, P466, P467, P468 and P469, combined shall not exceed 2.67 tpy, based on a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method:

The annual emission limitation was established by adding the PM₁₀ emissions from hopper/mixing, and core making. PM₁₀ emissions from hopper/mixing, and core making were established by multiplying the respective PM₁₀ emission limitations of 0.0182 lb/ton and 0.028 lb/ton by the annual sand throughput restriction of 114,696 tons per rolling, 12-month period and dividing by 2000 lbs/ton. Therefore as long as compliance with the annual sand throughput restriction is demonstrated by the record keeping requirements specified in d)(1), compliance with the annual limitation shall also be demonstrated.

i. Emission Limitation:

SO₂ emissions shall not exceed 9.18 tpy, based on a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method:

The annual emission limitation was established by multiplying the lb/ton of sand emission limitation by the annual sand restriction of 114,696 tons and dividing by 2000 lbs/ton. Therefore provided compliance is shown with the lb/ton emission limitation and the annual sand throughput, compliance with the annual limitation shall be demonstrated.

j. Emission Limitation:

SO₂ shall not exceed 0.16 lb/ton of sand (core making)



Applicable Compliance Method:

Compliance shall be demonstrated based on the results of emission testing conducted in accordance with Methods 1-4 and 6 of 40 CFR Part 60, Appendix A or as amended. Alternative or equivalent methods can be used with the approval of the director.

k. Emission Limitation:

Visible PE from the stack(s) serving this emissions unit shall not exceed 10% opacity, as a six-minute average.

Applicable Compliance Method:

If required, compliance shall be determined according to test Method 9 as set forth in the "Appendix on Test Methods" in 40 CFR Part 60 "Standards of Performance for New Stationary Sources" or as amended. Alternative or equivalent methods can be used with the approval of the director.

g) Miscellaneous Requirements

(1) None.



4. Emissions Unit Group -PSand Mod#2 Core Machines: P524,P527,P530,P533,P538

EU ID	Operations, Property and/or Equipment Description
P524	Precision Sand Mod #2 Core Machine #1
P527	Precision Sand Mod #2 Core Machine #2
P530	Precision Sand Mod #2 Core Machine #3
P533	Precision Sand Mod #2 Core Machine #4
P538	Precision Sand Mod #2 Core Machine #5

a) The following emissions unit terms and conditions are federally enforceable with the exception of those listed below which are enforceable under state law only:

(1) b)(2)g.

b) Applicable Emissions Limitations and/or Control Requirements

(1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	OAC rule 3745-31-10 through 20	<p> Volatile organic compound emissions (VOC) from emissions units P524, P527, P530, P533, P538 and P638, combined, shall not exceed 81.44 tons per year (tpy), based upon a rolling, 12-month summation of the monthly emissions. </p> <p> <u>Receiving hopper and sand mixer (Stacks PSand3-2 and PSand4-2)</u> VOC emissions shall not exceed 0.22 pound per ton of sand processed. </p> <p> <u>Core making (Stack PSandScr2)</u> VOC emissions shall not exceed 1.0 pound per ton of sand processed. </p> <p> <u>Maintenance (metal cleaning of core machine – Stack PSandScr2)</u> VOC emissions shall not exceed 0.20 pound per ton of sand processed. </p> <p> Fugitive VOC emissions shall not exceed 2.0 tpy, based on a rolling, 12-month summation of the monthly emissions. </p>



	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
		<p>Sulfur dioxide (SO₂) emissions from emissions units P524, P527, P530, P533, P538 and P638, combined, shall not exceed 9.18 tpy, based upon a rolling, 12-month summation of the monthly emissions.</p> <p><u>Core making (Stack PSandScr2)</u> SO₂ emissions shall not exceed 0.16 pound per ton of sand processed.</p> <p>See b)(2)a.</p>
b.	OAC rule 3745-31-05(D)	<p>Particulate matter less than or equal to 1-microns in size (PM₁₀) from emissions units P524, P527, P530, P533, P538 and P638, combined, shall not exceed 2.67 tpy, based upon a rolling, 12-month summation of the monthly emissions.</p> <p><u>Receiving hopper and sand mixer (Stacks PSand3-2 and PSand4-2)</u> PM₁₀ shall not exceed 0.0182 pound per ton of sand processed.</p> <p><u>Core making (Stack PSandScr2)</u> PM₁₀ shall not exceed 0.028 pound per ton of sand processed.</p> <p>Visible PE from the stacks serving this emissions unit shall not exceed 10% opacity, as a six-minute average.</p> <p>See b)(2)b., b)(2)c. and b)(2)d.</p>
c.	OAC rule 3745-17-07(A) OAC rule 3745-17-11(B) OAC rule 3745-18-06(E)	The emission limitations specified by these rules are less stringent than the emission limitations established pursuant to OAC rule 3745-31-05(D).
d.	ORC 3704.03(T)	See b)(2)e.
e.	OAC rule 3745-31-05(A)(3), as effective 11/30/01	See b)(2)f.
f.	OAC rule 3745-31-05(A)(3), as effective 12/01/06	See b)(2)g.
g.	OAC rule 3745-114-01 ORC 3704.03(F)	See B.2. – Facility-Wide Terms and Conditions



(2) Additional Terms and Conditions

- a. The permittee shall employ best available control technology (BAT) on this emissions unit for VOC and SO₂. BACT has been determined to be the uses of the following:
 - i. sand mixing – no control technologies were cost effective.
 - ii. core making – a packed tower wet scrubber. The wet scrubber shall achieve the following control efficiencies:
 - (a) dimethyl isopropyl amine (DMIPA) as catalyst: 99% for the DMIPA; and
 - (b) SO₂ as catalyst: 99% for SO₂.
- b. This permit establishes the following federally enforceable emission limitations for the purpose of limiting potential to emit (PTE) for PM₁₀. The PTE is being restricted such that the emission increase for PM₁₀ allowed for in Permit to Install (PTI) P0106622, issued 12/20/2010 will be below the Prevention of Significant Deterioration (PSD) “significant threshold” applicability level of 15 tpy (for PM₁₀). The federally enforceable emission limitations are based on the operational restrictions contained in c)(1) and c)(2), which require control equipment and process control:
 - i. PM₁₀ emissions shall not exceed:
 - (a) 0.0182 lb/ton of sand (receiving hopper and sand mixer),
 - (b) 0.028 lb/ton of sand (core making); and
 - (c) 2.67 tpy, based upon a rolling, 12-month summation of the monthly emissions.
- c. All emissions of particulate matter are PM₁₀.
- d. Prevention of Significant Deterioration (PSD) requirements for particulate matter equal to or less than 2.5 microns in size (PM_{2.5}) are being implemented through the PM₁₀ Surrogate Policy issued by EPA in 1997. For purposes of demonstrating that PM₁₀ is a reasonable surrogate for PM_{2.5}, all emissions of PM₁₀ will be considered PM_{2.5}.
- e. Best Available Technology (BAT) requirements for VOC emissions under ORC 3704.03(T) have been determined to be equivalent to BACT requirements established pursuant to OAC rule 3745-10 through 20.
- f. The Best Available Technology (BAT) requirements for SO₂ are equivalent to the BACT requirements established pursuant to OAC rule 3745-31-10 through 20; therefore, the permittee has satisfied the Best Available Technology (BAT) requirements pursuant to OAC rule 3745-31-05(A)(3), as effective November 30, 2001, in this permit.



The Best Available Technology (BAT) requirements for PM₁₀ under OAC rule 3745-31-05(A)(3), as effective November 30, 2001 have been determined to be compliance with the annual emission limitation for PM₁₀ as established pursuant to OAC rule 3745-31-05(D).

- g. On December 1, 2006, paragraph (A)(3) of OAC rule 3745-31-05 was revised to conform to Ohio Revised Code (ORC) changes effective August 3, 2006 (Senate Bill 265 Changes), such that BAT is no longer required by State regulations for NAAQS pollutants less than ten tons per year. However, that rule revision has not yet been approved by U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). Therefore, until the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-31-05, the requirement to satisfy BAT still exists as part of the federally-approved SIP for Ohio. Once U.S. EPA approves the December 1, 2006 version of 3745-31-05, the requirements of 3745-31-05(A)(3) as effective November 30, 2001 will no longer apply.

It should be noted that the emission limitations and control requirements established pursuant to OAC rule 3745-31-05(D) will remain applicable after the above SIP revisions are approved by U.S. EPA.

- h. This rule paragraph applies once U.S. EPA approves the December 1, 2006 version of the OAC rule 3745-31-05 as part of the State Implementation Plan.

The Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3) do not apply to the emissions of PM₁₀ from this air contaminant source since the potential to emit is less than ten tons per year, taking into account the federally enforceable restriction on the amount of sand processed, the use of a baghouse and cyclone.

The Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3) do not apply to the emissions of SO₂ from this air contaminant source since the potential to emit for each is less than ten tons per year, taking into account the federally enforceable restriction on the amount of sand processed and the use of a wet scrubber.

c) Operational Restrictions

- (1) The maximum annual sand processed in emission units P524, P527, P530, P533, P538 and P638, combined, shall not exceed 114,696 tons, based upon a rolling, 12-month summation of sand processed.

Note: This is an administrative modification, as such these emissions units have been in operation for more than 12 months and, as such, the permittee has existing records to generate the rolling, 12-month summation of the emissions, upon issuance of this permit.

- (2) The permittee shall operate the baghouse at all times when any of the emissions units is in operation.



d) Monitoring and/or Recordkeeping Requirements

(1) The permittee shall collect and record the following information each month for emissions units P524, P527, P530, P533, P538 and P638, combined:

- a. the quantity of sand processed, in tons; and
- b. the quantity of sand processed, in tons, based on a rolling, 12-month summation of the monthly sand processed.

*The amount of sand processed through this emissions unit is equivalent to the amount of sand received in emissions units P906, P907, P908 and P909. The monitoring and record keeping associated with the sand received in emissions unit P906 can be used to fulfill the requirements in this section.

(2) The permittee shall properly operate and maintain equipment to continuously monitor the liquor pH and the scrubber liquor flow rate while the emissions unit is in operation. The monitoring devices and any recorders shall be calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

The permittee shall collect and record the following information each day:

- a. the catalyst gas scrubber liquor pH, on a once-per-shift basis;
- b. the catalyst gas scrubber liquor flow rate, in gallons per minute, on a once-per-shift basis; and
- c. the operating times for the capture (collection) system, control device, monitoring equipment, and the associated emissions unit.

Whenever the monitored values for the catalyst gas scrubber liquor pH and catalyst gas scrubber liquor flow rate deviate from the range specified below, the permittee shall promptly investigate the cause of the deviation. The permittee shall maintain records of the following information for each investigation: the date and time the deviation began and the magnitude of the deviation at that time, the date(s) the investigation was conducted, the names of the personnel who conducted the investigation, and the findings and recommendations.

In response to each required investigation to determine the cause of a deviation, the permittee shall take prompt corrective action to bring the operation of the control equipment within the acceptable ranges specified below, unless the permittee determines that corrective action is not necessary and documents the reasons for that determination and the date and time the deviation ended. The permittee shall maintain records of the following information for each corrective action taken: a description of the corrective action, the date it was completed, the date and time the deviation ended, the total period of time (in minutes) during which there was a deviation, the catalyst gas scrubber liquor pH and catalyst gas scrubber liquor flow rate immediately after the corrective action, and the names of the personnel who performed the work. Investigation and records required by



this paragraph does not eliminate the need to comply with the requirements of OAC rule 3745-15-06 if it is determined that a malfunction has occurred.

- d. The catalyst gas scrubber, utilizing the DMIPA, catalyst, recirculating liquor pH shall be continuously maintained at a value of less than or equal to 5 at all times while the emissions unit is in operation, or as established during the most recent performance test that demonstrated the emissions unit was in compliance. The caustic catalyst gas scrubber, utilizing the SO₂ catalyst, recirculating liquor pH shall be continuously maintained at a value of greater than or equal to 9 at all times while the emissions unit is in operation, or as established during the most recent performance test that demonstrated the emissions unit was in compliance.
- e. The catalyst gas scrubber liquor flow rate shall be continuously maintained at a value of not less than 3 gallons per minute per 1,000 cfm of gas flow at all times while the emissions unit is in operation, or as established during the most recent performance test that demonstrated the emissions unit was in compliance.

These ranges are effective for the duration of this permit, unless revisions are requested by the permittee and approved in writing by the appropriate Ohio EPA District Office or local air agency. The permittee may request revisions to the ranges based upon information obtained during future tests that demonstrate compliance with the allowable VOC emission rate for this emissions unit. In addition, approved revisions to the ranges will not constitute a relaxation of the monitoring requirements of this permit and may be incorporated into this permit by means of administrative modification.

- (3) The permittee shall maintain records documenting any time periods when any of the emissions units was in operation and the baghouse was not operating.
- (4) The permittee shall perform weekly* checks when the emissions unit is in operation and when the weather conditions allow, for any visible particulate emissions from the baghouse and from the cyclone serving this emissions unit. The presence or absence of any visible emissions, excluding water vapor, shall be noted in an operations log. If visible emissions are observed, the permittee shall also note the following in the operations log:
 - a. the date and time of the visible emission observation;
 - b. the identification of the stack observed;
 - c. the color of the emissions;
 - d. the total duration of any visible emission observation; and
 - e. the corrective actions, if any, taken to eliminate the visible emissions.

*once during each normal calendar week



- (5) The permittee shall collect and record the following information on a monthly basis for the metal cleaner applied in this emissions unit:
- a. the name and identification of each metal cleaner employed;
 - b. the VOC content of each metal cleaner, in pounds per gallon;
 - c. the number of gallons of each metal cleaner employed;
 - d. the total VOC emission rate from all metal cleaners, i.e., the summation of the products of d)(5)b. x d)(5)c. for all metal cleaners employed, in pounds; and
 - e. the pound per ton of VOC emissions from all metal cleaners employed [d)(5)d./d)(1)a].

e) Reporting Requirements

- (1) The permittee shall submit quarterly deviation (excursion) reports, which identify all exceedances of the following:

- a. the rolling, 12-month restriction on the quantity of sand processed.

These quarterly deviation reports shall be submitted in accordance with the Standard Terms and Conditions of this permit.

- (2) The permittee shall submit deviation (excursion) reports that identify the following:

- a. any time periods when the emissions unit was in operation and the baghouse(s) was not operating; and
- b. any exceedance of the 0.20 lb VOC/ton of sand emission limitation for the metal cleaner.

Each report shall be submitted within 30 days after the deviation occurs.

- (3) The permittee shall submit quarterly deviation (excursion) reports that identify the following information concerning the operation of the wet scrubber during the operation of the emissions unit(s):

- a. each period of time (start time and date, and end time and date) when the liquid flow rate or the liquid pH was outside of the appropriate range or limit specified by the manufacturer and outside of the acceptable range for each parameter following any required compliance demonstration;
- b. an identification of each incident of deviation described in (3)a. where a prompt investigation was not conducted;
- c. an identification of each incident of deviation described in (3)a. where prompt corrective action, that would bring the liquid flow rate or scrubber liquid pH into compliance with the acceptable range, was determined to be necessary and was not taken; and



- d. an identification of each incident of deviation described in (3)a. where proper records were not maintained for the investigation and/or the corrective action(s), as identified in the monitoring and record keeping requirements of this permit.

If no deviations/excursions occurred during a calendar quarter, the report shall so state that no deviations occurred during the reporting period.

The quarterly deviation reports shall be submitted in accordance with the reporting requirements of the Standard Terms and Conditions of this permit.

- (4) The permittee shall submit semiannual written reports that (a) identify all days during which any visible particulate emissions, excluding water vapor, were observed from the baghouse and from the cyclone serving this emissions unit and (b) describe the corrective actions, if any, taken to eliminate the visible particulate emissions. These reports shall be submitted to the Director (the Northwest District Office) by January 31 and July 31 of each year and shall cover the previous 6-month period.
- (5) The permittee shall submit annual reports to the appropriate Ohio EPA District Office or local air agency, documenting any changes made to a parameter or value used in the dispersion model, that was used to demonstrate compliance with ORC 3704.03(F) through the predicted 1-hour maximum ground-level concentration. If no changes to the emissions unit(s) or the exhaust stack have been made, then the report shall include a statement to this effect. This report shall be postmarked or delivered no later than January 31 following the end of each calendar year.

f) **Testing Requirements**

- (1) The permittee shall conduct, or have conducted, emission testing for all four (4) precision sand modules in accordance with the following requirements:
 - a. The emissions testing shall be conducted over four (4) consecutive years, beginning no later than 180 days after achieving the maximum production rate at which Psand module 1 (emissions units P464, P465, P466, P467, P468, P469) or Psand module 2 (emissions units P524, P527, P530, P533, P538, P638) or Psand module 3 (emissions units P525, P528, P531, P534, P536, P539) or Psand module 4 (emissions units P526, P529, P532, P535, P537, P540), will be operated, whichever comes first. The permittee shall test a minimum of one module per year.
 - b. The emission testing shall be conducted to demonstrate compliance with the following emission limitations involving DMIPA as the catalyst:
 - i. 1.0 lb of VOC per ton of sand, for core making.
 - c. When the emission unit first utilizes SO₂ as the catalyst for purposes other than research and development, the permittee shall conduct testing within 60 days after the initial use of SO₂ to demonstrate compliance with the following emission limitations when utilizing SO₂ as the catalyst:



- i. 0.16 lb of SO₂ per ton of sand, for core making; and
 - ii. The control efficiency for SO₂.
- d. The following test methods shall be employed to demonstrate compliance with the above emission limitations:
- i. for total VOC, Methods 1-4 and 18, 25 or 25A (as applicable) of 40 CFR Part 60, Appendix A. Appropriate methods shall be used in conjunction with the test methods and procedures specified in Methods 18, 25, or 25A (as applicable) of 40 CFR Part 60, Appendix A for determining total VOC mass emissions.
 - ii. for SO₂, Methods 1-4 and 6 of 40 CFR Part 60, Appendix A. Appropriate methods shall be used in conjunction with the test methods and procedures specified in Methods 6 of 40 CFR Part 60, Appendix A for determining SO₂ mass emissions.
- Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA, NWDO. The test method(s) which must be employed to demonstrate compliance with the control efficiencies are specified below.
- e. The test methods and procedures selected shall be based on a consideration of the diversity of the organic species present and their total concentration, and on a consideration of the potential presence of interfering gases."
 - f. The test(s) shall be conducted at a Maximum Source Operating Rate (MSOR), unless otherwise specified or approved by the appropriate Ohio EPA District Office or local air agency. MSOR is defined as the condition that is most likely to challenge the emission control measures with regards to meeting the applicable emission standard(s). Although it generally consists of operating the emissions unit at its maximum material input/production rates and results in the highest emission rate of the tested pollutant, there may be circumstances where a lower emissions loading is deemed the most challenging control scenario. Failure to test at the MSOR is justification for not accepting the test results as a demonstration of compliance.
 - g. During emission testing, the permittee shall also record the following information:
 - i. the pH range for the scrubbing liquid;
 - ii. the scrubber water flow rate, in gallons/minute; and
 - iii. the catalyst and resin used to make the cores.
 - h. Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA, NWDO. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of



the test(s), and the person(s) who will be conducting the test(s). Failure to submit such notification for review and approval prior to the test(s) may result in the Ohio EPA, NWDO's refusal to accept the results of the emission test(s).

Personnel from the Ohio EPA, NWDO shall be permitted to witness the test(s), examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment.

A comprehensive written report of the results of the emissions test(s) shall be signed by the person or persons responsible for the tests and submitted to the Ohio EPA, NWDO within 30 days following completion of the test(s). The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Ohio EPA, NWDO.

- (2) Compliance with the Emissions Limitations and/or Control Requirements specified in section b) of these terms and conditions shall be determined in accordance with the following methods:

a. Emission Limitation:

The maximum annual amount of sand processed for P524, P527, P530, P533, P538 and P638, combined shall not exceed 114,696 tons per rolling, 12-month period.

Applicable Compliance Method:

Compliance shall be demonstrated by the record keeping requirements specified in d)(1).

b. Emission Limitations:

1.0 lb of VOC per ton of sand (core making)

Applicable Compliance Method:

Compliance shall be demonstrated based on the results of emission testing conducted in accordance with Methods 1-4 and 18, 25 or 25A (as applicable) of 40 CFR Part 60, Appendix A or as amended. Alternative or equivalent methods can be used with the approval of the director.

c. Emission Limitations:

0.22 lb of VOC per ton of sand (hopper and mixing)

Applicable Compliance Method:

The lb/ton emission limitation was established based on Ohio Cast Metals Association (OCMA) stack test data.



If required, compliance shall be demonstrated based on the results of emission testing conducted in accordance with Methods 1-4 and 18, 25 or 25A (as applicable) of 40 CFR Part 60, Appendix A or as amended. Alternative or equivalent methods can be used with the approval of the director.

d. Emission Limitation:

0.20 lb of VOC per ton of sand (metal cleaning)

Applicable Compliance Method:

The lb/ton emission limitation was established based on the use of five 55 gallon drums of metal cleaner per month with a VOC content of 8.1 lbs per gallon with 85% captured by the scrubber [scrubber does not provide control during metal cleaning] and the use of 114,696 tons per year of sand. Compliance shall be demonstrated based on the record keeping requirements specified in d)(5).

If required, compliance shall be demonstrated based on the results of emission testing conducted in accordance with Methods 1-4 and 18, 25 or 25A (as applicable) of 40 CFR Part 60, Appendix A or as amended. Alternative or equivalent methods can be used with the approval of the director.

e. Emission Limitations:

PM₁₀ emissions shall not exceed 0.0182 lb/ton of sand (hopper and mixing)

PM₁₀ emissions shall not exceed 0.028 lb/ton of sand (core making)

Applicable Compliance Method:

If required, compliance with the company-established emission factors shall be demonstrated based on the results of emission testing conducted in accordance with Methods 1-4 of 40 CFR Part 60, Appendix A and Methods 201/201A and 202 of 40 CFR Part 51, Appendix M or as amended. Alternative or equivalent methods can be used with the approval of the director.

f. Emission Limitation:

VOC emissions from emission units P524, P527, P530, P533, P538 and P638, combined shall not exceed 81.44 tpy, based on a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method:

The annual emission limitation was established by adding the VOC emissions from hopper and mixing, core making, and metal cleaning. VOC emission from hopper and mixing, core making, and metal cleaning were established by multiplying the respective VOC emission limitations of 0.22 lb/ton, 1.0 lb/ton, and 0.20 lb/ton by the annual sand throughput restriction of 114,696 tons per rolling, 12-month period and dividing by 2000 lbs/ton. Therefore provided compliance is



shown with the lb/ton emission limitations and the annual sand throughput, compliance with the annual limitation shall also be demonstrated.

g. Emission Limitation:

Fugitive VOC emissions shall not exceed 2.0 tpy, based on a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method:

The emission limitation was established by multiplying the company-supplied emission factors of 0.035 lb of VOC per ton of sand by the annual sand restriction of 114,696 tons and dividing by 2000 lbs/ton.

h. Emission Limitation:

PM₁₀ emissions P524, P527, P530, P533, P538 and P638, combined shall not exceed 2.67 tpy, based on a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method:

The annual emission limitation was established by adding the PM₁₀ emissions from hopper/mixing, and core making. PM₁₀ emissions from hopper/mixing, and core making were established by multiplying the respective PM₁₀ emission limitations of 0.0182 lb/ton and 0.028 lb/ton by the annual sand throughput restriction of 114,696 tons per rolling, 12-month period and dividing by 2000 lbs/ton. Therefore as long as compliance with the annual sand throughput restriction is demonstrated by the record keeping requirements specified in d)(1), compliance with the annual limitation shall also be demonstrated.

i. Emission Limitation:

SO₂ emissions shall not exceed 9.18 tpy, based on a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method:

The annual emission limitation was established by multiplying the lb/ton of sand emission limitation by the annual sand restriction of 114,696 tons and dividing by 2000 lbs/ton. Therefore provided compliance is shown with the lb/ton emission limitation and the annual sand throughput, compliance with the annual limitation shall be demonstrated.

j. Emission Limitation:

SO₂ shall not exceed 0.16 lb/ton of sand (core making)



Applicable Compliance Method:

Compliance shall be demonstrated based on the results of emission testing conducted in accordance with Methods 1-4 and 6 of 40 CFR Part 60, Appendix A or as amended. Alternative or equivalent methods can be used with the approval of the director.

k. Emission Limitation:

Visible PE from the stack(s) serving this emissions unit shall not exceed 10% opacity, as a six-minute average.

Applicable Compliance Method:

If required, compliance shall be determined according to test Method 9 as set forth in the "Appendix on Test Methods" in 40 CFR Part 60 "Standards of Performance for New Stationary Sources" or as amended. Alternative or equivalent methods can be used with the approval of the director.

g) Miscellaneous Requirements

(1) None.



5. Emissions Unit Group -PSand Mod#3 Core Machines: P525,P528,P531,P534,P536,P539

EU ID	Operations, Property and/or Equipment Description
P525	Precision Sand Mod #3 Core Machine #1
P528	Precision Sand Mod #3 Core Machine #2
P531	Precision Sand Mod #3 Core Machine #3
P534	Precision Sand Mod #3 Core Machine #4
P536	Precision Sand Mod #3 Core Machine #6
P539	Precision Sand Mod #3 Core Machine #5

- a) The following emissions unit terms and conditions are federally enforceable with the exception of those listed below which are enforceable under state law only:
- (1) b)(2)g.
- b) Applicable Emissions Limitations and/or Control Requirements
- (1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	OAC rule 3745-31-10 through 20	<p>Volatile organic compound emissions (VOC) from emissions units P525, P528, P531, P534, P536 and P539, combined, shall not exceed 81.44 tons per year (tpy), based upon a rolling, 12-month summation of the monthly emissions.</p> <p><u>Receiving hopper and sand mixer (Stacks PSand3-3 and PSand4-3)</u> VOC emissions shall not exceed 0.22 pound per ton of sand processed.</p> <p><u>Core making (Stack PSandScr3)</u> VOC emissions shall not exceed 1.0 pound per ton of sand processed.</p> <p><u>Maintenance (metal cleaning of core machine – Stack PSandScr3)</u> VOC emissions shall not exceed 0.20 pound per ton of sand processed.</p> <p>Fugitive VOC emissions shall not exceed 2.0 tpy, based on a rolling, 12-month</p>



	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
		<p>summation of the monthly emissions.</p> <p>Sulfur dioxide (SO₂) emissions from emissions P525, P528, P531, P534, P536 and P539, combined, shall not exceed 9.18 tpy, based upon a rolling, 12-month summation of the monthly emissions.</p> <p><u>Core making (Stack PSandScr3)</u> SO₂ emissions shall not exceed 0.16 pound per ton of sand processed.</p> <p>See b)(2)a.</p>
b.	OAC rule 3745-31-05(D)	<p>Particulate matter less than or equal to 1-microns in size (PM₁₀) from emissions units P525, P528, P531, P534, P536 and P539, combined, shall not exceed 2.67 tpy, based upon a rolling, 12-month summation of the monthly emissions.</p> <p><u>Receiving hopper and sand mixer (Stacks PSand3-3 and PSand4-3)</u> PM₁₀ shall not exceed 0.0182 pound per ton of sand processed.</p> <p><u>Core making (Stack PSandScr3)</u> PM₁₀ shall not exceed 0.028 pound per ton of sand processed.</p> <p>Visible PE from the stacks serving this emissions unit shall not exceed 10% opacity, as a six-minute average.</p> <p>See b)(2)b., b)(2)c. and b)(2)d.</p>
c.	OAC rule 3745-17-07(A) OAC rule 3745-17-11(B) OAC rule 3745-18-06(E)	The emission limitations specified by these rules are less stringent than the emission limitations established pursuant to OAC rule 3745-31-05(D).
d.	ORC 3704.03(T)	See b)(2)e.
e.	OAC rule 3745-31-05(A)(3), as effective 11/30/01	See b)(2)f.
f.	OAC rule 3745-31-05(A)(3), as effective 12/01/06	See b)(2)g.
g.	OAC rule 3745-114-01 ORC 3704.03(F)	See B.2. – Facility-Wide Terms and Conditions



(2) Additional Terms and Conditions

- a. The permittee shall employ best available control technology (BAT) on this emissions unit for VOC and SO₂. BACT has been determined to be the uses of the following:
 - i. sand mixing – no control technologies were cost effective.
 - ii. core making – a packed tower wet scrubber. The wet scrubber shall achieve the following control efficiencies:
 - (a) dimethyl isopropyl amine (DMIPA) as catalyst: 99% for the DMIPA; and
 - (b) SO₂ as catalyst: 99% for SO₂.
- b. This permit establishes the following federally enforceable emission limitations for the purpose of limiting potential to emit (PTE) for PM₁₀. The PTE is being restricted such that the emission increase for PM₁₀ allowed for in Permit to Install (PTI) P0106622, issued 12/20/2010 will be below the Prevention of Significant Deterioration (PSD) “significant threshold” applicability level of 15 tpy (for PM₁₀). The federally enforceable emission limitations are based on the operational restrictions contained in c)(1) and c)(2), which require control equipment and process control:
 - i. PM₁₀ emissions shall not exceed:
 - (a) 0.0182 lb/ton of sand (receiving hopper and sand mixer),
 - (b) 0.028 lb/ton of sand (core making); and
 - (c) 2.67 tpy, based upon a rolling, 12-month summation of the monthly emissions.
- c. All emissions of particulate matter are PM₁₀.
- d. Prevention of Significant Deterioration (PSD) requirements for particulate matter equal to or less than 2.5 microns in size (PM_{2.5}) are being implemented through the PM₁₀ Surrogate Policy issued by EPA in 1997. For purposes of demonstrating that PM₁₀ is a reasonable surrogate for PM_{2.5}, all emissions of PM₁₀ will be considered PM_{2.5}.
- e. Best Available Technology (BAT) requirements for VOC emissions under ORC 3704.03(T) have been determined to be equivalent to BACT requirements established pursuant to OAC rule 3745-10 through 20.
- f. The Best Available Technology (BAT) requirements for SO₂ are equivalent to the BACT requirements established pursuant to OAC rule 3745-31-10 through 20; therefore, the permittee has satisfied the Best Available Technology (BAT) requirements pursuant to OAC rule 3745-31-05(A)(3), as effective November 30, 2001, in this permit.



The Best Available Technology (BAT) requirements for PM₁₀ under OAC rule 3745-31-05(A)(3), as effective November 30, 2001 have been determined to be compliance with the annual emission limitation for PM₁₀ as established pursuant to OAC rule 3745-31-05(D).

On December 1, 2006, paragraph (A)(3) of OAC rule 3745-31-05 was revised to conform to Ohio Revised Code (ORC) changes effective August 3, 2006 (Senate Bill 265 Changes), such that BAT is no longer required by State regulations for NAAQS pollutants less than ten tons per year. However, that rule revision has not yet been approved by U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). Therefore, until the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-31-05, the requirement to satisfy BAT still exists as part of the federally-approved SIP for Ohio. Once U.S. EPA approves the December 1, 2006 version of 3745-31-05, the requirements of 3745-31-05(A)(3) as effective November 30, 2001 will no longer apply.

It should be noted that the emission limitations and control requirements established pursuant to OAC rule 3745-31-05(D) will remain applicable after the above SIP revisions are approved by U.S. EPA.

- g. This rule paragraph applies once U.S. EPA approves the December 1, 2006 version of the OAC rule 3745-31-05 as part of the State Implementation Plan.

The Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3) do not apply to the emissions of PM₁₀ from this air contaminant source since the potential to emit is less than ten tons per year, taking into account the federally enforceable restriction on the amount of sand processed, the use of a baghouse and cyclone.

The Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3) do not apply to the emissions of SO₂ from this air contaminant source since the potential to emit for each is less than ten tons per year, taking into account the federally enforceable restriction on the amount of sand processed and the use of a wet scrubber.

c) Operational Restrictions

- (1) The maximum annual sand processed in emission units P525, P528, P531, P534, P536 and P539, combined, shall not exceed 114,696 tons, based upon a rolling, 12-month summation of sand processed.

Note: This is an administrative modification, as such these emissions units have been in operation for more than 12 months and, as such, the permittee has existing records to generate the rolling, 12-month summation of the emissions, upon issuance of this permit.

- (2) The permittee shall operate the baghouse at all times when any of the emissions units is in operation.



d) Monitoring and/or Recordkeeping Requirements

(1) The permittee shall collect and record the following information each month for emissions units P525, P528, P531, P534, P536 and P539, combined:

- a. the quantity of sand processed, in tons; and
- b. the quantity of sand processed, in tons, based on a rolling, 12-month summation of the monthly sand processed.

*The amount of sand processed through this emissions unit is equivalent to the amount of sand received in emissions units P906, P907, P908 and P909. The monitoring and record keeping associated with the sand received in emissions unit P906 can be used to fulfill the requirements in this section.

(2) The permittee shall properly operate and maintain equipment to continuously monitor the liquor pH and the scrubber liquor flow rate while the emissions unit is in operation. The monitoring devices and any recorders shall be calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

The permittee shall collect and record the following information each day:

- a. the catalyst gas scrubber liquor pH, on a once-per-shift basis;
- b. the catalyst gas scrubber liquor flow rate, in gallons per minute, on a once-per-shift basis; and
- c. the operating times for the capture (collection) system, control device, monitoring equipment, and the associated emissions unit.

Whenever the monitored values for the catalyst gas scrubber liquor pH and catalyst gas scrubber liquor flow rate deviate from the range specified below, the permittee shall promptly investigate the cause of the deviation. The permittee shall maintain records of the following information for each investigation: the date and time the deviation began and the magnitude of the deviation at that time, the date(s) the investigation was conducted, the names of the personnel who conducted the investigation, and the findings and recommendations.

In response to each required investigation to determine the cause of a deviation, the permittee shall take prompt corrective action to bring the operation of the control equipment within the acceptable ranges specified below, unless the permittee determines that corrective action is not necessary and documents the reasons for that determination and the date and time the deviation ended. The permittee shall maintain records of the following information for each corrective action taken: a description of the corrective action, the date it was completed, the date and time the deviation ended, the total period of time (in minutes) during which there was a deviation, the catalyst gas scrubber liquor pH and catalyst gas scrubber liquor flow rate immediately after the corrective action, and the names of the personnel who performed the work. Investigation and records required by



this paragraph does not eliminate the need to comply with the requirements of OAC rule 3745-15-06 if it is determined that a malfunction has occurred.

- d. The catalyst gas scrubber, utilizing the DMIPA, catalyst, recirculating liquor pH shall be continuously maintained at a value of less than or equal to 5 at all times while the emissions unit is in operation, or as established during the most recent performance test that demonstrated the emissions unit was in compliance. The caustic catalyst gas scrubber, utilizing the SO₂ catalyst, recirculating liquor pH shall be continuously maintained at a value of greater than or equal to 9 at all times while the emissions unit is in operation, or as established during the most recent performance test that demonstrated the emissions unit was in compliance.
- e. The catalyst gas scrubber liquor flow rate shall be continuously maintained at a value of not less than 3 gallons per minute per 1,000 cfm of gas flow at all times while the emissions unit is in operation, or as established during the most recent performance test that demonstrated the emissions unit was in compliance.

These ranges are effective for the duration of this permit, unless revisions are requested by the permittee and approved in writing by the appropriate Ohio EPA District Office or local air agency. The permittee may request revisions to the ranges based upon information obtained during future tests that demonstrate compliance with the allowable VOC emission rate for this emissions unit. In addition, approved revisions to the ranges will not constitute a relaxation of the monitoring requirements of this permit and may be incorporated into this permit by means of administrative modification.

- (3) The permittee shall maintain records documenting any time periods when any of the emissions units was in operation and the baghouse was not operating.
- (4) The permittee shall perform weekly* checks when the emissions unit is in operation and when the weather conditions allow, for any visible particulate emissions from the baghouse and from the cyclone serving this emissions unit. The presence or absence of any visible emissions, excluding water vapor, shall be noted in an operations log. If visible emissions are observed, the permittee shall also note the following in the operations log:
 - a. the date and time of the visible emission observation;
 - b. the identification of the stack observed;
 - c. the color of the emissions;
 - d. the total duration of any visible emission observation; and
 - e. the corrective actions, if any, taken to eliminate the visible emissions.

*once during each normal calendar week

- (5) The permittee shall collect and record the following information on a monthly basis for the metal cleaner applied in this emissions unit:



- a. the name and identification of each metal cleaner employed;
- b. the VOC content of each metal cleaner, in pounds per gallon;
- c. the number of gallons of each metal cleaner employed;
- d. the total VOC emission rate from all metal cleaners, i.e., the summation of the products of d)(5)b. x d)(5)c. for all metal cleaners employed, in pounds; and
- e. the pound per ton of VOC emissions from all metal cleaners employed [d)(5)d./d)(1)a].

e) Reporting Requirements

- (1) The permittee shall submit quarterly deviation (excursion) reports, which identify all exceedances of the following:

- a. the rolling, 12-month restriction on the quantity of sand processed.

These quarterly deviation reports shall be submitted in accordance with the Standard Terms and Conditions of this permit.

- (2) The permittee shall submit deviation (excursion) reports that identify the following:

- a. any time periods when the emissions unit was in operation and the baghouse(s) was not operating; and
- b. any exceedance of the 0.20 lb VOC/ton of sand emission limitation for the metal cleaner.

Each report shall be submitted within 30 days after the deviation occurs.

- (3) The permittee shall submit quarterly deviation (excursion) reports that identify the following information concerning the operation of the wet scrubber during the operation of the emissions unit(s):

- a. each period of time (start time and date, and end time and date) when the liquid flow rate or the liquid pH was outside of the appropriate range or limit specified by the manufacturer and outside of the acceptable range for each parameter following any required compliance demonstration;
- b. an identification of each incident of deviation described in (3)a. where a prompt investigation was not conducted;
- c. an identification of each incident of deviation described in (3)a. where prompt corrective action, that would bring the liquid flow rate or scrubber liquid pH into compliance with the acceptable range, was determined to be necessary and was not taken; and



- d. an identification of each incident of deviation described in (3)a. where proper records were not maintained for the investigation and/or the corrective action(s), as identified in the monitoring and record keeping requirements of this permit.

If no deviations/excursions occurred during a calendar quarter, the report shall so state that no deviations occurred during the reporting period.

The quarterly deviation reports shall be submitted in accordance with the reporting requirements of the Standard Terms and Conditions of this permit.

- (4) The permittee shall submit semiannual written reports that (a) identify all days during which any visible particulate emissions, excluding water vapor, were observed from the baghouse and from the cyclone serving this emissions unit and (b) describe the corrective actions, if any, taken to eliminate the visible particulate emissions. These reports shall be submitted to the Director (the Northwest District Office) by January 31 and July 31 of each year and shall cover the previous 6-month period.
- (5) The permittee shall submit annual reports to the appropriate Ohio EPA District Office or local air agency, documenting any changes made to a parameter or value used in the dispersion model, that was used to demonstrate compliance with ORC 3704.03(F) through the predicted 1-hour maximum ground-level concentration. If no changes to the emissions unit(s) or the exhaust stack have been made, then the report shall include a statement to this effect. This report shall be postmarked or delivered no later than January 31 following the end of each calendar year.

f) Testing Requirements

- (1) Compliance with the Emissions Limitations and/or Control Requirements specified in section b) of these terms and conditions shall be determined in accordance with the following methods:
 - a. The emissions testing shall be conducted over four (4) consecutive years, beginning no later than 180 days after achieving the maximum production rate at which Psand module 1 (emissions units P464, P465, P466, P467, P468, P469) or Psand module 2 (emissions units P524, P527, P530, P533, P538, P638) or Psand module 3 (emissions units P525, P528, P531, P534, P536, P539) or Psand module 4 (emissions units P526, P529, P532, P535, P537, P540), will be operated, whichever comes first. The permittee shall test a minimum of one module per year.
 - b. The emission testing shall be conducted to demonstrate compliance with the following emission limitations involving DMIPA as the catalyst:
 - i. 1.0 lb of VOC per ton of sand, for core making.
 - c. When the emission unit first utilizes SO₂ as the catalyst for purposes other than research and development, the permittee shall conduct testing within 60 days after the initial use of SO₂ to demonstrate compliance with the following emission limitations when utilizing SO₂ as the catalyst:



- i. 0.16 lb of SO₂ per ton of sand, for core making; and
 - ii. The control efficiency for SO₂.
- d. The following test methods shall be employed to demonstrate compliance with the above emission limitations:
- i. for total VOC, Methods 1-4 and 18, 25 or 25A (as applicable) of 40 CFR Part 60, Appendix A. Appropriate methods shall be used in conjunction with the test methods and procedures specified in Methods 18, 25, or 25A (as applicable) of 40 CFR Part 60, Appendix A for determining total VOC mass emissions.
 - ii. for SO₂, Methods 1-4 and 6 of 40 CFR Part 60, Appendix A. Appropriate methods shall be used in conjunction with the test methods and procedures specified in Methods 6 of 40 CFR Part 60, Appendix A for determining SO₂ mass emissions.
- Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA, NWDO. The test method(s) which must be employed to demonstrate compliance with the control efficiencies are specified below.
- e. The test methods and procedures selected shall be based on a consideration of the diversity of the organic species present and their total concentration, and on a consideration of the potential presence of interfering gases."
 - f. The test(s) shall be conducted at a Maximum Source Operating Rate (MSOR), unless otherwise specified or approved by the appropriate Ohio EPA District Office or local air agency. MSOR is defined as the condition that is most likely to challenge the emission control measures with regards to meeting the applicable emission standard(s). Although it generally consists of operating the emissions unit at its maximum material input/production rates and results in the highest emission rate of the tested pollutant, there may be circumstances where a lower emissions loading is deemed the most challenging control scenario. Failure to test at the MSOR is justification for not accepting the test results as a demonstration of compliance.
 - g. During emission testing, the permittee shall also record the following information:
 - i. the pH range for the scrubbing liquid;
 - ii. the scrubber water flow rate, in gallons/minute; and
 - iii. the catalyst and resin used to make the cores.
 - h. Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA, NWDO. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of



the test(s), and the person(s) who will be conducting the test(s). Failure to submit such notification for review and approval prior to the test(s) may result in the Ohio EPA, NWDO's refusal to accept the results of the emission test(s).

Personnel from the Ohio EPA, NWDO shall be permitted to witness the test(s), examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment.

A comprehensive written report of the results of the emissions test(s) shall be signed by the person or persons responsible for the tests and submitted to the Ohio EPA, NWDO within 30 days following completion of the test(s). The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Ohio EPA, NWDO.

(2) Compliance with the emission limitations in b)(1) of these terms and conditions shall be determined in accordance with the following methods:

a. Emission Limitation:

The maximum annual amount of sand processed for P525, P528, P531, P534, P536 and P539, combined shall not exceed 114,696 tons per rolling, 12-month period.

Applicable Compliance Method:

Compliance shall be demonstrated by the record keeping requirements specified in d)(1).

b. Emission Limitations:

1.0 lb of VOC per ton of sand (core making)

Applicable Compliance Method:

Compliance shall be demonstrated based on the results of emission testing conducted in accordance with Methods 1-4 and 18, 25 or 25A (as applicable) of 40 CFR Part 60, Appendix A or as amended. Alternative or equivalent methods can be used with the approval of the director.

c. Emission Limitations:

0.22 lb of VOC per ton of sand (hopper and mixing)

Applicable Compliance Method:

The lb/ton emission limitation was established based on Ohio Cast Metals Association (OCMA) stack test data.



If required, compliance shall be demonstrated based on the results of emission testing conducted in accordance with Methods 1-4 and 18, 25 or 25A (as applicable) of 40 CFR Part 60, Appendix A or as amended. Alternative or equivalent methods can be used with the approval of the director.

d. Emission Limitation:

0.20 lb of VOC per ton of sand (metal cleaning)

Applicable Compliance Method:

The lb/ton emission limitation was established based on the use of five 55 gallon drums of metal cleaner per month with a VOC content of 8.1 lbs per gallon with 85% captured by the scrubber [scrubber does not provide control during metal cleaning] and the use of 114,696 tons per year of sand. Compliance shall be demonstrated based on the record keeping requirements specified in d)(5).

If required, compliance shall be demonstrated based on the results of emission testing conducted in accordance with Methods 1-4 and 18, 25 or 25A (as applicable) of 40 CFR Part 60, Appendix A or as amended. Alternative or equivalent methods can be used with the approval of the director.

e. Emission Limitations:

PM₁₀ emissions shall not exceed 0.0182 lb/ton of sand (hopper and mixing)

PM₁₀ emissions shall not exceed 0.028 lb/ton of sand (core making)

Applicable Compliance Method:

If required, compliance with the company-established emission factors shall be demonstrated based on the results of emission testing conducted in accordance with Methods 1-4 of 40 CFR Part 60, Appendix A and Methods 201/201A and 202 of 40 CFR Part 51, Appendix M or as amended. Alternative or equivalent methods can be used with the approval of the director.

f. Emission Limitation:

VOC emissions from emission units P525, P528, P531, P534, P536 and P539, combined shall not exceed 81.44 tpy, based on a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method:

The annual emission limitation was established by adding the VOC emissions from hopper and mixing, core making, and metal cleaning. VOC emission from hopper and mixing, core making, and metal cleaning were established by multiplying the respective VOC emission limitations of 0.22 lb/ton, 1.0 lb/ton, and 0.20 lb/ton by the annual sand throughput restriction of 114,696 tons per rolling, 12-month period and dividing by 2000 lbs/ton. Therefore provided compliance is



shown with the lb/ton emission limitations and the annual sand throughput, compliance with the annual limitation shall also be demonstrated.

g. Emission Limitation:

Fugitive VOC emissions shall not exceed 2.0 tpy, based on a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method:

The emission limitation was established by multiplying the company-supplied emission factors of 0.035 lb of VOC per ton of sand by the annual sand restriction of 114,696 tons and dividing by 2000 lbs/ton.

h. Emission Limitation:

PM₁₀ emissions P525, P528, P531, P534, P536 and P539, combined shall not exceed 2.67 tpy, based on a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method:

The annual emission limitation was established by adding the PM₁₀ emissions from hopper/mixing, and core making. PM₁₀ emissions from hopper/mixing, and core making were established by multiplying the respective PM₁₀ emission limitations of 0.0182 lb/ton and 0.028 lb/ton by the annual sand throughput restriction of 114,696 tons per rolling, 12-month period and dividing by 2000 lbs/ton. Therefore as long as compliance with the annual sand throughput restriction is demonstrated by the record keeping requirements specified in d)(1), compliance with the annual limitation shall also be demonstrated.

i. Emission Limitation:

SO₂ emissions shall not exceed 9.18 tpy, based on a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method:

The annual emission limitation was established by multiplying the lb/ton of sand emission limitation by the annual sand restriction of 114,696 tons and dividing by 2000 lbs/ton. Therefore provided compliance is shown with the lb/ton emission limitation and the annual sand throughput, compliance with the annual limitation shall be demonstrated.

j. Emission Limitation:

SO₂ shall not exceed 0.16 lb/ton of sand (core making)



Applicable Compliance Method:

Compliance shall be demonstrated based on the results of emission testing conducted in accordance with Methods 1-4 and 6 of 40 CFR Part 60, Appendix A or as amended. Alternative or equivalent methods can be used with the approval of the director.

k. Emission Limitation:

Visible PE from the stack(s) serving this emissions unit shall not exceed 10% opacity, as a six-minute average.

Applicable Compliance Method:

If required, compliance shall be determined according to test Method 9 as set forth in the "Appendix on Test Methods" in 40 CFR Part 60 "Standards of Performance for New Stationary Sources" or as amended. Alternative or equivalent methods can be used with the approval of the director.

g) Miscellaneous Requirements

(1) None.



6. Emissions Unit Group -PSand Mod#4 Core Machines: P526,P529,P532,P535,P537,P540

EU ID	Operations, Property and/or Equipment Description
P526	Precision Sand Mod #4 Core Machine #1
P529	Precision Sand Mod #4 Core Machine #2
P532	Precision Sand Mod #4 Core Machine #3
P535	Precision Sand Mod #4 Core Machine #4
P537	Precision Sand Mod #4 Core Machine #6
P540	Precision Sand Mod #4 Core Machine #5

a) The following emissions unit terms and conditions are federally enforceable with the exception of those listed below which are enforceable under state law only:

(1) b)(2)g.

b) Applicable Emissions Limitations and/or Control Requirements

(1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	OAC rule 3745-31-10 through 20	<p>Volatile organic compound emissions (VOC) from emissions units P526, P529, P532, P535, P537 and P540, combined, shall not exceed 81.44 tons per year (tpy), based upon a rolling, 12-month summation of the monthly emissions.</p> <p><u>Receiving hopper and sand mixer (Stacks PSand3-4 and PSand4-4)</u> VOC emissions shall not exceed 0.22 pound per ton of sand processed.</p> <p><u>Core making (Stack PSandScr4)</u> VOC emissions shall not exceed 1.0 pound per ton of sand processed.</p> <p><u>Maintenance (metal cleaning of core machine – Stack PSandScr4)</u> VOC emissions shall not exceed 0.20 pound per ton of sand processed.</p> <p>Fugitive VOC emissions shall not exceed 2.0 tpy, based on a rolling, 12-month</p>



	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
		<p>summation of the monthly emissions.</p> <p>Sulfur dioxide (SO₂) emissions from emissions P526, P529, P532, P535, P537 and P540, combined, shall not exceed 9.18 tpy, based upon a rolling, 12-month summation of the monthly emissions.</p> <p><u>Core making (Stack PSandScr4)</u> SO₂ emissions shall not exceed 0.16 pound per ton of sand processed.</p> <p>See b)(2)a.</p>
b.	OAC rule 3745-31-05(D)	<p>Particulate matter less than or equal to 1-microns in size (PM₁₀) from emissions units P526, P529, P532, P535, P537 and P540, combined, shall not exceed 2.67 tpy, based upon a rolling, 12-month summation of the monthly emissions.</p> <p><u>Receiving hopper and sand mixer (Stacks PSand3-3 and PSand4-3)</u> PM₁₀ shall not exceed 0.0182 pound per ton of sand processed.</p> <p><u>Core making (Stack PSandScr3)</u> PM₁₀ shall not exceed 0.028 pound per ton of sand processed.</p> <p>Visible PE from the stacks serving this emissions unit shall not exceed 10% opacity, as a six-minute average.</p> <p>See b)(2)b., b)(2)c. and b)(2)d.</p>
c.	OAC rule 3745-17-07(A) OAC rule 3745-17-11(B) OAC rule 3745-18-06(E)	The emission limitations specified by these rules are less stringent than the emission limitations established pursuant to OAC rule 3745-31-05(D).
d.	ORC 3704.03(T)	See b)(2)e.
e.	OAC rule 3745-31-05(A)(3), as effective 11/30/01	See b)(2)f.
f.	OAC rule 3745-31-05(A)(3), as effective 12/01/06	See b)(2)g.
g.	OAC rule 3745-114-01 ORC 3704.03(F)	See B.2. – Facility-Wide Terms and Conditions



- (2) Additional Terms and Conditions
- a. The permittee shall employ best available control technology (BAT) on this emissions unit for VOC and SO₂. BACT has been determined to be the uses of the following:
 - i. sand mixing – no control technologies were cost effective.
 - ii. core making – a packed tower wet scrubber. The wet scrubber shall achieve the following control efficiencies:
 - (a) dimethyl isopropyl amine (DMIPA) as catalyst: 99% for the DMIPA; and
 - (b) SO₂ as catalyst: 99% for SO₂.
 - b. This permit establishes the following federally enforceable emission limitations for the purpose of limiting potential to emit (PTE) for PM₁₀. The PTE is being restricted such that the emission increase for PM₁₀ allowed for in Permit to Install (PTI) P0106622, issued 12/20/2010 will be below the Prevention of Significant Deterioration (PSD) “significant threshold” applicability level of 15 tpy (for PM₁₀). The federally enforceable emission limitations are based on the operational restrictions contained in c)(1) and c)(2), which require control equipment and process control:
 - i. PM₁₀ emissions shall not exceed:
 - (a) 0.0182 lb/ton of sand (receiving hopper and sand mixer),
 - (b) 0.028 lb/ton of sand (core making); and
 - (c) 2.67 tpy, based upon a rolling, 12-month summation of the monthly emissions.
 - c. All emissions of particulate matter are PM₁₀.
 - d. Prevention of Significant Deterioration (PSD) requirements for particulate matter equal to or less than 2.5 microns in size (PM_{2.5}) are being implemented through the PM₁₀ Surrogate Policy issued by EPA in 1997. For purposes of demonstrating that PM₁₀ is a reasonable surrogate for PM_{2.5}, all emissions of PM₁₀ will be considered PM_{2.5}.
 - e. Best Available Technology (BAT) requirements for VOC emissions under ORC 3704.03(T) have been determined to be equivalent to BACT requirements established pursuant to OAC rule 3745-10 through 20.
 - f. The Best Available Technology (BAT) requirements for SO₂ are equivalent to the BACT requirements established pursuant to OAC rule 3745-31-10 through 20; therefore, the permittee has satisfied the Best Available Technology (BAT) requirements pursuant to OAC rule 3745-31-05(A)(3), as effective November 30, 2001, in this permit.



The Best Available Technology (BAT) requirements for PM₁₀ under OAC rule 3745-31-05(A)(3), as effective November 30, 2001 have been determined to be compliance with the annual emission limitation for PM₁₀ as established pursuant to OAC rule 3745-31-05(D).

On December 1, 2006, paragraph (A)(3) of OAC rule 3745-31-05 was revised to conform to Ohio Revised Code (ORC) changes effective August 3, 2006 (Senate Bill 265 Changes), such that BAT is no longer required by State regulations for NAAQS pollutants less than ten tons per year. However, that rule revision has not yet been approved by U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). Therefore, until the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-31-05, the requirement to satisfy BAT still exists as part of the federally-approved SIP for Ohio. Once U.S. EPA approves the December 1, 2006 version of 3745-31-05, the requirements of 3745-31-05(A)(3) as effective November 30, 2001 will no longer apply.

It should be noted that the emission limitations and control requirements established pursuant to OAC rule 3745-31-05(D) will remain applicable after the above SIP revisions are approved by U.S. EPA.

- g. This rule paragraph applies once U.S. EPA approves the December 1, 2006 version of the OAC rule 3745-31-05 as part of the State Implementation Plan.

The Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3) do not apply to the emissions of PM₁₀ from this air contaminant source since the potential to emit is less than ten tons per year, taking into account the federally enforceable restriction on the amount of sand processed, the use of a baghouse and cyclone.

The Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3) do not apply to the emissions of SO₂ from this air contaminant source since the potential to emit for each is less than ten tons per year, taking into account the federally enforceable restriction on the amount of sand processed and the use of a wet scrubber.

c) Operational Restrictions

- (1) The maximum annual sand processed in emission units P526, P529, P532, P535, P537 and P540, combined, shall not exceed 114,696 tons, based upon a rolling, 12-month summation of sand processed.

Note: This is an administrative modification, as such these emissions units have been in operation for more than 12 months and, as such, the permittee has existing records to generate the rolling, 12-month summation of the emissions, upon issuance of this permit.

- (2) The permittee shall operate the baghouse at all times when any of the emissions units is in operation.



d) Monitoring and/or Recordkeeping Requirements

(1) The permittee shall collect and record the following information each month for emissions units P526, P529, P532, P535, P537 and P540, combined:

- a. the quantity of sand processed, in tons; and
- b. the quantity of sand processed, in tons, based on a rolling, 12-month summation of the monthly sand processed.

*The amount of sand processed through this emissions unit is equivalent to the amount of sand received in emissions units P906, P907, P908 and P909. The monitoring and record keeping associated with the sand received in emissions unit P906 can be used to fulfill the requirements in this section.

(2) The permittee shall properly operate and maintain equipment to continuously monitor the liquor pH and the scrubber liquor flow rate while the emissions unit is in operation. The monitoring devices and any recorders shall be calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

The permittee shall collect and record the following information each day:

- a. the catalyst gas scrubber liquor pH, on a once-per-shift basis;
- b. the catalyst gas scrubber liquor flow rate, in gallons per minute, on a once-per-shift basis; and
- c. the operating times for the capture (collection) system, control device, monitoring equipment, and the associated emissions unit.

Whenever the monitored values for the catalyst gas scrubber liquor pH and catalyst gas scrubber liquor flow rate deviate from the range specified below, the permittee shall promptly investigate the cause of the deviation. The permittee shall maintain records of the following information for each investigation: the date and time the deviation began and the magnitude of the deviation at that time, the date(s) the investigation was conducted, the names of the personnel who conducted the investigation, and the findings and recommendations.

In response to each required investigation to determine the cause of a deviation, the permittee shall take prompt corrective action to bring the operation of the control equipment within the acceptable ranges specified below, unless the permittee determines that corrective action is not necessary and documents the reasons for that determination and the date and time the deviation ended. The permittee shall maintain records of the following information for each corrective action taken: a description of the corrective action, the date it was completed, the date and time the deviation ended, the total period of time (in minutes) during which there was a deviation, the catalyst gas scrubber liquor pH and catalyst gas scrubber liquor flow rate immediately after the corrective action, and the names of the personnel who performed the work. Investigation and records required by



this paragraph does not eliminate the need to comply with the requirements of OAC rule 3745-15-06 if it is determined that a malfunction has occurred.

- d. The catalyst gas scrubber, utilizing the DMIPA, catalyst, recirculating liquor pH shall be continuously maintained at a value of less than or equal to 5 at all times while the emissions unit is in operation, or as established during the most recent performance test that demonstrated the emissions unit was in compliance. The caustic catalyst gas scrubber, utilizing the SO₂ catalyst, recirculating liquor pH shall be continuously maintained at a value of greater than or equal to 9 at all times while the emissions unit is in operation, or as established during the most recent performance test that demonstrated the emissions unit was in compliance.
- e. The catalyst gas scrubber liquor flow rate shall be continuously maintained at a value of not less than 3 gallons per minute per 1,000 cfm of gas flow at all times while the emissions unit is in operation, or as established during the most recent performance test that demonstrated the emissions unit was in compliance.

These ranges are effective for the duration of this permit, unless revisions are requested by the permittee and approved in writing by the appropriate Ohio EPA District Office or local air agency. The permittee may request revisions to the ranges based upon information obtained during future tests that demonstrate compliance with the allowable VOC emission rate for this emissions unit. In addition, approved revisions to the ranges will not constitute a relaxation of the monitoring requirements of this permit and may be incorporated into this permit by means of administrative modification.

- (3) The permittee shall maintain records documenting any time periods when any of the emissions units was in operation and the baghouse was not operating.
- (4) The permittee shall perform weekly* checks when the emissions unit is in operation and when the weather conditions allow, for any visible particulate emissions from the baghouse and from the cyclone serving this emissions unit. The presence or absence of any visible emissions, excluding water vapor, shall be noted in an operations log. If visible emissions are observed, the permittee shall also note the following in the operations log:
 - a. the date and time of the visible emission observation;
 - b. the identification of the stack observed;
 - c. the color of the emissions;
 - d. the total duration of any visible emission observation; and
 - e. the corrective actions, if any, taken to eliminate the visible emissions.

*once during each normal calendar week



- (5) The permittee shall collect and record the following information on a monthly basis for the metal cleaner applied in this emissions unit:
 - a. the name and identification of each metal cleaner employed;
 - b. the VOC content of each metal cleaner, in pounds per gallon;
 - c. the number of gallons of each metal cleaner employed;
 - d. the total VOC emission rate from all metal cleaners, i.e., the summation of the products of d)(5)b. x d)(5)c. for all metal cleaners employed, in pounds; and
 - e. the pound per ton of VOC emissions from all metal cleaners employed [d)(5)d./d)(1)a].

e) Reporting Requirements

- (1) The permittee shall submit quarterly deviation (excursion) reports, which identify all exceedances of the following:

- a. the rolling, 12-month restriction on the quantity of sand processed.

These quarterly deviation reports shall be submitted in accordance with the Standard Terms and Conditions of this permit.

- (2) The permittee shall submit deviation (excursion) reports that identify the following:

- a. any time periods when the emissions unit was in operation and the baghouse(s) was not operating; and
- b. any exceedance of the 0.20 lb VOC/ton of sand emission limitation for the metal cleaner.

Each report shall be submitted within 30 days after the deviation occurs.

- (3) The permittee shall submit quarterly deviation (excursion) reports that identify the following information concerning the operation of the wet scrubber during the operation of the emissions unit(s):

- a. each period of time (start time and date, and end time and date) when the liquid flow rate or the liquid pH was outside of the appropriate range or limit specified by the manufacturer and outside of the acceptable range for each parameter following any required compliance demonstration;
- b. an identification of each incident of deviation described in (3)a. where a prompt investigation was not conducted;
- c. an identification of each incident of deviation described in (3)a. where prompt corrective action, that would bring the liquid flow rate or scrubber liquid pH into compliance with the acceptable range, was determined to be necessary and was not taken; and



- d. an identification of each incident of deviation described in (3)a. where proper records were not maintained for the investigation and/or the corrective action(s), as identified in the monitoring and record keeping requirements of this permit.

If no deviations/excursions occurred during a calendar quarter, the report shall so state that no deviations occurred during the reporting period.

The quarterly deviation reports shall be submitted in accordance with the reporting requirements of the Standard Terms and Conditions of this permit.

- (4) The permittee shall submit semiannual written reports that (a) identify all days during which any visible particulate emissions, excluding water vapor, were observed from the baghouse and from the cyclone serving this emissions unit and (b) describe the corrective actions, if any, taken to eliminate the visible particulate emissions. These reports shall be submitted to the Director (the Northwest District Office) by January 31 and July 31 of each year and shall cover the previous 6-month period.
- (5) The permittee shall submit annual reports to the appropriate Ohio EPA District Office or local air agency, documenting any changes made to a parameter or value used in the dispersion model, that was used to demonstrate compliance with ORC 3704.03(F) through the predicted 1-hour maximum ground-level concentration. If no changes to the emissions unit(s) or the exhaust stack have been made, then the report shall include a statement to this effect. This report shall be postmarked or delivered no later than January 31 following the end of each calendar year.

f) Testing Requirements

- (1) Compliance with the Emissions Limitations and/or Control Requirements specified in section b) of these terms and conditions shall be determined in accordance with the following methods:
 - a. The emissions testing shall be conducted over four (4) consecutive years, beginning no later than 180 days after achieving the maximum production rate at which Psand module 1 (emissions units P464, P465, P466, P467, P468, P469) or Psand module 2 (emissions units P524, P527, P530, P533, P538, P638) or Psand module 3 (emissions units P525, P528, P531, P534, P536, P539) or Psand module 4 (emissions units P526, P529, P532, P535, P537 P540), will be operated, whichever comes first. The permittee shall test a minimum of one module per year.
 - b. The emission testing shall be conducted to demonstrate compliance with the following emission limitations involving DMIPA as the catalyst:
 - i. 1.0 lb of VOC per ton of sand, for core making.
 - c. When the emission unit first utilizes SO₂ as the catalyst for purposes other than research and development, the permittee shall conduct testing within 60 days after the initial use of SO₂ to demonstrate compliance with the following emission limitations when utilizing SO₂ as the catalyst:



- i. 0.16 lb of SO₂ per ton of sand, for core making; and
 - ii. The control efficiency for SO₂.
- d. The following test methods shall be employed to demonstrate compliance with the above emission limitations:
- i. for total VOC, Methods 1-4 and 18, 25 or 25A (as applicable) of 40 CFR Part 60, Appendix A. Appropriate methods shall be used in conjunction with the test methods and procedures specified in Methods 18, 25, or 25A (as applicable) of 40 CFR Part 60, Appendix A for determining total VOC mass emissions.
 - ii. for SO₂, Methods 1-4 and 6 of 40 CFR Part 60, Appendix A. Appropriate methods shall be used in conjunction with the test methods and procedures specified in Methods 6 of 40 CFR Part 60, Appendix A for determining SO₂ mass emissions.
- Alternative U.S. EPA-approved test methods may be used with prior approval from the Ohio EPA, NWDO. The test method(s) which must be employed to demonstrate compliance with the control efficiencies are specified below.
- e. The test methods and procedures selected shall be based on a consideration of the diversity of the organic species present and their total concentration, and on a consideration of the potential presence of interfering gases."
 - f. The test(s) shall be conducted at a Maximum Source Operating Rate (MSOR), unless otherwise specified or approved by the appropriate Ohio EPA District Office or local air agency. MSOR is defined as the condition that is most likely to challenge the emission control measures with regards to meeting the applicable emission standard(s). Although it generally consists of operating the emissions unit at its maximum material input/production rates and results in the highest emission rate of the tested pollutant, there may be circumstances where a lower emissions loading is deemed the most challenging control scenario. Failure to test at the MSOR is justification for not accepting the test results as a demonstration of compliance.
 - g. During emission testing, the permittee shall also record the following information:
 - i. the pH range for the scrubbing liquid;
 - ii. the scrubber water flow rate, in gallons/minute; and
 - iii. the catalyst and resin used to make the cores.
 - h. Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA, NWDO. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of



the test(s), and the person(s) who will be conducting the test(s). Failure to submit such notification for review and approval prior to the test(s) may result in the Ohio EPA, NWDO's refusal to accept the results of the emission test(s).

Personnel from the Ohio EPA, NWDO shall be permitted to witness the test(s), examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment.

A comprehensive written report of the results of the emissions test(s) shall be signed by the person or persons responsible for the tests and submitted to the Ohio EPA, NWDO within 30 days following completion of the test(s). The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Ohio EPA, NWDO.

(2) Compliance with the emission limitations in b)(1) of these terms and conditions shall be determined in accordance with the following methods:

a. Emission Limitation:

The maximum annual amount of sand processed for P526, P529, P532, P535, P537 and P540, combined shall not exceed 114,696 tons per rolling, 12-month period.

Applicable Compliance Method:

Compliance shall be demonstrated by the record keeping requirements specified in d)(1).

b. Emission Limitations:

1.0 lb of VOC per ton of sand (core making)

Applicable Compliance Method:

Compliance shall be demonstrated based on the results of emission testing conducted in accordance with Methods 1-4 and 18, 25 or 25A (as applicable) of 40 CFR Part 60, Appendix A or as amended. Alternative or equivalent methods can be used with the approval of the director.

c. Emission Limitations:

0.22 lb of VOC per ton of sand (hopper and mixing)

Applicable Compliance Method:

The lb/ton emission limitation was established based on Ohio Cast Metals Association (OCMA) stack test data.



If required, compliance shall be demonstrated based on the results of emission testing conducted in accordance with Methods 1-4 and 18, 25 or 25A (as applicable) of 40 CFR Part 60, Appendix A or as amended. Alternative or equivalent methods can be used with the approval of the director.

d. Emission Limitation:

0.20 lb of VOC per ton of sand (metal cleaning)

Applicable Compliance Method:

The lb/ton emission limitation was established based on the use of five 55 gallon drums of metal cleaner per month with a VOC content of 8.1 lbs per gallon with 85% captured by the scrubber [scrubber does not provide control during metal cleaning] and the use of 114,696 tons per year of sand. Compliance shall be demonstrated based on the record keeping requirements specified in d)(5).

If required, compliance shall be demonstrated based on the results of emission testing conducted in accordance with Methods 1-4 and 18, 25 or 25A (as applicable) of 40 CFR Part 60, Appendix A or as amended. Alternative or equivalent methods can be used with the approval of the director.

e. Emission Limitations:

PM₁₀ emissions shall not exceed 0.0182 lb/ton of sand (hopper and mixing)

PM₁₀ emissions shall not exceed 0.028 lb/ton of sand (core making)

Applicable Compliance Method:

If required, compliance with the company-established emission factors shall be demonstrated based on the results of emission testing conducted in accordance with Methods 1-4 of 40 CFR Part 60, Appendix A and Methods 201/201A and 202 of 40 CFR Part 51, Appendix M or as amended. Alternative or equivalent methods can be used with the approval of the director.

f. Emission Limitation:

VOC emissions from emission units P526, P529, P532, P535, P537 and P540, combined shall not exceed 81.44 tpy, based on a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method:

The annual emission limitation was established by adding the VOC emissions from hopper and mixing, core making, and metal cleaning. VOC emission from hopper and mixing, core making, and metal cleaning were established by multiplying the respective VOC emission limitations of 0.22 lb/ton, 1.0 lb/ton, and 0.20 lb/ton by the annual sand throughput restriction of 114,696 tons per rolling, 12-month period and dividing by 2000 lbs/ton. Therefore provided compliance is



shown with the lb/ton emission limitations and the annual sand throughput, compliance with the annual limitation shall also be demonstrated.

g. Emission Limitation:

Fugitive VOC emissions shall not exceed 2.0 tpy, based on a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method:

The emission limitation was established by multiplying the company-supplied emission factors of 0.035 lb of VOC per ton of sand by the annual sand restriction of 114,696 tons and dividing by 2000 lbs/ton.

h. Emission Limitation:

PM₁₀ emissions P526, P529, P532, P535, P537 and P540, combined shall not exceed 2.67 tpy, based on a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method:

The annual emission limitation was established by adding the PM₁₀ emissions from hopper/mixing, and core making. PM₁₀ emissions from hopper/mixing, and core making were established by multiplying the respective PM₁₀ emission limitations of 0.0182 lb/ton and 0.028 lb/ton by the annual sand throughput restriction of 114,696 tons per rolling, 12-month period and dividing by 2000 lbs/ton. Therefore as long as compliance with the annual sand throughput restriction is demonstrated by the record keeping requirements specified in d)(1), compliance with the annual limitation shall also be demonstrated.

i. Emission Limitation:

SO₂ emissions shall not exceed 9.18 tpy, based on a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method:

The annual emission limitation was established by multiplying the lb/ton of sand emission limitation by the annual sand restriction of 114,696 tons and dividing by 2000 lbs/ton. Therefore provided compliance is shown with the lb/ton emission limitation and the annual sand throughput, compliance with the annual limitation shall be demonstrated.

j. Emission Limitation:

SO₂ shall not exceed 0.16 lb/ton of sand (core making)



Applicable Compliance Method:

Compliance shall be demonstrated based on the results of emission testing conducted in accordance with Methods 1-4 and 6 of 40 CFR Part 60, Appendix A or as amended. Alternative or equivalent methods can be used with the approval of the director.

k. Emission Limitation:

Visible PE from the stack(s) serving this emissions unit shall not exceed 10% opacity, as a six-minute average.

Applicable Compliance Method:

If required, compliance shall be determined according to test Method 9 as set forth in the "Appendix on Test Methods" in 40 CFR Part 60 "Standards of Performance for New Stationary Sources" or as amended. Alternative or equivalent methods can be used with the approval of the director.

g) Miscellaneous Requirements

(1) None.