

Air Pollution Control Requirements for Industrial Sand Mines^{1,2}

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What is an industrial sand mine?

An industrial sand mine is any mine, pit or quarry engaged in mining or dredging of industrial grade sand and facilities engaged in washing, screening and preparing industrial grade sand. Typical industrial grade sands are used as abrasives, for sand blasting, as enamels, as filtration media, for frac sand or in the foundry or glass manufacturing industries. Industrial sand does not include sand and gravel that will be used in construction. If your mine produces both industrial and construction sand, the site would still be considered an industrial sand mine.

NOTE: If you sell industrial grade sand that has been dug or dredged for other purposes such as creating or maintaining cranberry beds or other activities, your facility would still be considered an industrial sand mine. If you simply stockpile sand and use it on site for your own purposes, then your operations would not be considered industrial sand mining.

Does my sand mining operation need a permit?

Some industrial sand mining operations will need an air pollution control permit. Smaller operations may be exempt from air pollution permit requirements. **IMPORTANT NOTE:** Whether or not your operation needs an air permit, **all** sand mines must meet the requirements listed in the section on “What must I do to comply?”

Exemptions: CAUTION: Operations that include sand dryers are not exempt even if their production meets an exemption threshold. This includes sand dryers on site and, with some rare exceptions, usually includes mines transporting wet sand to a dryer in the area.

There are two ways a facility may be exempt from needing an air permit.

- **Specific exemption:** The first exemption is for very small mines that produce less than 2000 tons of sand per month averaged over any 12 consecutive month period. One way to estimate this is to assume a load of damp sand in a 15 yard dump truck is about 13 tons of sand.

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² Author: Kristin Hart. Document Date: June 8, 2012.

- **10-Ton exemption:** The second exemption is for mines that will not emit particulate matter and fugitive dust in excess of 10 tons per calendar year. Emissions at a mine depend on the amount of paved and unpaved roadways, how much sand is stored on site, and whether sand is screened, or if crushing occurs on site. As a rough estimate, wet sand operations averaging up to about 20,000 tons of sand per month can meet this exemption threshold. Operations over 20,000 tons per month may also be exempt, but some calculations need to be done to be certain.

To use either of these exemptions, you need to prepare and follow a fugitive dust plan, and keep records of monthly sand production in tons per month. Without records, these exemptions are not valid. More information, including forms and instructions for applying for exemptions, is available at <http://dnr.wi.gov/topic/AirPermits/Options.html>.

Permits and Waivers: Facilities that will exceed 10 tons of emissions over the course of a calendar year, or that will use a sand dryer on site or near the mining site, need to obtain an air pollution control permit **before** breaking ground **unless** a construction permit waiver is granted by the DNR. DNR has the ability to grant a waiver to allow construction to start before the air permit is issued, provided all other local, state and federal permits/approvals or reviews have been issued or conducted. The waiver can only be granted if a complete air permit application has been submitted and a fugitive dust control plan has been approved by DNR. However, no facility can **operate** without the air permit being issued if one is needed. More information on construction permit waivers is available at <http://dnr.wi.gov/topic/AirPermits/Options.html#tabx2>

There are two types of permits available to sand mining operations:

- **Type A Registration Permit** is available for mining operations without dryers that emit less than 25 tons of particulate matter per year. NOTE: This 25 tons per year emission cap does not include fugitive dust. The Registration Permit's advantages include a faster, simplified application, and the permit covers both construction and facility operation. Applications are submitted through an on-line system. DNR reviews and decides whether to grant the permit within 15 days of receiving a complete application. Complete applications must include:
 - a hard copy of the on-line application signed by the responsible official
 - a fugitive dust plan, and
 - a facility description that includes the expected annual sand production rate.

More information on Registration Permits is available at <http://dnr.wi.gov/topic/AirPermits/Options.html#tabx4>.

- **Source specific permits** must be obtained for mines that will have a dryer at the mine site or an associated dryer nearby. Individual permits are more complicated to prepare, undergo a more rigorous review, and involve a public notice and public comment period. A public hearing may also be held if one is requested. Depending on the complexity of the project, it can take from 3 to 6 months to receive a source specific air permit.

More information on obtaining air pollution permits is available at <http://dnr.wi.gov/topic/AirPermits/>.

What must I do to comply with all Wisconsin's air pollution regulations?

Whether or not your sand mine needs a permit, there are air pollution regulations that apply to your sand mine. You must keep records to document that you are meeting these requirements.

All industrial sand mines must meet at least some of the requirements for controlling particulate matter emissions in s. NR 415.075 of Wisconsin's regulation (available at https://docs.legis.wisconsin.gov/code/admin_code/nr/415/075). Here is a quick summary of the requirements (refer to the rule for more details):

- **Recordkeeping:** All industrial sand mining operations, no matter how small, must keep records of:
 - monthly hours of operation
 - monthly sand production in tons per month
 - records that demonstrate you are following your fugitive dust plan

- **Fugitive Dust Control Plan:** All sand mining operations must prepare and follow a fugitive dust plan to detect dust and prevent it from becoming airborne. Fugitive dust plans must be written and should be kept on-site to be available for review by a compliance inspector. For help preparing a fugitive dust plan, visit http://dnr.wi.gov/cias/guidance/guidanceexternal/guidanceitem.aspx?item_seq_no=2091.
- **Ambient Air Monitoring:** Mining operations with production averaging more than 2000 tons per month are required to install and operate ambient air monitors. Facilities can apply for a variance from this requirement if they can demonstrate that the general public will not be exposed to significant levels of particulate matter. Variance requests must be submitted to DNR in writing (see the contact information below for more information).

How can I figure out what I emit?

Estimating emissions from sand mining operations is not an exact science and can be done by a variety of methods. DNR will review any methods proposed by a facility as long as they are clearly explained and justified.

The attached table gives some information that is useful when calculating emissions.

Where can I get more information?

General questions on sand mining in Wisconsin: Tom Woletz - 715-839-3756, thomas.woletz@wisconsin.gov

Questions on air permits and exemptions: Kristin Hart - 608-273-5605, kristin.hart@wisconsin.gov

Variance requests and other compliance questions: Rick Wulk - 920-662-5181, richard.wulk@wisconsin.gov

Attachment Calculating Emissions from Industrial Sand Mining

One method for estimating emissions from various operations is to make use of emission factors. An emission factor basically estimates the amount of a pollutant released during certain operations (like sand crushing, or drying) and activities (for instance, hauling over unpaved roads). This table gives some emission factors that DNR has used for calculating emissions.

To use this table, multiply the emission factor by the tons of sand produced at the operation or the miles of roadway traveled per truck (VMT) to get the annual emissions of particulate matter and PM10.

Calculating Emissions of Particulate Matter from Sand Mining Operations			
Operation	Control Method	Emission Factor	Notes
Fugitive Emissions			
Truck traffic on unpaved roads	Fugitive Dust Plan	2.7 lb particulate matter/VMT	AP-42 section 13.2.2 assume 25 ton trucks
Truck traffic on paved roads	Fugitive Dust Plan	1.4 lb particulate matter/VMT	AP-42 section 13.2.1 assume 25 ton trucks
Drilling	natural moisture	0.00008 lb/ton sand produced	AP-42 section 11.19.2
Material Transfers/Storage Piles	fugitive dust plan	0.0.0065 lb/ton sand transferred	assumes natural moisture. Can't be used if sand is allowed to dry out.
Point Source Emissions (No dryers or dried sand processed)			
Crushing/delumping	natural moisture	0.000054 lb/ton crushed	AP-42 Section 11.19.2
*Screening of damp sand	natural moisture	0.0415 lb/ton screened per screen	assumes no other controls
*Handling from screening	natural moisture	0.0065 lb/tons screened	assumes no other controls
Washing/screening/handling of saturated materials	saturated materials	negligible	assumes screening and handling occurs immediately after washing
Emissions from sand Processed in a Dry Plant			
Sand Dryer	uncontrolled	2.0 lb/ton dried sand	AP-42 section 11.19.1
Sand Dryer	with wet scrubber	0.39 lb/ton dried sand	AP-42 section 11.19.1
Sand Dryer	with baghouse	0.10 lb/ton dried sand	AP-42 section 11.19.1
*Dry sand handling transfer storage	with wet scrubber	0.0013 lb/ton dried sand per transfer point	AP-42 section 11.19.1
*Dry sand screening	with venturi scrubber	0.0083 lb/ton dried sand per screen.	AP-42 section 11.19.1

*Emissions will be generated from screening each time sand is run through a screen. So if a ton of sand is run through first one mesh screen, then the remaining half ton is screened again through a finer mesh screen emissions must be calculated for each of those screens. Similarly, if the same ton of sand is handled more than once, the emissions are generated each time the sand is handled. Simply multiplying annual sand production by these numbers may be underestimating emissions. If in doubt, call the DNR.

VMT = Vehicle Miles Traveled

PM10 = Particulate matter less than 10 microns in diameter

AP-42 = USEPA document of emission factors available at <http://www.epa.gov/ttnchie1/ap42/>