

The Environmental Impact of Asphalt Plants



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Hundreds of communities across the country coexist peacefully with asphalt plants. These facilities are in urban, suburban, and rural areas, and most of them are known as good neighbors who are engaged with their community and dedicated to sustainable operations.

However, there is a lot of misleading and often daunting information about asphalt plants and asphalt products. Therefore, it's important to understand what's fact, what's fiction, and what the differences are between different types of asphalt products.

As with any industrial facility, it's helpful to understand what happens behind the gates at an asphalt plant. This paper provides basic information about what happens at an asphalt plant including how it impacts your neighborhood, the community, and the environment.

Well Regulated by the U.S. EPA

Asphalt plants, or more accurately asphalt pavement mixing facilities, are industrial operations that mix liquid asphalt binder (also called asphalt cement) with crushed rock, gravel, and sand (collectively called aggregates) to make pavement. Asphalt binder, the glue that binds the aggregates together, is one of many distilled products obtained from the oil refining process. Similar to other refined oils, such as lubricating oils, asphalt binder is processed to meet defined standards. Some mixes also require additives, which can

range from chemicals that improve mix performance to natural fibers that strength specialty mixes. The use and storage of these materials is carefully monitored and regulated.

Asphalt pavement mixing facilities are well-regulated by federal and state environmental agencies, and they employ multiple emission control systems. The small amount of emissions released from these control systems are closely monitored to ensure they stay well below any permitted level set by the U.S. Environmental Protection Agency (EPA) and other regulators to ensure that they pose no health or environmental risk to nearby communities.

In fact, over a decade ago, the EPA reviewed emissions from asphalt plants and determined that such facilities are not a major source of air pollution and were subsequently delisted by the agency.¹ Subsequent studies by various regulatory agencies have verified that emissions from asphalt pavement mixing facilities do not present an environmental or public health hazard.

Emissions — Very Low and Getting Lower

The majority of emissions at asphalt mixing facilities come from the combustion of fuel, such as natural gas, that are used to dry and heat the rock or aggregate and to keep the temperature of the asphalt hot. Most of the other potential emissions, such as the dust gener-





ated during the drying of aggregate, are captured by baghouse filters or similar controls and never released to the environment.

At times, there may be noticeable emissions coming from an asphalt plant's stack, but in almost all circumstances this is just steam — the loss of water vapor from the drying of aggregate at high temperatures.

Sometimes odors from the heated materials may also emanate from an asphalt plant. Although they may be noticeable, these odors pose no danger to either plant personnel or to the communities in which a plant operates. A noticeable odor does not indicate a health hazard; there are many instances of natural and man-made odors that are noticeable, but not harmful — skunks, dairy farms, garlic, and marshlands to name but a few. Asphalt plant odors are not harmful.

A 2001 study² compared emissions from an asphalt plant to emissions from other common community and industrial sources. The study found that the low annual emissions from an asphalt plant are equivalent or well below many other common sources:

- Similar volatile organic compound (VOC) emissions from one bakery operating for about two weeks or from 13 residential fireplaces over the course of a year
- Less than six months' worth of toluene emissions from an automotive gasoline filling station

Since 1970, the asphalt pavement industry has documented a decrease in total stack emissions of 97%, while increasing pavement production by 250%.

In an effort to further reduce an asphalt plant's environmental footprint, a number of technological advances have been pursued and implemented by the asphalt pavement industry over the past 10 years. These advances have helped reduce the amount of energy needed to make asphalt pavements and have expanded the use of recycled materials in asphalt pavements,

resulting in dramatic and well-documented reductions in the carbon footprint of asphalt pavements.

The fact is, asphalt pavements have a very small carbon footprint compared to other pavement materials.³ In addition, the U.S. Department of Energy recognizes asphalt as a top material for sequestering carbon.⁴

Not All Asphalt Is the Same

When examining regulations and health information regarding asphalt, it is important to note that the word *asphalt* (or its European name *bitumen*) is used for multiple products that are produced and used in different ways. Asphalt pavement material (sometimes called asphalt concrete) is not the same thing as roofing asphalt, and it is unrelated to coal tar.

Each of these materials has different components, properties, and is used at different temperatures, which results in very different potentials for emissions. The asphalt pavement industry has spent decades advancing technology that reduces the temperature needed to produce asphalt pavement, thereby minimizing and eliminating those emissions.

100% Recyclable and Inert

Asphalt pavement is the most recycled material in the U.S. Not only recyclable, it can be reused over and over again in new asphalt pavement mixes. Recycled or reclaimed asphalt pavement (RAP) contains old asphalt binder and aggregates that can replace virgin material requirements. The old asphalt binder is reactivated, replacing part of the binder required in a new mix, just as the old aggregate becomes part of the aggregate content of the new pavement. About 80 million tons of asphalt pavement is reclaimed each year, and over 99% of that total is reused or recycled.

Asphalt is also inert. No materials are leached from the pavement itself (because it is waterproof). In fact, a number of drinking water reservoirs and fish hatcher-

ies are lined with asphalt.⁵ Although vehicle emissions like grease and oil may be deposited on roadways over time, emissions and leachate from RAP stockpiles have been found to be practically nonexistent. The EPA recognizes that RAP piles are unlikely to cause fugitive dust problems⁶ and can actually be used to reduce dust from unpaved roads. Numerous studies have documented that leachate or runoff from RAP storage is not a problem,^{5,7} and RAP is commonly used as clean fill material in highway construction.

In addition to reclaimed asphalt pavements, materials from other industries are routinely recycled into asphalt pavements, including rubber from used tires, glass, asphalt roofing shingles, and blast furnace slag. Recycling of asphalt pavement and asphalt roofing shingles conserves more than 21 million barrels of liquid asphalt binder annually.

Busy Places and Controlled Traffic

Although asphalt plants don't take up a large amount of real estate, they do contain a lot of equipment and are busy places to work. From the street, visible equipment may include large silos used to store the finished pavement material, big pieces of environmental-control equipment to filter out stack emissions, and many stockpiles of raw materials, including sand, rocks, reclaimed asphalt pavement, and other recycled materials.

Asphalt plants also contain tanks that store both fuel and liquid asphalt. The EPA and other environmental agencies closely regulate these tanks to ensure that they don't rupture, and there are adequate protection systems and safeguards in place to prevent any discharge in the unlikely event of a leak.

Other pieces of large equipment include the aggregate dryer drum, which is used to warm and remove moisture from the aggregate before the materials are

all mixed together in a large mill. The final finished pavement material is then stored in on-site silos for short periods of time before it is loaded into trucks to be taken out to a job site.

Truck traffic to and from a plant can be heavy, particularly during the summer months when road repair and construction are greatest. To ensure that the asphalt mix reaches the paving site at the proper temperature to ensure quality, plants and paving companies aim to manage truck traffic carefully to minimize delays at the plant or the paving site. Proximity to roadway work sites also plays a role in deciding where a new or temporary plant should be placed.

Asphalt Plants Benefit the Community

Asphalt plants are good neighbors, who are active in their community. They offer opportunities for local employment, and often contribute to community events with volunteers and financial donations. Many asphalt plants are family-owned and -operated and have been an important part of their community for decades.

Essential to Our Nation's Infrastructure

Asphalt pavements have been produced since the late 1800s — in fact, naturally occurring asphalt has been used for thousands of years as a waterproofing agent. Asphalt plants are an important link in the nation's transportation infrastructure.

Today, more than 94% of the nation's 2 million miles of paved streets and highways are surfaced with asphalt. That's because state and federal highway departments have long known that asphalt pavements are smooth, cost-effective to construct and maintain, exceptionally durable, environmentally friendly, and 100% recyclable.

In addition, asphalt pavements can provide solutions for multiple forms of transportation, including walking trails, cycle tracks, bus rapid transit lanes, and airport runways. And specialty pavement mixes, such as porous asphalt, are an important option for stormwater management.

References

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