

DWGB-26-8

2020

## Water Efficiency: Quarries and Sand and Gravel Operations

Washing and sorting aggregates is a water-intensive process. Considerable water is lost to evaporation and incorporation into the product. Employing water efficiency practices reduces water loss and saves money, protecting surface and groundwater supplies. This fact sheet addresses mechanisms and procedures to minimize water use.

### General Water Efficiency Practices

- Perform a water audit to determine where and how you use water at your facility. The NHDES fact sheet DWGB-26-16 “Water Efficiency: Business or Industry Water Use and Conservation Audit” provides information about performing water audits.
- Incorporate dry sorting techniques into your process, such as vibrating or conveyor sorting systems. These methods shake aggregates through different size screens to sort them.
- Use high-pressure, low-volume spray nozzles, flow restrictors on valves where high volume is not necessary, and automatic shut-off valves on equipment to optimize water use efficiency.
- Consider implementing reuse and recycling systems for aggregate washing.
- Develop a maintenance program. Routinely inspect all plumbing and fixtures, equipment, water lines, spray systems, valves, and pumps for leaks, clogging, worn-out parts, and faulty operation. Keep replacement and repair parts on hand. Metering at strategic points in the facility helps detect leaks and maintain minimum flow rates.
- Wash only the products that are required to be clean.
- Replace or retrofit indoor plumbing fixtures with low-flow water devices and models.
- Educate employees on water conservation techniques and post conservation notices at points of use.

### Water Recycling Systems

Recycling aggregate wash water can save large quantities of water. Most aggregate pits in New Hampshire that use wash methods to sort and clean their products use settling ponds or tanks. The following water efficiency practices refer specifically to onsite water use recycling related to settling ponds and tanks:

- Dredge earthen settling ponds regularly. A deeper, narrower pond will lose less water to evaporation.
- Remove settling tank sludge routinely.
- Add polymers to settling tank systems to aid flocculation and speed settling. Decreasing the time water is held in settling tanks reduces water losses due to evaporation.
- Consider adding centrifugal-flow equipment for removal of fines. This reduces time water is held in

settling ponds and lowers losses due to evaporation.

- Adjust centrifugal fines-removal equipment to maximize removal based on water flow and particle size distribution.
- Regularly inspect earthen water containment structures for leaks and degradation and repair failing structures.
- Filter beds can be installed that consist of a network of distribution and subsurface collection pipes capable of removing particulates based on size. Be aware that the area required for such systems is extensive for large flows, and effluent water quality can vary. The system can plug and requires removal of surface clays and silts.

### **Dust Control**

Dust control can be a problem for sand and gravel pit owners. Dust suppression is required by regulation but involves time, labor and large amounts of water. The following water efficiency practices are designed to minimize the amount of water used for dust control:

- Minimize areas designated for traffic. Consider using road surfacing materials, such as recycled asphalt and crushed stone, to reduce the need for dust control.
- Limit road and parking area water applications to a minimum based on need for dust suppression. Monitor road surface conditions regularly.
- Reduce exposed areas by seeding feasible areas with hardy, drought-tolerant grasses.
- Apply digested or composted municipal wastewater treatment plant sludge to increase the land fertility for seeding. Be sure to obtain required federal and state permits as required for land application.
- Incorporate water-retentive polymers or wetting agents such as those used on golf courses and in agriculture into roadway substrate to help reduce evaporation from the sandy soils found at pits.

### **Stone Cutting**

Traditionally, water has been used to dissipate the heat produced by the process of cutting stone and for dust suppression. It is still the most economical method. The following water efficiency practices pertain to stone cutting:

- Recycle water for pressurizing ledge stone cutters.
- Focus dust control sprays close to the production source to increase efficiency and limit flow rates in cutting and processing operations. This reduces water loss due to over spray, evaporation, and wind.

### **For More Information**

Please contact the Drinking Water and Groundwater Bureau at (603) 271-2513 or [dwgbinfo@des.nh.gov](mailto:dwgbinfo@des.nh.gov) or visit our website at [www.des.nh.gov](http://www.des.nh.gov).

### **References**

New England Interstate Water Pollution Control Commission; *MRI Water Conservation Technical Bulletin #11, Water Conservation Best Management Practices for Quarries and Sand and Gravel Operations*; New England Interstate Water Pollution Control Commission; Lowell, MA; 1996.

Note: This fact sheet is accurate as of July 2019. Statutory or regulatory changes or the availability of additional information after this date may render this information inaccurate or incomplete.