

## 4.2-a ABRASIVE AND DEICER MANAGEMENT

Alternative Names: Road Sand, Road Salt, Traction Abrasive, Brining

### DESCRIPTION

Road abrasives and deicers are applied on Lake Tahoe Region roads and parking lots to improve traffic safety during the winter. These practices can have negative impacts on water quality and other resources such as vegetation, soils, and air quality. This BMP provides guidelines for managing road abrasive and deicer applications primarily with the use of best available technology (BAT). The intent of the guidelines is to improve water quality through increased efficiency of operations without diminishing traffic safety. The guidelines do not set numerical targets for the mass of road abrasives that should be applied, as specific operational practices necessary to ensure traffic safety are the responsibility of each jurisdiction maintaining roads within the Lake Tahoe Region.

### APPLICABILITY

All Lake Tahoe Region roads and parking lots where road abrasives and deicers are applied to provide safer driving conditions.

### Advantages

- Can reduce the discharge of road abrasives and deicers to receiving waters or other sensitive areas (e.g., SEZs).
- Can reduce maintenance requirements for downstream stormwater treatment and infiltration BMPs.
- May cost effectively reduce pollutant loading, including fine sediment particles, from roads and parking lots.

### Disadvantages

- There may be increased costs associated with procurement of new equipment, training, and support services.

### DESIGN AND OPERATION CONSIDERATIONS

- Keep accurate records of all road abrasive and deicer applications, including location, date/time, and application rate.
- Material storage facilities should be designed to protect surface and groundwater quality:
  - Store road abrasives and deicing materials on paved surfaces, protected from precipitation and runoff by covered three-sided bins or other structures. Face openings away from prevailing winds.
  - Thoroughly sweep the loading pad after loading.

#### BMP DESIGN APPROACH

Pollutant Source Control

Hydrologic Source Control

Stormwater Treatment

#### SCALE OF APPLICATION

All SFR and MFR < 1 acre

MFR 1-5 Acre and CICU < 5 acres

MFR and CICU > 5 acres and all WQIPs

#### BMP TYPE

Temporary

Permanent

- Obtain and use a road abrasive source that minimizes the potential for fine sediment particle generation. At a minimum, specifications for an abrasive source should meet the following general water quality standards:
  - Contain no fine sediment particles (defined as particles 16 microns or less in diameter).
  - Resist pulverization into fine sediment particles.
  - Contain minimal to no phosphorus and nitrogen.
- Use BAT bulk spreading equipment for road abrasive and deicer applications that meet the following general standards:
  - Abrasives within the hopper should not rest on the conveyer belt. Abrasives should be supplied to the conveyor belt using an agitator and delivery roller, which allows for a more consistent application rate.
  - Operators should have the ability to adjust the quantity, width, and symmetry of abrasive applications.
  - Equipment should provide the ability for pre-wetting of abrasives occurring at the spreader disc, which helps abrasives stick to the road surface.
  - Equipment should provide automated width and rate compensation to ensure constant spreading rates.
  - The bulk spreading system should be controlled by a computer and include data logging features that record the mass of abrasives applied per event and per winter season.
- Use BAT weather and temperature monitoring to inform the timing and intensity of road abrasive and deicer applications.
  - Subscribe to a weather forecasting service that specializes in forecasts for the Sierra Nevada region, or develop meteorological expertise in-house. Base decisions and tailor road abrasive and deicer applications to the type of storm and the timing of snowfall or rainfall.
  - Develop a network of gages or an equivalent system that monitors the temperature of pavement where abrasives are typically applied. Base decisions and tailor road abrasive and deicer applications to changes in the temperature of pavement in coordination with the timing of forecasted snowfall.



*Abrasives and deicers should be stored on a paved surface and covered on the top and three sides to protect the material from precipitation and wind.*

## INSPECTION AND MAINTENANCE

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- Jurisdictions responsible for maintaining roads within the Lake Tahoe Region shall follow TRPA requirements for Maintenance Efficiency Reporting.
- For large properties that use abrasives and deicers (but are not required to submit a Maintenance Efficiency Report to TRPA), internally track the rate and amount of material applied per season. Use this information to increase efficiency of operations over time.

## EFFECTIVENESS CONSIDERATIONS

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The Lake Tahoe Total Maximum Daily Load (TMDL) identified stormwater runoff from developed portions of the Lake Tahoe Region as the primary contributor of fine sediment particle (FSP) loading impacting lake clarity. Among urban land uses generating stormwater runoff, the Lake Tahoe TMDL identified roads as the primary source of pollutant loading to Lake Tahoe<sup>1</sup>. While monitoring studies are lacking that definitely link changes in winter road operations to improvements in water quality in the Lake Tahoe Region, the premise of the guidelines provided for this BMP are as follows: 1) pollutant loading from Lake Tahoe Region roads has been identified as a primary cause of lake clarity decline; 2) winter road operations influence the magnitude of pollutant loading; 3) operational improvements that can reduce road abrasives applications without diminishing traffic safety will reduce pollutant loading to Lake Tahoe.

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<sup>1</sup> Roberts, David M. and Reuter, John E., September 2007, *Lake Tahoe Total Maximum Daily Load Technical Report*

