

Implementation Report

Testing and Evaluation of Recovered Traction Sanding Material

<http://www.mdt.mt.gov/research/projects/env/recycling.shtml>

Introduction and Purpose

Large amounts of abrasive traction sanding material (traction sand) are applied to roadways in northern climates every winter season to increase tire-road friction and improve traction control. In the spring, the deployed traction sand is collected along the roadway as part of highway maintenance operations, which include: sweeping and vacuuming roadway surfaces, shoveling accumulated material from between guardrail posts, and cleaning and collecting material from road shoulders and borrow ditches. While removing accumulations of material helps to alleviate problems alongside

highways, such as sedimentation in streams and clogging of culverts, it can create storage and disposal problems unless cost-effective alternatives are identified and implemented.

The recovery and reuse of this material represents a potentially desirable option to reduce the quantity of landfilled materials and to conserve natural resources. However, it was unknown if traction sand could cost-effectively be collected and reused. The practical suitability and cost effectiveness of a statewide program for recycling and reusing traction sand on Montana roadways was evaluated in this study sponsored by MDT and conducted at Montana State University (MSU).

The recommendations

made by the researcher in the final report are listed in this document, along with the actions that will be taken based on these recommendations.

Implementation Summary

- MDT will continue to collect traction sand during spring clean up activities. However, based on this research, MDT will begin stockpiling this material, keeping the borrow ditch material separate from the rest of the material collected.
- MDT will randomly sample collected material, conduct contaminant testing and sieve analyses, and will process the collected material as indicated by this testing.

Implementation Recommendations

The most practical and economical recycling option involves the collection and reuse as traction sand material. However, traction sand reuse procedures will need to be specially catered to mesh with routine procedures and practices already in place, and currently used for spring cleaning and maintenance. Initially, the procedures should use to the maximum extent possible



Accumulated sanding material along I 90 near Lookout Pass

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equipment that is currently available at the local district maintenance shops. It is anticipated that over time, procedures and equipment will be modified to improve the efficiency of the process and the consistency of the results.

Gradation data from samples collected in this study indicate the material cleaned from ditches contains random and sometimes excessive amounts of rock, oversized material, debris, etc. and would incur substantially greater processing to develop a material that is suitable for reuse.

However, for materials collected from other locations, gradation data yield particle size distributions on the finer border of the specified gradation range for traction sand. This indicates that over time, as the sand is reused and recollected over multiple seasons, the gradation will continue to drift into the finer range and, consequently, the amount of necessary processing is expected to increase over time. This additional processing will involve either screening and removing undersize material or blending in additional course material. It is anticipated the most cost efficient option would involve the blending of salvaged sand with newly imported virgin traction sand.

With a few exceptions, chemical lab tests conducted in the study showed samples of sanding materials collected from the roadside have chemical and metal concentrations generally characteristic of naturally occurring background soil levels at the sites.

Recommendation 1: As soon as practical, collect previously deployed traction sand material from the roadway, shoulders, borrow ditches, and between guardrails. Due to a higher contamination of the borrow ditch material, to the extent possible and practical, keep this material separate from that collected from the shoulders, between the guardrails, and from roadway surface sweepings.

It is anticipated collection of traction sand will be accomplished by loading the material into trucks and hauling to a nearby designated stockpile location convenient in terms of both spring maintenance activities and winter snow fighting purposes. The designated location should be selected such that it has sufficient size and convenience for the minor processing necessary to remove debris and oversized material. Ideally, this location also will have sufficient area to store the stockpile until the next winter season.

Technical Panel Response: MDT will continue to collect traction sand during spring clean up activities. However, based on this research, MDT will begin stockpiling this material, keeping the borrow ditch material separate from the rest of the material collected.

Recommendation 2: Because there will be some variability in the recovered material, both spatially and temporally, collect random samples of salvaged sand and conduct testing for contaminants and sieve analyses to establish the amount of processing necessary prior to recycling

these materials. Compare the test results to those obtained from testing and analysis of virgin material and process the material as indicated.

Technical Panel Response: MDT will randomly sample collected material, conduct contaminant testing and sieve analyses, and will process the collected material as indicated by this testing. The results will be compared to the virgin material.

Recommendation 3: Based on the measured particle size gradations, collected material is screened and washed to remove excessive fines. If necessary, the collected material may be blended with virgin material.

The amount of necessary processing is expected to increase over time. This additional processing will involve either screening and removing (discarding) undersize and/or oversized material, as well as, other debris. It is anticipated, that the most cost efficient option would involve the blending of salvaged sand with newly imported virgin traction sand.

Technical Panel Response: MDT recognizes the potential benefit of this proposed work and when enough material is collected will hire a contractor to screen and blend material. It is expected that Lookout Pass will hire a contractor for this process every three years, while Bozeman Pass may contract every year.

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