LAKE MANITOBA LAKE ST. MARTIN

OUTLET CHANNELS PROJECT

MANITOBA TRANSPORTATION AND INFRASTRUCTURE

Dust Control Plan

June 30, 2022



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DISCLAIMER

This document was developed to support the Environmental Management Program (EMP) for the Lake Manitoba and Lake St. Martin Outlet Channels Project (the Project). It has been prepared by Manitoba Transportation and Infrastructure as a way to share information and facilitate discussions with Indigenous rights-holders, stakeholders and the public. It has been prepared using existing environmental and engineering information and professional judgement, as well as information from previous and ongoing public and Indigenous engagement and consultation. The contents of this document are based on conditions and information existing at the time the document was prepared and do not take into account any subsequent changes. The information, data, recommendations, and conclusions in this report are subject to change as the information has been presented as draft. This draft plan should be read as a whole, in consideration of the entire EMP, and sections or parts should not be read out of context.

Revisions to draft plans have been informed by and will be based on information received from the engagement and consultation process, the Environmental Assessment process, Project planning activities, and on conditions of provincial and federal environmental regulatory approvals received for the Project. As these will be living documents, any changes to the plans that occur after Project approvals are received will be shared with regulators, Indigenous rights-holders and stakeholders prior to implementation of the change. Either a revision number or subsequent amendment would be added to the specific environmental management plan to communicate the revision or change.

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PREFACE

The Lake Manitoba and Lake St. Martin Permanent Outlet Channels Project (the Project) is proposed as a permanent flood control mitigation for Lake Manitoba and Lake St. Martin to alleviate flooding in the Lake St. Martin region of Manitoba. It will involve the construction and operation of two new diversion channels: the Lake Manitoba Outlet Channel (LMOC) will connect Lake Manitoba to Lake St. Martin and the Lake St. Martin Outlet Channel (LSMOC) will connect Lake St. Martin to Lake Winnipeg. Associated with these outlet channels are the development of bridges, control structures with power connections, a new realignment of Provincial Road (PR) 239, and other ancillary infrastructure.

Manitoba Transportation and Infrastructure is the proponent for the proposed Project. After receipt of the required regulatory approvals, Manitoba Transportation and Infrastructure will develop, manage and operate the Project. This Dust Control Plan is one component of the overall Environmental Management Program (EMP) framework, which describes the environmental management processes that will be followed during the construction and operation phases of the Project. The intent of the EMP is to facilitate the timely and effective implementation of the environmental protection measures committed to in the Environmental Impact Statement (EIS), the requirements and conditions of the provincial licence issued under *The Environment Act*, the federal Decision Statement issued under the *Canadian Environmental Act 2012*, and other approvals received for the Project. This includes the verification that environmental commitments are implemented, monitored, evaluated for effectiveness, and adjustments made if/as required. It includes a commitment that information is reported back in a timely manner for adjustment, if required.

A key component for the success of the EMP is environmental monitoring, such that environmental management measures are inspected and modified for compliance with environmental and regulatory requirements, including those set out in provincial and federal approvals received for the Project. As indicated, monitoring results will be reviewed and used to verify predicted environmental assessment conclusions and effectiveness of mitigation measures. If unanticipated effects occur, or if mitigation measures are inadequate, adaptive management measures and subsequent monitoring will be applied as described further in individual environmental management and monitoring plans.

Monitoring results and application of adaptive management measures will inform follow-up reporting to regulators and any required revisions to environmental management plans. Manitoba Transportation and Infrastructure has initiated discussions with rights-holders and the Rural Municipality (RM) of Grahamdale in the Project area on the establishment of an Environmental Advisory Committee (EAC). The EAC would be a platform for sharing monitoring results and discussing issues of concern. In addition, Manitoba Transportation and Infrastructure anticipates that the EAC will coordinate Indigenous Environmental Monitors and communications during the construction period and will be working with rights-holders and stakeholders on its structure and purpose.

Manitoba Transportation and Infrastructure remains committed to consultation and ongoing engagement with Indigenous rights-holders and stakeholders that are potentially impacted by the Project. Detailed EMP review discussions were incorporated into Indigenous group-specific consultation work plans. Engagement opportunities included virtual open house events, sharing draft environmental management and monitoring plans, sharing plan-specific questionnaires, and meetings to discuss related questions and recommendations.

The intent has been to offer multiple avenues to share information about the Project so that rights-holders and stakeholders would be informed and could provide meaningful input into Project planning. The original draft EMP plans and questionnaires that were posted on the Project website for public review and comment are being replaced by the second draft of each plan as it becomes available. Feedback and recommendations received were used to update the current version of the draft plans, which are posted to the Project website at: https://www.gov.mb.ca/mit/wms/lmblsmoutlets/environmental/index.html.

Figure A displays a summary of the EMP process. The EMP provides the overarching framework for the Project Construction Environmental Management Program (CEMP) and the Operation Environmental Management Program (OEMP). These will be updated prior to Project construction and operation, respectively, and will consider applicable conditions of *The Environmental Act* provincial licence, *The Canadian Environmental Assessment Act 2012* federal Decision Statement conditions and other approvals, any other pertinent findings through the design and regulatory review processes, and key relevant outcomes of the ongoing Indigenous consultation and public engagement processes. Until such time, these plans will remain in draft form.

The purpose of the CEMP and OEMP is to guide how environmental issues will be addressed during construction and operation, respectively, and how adverse effects of activities will be mitigated. The CEMP is supported by several specific or targeted management plans that will guide Manitoba Transportation and Infrastructure's development of the Project's contract documents and subsequently, the Contractor(s) activities, in an environmentally responsible manner and to meet regulatory compliance in constructing the Project. The OEMP will include some of the same targeted plans developed to manage issues during construction, but prior to construction completion, they would be revised and adapted to suit the specific needs during the operation phase.

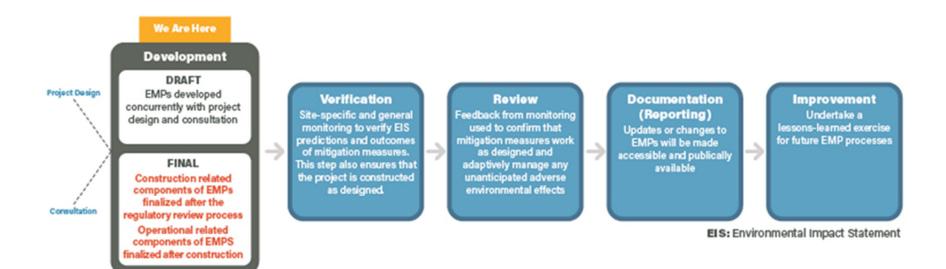


Figure A: EMP Process

LIST OF ACRONYMS AND GLOSSARY OF TERMS

Acronyms

μg/m³ micrograms per metre cubed

CAAQS Canadian Ambient Air Quality Standards

CaCl₂ Calcium Chloride

CEMP Construction Environmental Management Program

CRP Complaint Resolution Process

EIS Environmental Impact Statement

EMP Environmental Management Program

L litres

LSMOC Lake Manitoba Outlet Channel
LSMOC Lake St. Martin Outlet Channel

m metre

MAAQC Manitoba Ambient Air Quality Criteria

MgCl₂ Magnesium Chloride

OEMP Operation Environmental Management Program

PDA Project development area

PER Project Environmental Requirements

PM_{2.5} particulate matter 2.5 micrometers or less in diameter

PR Provincial Road

the Project The Lake Manitoba and Lake St. Martin Permanent Outlet Channels Project

RM Rural Municipality

TSP total suspended particulate

Glossary of Terms

Calcium chloride: Is an inorganic compound, a white coloured crystalline salt with the chemical formula CaCl₂ that is a solid at room temperature, highly soluble in water and used as a dust suppressant.

Contract Administrator: refers to the individuals, entities or groups delegated by Manitoba Transportation and Infrastructure to provide professional Engineering and Consulting Services for the Permanent Outlet Channels Project. This includes oversight of construction and maintenance contracts and operations; review of contractor submittals, plans and proposals for compliance with Project commitments and restrictions and making recommendation for acceptance or rejection of such plans by the Owner; and monitoring, inspecting, documenting and enforcing compliance with contractual and regulatory requirements.

Contractor: refers to the individuals, entities or groups contracted by Manitoba Transportation and Infrastructure to undertake specific Project construction, operation or maintenance activities, and includes all subcontractors and affiliates.

Environmental Monitor: refers to the individuals, groups or designated representatives engaged by Manitoba Transportation and Infrastructure to monitor, inspect, and document compliance with contractual and regulatory requirements associated with the construction activities and associated works for the Project. The monitor may also be an active member (or representative) of the Project's Environmental Advisory Committee.

Inspector: refers to the individuals or designated representatives delegated by Manitoba Transportation and Infrastructure to monitor, inspect, document, and enforce compliance with contractual and regulatory requirements associated with the construction and/or maintenance activities and associated works for the Project.

Magnesium chloride: Is an inorganic compound, a white coloured crystalline salt with the chemical formula MgCl₂ that is a solid at room temperature, highly soluble in water and used as a dust suppressant.

The Owner: refers to Manitoba Transportation and Infrastructure or a designated representative delegated by Manitoba Transportation and Infrastructure with overall responsibility for, and oversight of, Project design, construction and operation.

Runoff: Surface water that flows overland and into streams, wetlands or waterbodies, or into drainage systems.

Rights-holders: include First Nations, Metis Communities and other Indigenous communities who hold Aboriginal or Treaty rights that are protected under Section 35 of *The Constitution Act* 1982. Commonly, these include hunting, trapping, fishing or gathering rights.

Specific gravity: Is the ratio of the density of a substance to the density of a given reference material. Specific gravity for solids and liquids is nearly always measured with respect to water at its densest; for gases, the reference is air at room temperature.

Suppressant (dust): A substance which acts to suppress or restrain something (dust).

1.0 INTRODUCTION

1.1 Objective

Manitoba Transportation and Infrastructure has developed a series of environmental management plans and monitoring plans as part of the Environmental Management Program (EMP) for the Lake Manitoba and Lake St. Martin Outlet Channels Project (the Project). These plans are developed to provide mitigation measures and Best Management Practices to be applied during Project planning, construction, and operation and maintenance activities to reduce or avoid potential adverse effects. The plans outline monitoring activities that will be undertaken to document environmental conditions, guide mitigation and adaptive management measures, and undertake Project activities such that they are carried out in compliance with applicable environmental legislation and licensing requirements and have considered and incorporated input received from Indigenous communities and other Project stakeholders.

The requirements for dust suppression are discussed in Section 2.7 of the Project Environmental Requirements (PERs). The Dust Control Plan, which is a component of the overall Project EMP, addresses visual and instrumentation monitoring for dust and the dust suppressant requirements for the Project construction and operation activities to adhere to Manitoba Transportation and Infrastructure's dust control specifications. The plan describes monitoring, the products to use, and the methods of their application to minimize and mitigate effects from increased dust levels, in particular when in proximity to residences. Mitigation measures will be revised as required to meet specific site conditions. Potential activities that could generate dust were discussed in the Environmental Impact Statement and include areas of excavation and material stockpiles, construction of Provincial Road (PR) 239, and transportation of materials along gravel access roads. Once constructed PR 239 will be paved and will no longer be a material source of dust.

1.2 Applicable Legislation and Reference Documents

Federal and provincial legislation and applicable reference documents will be followed by Contractors while controlling dust. All relevant plans, such as the PERs and management plans, will be among the information that is referenced in the tender document(s) to be provided to prospective Contractor(s). Key reference documents are as follows:

- PERs Section 2.7 Dust Suppression.
- Manitoba Infrastructure. February 2019. Specifications for the Approval, Supply and Application of Dust Control. Specification No. 1280
- Manitoba Infrastructure. June 2000. Specification for Dust Control. Specification No.220ASTM D 98 –
 Standard Specification for Calcium Chloride
- ASTM D 1293 Standard Test Methods for pH of Water
- ASTM D 1429 Standard Test Methods for Specific Gravity of Water and Brine
- ASTM E 449 Standard Test Methods for Analysis of Calcium Chloride
- Pulp and Paper Association of Canada Standard H1 Determination of Solids Content of Pulp and Paper
 Mill Effluents

- Standard Methods for the Examination of Water and Wastewater, 3120 Metals by Plasma Emission Spectroscopy
- Manitoba Environment, Climate and Parks Manitoba Ambient Air Quality Criteria (MAAQC)
- Canadian Ambient Air Quality Standards (CAAQS)

1.3 Scope

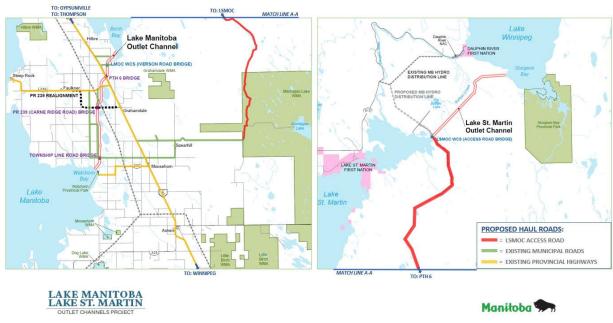
This plan covers the requirements and application of dust suppressants and other mitigation measures used for dust control and stabilization. The Dust Control Plan also includes measures for monitoring of dust and air quality.

1.4 Monitoring and Follow-up

1.4.1 Construction

In accordance with standard construction practices, visual inspections for dust or potential for dust generation and ambient air quality monitoring will be conducted to determine where and when dust control needs to be applied to avoid or minimize dust generation. Areas or activities identified as potential sources of dust generation will be watered, as required to prevent generation of dust when there is a potential human receptor. The on-site personnel, which may include the Contractor, Contract Administrator, Manitoba Transportation and Infrastructure Construction Inspector or designated alternate, will be responsible for the visual and ambient air quality monitoring of dust conditions on PR 239, designated haul or access roads (Figure 1), and all areas where construction activities will take place in proximity to human receptors. In accordance with the Manitoba Transportation and Infrastructure construction contracts, a monitor will be onsite at all times during construction to confirm that appropriate dust controls are implemented in accordance with this plan. Dust control will be a discussion topic of biweekly construction meetings initiated by Manitoba Transportation and Infrastructure Inspector or designated alternate to routinely report and address concerns or deficiencies in the environmental management measures and follow-up on direction provided to take appropriate and timely corrective action.

In addition to visual monitoring, ambient air quality monitoring for particulate matter 2.5 micrometers or less in diameter ($PM_{2.5}$) and total suspended particulate (TSP) will be implemented at a representative location that coincides with greatest number of proximate residents and sensitive receptors near construction activities. The air monitoring program results will facilitate the timely application of additional mitigation measures for fugitive dust should excessive particulate matter concentrations be measured.



Lake Manitoba & Lake St. Martin Outlet Channels – Proposed Site Access Roads

Figure 1: Proposed construction access and haul roads for the Project

Manitoba Transportation and Infrastructure proposes to conduct air quality monitoring for PM_{2.5} and TSP at a location near the Project development area (PDA) and residences along PR 239 during periods with construction activity associated with the Lake Manitoba Outlet Channel (LMOC) and PR 239 realignment. The specific monitoring location will be determined based on year-round access to the site for deployment, monthly calibration and maintenance, other site visits as needed, access to reliable electrical power that will be relatively uninterrupted during construction, site security, and regulatory air monitoring siting guidance. The selected instrument may vary depending upon the availability of electrical power or potentially the need to rely upon solar or battery power. Candidate instruments include the E-BAM Portable Environmental Beta-Attenuation Mass Monitor, the DustTrak Environmental Monitor, Thermo Scientific ADR1500, or GRIMM Aerosol Environmental Dust Monitor (EDM164). Monitoring equipment would also be equipped with meteorological sensors to measure meteorological parameters (e.g., winds and temperature). The stations will be outfitted with equipment to collect and store the monitoring data and transmit it via the local cellular phone network for long-term storage. Monitoring equipment will be deployed, operated, and maintained as per manufacturer recommendations.

The monitoring data will be reviewed daily to identify if concentrations exceed trigger levels, the MAAQC, or the CAAQS. The proposed trigger levels are 2/3 of 24-hour Maximum Acceptable Level 24-hour average PM_{2.5} and 24-hour average TSP MAAQC equal to 20 micrograms per metre (m) cubed ($\mu g/m^3$) and 80 $\mu g/m^3$, respectively.

If the PM_{2.5} or TSP concentrations are higher than the proposed trigger limits, this will provide an initial warning that mitigation of fugitive dust may be required. Concentrations greater than the trigger levels will be investigated to determine possible causes of elevated particulate matter concentrations. If they are associated with the Project activities, Manitoba Transportation and Infrastructure can determine the appropriate mitigation measures to apply to lower the particulate emissions. The proposed 2/3 of the MAAQC for PM_{2.5} is less than the CAAQS and is an adequate trigger for both the MAAQC and CAAQS.

If measured TSP or PM_{2.5} concentrations are above the MAAQC, the concentration measurements and instruments will be reviewed to determine whether measurement error exists (i.e., confirm that the measurements are valid). If exceedances are verified, then Manitoba Transportation and Infrastructure will investigate to determine possible causes of elevated particulate matter concentrations and determine the appropriate adaptive mitigation. Recent construction activities will be reviewed to determine which activities may have contributed to measured TSP and PM_{2.5} concentrations. If ground-level PM_{2.5} and TSP concentrations are greater than the MAAQC and are associated with the Project, additional mitigation to reduce dust emissions will be implemented. This mitigation may include increased watering of access roads, the spraying of acceptable dust control chemicals, stabilizing soil stockpiles, silt fencing, or the suspension of certain construction activities at the site.

The monitoring instruments may be relocated during the Project to accommodate construction requirements, changes to the Project, consultation with stakeholders or regulators, or based on observations made in the field during construction or Project operations. These locations should be periodically reviewed to check that they are correctly placed to protect human health and inform adaptive dust control efforts. Additional monitoring stations may be added to the program as needed.

A daily log of visual dust monitoring and meteorological condition observations will be recorded for the primary access roads and active construction areas. The combination of instrument-based particulate monitoring and visual dust observations will be used to verify the effectiveness of dust control and identify areas of meteorological conditions that result in insufficient mitigation. An adaptive management approach will be implemented to continuously review the effectiveness of the mitigation, and adapt mitigation as necessary, based upon both visual monitoring, PM_{2.5} and TSP monitoring, and meteorological conditions. Monitoring and meteorological records will be reviewed periodically to determine if management actions and mitigations are appropriate.

A summary report will be prepared each time there is an air quality event that requires investigation. This will document the conditions leading up to the event, any mitigation actions taken to reduce the effects on ambient air quality, determination of the source of the emissions causing the event where possible, and any other relevant information.

1.4.2 Operation

To determine when dust control needs to be applied Manitoba Transportation and Infrastructure or a designated alternate will be responsible for visually monitoring dust conditions in areas associated with the Project operations and maintenance activities. As the relocated PR239 will be paved, it will not be a material source of dust emissions once construction is complete. Municipal roads which had been used as designated haul and access roads during Project construction would return to the care and control of the RM of Grahamdale and would no longer be maintained by Manitoba Transportation and Infrastructure. Manitoba Transportation and Infrastructure's standard practices for application of dust control on PRs in the region will determine whether and where to apply dust suppressant. PR 239 will not require application of dust suppressants as it will be paved. Manitoba Transportation and Infrastructure has developed a draft Complaint Resolution Process (CRP) intended to collect, respond to, and resolve any Project-related complaints, including dust concerns.

2.0 SUBMISSION REQUIREMENTS

The following will be submitted to Manitoba Transportation and Infrastructure or a designated representative with a request to approve the dust suppressant:

- The name of the material.
- The name of the manufacturer or supplier.
- The manufacturer's guidelines and recommendations for application rates that meet or exceed the performance of calcium chloride (CaCl₂) or magnesium chloride (MgCl₂).

3.0 MATERIALS

3.1 Construction Areas, Roadways, and Parking Areas

Only water or approved dust suppressants shall be used for dust control, with water being the preferred material. The use of waste petroleum or petroleum by-products as dust suppressants is not allowed. The following chemicals may be specified:

- 38% Liquid Calcium/Magnesium Chloride (Ca/MgCl₂)
- 35% Liquid Ca/MgCl₂
- 34% Liquid Ca/MgCl₂
- 30% Liquid Ca/MgCl₂
- 77% Flake Ca/MgCl₂
- 32.6% Liquid MgCl₂
- 30.3% Liquid MgCl₂
- 28% Liquid MgCl₂
- Lignosulfonate-Solution (Liquid)
- Lignosulfonate Solution & Carbohydrates (Liquid)

3.1.1 Specification for Supply of Material

The chemicals shall comply with the requirements of Table 1.

3.1.2 Chemical Requirements

Liquid Ca/MgCl₂ shall be composed of CaCl₂ or a combination of CaCl₂ and MgCl₂. The quantity of chloride chemicals shall be calculated to achieve a strength equivalency of 77% pure flake CaCl₂. Water used in the solution shall be free of contaminants that could adversely affect either field material performance or the environment.

3.2 Soil Stockpiles

Where appropriate, water or tarps will be utilized to prevent excess dust originating from soil stockpiles. Soil stockpiles are not expected to be significant sources of dust.

Table 1: Chemical Specification

	Chemical									
Requirements	Ca/MgCl₂ Liquid				Ca/MgCl₂ Flake	MgCl₂ Liquid			Lignosulfonate (Liquid)	Test Method ⁽¹⁾
Minimum Concentration Percentage (by mass) ²	38%	35%	34%	30%	77%	32.6%	30.3%	28%		ICP-AES as described in "Standard Methods for the examination of Water and Wastewater" Sec. 3120, APHA- AWWA-WEF
Gradation (Percent Passing)					9.5 mm – 100% 4.75 mm – 80 to 100%					ASTM D98
Minimum Percentage of Total Solids (by mass)									27%	Canadian Pulp and Paper Association Standard Method H.1
Product Specific Gravity	1.38	1.35	1.35	1.30		1.30	1.28	1.125		ASTM D-1429
рН									3-8	ASTM D-1293
Equivalency %	88	98	100	118		88	100	108		

Notes:

- 1. All Test Methods refer to the current version.
- 2. Alkali Chloride determination, as required for Minimum Concentration analysis, is calculated by use of ASTM E449.

4.0 EQUIPMENT

4.1 General

Application equipment shall be capable of distributing the dust suppressant in a uniform manner at an application rate specified by the manufacturer or Manitoba Transportation and Infrastructure.

4.2 Equipment Used

Pressure distributors shall be propelled by a power unit capable of accurately maintaining any speed required for spraying and shall be provided with the following minimum equipment:

- A pump capable of developing a constant uniform pressure in the spray manifold to sustain the required application.
- A pressure gauge indicating the pressure within the spray bar graduated in increments of 15 kilopascals or less and visible to the operator.
- A rear mounted spray bar having a cab-activated positive and instant shut off that can be set at variable heights parallel to the surface and to any spraying width from 1 to 3 metres (m) to spray any portion of the roadway surface, including the shoulders.
- The spray bar nozzles shall be:
 - All the same manufacture and size.
 - Clean and good working condition.
 - Designed and set to facilitate uniform fan shaped spray without atomization.
- A strainer installed in the feed system to prevent clogging of the spray bar nozzles.
- A device or method that allows the operator to determine the volume remaining in the tank to an accuracy of 200 litres (L).
- Splash guards or other approved devices for shoulder spraying that shall permit spraying immediately adjacent to the roadway without over-spraying the road surface.
- A system (e.g., meter, GPS device, ground speed sensors, or calibration charts) that allows the operator to determine the rate of application with accuracy while spreading the dust suppressant.

The application rate per kilometer shall be confirmed by running 250 m test sections in the presence of the Contract Administrator, Construction Inspector or a designated alternate by Manitoba Transportation and Infrastructure.

5.0 APPLICATION OF SUPPRESSANT FOR DUST CONTROL

5.1 General Requirements

Water should be applied on the surface of the road before applying the dust suppressant. Steps shall be taken as necessary to control dust resulting from operations or by traffic such that it does not:

- Affect traffic.
- Enter surface waters by ensuring that at 50 m from a water crossing the machinery applying the dust suppressant only passes on the middle between two narrow lanes.
- Escape beyond the right-of-way to cause a nuisance to residents, businesses, or utilities by ensuring an overpass in the middle of two lanes, thus leaving a certain margin of area not covered by the dust suppressant on both sides of the road.

Dust suppressant shall be applied when the speed of winds does not exceed 15 to 20 kilometres per hour to make sure to avoid ponding, runoff, drifting, and tracking of the material beyond the area of application. Carefully monitor the application rate of all dust suppressants so that adequate coverage occurs without pooling or runoff of products. The amount of dust suppressant applied should not exceed the minimum amount required to effectively suppress dust.

The suppressant application shall not proceed during periods of rain when the surface is in a saturated condition or on areas of ponded water or roads that are subject to flooding. The surface needs to be dry for the suppressants to be effective. Thus, when there is a high probability forecast for precipitation, only use water as a suppressant to prevent the loss of dust suppressant from the intended area of application. Areas receiving rainfall within 6 hours of application may require reapplication of the dust suppressant.