Appendix C.3

Draft Fugitive Dust Control Plan – May 2021as
Completed for the Updated 2021 Beaver Dam Mine EIS

Draft Fugitive Dust Control Plan
Version 2.0

Beaver Dam Mine Project 2021
Atlantic Mining NS Inc.
Marinette, Nova Scotia
May 2021

REVISION HISTORY

Version	Date	Notes/Revisions
Version 1.0	February 2019	Submitted as part of the Beaver Dam Mine Project Revised 2019 Environmental Impact Statement application to the Canadian Environmental Assessment Agency and Nova Scotia Environment. This plan describes the preliminary Fugitive Dust Control Management Plan during construction, and operations.
Version 2.0	May 2021	Submitted as part of the Beaver Dam Mine Project Updated 2021 Environmental Impact Statement application to the Impact Assessment Agency of Canada and Nova Scotia Environment. The preliminary Fugitive Dust Control Management Plan has been updated in response to Round 2, Information Requests (CEAA and NSE 2019) and update to the mine site and Haul Road layouts describes the preliminary Fugitive Dust Control Management Plan during construction, operations and potentially active closure of the mine.

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1 INTRODUCTION

Atlantic Mining NS Inc (AMNS) provides a Fugitive Dust Control Plan (the Plan), herein, that has been developed to address an Information Request (IR) received from the Canadian Environmental Assessment Agency (CEAA) in August 2017. Specifically, the IR in question was identified as NSE 1-42 and originated from Nova Scotia Environment's (NSE) review of the Beaver Dam Mine Project Environmental Impact Statement (EIS) which was submitted to CEAA in June 2017.

Specifically, IR NSE 1-42 requested that AGC:

> *"Provide a dust suppression plan for the Beaver Dam Mine site, haul road and addition mitigation measures for the Touquoy site."*

The Project Description for the Beaver Dam Mine Project was originally submitted in the June 2017 EIS. A Revised 2019 EIS with Project Description was re-submitted to CEAA in February 2019. This Updated 2021 EIS has been prepared to provide additional clarification on air monitoring including fugitive dust.

This Plan has been developed based on experience gained from the Touquoy Mine which has been in operational phase since October 2017 and in construction phase 2016 to 2017. Industry best practice has also been used to develop this plan. A guidance document that has been adopted is the Ontario Ministry of Environment, Conservation and Parks (MECP) Technical Bulletin - Management Approaches for Industrial Fugitive Dust Sources (February 2017). The MECP document informative because it is an overview that incorporates best management practices for industrial sources of fugitive dust emissions from a broad list of references collected from jurisdictions worldwide.

This Plan is considered preliminary in nature and will updated and revised to include approved project scope and will incorporate project specific conditions as issued by CEAA. This updated Plan (Version 2) is being submitted as a draft Plan as part of the Updated 2021 EIS and will be finalized and submitted as part of the NSE Industrial Approval application process.

2 PLAN OBJECTIVES

The Fugitive Dust Control Plan describes the control measures and practices to be employed to minimize and control fugitive dust. The plan is based on five principles:

• Problem identification

• Design mitigation (plan)

• Operating mitigation (do)

• Monitoring and reporting (check)

• Corrective action (act)

The overall goal of the Plan is to provide a framework for the control of fugitive dust which will enable AGC to protect the health and safety of its workers and the public, as well as to mitigate potential adverse effects to the adjacent natural environment (e.g., impacts to plants and fauna). To meet this goal, the Fugitive Dust Control Plan has the following objectives:

• Identify fugitive dust emission sources

• Describe primary and contingent control measures and practices

• Explain inspection and observation procedures

• Establish reporting requirements

• Detail corrective action

• Define training issues

Identification of fugitive dust emission sources will be accomplished by a thorough review of the proposed operating plan. Primary and contingent control measures from industry best practices (i.e., MECP Technical Bulletin, 2017) will be applied to each source of fugitive dust emissions. Inspection and observation procedures will provide feedback as to the effectiveness of mitigation measures and the need for corrective action. Reporting will provide the basis for corrective action and, if necessary, amending and improving the control measures. Training will be focused on hazard recognition, taking corrective action, and implementing proper procedures.

3 FUGITIVE EMISSION SOURCES

Fugitive dust can be generated throughout project phases and from specific components of the project site. These include construction phase activities initially and during operational phase, the open pit, waste rock stockpile, quarries, process plant, crushing/blasting operations, and the service complex. Closure phase will be similar to construction phase in regard to dust generation. A description of the general sources of fugitive dust are as follows.

3.1 Construction and Closure Phase Activities

During construction activities dust can be generated from several sources including vehicular traffic on gravel road surfaces, loading and dumping of soil and aggregate materials, tracking and re-entraining aggregate materials along asphalt roads, quarrying and borrowing activities, road grading, and dozing/levelling activities. Similar activities will occur during closure phase with the addition of building demolition and leveling/recontouring of the ground surface.

3.2 Open Pit – Beaver Dam Mine Site and Quarries / Borrow Pits – Beaver Dam Haul Road

Dust is generated by the various unit operations involved in mining. Drilling can generate dust from the ground up rock that forms the cuttings. Blasting creates dust during detonation. Dust can be generated during excavation of dry muck and subsequent loading into trucks. Dozing and grading material on bench floors and roads will generate dust in dry conditions. Ditches and sumps may become a source of dust if they fill with fines and dry out.

3.3 Haul Roads – Beaver Dam and Touquoy Mine Sites, Beaver Dam Haul Road

Dust can be generated from mine haul truck tires interacting with gravel surfaced Mine Haul Roads and Beaver Dam Haul Roads. Dust is also generated during the truck loading and dumping activities. There is the potential for dust to be blown from haul trucks that are uncovered. Dust can also be tracked across asphalt roads and re-entrained by traffic or by the wind.

3.4 Waste Rock Stockpile – Beaver Dam Mine Site

Dust can be generated on the waste rock stockpile by the unloading of trucks and the pushing of waste material to create each working lift. The haul road to the waste dump from the open pit is also a potential source of dust from haul trucks and other mobile equipment moving along its length.

3.5 Process Plant – Touquoy, Crushing Plants Beaver Dam Mine Site, Blasting Operations Beaver Dam Mine Site, and Beaver Dam Haul Road

Dust can be generated at the process plant, crushing area and blasting area in three distinctly different areas. When ore or aggregate is hauled to the crusher pads, dumping in the ore / aggregate stockpiles or crusher dump pockets can generate dust in a similar manner to that which occurs on the waste rock stockpile. The loader on the ROM pad and crusher pads can generate dust while tramming ore/aggregate to the crushers, loading trucks, or cleaning off grizzlies.

Dust emissions from storage piles of granular material can result from dust pick-up under certain wind speeds and directions. Dust emissions can also occur as material is dropped from a conveyor, loader or other equipment where there is an associated drop height onto the storage pile.

The crushing circuits generate dust as the blasted rock or ore is reduced in size. Dust occurs at conveyor transfer points, the sizing screens, and during discharge onto the crushed stockpiles. Dust can also occur when feeders draw ore from under the crushed ore stockpile to the reclaim conveyor which feeds the ball mill.

AGC is currently evaluating a blasting option instead of using the crushing operations. The blasting option would have a similar emission profile to the crushing operation and follow a similar path for processing. If AGC proceeds with the blasting option the measures to minimize fugitive emissions for the crushing operations would be relevant to the blasting operations.

3.6 Service Complex

Dust may be generated on the service complex access roads, in the site parking lots, and maintenance yards.

4 OPERATING PRACTICES AND CONTROL MEASURES

The following sections describe the primary and contingent control measures to be employed to manage fugitive dust generated by the Project for the identified processes. Primary control measures generally focus on prevention through design of physical or operating systems, for example, a dust collection system. Contingent control measures are directed towards mitigation of fugitive dust and rely more on operating procedures. It should be recognized that the prevailing wet climate will be effective in suppressing dust in all outdoor areas for substantial spans of time throughout the year. The reader is also directed to the MECP Technical Bulletin Management Approaches (2017) for Industrial Fugitive Dust Sources which provides current best practices for dust control under a variety of conditions.

4.1 Process Sources

- Minimize fugitive dust emissions considering alternative processes/equipment to eliminate or minimize primary dust generation.
- Relocating an outdoor activity indoors for better fugitive dust control where feasible.
- Wetting material prior to processing or loading where possible.
- Installing and maintaining process containment and redirecting dust emissions to the dust collection system.
- Implementing a preventative maintenance program for processes and control equipment.

4.2 Aggregate, Ore, Waste Rock and Soil Stockpiles

- Dust control options for storage piles can include enclosures, barriers, shelters, proper layout, covers, water application, or other dust suppressant.
- Enclosures covered storage of very fine materials with a high dust emitting potential should be considered (e.g., fine ore stockpile).
- Use silos, bunkers or hoppers where feasible. Doors should be kept closed. Properly designed ventilation and filtering systems should be used as appropriate.
- Locate storage piles, especially of fine materials, in sheltered or protected areas where feasible.
- Storage piles should be located away from the prevailing downwind site boundaries where practical, or in designated areas with windbreaks and restricted traffic, and as far away from residents and other human receptors as possible.
- The number of piles should be kept to a minimum for the same material to minimize surface area.
- Open storage piles may be covered with durable materials such as tarpaulins or plastic. Alternatively, soil or latex binders may be applied on the top of the pile to reduce wind erosion of the material. For piles that are inactive, a vegetative cover may also be used.
- Use a water or dust chemical dust suppressant that is compatible with the stored material can be applied to the surface of the storage pile to reduce wind erosion.

4.3 Transport of Materials on Haul Roads

Paved Roads

- Dust emissions from paved surfaces where there are entrained fines can be minimized by movement control and handling of fine materials to prevent spillages onto paved surfaces.
- Regular cleaning of paved surfaces, using a mobile sweeper in conjunction with a water truck.
- Mud and dust track-out from unpaved roads can be minimized by the use of simple wheel shakers (but these can sometimes be impractical and cause unacceptable wear and tear on the equipment).

Other Measures

- Crushed or broken ore or aggregate materials should be transported in trucks with adequate freeboard to avoid spillage.
- Cover truck loads whenever feasible with durable materials such as tarpaulins or screening material that are extended over the truck bed and secured to the truck.

4.4 Material Handling/Transfer Actives

- Where feasible, activities that take place at an existing storage pile (i.e., loading and unloading) should be confined to the downwind side of the storage pile.
- Continuous transport such as conveyors should be used where feasible.
- Conveyors should be designed to minimize material overflow or spillage and where feasible should be enclosed or housed especially for fine material.
- Optimize the conveyor speed with the use of an adjustable speed conveyor.
- Use water sprays or sprinklers at conveyor transfer points.
- Minimize drop heights at transfer points, including use of conveyors that can be raised and lowered.
- Perform regular clean-up of spillages around transfer points.
- When handling/loading/dumping material using a front-end loader, excavator, or dump truck consider dumping material in a sheltered location when feasible, minimize the speed of descent; and minimize the material free fall (drop height).
- Where feasible, use sprinklers or water sprays around hoppers and other transfer points.
- Design hopper load systems to ensure a good match with truck size.
- Where feasible, the loading and unloading activities should be conducted when the wind speed is low to minimize fugitive dust emissions. In very high wind conditions, these activities should be suspended where practical.

4.5 Mine Site Infrastructure Pads

- Use of windbreak measures where feasible including use of natural land features, or artificial features such as barriers, to provide a degree of wind protection.
- Berms, tree lines or vegetation should be used in the surrounding areas of the mine infrastructure pad.
- All accumulated material on the windward side of the windbreak should be periodically removed to prevent failure of the windbreak.
- Application of water and chemical dust suppressants as required.

4.6 Exposed Erodible Soil Surfaces

- Implement a progressive re-vegetation plan to reduce wind and rain erosion of berms or disturbed areas Techniques such as hydroseeding and the use of geotextiles should be used on sloping ground and other difficult surfaces.

4.7 Open Pit and Quarries Activities

- Drilling should employ a water spray suppression system to control dust on each drill rig as feasible. The annulus of each blast hole will be shrouded by a rubber dust curtain which hangs down from the drill deck and prevents cuttings from blowing away.
- Loading of trucks will ensure that payload is centered with adequate freeboard to avoid spillage.
- Excavators and loaders will place material in truck boxes to avoid excessive fall when filling trucks.
- Haul roads in and out of the pit should be watered as required to prevent dust generation.
- Establish and adhere to speed limits.
- Bench floors and haul roads should be constructed of material containing minimum fines. Capping should be competent granular material which doesn't easily break down into fines.
- Sumps and ditches should be cleaned out regularly so that they too do not create a source of fines that can result in dust generation.

4.8 Waste Rock Stockpile

- The haul road and working platforms on the waste rock stockpile should be watered and maintained in the same way as the roads and benches in the pit.
- Mud and material containing organics will be stockpiled separately and will not be used to construct travel surfaces as they have poor bearing strength and will generate dust when they dry.
- Consideration should be given to progressive reclamation of the waste rock pile as it is developed, especially re-sloping, covering with topsoil, and re-vegetated.

5 INSPECTION, MONITORING, AND REPORTING

Formal inspections of working areas will be conducted periodically by management and employee representatives of the Occupational Health and Safety Committee (OHSC). Monthly or more frequent inspections will also be conducted by each shift supervisor in each respective area. Lastly, observations are to be made each shift regarding dust conditions.

The inspections will use the principles and objectives of the Fugitive Dust Control Plan as a guide. The course of inspections should adhere to the following pattern:

- Review dust management practices for the area
- Conduct physical inspection
- Identify any sources of fugitive dust not being effectively managed
- Recommend existing corrective action
- Suggest alternatives to the management group if existing practice is deemed ineffective
- Determine if additional resources are required and inform management group
- Establish accountability for the corrective action (s)
- Document inspection finding in report form
- Submit report for review and to enable follow up

OHSC inspection reports will be circulated at the general management level. Shift supervisor reports will be circulated at the department management level. Observations made each shift will be recorded in the shift log book along with corrective action taken and any other pertinent information. Shift supervisors and department managers will be responsible for addressing recognized fugitive dust issues in cooperation with the Health, Safety and Environment Department which will serve as a technical resource to operating groups. The early identification of fugitive dust is first and foremost a visual assessment.

Science-based fugitive air quality dust sampling/monitoring programs will also be implemented on a periodic basis (e.g., monthly, quarterly, annual) as specified in the EA project conditions and as outlined in the NSE Industrial Approval. The monitoring results from these programs will be compared to applicable guidelines and limits and used as a basis to objectively determine the overall effectiveness of dust mitigation and may trigger corrective actions in the form of additional mitigation. Qualified professionals will be used to develop, implement, and to interpret the results of these programs.

6 TRAINING

An integral part of the implementation of the Fugitive Dust Control Plan is appropriate training for the personnel involved. Training regarding fugitive dust control will be integrated into the overall new employee orientation and health and safety plans for the site. Specifically, the health and safety plan involve field level risk assessments, analyses and adoption of adequate controls to mitigate risk, and job or procedure specific task training.

Supervisors will be trained to recognize and identify the hazards related to fugitive dust and will understand specific tasks related to dust control. Job specific task training would teach personnel how to manage fugitive dust issues that may affect them when performing their specific job functions. For example, a water truck driver would learn the frequency to water roads, and correct mixing (for chemical suppressants) and application procedure to maximize the effectiveness dust suppression without creating other hazards. A grader operator would be taught the importance of proper drainage and the need to use select material in construction to avoid the excessive generation of fines by traffic. Basic knowledge of fugitive dust issues and the responsibility of each employee to report occurrences will be imparted during initial employment orientation. Periodic safety meetings can be used as a forum to discuss how crews can employ best practice to manage fugitive dust in the workplace.