Revelstoke West Side Dust Management Strategy

A Plan to Identify, Implement and Monitor the Application of Best Management Practices to Control Dust Related to Industrial Activities in the Westside of Revelstoke

Prepared By:

British Columbia Ministries of Energy, Mines and Petroleum Resources

Draft for Review

May 28, 2019 – Version 12

Revelstoke West Side Dust Control Plan

Purpose and Objectives

The purpose of the Revelstoke West side Dust Control Plan is to identify, implement and monitor the application of best management practices (BMPs) to help reduce the fugitive and small particle dust related to the industrial activities on the Westside area of Revelstoke and the impacts on the neighbouring residential areas. Monitoring the air quality will be the onus of the proponent; however, the BMPs will be monitored by the appropriate agencies through inspections, such as but not limited to: EMPR, Mines Act Permit; MOTI, Road use permit; FLNROFD, Land Tenure.

The plan includes activity-specific dust control criteria and dust suppression procedures that have been reviewed and agreed to by all parties. BMPs will be implemented throughout the industrial operations on an as needed basis and may become permit conditions. This depends upon the activity and the agency oversight. The plan also includes guidance from the Ministries of Environment and Climate Change Strategy and the Ministry of Energy, Mines and Petroleum Resources to ensure provincial requirements are met. These are included in Appendix 3 – Reference and Guidance Materials.

This plan also explains the relationship between land and project permitting and fugitive dust control plans which when implemented and monitored will meet an objective of assessing and managing the impacts to nearby residents.

Table of Contents

1. Background

Potential for cumulative impacts and effects of intense industrial activities in North West Revelstoke including exposure to dust with respect to the environment and the public have been identified as major issues within the project area (Figure 1). The potential cumulative impacts and the perception of the effects are challenging permit and authorization statutory decision makers and monitoring and enforcement of permit conditions on specific sites. Decisions are currently made on individual applications on their merit, however, cumulative effects should be considered. The offsite impacts of each use impacts all and thus a new collaborative approach to managing dust is needed. By using BMPs and incorporating them into relevant authorizations as conditions, the issues can be more readily addressed.

BMPs represent the current approach to manage project-specific dust impacts and effects and aim to produce outcomes consistent with the community's social, economic and environmental expectations. BMPs encompass all aspects of resource recovery and waste transfer facility planning, design, operation and rehabilitation. Resource recovery, managing environmental impacts, safety and air quality must be adequately addressed. Continuous improvement is an important component of best practice.

The City of Revelstoke (City), Ministry of Energy, Mines and Petroleum Resources (MEMPR) and the Ministry of Forest, Lands and Natural Resource Operations (MFLNRO) all permit or authorize the use of land for various industrial activities. FLNRO is the only agency that can authorize occupation of the surface on Crown Land under the *Land Act*. MEMPR may authorize the tenures for the undersurface for the extraction of minerals under the *Mineral Tenure Act* and permit resource recovery under the *Mines Act*. Ministry of Transportation and Infrastructure (MOTI) and FLNRO have the regulatory responsibilities of the roads in the area. MOTI and the City have gravel pits on the West side that contractors use for various purposes and should consider aggregate characteristics in relation to the product end use; example road grit appropriate for traffic safety yet low dust potential, and gravel for concrete mix. Point source dust and effluent are two (of multiple) types of waste defined in the *Environmental Management Act*. The Ministry of Environment and Climate Change Strategy and Ministry of Energy, Mines and Petroleum Resources has collaboratively developed a template for fugitive dust control planning attached as Appendix 3. Also, the Ministry of Water, Land and Air Protection March 2005 Best Management Practices to Mitigate Road Dust from Winter Traction Materials BMP's attached in Appendix 4 (22) assists in guiding these BMPs.

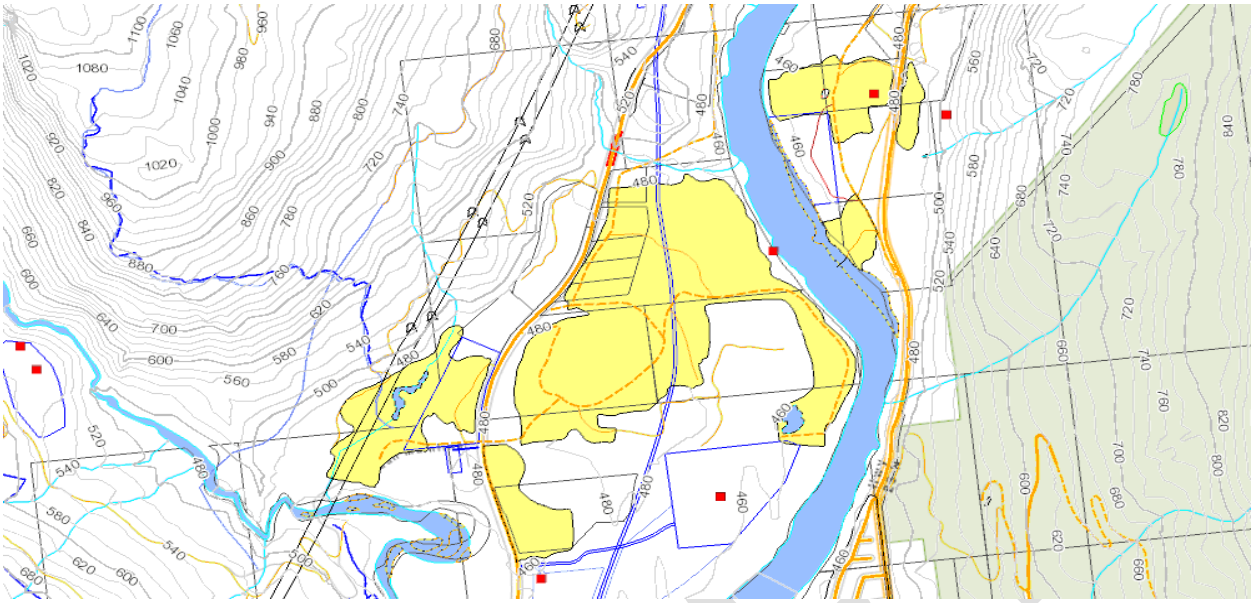
The Regional District of Columbia Shuswap and the City may require approvals for rezoning land and issue special development permits if applicable bylaws exist. The City or Regional District should be contacted to determine specific local requirements. Municipalities with approved soil removal and deposit bylaws may have additional requirements, including soil removal and disposal permits, security and fees. Proponents should check with local planning or engineering services to determine the specific requirements of a soil removal and deposit bylaw.

In the past, there has not been a coordinated response to how permits or tenures are authorized over the same piece of land or adjacent lands. This has resulted in confusion and expectations of the public and the industrial users not being fulfilled. It has been agreed through this plan that all authorizations and permits be coordinated with the regulatory bodies prior to issuance. This plan also applies to contractors using any of the MOTI or City pits. This plan is expected to provide a more effective and streamlined permitting process. The permits will reflect the BMPs and be incorporated into permit conditions as applicable. As well, this plan outlines an approach to a coordinated and collaborative approach to the plan implementation and ongoing compliance, and monitoring of its outcomes.

To address cumulative effects and ensure all interests were engaged in the information exchange, assessment, and recommendations for managing impacts; representatives of the following provincial statutory decision-makers, local and regional governments and user groups worked together to produce the results presented in the plan.

- Ministry of Energy, Mines and Petroleum Resources
- Ministry of Transportation and Infrastructure
- Ministry of Environment and Climate Change Strategy
- Interior Health, Population Health
- Ministry of Forests, Lands and Natural Resource Operations
- City of Revelstoke
- Regional District of Columbia Shuswap

Figure 1 - Location Map



2. Industrial Users on the West side of Revelstoke

The industrial users of the West side of the Columbia River include:

- **Ministry of Transportation and Infrastructure** – Jordan pit
- **City of Revelstoke** – waste transfer station, gravel pit
- **Interoute Construction** – gravel pit
- **Revelstoke Sand and Gravel Ltd** – sand and gravel quarry

3. Best Management Practices

Proactive controls will be instituted to reduce the amount of dust generation during any site activities, including enforcement of low speed limits for vehicular traffic, decontamination of trucks leaving work areas and height limits for debris/waste or gravel stock piles. BMPs include wetting active areas, minimizing or ceasing activity during periods of specific weather events, wetting unpaved areas, application of dust suppressant materials as well covering stockpiles. Proponents must indicate the potential conditions that will trigger a response and provide mitigation measures (see template, appendix 3).
If Site conditions require increased dust suppression, emulsifiers or surfactants may be added to improve the “wettability” of water sprays, and paper mulch mixed with a tackifier may be used on waste/debris stockpiles. A dust event is identified and described in the Appendix 2. Proposed solutions are identified in the best management practices and would be required in the specific project management plan. On mine sites, the mine manager must ensure that wherever

practicable, water sprays or other dust suppression means and devices are used at every dusty place where work is carried out and where it is impractical to do so, personal protective equipment shall be supplied and worn by all persons working in that location - Health, Safety and Reclamation Code for Mining Section 6.24.2.

Other dust management BMPs include:

- Limit surface areas disturbed, limit work in the wind thresholds greater than 20 km/hr, apply suppressant as needed, and clean up spills immediately;
- Grow groundcover, erect windbreaks, apply crust chemicals; and
- Pave roads, enclose storage areas, cover storage piles, water, and wet sweep or dry sweep with a dust capture system often, reduce speed limits, minimize trips, limit area access, and prevent carryout offsite.
- All trucks leaving the site will be covered by a tarp
- Placement of the crusher will be in the bottom of the pit
- Crushers will be equipped with effective water sprays
- Area not being mined or used for stockpiling will be seeded with a local forestry range mix
- A maximum material drop height is not to exceed 1 meter, minimize where possible and should use chute or rock ladders.
- In cases of a wind event or extreme heat and should the above mentioned measures be inadequate, operations will stop until the dust is managed effectively. This is described in Appendix 2.
- All personnel will be notified of the dust control plan

Specific BMPs for the Revelstoke area should be part of the dust control plan

- 160 m buffer on river west side
- Communication plan among working group, community and industrial users. How citizens may be informed of control plans in place to mitigate dust issues.

Appendix 1 outlines the BMPs that were developed, reviewed and agreed to by the parties and will guide the implementation plan to manage and monitor dust management strategies in and around the project sites.

Appendix 2 provides the triggers that will then require the BMPs to be activated.
Appendix 3 provides a draft template prepared by ENV and EMPR for fugitive dust control plans and the guidance document directing the information required in the template for sand and gravel operations. Appendix 3 outlines the list of guidance and related documents to assist

governments and industrial users with respect to fugitive dust control planning, monitoring and reporting.

4. Plan Implementation

4.1. Permit Application Review and Collaboration

To assist the industrial users to understand, develop and comply with BMP's , and contribute to an assessment of cumulative impacts and effects, this section outlines a coordinated approach to the review and approvals of individual applications and sets out a proposed framework for a cumulative effects assessment.

This strategy proposes to establish project-specific coordinated review of applications, monitoring and assessment. The appropriate agencies will review the dust control management plan that is submitted by the proponent to ensure the BMPs have been incorporated into the plan.

2. Monitoring

Monitoring will be on the onus of the industrial user and should include:

- Visual inspection for dusty conditions shall occur at a minimum of twice daily
- Visual inspections shall be carried out hourly when overburden removal, berm construction, rehabilitation.
- Inspection of dust controls functioning properly such as watering and if chutes are effective.
- Excavation and loading operations should be monitored hourly when there is dry weather and winds are anticipated to be blowing towards the residences.
- Site manager or delegate will be responsible for monitoring current conditions and weather forecasts from Environment Canada, to subsequently help plan for current and next day watering needs and other measures.
- Records regarding when and how dust control measures are implemented must be kept on site. These records must include and not limited to: watering on roads, visible dust observed, meteorological conditions for that day.

Records will be reviewed by the appropriate inspector and may be reviewed by the working group through an annual report should it be required.

2.1. Permit and Authorization Compliance and Enforcement

The Ministry of Energy, Mines and Petroleum Resources is responsible for dust on a mine site and the Ministry of Environment is responsible for fugitive dust off the mine site. In cooperation, the two Ministries work together to ensure compliance is enforced. The Ministry of Transportation and Infrastructure is responsible for the activities in their sand and gravel pits regarding contractors and maintenance. The City of Revelstoke and the Regional District of Columbia Kootenay have bylaws that are applied to private properties and the waste transfer station. The Ministry of Forests, Lands and Natural Resource Operations should monitor the conditions of the unpaved roads and any Crown land disturbances that may create dust in certain weather events. Interior Health oversees public health of communities and has an interest in ensuring the BMPs are implemented.

Gravel pit operations should be inspected by the various Ministries twice a year in total. It would be important that one of these inspections should occur during a dry, windy event to monitor the effectiveness of the mitigation measures that are in place.

The Ministry of Transportation and Infrastructure would have inspections during operations of their pits.

2.2. Approach to monitoring and assessing Potential for Cumulative Impacts and Effects

The appropriate agencies will be responsible for monitoring and assessing the impacts and effectiveness of the plan in relationship to new industrial activities should it be required. The working group that will be formed once this plan is implemented should convene once a year to review the BMPs and make adjustments if required. On mine sites, the Mine Manager is responsible for monitoring workplace contaminants for worker exposure – Health, Safety and Reclamation Code for Mining Sections 2.1.1 and 2.1.3.

Appendix 1 – Table of Recommended Best Management Practices

Dust plan - site	Source	Mitigation	BMP	Contingency Dust Control Measure	Product End User
Gravel pits	***Dust from*** • Roads within mine site • Feeds and discharges for conveyors, crushers, screens • Front end loaders moving material • Load out facilities • Soil and overburden removal, handling and storage • If there is any blasting to occur on any site then restrict blasting activities to daytime only and ensure continued wetting of area. Site preparation – overburden and berm construction	• Water roads or use surfactants (calcium chloride) • Wheel washer • Wash down trucks • Pave high use areas • Install bag house • Water sprays 1 • Wind breaks • Keep storage piles covered either with a physical cover or dust suppressant spray • Avoid overburden removal and berm construction during dry months	• Berms • Buffer zones • Fences • Lighting management • Temporary or permanent plant covers, erosion blankets, dust suppressants and plastic sheeting • Minimize area of disturbance • Limit work on windy days • Routine inspections • Stripping materials placed on perimeter edges adjacent to 30 m tree buffer • No preparation or construction during dry weather periods • Winds are anticipated to be blowing toward residences	• Locate and orient the extraction working face and haul roads so that they are not in wind “chutes” or susceptible to strong winds • Spray bars on crushers and conveyors – watering rate set as needed • Screenings and other high-fine materials, stackers will be kept as close to the tops of stockpiles – drop height 1 m or less • Enclosing transfer points along conveying circuits where dust may be created and apply sprays. • Install chutes at drop points. • Max dump heights not to exceed 1 meter, minimize where possible and should use chute or rock ladders • Minimized stockpiling • Treat stockpiles • Passive dust suppression – no operations on hot, windy days • Progressive reclamation - Re-sloping mined out pit walls and Re-establishing soil cover and immediate re-vegetation or cover • Speed within mine site to be less than 20 km/ hr • Should post km/hr	• Selecting the right pit material for the end use is critical; example as per page 7 in the 2005 BMP’s to Mitigate Dust from Winter Traction Materials document, larger than 300 microns (300 µm) in diameter is most effective for traction. • Material selection importance extends to other end uses as well, example concrete mix and radiological concerns re indoor radon gas.

Dust plan - site	Source	Mitigation	BMP	Contingency Dust Control Measure	Product End User
Roads	***Dust from*** • travelled gravel roads – Jordan River • gravel trucks on public roads • winter traction material • mud from logging trucks	• Watering roads or use of dust palliatives	• Dust suppression applied at the confluence of paved and unpaved roads • Dust suppressants that do not pollute the environment or habitat • Clean up of winter traction material • Use appropriate sized winter traction material as per guidelines and more durable aggregates.	• Covered loads • Speed limits reduced to 50 km when hot windy periods of weather • Sweeping of paved road by a suppressant (eg. Water) or vacuum system to reduce producing more dust • Dust suppression – palliative such as mag chloride • Watering of unpaved haul roads • Reduce amount of material put on roads during winter • Modify surfaces of dirt and gravel borders to minimize dust emissions	Select appropriate road grit for traction and dust prevention as per the 2005 BMP's to Mitigate Dust from Winter Traction Materials document,

Dust plan - site	Source	Mitigation	BMP	Contingency Dust Control Measure	Product End User
Transfer station	***Dust from*** • Roads within station • equipment moving within the station • construction and industrial waste recovery	• watering of area when required • sprinkler systems • use of trees and shrubs as wind breaks • use storage sheds or open ended building for construction material storage	• sprinkler systems • design access and internal roads to minimize • provide earthen embankments • where possible, pave of all operating, storage, unloading and loading areas • seal roads • minimize areas of exposed earth through suitable landscaping • limiting hours of vehicle traffic • minimize stockpile heights	• utilize dust suppressants (light water spray) • install wind breaks to prevent particulates becoming airborne • regular suction sweeping of surfaces where appropriate • where water or chemicals are used as a suppressant, must not create contaminated run-off • any trucks loaded with construction debris will be tarped. • Minimize stockpile heights to 3 meters	

Water sprays:

1. Adjust nozzles so that the spray is directed to dust generating areas to provide complete coverage.
2. Locate nozzles upstream of dust generation points and close enough so that the spray is not carried away by wind.
3. Ensure the volume and size of droplets are adequate to sufficiently wet the material (optimal droplet size is 10-150µm).
4. Time water spray application to ensure the materials are still damp when they are disturbed.

Source: https://www.osha.gov/dsg/topics/silicacrystalline/

Appendix 2 –Triggers for Dust Management mitigation examples and definitions

Weather and dust events create significant hazards to the control of dust management. It maybe that these events supersede the normal dust control methods as per Appendix 1 and will require special treatment.

Typical triggers of employing dust control measures would be:

- If material handling activities are occurring that may impact air quality beyond the property boundary:
- If visible dust is being generated by material handling activities; and/or stockpiles
- If the weather forecast indicates dry conditions and strong winds are likely.
- Visual cues will be the primary trigger for mitigation action to be taken with respect to fugitive dust emissions.

Unusual weather or dust events can include the following:

- Forest fire smoke hampering air quality – threshold rating of 7-10
- Temperature inversions and /or cloud cover creating poor air quality
- Temperatures over 30 degrees C
- Wind speeds over 19 hourly
- Long dry hot periods that exceed 19.3 km/h over a period of 5 days with less than.254 mm of precipitation with temperatures exceeding 30 degrees C. Also the 30/30/30 rule applies here – Temperature and wind – 30 and humidity 30 %.
  (the Canada Environment Pollutant Release guide https://www.canada.ca/en/environment-climate-change/services/national-pollutant-release-inventory/report/pits-quarries-guide.htmlsays: the average number of days during the year that experienced at least 0.254 mm pf precipitation and the percentage of time during the year that the unobstructed wind speed exceeded 19.3 kh/h using Online climate data from Environment Canada Weather website: http://climate.weather.gc.ca/

At certain thresholds it would be prudent to shut down any activities that are producing visible dust and impacting neighbourhoods. In producing the dust management plan per this Dust Control Plan the industrial user should indicate when the techniques are no longer appropriate and activities should cease along with a plan to ensure stockpiles are protected. See appendix 4 from the EPA Compilation of Air Pollutant Emission Factors, Volume1: Stationary Point and Area Sources 5th Edition, National Service Center for Environmental Publications, 1995.

Controls for dust management should not be at the expense of water quality. Runoff from various substances in the pit and to help dust management will need to be controlled and monitored. Please refer to the guidance document enclosed.

The majority of the dust control measures listed in this document are also required to be in place to protect the workers from exposure to dust. It is important to note that fine, airborne respirable crystalline silica may be present around work areas, at potentially hazardous concentrations, even when visible dust appears to be low. Therefore many of these dust control practices are still required when visible dust may not be detected

Appendix 3 Fugitive Dust Management Plan and Template

Ministry of Energy, Mines and Petroleum Resources & Ministry of Environment and Client Change Strategy: Developing a Fugitive Dust management Plan for Industrial Projects

Appendix 4 – EPA Compilation of Air Pollutant Emission Factors, Volume 1

Stationary Point and Area Sources, 5th Ed. Chapter 11.19.2.2 Crushed Stone Processing Emissions and Controls, pages 1145 and 1146

In certain cases, stone washing is required to meet particular end product specifications or demands as with concrete aggregate processing. Crushed and broken stone normally is not milled but is screened and shipped to the consumer after secondary or tertiary crushing.

11.19.2.2 Emissions And Controls[1-8]

Emissions of PM and PM-10 occur from a number of operations in stone quarrying and processing. A substantial portion of these emissions consists of heavy particles that may settle out within the plant. As in other operations, crushed stone emission sources may be categorized as either process sources or fugitive dust sources. Process sources include those for which emissions are amenable to capture and subsequent control. Fugitive dust sources generally involve the reentrainment of settled dust by wind or machine movement. Emissions from process sources should be considered fugitive unless the sources are vented to a baghouse or are contained in an enclosure with a forced-air vent or stack. Factors affecting emissions from either source category include the stone size distribution and surface moisture content of the stone processed; the process throughput rate; the type of equipment and operating practices used; and topographical and climatic factors.

Of geographic and seasonal factors, the primary variables affecting uncontrolled PM emissions are wind and material moisture content. Wind parameters vary with geographical location, season, and weather. It can be expected that the level of emissions from unenclosed sources (principally fugitive dust sources) will be greater during periods of high winds. The material moisture content also varies with geographic location, season, and weather. Therefore, the levels of uncontrolled emissions from both process emission sources and fugitive dust sources generally will be greater in arid regions of the country than in temperate ones, and greater during the summer months because of a higher evaporation rate.

The moisture content of the material processed can have a substantial effect on emissions. This effect is evident throughout the processing operations. Surface wetness causes fine particles to agglomerate on, or to adhere to, the faces of larger stones, with a resulting dust suppression effect. However, as new fine particles are created by crushing and attrition, and as the moisture content is reduced by evaporation, this suppressive effect diminishes and may disappear. Plants that use wet suppression systems (spray nozzles) to maintain relatively high material moisture contents can effectively control PM emissions throughout the process. Depending on the geographic and climatic conditions, the moisture content of mined rock may range from nearly zero to several percent. Because moisture content is usually expressed on a basis of overall weight percent, the actual moisture amount per unit area will vary with the size of the rock being handled. On a constant mass-fraction basis, the per-unit area moisture content varies inversely with the diameter of the rock. Therefore, the suppressive effect of the moisture depends on both the absolute mass water content and the size of the rock product. Typically, wet material contains 1.5 to 4 percent water or more.

A variety of material, equipment, and operating factors can influence emissions from crushing. These factors include (1) stone type, (2) feed size and distribution, (3) moisture content, (4) throughput rate, (5) crusher type, (6) size reduction ratio, and (7) fines content. Insufficient data are available to present a matrix of rock crushing emission factors detailing the above classifications and variables. Available data indicate that PM-10 emissions from limestone and granite processing operations are similar. Therefore, the emission factors developed from the emission data gathered at limestone and granite processing facilities are considered to be representative of typical crushed stone processing operations. Emission factors for filterable PM and PM-10 emissions from crushed stone processing operations are presented in Tables 11.19-1 (metric units) and 11.19-2 (English units).

Table 11.19.2-1 (Metric Units). EMISSION FACTORS FOR CRUSHED STONE PROCESSING OPERATIONS[a]

Source[b]	Total Particulate Matter	EMISSION FACTOR RATING	Total PM-10[c]	EMISSION FACTOR RATING
Screening (SCC 3-05-020-02,-03)	—[d]		0.0076[e]	C
Screening (controlled) (SCC 3-05-020-02-03)	—[d]		0.00042[e]	C
Primary crushing (SCC 3-05-020-01)	0.00035[f]	E	ND[g]	
Secondary crushing (SCC 3-05-020-02)	ND		ND[g]	
Tertiary crushing (SCC 3-05-020-03)	—[d]		0.0012[h]	C
Primary crushing (controlled) (SCC 3-05-020-01)	ND		ND[g]	
Secondary crushing (controlled) (SCC 3-05-020-02)	ND		ND[g]	
Tertiary crushing (controlled) (SCC 3-05-020-03)	—[d]		0.00029[h]	C
Fines crushing[i] (SCC 3-05-020-05)	—[d]		0.0075	E
Fines crushing (controlled)[i] (SCC 3-05-020-05)	—[d]		0.0010	E
Fines screening[i] (SCC 3-05-020-21)	—[d]		0.036	E
Fines screening (controlled)[i] (SCC 3-05-020-21)	—[d]		0.0011	E
Conveyor transfer point[k] (SCC 3-05-020-06)	—[d]		0.00072	D
Conveyor transfer point (controlled)[k] (SCC 3-05-020-06)	—[d]		2.4×10^{-5}	D
Wet drilling: unfragmented stone[m] (SCC 3-05-020-10)	ND		4.0×10^{-5}	E
Truck unloading: fragmented stone[m] (SCC 3-05-020-31)	ND		8.0×10^{-6}	E
Truck loading—conveyor: crushed stone[n] (SCC 3-05-020-32)	ND		5.0×10^{-5}	E

[a] Emission factors represent uncontrolled emissions unless noted. Emission factors in kg/Mg of material throughput. SCC = Source Classification Code. ND = no data.

[b] Controlled sources (with wet suppression) are those that are part of the processing plant that employs current wet suppression technology similar to the study group. The moisture content of the study group without wet suppression systems operating (uncontrolled) ranged from 0.21 to 1.3 percent and the same facilities operating wet suppression sytems (controlled) ranged from 0.55 to 2.88 percent. Due to carry over or the small amount of moisture required, it has been shown that each source, with the exception of crushers, does not need to employ direct water sprays. Although the moisture content was the only variable measured, other process features may have as much influence on emissions from a given source. Visual observations from each source under normal operating conditions are probably the best indicator of which emission factor is most appropriate. Plants that employ sub-standard control measures as indicated by visual observations should use the uncontrolled factor with an appropriate control efficiency that best reflects the effectiveness of the controls employed.

[c] Although total suspended particulate (TSP) is not a measurable property from a process, some states may require estimates of TSP emissions. No data are available to make these estimates. However, relative ratios in AP-42 Sections 13.2.2 and 13.2.4 indicate that TSP emission factors may be estimated by multiplying PM-10 by 2.1.

Appendix 5 - Reference and Guidance Material

1. B.C. Ministry of Environment, Air Quality Section. Guidance document for fugitive dust control plans. Draft Template. 2016.
2.
3. B.C. Ministry of Energy, Mines and Petroleum Resources. Ministry of Energy, Mines and Petroleum Resources Dust Management Plan Guidance. Implementation and Monitoring of the Application of Best Management Practices and Site Specific Mitigation measures to manage Dust Related to Industrial Mining Activities. Jan. 26, 2016

4. Aggregate Operators Best Management Practices Handbook for British Columbia 2002, Ministry of Energy, Mines and Petroleum Resources

5. The Province of British Columbia. Environmental Management Act [SBC 2003, chapter118]. Accessed on January 11, 2017. 1996. Available from: http://www.bclaws.ca/civixdocument/LOC/ complete/ statreg/ -- %20E%20 -- / Environmental%20Management%20Act%20[SBC%202003]%20c.%2053/00 Act/03053 00.htm.

6. Environment and Climate Change Canada. National Pollutant Release Inventory Toolbox: Pits and Quarries Guidance. Accessed on January 27, 2017. Available from: https://www.ec.gc.ca/inrp-npri/default.asp?lang=en&xml=A9C1EE34-2F2B-4583-BBAEE58E8CFE7A8A.

7. J. Csavina, J. Field, O. Felix, A. Y. Corral-Avitia, A. E. S ´ aez, E. A. Betterton. Effect of ´wind speed and relative humidity on atmospheric dust concentrations in semi-arid climates. Science of The Total Environment, 487 (2014), 82–90. ISSN: 0048-9697. Available fromfile://www.sciencedirect.com/science/article/pii/S0048969714004902

8. S. Ravi, T. M. Zobeck, T. M. Over, G. S. Okin, P. D'Odorico. On the effect of moisture bonding forces in air-dry soils on threshold friction velocity of wind erosion. Sedimentology, 53 (3) (2006), 597–609. ISSN: 1365-3091. Available from: http://dx.doi.org/10.1111/j.1365-3091.2006.00775.x.

9.

10. B.C. Ministry of Environment. Air Monitoring Instrumentation - Guidance for Instrument Selection. Guidance document. Victoria, B.C.: Environmental Sustainability and Strategic Policy Division, Environmental Monitoring, Reporting and Economics, 2016.

11. B.C. Ministry of Environment. Meteorological Sensors, Calibration and Routine Verification Ambient Air Program Standard Operating Procedures (SOP). Standard Operating Procedure. Victoria, B.C.: Environmental Sustainability and Strategic Policy Division; Environmental Monitoring, Reporting and Economics (previously Water and Air Monitoring and Reporting), 2007.

12.

13. B.C. Ministry of Environment. Meteorological Data and Sensing Requirements in the B.C. Ministry of Environment. Guidance document. Victoria, B.C.: Environmental Sustainability and Strategic Policy Division; Environmental Monitoring, Reporting and Economics (previously Water and Air Monitoring and Reporting), 2013

14. B.C. Ministry of Environment. Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators. Accessed on November 2, 2016. Available from: http : / / www2 . gov. bc . ca / assets / gov / environment / waste - management / industrial - waste/ industrial-waste/water air baseline monitoring.pdf.

15.

16. B.C. Ministry of Environment. A User Guide for the Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators. Accessed on November 2, 2016. Available from: http : / / www2 . gov. bc . ca / assets / gov / environment / waste - management / industrial - waste / industrial - waste / mining - smelt - energy / guidance - documents/ug water and air baseline.pdf.

17. B.C. Ministry of Environment. Air Monitoring Site Selection and Exposure Criteria (draft, version 6). Guidance Document. Victoria, B.C.: B.C. Ministry of Environment (previously Ministry of Water, Land and Air Protection), Environmental Protection Division, 2013

18. U.S. Environmental Protection Agency. Control of Open Fugitive Dust Sources. Accessed on November 2, 2016. 1988. Available from: https://www3.epa.gov/ttn/chief/old/ap42/ch13/s025/reference/ref 10c13s025 1995.pdf.

19. U.S. Environmental Protection Agency. Fugitive dust background document and technical information document for best available control measures. Accessed on November 2, 2016. 1992. Available from: http://www.nrc.gov/docs/ML1224/ML12241A395.pdf.

20.

21. Golder Associates Ltd. Literature Review of Current Fugitive Dust Control Practices Within the Mining Industry. Accessed on November 2, 2016. 2010. Available from: https:// www.miningexcellence.ca/wp-content/uploads/2014/01/Literature.pdf.

22.

23. Dust Control Operations Manual, Operations Illustrated, Mary Foster

24. Dust Control Plan for Exide Technologies Recycling Center, Remediation Services, Texas 2012

25. Environmental Best Practices for Highways Maintenance Activities, Ministry of Transportation and Infrastructure 2010

26. Guidebook for Sustainable Land Handling Facilities Best Management Practises, G3Consulting, 2003 for the Department of Fisheries and Oceans, Canada

27. Environment Yukon. 2014. *Dust Management Plan Guidelines - Application for Approval.* Available at: http://www.env.gov.yk.ca/air-water-waste/documents/DustManagementPlanGuidelines2014FINAL.pdf

28. *Best Management Practices to Mitigate Road dust from winter Traction Materials*, March 2005, Ministry of Water, Land and Air Protection, BC .https://www.for.gov.bc.ca/hfd/library/documents/bib95657.pdf