BRITISH COLUMBIA

Environmental Appeal Board

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DECISION NO. 2017-EMA-011(b)

In the matter of an appeal under section 100 of the *Environmental Management Act,* S.B.C. 2003, c. 53.

BETWEEN:	Thomas H. Coape-Arnold	**APPELLANT**
AND:	Delegate of the Director, *Environmental Management Act*	**RESPONDENT**
AND:	Pinnacle Renewable Energy Inc.	**THIRD PARTY**

BEFORE: A Panel of the Environmental Appeal Board

Gregory J. Tucker, QC	Panel Chair
R.G. (Bob) Holtby	Member
Kent Jingfors	Member

DATE: February 26 - March 1, 2018

PLACE: Vernon, BC

APPEARING:

For the Appellant:	Thomas H. Coape-Arnold
For the Respondent:	Meghan Butler and Johnny Van Camp, Counsel
For the Third Party:	Simon R. Wells, Counsel

APPEAL

[1] Thomas H. Coape-Arnold appeals a July 10, 2017 decision (the "Decision") made by Brian Vroom, delegate of the Director, *Environmental Management Act*, Ministry of Environment and Climate Change Strategy (the "Ministry"). The Decision granted an amended permit (the "Amendment" or the "Amended Permit") to Pinnacle Renewable Energy Inc. ("Pinnacle"). The Permit authorizes the discharge of contaminants to the air from Pinnacle's wood pellet manufacturing plant located in Lavington, British Columbia (the "Facility"). The Appellant, Mr. Coape-Arnold, submits that the Amendment should not have authorized certain emissions, and certain conditions should have been attached to the Permit.

[2] Section 103 of the *Environmental Management Act*, S.B.C. 2003, c. 53 (the "*Act*") provides:

Powers of appeal board in deciding appeal

103 On an appeal under this Division, the appeal board may

(a) send the matter back to the person who made the decision, with directions,

(b) confirm, reverse or vary the decision being appealed, or

(c) make any decision that the person whose decision is appealed could have made, and that the appeal board considers appropriate in the circumstances

BACKGROUND

The community and the Appellant

[3] Lavington is a community in the District of Coldstream, approximately 15 km east of Vernon, in the Whitevale Valley. Lavington supports a mix of rural, residential and industrial uses. There are approximately 600 residential households. The Whitevale Valley has an east-west orientation. Like many valleys in the interior of British Columbia, the Whitevale Valley is subject to periods of limited airflow and stagnant air, particularly in winter.

[4] The Appellant has resided in Lavington since 2011. He is retired, but spent most of his career with the Government of Ontario, including with the Ministry of the Environment and Ministry of Natural Resources. He has training as a scientist.

Manufacture of wood pellets and Pinnacle's Facility

[5] Wood pellets are manufactured from the by-products of wood processing. There are several wood pellet manufacturing plants in British Columbia. Those plants primarily produce wood pellets for export. The pellets are used in industrial and residential heating in various countries.

[6] The Pinnacle Facility is located on the site of the Tolko Forest Industries Ltd. ("Tolko") sawmill. The Tolko mill has operated in Lavington for many years. The Pinnacle Facility utilizes by-products from the Tolko mill in the manufacture of wood pellets.

[7] The wood pellet manufacturing process involves drying the wood chips, sawdust and shavings which make up the raw materials for the process. Historically, this was done through the use of rotary drum dryers. In recent years, there has been a switch to belt dryers. One significant difference between rotary dryers and belt dryers is that belt dryers operate at substantially lower temperatures.

[8] Pinnacle's Facility utilizes belt dryers manufactured by a German company, STELA Laxhuber Mgbh ("STELA"). Pinnacle's Facility is one of four British Columbia pellet manufacturing plants which utilize STELA belt dryers. The others are in Merritt, Fort St. John and Chetwynd.

Emissions of concern and applicable standards/guidelines

[9] The air pollutant of primary concern in the Interior region of British Columbia is "fine particulate matter", especially "$PM_{2.5}$" and "PM_{10}". $PM_{2.5}$ and PM_{10}, respectively, are particles which have a diameter less than 2.5 or 10 micrometers, also known as microns (µm)[1]. $PM_{2.5}$ is of the greatest concern for human health and has been the focus of attention in connection with the Facility. Particulate matter is produced from a number of sources, both natural and human made.

[10] There are regulatory standards or objectives in British Columbia both for ambient exposure to fine particulate matter, and the sources of fine particulate matter. Standards or objectives for ambient exposure consider the level of fine particulate matter at a location, irrespective of source. Objectives for the sources of fine particulate matter deal with the pollutants emitted from a specific industrial or other sources.

[11] Current standards in British Columbia for ambient exposure to $PM_{2.5}$ were adopted on April 9, 2009 as a Provincial Ambient Air Quality Objective (or "AAQO"). The AAQOs specify three different criteria for $PM_{2.5}$. The 24-hour objective for $PM_{2.5}$ is 25 micrograms per cubic metre (µg/m^3), which means that the concentration does not exceed 25 µg/m^3 when averaged over a 24-hour period. The annual objective for $PM_{2.5}$ is 8 µg/m^3, based on a one year averaging period. The planning goal for $PM_{2.5}$ is of 6 µg/m^3 based on a one year averaging period. Accordingly, to meet the AAQOs for $PM_{2.5}$, a community should not be exposed to $PM_{2.5}$ at a concentration exceeding an average of 25 µg/m^3 over a 24-hour period, and an average of 8 µg/m^3 over a one year period. The AAQO for PM_{10} is 50 µg/m^3, averaged over a 24-hour period.

[12] The AAQOs are not specific to any emission source. They refer to ambient measurement, and take into account all sources affecting a particular location. The AAQOs are not regulatory standards, but are documented standards that are utilized by the Ministry in connection with permitting. The AAQOs are also utilized for other purposes, including issuance of air quality advisories.

[13] Modelling is used to attempt to predict the exposure to particulate matter in a community or at a particular location, and the predictions generated by modelling may be confirmed by measuring ambient concentrations using mobile or fixed monitoring stations. Modelling involves the application of one or more assessment methods, based on various measured or assumed inputs, including emissions sources, atmospheric conditions, and other variables. One aspect of air pollution measurement or modelling relevant to this Appeal is use of "windroses" and "pollution roses". A windrose indicates prevailing winds at a particular location (which can, themselves, be modelled or measured). A "pollution rose" is a windrose which shows pollutants as associated with prevailing winds.

[14] Turning to the regulation of emissions sources, the Ministry has developed a non-statutory Operational Policy Guideline for Emissions from Wood Pellet Manufacturing Facilities (the "Guidelines"). The Guidelines were published in 2010. The Guidelines set a limit for particulate matter in dryer exhaust emissions of 60

[1] A micrometer is a millionth of a meter.

milligrams per cubic metre (mg/m^3)[2], with dryer exhaust to be monitored quarterly. The limit was initially sent as an "interim" two year limit which was referred to in the Guidelines as subject to potential adjustment. The Guidelines have not been adjusted.

[15] Emissions are generally measured via "stack tests", conducted periodically on each "stack" (or vertical exhaust pipe) at an industrial facility.

Volatile organic compounds, the "Prince George study", and the Envirochem Report

[16] The Appeal focuses on a specific category of air emissions, called volatile organic compounds or "VOCs". VOCs are present naturally in wood, and are emitted at a low level on an ongoing basis by trees and other plants. VOC's are emitted at a higher level during drying or burning of wood. Sources of elevated VOC's include natural fires, controlled fires, woodstoves and industrial processes, including the pellet manufacturing process. VOCs will constitute a certain portion of the particulate and non-particulate matter emitted from a wood product processing facility, including wood pellet manufacturing. Accordingly, to the extent that VOCs are emitted as, or become, fine particulate matter, they are subject to the AAQOs. However, VOCs are not separately or specifically regulated in British Columbia. VOCs are the subject of specific regulations or guidelines in some other jurisdictions.

[17] In connection with VOCs, the Appellant makes substantial reference to the "Prince George study". The primary relief which the Appellant seeks is that the Board direct the Ministry and/or Pinnacle to conduct a similar study in Lavington. The "Prince George study" was a VOC study conducted by the Ministry, in response to odour complaints in areas of Prince George. The study involved testing ambient levels of several VOCs. The results were set out in a 2013 report issued by the Ministry (2011-2012 Prince George Neighbourhood Volatile Organic Compound (VOC) Sampling Program, BC Ministry of Environment, March 2013). Because British Columbia has no ambient air quality objectives for the VOCs tested, the ambient levels of VOCs were compared against the most stringent air quality objectives from other North American jurisdictions. The study found that all VOCs studied were well below regulatory levels found in other jurisdictions, except for one specific compound: acrolein. Acrolein is emitted from vegetation and is most abundant in coniferous trees, especially Pine, according to the Prince George study. The Prince George study found some acrolein exceedances, when measured against the California Environmental Protection Agency objectives. The Prince George study notes that alpha pinene was the only other compound that was measured at levels of 20% of regulatory standards in other jurisdictions.

[18] VOC emissions from the wood pellet manufacturing process were studied by the Ministry commencing in 2008, and were the subject of a May 12, 2010 report prepared by EnviroChem Services Inc. for the Ministry, titled "Emissions and Air Pollution Controls for the Biomass Pellet Manufacturing Industry" (the "EnviroChem Report"). The EnviroChem Report is based on a study of rotary dryers, which, as

[2] A milligram is 1,000 micrograms, or one thousandth of a gram.

noted above, operate at much higher temperatures than belt dryers. Based on data from pine bark (as opposed to white wood which is most commonly used in pellet plants), the EnviroChem Report concluded that, as temperature rises from 175 °C to 275 °C, VOC emissions increase from less than 1 kg/tonne of wood to approximately 40 kg/tonne of wood. Above approximately 275° C, VOC emissions increase exponentially. The EnviroChem Report indicates that there are no or negligible VOC emissions from pine bark at lower temperatures. The Report includes a graph on p. 25, in which VOC emissions flat-line along the bottom, or zero, axis of the graph below 175 °C. However, on page 30, the EnviroChem Report states that "PM and VOC emissions from pellet dryers depend on the type of feed stock (tree species, age of wood, moisture content, and particle size), and dryer technology and settings (e.g. temperature)." The Ministry relied, in part, on the EnviroChem Report when assessing the application for the Amended Permit, and particularly in considering the issue of VOC emissions.

The Permit and operation of the Facility

[19] The proposal to construct the Facility was subject to some controversy in Lavington. There was pre-existing concern among some residents as to air quality in the Whitevale Valley. An informal group of residents known as "Lavington Life" were active in questioning the proposed Facility, including its permitting. The Appellant was among those who took a lead role on this issue.

[20] Because the Facility would produce waste emissions, a permit was required under section 14 of the *Act*. In 2014, Pinnacle applied for its original permit in connection with the Facility.

[21] The original Permit for the Facility was issued on December 17, 2014, following an application process. The Permit authorized certain discharges from specific components of the Facility; specifically, two STELA belt dryers, a pellet mill baghouse, a hammermill baghouse, and a truck tipper suction system. The hammermill crushes material, and the pellet mill presses or pelletizes material, as part of the pellet manufacturing process. The truck tipper is related to delivery of materials. The belt dryers dry the raw materials, and are central to the pellet manufacturing process. The focus of this appeal is on the dryers.

[22] The Permit set limits on discharge rates and characteristics. The maximum permitted rate of discharge from each of the belt dryers was 66 m^3 per second. Pursuant to clause 2.1.3 of the Permit, characteristics of the discharge from each of the dryers was required to be equivalent to or better than 15 mg/m^3 of total particulate matter (or "TPM"). Maximum net combined discharge of TPM for both belt dryers, the pellet mill and hammermill baghouses, and the truck tipper suction system, was not to exceed 10.314 kg/hour.

[23] The Permit also set several general requirements, including a provision that the Director may require monitoring and analysis (clause 3.3), and a requirement for certain "emission offset works". This requires explanation. The Permit, while authorizing certain emissions from the Facility, required a corresponding reduction in emissions from the adjacent Tolko sawmill. This was to be achieved by replacement of the Tolko planer mill cyclones with a baghouse filtration system, on or before the day the Pinnacle Facility was to commence operations. The planer

mill manufactures dimensional lumber. Those changes to the Tolko planer mill permitted a reduction in emissions corresponding to the expected emissions from the Facility.

[24] While not specified in the Permit, the Permit was issued on the assumption that the two STELA belt dryers would be operated as "double pass" dryers. In a "double pass" system, air is circulated twice over the pellets prior to being discharged into the atmosphere. The maximum discharge rate of 66 m^3 per second for each dryer assumed a "double pass" operation.

[25] The Facility commenced operations in fall 2015.

First emissions monitoring station

[26] On November 9, 2015, the Ministry installed an air emissions monitoring station in Lavington. The station was installed at the Lavington Baptist Church, located just west of the Pinnacle plant. Given the east-west orientation of the Whitevale Valley and prevailing winds, the Lavington Baptist Church station is generally downwind of the Facility. Accordingly, the station would generally record emissions including any contribution from the Facility.

The First Appeal

[27] Three individuals, including Mr. Coape-Arnold, appealed the Director's decision to grant the Permit. The Notice of Appeal was filed on January 13, 2015 (the "First Appeal"). The First Appeal reached a reasonably advanced stage, including the filing of the Appellant's Statement of Points. Among the issues raised in First Appeal were: alleged inadequacies in air emissions modeling conducted by Pinnacle and assessed by the Ministry; alleged lack of proper assessment of "Best Available Technology" (or "BAT"); and, alleged lack of proper assessment of VOCs.

[28] The First Appeal was settled by way of a Memorandum of Understanding ("MOU") dated June 7, 2016. The MOU states that it is a public document, and it was agreed that the MOU could be considered in connection with the present appeal. The terms of the MOU include the following:

- Pinnacle would engage a specific named consultant to consider methods to ascertain $PM_{2.5}/PM_{10}$ size fraction ratios at its Merritt pellet mill "under EPA approved methods" (clause 1).
- Pinnacle and the Ministry would establish an air quality management committee consisting of at least one representative from the Ministry, two members of the community, and a representative from Pinnacle. The Ministry would chair the committee until such time as a member of the District of Coldstream joined the committee. The committee would meet at least once every six months. Terms of reference would include pursuing "preparation of a science based air quality management plan" (clause 7).
- The Ministry would "commit to continued ambient monitoring in Lavington, until December 2017" (clause 9).

[29] There were a number of other terms, including references to terms for fugitive dust emission. Fugitive dust emissions were an issue on the First Appeal, but not on the current appeal.

Reasons for Pinnacle's amendment application

[30] On March 9, 2016, there was a fire at the Facility. The cause of the fire was determined by Pinnacle to be material passed back through the belt dryer as a result of the "double pass" recirculation system. Pinnacle had also become concerned about excessive corrosion to equipment which was believed to result from the recirculation of air.

[31] As a result of these two matters, Pinnacle concluded that it was necessary to eliminate the double pass recirculation system. While the Permit did not specify or require that a double pass system be utilized, an increase in emissions resulting from the changed operation method would require an amendment to the Permit.

Permit amendments - section 16 of the *Act*

[32] Permit amendments are governed by section 16 of the *Act*. Section 16 states, in part:

> **Amendment of permits and approvals**
>
> **16** (1) A director may, subject to section 14 (3), this section and the regulations, for the protection of the environment,
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> (a) on the director's own initiative if he or she considers it necessary, or
>
> (b) on application by a holder of a permit or an approval,
>
> amend the requirements of the permit or approval.
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> ...
>
> (4) A director's power to amend a permit or an approval includes all of the following:
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> (a) authorizing or requiring the construction of new works in addition to or instead of works previously authorized or required;
>
> (b) authorizing or requiring the repair of, alteration to, improvement of, removal of or addition to existing works;
>
> (c) requiring security, altering the security required or changing the type of security required or the conditions of giving security;
>
> (d) extending or reducing the term of or renewing the permit or approval;

> (e) authorizing or requiring a change in the characteristics or components of waste discharged, treated, handled or transported;
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> (f) authorizing or requiring a change in the quantity of waste discharged, treated, handled or transported;
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> (g) authorizing or requiring a change in the location of the discharge, treatment, handling or transportation of the waste;
>
> (h) altering the time specified for the construction of works or the time in which to meet other requirements imposed on the holder of the permit or approval;
>
> (i) authorizing or requiring a change in the method of discharging, treating, handling or transporting the waste;
>
> (j) changing or imposing any procedure or requirement that was imposed or could have been imposed under section 14 *[permits]* or 15 *[approvals]*.
>
> ...

Pinnacle's application to amend the Permit

[33] The application and notification requirements that apply to applications for an amendment to an air emissions permit granted under the *Act* are set out in the *Public Notification Regulation*, B.C. Reg. 202/94. The requirements for permit amendment applications vary, depending on whether the applicant proposes to make "minor amendments" or "significant amendments" to the permit, as defined in the *Public Notification Regulation*. When an application proposes significant amendments to a permit, public notification of the application must be provided, and the director must give notice of his decision to all persons who provide written submissions expressing concerns about the application.

[34] The proposal to amend the Permit was first referred to in an email from Pinnacle to the Ministry dated November 14, 2016. In that email, Pinnacle referred to the condensation issues (not the spring 2016 fire) resulting from air passing through the belt dryers twice before discharge to the atmosphere, and the fact that the Merritt, Fort St. John, and Chetwynd pellet plants all operated with "single pass" belt dryer systems. Pinnacle proposed an amendment that would allow an increase in air flow by changing to a single pass through the belt dryers, and small changes to emissions concentration and loading. At that time, Pinnacle was proposing to reduce TPM emissions concentrations on each dryer from 15 mg/m^3 to 10 mg/m^3.

[35] This was followed by internal correspondence within the Ministry assessing the proposed changes. These internal initial assessments noted, among other things, that the increase in flow rates through the dryer stacks should result in a corresponding decrease in stack concentrations, as well as a decrease in ambient concentrations due to higher stack exit velocities. In other words, by doubling the flow through the dryers as a result of passing the air over the bed only once, and with the volume and characteristics of the raw material remaining the same, logic would indicate that the concentration in the emissions should decrease. The higher

velocity of the material exiting the stacks would disperse the emissions over a wider area, which should decrease local exposure. At that time, Pinnacle and the Ministry expected that the proposed amendment would qualify as a "minor" amendment, involving limited revision to emissions, and a simplified application process.

[36] There was discussion between Pinnacle and Ministry staff concerning the information and analysis that would be necessary in connection with the formal application for the Amended Permit. This was to include dispersion modelling, to be carried out by Pinnacle. This work would be intended to model the expected air quality impacts of the changes that Pinnacle was proposing. The new studies were to take the form of an addendum to modelling work prepared by Pinnacle in 2014 in connection with the original Permit application. Essentially, the modelling would be re-done by substituting the expected changes in stack configurations and flow rates.

[37] In February 2017, Pinnacle submitted that analysis to the Ministry in a report titled, "Addendum Comments on Stack Testing and Ambient Monitoring", which was prepared by a consultant retained by Pinnacle, RWDI Air Inc. ("RWDI"). This report indicated that there may be an increase of more than 10% in emissions relative to the levels authorized in the Permit. The analysis indicated that emissions from the dryers would double, and emissions from the Facility overall would increase by 70%. As a result, the amendment to the Permit would be classified as a "major" amendment, requiring a more extensive application and public notification process.

[38] During spring 2017, there was further detailed internal Ministry assessment of Pinnacle's proposal, and correspondence between the Ministry and Pinnacle. Some of this correspondence is referred to in more detail below, in connection with Issue #4 (setting TPM limits). Ministry staff also investigated stack testing information from the four operating pellet plants utilizing belt dryers in British Columbia referred to above, as well as the compliance history of those plants.

[39] On March 27, 2017, Pinnacle submitted a preliminary formal application for amendments to the Permit. The preliminary application proposed four primary changes to the Permit:

- Permitted airflow on both belt dryers would be increased. Total maximum rate of discharge would be doubled, from 66 m^3 per second to 132 m^3 per second, with the maximum discharge rate now specifically allocated to the two stacks which would serve the dryers.
- The hammermill baghouse emissions limits would be removed. This was on the basis that the pellet mill cyclofilter had sufficient capacity to treat airflow from both the hammermill and the pellet mill.
- Authorized emissions from the pellet mill baghouse would be reduced from 15 mg/m^3 to 10 mg/m^3. The 15 mg/m^3 of TPM authorized for each dryer would remain.
- Maximum combined rate of TPM discharge for all sources would increase from 10.314 kilograms per hour to 15.480 kilograms per hour.

[40] In a March 27, 2017 email from Pinnacle to the Ministry, Pinnacle stated that it was requesting a "Minor Amendment" as it was keeping the increase in emissions below 10% for the entire Facility.

[41] On April 3, 2017, the Ministry sent a letter to Pinnacle, stating that the Ministry required further information from Pinnacle before the amendment application would be considered complete and ready for Ministry consideration. In summary, the Ministry required Pinnacle to: provide further technical information including predicted $PM_{2.5}$ ground level concentrations; publish public notice of the proposed amendment; meet with the Interior Health Authority, District of Coldstream, and the Lavington Life Society; and, consult local First Nations.

[42] Thus, following the submission of the initial application, Pinnacle conducted consultation with the Lavington Life Society and the other specified parties. In spring 2017, there were one or more conference calls involving representatives of the Ministry, Pinnacle, and the Lavington Life Society, including Mr. Coape-Arnold. Some correspondence was also exchanged. Concerns were expressed by representatives of Lavington Life Society regarding VOCs, among other things. There was also internal correspondence and discussion among Ministry staff as to the possibility of requiring a VOC study to be conducted as a condition of amending the Permit.

[43] In June and early July 2017, Pinnacle submitted its final application for the amendments. The final application included a consultation report and additional technical information. The proposed amendments were as set out in the preliminary application.

The Adams Report

[44] A detailed report dated July 5, 2017, titled "Review of Technical Assessment Report for Stack Modifications to Pinnacle Pellet Plant, Lavington" was prepared by Ralph Adams of the Ministry's Environmental Protection Division, Monitoring, Assessment and Stewardship, Kamloops (the "Adams Report").

[45] The Adams Report discussed several matters including air quality in Lavington, dispersion modeling, and operations of the existing Lavington plant and similar pellet plants in British Columbia. The Adams Report covered several matters that are relevant to the present appeal, and this decision refers to it in some detail.

[46] The Adams Report discussed results of air quality testing in Lavington at the Lavington Baptist Church location during 2015, 2016, and 2017, and referred to air quality testing in other communities including Vernon and Kamloops. $PM_{2.5}$ levels in Vernon and Lavington were very similar for 2016. The annual average, used as a measure of long term exposure to $PM_{2.5}$, was 6.3 and 6.7 $\mu gm/m^3$ in Lavington and Vernon, respectively, well below the AAQO objective of 8 $\mu gm/m^3$. The 98^{th} percentile, used as a measure of short term exposure to $PM_{2.5}$, was 17 $\mu gm/m^3$ in both Lavington and Vernon. This was, again, well below the provincial AAQO figure of 25 $\mu gm/m^3$. The annual average and daily maximums for $PM_{2.5}$ were higher in Kamloops than in Lavington or Vernon. Only a few interior communities had lower annual average $PM_{2.5}$ levels than Lavington in 2016. There was one day, January 5,

2017, when average $PM_{2.5}$ concentrations in Lavington exceeded 25 µgm/m^3, resulting in an air advisory. The cause appeared to be illegal burning of waste near Lumby, and a fire at the Tolko sawmill.

[47] The Adams Report noted discrepancies between the modelling submitted by Pinnacle and certain work completed by the Ministry. The discrepancies were generally in wind direction. In his Report, Mr. Adams referred to pollution rose modelling, based on wind rose modelling. On page 11 of the Adams Report, he explained that a "pollution-rose is simply a wind-rose where the windspeed has been replaced by a pollutant concentration." Mr. Adams noted that wind rose and pollution rose modelling indicated no significant contribution from the Facility. He noted that the pollution rose modelling, which included contribution from the Facility (based on wind direction), did not indicate a materially greater proportion of particulate matter in the $PM_{2.5}$ range. This is referred to in more detail below, as this issue forms part of the basis of the Appellant's second ground of appeal.

[48] After reviewing the wind rose and pollution rose modelling, Mr. Adams concluded that, in order to determine the contribution of the Pinnacle Facility and Tolko mill to $PM_{2.5}$ levels in the Lavington airshed, additional information would be required. He stated that the best options involved enhanced monitoring: either install a duplicate monitoring station upwind of the Pinnacle Facility and Tolko mill relative to the existing Lavington Baptist Church station; or, use a mobile vehicle mounted monitoring station.

[49] Page 14 of the Adams Report provides the following summary of conclusions regarding ambient air quality:

- $PM_{2.5}$ levels in the Lavington airshed are similar to those in Vernon. In the 2016 calendar year all provincial air quality objectives were met.
- In 2016, Lavington was among the interior valley communities with the best air quality.
- The trends in $PM_{2.5}$ concentrations through the year and days suggest that woodsmoke is a significant contributor to $PM_{2.5}$ levels in the airshed.
- Analysis of wind data and $PM_{2.5}$ data did not show a significant contribution from the Pinnacle and Tolko mills to the observed $PM_{2.5}$ values.
- Since November 2015 there has only been a single day where $PM_{2.5}$ concentrations reached levels where an advisory was issued. This occurred on January 5th, 2017. It was determined that the source of the $PM_{2.5}$ was smoke from illegal burning of mill waste near Enderby and an unreported hog-pile fire at the Tolko mill.
- It is not possible with available measurements to determine the proportion of the measured $PM_{2.5}$ contributed by the Pinnacle and Tolko Mills. To make this determination expanded monitoring would be required if this is necessary. At the levels currently measured in Lavington it would be unusual to continue or expand the monitoring unless there was deterioration in ambient air quality.

[50] Mr. Adams then considered the dispersion modelling analysis that RWDI prepared on behalf of Pinnacle. That data indicated that emission concentrations in Lavington would decrease following the revised operations proposed in Pinnacle's application for the amendment. However, the Adams Report states on page 15, "Given that permitted emissions increase by approximately 70% after the modifications this requires comment". RWDI had concluded that the decrease in modelled ambient $PM_{2.5}$ was likely due to increased temperature and exit velocity of the modified stacks, which would increase vertical momentum for emissions from the Facility and cause emissions to disperse over a wider area. Mr. Adams concluded that this was a "plausible argument", because under normal conditions, a plume with a higher exit velocity and temperature would rise higher, and therefore, have more time to disperse. In addition, he noted that the proposed changes in two of the four stacks may result in plume points becoming more separated, which would dilute ground level exposure. The reduced air emissions from the hammermill and pelletmill may also be relevant. However, Mr. Adams concluded that there were "high uncertainties" in RWDI's modelling results, because "the modelled windfields do not match measurements from the Coldstream Ranch and Lavington Baptist Church [monitoring station] sites.

[51] Next, Mr. Adams discussed the steps that the Ministry took to investigate that uncertainty. Mr. Adams discussed data taken from the Coldstream Ranch monitoring station, the Lavington Baptist Church station, and various modelling runs undertaken by the Ministry. Mr. Adams concluded that the Ministry results were more reliable than those submitted by Pinnacle. At pages 21 – 22, the Adams Report concluded that, based on the Ministry's modelling results, there would be little change in the existing $PM_{2.5}$ concentrations in Lavington if the application for the amendment was granted. Modelling by both the Ministry and RWDI indicated that the largest increase in predicted ambient concentrations would occur at the fence line or within the boundaries of the Facility, and values would decrease rapidly with distance from the Facility. The Ministry and RWDI modelling also indicated that the maximum $PM_{2.5}$ concentrations were indicated to occur northeast (upwind) of the Facility, although the Ministry modelling indicated higher maxima than the RWDI modelling. The Ministry modelling indicated that secondary maxima may occur on elevated terrain to the north and southwest of the Facility, with some portions occurring in a residential area. The Adams Report concluded on page 24 that there was uncertainty in the modelling of estimated ambient concentrations, and "In my opinion, it is unlikely that additional modelling would reduce the uncertainty."

[52] Mr. Adams discussed operation of similar pellet plants around British Columbia. Mr. Adams noted that four pellet plants equipped with STELA belt dryers were operating under permits in British Columbia. Those plants were located in: Merritt; Fort St. John; Chetwynd; and Lavington. Mr. Adams set out the permitted PM loading for the STELA dryer equipped plants Fort St. John, Merritt, and Chetwynd, as compared to the permitted and proposed loading from the Lavington Facility. Results from the other facilities indicate that emissions from single pass dryers are similar to those from double pass dryers.

[53] Mr. Adams reviewed the operation of the Lavington Facility under the terms of the Permit. Stack testing showed that all stack limits were met. Stack

concentrations of total PM were well below the limit of 15 mg/m^3. The highest value measured at any single stack was 10.1 mg/m^3 on Dryer No. 1 South in June 2016, approximately 2/3 of the permitted value. The average value for all tests was 6.1 mg/m^3. Mr. Adams noted the uncertainty in modelling discussed above, and that the large increase in actual emissions would increase the uncertainty in estimating potential ambient air impacts in connection with the proposed amendment.

[54] Mr. Adams referred to odor complaints and reports of smoke plumes, usually associated with a single stack at the Lavington plant. Most of the smoke reports occurred early in the operation of the plant, although Pinnacle had reported several small fires in the dryers caused by corrosion due to use of the two pass configuration system. Mr. Adams noted that the conversion of the dryers to single pass was intended to eliminate the risk of such fires.

[55] In summary, the Adams Report concluded as follows on page 2:

> My conclusion after reviewing the available information is that there is no clear evidence that ambient air quality would deteriorate in the Lavington airshed if the requested modifications were made. However, due to the increased uncertainty in model output, there is risk that an increase in $PM_{2.5}$ concentrations will occur under certain meteorological conditions given the large increase in dryer emissions. In my opinion, the only way to confirm that an increase has not occurred is by stack testing and ambient monitoring.
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> If the amendment is granted, my recommendations are:
>
> - Stack testing of the dryer and cyclofilter stack be completed within 60 days of the modified plant starting to confirm that the values for stack emissions used in this assessment are correct (based on experience with other plants operating in BC, I do not recommend that these tests include size fractionation of the PM). Stack tests on the dryer stack should include both filterable and condensable fraction of PM.
> - That quarterly stack testing be required for the first year of operations after modifications are complete and the modified plant is operating.
> - That the proponent be required to participate, at the discretion of the Director, in an ambient air quality monitoring programme in the Lavington airshed. Note that Pinnacle declined to participate in funding the existing monitoring at the Lavington Elementary School. Pinnacle should cover all costs of monitoring in the future.
> - A review of measured $PM_{2.5}$ levels al the existing Lavington Baptist Church station after the modifications to the plant are completed must be undertaken by ministry staff to determine if the modifications have resulted in adverse changes in ambient air quality. If required, an enhanced monitoring programme should be implemented which not only supplies information about ambient air

> quality levels (the existing monitoring), but also supplie[s] information on the contribution of the pellet plant to ambient concentrations, and the spatial variability in $PM_{2.5}$ levels in the airshed.
>
> - An episode management plan be implemented that includes emission reductions at the plaint if ambient air quality levels exceed advisory levels.
>
> [underlining added]

[56] Mr. Adams provided his Report to Safwan Soufan, an Environmental Protection Officer with the Ministry, via an email dated July 7, 2017, which said, in part:

> I would like to emphasize that there is a greater level of uncertainty in the conclusions than is normal in this kind of review. While I do not believe there is likely to be a deteriorat[ion] of ambient air quality if the amendment is granted, there is risk. This is why I believe it is imperative that we use monitoring to confirm that there has been no deterioration.

The Soufan Report

[57] The Adams Report was followed by a Ministry Assessment Report dated July 9, 2017, prepared for the Director by Mr. Soufan (the "Soufan Report"). The Soufan Report details the application and consultation process, and refers to the conclusions in the Adams Report. The Soufan Report considers certain additional matters. On page 16, the Soufan Report considers whether the proposed amendment involved "best achievable technology" in accordance with the Ministry's 2010 Guidelines, and concludes that although no pollution control technology was specified in the Permit, this was consistent with other authorizations for belt dryers in British Columbia, and the proposed TPM concentrations were well below the Permit limit. The Soufan Report also discusses the EnviroChem Study, and concluded on page 17 that, given the relatively low temperature operating range at the Facility, VOC emissions "are deemed to be most likely of a minor impact on the receiving environment".

[58] Overall, the Soufan Report concluded as follows on page 20:

- The proposed changes involve operational changes associated with flow rate increase, stack configuration changes that result in an increase in the particulate matter mass loading rate to the receiving environment by approximately 50^{+}%.
- The noted proposed changes entailed conducting airshed modelling by the Applicant's QP [Qualified Professional, RWDI] as requested by the ministry to assess the impact on the receiving environment.
- The proposed changes entailed adjudicating a significant permit amendment as defined and required by the Public Notification Regulation as well as First Nations engagement and follow up.

- The Ministry's SME [Subject Matter Expert, Mr. Adams] reviewed, assessed the modelling findings and additionally conducted independent dispersion modelling, and provided a Summary and Recommendations (Section 8).
- Based on the Public Notification and first Nations engagement and referral follow up outcomes, it has been concluded that, at this point, further notification is not required.
- The noted proposed changes entailed conducting a comprehensive review of the current permit requirements, recommending updates and additions to the current requirement as deemed appropriate. The updates mainly included:
    - o Updating permit definitions which included the addition of Qualified Professional and Fugitive Dust definitions.
    - o Updating authorized source descriptions, emission rates and the total particulate matter mass loading rate.
    - o Updating the permit General Requirements including mainly:
        - Requiring that the Air Episode Management Plan is subject to the Director's approval
        - Updating the previously fulfilled Emission Offset Works requirement
        - The Director may require studies by QP
    - o Updating the Monitoring and Reporting Requirements, including: source monitoring frequencies and conditions, submission of a Dust Monitoring Plan (by QP) for approval, future impact assessments to be prepared by QP, and requiring the permittee to pay for a portion of an air quality and meteorological monitoring program.

Based on the information provided by the proponent in Final Application documents and the Ministry's SME Environmental Impact Assessment Report and these report findings, I recommend that authorization 107369 be amended subject to the terms and conditions contained within the draft permit.

The Amended Permit

[59] The Amended Permit was issued on July 10, 2017, as noted above. The Amended Permit revised emissions levels in accordance with the changes sought by Pinnacle, and added or revised certain permit conditions. In summary:

- The Amended Permit authorizes discharge to "single pass" dryers (the original Permit was silent).
- Total maximum rate of discharge is 132 m^3 per second for each dryer (clause 2.1.1), an increase from 66 m^3 per second. Characteristics of the

discharge must be equivalent to or better than 15 mg/m^3 of TPM, which is unchanged from the original Permit.

- The cyclofilter baghouse stack limit was reduced to 10 mg/m^3 of TPM, from 15 mg/m^3 (clause 2.3.4).
- Maximum combined discharge rate of TPM from all sources must not exceed 15.480 kilograms per hour, which is an increase from 10 kilograms per hour (clause 2.4).
- Certain restrictions were added in terms of event notification, including a requirement that certain steps be taken within 24 hours, which was decreased from 60 hours in the Permit (clause 3.2).
- Additional language was added with regard to "future impact assessment", clarifying that the Director may require studies to be conducted by a qualified professional (clause 3.4).
- Additional requirements were added in connection with fugitive dust control (clause 3.6).
- Additional requirements were added in connection with the Facility's air episode management plan (clause 3.7).
- A new term was added requiring Pinnacle to participate in a joint ambient air quality and meteorological monitoring program in the local area, that includes $PM_{2.5}$ or related studies, as directed in writing by the Director. Pinnacle was required to pay an unspecified portion of the associated costs. Based on the results of the monitoring, the Director may direct Pinnacle to conduct additional air quality and meteorological monitoring (clause 4.7)

Second monitoring station

[60] In November 2017, an additional monitoring station was installed upwind of the Facility. As of the date of appeal hearing, there were no results or analysis from the second monitoring facility. The additional monitoring facility is the facility referenced in the Adams and Soufan Reports, and referred to in the Amended Permit. The second monitoring station should assist in determining whether there is any increase in TPM, $PM_{2.5}$ or PM_{10} following the issuance of the Amended Permit, and whether the Facility is the cause of or a contributor to any such increase.

The Appeal

[61] The Notice of Appeal was filed on August 9, 2017. The Notice of Appeal raised seven grounds of appeal. In a preliminary decision issued on November 6, 2017 (Decision No. 2017-EMA-011(a)), two grounds of appeal were dismissed as being outside of the Board's jurisdiction, and one was "read down" so that it was limited to the decision to grant the Amended Permit.

[62] In addition, a ground of appeal regarding discharge fees was abandoned during the appeal hearing.

[63] Consequently, the remaining grounds for appeal, as amended, are as follows:

- **Lack of proper consideration of increase in VOCs**. The Appellant asserts that VOCs were not properly considered in connection with the Amended Permit. The Appellant does not assert that the Amended Permit should be set aside on this ground, but says that a VOC study should have been required as a condition of granting the Permit. The Appellant says that the Board should direct such a study. However, the Board's November 6, 2017 decision ruled that this ground of appeal must be read down to relate only to any increase in VOCs as a result of the Amended Permit, and the original Permit could not be challenged. Thus, the issue is whether a VOC study is required as a result of any increase in emissions resulting from the Amended Permit.
- **Inadequate emissions dispersion modelling**. The Appellant asserts that the dispersion modelling utilized in connection with the amendment process did not take into account local data, including data from the Lavington Baptist Church monitoring station. The Appellant asserts that the Board should require the Permit to be amended to require certain specific additional modelling, and if that modelling demonstrates $PM_{2.5}$ levels exceeding 6.0 µg/m^3, the Permit should be further amended to reduce allowable TPM and $PM_{2.5}$.
- **Requirement to specify discharge limits for $PM_{2.5}$ and PM_{10}**. The Appellant asserts that, with $PM_{2.5}$ being the particulate of primary concern, it should be specifically regulated, and that there are stack measurement methods which can properly measure $PM_{2.5}$. The Notice of Appeal calls for the Ministry to undertake the work to validate and apply those methods.
- **TPM limits set too high**. The Appellant asserts that the TPM limit of 15.48 kg/hr in the Amended Permit is too high, as Pinnacle estimated that the Facility's actual TPM loading would be less than 5 kg/hr. After the appeal was filed, the Appellant's argument on this ground changed to focus on the dryer limits of 15 mg/m^3 rather than hourly TPM limits for the Facility as a whole[3].

The Appellant's "thesis" and central argument

[64] At the appeal hearing, the Appellant put forward what he called a "theory" or "thesis" which had two parts. The first part is that there will be an inordinate increase in VOC emissions where there is an increase in dryer temperature, at the temperature ranges at the Facility. The second part of the Appellant's theory is that certain VOCs, which are components of the Facility's emissions, are highly reactive and combine with certain substances to form aerosol particles that condense as particulate matter in the $PM_{2.5}$ range, causing an increased health risk.

[3] At certain points in his materials, including in connection with this issue, the Appellant mistakenly refers to micrograms (µg), when he intends to refer to milligrams (mg). A microgram is one millionth of a gram, and a milligram is one thousandth of a gram. The Panel treats the materials as amended to correct this error wherever it occurs.

[65] The Appellant's theory is central to the first three substantive issues addressed below (Issues 5. a., b., and c.). It is relevant, although not central, to the fourth substantive issue (Issue 5. d.).

[66] The EnviroChem Report states, and the Respondent agrees, that at temperatures which are much higher than the temperature range in the STELA belt dryers at the Facility, there are significant VOC emissions. The Appellant's theory is that such increases also take place at lower temperatures. The merits of this point, crucial to the Appellant's theory, are dealt with below.

[67] A key component of the Appellant's theory is the assertion that the increase in bed temperature in the dryer, associated with the Amended Permit, has a significant change on the amount and/or composition of VOCs emitted from the Facility. Neither the Permit nor the Amended Permit specify bed temperature. The Respondent and Pinnacle acknowledge that the change from a double-pass to single-pass dryer system is accompanied by an increase in bed temperature.

ISSUES

[68] In addition to the issues raised by the Appellant's grounds for appeal, several preliminary issues were raised.

[69] As a result of pre-hearing motions and case management conferences, it was clear that the parties wished to raise certain preliminary evidentiary issues. Specifically, the Appellant wished to tender two emails as expert evidence in support of his appeal, and to tender a number of documents, including journal articles and policies and procedures, regarding VOCs in other jurisdictions. It was determined at a pre-hearing conference that these issues would be decided at the hearing. The Respondent and Pinnacle advised that they would object to the admissibility of this material, and intended to bring a "no evidence" motion on some or all issues following the conclusion of the Appellant's case, if the documents referred to above were found to be inadmissible. A "no evidence" motion is essentially an application to dismiss an appeal on the basis that an appellant has provided no admissible evidence in support of their appeal.

[70] At the appeal hearing, a no evidence motion was brought by Pinnacle and supported by the Respondent. The Respondent also challenged the Appellant's standing to appeal the Amended Permit.

[71] The Panel ultimately dismissed three of the four substantive issues on the basis of the no evidence motion. The following reasons provide the Panel's findings on the preliminary issues and the four substantive issues.

[72] The issues that have been decided are as follows:

1. Whether the Appellant has standing to appeal the Amended Permit as a "person aggrieved" within the meaning of section 100(1) of the *Act.*
2. Whether two emails tendered by the Appellant are admissible as expert evidence.
3. To what extent are the other documents tendered by the Appellant admissible?

4. The test for granting a "no evidence" motion in this case.

5. The substantive issues raised by the appeal:

   a) Did the Director fail to properly consider the potential for an increase in VOC emissions?

   b.) Was the dispersion modelling adequate?

   c.) Should the Amended Permit specify discharge limits for $PM_{2.5}$ and PM_{10}?

   d.) Is the TPM Limit in the Amended Permit too high?

6. Request to make submissions on costs

ANALYSIS

1. Whether the Appellant has standing to appeal the Amended Permit as a "person aggrieved" within the meaning of section 100(1) of the *Act*

[73] The Respondent challenged the Appellant's standing to appeal the Amended Permit.

[74] Section 100(1) of the *Act* provides that a "person aggrieved" by a decision of the Director may appeal that decision to the Board. Section 100(1) of the *Act* states:

> **Appeals to Environmental Appeal Board**
>
> **100** (1) A person aggrieved by a decision of a director or a district director may appeal the decision to the appeal board in accordance with this Division.

[75] The requirement that an appeal be brought only by a "person aggrieved" has been interpreted by the courts as being intended to screen out "mere busybodies", and separate the general public from persons who can demonstrate, on a *prima facie* basis, some form of prejudice to their individual interests (*Gagne v Sharpe*, 2014 BCSC 2077, paras. 73 - 74).

[76] The Respondent asserts that the Appellant is not a person who has suffered, or can claim to have suffered, a particular or unique impact of any potential increase in emissions from the Facility.

[77] The Appellant resides in the vicinity of the Facility, but the Board has previously found that the location of an appellant's residence is not necessarily sufficient to demonstrate a genuine grievance with the appealed decision. In this case, the Panel finds that the Appellant has demonstrated a "genuine grievance", on a *prima facie* basis. The Appellant testified that he is concerned with potential impacts to his health from the Facility's permitted emissions. In addition, the Appellant is an active member of the Lavington Life Society, which was consulted by the Ministry and Pinnacle after providing the Director with written concerns about the proposed amendment, and is involved on an ongoing basis with the MOU that followed the First Appeal. In these circumstances, the Panel finds that the Appellant has standing to bring this appeal.

2. Whether two emails tendered by the Appellant are admissible as expert evidence

The Application

[78] At the outset of the hearing, the Appellant sought to have two emails declared admissible as expert evidence. It was necessary to rule on this issue at the hearing, given its relevance to the no evidence motion and other issues arising at the hearing. During the hearing, the Panel issued an oral ruling declining to admit the emails as expert reports, with more detailed reasons to follow.

[79] One of the emails is from Karin Granstrom, a professor in the Department of Engineering in Chemical Sciences at Karlstad University in Karlstad, Sweden. Ms. Granstrom's *curriculum vitae* ("CV") was provided. Ms. Granstrom has substantial expertise in wood dryers, having authored various academic papers on that subject, including papers on belt dryers and emission from belt dryers.

[80] Mr. Coape-Arnold sent Ms. Granstrom an email which in summary asked whether an increase in air flow (as contemplated in the Amendment) would be expected to increase VOC loadings from the dryer stack emissions. Mr. Coape-Arnold also asked some related questions. Ms. Granstrom's email response is dated February 15, 2018. The relevant portion of the email is as follows:

> Hi,
>
> Here are my thoughts on the matter. I hope it helps. Unfortunately, I cannot give exact answers as several factors are in play.
>
> Regarding CMP [condensable particulate matter] an increased airflow would remove emitted vapors faster and thus increase the concentration gradient between the fresh air and the wood-air boundary layer. Thus an increase of emissions from the wood particle would be expected, if the concentration gradient is the rate limiting step, but not if the rate limiting step is something else like mass transport of a VOC from the interior of the wood to its surface.
>
> I would not expect to see the same thing with terpenes, as the terpenes collected on wood surface would be emitted to air immediately and the terpenes in the interior are constrained by mass transport from the inside of the wood. If the release rate of the latter is dependent on terpene vapor pressure, this correlates with temperature. Unless, if the increased air flow also cause increased drying (which would be the case if the residence time of wood in the dryer was unchanged), the wood could become sufficiently dry for a spike in emissions at the tail end of the dryer (as seen for Plant B in my 2016 paper).

[81] Ms. Granstrom goes on to note that the most important factors are temperature and residence time, as well as wood terpene content. Wood temperature is dependent upon maximum temperature of the bed, generally approximated by temperature of the heat exchangers and temperature around the "almost-dry" wood. The almost-dry wood is more sensitive to air temperature, and

"the (obvious) rule of thumb here is that in order to get low emissions one should never expose dry wood to high temperatures". Ms. Granstrom also notes that a high airflow would both dilute the emissions and lower the concentrations.

[82] The second email which the Appellant sought to adduce as an expert opinion was authored by Kevin Crosby. No CV was provided for Mr. Crosby. Mr. Crosby's email is quite short and simply concludes that a higher mass emission rate of condensable particulate matter "could" result in a higher emission rate of VOCs. Mr. Crosby stresses that "this is not an opinion" but is a description of a mathematical and logical process based on the premise that both the concentration and volumetric flow from the dryer have increased.

[83] The Respondent and Pinnacle both opposed admission of the Granstrom and Crosby emails as expert opinions. They pointed to lack of procedural fairness arising from the inability to cross-examine Ms. Granstrom or Mr. Crosby, late notice (with the emails having been provided only a few weeks prior to the hearing), and a lack of objectivity. They submitted that a lack of objectivity was evidenced by, among other things, Ms. Granstrom's use of the word "unfortunately", presumably predicated on an assertion that Ms. Granstrom, contrary to the normal role of an objective expert, was saying she would like to find support for Mr. Coape-Arnold's theory.

[84] The Respondent and Pinnacle referred to various judicial decisions on the standards applicable to expert evidence, in order to ensure its objectivity and reliability. On a fundamental level, for expert testimony to be admissible in court, it must be relevant; must assist the trier of fact; must not be subject to an exclusionary rule; and, must be given by a qualified expert (*R. v. Mohan* [1994] 2 SCR 9). The Respondent and Pinnacle challenge the material which the Appellant proposed to tender on all of these grounds.

The Panel's ruling

[85] The Board's standards for the admission of evidence, including expert evidence, are more flexible than those of the courts. Section 40 of the *Administrative Tribunals Act* provides the Board with broad discretion to accept information, regardless of whether the information would be admissible in court. Section 40 of that Act states:

> **40** (1) The tribunal may receive and accept information that it considers relevant, necessary and appropriate, whether or not the information would be admissible in a court of law.
>
> (2) Despite subsection (1), the tribunal may exclude anything unduly repetitious.
>
> (3) Nothing is admissible before the tribunal that is inadmissible in a court because of a privilege under the law of evidence.
>
> (4) Nothing in subsection (1) overrides the provisions of any Act expressly limiting the extent to or purposes for which any oral testimony, documents or things may be admitted or used in evidence.
>
> [underlining added]

[86] Consistent with section 40 of the *Administrative Tribunals Act*, the Board's *Practice and Procedure Manual* states on page 43:

> Relevance is the primary consideration for the Board when deciding whether to admit evidence. Relevant evidence can be described as evidence (oral or written) that will shed some light on a disputed matter or tends to prove or disprove a fact in issue.
>
> The Board may also exclude evidence. Section 40(2) of the *Administrative Tribunals Act* allows the Board to exclude anything unduly repetitious. In addition, in accordance with general legal principles, the Board may exclude evidence if it is of minimal relevance, is unreliable, may confuse the issues, or may prejudice the other parties. The Board may be obligated to exclude evidence that is privileged or is restricted by a statute such as the *Evidence Act*.
>
> [underlining added]

[87] The Board has additional requirements with respect to expert evidence. The Board's Rule 25 sets out certain procedural requirements concerning expert evidence. In summary, unless the Board directs otherwise, a party must deliver a written statement or report by an expert at least 84 calendar days before the scheduled oral hearing date, and one must provide notice of expert testimony (for an expert who is to testify at the hearing without a report) on the same schedule. Also, under Rule 25, an expert must generally be available for cross-examination and the expert's qualifications must be provided.

[88] The Board's *Practice and Procedure Manual* states on page 45:

> … To be "qualified" to give expert opinion evidence on a particular subject matter(s), the Board must be satisfied that the witness has the appropriate experience and training to be an expert in the matters for which he or she is giving expert opinion evidence.
>
> If a person is not qualified to give expert evidence on a particular subject matter, the Board may still receive the witness's evidence. The Board will determine what weight should be given to each witness's testimony. The qualifications and experience of the witness will be a factor in determining the weight to be given to that witness's testimony.

[89] The Board's relaxed standards for the admission of evidence are intended, at least in part, to ensure that the appeal process is accessible and easy to understand. However, the Board will still consider whether: the evidence being tendered is relevant to the issues in the appeal; the evidence will assist the Panel in deciding the issues in the appeal; and, admission of the evidence would prejudice the other parties. Moreover, when evidence is being tendered as expert evidence, the Board will consider the additional requirements described above.

[90] Regarding the email from Ms. Granstrom, the Panel finds that she has substantial qualifications and is qualified to opine on questions relating to release of emissions from wood in certain types of equipment. Some of Ms. Granstom's articles on this subject are referred to below, as they are part of the Appellant's

more general documents admission application. Also, the Panel sees no basis to question Ms. Granstrom's objectivity. In her response to Mr. Coape-Arnold, Ms. Granstrom appears to be attempting to genuinely answer the questions, and gives no indication of being partisan towards Mr. Coape-Arnold.

[91] The key question for the Panel is whether Ms. Granstrom's email addresses any issue in the appeal in a way that assists the Panel. Ms. Granstom's email makes it clear that she can draw no clear relation between increased air flow and emission of VOCs. In fact, portions of Ms. Granstrom's analysis indicate the opposite of the conclusion that the Appellant wishes to draw. While Ms. Granstrom acknowledges that she cannot be in any way conclusive, she indicates that residence time of wood in the dryer is a crucial factor, and that airflow over "almost-dry" wood will potentially result in a greater increase in VOC emissions. Mr. Coape-Arnold's email to Ms. Granstrom refers to doubling of airflow, but does not specifically indicate that the dryer in question has been altered from double pass to single pass. Ms. Granstrom's reference to the importance of residence time could actually indicate that a doubling of airflow when changing from a double pass to a single pass system would have more favourable characteristics then a double pass system, as residence time is decreased.

[92] Given those uncertainties, combined with the inability of the Respondent/Pinnacle or the Panel to put any questions to Ms. Granstrom by way of cross-examination of otherwise, the Panel can take no value from Ms. Granstrom's email, and cannot admit her email as an expert report.

[93] Regarding Mr. Crosby's email, the Panel finds that Mr. Crosby simply states that a higher mass emission rate of condensable PM would generally cause a higher emission rate of VOCs. That is not, in itself, a useful or helpful conclusion. The question is the extent of any increase. Mr. Crosby's brief email is entirely consistent with there being only a marginal or negligible increase in VOCs associated with an increase in TPM. Nothing more can be drawn from Mr. Crosby's email. A conclusion that there is some increase in VOCs does not assist the Panel in this case. There are also serious problems in connection with Mr. Crosby's email, including the fact that the Panel has no CV for Mr. Crosby and very little in the way of back-up to his qualifications for the questions that were put to him.

[94] For those reasons, the Panel finds that neither the Granstrom nor Crosby emails can be admitted as expert opinions.

3. To what extent are the other documents tendered by the Appellant admissible?

The Parties' submissions

[95] The Appellant sought to introduce into evidence a large number of documents, generally comprised of a binder of the Appellant's documents and a supplementary binder of documents. At the outset of the hearing (and as the Appellant was previously advised), the Respondent and Pinnacle objected to the admission of a number of those documents.

[96] After initial discussion with the Panel, the parties took some time to try to reach an agreement as to admissibility of some documents, and the basis for objection to specific documents. The parties were able to reach agreement on the admissibility of a number of the documents relied on by the Appellant. Those documents generally relate to the process for considering and granting the Amended Permit, including various emails, internal memoranda, and Ministry reports (such as the Adams and Soufan Reports). All of those materials were admitted into the record by agreement.

[97] The parties remained at odds over the admissibility of many remaining documents. Those documents generally fell into two categories.

[98] First, the Appellant sought to rely on a number of articles and/or article extracts. These included articles by Ms. Granstrom, either alone or with others (for example, *Wood Processing as a Source of Terpene Emissions Compared to Natural Sources, Air Pollution XV*, WIT Press UK (2007), Ståhl et al (including Granstrom); *Industrial Processes for Biomass Drawing and Their Effects on the Quality Properties of Wood Pellets*, Biomass and Energy (2004) Milotaa et al *Emissions of Hazardous Air Pollutants from Lumber Drying*, Porous Products Journal (July/August 2008) and several others).

[99] Second, the Appellant sought to rely on guidelines and non-statutory standards from other jurisdictions concerning VOCs and particulate matter, including: *Procedure for Preparing an Emissions Summary and Dispersion Modelling Report*, published by the Government of Ontario in February 2017; *Good Practice Guide for Atmospheric Dispersion Modelling*, published by the New Zealand Ministry for the Environment (2004); and, various other similar documents.

[100] The Respondent and Pinnacle objected to the admission of those documents. With regard to the scholarly papers and articles, the Respondent and Third Party assert that these materials could only be admissible as constituting or in support of an expert opinion. The Respondent and Pinnacle relied on the same considerations as referred to above in connection with the email evidence. The Respondent and Pinnacle also submitted that some of this material constituted excerpts from larger articles or papers, and the policies and procedures from other jurisdictions were irrelevant.

[101] The Appellant argued that the scholarly papers and articles, while not constituting expert reports and not meeting the requirements of Rule 25, met a basic test of reliability. The Appellant asserted that it is possible to draw from these materials logical inferences which support his position. With regard to standards and guidelines in other jurisdictions, the Appellant submitted that some of them were referred to in the Prince George study, and to that extent, they ought to be accepted as relevant.

[102] The Panel declined to rule at the hearing on a blanket basis on these materials. The Panel ruled at the hearing that the material must be considered on a case by case, document by document, basis. In keeping with the Board's somewhat relaxed standards for the admission of expert evidence, a scholarly article or paper which reaches a clear conclusion that is relevant to the issues before the Board may be admissible. That determination cannot be made without

reviewing each individual article, and the context for which its admission is sought. Some of the individual articles and papers in the Appellant's material are discussed below.

The Panel's findings

[103] Having now reviewed the Appellant's documents, the Panel concludes that none of those articles or papers assist the Appellant's position. For reasons explained below in connection with the individual articles and papers, the Panel finds that those materials simply do not support the conclusions that the Appellant sought to be drawn from them. On that basis, none of the disputed articles or papers meet the necessary standard of relevance and reliability. They are not admissible as expert evidence, or otherwise admissible as evidence in support of the Appellant's thesis. If admissible, in that they are generally relevant to the subject matter of the appeal, they could be given no weight with respect to the Appellant's specific arguments.

[104] Even if the materials are inadmissible as, or in support of, an expert opinion or the Appellant's specific arguments, they could potentially be admissible as documents if they are relevant for some other purpose. The purpose could be, for example, to show that particular types of VOCs are generally a matter of concern and study. The Panel finds that the articles and papers are admissible for that limited purpose.

[105] Similarly, the Panel finds that the policies and standards from other jurisdictions are admissible to show that VOCs and particulate matter emissions are a concern to regulators in many jurisdictions, and have been dealt with in somewhat different ways. Those documents are also admissible to show that some jurisdictions have VOCs standards which are stricter, at least in certain instances, than those in British Columbia. With regard to the policies and standards from other jurisdictions, it is not clear that the Appellant seeks to adduce those documents for any purpose beyond that.

4. The test for granting a "no evidence" motion in this case

[106] At the conclusion of the Appellant's case at the hearing, Pinnacle brought a no evidence motion, which was supported by the Respondent.

[107] A no evidence motion is an unusual procedure at a Board hearing. The Board's procedures are intended to be flexible, and to ensure that reasonable access is provided to the Board for those who may not have legal training or other resources to retain counsel. Nonetheless, applications to dismiss an appeal on the basis of no evidence have been made in the past, and in rare cases have been granted by the Board.

[108] The Board considered a no evidence motion in *Harris v. British Columbia (Ministry of Environment)*, [2010] BCEA No. 4, at paras. 19, 29, 31-32, and *Avren et al v. British Columbia (Ministry of Environment)*, [2007] BCEA No. 9 [*Avren*], at para. 54. The requirements for granting a no evidence motion were discussed in *Avren*. To paraphrase the findings in *Avren*, the appellant must lead evidence that the Board could consider sufficient to conclude that the decision-maker should have

made a different decision based on the facts, or that the decision-making process was flawed. That is the question in the present case.

[109] It is important to note that although the application in *Avren* was framed as a "no evidence" motion, the Board stated in para. 54 of *Avren* that the appellants were obliged to lead "some evidence that either the order [under appeal] was wrong in law or fact, or that the process leading to the order was flawed in some way" [underlining added]. Thus, the decision in *Avren* was not solely based on a lack of evidence to support the facts asserted by the appellants. It was also based on the Board's assessment of the appellants' arguments with respect to whether the appealed decision was "wrong in law", "or that the process leading to the order was flawed in some way." In that sense, the decision in *Avren* was more akin to a preliminary assessment of the appellants' case, to determine whether the respondent and third party should be required to respond.

[110] It is also important to note that *Avren* was decided before section 31 of the *Administrative Tribunals Act* applied to the Board. Section 31 of that Act provides the Board with the power to summarily dismiss an appeal on the basis of the reasons listed in section 31, including on the basis that there is no reasonable prospect that the appeal will succeed. In contrast, in *Avren*, the Board was relying on its common law powers to control its own procedures when it granted the no evidence motion. Arguably, an application under section 31 of the *Administrative Tribunals Act* now provides a more appropriate means for a party to seek summary dismissal of an appeal.

[111] In any event, the Board recently considered a no evidence motion in another appeal involving a permit amendment: *John Pickford et al v. Director, Environmental Management Act,* Decision Nos. 2016-EMA-130(b); 2016-EMA-144(b), 145(b), 146(b), 147(b) and 149(b) (Group File: 2016-EMA-G05) [*Pickford*]. Although *Pickford* was issued after the conclusion of the hearing of the present appeal, *Pickford* is worth noting because it considered *Avren* and summarized the legal test for a no evidence motion. At para. 87 of *Pickford*, the Board stated as follows:

> … the Panel finds that the onus is on the Appellants to provide some evidence that is relevant to, and capable of supporting, the facts that they assert. Also, to the extent that the Appellants allege any legal errors by the Director, they must articulate some legal argument that could support a finding that the Amendment Decision was wrong in law, or that the process leading to the Amendment Decision was flawed in some way. …

[112] Turning to the present no evidence motion, some particular factors are important to consider. First, this appeal is against the granting of a permit amendment, and not the granting of a permit. The matters that the Panel can consider in this appeal are only those which flow from the Amended Permit; not those which flow from the original Permit. The First Appeal concerning the Permit was settled. That settlement remains in place. No party has suggested that the MOU has been breached or is no longer operative. Therefore, to the extent that the Appellant has provided evidence or arguments that relate to the original Permit, they are outside of the Board's jurisdiction in the present appeal.

[113] Second, the questions which were raised generally by the Appellant in this appeal, concerning effect of the potential increase in emissions arising from the Amended Permit, in terms of air quality in and around Lavington, were considered in detail by the Ministry, as indicated in the reports that are before the Panel. Conditions were imposed in the Amended Permit to address those concerns. Additional testing was implemented. The possibility of additional testing and/or study is expressly contemplated in the Amended Permit, depending on ongoing developments. The key development, of course, would be the results of the ongoing additional testing, following implementation of the changes to Pinnacle's operations in accordance with the Amended Permit. The record of evidence before the Panel includes the reports that set out the reasoning of the Ministry's technical staff who considered Pinnacle's application and technical reports, and provided recommendations to the Director.

[114] The question, therefore, is whether the Appellant has provided evidence and arguments from which the Panel could find that the terms and conditions in the Amended Permit are insufficient, and that additional terms in relation to conducting a general VOC study, requiring additional modelling, or requiring differentiation in connection with $PM_{2.5}$ and PM_{10}, should have been imposed by the Panel. Put another way, the question is whether the Appellant put forward evidence or arguments which require evidence in response from the Respondent and Pinnacle, beyond the record of evidence that the Director relied on in making his decision (which the Panel has considered).

[115] It is also important to point out that the Appellant appears to have made his evidence and submissions on the basis that the issue is whether there is the potential for an inordinate or substantial increase in emissions from the Facility, beyond what considered by the Director in granting the Amended Permit.

5. The Panel's reasons with respect to the substantive issues

[116] During the hearing, after the conclusion of the Appellant's case, the Panel granted the no evidence motion with regard to three of the substantive issues (alleged lack of proper consideration of increasing VOCs; inadequate emissions dispersion modelling; and, requirement to specify discharge limits for $PM_{2.5}$ and PM_{10}). The Panel denied the no evidence motion with regard to the fourth substantive issue (TPM limits set too high in the Amended Permit).

[117] The Panel now turns to its detailed reasons on each of the four substantive issues, keeping in mind that this Decision represents detailed reasons for the ruling made at the hearing.

a) Did the Director fail to properly consider the potential for an increase in VOC emissions?

[118] It bears repeating that, in considering this issue, that the appeal is restricted to consideration of any increase in VOC's resulting from the Amended Permit. The original Permit was challenged on the First Appeal, which was resolved. The

present appeal is only concerned with any incremental impact of any increase in emissions contemplated under the Amended Permit.

[119] The Appellant was frank in accepting that success on this issue depended on the Panel's acceptance of his thesis or theory.

[120] A key component of the Appellant's theory is the assertion that the increase in bed temperature associated with the Amended Permit has a significant change on the amount and/or composition of VOCs emitted from the Facility. Neither the Permit nor the Amended Permit specify a limit on bed temperature. However, the Respondent and Pinnacle acknowledge that the change from a double-pass to single-pass system is accompanied by an increase in bed temperature. The Appellant refers to an increase from 45 °C to 54 °C. This assumed change in temperature was taken from the RWDI reports submitted by Pinnacle in connection with the application for the Amended Permit.

[121] The Panel notes that these are assumed exit temperatures, post-Amendment and after the change to a single-pass system. It is worth noting that the post-Permit stack temperatures do not, in fact, show an increase along the lines predicted by RWDI. It is questionable whether there has been an increase in temperature.

[122] As noted above, VOC emissions were studied by the Ministry commencing in 2008, and were the subject of the EnviroChem Report. That report shows no or negligible VOC emissions from the wood pellet manufacturing process at temperatures below 175° C. The Ministry relied on the EnviroChem Report in assessing the application for the Amended Permit, and considering the issue of VOC emissions.

[123] The Appellant asserts that the EnviroChem Report and its conclusions are not applicable here, because the physics of a belt dryer, as opposed to a rotary drum dryer, are different. It is not apparent to the Panel why this would be so, given that a belt dryer operates at substantially lower temperatures than a rotary drum dryer, which would generally lead to lower VOC emissions from a belt dryer as compared to a rotary drum dryer. However, the Appellant asserts that there is evidence that belt dryers are characterized by higher and/or different emissions than rotary drum dryers.

[124] In support of this contention, the Appellant relied on certain journal articles. One of the key articles that the Appellant relied on is by K. Granstrom and A. Javeed, titled "*Emissions from Sawdust in Packed Moving Bed Dryers and Subsequent Pellet Production"*, Drying Technology, Vol. 34, No. 3, pp. 258 – 266, January 28, 2016. The Appellant quoted from this article in his presentation materials (slide 76), and referred to Tables 5 and 6, which set out VOC emissions at two wood pellet plants with belt dryers. The article describes those plants as "plant A" and "Plant B". According to Tables 5 and 6 in the article, temperatures at the heat exchanger in the dryer at Plant A ranged from 72.4 to 74.9 °C, while temperatures at the heat exchanger in the dryer at Plant B ranged from 81 to 97 °C. Somewhat higher VOC emissions were recorded at Plant B, with a high of 76.3 parts per million (ppm), and with most measurements at both plants being in the range of 8 to 15 ppm. The relationship between dryer temperature and VOC

emissions was not consistent between the two plants, with some measurements at Plant B, the higher temperature plant, being as low as those at Plant A.

[125] The Panel finds that the conclusion which the Appellant seeks to draw from this article is not actually reached in the article. The article states, in its conclusions:

> Emissions [of VOCs] from PMB [belt] dryers can be predicted by the moisture content of dried sawdust and thus also by the residence time in the dryer; however, they are not predicted by the moisture content of undried sawdust and thus not by the amount of evaporated water. The temperature in the dryer has a small effect on emissions and affects primarily the emissions profile over the dryer.
>
> [underlining added]

[126] On that basis, the Panel finds that the article does not support the Appellant's theory that an inordinate increase in VOC emissions will result from an increase in dryer temperature, particularly given that the Appellant asserts that the change from a double-pass to single-pass dryer system will be accompanied by an increase in bed temperature from 45 °C to 54 °C. The article states that the temperature in the dryer only has a "small effect" on emissions. The article does not support the proposition that a large or inordinate increase in VOC emissions will be associated with a relatively small increase in dryer temperature at the low range. As such, the Panel finds that although the article is admissible in the sense that it is generally relevant to the subject matter of the appeal, the article is not relevant to, or admissible for the purpose of supporting, the Appellant's argument on this issue.

[127] The Appellant also relies on a paper by M. Milota and P. Mosher, titled "*Emissions of Hazardous Air Pollutants from Lumber Drying*", Forest Products Journal, Vol. 58, No. 7/8, July/August 2008. This study involved lumber drying in a kiln. The paper concluded that two types of VOC emissions, methanol and formaldehyde, increased as the kiln temperature, but other VOC compounds showed no consistent trends. The wood species tested were Red Alder, Ponderosa Pine, White Wood (Western Pines, Fir and Spruce), Douglas Fir, Western Hemlock, and White Spruce.

[128] The Panel finds that there are a number of problems with drawing any conclusions from this study in relation to pellet drying at the Facility. The study involved lumber drying in a kiln, which is different in several ways from pellet drying. Temperatures for drying lumber in a kiln are higher than those in the Facility's dryers. The Appellant relied on a table in this paper, showing emissions from Douglas Fir, and the kiln temperatures ranged from 76.7 °C to 112.7 °C. Total VOC emissions were higher on the highest temperature sample. However, for other species, there was no clear correlation between temperature and VOC emissions. For example, Western Hemlock showed slightly lower VOC emissions at 112.7° C than at 82.2° C. It is also unclear how the units of measurement in this study, pounds per thousand board feet, relate to the units of measurement referred to in other sources. Overall, the Panel finds that this paper cannot be used to support the Appellant's proposition that there will be a "doubling of VOC emissions

with 5.5 °C rise in temperature". This paper does not assist the Appellant in proving the facts that he asserts, has little or no relevance to the subject matter of the appeal, and is not admissible for this purpose.

[129] The Appellant referred to a third paper, by S. Banerjee titled, "*Mechanisms of Terpene Released During Sawdust and Flake Drying*", February 2000, IPST Technical Paper Series Number 840, Institute of Paper Science and Technology. This short paper considers the characteristics of release of certain terpenes during sawdust drying, and concludes as follows:

> In summary, there seems to be (at least) three mechanisms for the movement and release of A-pinene and other terpenes from wood. A burst occurs very early in the process, and this is attributed to the loss of pinene dissolved in surface water. Pinene and water then tend to be released in a near constant ratio, and this is attributed to water mobilizing pinene from the interior of the wood matrixed at the surface. It is believed that the surfactants present in wood solubilize pinene into water. Finally, when the wood is nearly dry, pinene is lost to evaporation. These mechanisms can be used to predict VOC emissions under different drying conditions, and to identify strategies that favour isolation of low-volume VOC-rich streams that lend themselves to incineration.

[130] The Appellant relies on this paper in support of his assertion that the greater the amount of water released, the greater the amount of pinenes released. Doubling of airflow through the dryers with relatively constant stack temperature implies a higher input heat load through the dryer bed per unit of time, a greater drying capacity, and a greater expected moisture elimination per unit of time. The Appellant submits that the rate at which pinenes are released would be expected to increase if there is an increase in airflow through the Facility's dryers.

[131] The Panel finds that this article does not support the Appellant's assertion. A potentially relevant question is whether a single pass system somehow extracts greater amounts of VOCs from the material than the double pass system. This article does not conclude, for example, that a single pass at somewhat higher temperatures would release more pinene than a double pass at slightly lower temperatures. Indeed, it would be possible to take the opposite conclusion from the article; namely, that the conditions of increased humidity associated with the double pass system would tend to favour the extraction of pinenes or other VOC compounds from wood. The Panel does not draw that conclusion, but also finds that the article does not support the Appellant's thesis, and is not relevant in that regard.

[132] Those are the three primary articles referred to by the Appellant. He also referred to certain other articles, but the Panel finds that those articles are also irrelevant and do not assist the Panel in deciding the issues in the appeal. The Panel finds that none of the articles are admissible to support the Appellant's assertion that the permitted changes in the pellet drying process will cause a substantial increase in VOC emissions at the relatively low temperatures used in the Facility's belt drying process.

[133] In support of his argument, the Appellant also referred to certain differences between pre and post-Amendment stack tests. As of the date of the hearing, there were post-Amendment stack testing results available for August to December 2017. Those tests showed, on average, higher TPM results, per dryer and for both dryers, relative to the pre-Amendment tests. Of the four tests conducted, only two provided complete results for both stacks (and two of those involved failed stack tests). TPM was 12.77 kg/hr (August 2017) and 10.36 kg/hr, as compared to TPM results in the 2-3 kg/hr range prior to the Amendment.

[134] These are a snapshot of a few results, in the immediate period post-Amendment, when there may have been start-up issues with the new dryers or other issues at the Facility. In addition, it was contemplated in connection with the Amendment that there potentially would be an increase in TPM emissions. The key question is whether that increase in TPM has any impact on ambient air quality in Lavington.

[135] The Appellant also relies on post-Amendment stack testing which shows an increase in condensable particulate matter in the emissions. The Panel finds that its conclusions with respect to TPM emissions apply equally to condensable particulate matter.

[136] Having considered all of the material submitted by the Appellant, the Panel finds that the test for granting the no evidence motion is met with respect to this issue. There is no support, in the material before the Panel, for the Appellant's assertion that, at the temperature ranges under consideration, a large increase in VOC emissions could be expected as a result of the Amendment. There is no material that could support a conclusion that the terms and conditions on which the Amendment was granted were not appropriate to permit assessment of any potential increase in TPM, or components of TPM, including VOC's.

[137] There is an existing monitoring program, being undertaken under the terms of the Amended Permit, involving both the existing Lavington Baptist Church station, and the newly installed station. The results of that ongoing monitoring will provide the best evidence as to whether there is, as a result of the Amendment, (and as a result of operation of the Facility generally), substantially increased emissions, including $PM_{2.5}$. The Amended Permit includes terms which would allow further study to be required, at the Director's discretion, based on those monitoring results. In the Panel's view, this is the appropriate means of dealing with any potential increase in TPM in the community which might result from the Amendment.

b.) Was the dispersion modelling adequate?

[138] The Appellant challenges the adequacy of the dispersion modelling conducted in connection with the application for the Amendment. The Appellant was critical of the RWDI modelling which predicted a decrease in average ambient $PM_{2.5}$. The Appellant was also critical of the Ministry modelling which was conducted following the RWDI modelling. The Appellant made a detailed argument on the pollution rose relied on by Mr. Adams, and challenged Mr. Adams' conclusion that the pollution

rose does not show substantially different concentrations at the lower end ($PM_{2.5}$ range) pre and post-Amendment.

[139] The Panel rejects the Appellant's assertion that this pollution rose, on its face, shows a significantly higher $PM_{2.5}$ ratio downwind of the Facility post-Amendment. However, the Panel finds that the key point here is an inherent question surrounding any emissions modelling. The Appellant's proposed remedy on this ground of appeal is for the Board to order further emissions testing with revised inputs. The question that has to be asked is whether further modelling would serve any purpose. The overall shortcomings and limitations inherent in the modelling conducted, and any further modelling, were recognized by the Ministry. That was the basis for the recommendation that additional monitoring be required as a condition of granting the Amendment.

[140] If the Ministry decided not to undertake continued monitoring, and to simply rely on the existing modelling, the Appellant would have a legitimate argument on this ground of appeal. However, the Panel finds that the Appellant has not presented any reasoned argument as to why the Ministry's proposal to conduct further and ongoing monitoring is not the best means to determine the contribution of the Facility to emissions in Lavington, including any increased emissions potentially resulting from the Amended Permit. The Panel finds that the test for a no evidence motion with respect to this ground of appeal has been met.

c.) Should the Amended Permit specify discharge limits for $PM_{2.5}$ and PM_{10}?

[141] This argument was set out in the Appellant's statement of points. It was not dealt with in his written presentation at the appeal, but was dealt with in oral evidence and submissions at the hearing.

[142] The Appellant asserts that the Amended Permit should have been issued only on conditions that specifically regulate $PM_{2.5}$, as opposed to TPM, on the basis that $PM_{2.5}$ is the particulate of primary concern, and that there are stack measurement methods which can properly measure $PM_{2.5}$.

[143] As discussed earlier, the question of potentially segregating emissions by particle size was part of the First Appeal. The MOU which resolved the First Appeal included a term which required the assessment of methods to ascertain size fraction ratios under EPA approved methods. It was determined, as a result of that assessment, that there are no EPA approved methods to carry out size fractionation of emissions.

[144] The Appellant relies on two documents as support for his argument that there are viable methods for determining size fractionation. The Respondent and Pinnacle objected to both documents. The first document is a two-page excerpt from a lengthy EPA document. The excerpt references a size fractionation test methodology. This is referred to in the excerpt as an "other test method". "Other test methods" are described as "test methods which have not yet been subject to the Federal rulemaking process". There is reference to the fact that the EPA encourages submission of additional supporting field and laboratory data as well as comments in regard to these methods. The test method discussed is for Measurable Filterable Particulate Matter Emissions [in the $PM_{2.5}$ range] in Moisture

Saturated and/or Droplet Laden Gas Streams from Stationary Sources. The method involves a heated probe and filter box to vaporize water droplets in the sample gas stream, and measures filterable $PM_{2.5}$ particulate matter based on material passing through a $PM_{2.5}$ cyclone. The method was submitted by the American Petroleum Industry and National Council for Air and Stream Improvement to EPA's Office of Air Quality Planning and Standards. The document confirms that acceptance as an "other test method" is "neither an endorsement by EPA regarding the validity of the test method nor a regulatory approval of the test method". The purpose of designation as an "other test method" "is to promote discussion of developing emission measurement methodologies and to provide regulatory agencies, the regulated community, and the public at large with potentially helpful tools".

[145] The second document is an excerpt from a 2015 presentation at a technology workshop, referring to a prototype piece of equipment and test procedure for a method that will extract appropriate size water droplets from a wet stack for evaporation and allow subsequent analysis for $PM_{2.5}$.

[146] With regard to admissibility, the Panel finds that these two documents are admissible for the purpose of showing that general discussion is ongoing amongst scientists regarding the development of one or more standards or methodologies to allow fractionation testing to segregate the $PM_{2.5}$ component in an emissions stream. However, these documents cannot be admitted for the purpose of showing that there is, in existence, a viable methodology that could be utilized at the Facility for this purpose. That would require expert evidence, different factual evidence, and/or acceptance by the Ministry.

[147] While the Panel finds that the documents put forward by the Appellant are inadmissible for the purposes he intends, and the test for a no evidence motion is met for this ground of appeal, the same result would follow if they were admitted as evidence. It is clear from these documents that there is no approved method of size fractionation for particulate emissions. Test methods in connection with size fractionation are experimental and developmental.

[148] In any event, the Panel finds that this ground of appeal does not raise an issue related to the Amended Permit. The measurement of emissions in the $PM_{2.5}$ range was the subject of substantial discussion and assessment in connection with the original Permit. It was one of the matters raised on the First Appeal, and was part of the MOU. If there was an EPA approved method of size fractionation, it would presumably be assessed for suitability at the Facility, under the MOU. In the absence of such a methodology, there is no basis for an order requiring size fractionation.

[149] The Appellant also seeks other relief on this ground of appeal, including a direction that the Ministry, "in conjunction with the stack testing industry and US EPA" undertake necessary laboratory and testing work to generate technically valid size fraction estimates and error bands for particulate matter. However, those matters are beyond the Panel's jurisdiction in this appeal. The Panel does not have the jurisdiction to direct the Ministry to undertake such studies in conjunction with private industry or an agency outside of British Columbia.

[150] Following the hearing, the Panel's review of the Appellant's documents revealed a June 7, 2017 email from Mr. Adams to the Director, which states, in part, that "There are now two sets of testing on STELA dryers conducted in BC which include size fractions so that the $PM_{2.5}$ to TPM ratio can be calculated. These are for the Diacarbon Plant in Merritt and the Canfor plant in Chetwynd". This indicates that there is some ability to test for $PM_{2.5}$ specifically, as a ratio of TPM. The Appellant did not refer to this statement at the hearing. However, this email does not affect the Panel's conclusion on this ground of appeal. The First Appeal addressed the question of EPA approved methods for testing of $PM_{2.5}$. There is clearly no EPA approved method at this point. The development of credible methodologies for size fractionation is a matter for ongoing work under the MOU arising from the First Appeal, or enforcement, or additional conditions or ongoing compliance under the Amended Permit based on post-Amendment testing.

d.) Is the TPM limit in the Amended Permit too high?

[151] This issue is somewhat different than issues 1 – 3. This issue obviously arises solely from the Amendment. It was not, and could not have been, dealt with on the First Appeal. This issue also was not dealt with in the Adams Report or the Soufan Report. Accordingly, there is not a clear record against which to assess the Appellant's arguments. For that reason, the Panel dismissed the no evidence motion with respect to this issue. This issue must be assessed on the basis of an evidentiary record.

[152] On this issue, the Appellant essentially argues that applicable emissions limits in the Amended Permit ought to have been set at lower levels. The Appellant points to statements and presentations made by Pinnacle, including to the District of Coldstream, in support of lower expected emissions. The Appellant also refers to what he termed a "logic problem", which was summarized earlier in this decision. Essentially, the Appellant asserts that with the change from a double pass to single pass operation, and all other inputs remaining the same, a decrease in emissions concentrations could reasonably be expected.

[153] The Appellant is not alone in drawing this conclusion. As generally referred to above, there was internal Ministry correspondence on this question. Mr. Adams provided a memorandum dated March 17, 2017 to the Director, regarding his review of RWDI's updated dispersion modelling report. In that memo, Mr. Adams stated that his initial review of the updated RWDI modelling report indicated that the proposed changes would not have "a significant effect on maximum ground level concentrations of PM_{10} and $PM_{2.5}$". However, he also stated that further information should be requested from Pinnacle. Mr. Adams asked for an explanation as to "why the maximum concentrations do not decrease as the flow increases". Mr. Adams' memo states as follows regarding dryer stack parameters:

> In most cases where flow is changed in a permitted source, an increase in flow results in a decrease in stack concentration, in fact this is the reason for setting standard conditions for reporting stack tests. In the case of the proposed changes to dryer stacks 2 and 4, this does not occur, or at least is not included in the modelling. Could the proponent please supply a brief explanation for why the maximum concentrations have not been decreased.

> In particular, is it expected that stack concentrations in the dryers will not change …, or is [it] the case that the levels are already so low that it is not possible to confidently predict a decrease? This is important as it affects the level of conservativism in the model assumptions and confidence in the maximum predicted concentrations.

[154] In a report dated May 1, 2017, Pinnacle responded to the Ministry's request for further information, and addressed the question of maintaining the 15 mg/m^3 limit on TPM emissions from the dryer stacks. Pinnacle's report states:

> The PM loading in the airstream after passing through the bed dryer belt should not exceed 15mg/m^3 as per the manufacturer's guarantee. Year to date, the PM observed from stack testing of the dryer system was in the range of 5-10 mg/m^3 and this is not expected to change per unit of air that is exiting the stack regardless of [whether] it is passed through the belt once or twice. The exit concentration of 15 mg/m^3 was used in the most recent air modelling to allow for a degree of conservativism.
>
> The fibre on the bed acts as a filter for particulate, and the concentration of particulate in the airstream after passing through the belt should be similar regardless of whether air is passing through the belt once or it is being recirculated and passes through the belt twice. This would be consistent with other bed dryers in BC that are single pass air systems which Pinnacle understands have similar performance of TPM emitted during stack tests as the dryers in Lavington.

[155] The Appellant is highly critical of Pinnacle's May 2017 response to the Ministry's questions regarding effect of the increased flow rate. The Appellant submits that Pinnacle avoided answering the question, and left the "logic problem" unresolved. The Appellant maintains that, with airflow doubled and no increase in mass released through the dryer, the concentration of particulates in the dryer emissions should decrease by half. This, the Appellant argues, suggests that there is ample room for lowering the stack limit.

[156] The Respondent and Pinnacle relied on evidence from Paul Pawlowski on this issue. Mr. Pawlowski is Pinnacle's Director of Energy and Environment. Mr. Pawlowski acknowledged that pre-Amendment performance was in the 5 to 10 mg/m^3 range. This compared favourably, as Mr. Pawlowski understood it, to other belt dryers in British Columbia, which generally appeared to operate in the 5 to 12 mg/m^3 range. However, Mr. Pawlowski testified that in his view, there was enough potential uncertainty regarding post-Amendment operation that it would not be appropriate to reduce the TPM limit to 10 mg/m^3. He confirmed that the source of the 15 mg/m^3 limit was the manufacturer's guarantee. STELA was prepared to guarantee operation at that level, but not at a lower level. Mr. Pawlowski testified that Pinnacle was not comfortable committing to a lower number, irrespective of past performance. On the question of why emissions concentration would not decrease when airflow doubled, Mr. Pawlowski testified that, on maximum pass, there would be pull through of air of 66 m^3. Mr. Pawlowski's view was that the theory that "double airflow equals half concentration" is overly simplistic. The change from a double pass to a single pass system results in double the flow.

[157] Mr. Pawlowski was also cross-examined on the stack tests subsequent to the Amended Permit. Those tests indicate some elevated levels of particulates. Mr. Pawlowski testified that there were some ongoing adjustments in the early operation of the system, which may have affected the initial stack test results. Those adjustments were ongoing as of the hearing.

[158] Overall, on this issue, the Panel finds that the Director did not set emissions limits in the Amended Permit at levels which were unnecessarily or inappropriately high. Limits were set at levels which incorporated a reasonable level of conservatism, and recognized some uncertainty. The Panel accepts Pinnacle's evidence that the "logic problem" posed by the Appellant is, or may be, overly simplistic. It would be inappropriate to set emissions limits at a level which would risk ongoing exceedances in the course of normal operations, bearing in mind that there is no evidence that setting the TPM limit at 15 mg/m^3 instead of 10 mg/m^3 poses a risk of harm to human health or the environment. The Panel finds that setting a limit consistent with the manufacturer's warranted levels was appropriate in the circumstances of this case.

[159] The Appellant also sought to raise a question concerning BAT in connection with this ground of appeal. No specific assertion was made in the Notice of Appeal or Statement of Points regarding BAT. It was first raised in the Appellant's oral submissions on the appeal.

[160] The Respondent and Pinnacle object to this issue being raised, on the basis that it was not raised in the Appellant's Notice of Appeal or Statement of Points. The Respondent and Pinnacle also object to any reference to BAT on the basis that it was an issue in the First Appeal, and is subject to the settlement of the First Appeal, except to the extent that any current BAT issue arises solely from the Amended Permit.

[161] Essentially, the Appellant submits that an additional technological solution ought to have been considered to keep emissions within the original estimated parameters. However, he refers to no specific technology. He generally suggests that a heat recovery and condensation module would be appropriate. The Appellant refers to a STELA brochure referencing a somewhat different piece of equipment, known as the RecuDry Two Stage Condensing Dryer. STELA advertises the RecuDry as creating less exhaust airflows and emissions.

[162] However, Mr. Pawlowski testified that this would not be a viable option at the Facility, as operating temperatures are too low to permit such a unit to operate effectively. There was no other evidence on this point.

[163] The Panel finds that BAT was an issue on the First Appeal. At clause 5.7, at p. 55 of the Appellant's Statement of Points in the First Appeal, the Appellant refers to "absence of proper assessment and consideration of best available technology", and sets out a detailed argument as to why the Appellant asserted that the dryers were not "best available technology".

[164] The Panel finds that the Appellant has not met the onus of establishing, on a balance of probabilities, that the Director should have considered whether Pinnacle could have adopted lower-emission dryer technology at the Facility, before he decided to grant the Amended Permit. The Appellant has only referred to general

information about a different type of dryer that appears to be inappropriate for the kind of processes used at the Facility.

6. Request to make submissions on costs

[165] The Respondent and Pinnacle asked for an opportunity to make submissions concerning costs, following issuance of the Panel's decision. The Panel is prepared to hear submissions concerning costs, if the Respondent and Pinnacle choose to make those submissions. Any written submissions from the Respondent and Pinnacle regarding costs must be submitted no later than 14 days after that date that this decision is issued. The Appellant may provide any written reply submissions no later than 14 days after the other parties' submissions are due.

DECISION

[166] In making this decision, the Panel has carefully considered all of the submissions and arguments before it, whether or not specifically reiterated here.

[167] For the reasons provided above, the appeal is dismissed.

[168] Costs may be addressed on the terms set out above.

"Gregory Tucker"

Gregory Tucker, Q.C., Panel Chair
Environmental Appeal Board

"R.G. Holtby"

R.G. (Bob) Holtby, Panel Member
Environmental Appeal Board

"Kent Jingfors"

Kent Jingfors, Panel Member
Environmental Appeal Board

March 27, 2019