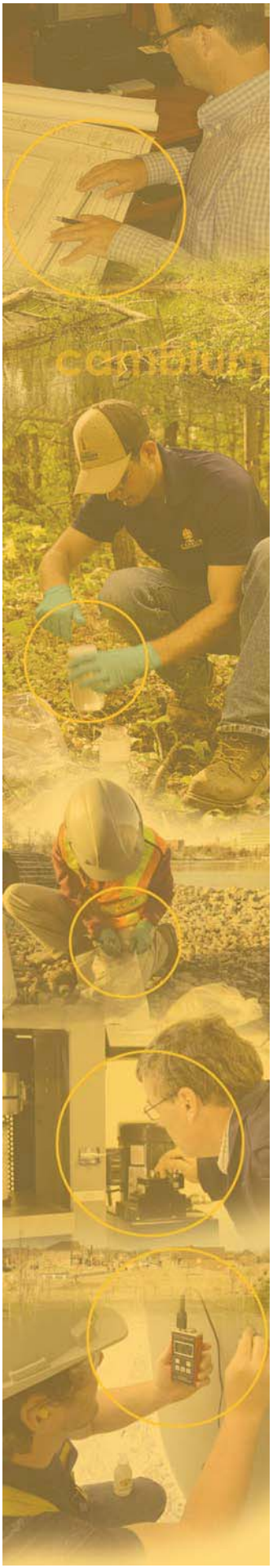

Land Use Compatibility Study (Air and Noise)- Melody Bay Trailer Park Version 2

Cambium Reference No.: 6225-001

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EXECUTIVE SUMMARY

This report is an update of the previous report dated August 31, 2017. This report has been updated in order to respond to requests presented in the peer review completed by WSP Canada Inc. (WSP Canada Inc., 2018).

The Melody Bay trailer park is located at 33 Melody Bay Road, Buckhorn, Ontario and is proposing to add 11 more trailers to the Site in the northwestern portion of the property. This expansion will be within the 150 m setback from the Buckhorn Sand and Gravel pit as set by the Municipality of Trent Lakes. As such, a compatibility study was required from the Municipality that determined if the proposed trailer park expansion would be impacted by the gravel pit from an air, noise and odour perspective.

Cambium visited the Melody Bay Trailer Park of August 3rd, 2017 to collect background noise levels at Melody Bay and complete dust, noise, and odour observations. A site visit was also completed by Cambium's Water Quality specialist on July 4th, 2017.

Additionally, Buckhorn Sand and Gravel was contacted to gain information pertaining to the sewage lagoons and gravel crushing equipment operated at the gravel pit.

The conclusions drawn from the study indicate that the proposed development will not significantly impact the operations of the Buckhorn Sand and Gravel for the following reasons:

- Modelling results indicate air quality levels are predicted to be less than Ontario Standards for both suspended particulate and nitrogen oxides emitted from representative crusher units including generators used to power the crushing operations;
- Fugitive dust from the site is required to be supressed as part of Buckhorn Sand and Gravels aggregate license. Further, fugitive dust emissions from Buckhorn Sand and Gravel do not contain metals;
- Stationary sources are required to comply at their property line;
- Odour complaints have not be logged at Melody Bay Trailer Park and no odour was detected during either of Cambium's site visits;

- Cambium conducted relative sensitivity odour analysis, which indicates that the proposed development will be predicted to have odour impacts that are lower than the existing most sensitive point of reception;
- Cambium has conducted relative noise analysis, which indicates that the proposed development is predicted to be more sensitive to noise impacts than the existing dwelling on site a noise barrier or berm will be required to be constructed along the northern property line to shield the proposed development from noise levels.
- It is considered to be good practice to notify future occupants of trailers encroaching Buckhorn Sand and Gravel of the possible nuisances prior to signing a lease.

The proposed expansion of the Melody Bay Trailer Park is considered compatible with the surrounding operations on the basis that they will not create additional sensitivity to the operations in the area. In addition, Cambium has recommended that Melody Bay install a noise barrier, or work with Buckhorn Sand and Gravel to identify on-site noise controls. This is due to the fact that the proposed trailers are closer to site than the existing nearest dwelling.

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1.0 INTRODUCTION

This report is an update of the previous report dated August 31, 2017. This report has been updated in order to respond to requests presented in the peer review completed by WSP Canada Inc. (WSP Canada Inc., 2018).

Cambium Inc. (Cambium) was retained by EcoVue Consulting Services Inc. (EcoVue) to complete a compatibility study at the Melody Bay Trailer Park (referred to herein as the Site), located at 33 Melody Bay Road, Buckhorn, Ontario. Parkbridge Lifestyle Communities Inc. (the owner of the Melody Bay Trailer Park) is proposing to add 11 additional trailers into the park. The 11 trailers are proposed to be placed in the northwestern corner of the Site. An aggregate pit, owned by Buckhorn Sand and Gravel, is located adjacent to the Site to the north. The proposed location of the 11 trailers is within the 150 m buffer of the pit as set by the Municipality of Trent Lakes in their Master Plan; as such, the Municipality of Trent Lakes requires a compatibility study to ensure that the operations of the aggregate pit will not interfere with the proposed trailer park expansion.

Cambium has therefore prepared an air, noise, and odour review based on the Ministry of the Environment and Climate Change's (MOECC's) procedures D-1, D-2 and D-6, with respect to the trailer park expansion in proximity to the existing gravel pit. Procedure D-1, section 2.4 (5) specifies that adverse effects must be determined and mitigated when incompatible sites encroach on one another. Furthermore, Procedure D-6 is to be implemented for pits and quarries, in the absence of site specific studies, when a sensitive land use encroaches on an existing pit and/or quarry.

1.1 SITE DESCRIPTION

The property area of the trailer park is approximately 13.8 hectares (ha) in size and is located on Buckhorn Lake with 124 trailers currently onsite. The proposed addition of 11 trailers will increase the number of onsite trailers to 135. Each of the 11 proposed trailers are within the 150 m buffer zone required by the Municipality of Trent Lakes for Development near existing pits and quarries. See Appendix A for the Proposed Site Development (Provided by EcoVue)

In addition to the trailers found on-site there is an administration building, two (2) pools, what is known as a comfort station (which includes washrooms, the water treatment system and laundry facilities), and a sports pad. A maintenance shed is located in the northern portion of the Site near the main entrance.

There is also a dwelling located in the northern portion of the Site. The proposed expansion of the trailer park will occur to the west of the dwelling, adjacent to the western property boundary. See the details of the site and the surroundings in Figure 1 - Site Map.

1.1.1 METEOROLOGY OF THE SURROUNDING ENVIRONMENT

From the statistics obtained from the weather station at the Peterborough Airport, the predominant wind direction is from the west, with an average wind speed of 4.5 mph during the operational season of the facility (April to October). The proposed trailers are located south-west of the property as noted in Figure 1.

Wind rose figures have been provided for both the pre-processed AERMET data used in AERMOD (based on Ottawa), as well as the nearest weather station, located at Trent University, in Figure 2 and Figure 3 respectively.

1.1.2 SURROUNDING LAND USE OF CONCERN

There is a current aggregate operation located adjacent to the Site to the north is owned by numbered company 1106488 Ontario Limited; local signage indicates that Buckhorn Sand and Gravel operates out of the pit. The pit is licenced under Aggregate Resource Act Licence Number 3286. The pit is licenced under Aggregate Resource Act Licence Number 3286 as a Class A pit and, according to Buckhorn Sand and Gravel, has been approved to extract aggregate materials from below the water table. It was noted that a mobile crusher may at times be located on site, based on a telephone interview with Buckhorn Sand and Gravel staff it is understood that the crusher is generally located centrally on the property, and is typically currently on site roughly twice a year for a period of one (1) too three (3) weeks to conduct crushing campaigns.

As per satellite imagery, there are ponds located onsite and it was confirmed that these ponds are from the historic extraction of materials below the water table. Wastewater lagoons are also operated at the pit positioned in the northwestern corner of the pit and located approximately 240 m from the property boundary of the Site. These lagoons can be seen in Appendix A. A copy of the Certificate of Approval (C of A) that governs the operation of the wastewater lagoon could not be acquired by Cambium; however, the following information was acquired from the Environmental Registry (Government of Ontario, 2017):

- C of A number: A710161;
- Approved to use and operate a waste disposal site, winter storage lagoon with a total area of 4,000 m^2;
- Household and commercial sewage is approved for transfer at the site at a maximum rate of 16,500 litres/day and at a maximum total storage volume of 3,800 m^3;
- Sewage generated from Counties of Peterborough, Victoria and Northumberland can be deposited in the lagoon; and
- An additional 16,500 litres/day was approved by the Ministry in 2006 for winter operations bringing the total permissible rate of septic waste input to 33,000 litres/day.

Based on phone interview with Buckhorn Sand and Gravel staff, Cambium understands that the Facility lagoons do not freeze during the winter months.

Cambium understands from the same phone interview that Buckhorn Sand and Gravel does not currently have expansion plans on their property.

2.0 ONTARIO GUIDELINES

2.1 D-1 LAND USE COMPATIBILITY

The guideline applies any time a sensitive land use, such as a proposed trailer, is within the area of influence of an existing facility or a facility that is proposed. This guideline seeks to protect all forms of life from having any adverse effects caused by the proposed/existing facility. The guideline also recognizes that buffer/controls may be used as a means to do this while the sensitive receptor remains within the area of influence. Adverse effects can relate to any impact, however they generally include noise/vibration, dust and other particulates, odour, and air pollution.

This guideline applies when there is a change in land use that changes the point of impingent in the surrounding environment; a point of impingement is considered to be a point at which a contaminant contacts the ground or a building.

Utilizing an appropriate separation distance from incompatible sites is the recommended method to preventing issues between industrial and sensitive land. Municipalities may increase the minimum setback for such sites and/or by placing a restriction on outdoor storage. It is however understood that maintaining an adequate separation distance is not always feasible; in these cases, barriers and control measures must be designed to mitigate the impact on the surroundings.

2.1.1 APPLICABILITY TO SITE

As the proposed trailers are within the area of influence of Buckhorn Sand and Gravel this guideline applies to the Site. These trailers are proposed to be located closer to the pit than the current trailers at the Site.

2.2 D-2 COMPATIBILITY BETWEEN SEWAGE TREATMENT AND SENSITIVE LAND USE

Waste stabilization ponds are recommended to have a 100 m to 400 m buffer from the property line of a sensitive receptor. This distance depends on the characteristics of the wastewater

present. It is noted that the setback from the proposed trailers will be approximately 260 metres, which is within the recommended minimum setback. It is also noted that there are existing homes to the east which are also approximately 260 metres from the lagoons. Site interviews with personnel at the trailer park also indicate that there is no current complaints from the trailer park regarding odour from the neighbouring operations.

2.2.1 APPLICABILITY TO SITE

At present, the septage lagoons at the neighbouring pit are located 240 m from the property line of Melody Bay Resort. These lagoons only accept waste during winter months and are used as a storage facility until the waste is extracted by a separate company for treatment off site. The water quality of these lagoons is unknown but no complaints of odours have been made by past or present trailer occupants to the best of our knowledge. As the water quality within the lagoons is unknown and may be altered over time and the proposed development is within the range of the required setback of 400 m, additional assessment is required; in order to complete this assessment Cambium has conducted a relative sensitivity model run with an assumed odour emission from the lagoons to compare the potential odour impacts at the Proposed Development, with the impacts at the existing sensitive receptor.

2.3 D-6 COMPATIBILITY BETWEEN INDUSTRIAL FACILITIES

The D-6 guideline was created by the Ontario Ministry of the Environment and Climate Change (MOECC) to minimalize issues between sensitive land sources and industrial sites when either one begins encroaching on the other due to proposed land use changes. This guide specifies separation distances for industries to sensitive receptors and can be seen in Table 1 below.

Table 1: Industrial Classification according to D-6 Guideline and Corresponding Separation Distances

Class I	• Small scale, self-contained facility • Low probability of fugitive dust • Infrequent not intense point source outputs of dust and odour • Day time operation hour • No outdoor storage • Not audible off site • No ground-borne vibration	Recommended Minimum Separation Distance: 20 m Potential Area of Influence: 70 m
Class II	• Medium scale processing facility • Outdoor storage of waste material • Periodic releases of odour, and/dust that could result in minor annoyance • Odour and dust can be occasionally intense • Frequent movement of product/heavy trucks during daytime • Sound is occasionally audible off property • Minimal ground-borne vibration	Recommended Minimum Separation Distance: 70 m Potential Area of Influence: 300 m
Class III	• Large Scale Manufacturing and Processing • Outdoor storage of final and waste material • Large footprint and production capacity • Continues movement of products and employees during shifts • Frequent outputs of point source odour or dust casing major annoyance • Odour and Dust emissions are intense • Sound is often audible off site • Vibration can be perceived off site	Recommended Minimum Separation Distance: 300 m Potential Area of Impact: 1,000 m

2.3.1 BUCKHORN SAND AND GRAVEL CLASSIFICATION

Subsection 1.3.4 in the guideline requires all pits, regardless of size and operation, are to be treated as a **Class III** industrial site. It is therefore understood that the recommended minimum separation distance for this site is 300 m, with a potential area of influence of 1,000 m. It should, however be noted that the facility is only operational during the day, has outdoor storage units, entails the use of large trucks frequently, is occasionally audible off site, and may occasionally release odour and/or fugitive dust that is of a minor nuisance to the surrounding community.

2.3.2 APPLICABILITY TO SITE

As Melody Bay Resort is proposing to place trailers (a sensitive receptor) within the 300 m minimum separation distance for a Class lll industrial site; Melody Bay Resort is therefore required by the D-6 guideline to fully acknowledge, investigate and mitigate possible negative effects from choosing to complete the expansion of its trailer resort. It should be noted that many of Melody Bay's trailer homes are currently within this 300 m distance; however, only the proposed are currently subject to the D-6 guideline due to a change in land use.

3.0 METHODOLOGY

Utilizing the information gathered about the Buckhorn Sand and Gravel Pit from the site owners, the C of A, site development plans, google satellite images, and other similar sites previously studied, models were created for the noise, odour, and fugitive dust emitted from the site using MOECC approved software. Air Quality results were based on the MOECC's Ontario Regulation 419/05 (O. Reg. 419/05) Air Pollution - Local Air Quality (July 2016) standards and utilized the Air Contaminants Benchmarks List: standards, guidelines and screening levels for assessing the point of impingement concentrations of air contaminants (Ontario Ministry of the Environment and Climate Change, December, 2016). The proposed trailers were used as the point of impingement (POI) for air contaminants emitted. The Dust Management Plan of Buckhorn Sand and Gravel was not reviewed, however, based upon commitments to their Aggregate Resource Act Licence, dust management is included in order to maintain their licence (Ministry of Natural Resources , 2015).

Dust was also assessed in a site visit to Melody Bay Resort through visual inspection and interviews with Melody Bay staff, which indicated minimal fugitive dust impacts on the Site. Dust sources that have the potential to be present onsite, such as a mobile crusher, were modelled as a worst case scenario based on similar site's Cambium has previously assessed.

Sound monitoring was completed at the site on August 3rd, 2017 using a Bruel & Kjaer 2270 Light Hand-Held Sound Monitor. Although open for business, there was not any excavating, crushing or other noise producing activities occurring on-site at the time of noise data collection; the data collected was therefore used as ambient condition data for classification and modeling purposes. This ambient data indicates that the trailers should be considered as Class 3 receptors as per the MOECC guidelines (namely the Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning (NPC-300) (Ministry of Environment and Climate Change, August, 2013)).

In order to estimate the sound emitted during operation of noise producing equipment at the pit, sound emitted from the site was assessed using known data from similar models of noise producing equipment previously studied and modelled by Cambium for the purpose of obtaining

mobile Environmental Compliance Approvals (ECA) for mobile crushing operations. It is understood from information gathered from Buckhorn Sand and Gravel that the mobile crusher that is typically used onsite should have a mobile ECA for its operations. The predicted noise levels were modeled using the Bruel and Kjaer Predictor sound modeling software utilizing the ISO 9613-2 calculation algorithm.

3.1 RELATIVE SENSITIVITY ANALYSIS

Note that the analysis provided to is intended to prove that the proposed development will not cause compliance issues for the existing operations, Cambium completed this analysis using relative sensitivity. Reviewing the site plan, it can be seen that there are a number of existing sensitive receptors in existence surrounding the site, Cambium has generally assumed that compliance would be maintained at these receptors as required. Therefore, the methodology used to assess the proposed development is generally based the relative comparison of potential impacts at that location compared to existing sensitive receptors surrounding the site, this applies especially to odour and noise.

4.0 ASSESSMENT OF EMISSIONS FROM SURROUNDING ENVIRONMENT

It has been determined that the only source of emissions generating activities that are in the vicinity of the proposed expanded trailer park would be from Buckhorn Sand and Gravel and therefore the following sections are focused on what would be generated from the potential activities that may occur on such a site and how that may impact the surrounding environment.

4.1 AIR QUALITY ASSESSMENT OF SURROUNDINGS

Air Quality Emissions must be compliant with Ontario Regulation 419/05: *Air Pollution – Local Air Quality* (Ontario Ministry of the Environment and Climate Change, July 2016) and may also need to be assessed using Ontario Regulation 1/17 (*Registrations under Part II.2 of the Act – Activities Requiring Assessment of Air Emissions*) (Ontario Ministry of the Environment and Climate Change, January 2017). Sites with an ECA or one that is registered via the Environmental Activity Sector Registry (EASR) for air and noise emissions must meet the above mentioned standards at the property line and this is often demonstrated through the use of modelling software and comparison with approved standards in order to obtain approval. Every contaminant that could cause a negative effect on the environment must be modelled and be below levels present on the *Air Contaminants Benchmarks List: standards, guidelines and screening levels for assessing point of impingement concentrations of air contaminants* (December, 2016) created by the MOECC.

If the concentration of a contaminant is not on the ACB list or exceeds a value provided, the adverse effect must be determined through a variety of different means; this may include the need mitigate a source of emissions in order to ensure that negative effects are not incurred to the surrounding environment. In cases where a source is a mobile unit that can be used on a number of sites for up to 60 days per calendar year per site, such as rental rock crushers which are generally used intermittently on sites, these mobile units possess their own mobile ECA to be operated in compliance with the MOECC regulation. These mobile units have operating conditions that are specific to the unit, such as operating time restrictions and minimum setback distances defined for which they need comply with in order to minimize the impact on sensitive receptors.

4.1.1 POTENTIAL NEARBY AIR EMISSION SOURCES

Contaminants such as particulate matter (total and fine), and crystalline silica have the potential to be released from the crushing of gravel via a mobile crushing units. It is understood that the nearby pit operated by Buckhorn Sand and Gravel may have such a crushing unit present on site for up to three (3) weeks at a time twice per year. Other sources of particulate matter that may also be present at the pit would be generated due to wind erosion and vehicle traffic on unpaved or dusty roads; however, those sources are presumed to be controlled by Buckhorn Sand and Gravel through their Aggregate Resources Act License requirements.

Additionally Nitrogen Oxides (NOx) has the potential to be emitted from diesel generators present for grinding/crushing and screening processes. The detailed emissions that may be generated from such processes would be outlined in the mobile ECA that could not be obtained for the specific machinery used at the pit.

Figure 4 provides the source layout used in air analysis. Note that a central location was used based on interviews with Buckhorn Sand and Gravel staff.

4.1.1.1 Possible Fugitive Dust Generating Activities

Fugitive Dust is dust is expected to be generated from two (2) physical processes that may occur on the Buckhorn Sand and Gravel Pit site; these include generation from turbulent air force (wind) over 19 km/hr or from the application of a physical force such as wheels over unpaved surfaces. Both of these processes result in dust becoming suspended and leading to the ability of the dust to migrate from the property. The rate of which settling is expected to occur can be estimated using values from Chapter 13 of the AP-42 (United States Environmental Protection Agency, September,2016).

Dust emissions in Ontario are regulated through O. Reg. 419/05. Suspended Particulate Matter can be modelled using AERMOD 16216 to determine the spread of plumes. In cases where the dust emissions are considered to only be nuisance sources and are not expected to contain metals, a detailed Fugitive Dust Control Plan can be implemented instead of modelling.

Dust emissions can be varied heavily by the particle size of stock piled material, the mechanical movement of material, its moisture content and finally the wind speed/weather variation. This means that dust emissions can vary drastically at a site. A Best Practices Fugitive Dust Control Plan is typically utilized to minimize the variability by which dust is emitted to keep suspended dust generation to a minimum at all times. This often includes the application of water or other dust suppressant chemicals to areas of known dust generation. Other mitigation measures can be lowering speed of traffic onsite or applying a low dust generating material to the top of stock piles that will not be disturbed frequently. This is explained in more detail in the Technical Bulletin: Management Approaches for Industrial Fugitive Dust Sources (Ministry of Environment and Climate Change, 2017).

Given the requirement for fugitive dust management and that the staff at Melody Bay indicated they have not encountered any issues with fugitive dust emanating from the Buckhorn Sand and Gravel site, it will not be assessed as a concern, only equipment sources of dust will be assessed.

4.1.2 POTENTIAL ON-SITE AIR EMISSION SOURCES

The proposed new trailers are standard dwelling units, and therefore under Ontario Regulation 419/05 the new trailers are not points of impingement for on-site sources. Specifically, only child care, health care, senior citizen residences and educational facilities would be considered as points of impingement on the same property as a source. It should also be noted that Cambium did not identify any significant air emission sources at the maintenance shed.

4.1.3 ESTIMATING AIR EMISSIONS FROM THE POTENTIAL SOURCES

Dust and NOx have been estimated to be released from the mobile crushing operations based on calculations produced by Cambium for similar studies; typical working hours and worst case rates of crushing of such a unit have been presumed and were accounted for in order to assess the maximum emissions that may potentially be generated from the Buckhorn Sand and Gravel facility as a worst case.

The similar operations includes the following equipment:

- One (1) jaw crusher;
- One (1) cone crusher;
- One (1) screen plant;
- One (1) 700 kW diesel generator; and,
- Overall throughput assumed of 125 tons per hour.

Note that since the site uses a mobile crushing operations, this representative air source was used for the purposes of air assessment. Since there are a number of existing long term receptors surrounding the site, it can be assumed that the site is compliant at those receptors during operations. Therefore Cambium has focused on addressing compliance at the proposed receptors, with the assumption of full compliance at the existing homes.

4.1.4 AIR MODELLING RESULTS FOR PM AND NOX

Results from modelling the emissions generated from the previously studied mobile crusher unit and its corresponding generator, assuming it was operated near the center of the Buckhorn Sand and Gravel facility property as indicated by Buckhorn Sand and Gravel, yielded results at the proposed trailer locations well below that of the Ontario Benchmark list for both suspended particulate matter (<44µm) and Nitrous Oxide emissions (highest impacts 16.21 % of the 1 hour limit for NOX).

Table 3 is a source and contaminant summary table, providing basic information regarding the sources modelled. Table 4 includes a source summary table, including modelling details and emission rates arranged by both source, and contaminant. Table 5 summarizing the model input data used in AERMOD, and Table 6 provides an emission summary table.

4.1.5 DUST CONTROL MEASURES CONSIDERED

In order to maintain their aggregate license through the Ministry of Natural Resources, Buckhorn Sand and Gravel must meet all prescribed conditions that apply to Class A licences; as described in the document, Provincial Standards of Ontario- Category 1 - Class A Below Water Pit (Ministry

of Natural Resources , 2015), dust must be mitigated on site. Worthy of noting is that the Standard also specifies the need for the following:

- The use of dust suppressant and/or water on internal haul roads and processing areas when required for dust suppression; and
- Processing equipment used on site must be fitted with dust suppressing or collecting devices when being operated within 300 m of a sensitive receptor.

4.1.6 SITE OBSERVATIONS RELATED TO AIRBORNE PARTICULATE

There was no dust generation observed from offsite when looking towards the trailer park site from the Melody Road Buckhorn Sand and Gravel entrance nor from the south while in Melody Bay Resort. Although conditions at the time were dry, there was precipitation the previous evening (August 2nd, 2017) resulting in approximately nine (9) millimetres of rain accumulated in the area.

4.2 ODOUR ASSESSMENT OF SURROUNDINGS

Odour impacts in Ontario are discussed in the Ministry of Environment and Climate Change technical bulletin entitled “Methodology for Modelling Assessments for Contaminants with 10 minute Average Standards and Guidelines as an addition to O.Reg 419/05”. This guideline presents one (1) odour unit/m^3 as the acceptable limit for odour in a 10-minute averaging period. This limit was determined by the point in which 99.5% of the population can perceive the odour. When determining odour impact it is not just important to consider concentration, but also to consider the frequency of the odour for compatibility purposes.

4.2.1 POTENTIAL SOURCES OF NEARBY ODOUR

The sources of potential odour from the Buckhorn Sand and Gravel Pit site include the onsite lagoons containing septic waste. It is observed that all lagoons on the Buckhorn Sand and Gravel property are at a distance of 260 m from the proposed expanded trailer park; however, based upon the D-2 Guidelines it is recommended that a separation distance between buffer of 100 m to 400 m be upheld depending on characteristics of the Pond. The distance from the proposed

trailers to the waste lagoons can be seen in Figure 1. This distance is approximately 240 m from the property line of Melody Bay. Cambium noted that the current nearest sensitive receptor is located approximately 260 m from the lagoons to the southeast.

Note the maximum approved area of 4000 square metres was used in the assessment of possible odour impacts.

Figure 5 provides the odour source layout used in the AERMOD analysis.

4.2.2 ESTIMATING ODOUROUS EMISSIONS

In order to provide support for the Melody Bay proposed Development with respect to possible odour impacts Cambium has conducted a sensitivity model run of the lagoon layout in the area, with an odour flux value assumed at 1 odour unit per square meter. Note that this analysis should not be perceived as a prediction of actual odour levels, but has been completed for comparative analysis between the existing most sensitive receptor, and the proposed sensitive receptors. Given that the existing most sensitive receptor and proposed development are at very similar setback distances from the ponds, it can be assumed that if the proposed development is equally or less sensitive to the odour impacts than the existing receptor, that the proposed development will not cause a compatibility issue for the existing land use.

4.2.3 POSSIBLE ODOUR CONTROL MEASURES

In general, odour issues may occur when a lagoon is not functioning correctly and would need to be corrected for normal operational purposes that would also act to reduce an odour issue that may have arose. It was noted through interview with Buckhorn Sand and Gravel that the lagoons do not freeze during winter time and are unlikely to become anoxic.

4.2.4 ODOUR MODELLING

The site was modelled as an odour source using the representative odour flux indicated. Note that the assessment was completed only for the purpose of comparing relative potential impacts at various locations around the site. Results indicate that the impacts at the proposed

development would be expected to be roughly equivalent to the existing nearest sensitive receptor.

One (1) hour results were multiplied by a factor of 1.65 to convert the averaging period from 1 hour to 10 minutes. Discrete receptors were used to obtain odour results for the five (5) year meteorological data set. Figure 6 provides a histogram of odour impacts comparing the existing most sensitive receptor to the proposed trailer. It can been seen from these results that the impacts are slightly lower at the proposed development location than the existing most sensitive receptor.

Given that the lagoons are within the range indicated in the D2 guidelines as possibly acceptable (100 to 400 metres), as well as the results of the sensitivity analysis comparing the existing receptor location to the proposed location. It can be concluded that the potential for additional odour impacts due to this proposed development are low and therefore the Proposed Development is compatible.

4.2.5 ODOUR COMPLAINTS

Interviews with Melody Bay personnel indicated that there have been no odour complaints that they are aware of. Cambium has attempted communication with the District MOECC office regarding the status of complaints in the area, however no response has yet been obtained. Regardless of complaint status, the relative sensitivity combined with Melody Bay's observations support that there is not an existing odour issue to the south of the lagoons.

4.2.6 SITE OBSERVATIONS RELATED TO ODOUR

It should be noted that site observations were never indicated as being completed by an EN13725:2003 standard certified technician. These are general observations of the site conditions. Note that the site visit was conducted in the summer time, while the approval for the lagoons relates to winter time storage.

There were no obvious odourous emissions detected during the site visit that was conducted on August 3, 2017 at no location that was investigated on and in the surrounding environment of the Melody Bay trailer park.

4.3 NOISE

Noise is regulated in Ontario by NPC-300, Environmental Guideline, Stationary and Transportation Sources - Approval and Planning (Ministry of Environment and Climate Change, August, 2013).

Melody Bay Resort is in an area classified as a Class 3 Rural area as per NPC-300. Class three (3) has been selected based on the ambient measurement conduct on August 3, 2017 as well as a review of the area. Class 3 areas are defined as being dominated by natural sounds at all times of day with little or no traffic. A review of the area indicates that would be the case for the Melody Bay Trailer part.

This type of noise designation indicates minimum daytime and nighttime 1 hour equivalent sound level (Leq) noise limits levels of 45 dBA and 40 dBA, respectively.

This means that new developments must not result in, L_{eq} noise levels that exceed the one hour ambient noise level at the closest receptor to the source of noise in the corresponding hour. The closest proposed trailer will be used as the closest receptor for the purpose of this analysis.

A sound level meter was setup in 1 minute logging mode at the general area of the proposed new development. It was noted that no significant noise sources were present at the Buckhorn Sand and Gravel site. Therefore the measurement is an ambient background measurement the overall broadband data recorded is summarized in Table 2 below.

Table 2: Background Noise Measurements

Measurement Location	Measurement Duration	LAeq (dBA)	LAF90 (dBA)
Measurement taken at the proposed development area at 1.5 m height	1 hour 28 minutes and 44 seconds	48	33.9

Review of the one (1) minute logging data indicates that once the minutes at the start and end of the measurement are removed, only five (5) of the one (1) minute Leq values exceed 45 dBA. This noise data supports that the area is a Class 3 area. The LAF90 level of 33.9 dBA also supports Class 3 designation.

4.3.1 POTENTIAL SOURCES OF OFFSITE NOISE

At Buckhorn Sand and Gravel the gravel crushers and heavy machinery used to move the sand and gravel will potentially be the primary noise and vibration sources at the site. The gravel crushers are not expected to be present on site for the majority of the year. Based on telephone interview with Buckhorn Sand and Gravel staff, the crusher would be on site typically two (2) times per year for a period of weeks (typically one (1) too three (3) weeks). The equipment operates generally in the central portion of the site per Buckhorn Sand and Gravel only during work hours (daytime).

Note that noise source data is provided in Table 7. Also noise source layout has been provided as Figure 7, including the pre-development and post development models.

4.3.2 POTENTIAL SOURCES OF ONSITE NOISE

The trailer park has a maintenance shed located approximately 100 m northeast from the new trailers. During Cambium's site review no significant sources of noise were found. In addition, it should be noted that under NPC-300 a land use that would normally be considered sensitive, such as a dwelling, but is located within the property boundaries of the stationary sources is not considered a noise sensitive land use (Ministry of Environment and Climate Change, August, 2013).

4.3.3 NOISE EMISSION ESTIMATES

As stated above, the major noise emissions that could potentially be generated at the Buckhorn Sand and Gravel Site are assumed to be the result of the use of a portable mobile crushing unit onsite. The noise that the mobile crusher may have the ability to produce was therefore required for the sake of modelling the emissions generated from its use at the Buckhorn Sand and Gravel site; hence, a similar type of operation that was previously analyzed by Cambium in 2014 which received approval from the MOECC in 2015 was used for the purpose of noise propagation modelling. The similar operations includes the following equipment:

- One (1) jaw crusher;

- One (1) cone crusher;
- One (1) screen plant;
- One (1) 700 kW diesel generator;

Note that since the site uses a mobile crushing operations, this representative noise source was used for the purposes of noise assessment. Given there are a number of existing long term noise receptors surrounding the site, it can be assumed that the site is compliant at those receptors during operations. Therefore Cambium has focused on addressing compliance at the proposed receptors, with the assumption of full compliance at the nearest receptor, which is the existing home located approximately 46 metres east of the proposed trailers.

4.3.4 NOISE MODELLING RESULTS

As noted above the noise modelling was conducted with the assumption that the operations are compliant at the existing receptor location. Effectively this assessment is a relative assessment. Therefore, the representative noise source was located centrally at the site, and a correction applied until compliance was achieved at the previously existing receptor nearest to the proposed trailers, specifically the dwelling unit located on Melody Bay Property.

The noise modelling was conducted using sound modeling software utilizing the calculation algorithm approved by the MOECC (ISO 9613-2); the results indicate that there is a risk present that noise levels may be greater than the NPC-300 standards when the representative mobile crusher unit was used as the noise source operating in the centre of the Buckhorn Sand and Gravel Pit.

Based on this relative analysis, comparing the existing noise receptor to the proposed new receptors, it would appear that noise mitigation measures are required for the proposed trailers to maintain compliance for Buckhorn Sand and Gravel.

4.3.5 NOISE MITIGATION MEASURES

Compliance has predicted compliance for the proposed development scenario provided the new trailers are installed with a noise barrier wall or berm, starting at the northwest corner of the

property and proceeding 60 metres along the property line to the east, with an overall height of 3 metres. This barrier could be any combination of berm or barrier wall, provided it meets the MOECC requirements of a surface density of 20 kilograms per square meter, and is constructed with no cracks or gaps (ie air tight).

4.3.6 SITE OBSERVATION

While onsite, Cambium noted that there was no notable noise sources from Buckhorn Sand and Gravel. All noise levels recorded on the noise meter were determined to be typical of background levels for the area. Note that due to the intermittent nature of crusher on the site, there was no crushing occurring during Cambium's sit visit.

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 AIR QUALITY AND DUST

As per guideline D-6 the minimum recommended separation distance for aggregate operations is 300 metres. As noted, the proposed development is within that setback distance. As such further analysis was required.

As per the air analysis complete by Cambium as presented above and in the supporting documentation, it is not anticipated that the proposed development will hinder or inhibit the existing operations at Buckhorn Sand and Gravel. The facility has a significant number of sensitive receptors in worse downwind locations than the proposed development. Analysis shows that compliance can be maintained for possible representative mobile crushing activities on-site.

In addition to Cambium's analysis for the potential mobile operations, it should be noted that for stationary sources the point of impingement is assessed at the property line under Ontario Regulation 419/05. Also fugitive sources of dust are regulated under the Aggregate Resources Act which requires fugitive dust management plans.

Cambium would conclude that, as proposed, the development is compatible with the nearby land uses according to guideline D-6 with respect to air quality.

5.2 ODOUR

As per Guideline D-2 the recommended setback distance for lagoons under guideline D-2 is "from 100 to 400 metres".

The proposed development is within that range, meriting additional analysis. Cambium conducted relative sensitivity analysis which indicates that the proposed development is no more sensitive to the lagoons as an odour source than the existing most sensitive receptor. Moreover, the recommended setback distance for lagoons under guideline D-2 is "from 100 to 400 metres". Given that the existing sensitive receptors are located at approximately the same setback distance as the proposed development it would also be reasonable to assume that the

approximately 260 metre setback distance is appropriate for these lagoons given that it is within the acceptable range listed in guideline D-2.

Cambium would conclude that as proposed the development is compatible with the odour producing land uses, according to guideline D-2.

5.3 NOISE

Noise is expected to be the greatest possible nuisance to the residences on the Site during operating hours when the crushing unit is present at Buckhorn Sand and Gravel.

Cambium has completed analysis based on the assumption that compliance is initially maintained at the dwelling located within close proximity of the proposed new trailers. An assumed level of noise control was applied to the representative sources, since the home has been there for some time it is expected that compliance would already be maintained at that location. Based on that analysis, it has been shown that having the proposed development located closer to the aggregate operation than the existing dwelling may potentially cause a noise impact issue. Therefore Cambium has included a requirement in this study that a noise barrier or berm of three (3) m height and 60 m length be constructed along the north property line of the Melody Bay Site, starting at northwest corner, the in order to maintain compliance with NPC-300.

Cambium would conclude that with the proposed noise controls included, the proposed development is compatible with the noise producing land uses, according to NPC-300.

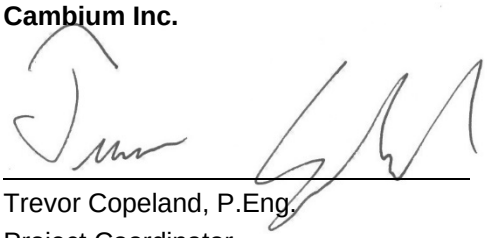
6.0 CONCLUSIONS

Cambium has assessed the site based on the relevant Provincial guidelines and procedures. The initial D-series guideline assessment indicated the requirement for additional analysis for air, odour and noise.

Analysis completed indicates the proposed new development is compatible with the surrounding land uses, provided the required noise controls are installed. According to Guideline D-6.

Respectfully submitted,

Cambium Inc.



Trevor Copeland, P.Eng.
Project Coordinator

P:\6200 to 6299\6225-001 Parkbridge Lifestyle Communities Inc. - Land Use Compatibility Study - Melody Bay Trailer Park\Deliverables\REPORT - Compatability Study (Air, Odour, Dust, Noise)\Version 2\Cambium Report.docx

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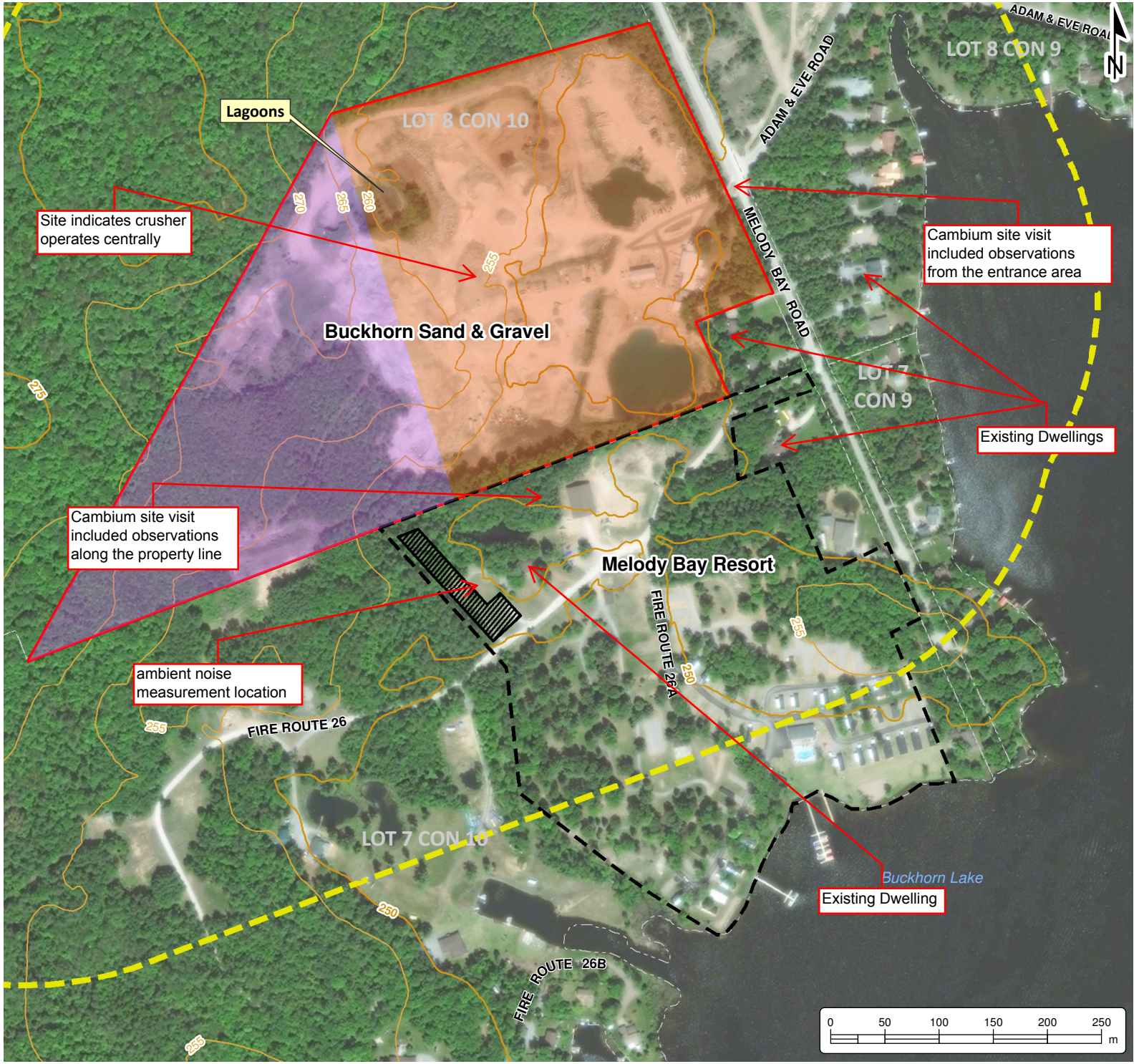
Appended Figures



LAND USE COMPATIBILITY STUDY - MELODY BAY TRAILER PARK

MUNICIPALITY OF TRENT LAKES

33 Melody Bay Road, Buckhorn, Ontario

LEGEND

- Contour 5m Interval (Major)
- Contour 5m Interval (Minor)
- Lot / Concession
- Melody Bay Resort (Approximate)
- Proposed Location for Additional Trailers (Approximate)
- Buckhorn Sand & Gravel (Approximate)
- 300m Buffer from Buckhorn Sand & Gravel

Zoning (Approximate)

- Industrial
- Extractable Industrial

Notes:

- 2016 aerial imagery accessed August, 2017 from ArcGIS Online. Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
- Base mapping features are © Queen's Printer of Ontario, 2017 (this does not constitute an endorsement by the Ministry of Natural Resources or the Ontario Government).
- Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.
- Cambium Inc. makes every effort to ensure this map is free from errors but cannot be held responsible for any damages due to error or omissions. This map should not be used for navigation or legal purposes. It is intended for general reference use only.

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www.cambium-inc.com

SITE MAP (AIR AND NOISE ASSESSMENT)

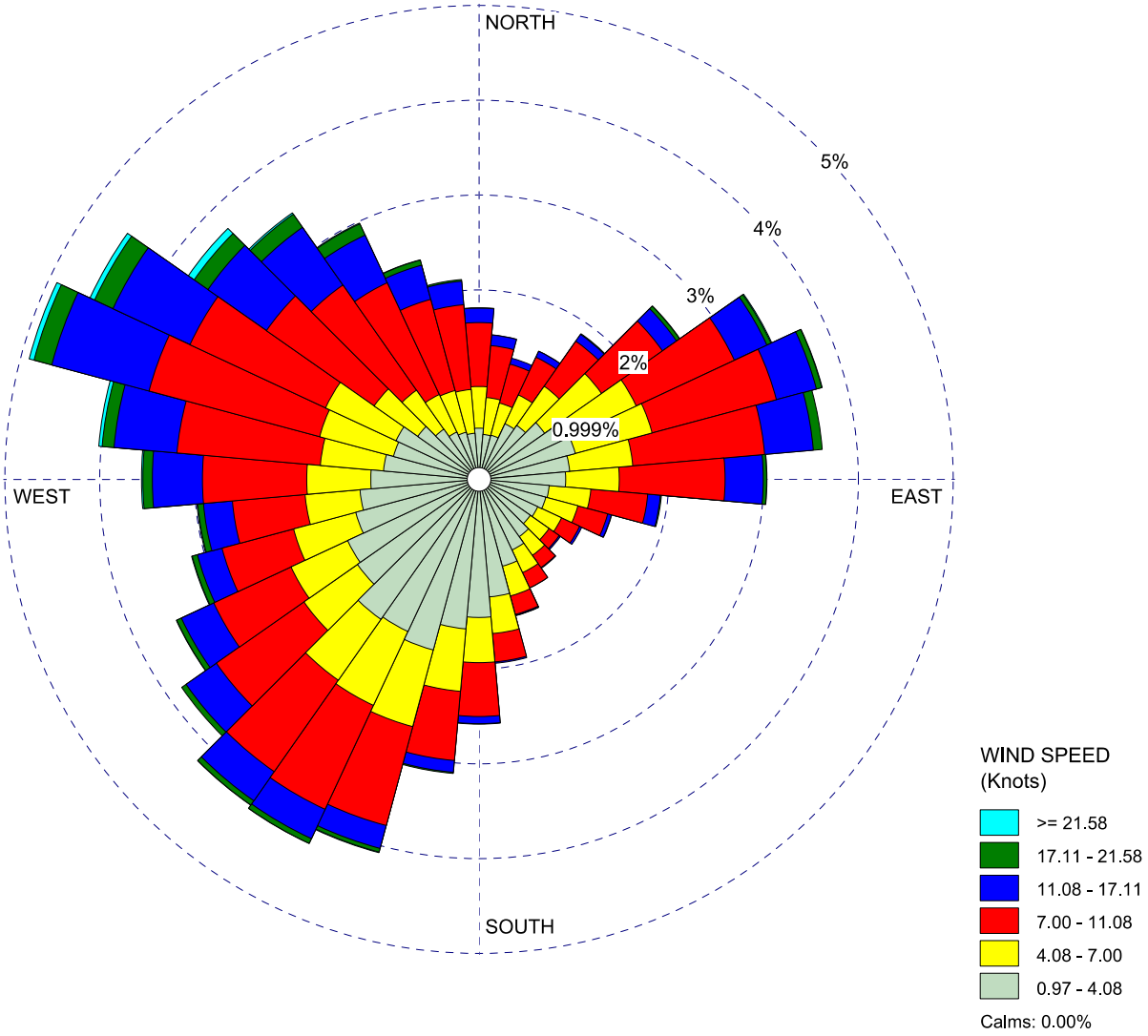
Project No.:	6225-001	Date:	March 2018
		Rev.:	2
Scale:	1:5,000	Projection:	NAD 1983 UTM Zone 17N
Created by:	TMC	Checked by:	TMC
Figure:	1		

O:\GIS\project_MXDs\6200-6299\6225-001 Parkbridge Lifestyles Communities Inc. - Land Use Compatibility Study - Melody Bay Trailer Park\2017-08-09 AaN FIG 1 Compatability Study.mxd

Figure 2 MOECC Preprocessed Wind Rose

WIND ROSE PLOT:
Station #61060 - OTTAWA, ON

DISPLAY:
Wind Speed
Direction (blowing from)



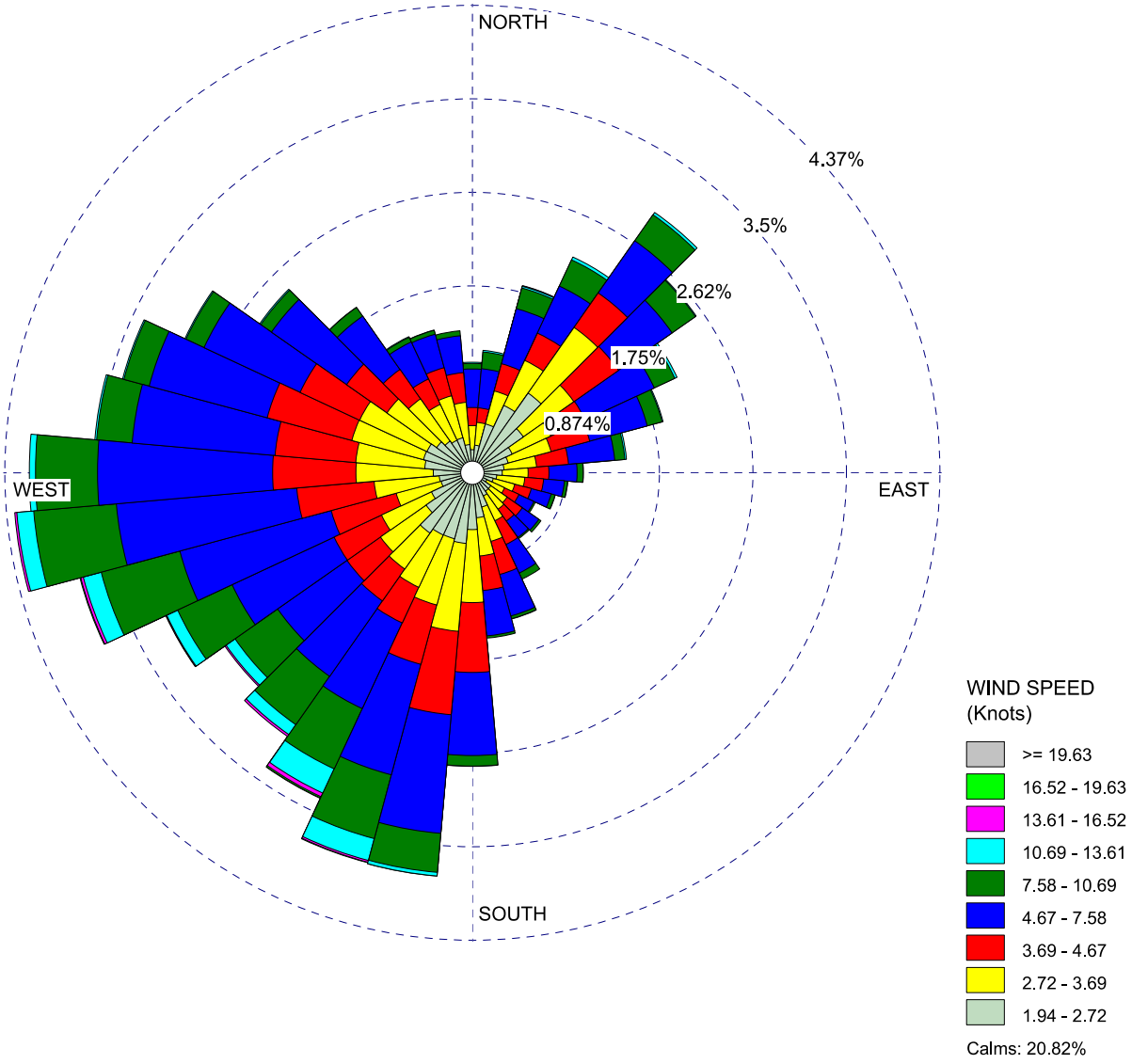
COMMENTS: MOECC Draft 16216 Data 1996-2000 Cambium Inc.	DATA PERIOD: **Start Date: 1/1/1996 - 00:00** **End Date: 12/31/2000 - 23:59**	COMPANY NAME: **Cambium Inc.**	
		MODELER: **MOECC**	
	CALM WINDS: **0.00%**	TOTAL COUNT: **43390 hrs.**	
	AVG. WIND SPEED: **6.29 Knots**	DATE: **3/7/2018**	PROJECT NO.: **6225-001**

WRPLOT View - Lakes Environmental Software

Figure 3 Trent U Wind Data

WIND ROSE PLOT:
Station #71672

DISPLAY:
Wind Speed
Direction (blowing from)



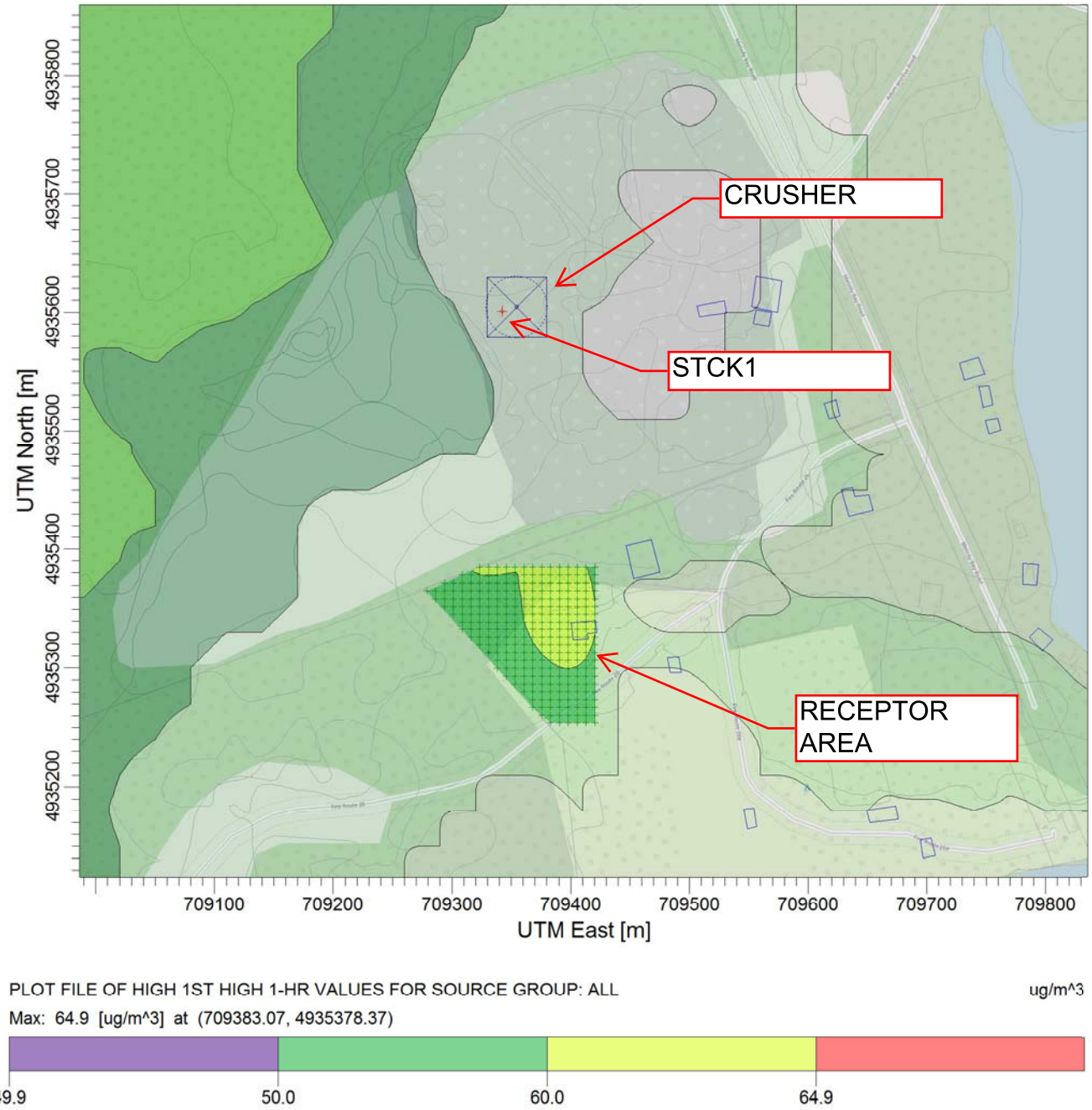
COMMENTS:	DATA PERIOD:	COMPANY NAME:	
Peterborough Trent U Weather Data 2013-2017 Cambium Inc.	**Start Date: 1/1/2013 - 00:00** **End Date: 12/31/2017 - 23:00**	**Cambium Inc. 6225-001**	
		MODELER: **Accessed from Environment Canada**	
	CALM WINDS: **20.82%**	TOTAL COUNT: **43824 hrs.**	
	AVG. WIND SPEED: **3.64 Knots**	DATE: **3/13/2018**	PROJECT NO.: **6225-001**

WRPLOT View - Lakes Environmental Software

Figure 4 Air Source Layout

PROJECT TITLE:

O:\AERMOD\6225-001 Melody Bay\6225-001 Crusher\6225-001 Crusher.isc



PLOT FILE OF HIGH 1ST HIGH 1-HR VALUES FOR SOURCE GROUP: ALL

ug/m^3

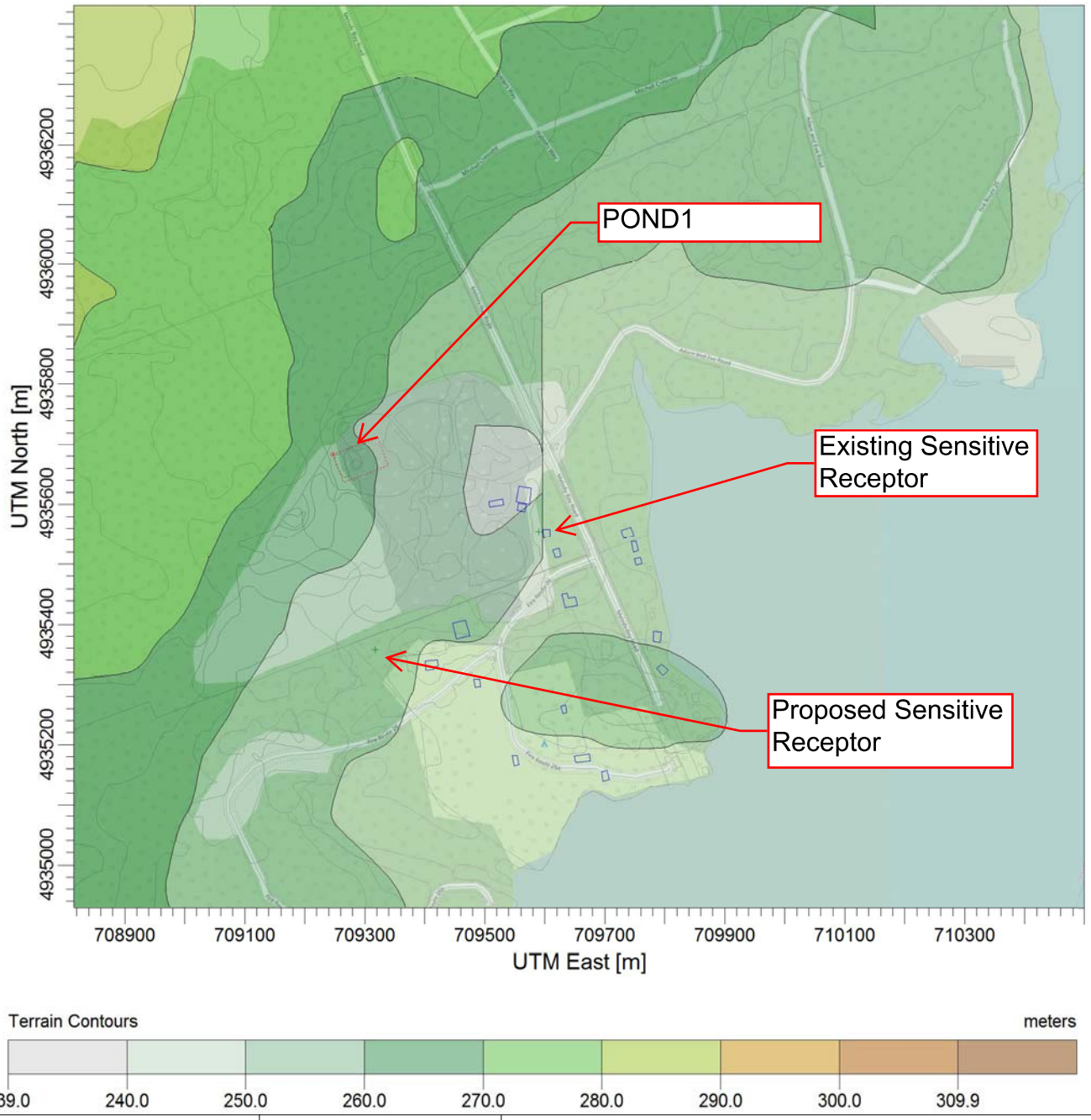
Max: 64.9 [ug/m^3] at (709383.07, 4935378.37)

COMMENTS: Figure 4 Air Source Layout NOX 1 hour	SOURCES: **2**	COMPANY NAME: Cambium Inc.	
	RECEPTORS: **279**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:5,342 0 0.2 km	
	MAX: **64.9 ug/m^3**	DATE: **3/14/2018**	PROJECT NO.: **6225-001**

Figure 5 Odour Layout

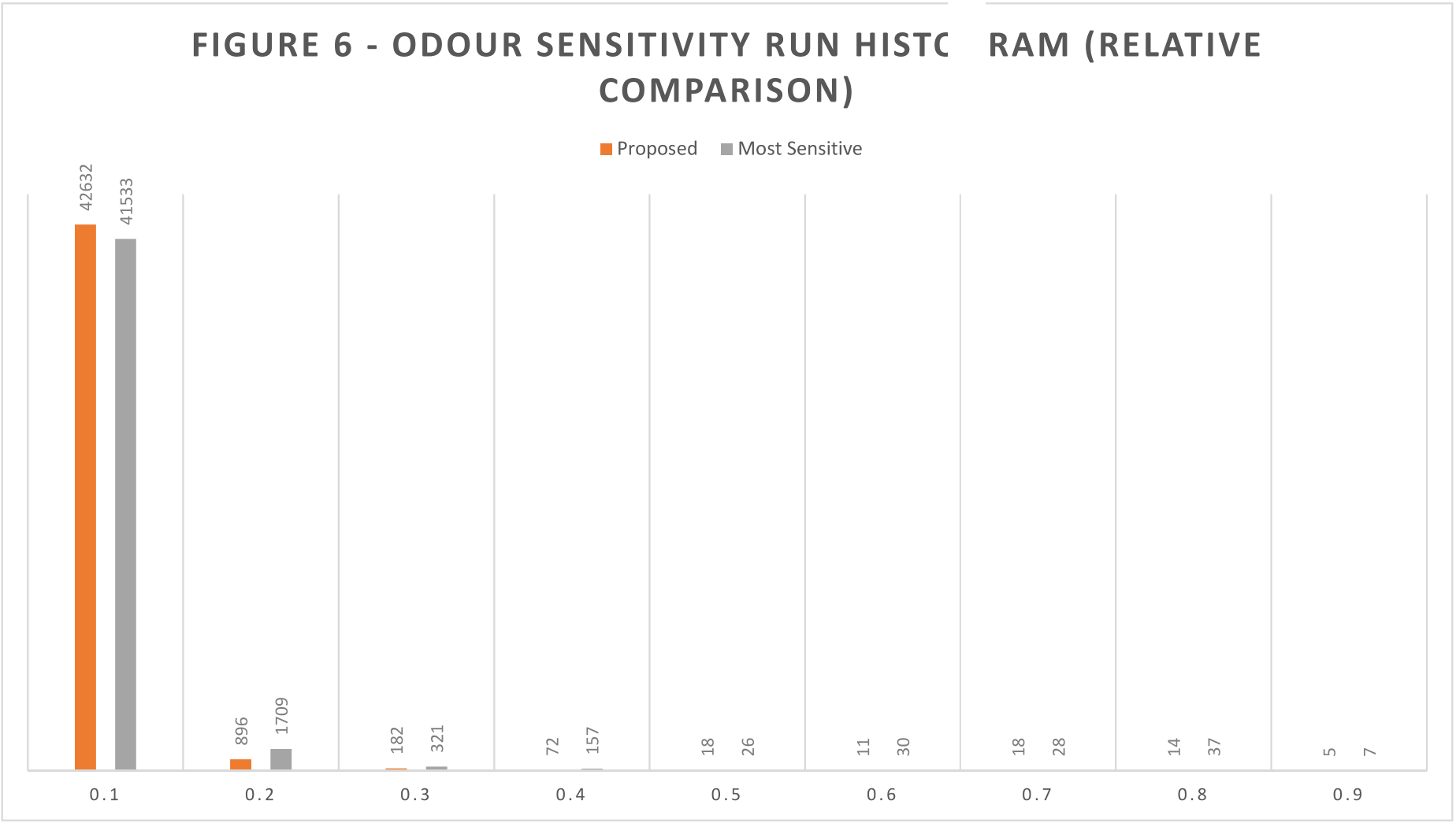
PROJECT TITLE:

O:\AERMOD\6225-001 Melody Bay\6225-001 Odour\6225-001 Odour.isc



COMMENTS: Figure 5 Odour Source Layout	SOURCES: **1**	COMPANY NAME: Cambium Inc.	
	RECEPTORS: **2**	MODELER:	
		SCALE: 1:10,591 0 0.4 km	
		DATE: **3/15/2018**	PROJECT NO.: **6225-001**

FIGURE 6 - ODOUR SENSITIVITY RUN HISTC RAM (RELATIVE COMPARISON)



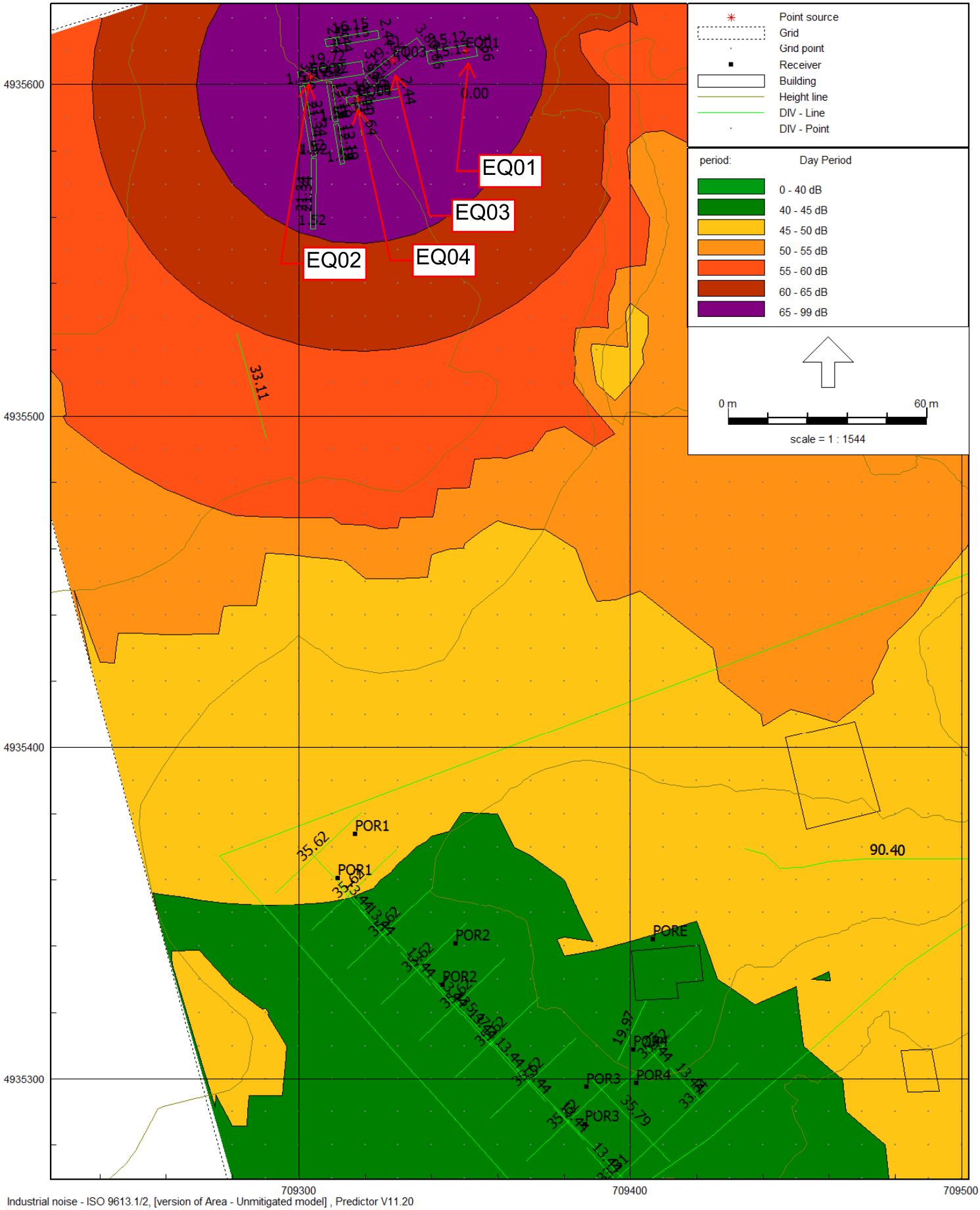
Note that these impacts are based on an assumed odour flux for the lagoons of 1 OU/M2. The results are presented here as a relative comparison between the existing most sensitive receptor, and the proposed new development. You can see that over the 5 year meteorological data period, there are more instances of higher impacts at the existing receptor than at the proposed development. This would indicate that the proposed development will not represent a significant increase in sensitivity to odour in the area.

Figure 7A - Noise Source Layout

Unmitigated model

14 Mar 2018, 13:38

Cambium Inc., Canada



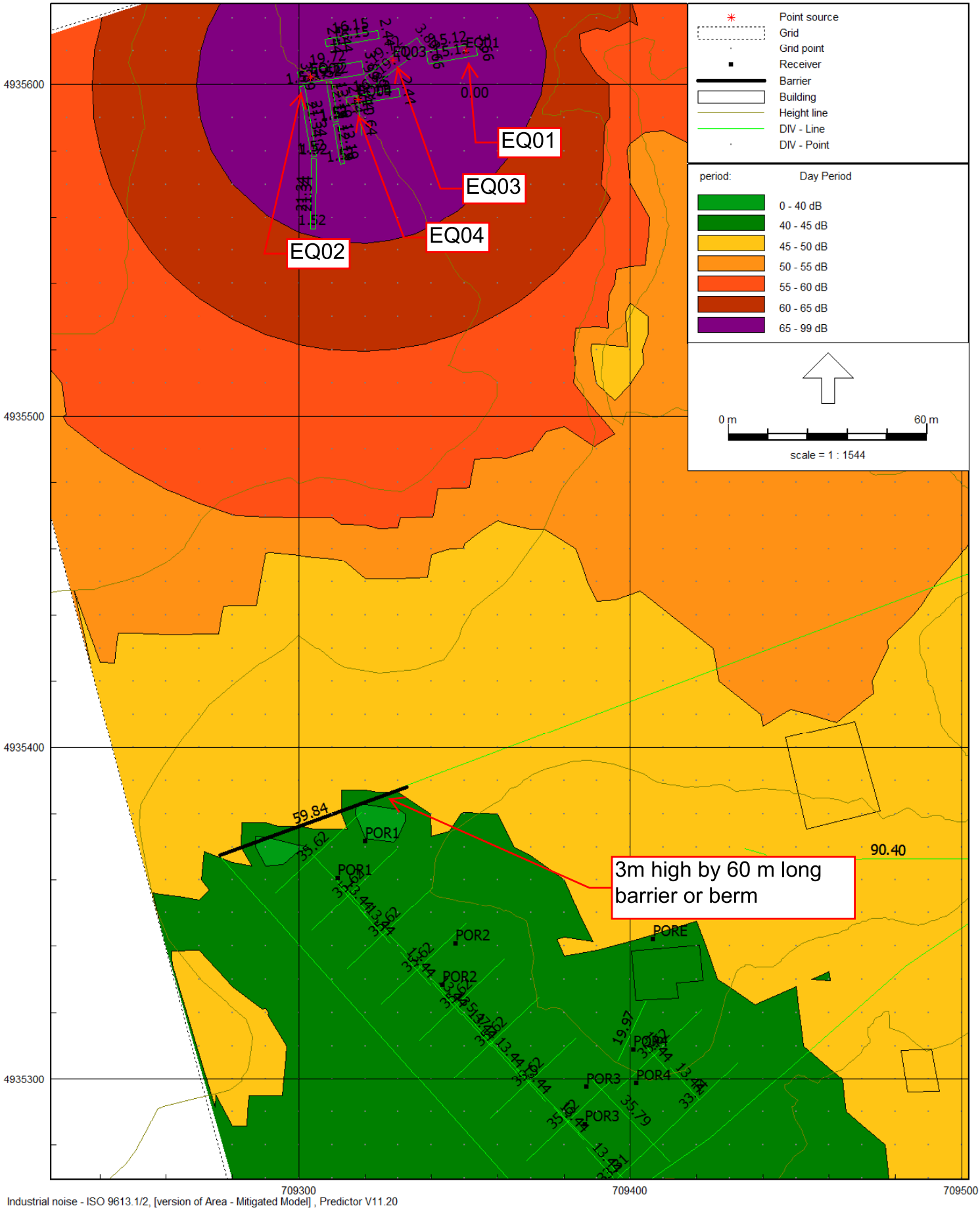
Industrial noise - ISO 9613.1/2, [version of Area - Unmitigated model] , Predictor V11.20

Figure 7B - Noise Source Layout

Mitigated model

14 Mar 2018, 13:38

Cambium Inc., Canada



Industrial noise - ISO 9613.1/2, [version of Area - Mitigated Model] , Predictor V11.20

Appended Tables

Table 3 Sources and Contaminants Identification Table

Source Information			Expected Contaminants	Included in Modelling?
Source Identifier	**Source Description**	**Location**	**Contaminant**	**Significant (Yes or No)**
STCK1	Generator Exhaust	Central	TSP	Yes
			Nitrogen Oxides	Yes
POND1	Lagoons	North	Odour	Yes
CRUSHER	Mobile Equipment	Central	TSP	Yes

Table 4a Source Summary Table Sorted by Contaminant

Source Data												Emissions Data					
Contaminant	**CAS Number**	**Source Identifier**	**Source Description**	**Stack Volumetric Flow Rate (m3/s)**	**Stack Gas Temperature (°C)**	**Stack Diameter (m)**	**Stack Height Above Grade (m)**	**Length or Sigma X**	**Length or Sigma Y**	**Stack Height Above Roof (m)**	**Source Coordinates (x,y) (m)**	**Maximum Emission Rate (g/s)**	**Averaging Period**	**Emission Estimating Technique**	**Sample Calculation Identifier**	**Data Quality**	**Percentage of Overall Emission (%)**
Odour	N/A (Odour)	POND1	Lagoons	-	-	-	0	66.66	60	0	709246.49, 4935683.3	1.00E+00	10 min	Emission Factors	Appendix C: Calc 1	Unknown	58.14%
TSP	N/A (TSP)	STCK1	Generator Exhaust	2.589237833	277.85	0.203	2	(blank)	(blank)	0	709342.12, 4935600.75	2.45E-02	24 hour	Emission Factors	Appendix A: Calc 3	Above Average	8.24%
		CRUSHER	Mobile Equipment	-	-	-	2	11.63	1.86	0	709354.6, 4935604.43	2.73E-01	24 hour	Emission Factors	Appendix A: Calc 2	Above Average	91.76%
Nitrogen Oxides	10102-44-0	STCK1	Generator Exhaust	2.589237833	277.85	0.203	2	(blank)	(blank)	0	709342.12, 4935600.75	2.13E+00	1 hour, 24 hour	Emission Factors	Appendix A: Calc 3	Above Average	100.00%

Table 4b Source Summary Table Sorted by Source

Source Data										Emissions Data							
Source Identifier	Source Description	Stack Volumetric Flow Rate (m3/s)	Stack Gas Temperature (°C)	Stack Diameter (m)	Stack Height Above Grade (m)	Stack Height Above Roof (m)	Length or Sigma X	Length or Sigma Y	Source Coordinates (x,y) (m)	Contaminant	CAS Number	Maximum Emission Rate (g/s)	Averaging Period	Emission Estimating Technique	Sample Calculation Identifier	Data Quality	Percentage of Overall Emission (%)
STCK1	Generator Exhau	2.589237833	277.85	0.203	2	0	(blank)	(blank)	709342.12,	TSP	N/A (TSP)	2.45E-02	24 hour	Emission Factors	Appendix A: Calc 3	Above Average	8.24%
										Nitrogen Oxides	10102-44-0	2.13E+00	1 hour, 24 hour	Emission Factors	Appendix A: Calc 3	Above Average	100.00%
POND1	Lagoons	-	-	-	0	0	66.66	60	709246.49,	Odour	N/A (Odour)	1.00E+00	10 min	Emission Factors	Appendix C: Calc 1	Unknown	58.14%
CRUSHER	Mobile Equipme	-	-	-	2	0	11.63	1.86	709354.6, 4	TSP	N/A (TSP)	2.73E-01	24 hour	Emission Factors	Appendix A: Calc 2	Above Average	91.76%

Table 5 Dispersion Modelling Input Summary Table

Relevant Section of the Regulation	Section Title	Description of How the Approved Dispersion Model was Used
Section 6	Approvde Air Dispersion (include Model Versions)	Site Specific Met data by MOECC v16216r AERMET V16216r (incl. in Met Data) BPIP v. 0474 AERMAP 011103 AERMOD version 16216
Section 8	Negligible Sources	See report.
Section 9	Same Structure Contamination	Not Applicable.
Section 10	Operating Conditions	All equipment was assumed to be operating at the maximum production rates at the same time during their applicable hours of operation.
Section 11	Source of Contaminant Emission Rates	See Table 3 and Appendices
Section 12	Combined Effect of Assumptions for Operating Conditions and Emission Rates	See Table 3 and Appendices
Section 13	Meteorological Conditions (include AERMET Version)	The draft preprocessed meteorological data provided by the MOECC (AERMOD v16216r) was used.
Section 14	Area of Modelling Coverage	Model coverage set to match MOECC guidelines specified in Section 14 of O.Reg. 419/05 is used.
Section 15	Stack Height for Certain New Sources of Contaminant	See Table 2 - Source Summary Table; no stack heights in this model (actual or modelled) exceed the restriction in Section 15 of O.Reg. 419/05.
Section 16	Terrain Data	terrain elevation contour data used was downloaded from the MOECC website http://www.applications.ene.gov.on.ca/archive/dem/index.html
Section 17	Averaging Periods	The appropriate averaging periods (as defined by the regulatory limits outlined in Schedule 3, and the listing of the MOECC Guidelines) were modelled for each contaminant. Emission rates were calculated based on averaging periods that matched the averaging period of the respective criterion. See Section 6.6.1 and Appendix A.

Table 6 Emission Summary Table

Contaminant	CAS #	Total Facility Emission Rate (g/s)	Averaging Period	Limiting Effect	Schedule	Ministry POI Limit (µg/m³)	Maximum POI Concentration (µg/m³)	Percentage of Ministry POI Limit (%)	Air Dispersion Model Used
Nitrogen Oxides	10102-44-0	2.13	24 hour	Health	Standard	200	8.24	4.12%	AERMOD 16216
			1 hour	Health	Standard	400	64.85	16.21%	AERMOD 16216
TSP	N/A (TSP)	0.2975	24 hour	Visibility	Standard	120	3.11	2.59%	AERMOD 16216
Odour Proposed	N/A (Odour)	1	10 minute	Odour	Sensitivity Run	N/A Sensitivity Run	0.807	-	AERMOD 16216
Odour Most Sensitive	N/A (Odour)	1	10 minute	Odour	Sensitivity Run	N/A Sensitivity Run	0.809	-	AERMOD 16216

Table 7 ***Noise Source Summary Table***

Source ID	Description	A-Weighted Sound Power Level								Total	Data Source	Equipment Location	Operating Times/Limits day,evening,night (%)	Proposed Noise Control[1]	Noise Quality[2]	Source Location	UTM Easting	UTM Northing	Height Above Rooftop or Ground
		63	125	250	500	1000	2000	4000	8000	dBA									
EQ01	Jaw Crusher	98.5	104.8	102.4	106.5	108.2	108.9	101.0	90.9	114.1	Site Measurements corre	Outdoors	100,--,--	N/A	SS	709309	709309	4935539	3
EQ02	Cone Crusher w Screen	90.3	102.9	101.5	112.2	111.9	108.5	108.0	99.1	116.9	Site Measurements corre	Outdoors	100,--,--	N/A	SS	709262	709262	4935531	3
EQ04	Generator	102.3	114.7	113.0	113.4	115.9	115.8	113.4	104.2	122.4	Site Measurements corre	Outdoors	100,--,--	N/A	SS	709276	709276	4935525	3
EQ03	Screen Plant	90.3	102.9	101.5	112.2	111.9	108.5	108.0	99.1	116.9	Site Measurements corre	Outdoors	100,--,--	N/A	SS	709287	709287	4935536	3

*** NOTE that these sound powers have been corrected based on an assumption of compliance at the existing POR (PORE)**

[1] Noise Control Descriptions:

N/A	Not applicable
S	Silencer
B	Barrier
E	Enclosure

[2] Noise Quality Descriptions:

SS	Steady State
T	Tonal
I	Impulse

Table 8A Point of Reception Noise Impact no Controls

Receptor ID	Receptor Coordinates				Predicted SPL (dBA)			Predictor Source ID	Source ID	PWL (dBA)	Time Correction (%)			Source/Receptor Distance (m)
	X (m)	Y (m)	Ground Elevation	Height	Daytime	Evening	Nighttime				Day	Evening	Night	
POR1_A	709311.9	4935361	251.69	1.5	**31.66**	**-200**	**-200**	420	EQ01	114.1	100.0	--	--	179
POR1_A	709311.9	4935361	251.69	1.5	**37.43**	**-200**	**-200**	421	EQ02	116.9	100.0	--	--	178
POR1_A	709311.9	4935361	251.69	1.5	**43.23**	**-200**	**-200**	422	EQ04	122.4	100.0	--	--	168
POR1_A	709311.9	4935361	251.69	1.5	**36.95**	**-200**	**-200**	423	EQ03	116.9	100.0	--	--	178
POR2_A	709343.4	4935328	251.2	1.5	**32.82**	**-200**	**-200**	420	EQ01	114.1	100.0	--	--	214
POR2_A	709343.4	4935328	251.2	1.5	**36.21**	**-200**	**-200**	421	EQ02	116.9	100.0	--	--	219
POR2_A	709343.4	4935328	251.2	1.5	**42.04**	**-200**	**-200**	422	EQ04	122.4	100.0	--	--	208
POR2_A	709343.4	4935328	251.2	1.5	**36.05**	**-200**	**-200**	423	EQ03	116.9	100.0	--	--	216
POR3_A	709386.4	4935286	250	1.5	**36.91**	**-200**	**-200**	420	EQ01	114.1	100.0	--	--	265
POR3_A	709386.4	4935286	250	1.5	**34.61**	**-200**	**-200**	421	EQ02	116.9	100.0	--	--	275
POR3_A	709386.4	4935286	250	1.5	**40.44**	**-200**	**-200**	422	EQ04	122.4	100.0	--	--	263
POR3_A	709386.4	4935286	250	1.5	**34.62**	**-200**	**-200**	423	EQ03	116.9	100.0	--	--	270
POR4_A	709401.8	4935299	250	1.5	**37.21**	**-200**	**-200**	420	EQ01	114.1	100.0	--	--	258
POR4_A	709401.8	4935299	250	1.5	**34.84**	**-200**	**-200**	421	EQ02	116.9	100.0	--	--	272
POR4_A	709401.8	4935299	250	1.5	**40.7**	**-200**	**-200**	422	EQ04	122.4	100.0	--	--	259
POR4_A	709401.8	4935299	250	1.5	**34.89**	**-200**	**-200**	423	EQ03	116.9	100.0	--	--	264
#N/A	709317.1	4935374	251.52	1.5	**31.29**	**-200**	**-200**	420	EQ01	114.1	100.0	--	--	#N/A
#N/A	709317.1	4935374	251.52	1.5	**37.79**	**-200**	**-200**	421	EQ02	116.9	100.0	--	--	#N/A
#N/A	709317.1	4935374	251.52	1.5	**43.57**	**-200**	**-200**	422	EQ04	122.4	100.0	--	--	#N/A
#N/A	709317.1	4935374	251.52	1.5	**37.04**	**-200**	**-200**	423	EQ03	116.9	100.0	--	--	#N/A

Table 8A Point of Reception Noise Impact no Controls

Receptor ID	Receptor Coordinates				Predicted SPL (dBA)			Predictor Source ID	Source ID	PWL (dBA)	Time Correction (%)			Source/Receptor Distance (m)
	X (m)	Y (m)	Ground Elevation	Height	Daytime	Evening	Nighttime				Day	Evening	Night	
POR2_B	709347.4	4935341	250.39	1.5	**32.46**	**-200**	**-200**	420	EQ01	114.1	100.0	--	--	202
POR2_B	709347.4	4935341	250.39	1.5	**36.55**	**-200**	**-200**	421	EQ02	116.9	100.0	--	--	209
POR2_B	709347.4	4935341	250.39	1.5	**42.4**	**-200**	**-200**	422	EQ04	122.4	100.0	--	--	198
POR2_B	709347.4	4935341	250.39	1.5	**36.26**	**-200**	**-200**	423	EQ03	116.9	100.0	--	--	205
POR3_B	709386.8	4935297	250	1.5	**37.24**	**-200**	**-200**	420	EQ01	114.1	100.0	--	--	254
POR3_B	709386.8	4935297	250	1.5	**34.94**	**-200**	**-200**	421	EQ02	116.9	100.0	--	--	265
POR3_B	709386.8	4935297	250	1.5	**40.79**	**-200**	**-200**	422	EQ04	122.4	100.0	--	--	253
POR3_B	709386.8	4935297	250	1.5	**34.95**	**-200**	**-200**	423	EQ03	116.9	100.0	--	--	259
POR4_B	709401	4935309	250	1.5	**37.53**	**-200**	**-200**	420	EQ01	114.1	100.0	--	--	248
POR4_B	709401	4935309	250	1.5	**35.15**	**-200**	**-200**	421	EQ02	116.9	100.0	--	--	263
POR4_B	709401	4935309	250	1.5	**41.03**	**-200**	**-200**	422	EQ04	122.4	100.0	--	--	250
POR4_B	709401	4935309	250	1.5	**35.2**	**-200**	**-200**	423	EQ03	116.9	100.0	--	--	255
PORE	709406.9	4935342	250	1.5	**38.56**	**-200**	**-200**	420	EQ01	114.1	100.0	--	--	220
PORE	709406.9	4935342	250	1.5	**36.09**	**-200**	**-200**	421	EQ02	116.9	100.0	--	--	239
PORE	709406.9	4935342	250	1.5	**42.03**	**-200**	**-200**	422	EQ04	122.4	100.0	--	--	225
PORE	709406.9	4935342	250	1.5	**36.15**	**-200**	**-200**	423	EQ03	116.9	100.0	--	--	229

Table 8B POR Noise Impact With Noise Control

Receptor ID	Receptor Coordinates				Predicted SPL (dBA)			Predictor Source ID	Source ID	PWL (dBA)	Time Correction (%)			Source/Receptor Distance (m)
	X (m)	Y (m)	Ground Elevation	Height	Daytime	Evening	Nighttime				Day	Evening	Night	
POR1_A	709311.9	4935361	251.69	1.5	**30.59**	**-200**	**-200**	420	EQ01	114.1	100.0	--	--	179
POR1_A	709311.9	4935361	251.69	1.5	**35.51**	**-200**	**-200**	421	EQ02	116.9	100.0	--	--	178
POR1_A	709311.9	4935361	251.69	1.5	**41.53**	**-200**	**-200**	422	EQ04	122.4	100.0	--	--	168
POR1_A	709311.9	4935361	251.69	1.5	**33.95**	**-200**	**-200**	423	EQ03	116.9	100.0	--	--	178
POR2_A	709343.4	4935328	251.2	1.5	**32.82**	**-200**	**-200**	420	EQ01	114.1	100.0	--	--	214
POR2_A	709343.4	4935328	251.2	1.5	**36.21**	**-200**	**-200**	421	EQ02	116.9	100.0	--	--	219
POR2_A	709343.4	4935328	251.2	1.5	**42.04**	**-200**	**-200**	422	EQ04	122.4	100.0	--	--	208
POR2_A	709343.4	4935328	251.2	1.5	**36.05**	**-200**	**-200**	423	EQ03	116.9	100.0	--	--	216
POR3_A	709386.4	4935286	250	1.5	**36.91**	**-200**	**-200**	420	EQ01	114.1	100.0	--	--	265
POR3_A	709386.4	4935286	250	1.5	**34.61**	**-200**	**-200**	421	EQ02	116.9	100.0	--	--	275
POR3_A	709386.4	4935286	250	1.5	**40.44**	**-200**	**-200**	422	EQ04	122.4	100.0	--	--	263
POR3_A	709386.4	4935286	250	1.5	**34.62**	**-200**	**-200**	423	EQ03	116.9	100.0	--	--	270
POR4_A	709401.8	4935299	250	1.5	**37.21**	**-200**	**-200**	420	EQ01	114.1	100.0	--	--	258
POR4_A	709401.8	4935299	250	1.5	**34.84**	**-200**	**-200**	421	EQ02	116.9	100.0	--	--	272
POR4_A	709401.8	4935299	250	1.5	**40.7**	**-200**	**-200**	422	EQ04	122.4	100.0	--	--	259
POR4_A	709401.8	4935299	250	1.5	**34.89**	**-200**	**-200**	423	EQ03	116.9	100.0	--	--	264
POR1_B	709320.1	4935372	251.31	1.5	**28.88**	**-200**	**-200**	420	EQ01	114.1	100.0	--	--	168
POR1_B	709320.1	4935372	251.31	1.5	**32.16**	**-200**	**-200**	421	EQ02	116.9	100.0	--	--	171
POR1_B	709320.1	4935372	251.31	1.5	**39.03**	**-200**	**-200**	422	EQ04	122.4	100.0	--	--	160
POR1_B	709320.1	4935372	251.31	1.5	**31.08**	**-200**	**-200**	423	EQ03	116.9	100.0	--	--	168

Table 8B POR Noise Impact With Noise Control

Receptor ID	Receptor Coordinates				Predicted SPL (dBA)			Predictor Source ID	Source ID	PWL (dBA)	Time Correction (%)			Source/Receptor Distance (m)
	X (m)	Y (m)	Ground Elevation	Height	Daytime	Evening	Nighttime				Day	Evening	Night	
POR2_B	709347.4	4935341	250.39	1.5	**32.46**	**-200**	**-200**	420	EQ01	114.1	100.0	--	--	202
POR2_B	709347.4	4935341	250.39	1.5	**36.55**	**-200**	**-200**	421	EQ02	116.9	100.0	--	--	209
POR2_B	709347.4	4935341	250.39	1.5	**42.4**	**-200**	**-200**	422	EQ04	122.4	100.0	--	--	198
POR2_B	709347.4	4935341	250.39	1.5	**36.26**	**-200**	**-200**	423	EQ03	116.9	100.0	--	--	205
POR3_B	709386.8	4935297	250	1.5	**37.24**	**-200**	**-200**	420	EQ01	114.1	100.0	--	--	254
POR3_B	709386.8	4935297	250	1.5	**34.94**	**-200**	**-200**	421	EQ02	116.9	100.0	--	--	265
POR3_B	709386.8	4935297	250	1.5	**40.79**	**-200**	**-200**	422	EQ04	122.4	100.0	--	--	253
POR3_B	709386.8	4935297	250	1.5	**34.95**	**-200**	**-200**	423	EQ03	116.9	100.0	--	--	259
POR4_B	709401	4935309	250	1.5	**37.53**	**-200**	**-200**	420	EQ01	114.1	100.0	--	--	248
POR4_B	709401	4935309	250	1.5	**35.15**	**-200**	**-200**	421	EQ02	116.9	100.0	--	--	263
POR4_B	709401	4935309	250	1.5	**41.03**	**-200**	**-200**	422	EQ04	122.4	100.0	--	--	250
POR4_B	709401	4935309	250	1.5	**35.2**	**-200**	**-200**	423	EQ03	116.9	100.0	--	--	255
PORE	709406.9	4935342	250	1.5	**38.56**	**-200**	**-200**	420	EQ01	114.1	100.0	--	--	220
PORE	709406.9	4935342	250	1.5	**36.09**	**-200**	**-200**	421	EQ02	116.9	100.0	--	--	239
PORE	709406.9	4935342	250	1.5	**42.03**	**-200**	**-200**	422	EQ04	122.4	100.0	--	--	225
PORE	709406.9	4935342	250	1.5	**36.15**	**-200**	**-200**	423	EQ03	116.9	100.0	--	--	229

Table 9A Acoustic Assessment Summary no Controls

Point of Reception ID	Point of Reception Information					Noise Characteristic	Daytime (dBA)	Evening (dBA)	Nighttime (dBA)	Verified by Acoustic Audit (Yes or No)	POR Class	Daytime Limit (dBA)	Evening Limit (dBA)	Nighttime Limit (dBA)	Compliant with Limit
	Description	UTM Easting	UTM Northing	Height POW	Height OLA										
POR1_A	Trailer POW	709312	4935361	1.5	--	Steady State Leq	45.2	--	--	N	3 POW	45	40	40	No
POR2_A	Trailer POW	709343	4935328	1.5	--	Steady State Leq	44.2	--	--	N	3 POW	45	40	40	Yes
POR3_A	Trailer POW	709386	4935286	1.5	--	Steady State Leq	43.4	--	--	N	3 POW	45	40	40	Yes
POR4_A	Trailer POW	709402	4935299	1.5	--	Steady State Leq	43.7	--	--	N	3 POW	45	40	40	Yes
POR1_B	Trailer OLA	709317	4935374	--	1.5	Steady State Leq	45.4	--	--	N	3 OLA	45	40	-	No
POR2_B	Trailer OLA	709347	4935341	--	1.5	Steady State Leq	44.5	--	--	N	3 OLA	45	40	-	Yes
POR3_B	Trailer OLA	709387	4935297	--	1.5	Steady State Leq	43.7	--	--	N	3 OLA	45	40	-	Yes
POR4_B	Trailer OLA	709401	4935309	--	1.5	Steady State Leq	44.0	--	--	N	3 OLA	45	40	-	Yes
PORE_A	Existing Dwelling	709407	4935342	1.5	--	Steady State Leq	45.0	--	--	N	3 POW	45	40	40	Yes

Table 3A Acoustic Assessment Summary for Mitigated Conditions

Point of Reception ID	Point of Reception Information					Noise Characteristic	Daytime (dBA)	Evening (dBA)	Nighttime (dBA)	Verified by Acoustic Audit (Yes or No)	POR Class	Daytime Limit (dBA)	Evening Limit (dBA)	Nighttime Limit (dBA)	Compliant with Limit
	Description	UTM Easting	UTM Northing	Height POW	Height OLA										
POR1_A	Trailer POW	709312	4935361	1.5	--	Steady State Leq	43.3	--	--	N	3 POW	45	40	40	Yes
POR2_A	Trailer POW	709343	4935328	1.5	--	Steady State Leq	44.2	--	--	N	3 POW	45	40	40	Yes
POR3_A	Trailer POW	709386	4935286	1.5	--	Steady State Leq	43.4	--	--	N	3 POW	45	40	40	Yes
POR4_A	Trailer POW	709402	4935299	1.5	--	Steady State Leq	43.7	--	--	N	3 POW	45	40	40	Yes
POR1_B	Trailer OLA	709317	4935374	--	1.5	Steady State Leq	40.7	--	--	N	3 OLA	45	40	-	Yes
POR2_B	Trailer OLA	709347	4935341	--	1.5	Steady State Leq	44.5	--	--	N	3 OLA	45	40	-	Yes
POR3_B	Trailer OLA	709387	4935297	--	1.5	Steady State Leq	43.7	--	--	N	3 OLA	45	40	-	Yes
POR4_B	Trailer OLA	709401	4935309	--	1.5	Steady State Leq	44.0	--	--	N	3 OLA	45	40	-	Yes
PORE_A	Existing Dwelling	709407	4935342	1.5	--	Steady State Leq	45.0	--	--	N	3 POW	45	40	40	Yes

Appendix A

Proposed Site Development (Provided by EcoVue)

30M WATERWAY BUFFER
15m WATERWAY BUFFER
EX. MAINTENANCE SHED
EX. ENVIRO-SEPTIC SYSTEM
WETLAND
EX. DOSING CHAMBER
EX. WELL
EX. PRE-TREATMENT TANKS
EX. FLOW BALANCING TANK
150m SETBACK
E.T.
MELODY BAY ROAD
EX. SPORTS PAD
EX. WATER TREATMENT BLDG.
EX. OFFICE
EX. POOL
EX. POOL
New Proposed Sites

PROPERTY AREA	13.8 Hectares	
TOTAL SITES	EXISTING:105 PROPOSED:127	
SITE AREA (MIN)	279 m2	385 m2
LOT COVERAGE (MAX)	20%	13%
SITE COVERAGE (MIN)	24%	32%
Description	ZONING	PROPOSED

E.T. – EX. TRANSFORMER (8 TOTAL)

No	Date	Description	By
3			
2			
1	APR 13,2016	Revised for 2016 Lots	ML

REVISIONS

Do not scale drawings.

Contractor is to check all dimensions and report any omissions or discrepancies to the Architect before proceeding with construction.

Parkbridge LIFESTYLE COMMUNITIES INC.

Date	JULY 2015
Drawn	BB
Checked	RW
Approved	INITIAL
CAD Version	AUTOCAD 2013

MELODY BAY

33 Melody Bay Rd.
LAKEFIELD, ONTARIO

DRAFT
SITE
PLAN

Scale 1:2000	Revision No 3
Project No MEL2014DS01	Drawing No SP-1

Appendix B

Emission Calculations (Air and Noise)

Calculation 1: Lagoon Emission Sensitivity Model Run

$$Emission\ Rate^{1} = Emission\ Factor \times \text{Area}$$

Source	Description	Maximum Approved Lagoon Area (m^2)	Emission Factor (OU/m^2)	Emission Rate (g/s)	Data Quality
POND1	Sewage Lagoon	4000	1	4.00E+03	N/A representative

Notes:

* as noted in the report, odour analysis is based on sensitivity comparison between existing and proposed sensitive receptors, this emission rate is a place holder to allow a comparison it does not imply a real emission rate.

Calculation 2 Particulate Matter Emissions from Crushing Operations (CRUSHER)

Fugitive Dust from Jaw Crusher

Activity (EQ01)	AP-42 Emission Factor (kg/Mg)	Rate (tph)[2]	Emission Rate (g/s)	Data Quality
Tertiary Crushing[1]	2.70E-03	125	9.53E-02	E
Conveyor Transfer Point[1]	7.00E-05	125	2.47E-03	E

Fugitive Dust from Cone Crusher with Screen

Activity (EQ02)	AP-42 Emission Factor (kg/Mg)	Rate (tph)	Emission Rate (g/s)	Data Quality
Tertiary Crushing	2.70E-03	125	9.53E-02	E
Screening (controlled)	1.10E-03	125	3.88E-02	E

Fugitive Dust from Screen Plant

Activity (EQ03)	AP-42 Emission Factor (kg/Mg)[1]	Rate (tph)	Emission Rate (g/s)	Data Quality
Screening (controlled)	1.10E-03	125	3.88E-02	E
Conveyor Transfer Point	7.00E-05	125	2.47E-03	E

Notes:

[1] *All Emission Factors from AP-42 11.19.2-1*

2 Based on assumption of 1/3 usable product from average raw material source

Calculation 3: Calculation of Emissions - STCK1- Diesel Generator

700 kw Generator set (937 hp)

Pollutant	Emission Estimate[1] (g/hp-hr)	hp of Generator	Emission Estimate (g/s)
NO_x	8.18E+00	9.37E+02	2.13E+00
CO	6.70E-01	9.37E+02	1.74E-01
HC	6.00E-02	9.37E+02	1.56E-02
PM	9.40E-02	9.37E+02	2.45E-02

[1]Nominal data from manufacturer specifications, consistant with ISO8178-1

Calculation of Emissions - All sources, Totals

Source	TSP (Volume) (g/s)	TSP (Point) (g/s)	Nox (Point) (g/s)
STCK1	-	2.45E-02	2.13E+00
CRUSHER	2.73E-01	-	-
Totals	**2.73E-01**	**2.45E-02**	**2.13E+00**

Point Source Sound Power Level Calculations From Representative Operations

*[1]Lw=Lp+20*log(r)+11-10*log(Q)*

*Lp(total)=10*log(10(Lp(31Hz)/10)+10(Lp(63Hz)/10)+…+10(Lp(8kHz)/10))*

r is distance measurement was taken, Q is directivity index, t is operating time

Source ID	Description	Condition	Measurement Distance (m)	Directivity Factor (Q)	Tonal (Yes/No)		Octave Band (Hz) 63	125	250	500	1000	2000	4000	8000	Total
EQ02,03	Cone and Screen	0	15	1	No	**Measured SPL (dB)**	81.81	84.40	75.96	80.65	77.34	72.93	72.44	65.60	88.31
						Calculated PWL (dB)[1]	116.33	118.92	110.48	115.17	111.86	107.45	106.96	100.12	122.83
						PWL with Penalties (dBA)	**90.33**	**102.92**	**101.48**	**112.17**	**111.86**	**108.45**	**107.96**	**99.12**	**116.93**
EQ04	Generator w Cone and Jaw	0	50	1	No	**Measured SPL (dB)**	83.34	85.75	77.04	71.44	70.87	69.86	67.37	60.23	88.35
						Calculated PWL (dB)[1]	128.32	130.73	122.02	116.42	115.85	114.84	112.35	105.21	133.33
						PWL with Penalties (dBA)	**102.32**	**114.73**	**113.02**	**113.42**	**115.85**	**115.84**	**113.35**	**104.21**	**122.42**
EQ01	Jaw w Generator	0	30	1	No	**Measured SPL (dB)**	83.97	80.20	70.87	68.92	67.67	67.36	59.48	51.38	85.87
						Calculated PWL (dB)[1]	124.51	120.75	111.42	109.47	108.22	107.90	100.02	91.93	126.42
						PWL with Penalties (dBA)	**98.51**	**104.75**	**102.42**	**106.47**	**108.22**	**108.90**	**101.02**	**90.93**	**114.09**

* measurement process previously approved by MOECC (weather conditions acceptable, meter calibration valid)

Raw Ambient Measurement Data

Project Name	Start Time	Elapsed Tir	Momentar	LAFmax	LAFmin	LApeak	LAIeq	LAeq	LAF90.0
20170803001	8/03/17 10:03	00:00:28	0	50.23	39.05	72.53	46.72	43.03	40.55
20170803001	8/03/17 10:04	00:01:00	0	56.31	36.42	76.51	47.66	41.49	37.59
20170803001	8/03/17 10:05	00:01:00	0	88.34	40.84	117.31	77.81		42.82
20170803001	8/03/17 10:06	00:01:00	0	54.12	35.89	73.15	44.44	41.15	37.37
20170803001	8/03/17 10:07	00:01:00	0	47.17	33.25	63.84	39.33	36.44	34.49
20170803001	8/03/17 10:08	00:01:00	0	42.22	34.73	56.42	38.46	37.93	36
20170803001	8/03/17 10:09	00:01:00	0	46.08	35.16	60.09	40.56	39.28	37.06
20170803001	8/03/17 10:10	00:01:00	0	42.34	34.21	55.29	38.79	38.45	35.12
20170803001	8/03/17 10:11	00:01:00	0	45.03	34.38	64.71	39.77	38.39	35.31
20170803001	8/03/17 10:12	00:01:00	0	45.5	34.44	67.33	39.58	37.27	35.6
20170803001	8/03/17 10:13	00:01:00	0	37.43	32.36	50.25	34.63	34.12	33.14
20170803001	8/03/17 10:14	00:01:00	0	41.89	31.83	54.45	37.41	37.04	32.64
20170803001	8/03/17 10:15	00:01:00	0	36.78	32.25	49.07	34.86	34.49	33.45
20170803001	8/03/17 10:16	00:01:00	0	38.89	32.52	51.75	35.98	35.13	33.65
20170803001	8/03/17 10:17	00:01:00	0	40.12	32.94	52.23	37.38	36.79	33.52
20170803001	8/03/17 10:18	00:01:00	0	39.16	33.45	64.1	35.99	35.5	34.09
20170803001	8/03/17 10:19	00:01:00	0	43.84	31.72	58.89	35.71	34.08	32.52
20170803001	8/03/17 10:20	00:01:00	0	50.8	34.34	71.73	42.28	38.92	35.34
20170803001	8/03/17 10:21	00:01:00	0	45.27	36.47	58.76	41.33	40.57	37.84
20170803001	8/03/17 10:22	00:01:00	0	45.34	37.51	57.57	41.91	41.42	38.24
20170803001	8/03/17 10:23	00:01:00	0	39.66	32.5	52.05	36.13	35.57	33.12
20170803001	8/03/17 10:24	00:01:00	0	42.68	33.96	58.15	37.13	36.36	34.97
20170803001	8/03/17 10:25	00:01:00	0	42.25	32.71	53.26	37.41	36.89	34.14
20170803001	8/03/17 10:26	00:01:00	0	39.49	32.02	62.81	36.68	34.92	33.49
20170803001	8/03/17 10:27	00:01:00	0	39.96	33.53	53.85	37.4	36.77	34.78
20170803001	8/03/17 10:28	00:01:00	0	39.78	33.49	53.59	36.84	36.35	34.71
20170803001	8/03/17 10:29	00:01:00	0	42.39	30.52	56.1	36.9	35.66	31.58
20170803001	8/03/17 10:30	00:01:00	0	46.44	30.5	60.61	38.18	35.35	31.8
20170803001	8/03/17 10:31	00:01:00	0	53.3	34.37	59.06	45.83	45.12	36.26
20170803001	8/03/17 10:32	00:01:00	0	47.89	32.2	68.91	41.37	38.66	34.17
20170803001	8/03/17 10:33	00:01:00	0	44.41	32.84	58.39	37.62	36.3	33.93
20170803001	8/03/17 10:34	00:01:00	0	39.23	31.96	55.4	36.74	36.22	34.26
20170803001	8/03/17 10:35	00:01:00	0	40.02	31.06	66.82	34.72	32.87	32.02
20170803001	8/03/17 10:36	00:01:00	0	54.93	32.6	86.14	45.56	36.79	33.8
20170803001	8/03/17 10:37	00:01:00	0	40.52	31.77	65.96	36.35	35.35	33
20170803001	8/03/17 10:38	00:01:00	0	40.97	34.28	54.2	37.93	37.16	35.94
20170803001	8/03/17 10:39	00:01:00	0	42.33	34.01	64.37	38.47	36.55	35.45
20170803001	8/03/17 10:40	00:01:00	0	42.99	34.54	59.79	40.83	37.36	35.5
20170803001	8/03/17 10:41	00:01:00	0	41.12	34.83	55.39	39.35	37.41	35.98
20170803001	8/03/17 10:42	00:01:00	0	45.71	34.1	59.53	39.36	36.73	35.03
20170803001	8/03/17 10:43	00:01:00	0	42.95	33.44	55.64	38.27	37.18	34.29
20170803001	8/03/17 10:44	00:01:00	0	48.61	40.84	61.57	44.86	43.93	42.41
20170803001	8/03/17 10:45	00:01:00	0	46.6	38.82	60.7	43.01	42.27	39.69
20170803001	8/03/17 10:46	00:01:00	0	44.3	31.73	55.85	39.23	38.26	33.3
20170803001	8/03/17 10:47	00:01:00	0	48.26	32.47	60.99	38.87	37.23	33.37
20170803001	8/03/17 10:48	00:01:00	0	46.22	33.17	62.72	42.09	41.33	34.76
20170803001	8/03/17 10:49	00:01:00	0	47.43	38.18	58.11	44.59	43.49	39.82
20170803001	8/03/17 10:50	00:01:00	0	50.48	39.4	62.21	45.04	43.92	41.31
20170803001	8/03/17 10:51	00:01:00	0	45.74	36.64	59.01	42.35	41.1	37.88

20170803001	8/03/17 10:52	00:01:00	0	43.91	36.28	56.58	39.67	38.64	37.33
20170803001	8/03/17 10:53	00:01:00	0	39.29	32.39	57.09	36.12	35.76	33.02
20170803001	8/03/17 10:54	00:01:00	0	39.56	30.42	54.22	33.51	32.37	31.27
20170803001	8/03/17 10:55	00:01:00	0	55.94	30.44	69.75	43.74	34.8	31.54
20170803001	8/03/17 10:56	00:01:00	0	46.58	33.05	60.55	42.31	41.23	36.98
20170803001	8/03/17 10:57	00:01:00	0	47.46	35.42	57.51	41.37	40.62	36.84
20170803001	8/03/17 10:58	00:01:00	0	42.98	36.04	54.86	39.6	38.93	37.22
20170803001	8/03/17 10:59	00:01:00	0	44.25	35.94	54.37	39.26	38.44	36.71
20170803001	8/03/17 11:00	00:01:00	0	45.76	35.92	57.14	41.3	40.57	37.1
20170803001	8/03/17 11:01	00:01:00	0	47.05	31.68	61.13	42.95	41.24	32.83
20170803001	8/03/17 11:02	00:01:00	0	47.42	31.81	59.6	42.54	41.41	34.22
20170803001	8/03/17 11:03	00:01:00	0	46.53	33.75	57.82	39.67	38.82	35.39
20170803001	8/03/17 11:04	00:01:00	0	48.93	39.48	58.65	43.73	42.7	40.85
20170803001	8/03/17 11:05	00:01:00	0	46.88	36.79	59.4	42.71	41.69	38.31
20170803001	8/03/17 11:06	00:01:00	0	56.56	39.14	68.76	46.38	44.16	41.31
20170803001	8/03/17 11:07	00:01:00	0	48.39	38.38	58.61	42.62	41.35	39.46
20170803001	8/03/17 11:08	00:01:00	0	43.12	37.64	56.63	40.73	40.01	38.68
20170803001	8/03/17 11:09	00:01:00	0	61.27	37.74	72.04	49.56	43.99	38.89
20170803001	8/03/17 11:10	00:01:00	0	46.5	38.21	59.39	43.4	42.12	39.86
20170803001	8/03/17 11:11	00:01:00	0	44.68	33.38	64.2	37.89	36.81	34.08
20170803001	8/03/17 11:12	00:01:00	0	43.13	30.74	67.29	38.77	36.49	31.61
20170803001	8/03/17 11:13	00:01:00	0	45.37	39.58	65.43	43.03	42.06	40.53
20170803001	8/03/17 11:14	00:01:00	0	49.93	37.6	76.71	45.15	42.65	40.03
20170803001	8/03/17 11:15	00:01:00	0	47.58	37.65	58.65	43.81	42.9	40.43
20170803001	8/03/17 11:16	00:01:00	0	47.66	41.5	59.13	45.18	44.17	42.55
20170803001	8/03/17 11:17	00:01:00	0	47.56	35.02	57.75	43.62	42.79	36.59
20170803001	8/03/17 11:18	00:01:00	0	47.68	41.78	63.16	45.83	45.26	43.76
20170803001	8/03/17 11:19	00:01:00	0	49.12	42.47	60.75	46.86	46.09	43.8
20170803001	8/03/17 11:20	00:01:00	0	46.56	36.37	65.37	41.7	40.84	37.67
20170803001	8/03/17 11:21	00:01:00	0	47.47	36.46	58.18	44.17	43.47	38.09
20170803001	8/03/17 11:22	00:01:00	0	47.76	41.8	59.98	45.34	44.84	43.12
20170803001	8/03/17 11:23	00:01:00	0	49.06	43.31	61.57	46.77	46.34	44.98
20170803001	8/03/17 11:24	00:01:00	0	49.5	41.71	60.46	45.74	45.12	43.27
20170803001	8/03/17 11:25	00:01:00	0	48.24	41.54	60.84	45.3	44.61	42.98
20170803001	8/03/17 11:26	00:01:00	0	46.85	40.84	57.7	44.09	43.49	42.2
20170803001	8/03/17 11:27	00:01:00	0	47.17	42	58.07	44.53	43.86	42.79
20170803001	8/03/17 11:28	00:01:00	0	45.9	41.13	58.33	43.98	43.34	42.25
20170803001	8/03/17 11:29	00:01:00	0	46.45	40.99	57.86	43.76	43.13	41.91
20170803001	8/03/17 11:30	00:01:00	0	47.36	39.91	58.33	44.55	43.75	42.03
20170803001	8/03/17 11:31	00:01:00	0	62.8	42.21	81.78	53.63		43.65
20170803001	8/03/17 11:32	00:00:16	0	76.46	39.57	98.92	71.12		40.96

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

HAND-HELD ANALYZER

Manufactured by:	BRUEL & KJAER
Model No:	2270
Serial No:	2679353
Calibration Recall No:	27084

Submitted By:

Customer:

Company: CAMBIUM INC.

Address:

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. 2270 BRUE

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.

West Caldwell Calibration Laboratories' calibration control system meets the requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Calibration Date: 18-Nov-16

Certificate No: 27084 - 1

Approved by:

FC

Felix Christopher (QA Mgr.)

ISO/IEC 17025:2005

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

ACCREDITED

Calibration Lab. Cert. # 1533.01

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

MICROPHONE

Manufactured by:	BRUEL & KJAER
Model No:	4189
Serial No:	2695416
Calibration Recall No:	27084

Submitted By:

Customer:

Company: CAMBIUM INC.

Address:

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. 4189 BRUE

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.

West Caldwell Calibration Laboratories' calibration control system meets the requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by:

Calibration Date: 18-Nov-16

Certificate No: 27084 - 2

Felix Christopher (QA Mgr.)

ISO/IEC 17025:2005

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

ACCREDITED

Calibration Lab. Cert. # 1533.01

Appendix C

Modelling Input/Output Provided Digitally Only