FREEFIELD LTD.
Ottawa, Ontario

ACOUSTIC ASSESSMENT REPORT FOR THE STITTSVILLE II QUARRY

CITY OF OTTAWA,

ONTARIO

Prepared for

R. W. Tomlinson Limited

Prepared by

Freefield Ltd.

2nd February 2024 (This version)

Postal Address: PO Box 74056, RPO Beechwood, Ottawa, Ontario, K1M 2H9, Canada
T/F: 613 747 0983 | E: info@freefieldacoustics.com | W: www.freefieldacoustics.com

ACOUSTIC ASSESSMENT REPORT FOR THE STITTSVILLE II QUARRY, CITY OF OTTAWA, ONTARIO

Executive Summary

R. W. Tomlinson Limited (Tomlinson) wish to expand their existing licensed quarry, referred as the Stittsville Quarry, located at Part Lots 14 and 15, Concession 11, Geographic Township of Goulbourn, City of Ottawa, Ontario, and are applying to the Ministry of Northern Development, Mines, Natural Resources and Forestry, MNDMNRF, for a Class A License, below water extraction, under the Aggregate Resources Act, ARA, for the proposed expansion area, referred as Stittsville II Quarry, located immediately east of the existing licensed boundary, at Part of Lots 14, 15 and 16, Concession 11, Geographic Township of Goulbourn, City of Ottawa, Ontario, as shown in Figures 1 and 2.

The existing licensed quarry, ARA License Number: 39958, operates under Amended Environmental Compliance Approval Number: 4956-8TRRJU, Issued: May 25, 2012 (ECA). The existing ECA covers all quarry operations occurring on-site at the Stittsville Quarry, as well as operations associated with Tomlinson's existing asphalt plant and ready-mix concrete plant, located on the site of the proposed licensed boundary of Stittsville II.

The North American Industry Classification System (NAICS) codes for the various on-site operations include 21231 (stone mining and quarrying), 324121 (asphalt production) and 327320 (ready-mix concrete production).

In addition, to the license application, Tomlinson is applying to the City of Ottawa for an official plan amendment to permit extraction operations on the whole of the proposed licensed area.

The MNDMNRF license and Municipal zoning applications require the submission of an acoustic assessment report (AAR) of the proposed operation. Freefield Ltd. has been retained by Tomlinson to complete this Acoustic Assessment.

The acoustic assessment has been carried out according to the applicable MECP noise assessment guidelines, including NPC-300, published August 2013[1], the City of Ottawa, Environmental Noise Control Guidelines, January 2016 (ENCG)[6], and the City of Ottawa, Noise Control Study Terms of Reference.[7]

The assessment considers the impacts on nearby noise sensitive lands, including existing residences and land zoned for potential noise sensitive use, of noise generated by all on-site equipment operations associated with the existing asphalt plant, ready-mix concrete plant, and proposed quarry operations at Stittsville II, including extraction and aggregate processing with rock drills, loaders, a crushing and screening plant and trucks used for delivery and shipping of product, but excluding the noise and vibration aspects of blasting. The impacts of blasting at the quarry are being assessed by blasting specialists.

Although the ARA license application and Municipal approval process refer only to the expansion area, Tomlinson will hold the license for both the existing Stittsville Quarry and the expansion area, Stittsville II, once the license is in place. It is noted that the extraction and aggregate processing equipment listed above currently operates in the existing quarry and will be moved to, and operate in the expansion area, Stittsville II once the license is in place and as production of aggregate is needed. While concurrent operations of both quarries were considered in this assessment, as it is the one set of extraction and aggregate processing equipment which will be in operation, the worst-case scenarios presented in this report, with all equipment relocated to the expansion area, represent worst case operating conditions for the subject site and form the basis for the recommended noise mitigation.

Noise impacts have been predicted and compared to the MECP and City of Ottawa sound level limits as set out in NPC-300[1] and ENCG[6]. Where applicable, noise mitigation measures such as restrictions on operations, berms and barriers etc. have been designed to ensure all operations are in compliance with the applicable sound level limits.

Assessment methodology is provided in Section 1. A detailed description of the facility and its operations is provided in Section 2. Noise sources associated with operations at the facility are summarized in Section 3. Critical receptors are described in Section 1 and Section 4, with Section 5 and 6 and 7, detailing applicable assessment criteria, an assessment of predicted noise impacts, and recommended noise mitigation measures.

Version Control

Title	Comments	Prepared By	Issue Date
DRAFT - Acoustic Assessment Report for the Stittsville II Quarry, City of Ottawa, Ontario	Issued to client for review	Freefield Ltd.	19 January 2023
DRAFT Version 2 - Acoustic Assessment Report for the Stittsville II Quarry, City of Ottawa, Ontario	Issued to client for review (Updated to incorporate revised extraction phases)	Freefield Ltd.	24 March 2023
DRAFT Version 3 - Acoustic Assessment Report for the Stittsville II Quarry, City of Ottawa, Ontario	Issued to client for review (Updated to incorporate planning review)	Freefield Ltd.	28th April 2023
DRAFT Version 4 - Acoustic Assessment Report for the Stittsville II Quarry, City of Ottawa, Ontario	Issued to client for review (Updated to incorporate revised phasing)	Freefield Ltd.	12th September 2023
Acoustic Assessment Report for the Stittsville II Quarry, City of Ottawa, Ontario	Issued for ARA License	Freefield Ltd.	30th October 2023
Acoustic Assessment Report for the Stittsville II Quarry, City of Ottawa, Ontario	Updated to address City of Ottawa request to include reference to the City of Ottawa's Environmental Noise Control Guidelines and the Noise Control Study Terms of Reference	Freefield Ltd.	2nd February 2024 (This version)

ACOUSTIC ASSESSMENT REPORT FOR THE STITTSVILLE II QUARRY, CITY OF OTTAWA, ONTARIO

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ACOUSTIC ASSESSMENT REPORT FOR THE STITTSVILLE II QUARRY, CITY OF OTTAWA, ONTARIO

1.0 Introduction

R. W. Tomlinson Limited (Tomlinson) wish to expand their existing Stittsville Quarry, ARA License Number: 39958, and are applying to the Ministry of Northern Development, Mines, Natural Resources and Forestry, MNDMNRF, for a Class A License, below water extraction, under the Aggregate Resources Act, ARA, for the proposed expansion area, referred as Stittsville II Quarry, located immediately east of the existing licensed boundary at Part of Lots 14, 15 and 16, Concession 11, Geographic Township of Goulbourn, City of Ottawa, Ontario, as shown in Figures 1 and 2.

In addition, to the license application, Tomlinson is applying to the City of Ottawa for an official plan amendment to permit extraction operations on the whole of the proposed licensed area.

The North American Industry Classification System (NAICS) codes for the various on-site operations include 21231 (stone mining and quarrying), 324121 (asphalt production) and 327320 (ready-mix concrete production).

The MNDMNRF license and Municipal zoning applications require the submission of an acoustic assessment report (AAR) of the proposed operation. Freefield Ltd. has been retained by Tomlinson to complete this Acoustic Assessment.

This report describes an assessment, carried out by Freefield Ltd., of the potential impact of noise from operations at the Stittsville II Quarry (the facility), on nearby noise sensitive receptors in accordance with MECP guidelines for stationary noise sources, [1, 2]

This report has been prepared in accordance with the MECP Document NPC-233, *Information to be Submitted for Approval of Stationary Sources of Sound*, October 1995[2]. Noise from the facility is assessed according to MECP Documents: NPC-300, *Stationary and Transportation Sources – Approval and Planning*, August 2013[1], the City of Ottawa, Environmental Noise Control Guidelines, January 2016 (ENCG)[6], and the City of Ottawa, Noise Control Study Terms of Reference.[7] This report follows the recommended format contained in, *Sample Application Package, Basic Comprehensive Certificate of Approval (Air and Noise)*, July 2009.[3]

The noise assessment methodology is summarised below.

- Identification of noise sensitive receptors in the vicinity of the facility. Potential noise sensitive receptors include residences, motels, places of worship, schools, hospitals and vacant land zoned for potential noise sensitive use.

- Determination of the MECP and City of Ottawa sound level limits[1] which apply at each of the noise sensitive receptors.

- Identification of the sources of noise that will arise from the facilities operations. In the current study, the strengths of the various noise sources were obtained from manufacturers data and from noise measurements of equipment at Stittsville Quarry and other similar facilities in Ontario by Freefield Ltd.

- Based on the strengths of the individual noise sources, noise levels due to the facilities operations are predicted at nearby noise sensitive receptors using a prediction procedure[6] which is favoured by the MECP. The MECP methodology requires that compliance be assessed under predictable "worst case" conditions for normal operations.

- Assessment of compliance of the noise due to the facilities operations with MECP and ENCG sound level limits. Where appropriate mitigation measures are recommended, such that, compliance with MECP and ENCG sound level limits is achieved at all receptors.

Note that this assessment does not consider the noise and vibrations caused by blasting. The impacts of blasting at the facility are being assessed by others.

Surrounding Lands, Acoustic Environment and Critical Receptors

The facility is located on the south side of Jinkinson Road approximately 1.4 km west of the intersection with Hazeldean Road as shown in Figure 1. Highway 7 lies immediately north of Jinkinson Road in the location of the facility and carries significant traffic on a 24-hour basis.

The surrounding lands are relatively flat with relatively minor changes in elevation general falling in an easterly direction.

The legal description of the land occupied by the facility is as follows:

Part of Lots 14, 15 and 16,
Concession 11,
Geographic Township of Goulbourn,
City of Ottawa,
Ontario

The civic address of the property is 635 Jinkinson Road, City of Ottawa, Ontario.
A location plan showing the site with respect to the surrounding area is provided in Figure 1. A site plan and detailed layout plan, showing the sites detailed arrangement and elevation contours, are provided in Figure 2. A land use zoning map is provided in Appendix 1.

The facility is located on land zoned Mineral Extraction (ME & ME[1r]-h), Rural (RU) and Environmental Protection (EP) as shown on the Zoning Map, Appendix 1.

Immediately north of the facility lies Jinkinson Road and Highway 7. Further north, on the north side of Highway 7, the land is zoned Rural Commercial (RC), Rural (RU), Environmental Protection (EP3) and Mineral Extraction (ME). An automotive racetrack which is a considerable source of noise when in operation, fronting Speedway Road, a paintball facility, the Moore Quarry and residences, fronting Spruce Ridge Road, lie in this direction. The closest existing residences in this direction have been selected as critical receptors in the following assessment.

Immediately east of the site the land is zoned Rural (RU), Environmental Protection (EP) and Rural General Industrial (RG). J.R.Brisson Equipment specializing in Heavy Construction equipment operate a facility in this direction on land zoned RG immediately. In addition, a portion of the land immediately east of the proposed licensed boundary is owned by the applicant (Tomlinson). Further east the land is zoned Rural (RU) and Environmental Protection (EP) and consists of large partially wooded lots. Two residences fronting Jinkinson Road lie in this direction. These existing residences have been selected as critical receptors in the following assessment.

Immediately south of the site a narrow strip of land is zoned Parks and Open Space (O1). This land is occupied by the Trans Canada Trail and forms the southern boundary of the site. Further south the land is zoned Mineral Extraction (ME), Rural (RU) and Environmental Protection (EP) and consists of large partially wooded lots extending south to Fernbank Road. The Stittsville Shooting Range, a considerable source of noise when in operation, the Taggart Fernbank Quarry, and residences fronting Fernbank Road exist south of the proposed quarry. The closest existing residences in this direction have been selected as critical receptors in the following assessment.

West of the site the land is zoned Mineral Extraction (ME) and is occupied by Tomlinson's existing licensed Stittsville Quarry and the Lafarge Bell Quarry. Jinkinson Road forms the western boundary to the existing licensed Stittsville Bell Quarries. Further west, the land is zoned Mineral Extraction (ME) and is occupied by an existing licensed quarry operated by Thomas Cavanagh Construction. Further west the land is zoned Environmental Protection (EP) then Parks and Open Space (O1). This land extends for approximately 2.7 km from the sites western site boundary with the closest existing residences, in this direction, fronting Link Road at an approximate distance of 2.7 km. Noise impacts from the proposed facility at these residences are expected to be insignificant, hence, no noise sensitive residences in a westerly direction have been included in this assessment.

The critical noise sensitive receptors, which have been selected for detailed analysis, are shown in Figure 1. These were selected as the receptors most likely impacted by noise from the facility. Other noise sensitive receptors are at greater distances and will be less affected by noise. Table 1 lists the noise sensitive receptors selected for analysis.

2.0 Facility Description

The Stittsville Quarry produces various sized aggregates, as well as asphalt and ready-mix concrete products. These products are produced from operations categorized as follows:

- Proposed Extraction and Aggregate Processing Operations,
- Existing Asphalt Plant operations,
- Existing Ready-Mix Concrete Plant operations (TRM Plant).

The proposed expansion area, Stittsville II, is shown in Figure 1 and 2. This area will expand the extraction and aggregate processing area of the existing quarry after the license is in place. No changes to the maximum production rate at the existing asphalt plant and ready-mix concrete plant, located within the proposed licensed boundary of the expansion area, are proposed with the expansion of the quarry.

The main entry to the existing Stittsville Quarry, and proposed expansion area, Stittsville II, is via Jinkinson Road which connects to Hazeldean Road at the intersection with Highway 7. The site entry is shown on Figure 2.

A detailed description of the various operations is provided below.

2.1 Extraction and Aggregate Processing Operations:

The quarry will have an annual tonnage limit of 3,000,000 tonnes.

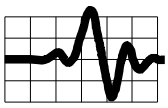
Raw material (aggregate) is extracted using a process of drilling and blasting. Blasting produces large pieces of rock which are loaded into haul trucks which deliver the raw material to the stationary crushing and screening plant which will be set up centrally on the site to minimize hauling. After crushing and screening, the various grades of aggregate produced are placed into stockpiles using conveyors and stackers. Loaders then load the stockpiled aggregate into highway trucks which are used to deliver the product to market or to stockpiles located near the existing asphalt and ready-mix concrete plant prior to being used in the production of asphalt or ready-mix concrete.

A 1500kW diesel generator is used to provide power to the plant.

Extraction and aggregate processing operations consist of mobile equipment that currently operates in the existing quarry. This equipment will be moved to, and operate in, the expansion area once the license is in place and as production of aggregate is needed.

The proposed expansion area is unexcavated with topography ranging from approximately 145 mASL at the western boundary of the site to 135 mASL at the sites eastern boundary.

Extraction will take place in seven phases, as shown in Figure 2, with each phase consisting of three lifts each approximately 10 m high. The lifts may be benched to allow for rock quality considerations and to comply with Ministry of Labour requirements.



Extraction will proceed in an easterly direction from the current lift face of Stittsville Quarry to the setback limits of Phase 1 before proceeding in a southerly direction to the setback limits of Phase 2 and Phase 3. Extraction will then proceed in an easterly direction to the setback limits of Phase 4 before proceeding in a southerly direction to the setback limits of Phase 5 and Phase 6 before proceeding in a northerly direction to the setback limits of Phase 7. During extraction of Phase 7 the existing Asphalt Plant and Ready-Mix Concrete Plant, described below, will be relocated to the quarry floor in Phase 1 when encroachment of extraction requires their relocation.

The quarry floor at each lift will be sloped with the first lift down ranging from an approximate elevation of 135 mASL at the western boundary to 125 mASL at the eastern boundary. The final quarry floor will be sloped at a maximum elevation ranging from 102 mASL in the northeast portion of Phase 7 to 122 mASL in the southwest portion of Phase 3.

The majority of extraction and aggregate processing equipment typically operates below grade on the quarry floor.

The major equipment associated with the extraction and aggregate processing operation are as follows:

- One portable standard hydraulic rock drill,
- One stationary crushing plant, including primary, secondary and tertiary crushing and screening units and associated diesel generator,
- Up to three loaders or excavators carrying out extraction and stockpiling operations,
- Haulage trucks used to delivery raw material to the crushing plant and processed aggregate to the asphalt plant and ready-mix concrete plant,
- Highway trucks used for shipping,
- Portable equipment for site preparation and rehabilitation, including excavators, hydraulic shovels, dozers and scrapers.

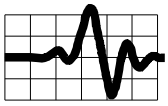
Associated equipment including hoppers, bins, conveyors and stackers located at the crushing plant, as well as a water fill station used for dust suppression, were assessed as insignificant noise sources during the site visit to the facility. Refer Section 3.0 Noise Source summary.

The extraction and aggregate processing operations occur on a 24-hour basis (24 hours) with limited operations permitted during the evening and nighttime period (19:00 to 07:00). Refer to Section 7.0.

2.2 Asphalt Plant Operations:

The existing asphalt plant has a maximum production rate of 363 tonnes per hour.

Asphalt is produced from an aggregate mixture (crushed stone, sand, etc.) that is fed by loader into hoppers which transfers the material via conveyors to a screener then to the drum mixer (drum). Liquid bitumen, stored in oil tanks, is combined with the aggregate in the drum under heat provided by the burner. The resulting product is transferred to the asphalt silos prior to being delivered to trucks located under the silo's, via gravity feed, for delivery off site.



The baghouse fan draws water vapour, the products of combustion and entrained dust particles, from the drum into the baghouse. A dust auger is used to draw the entrained dust particles from the baghouse to the mineral silo before the exhaust passes up the stack to the baghouse exhaust to be discharged into the atmosphere.

Electricity supplied by the grid is used to operate the plant during production periods and during shutdowns.

The existing asphalt plant is manufactured by Gencor Industries Inc. Noise data was obtained from Gencor for the 400tph Gencor Ultraplant, which is similar to the asphalt plant on-site and shares many of the same components with respect to noise generation.

The major components of the existing asphalt plant are as follows:

- Rotating drum mixer (drum) with oil fired burner,
- Baghouse with associated exhaust fan,
- Mineral fines silo with associated dust auger,
- Batch tower (asphalt silo's) with associated air compressor,
- Aggregate Screen,
- Recycled Asphalt Product (RAP) screen,
- Bitumen tanks and associated oil heater,
- Fuel oil tanks,
- Control trailer.
- Hoppers,
- Aggregate and product conveyors.
- Loader (to load aggregate into hoppers),
- Highway Trucks used for delivery and shipping of product.

The asphalt plant operations occur on a 24-hour basis (24 hours).

2.3 Ready-Mix Concrete Plant Operations:

The existing ready-mix concrete plant has a maximum production rate of 480 tonnes per hour.

Raw material, including sand and coarse aggregate, are delivered by highway and aggregate trucks and stored in stockpiles near the plant, a loader is used to feed the stockpiled material into a pit or hopper. Conveyors transfer the material to an elevated dispensing bin. The elevated dispensing bin loads metered quantities of the washed sand and aggregate into the concrete batch silo where materials are combined. The resultant mix of sand and aggregate is then delivered directly into a concrete truck located under the batch silo i.e. gravity fed.

Cement and slag powder stored in an enclosed split silo is added directly into the concrete truck with water at the appropriate ratio. Cement supplements (slag, additives), stored in a separate compartment within the split silo, may be added in appropriate quantities depending on the type of mix being prepared.

Concrete trucks enter the site from the existing site entry and proceed to the load and mix location under the concrete batch silo. At certain times concrete trucks proceed to the wash out area prior to proceeding to the load and mix location. A signal horn sounds at the completion of loading. The signal horn operates for approximately 2 seconds per load / truck.

The concrete truck remains at the load and mix location, mixing the components, for 3 - 5 minutes. During this period, the trucks run at a fast idle with the concrete drum spinning to achieve the mixing.

After loading the concrete trucks proceed to the slump mix station where additional water is added, as needed. This typically takes 3 - 5 minutes with the concrete drum spinning to continue the mixing process. Concrete trucks then leave the site via the existing site entry at Jinkinson Road. Cement powder and powdered slag are delivered by a specialized powder tanker truck equipped with a blower/pump to unload the cement powder or powdered slag into the silos. The blower/pump is located under the chassis of the truck, immediately behind the cab. Powder trucks typically have a capacity of 40 tonnes. Unloading of the cement powder or slag typically takes approximately 1 to 2 hours.

The cement and slag storage silos are fitted with a baghouse (dust collector) to control dust emissions. The dust collector is typically operated at the start and end of the filling process for approximately 10 minutes. For the purpose of assessing compliance, it has been assumed the dust extractor is in operation 10 minutes per hour.

Ancillary operations include mechanical and maintenance operations associated with the concrete trucks and administration operations occurring inside the plant building. In addition, an oil burner, that exhausts through an exhaust stack located on the roof of the plant building, and an air compressor are located internally. These were assessed as insignificant during the site visit.

Electricity supplied by the grid is used to operate the plant during production periods. During power outages a 1135 kW diesel fired emergency generator fitted with an exhaust silencer is used to maintain the plant in an operational condition, and, to provide security lighting. All other processes are generally shut down.

The major components and / or operations of the ready-mix concrete plant are as follows:

- Concrete truck loading and mixing and associated signal horn,
- Concrete truck slump test and mixing,
- Concrete truck wash out,
- Cement powder tanker truck equipped with a blower/pump to unload the cement powder or slag,
- Dust collector (baghouse),
- Loader (to load sand and aggregate into the pit or hopper),
- Concrete truck on-site movements,
- Aggregate truck on-site movements delivering aggregate to stockpiles,

- Highway truck on-site movements delivering sand or recycled concrete to stockpiles,
- Powder tanker truck on-site movements delivering powdered cement and slag;
- Oil Boiler Exhaust*,
- Conveyors used to transfer material*,
- Silo's and associated shakers located at the top of the silos*,
- Air compressor located inside insulated building*,
- Small vents and exhausts located at the office and control tower building*.

*Assessed as an insignificant noise source in this analysis. Refer Section 3.0 Noise Source summary.

The ready-mix concrete plant operations occur on a 24-hour basis (24 hours) with limited operations permitted during the evening and nighttime period (19:00 to 07:00). Refer to Section 7.0.

Hours of Operation

Daytime Operations (07:00 to 19:00) - During the daytime period, all significant noise sources associated with on-site operations are assumed to be in operation concurrently.

Evening and Night Operations (19:00 – 07:00) - During the evening and nighttime period preparing for blasting with rock drilling operations does not occur. All other significant noise sources associated with on-site operations are assumed to be in operation concurrently.

Refer to Section 7.0 for restrictions and recommended mitigation measures that apply for the various MECP defined periods of operation.

3.0 Noise Source Summary

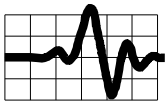
The following noise sources have been used to model noise generated by operations at the quarry including the proposed extraction and aggregate processing, the existing asphalt plant and the existing ready-mix concrete plant. In brackets are the shortened names of the noise sources as used in the acoustic model. The characteristics of these sources, as used in acoustic modelling, are summarized in Table 1.

Extraction and Aggregate Processing Noise Sources:

- Rock Drill (source: CP_Rockdrill),
- Crushing and Screening Plant and associated equipment (Source: CP_Crusher_1, CP_Crusher_2_3, CP_Scalper, CP_Screen_1, CP_Screen_2, CP_Screen_3),
- Diesel Generator (Source: CP_Genset_1),
- Loaders carrying out extraction, stockpiling and loading operations (Source: CP_Loader_1, CP_Loader_2, CP_Loader_3),
- Rock trucks unloading extracted raw material into the hopper at the crushing plant (Source: CP_Rock_Truck_Unloading)
- Rock trucks used for delivery of raw material (blast rock) from the lift face to the crushing plant and processed aggregate from the crushing plant to the HMA and TRM Plants (Source: Q_IHR_Aggregate, QAP_IHR_Aggregate, QRMC_IHR_Aggregate),
- Highway trucks used to ship processed aggregate off-site (Source: Q_IHR_Shipping),

Asphalt Plant Noise Sources:

- Drum Mixer (Source: AP_Drum);
- Burner (Source: AP_Burner);
- Baghouse Fan (Source: AP_Baghouse_Fan);
- Dust Auger (Source: AP_Dust_Auger);
- Oil Heater (Source: AP_Oil_Heater);
- Air Compressor (Source: AP_Air_Compressor);
- Aggregate Screen (Source: AP_Aggregate_Screen);
- Recycled Asphalt Product Screen (Source: AP_RAP_Screen);
- Loader used to feed aggregate and recycled asphalt product into the asphalt plants hoppers (Source: AP_Loader);
- Highway trucks used for shipping of asphalt product (Source: AP_IHR_Shipping),



Ready-Mix Concrete Plant Noise Sources:

- Ready-mix concrete truck wash-out (Source: RMC_Concrete_Truck_Wash_Out);
- Ready-mix concrete truck loading and mixing (Source: RMC_Concrete_Truck_Loading);
- Ready-mix concrete truck slump test and mixing (Source: RMC_Concrete_Truck_Slump_Mix);
- Cement and slag powder silos and associated dust collection system (Source: Dust_Collector),
- Noise from the compressor (Source: RMC_Compressor);
- One loader loading aggregate into the bins of the plant (Source: RMC_Loader),
- Powder trucks unloading cement and slag into the silo (Source: RMC_Powder_Truck_Unloading);
- Ready-mix concrete trucks arriving and departing (Source: RMC_IHR_Shipping),
- Stand-by Emergency Diesel Generator used to provide power to the plant during power outages (Source: STBY_Genset_1).

The strengths of the noise sources, i.e. the sound powers shown in Table 2, and used in this analysis, are taken from manufacturers data, data from a database of noise measurements made by Freefield Ltd. of similar operations at other facilities in Ontario and from noise measurements carried out on-site in September 2023. Refer to Table 2 for calculated sound powers, Appendix 2 for raw measurement data and Appendix 3 for manufacturers data.

Crushing and Screening Plant: The strengths of the noise sources for the crushing and screening plant, i.e. the sound powers shown in Table 2 and Table A2.6, are based on measurement data carried out on-site in September 2022. The sound powers where calculated for each of the individual noise sources based on a combination of both near and far field measurement data. Following calibration, the individual sources where further calibrated such that noise from the overall plant was in line with the noise measurement data at far field measurement locations P1 to P5 as shown in Appendix 4, Figure A4.1. The results shown in Figure A4.1, exceed the measurement data at all locations, hence, the calculated sound levels are considered conservative.

Secondary and tertiary screening units (source: CP_Screen_2 and CP_Screen_3) located at the portable crushing and screening plant where not running during noise measurements. Noise from these units has been based on measurements data for the primary screening unit (source: CP_Screen_1).

Asphalt Plant: The strengths of the noise sources for the asphalt plant, i.e. the sound powers shown in Table 2 and Table A2.6, are based on manufacturers data. The sound powers where calculated for each of the individual noise sources using a combination of both near and far field measurement

data provided by the manufacturer. Following calibration, noise from the overall asphalt plant was compared to the far field measurement data at location 38 and location 39 at 100ft and 50 ft respectively, refer to manufacturers sound data in Appendix 3, Figure A3.1. The results indicted that the predicted results after calibration exceed the manufacturers measurement data at these far field measurement locations, hence, the calculated sound levels are considered conservative.

Noise from the dust silo blower (source: AP_Baghouse_Fan) includes the attenuation provided by the recommended Stoddard Silencer Model: F64-5. In addition, a 5 dBA penalty has been added to the sound power for this source to account for the potential tonal quality of the sound as per MECP Guideline NPC-104.

Ready-Mix Concrete Plant: The strengths of the noise sources for the ready-mix concrete plant, i.e. the sound powers shown in Table 2 and Table A2.6, are based on noise measurements carried out on-site in September 2023. Noise from equipment not in operation during the site visit was taken from a database of noise measurements made by Freefield Ltd. of similar operations at other facilities in Ontario.

Stand-by Generator: Noise from the stand-by emergency generator (source: STBY_Genset_1) includes the attenuation provided by the installed exhaust silencer. Insertion loss based on Silex Silencer Model JB6 which is similar the Silex Model JB4 installed.

All noise sources, except as noted below, have been modelled as point sources.

Noise from the loaders at the asphalt plant and ready-mix concrete plant have been modelled as a moving point source within a typical area of operation.

Noise from the haul routes is modelled as a line source using the moving point source method.

The truck movements associated with the extraction and aggregate processing operation are based on a maximum annual tonnage of 3 million tonnes and typical 20 tonne highway truck capacity and 40 tonne haul truck capacity. As such, it is assumed twenty-two (22) loads of processed aggregate will be shipped via highway truck per hour during periods of maximum capacity during the daytime, evening and nighttime period. Refer to Castleglenn Consultants Inc., *"Traffic Impact Assessment for the R.W. Tomlinson Stittsville II Quarry – Ottawa, Ontario"*, dated August 2022[5] (Traffic Impact Study) for further details.

The truck movements associated with the asphalt plant and ready-mix concrete plant are based on the peak hour traffic volumes presented in the Traffic Impact Study[5]. As such, we have assumed eight (8) loads of either asphalt or ready-mix concrete will be shipped per hour during periods of maximum capacity during the daytime, evening and nighttime period. To assess compliance of worst-case operations during periods when the asphalt plant and ready-mix concrete plant are in operation concurrently, we have assumed the eight (8) loads will consist of four (4) loads of asphalt and four (4) loads of ready-mix concrete being shipped per hour during periods of maximum capacity.

It has been assumed ancillary truck traffic, entering and exiting the site, associated with the delivery of sand, aggregate, recycled asphalt product, liquid asphalt (bitumen), and / or powdered cement, to the asphalt plant and ready-mix concrete plant, as applicable, will occur outside of peak production periods.

Haul trucks delivering raw material from the lift face to the crushing plant and delivering processed aggregate from the crushing and screening plant to the asphalt plant and ready-mix concrete plant circulate internally on-site. It has been assumed that twenty five (25) loads of extracted raw material will be delivered from the lift face to the crushing plant and four (4) loads of processed aggregate will be delivered to both the asphalt plant and ready-mix concrete plant per hour during periods of maximum capacity during the daytime, evening and nighttime period.

Conveyors and stackers used to transfer material are considered insignificant noise sources.

Noise measurements were carried out using a Brüel & Kjær Type 2270 sound level meter. Field calibrations, using a Brüel & Kjær 4231 field calibrator, and battery checks were carried out before and after each measurement series. In no case did the field calibration vary by more than 0.1 dB over a series of measurements. In addition, the sound level meters, and the field calibrator are laboratory calibrated on an annual basis. Copies of the relevant calibration certificates are included in Appendix 3.

The weather conditions on the day of measurements were well suited to outdoor noise measurements, variable winds below 20 km/h during noise measurements. Skies were clear and humidity less than 77%. A windscreen was used during all measurements.

Refer Figure 3, 5, 7 and 9 for location of sources for worst case modes of operation analysed and Figure 11, 12 and 13 for detailed layout of the crushing, asphalt and ready-mix concrete plant.

4.0 Point of Reception Summary

A total of eight nearby noise sensitive receptors have been selected for detailed noise evaluation. These existing residences and vacant lots zoned for potential noise sensitive development are those closest to the proposed quarry in all directions and represent the worst-case noise impacts in comparison to other nearby or more distant noise sensitive receptors.

The eight points of reception selected for analysis, POR 1 to POR 8, are shown in Figure 1 and listed in Table 1.

As per MECP Guideline NPC-300, two points of reception (POR) have been selected at each residence for which worst case sound levels have been calculated.

> POW – Plane of window (POW) points of reception are located on the dwelling or noise sensitive building, typically 2 m above ground for single storey dwellings and 4.5 m above ground for two storey dwellings.
>
> OPR – Outdoor Point of Reception, an area on the property of the residence. For large properties, the OPR point of reception can be up to 30 m from the dwelling at a height of 1.5 m above ground.

Where receptors have been located on vacant land zoned for potential noise sensitive development i.e. a possible future residence located on land zoned rural, the location selected for assessment is consistent with the existing pattern of development in the area.

5.0 Assessment Criteria, Performance Limits

Sound level limits, as specified in the MECP guideline NPC-300[1], and the City of Ottawa, ENCG[6], depend on the acoustical classification of the area as Class 1, 2, 3 or 4.

> **Class 1 area** 'an area with an acoustical environment typical of a major population centre, where the background sound level is dominated by the activities of people, usually road traffic, often referred to as urban hum.'
>
> **Class 2 area** 'an area with an acoustical environment that has qualities representative of both Class 1 and Class 3 areas: sound levels characteristic of Class 1 during daytime (07:00 to 19:00 or to 23:00 hours); and low evening and night background sound level defined by natural environment and infrequent human activity starting as early as 19:00 hours (19:00 or 23:00 to 07:00 hours).'
>
> **Class 3 area** 'a rural area with an acoustical environment that is dominated by natural sounds having little or no road traffic, such as: a small community; agricultural area; a rural resort area such as a cottage or resort area; or, a wilderness area. '
>
> **Class 4 area** 'an area or specific site that would otherwise be defined as Class 1 or 2 and which: is an area intended for development with new noise sensitive land use(s) that are not yet built; is in proximity to existing, lawfully established stationary source(s); and, has formal confirmation from the land use planning authority with the Class 4 area classification which is determined during the land use planning process. Additionally, areas with existing noise sensitive land use(s) cannot be classified as Class 4 areas.'

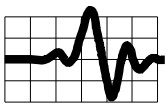
Due to the relatively high levels of road traffic on Highway 7, the area in which receptors POR 1, 2 and 8 are located is subject to traffic noise particularly during the daytime and evening period, with lower levels realized during the nighttime period. As such these receptors are classified as Class 2 Area.

Due to the larger distance from Highway 7, the relatively low levels of traffic on Jinkinson Road and Fernbank Road and the dominant rural character of the environment, the area in which POR 3 to 7 are located is subject to occasional daytime traffic noise but dominated by natural sounds when the nearby Stittsville Shooting Range is not in operation. Hence, POR 3 to 7 have been classified as Class 3 Area (Rural).

The applicable outdoor sound level limit at a point of reception is the higher of the applicable exclusion limit value, presented in Tables 3 and Table 4, or the background sound level for that point of reception. Background sound level means the sound level that is present in the environment produced by noise sources other than the source under assessment.

An assessment of background noise was not carried out, hence, the levels given in Table 3 and 4 are taken as the sound level limits at all points of reception for the purpose of this assessment according to their location in a Class 2 Area and Class 3 Area.

The applicable sound level limits for each point of reception are set out in Table 5.



The applicable sound level limits for each point of reception are set out in Table 5.

Sound levels are assessed in terms of the 1-hour equivalent sound level, L_{eq}, effectively the average sound level over each hour. All sound levels are A-weighted, A-weighting being a frequency weighting with represents sensitivity of human hearing to sounds of differing frequencies.

Sound Level Limits for Emergency Equipment

The sound level limits for noise produced by emergency equipment operating in non-emergency situations, such as during routine testing or maintenance, are 5 dB greater than the sound level limits otherwise applicable. The noise produced by emergency equipment operating in non-emergency situations is assessed independently of all other stationary sources of noise as per NPC- 300.[2]

As such, for the purpose of assessing the noise emissions from the testing and maintenance of the emergency generators located at the asphalt plant and ready-mix concrete plant, the sound level limit is taken to be 55 dBA at receptors POR 1, 2 and 8 and 50 dBA at receptors POR 2 to 7, which is 5 dB greater than the applicable exclusion sound level during the daytime period (07:00 to 19:00).

The sound level limits do not apply to emergency equipment operating in emergency situations.

6.0 Impact Assessment

Noise levels have been predicted at the critical receptors using "predictable worst case" assumptions under normal operations and using the ISO sound propagation methodology[4] as implemented in the sound prediction software Cadna-A, Version 2023. The "predictable worst case" is interpreted as meaning the greatest noise impact anticipated under normal operating conditions. The ISO methodology provides a conservative (i.e. high) estimate of the noise level at a receptor taking into account adverse wind and meteorological conditions.

The estimation method includes the following:

- Distance attenuation is based on spherical spreading.
- Atmospheric attenuation.
- Ground attenuations, as appropriate.
- Barrier attenuation, as appropriate.

In order to consider cases of worst noise impacts, five operational scenarios have been modeled.

In general, the worst impacts are those which occur when all equipment is operating concurrently on the original surface or one lift down. It has been assumed all extraction and aggregate processing equipment, apart from the rock drill, is in operation on the first lift down. The rock drill is assumed to be in operation on the original surface in this assessment. In addition, the asphalt plant and ready-mix concrete plant have been assessed in their existing locations on the original surface for all scenarios except Scenario 4 which analyses worst case impacts associated with extraction of Phase 4. Prior to commencement of Phase 4 extraction, the asphalt plant and ready-mix concrete plant will be relocated to the floor of quarry one lift down.

The following five worst-case scenarios are presented in this report and form the basis for the recommended mitigation measures and assessment of compliance to MECP and ENCG criteria:

Scenario 1: *Worst Case, Asphalt plant, ready-mix concrete plant, and crushing plant in operation concurrently with extraction occurring at southwest setback limit of Phase 3 closest to POR 5, 6 and 7, Day (07:00 – 19:00) and Evening and Nighttime (19:00 – 07:00) Period – Figure 3, 4.1 and 4.2.*

Scenario 2: *Worst Case, Asphalt plant, ready-mix concrete plant, and crushing plant in operation concurrently with extraction occurring at southeast setback limit of Phase 6 closest to POR 3 and 4, Day (07:00 – 19:00) and Evening and Nighttime (19:00 – 07:00) Period – Figure 5, 6.1 and 6.2.*

Scenario 3: *Worst Case, Asphalt plant, ready-mix concrete plant, and crushing plant in operation concurrently with extraction occurring at northeast setback limit of Phase 7 closest to POR 1, 2 and 8, Day (07:00 – 19:00) and Evening and Nighttime (19:00 – 07:00) Period - Before relocation of Asphalt plant and ready-mix concrete plant – Figure 7, 8.1 and 8.2.*

Scenario 4: *Worst Case, Asphalt plant, ready-mix concrete plant, and crushing plant in operation concurrently with extraction occurring at northeast setback limit of Phase 7 closest to POR 1, 2 and 8, Day (07:00 – 19:00) and Evening and Nighttime (19:00 – 07:00) Period - After relocation of Asphalt plant and ready-mix concrete plant – Figure 9, 10.1 and 10.2.*

Scenario 5: *Worst Case, Emergency power generator in operation for testing and routine maintenance (Daytime Period, 7 am to 7 pm) – Figure 11 and 12.*

In Table 6.1 to Table 6.5, estimated noise levels at the nearest receptors for the worst-case scenarios, for daytime and evening and nighttime periods, are compared with the applicable sound level limits. More detailed estimates, for all sources and scenarios, are contained in Appendix 2, Tables A2.8.1 to A2.8.9.

It can be seen that with the recommended mitigation measures as detailed in Section 7.0 the sound level limits are met at all noise sensitive points of reception, POR 1 to POR 8, for worst case operating conditions during the proposed daytime period of operation (07:00 to 19:00) and the proposed evening and nighttime period of operation (19:00 to 07:00).

Details of acoustic modeling are provided in Appendix 2. Figures 4.1, 4.2, 6.1, 6.2, 8.1, 8.2, 10.1, 10.2 and 12 show predicted noise contours for each mode of operation analyzed.

Statement of Compliance

It is concluded that, with the recommended noise mitigation measures detailed in section 7.0, noise impacts from operations at the proposed quarry will be in compliance with MECP Environmental Noise Guidelines[1] and the City of Ottawa, Environmental Noise Control Guidelines, January 2016[6], for the proposed daytime 7 am to 7 pm (07:00 to 19:00) and evening and nighttime 7 pm to 7 am (19:00 to 07:00) period of operation.

7.0 Mitigation Measures

Noise mitigation measures for the proposed quarry are detailed below.

The predicted noise impacts shown in Tables A2.8.1 to A2.8.8 are based on the implementation of the following mitigation measures:

7.1 Quarry Operations

7.1.1 The operation of a standard hydraulic rock drill may take place only during the daytime period (07:00 – 19:00), anywhere in the extraction, area above or below grade.

7.1.2 The operation of the portable crushing and screening plant (crusher) may take place on a twenty-four-hour basis (24-hour) and shall comply with the following:

7.1.2.1 The crusher is to be located on the quarry floor, one or more lifts down, a minimum 10 m below grade.

7.1.3 The operation of the loaders may take place on a twenty-four-hour basis (24-hour), anywhere in the extraction, area above or below grade, and shall comply with the following:

7.1.3.1 When operating during the daytime period (07:00 – 19:00):

i. A maximum of three (3) loaders may be in operation concurrently carrying out extraction, loading and stockpiling operations.

7.1.3.2 When operating during the evening or nighttime period (19:00 – 07:00):

i. A maximum of two (2) loaders may be in operation concurrently carrying out extraction, loading and stockpiling operations.

7.1.4 The loading and shipping of product using trucks may take place on a twenty-four-hour basis (24-hour) and shall comply with the following:

7.1.4.1 When operating on-site, trucks shall not exceed 20 km/h and shall not use compression braking (Jake Brakes).

7.2 Asphalt Plant

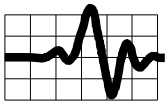
7.2.1 The operation of the asphalt plant and associated equipment, may take place on a twenty-four-hour basis (24-hour) and shall comply with the following:

7.2.1.1 The asphalt plant is to remain in its existing location shown on Figure 2 and 14 or relocated to the alternative location shown on Figure 9.

7.2.1.2 The dust silo blower (source: AP_Baghouse_Fan) is to be fitted with air intake silencer, spec: Stoddard F64-5 or similar, constructed of minimum 16-gauge weather resistant metal and shall have a high transmission loss casing. The minimum dynamic insertion loss of the silencer is to meet minimum attenuation requirements noted in Table 7. The maximum outdoor sound power of the dust silo blower, at the point of emissions into the atmosphere, after installation of the silencer, is not to exceed the level listed in Table 2.

7.2.2 The operation of the loader may take place on a twenty-four-hour basis (24-hour) and shall comply with the following:

7.2.2.1 During the daytime, evening and nighttime period (24-hour) a maximum of one loader may be in operation at the asphalt plant.



7.2.3 The loading and shipping of product using trucks may take place on a twenty-four-hour basis (24-hour) and shall comply with the following:

7.2.3.1 When operating on-site, trucks shall not exceed 20 km/h and shall not use compression braking (Jake Brakes).

7.3 Ready Mix Concrete Plant Operations:

7.3.1 The ready-mix concrete plant may operate on a twenty-four-hour basis (24-hour) and shall comply with the following:

7.3.2 The ready-mix concrete plant is to remain in its existing location shown on Figure 2 and 15 or relocated to the alternative location shown on Figure 9.

7.3.3 The operation of the loader may take place on a twenty-four-hour basis (24-hour) and shall comply with the following:

7.3.3.1 During the daytime, evening and nighttime period (24-hour) a maximum of one loader may be in operation at the ready-mix concrete plant.

7.3.4 The loading and shipping of product using trucks may take place on a twenty-four-hour basis (24-hour) and shall comply with the following:

7.3.4.1 When operating on-site, trucks shall not exceed 20 kph and shall not use compression braking (Jake Brakes).

7.3.5 Testing and routine maintenance operations of the emergency generator shall take place only during the daytime period (07:00 – 19:00). The existing silencer installed on the standby generator exhaust is to be maintained.

7.1 Portable construction equipment

7.1.1 Portable construction equipment used for site preparation (e.g. land clearing and construction of berms) and rehabilitation shall comply with MECP Publication NPC-115, Construction Equipment, August 1978. (This publication gives noise standards to be met by construction equipment in Ontario.) Site preparation and rehabilitation activities shall take place only during daytime hours (07:00 – 19:00).

7.2 New Process

7.2.1 If a new process is introduced to the site, or the layout of the existing asphalt plant or existing ready-mix concrete plant is altered, then this new or modified process shall be assessed by a qualified acoustical consultant prior to commissioning. Noise mitigation measures shall be reviewed, and altered, if necessary, to ensure that MECP sound level limits are met at all points of reception.

8.0 Conclusions

An acoustic assessment of noise from the proposed quarry has been conducted according to MECP and City of Ottawa noise assessment procedures .

It has been found that noise levels from the proposed extraction and aggregate processing and existing asphalt plant and ready-mix concrete plant operations at nearby receptors are in compliance with MECP and City of Ottawa sound level limits as set out in publication NPC-300[1] and ENCG[6], provided that the noise mitigation measures described in Section 7.0 of this report are followed.

Professional Engineers Ontario

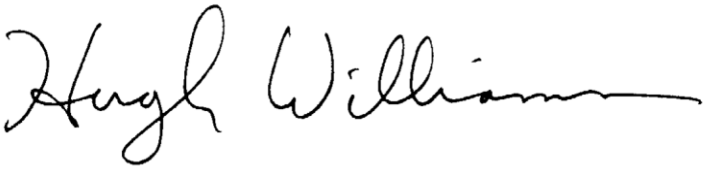
2nd February 2024

Limited Engineering Licensee

Name: M. A. WELLS
Number: 100542557
Limitations: Environmental acoustic assessments and recommendations to mitigate noise and vibration; acoustical engineering services for land-use planning, architectural and building acoustics, industrial acoustics, and occupational health and safety audits.

Association of Professional Engineers of Ontario

Michael Wells, B.Architecture (Hons), B.Sc.Arch.
Limited Engineering Licensee, Professional Engineers Ontario, Registered Architect of NSW, Member, Canadian Acoustical Society, Member, Australian Acoustical Society (M.A.A.S.)



Hugh Williamson, Ph.D., P.Eng.
Member, Canadian Acoustical Association

References

1. Ministry of Environment, Conservation and Parks Publication NPC-300, *Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning*, August 2013, adopted by the MECP on 22 October 2013.

2. Ministry of Environment, Conservation and Parks, Document NPC-233, *Information to be Submitted for Approval of Stationary Sources of Sound*, October 1995.

3. Ministry of Environment, Conservation and Parks, *Sample Application Package, Basic Comprehensive Certificate of Approval (Air and Noise)*, July 2009.

4. International Standards Organization, *Acoustics - Attenuation of Sound during Propagation Outdoors, Part 2: General Method of Calculation*, ISO 9613-2: 1996(E).

5. Castleglenn Consultants Inc., *"Traffic Impact Assessment for the R.W. Tomlinson Stittsville II Quarry – Ottawa, Ontario"*, dated August 2022.

6. City of Ottawa, *Environmental Noise Control Guidelines*, January 2016.

7. City of Ottawa, *Noise Control Study Terms of Reference.*

TABLES

Table 1: Point of Reception Summary Table

Point of Reception	Location[1]
POR 1	Residence 385 Jinkinson Road (2 storey)
POR 2	Residence 423 Jinkinson Road (1.5 storey)
POR 3	Residence 7007 Fernbank Road (1 storey) (Also represents 7025 and 7035 Fernbank Road)
POR 4	Residence 7101 Fernbank Road (Assumed 2 storey)
POR 5	Residence 7165 Fernbank Road (2 storey)
POR 6	Residence 7265 Fernbank Road (2 storey) (also represents 7255 Fernbank Road)
POR 7	Vacant Lot 1604 Jinkinson Road (2 storey)
POR 8	Residence 27 Spruce Ridge Road (1 storey) (Also represents 31 and 37 Spruce Ridge Road)

Notes:

1. For assessment purposes, points of reception, (POR), have been taken as upper floor plane of window (POW) locations, 2 m above grade for single storey and 4.5 m above grade to represent two storey residences, and, outdoor point of receptions (OPR), 30 m from residence, 1.5 m above grade, in acoustic calculations. Vacant lots have been assessed as two storeys in height.

Table 2: Noise Source Summary Table

Name	Source ID	Sound Power (dBA)	Source Location Ht. above ground (m)	Sound Characteristics	Noise Control Measures
Extraction and Aggregate Processing Operations:					
Standard Hydraulic Rock Drill	CP_Rockdrill	121.6	1.0	Steady, non-tonal, non-directional	As noted in section 7.0
Crushing and Screening Plant (Includes primary, secondary and tertiary crushing and screening units and an associated diesel generator)	CP_Crusher_1	113.1	6.0	Steady, non-tonal, non-directional	As noted in section 7.0
	CP_Crusher_2_3	110.3	4.0	Steady, non-tonal, non-directional	As noted in section 7.0
	CP_Scalper	108.5	4.0	Steady, non-tonal, non-directional	As noted in section 7.0
	CP_Genset_1	116.4	4.2	Steady, non-tonal, non-directional	As noted in section 7.0
	CP_Screen_1 (CP_Screen_2) (CP_Screen_3)	110.0	8.0 (6) (6)	Steady, non-tonal, non-directional	As noted in section 7.0
Loaders (Carrying out extraction, stockpiling and loading operations)	CP_Loader_1_Stockpiling	107.7	2.5	Steady, moving, non-tonal, non-directional	As noted in section 7.0
	CP_Loader_2_Extraction CP_Loader_3_Extraction	113.4	2.5	Steady, moving, non-tonal, non-directional	As noted in section 7.0
Haul trucks unloading extracted raw material into the hopper	CP_Rock_Truck_Unloading	111	2.5	Steady, non-tonal, non-directional	As noted in section 7.0
Haul truck on-site movements (Delivering raw material to the crushing plant and processed aggregate from the crusher to the asphalt plant or ready mix concrete plant)	Q_IHR_Aggregate QAP_IHR_Aggregate QRMC_Arregate (CP_Rock_Truck_Passby)	112.2	2.5	Steady, moving non-tonal, non-directional	As noted in section 7.0
Highway trucks delivering processed aggregate off-site	CP_HWY_Truck_Passby	98.8	2.5	Steady, moving non-tonal, non-directional	As noted in section 7.0
Water truck carrying out dust suppression	QAPRMC_IHR_Water_ Truck	110.1	2.5	Steady, moving non-tonal, non-directional	As noted in section 7.0
Asphalt Plant Operations:					
Drum Mixer	AP_Drum_Drive	105.7	4.2	Steady, non-tonal, non-directional	As noted in section 7.0

Burner	AP_Burner	105.7	4.2	Steady, non-tonal, non-directional	As noted in section 7.0
Baghouse (Dust silo blower)	AP_Baghouse_Fan	99.1[1,3]	1.5	Steady, tonal,non-directional	As noted in section 7.0
Dust Auger	AP_Dust_Auger	79.1	1.9	Steady, non-tonal, non-directional	As noted in section 7.0
Liquid Asphalt (Bitumen) Tanks and associated heater and pumps	AP_Oil_Heater	89.1	1.0	Steady, non-tonal, non-directional	As noted in section 7.0
Compressor	AP_Air_Compressor	96.3	1.5	Steady, non-tonal, non-directional	As noted in section 7.0
Aggregate Screen	AP_Aggregate_Screen	102.9	5.2	Steady, non-tonal, non-directional	As noted in section 7.0
Recycled Asphalt Product Hoppers (Bins)	AP_RAP_Screen	97.7	5.2	Steady, non-tonal, non-directional	As noted in section 7.0
Loader	AP_Loader	98	2.5	Steady, moving, non-tonal, non-directional	As noted in section 7.0
Highway Trucks shipping asphalt product off-site	AP_IHR_Asphalt (HWYTruck_Slow58)	110.1	2.5	Steady, moving non-tonal, non-directional	As noted in section 7.0
Ready-Mix Concrete Plant Operations:					
Concrete Truck Wash Out	RMC_Concrete_Truck_ Wash_Out	100.9	4.0	Steady, non-tonal, non-directional	As noted in section 7.0
Concrete Truck Loading and Mixing	RMC_Concrete_Truck_ Loading	109.4	4.0	Steady, non-tonal, non-directional	As noted in section 7.0
Concrete Truck Slump Test and Mixing	RMC_Concrete_Truck_ Slump_Mix	112.9	4.0	Steady, non-tonal, non-directional	As noted in section 7.0
Powder Trucks unloading powdered cement or slag into the silo's	RMC_Powder_Truck_ Unloading	99.4	1.5	Steady, non-tonal, non-directional	As noted in section 7.0
Baghouse with associated dust collector to control dust emissions	RMC_Dust_Collector	112.0	13.0	Steady, non-tonal, non-directional	As noted in section 7.0
Compressor	RMC_Compressor	100.8	1.5	Steady, non-tonal, non-directional	As noted in section 7.0
Loader loading sand and aggregate into the hopper	RMC_Loader	103.8	2.5	Steady, moving, non-tonal, non-directional	As noted in section 7.0
Concrete truck on-site movements	RMC_Concrete_Truck_ Passby	104.3	2.5	Steady, moving, non-tonal, non-directional	As noted in section 7.0

Stand-by emergency diesel generator during testing and routine maintenance	STBY_Genset_1	95.1[2]	13.0	Steady, non-tonal, non-directional	As noted in section 7.0

Notes:

1. Includes attenuation provided by recommended silencer at the dust silo blower air intake (source: AP_Baghouse_Fan). Refer Table 7.
2. Includes attenuation provided by existing silencer installed on the stand-by emergency generator exhaust.
3. Noise from the dust silo blower (source: AP_Baghouse_Fan) includes a 5 dBA penalty which has been added to the sound power for this source to account for the potential tonal quality of the sound as per MECP Guideline NPC-104.

Table 3: MECP Exclusion Limit Values for One-Hour Equivalent Sound Level (Leq, dBA) at Outdoor Points of Reception

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 19:00	50	50	45	55
19:00 – 23:00	50	45	40	55

Table 4: MECP Exclusion Limit Values for One-Hour Equivalent Sound Level (Leq, dBA) at Plane of Window of Noise Sensitive Spaces

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 19:00	50	50	45	60
19:00 – 23:00	50	50	40	60
23:00 – 07:00	45	45	40	55

Table 5: Applicable One Hour Sound Level Limits for the Proposed Daytime (07:00 – 19:00) and Early Morning Period (06:00 – 07:00) period of operation.

Receptor & Point of Reception POW = Plane of Widow OPR = Outdoor Point of Reception	Sound Level Limit 1-hour LAEQ dBA (Daytime Period, 07:00 – 19:00)	Sound Level Limit 1-hour LAEQ dBA (Evening Period, 19:00 – 23:00)	Sound Level Limit 1-hour LAEQ dBA (Nighttime Period, 23:00 – 07:00)
POR 1 - POW	50	50	45
POR 1 - OPR	50	45	-
POR 2 - POW	50	50	45
POR 2 - OPR	50	45	-
POR 3 - POW	45	40	40
POR 3 - OPR	45	40	-
POR 4 - POW	45	40	40
POR 4 - OPR	45	40	-
POR 5 - POW	45	40	40
POR 5 - OPR	45	40	-
POR 6 - POW	45	40	40
POR 6 - OPR	45	40	-
POR 7 - POW	45	40	40
POR 7 - OPR	45	40	-
POR 8 - POW	50	50	45
POR 8 - OPR	50	45	-

Table 6.1: Acoustic Assessment Summary Table, Scenario 1: Worst Case, Daytime, (07:00 - 19:00), Evening, (19:00 – 23:00) and Nighttime, (23:00 – 07:00) Period of Operation

Point of Reception ID	POR Description	Location	Daytime (07:00 - 19:00)			Evening and Nighttime (19:00 – 07:00)			Verified by an acoustic Audit (Yes / No)
			Estimated Sound Level at POR Daytime Period (Worst Case) (dBA)	Performance Limit* Daytime Period (dBA)	Compliance with Performance Limit (Yes/No)	Estimated Sound Level at POR Evening and Nighttime Period (Worst Case) (dBA)	Performance Limit* Evening and Nighttime Period (dBA)	Compliance with Performance Limit (Yes/No)	
POR 1	Residence	POW	43.6	50	Yes	42.1	45	Yes	No
		OPR	43.5	50	Yes	42.3	45	Yes	No
POR 2	Residence	POW	42.5	50	Yes	41.1	45	Yes	No
		OPR	41.6	50	Yes	40.2	45	Yes	No
POR 3	Residence	POW	38.5	45	Yes	35.2	40	Yes	No
		OPR	38.6	45	Yes	35.4	40	Yes	No
POR 4	Residence	POW	39.7	45	Yes	38	40	Yes	No
		OPR	39.2	45	Yes	37.6	40	Yes	No
POR 5	Residence	POW	39.2	45	Yes	37.2	40	Yes	No
		OPR	39.3	45	Yes	37.3	40	Yes	No
POR 6	Residence	POW	38.3	45	Yes	35.9	40	Yes	No
		OPR	38.5	45	Yes	36.1	40	Yes	No
POR 7	Residence	POW	35.6	45	Yes	33.5	40	Yes	No
		OPR	35.7	45	Yes	33.70	40	Yes	No
POR 8	Residence	POW	45.9	50	Yes	44.80	45	Yes	No
		OPR	44.5	50	Yes	43.10	45	Yes	No

Notes:

1. Performance limits are based on 1-hour equivalent sound levels, Leq.
2. The highest predicted sound level at plane of window or outdoor point of reception are provided above as these are the most critical at each point of reception. Refer to Tables A2.8.1 to A2.8.9 in Appendix 2 for more detailed sound level estimates by source.
3. Outdoor Points of Reception (OPR) are not considered noise sensitive during the nighttime period (23:00 to 07:00) as per MECP criteria.

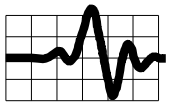


Table 6.2: Acoustic Assessment Summary Table, Scenario 2: Worst Case, Daytime, (07:00 - 19:00), Evening, (19:00 – 23:00) and Nighttime, (23:00 – 07:00) Period of Operation

Point of Reception ID	POR Description	Location	Daytime (07:00 - 19:00)			Evening and Nighttime (19:00 – 07:00)			Verified by an acoustic Audit (Yes / No)
			Estimated Sound Level at POR Daytime Period (Worst Case) (dBA)	Performance Limit* Daytime Period (dBA)	Compliance with Performance Limit (Yes/No)	Estimated Sound Level at POR Evening and Nighttime Period (Worst Case) (dBA)	Performance Limit* Evening and Nighttime Period (dBA)	Compliance with Performance Limit (Yes/No)	
POR 1	Residence	POW	44.0	50	Yes	42.3	45	Yes	No
		OPR	43.9	50	Yes	42.5	45	Yes	No
POR 2	Residence	POW	43.1	50	Yes	41.3	45	Yes	No
		OPR	42.1	50	Yes	40.4	45	Yes	No
POR 3	Residence	POW	39.1	45	Yes	36.2	40	Yes	No
		OPR	39.3	45	Yes	36.4	40	Yes	No
POR 4	Residence	POW	39.6	45	Yes	38	40	Yes	No
		OPR	38.8	45	Yes	37.5	40	Yes	No
POR 5	Residence	POW	39.0	45	Yes	37.2	40	Yes	No
		OPR	39.1	45	Yes	37.3	40	Yes	No
POR 6	Residence	POW	38.1	45	Yes	36	40	Yes	No
		OPR	38.3	45	Yes	36.2	40	Yes	No
POR 7	Residence	POW	35.2	45	Yes	33.6	40	Yes	No
		OPR	35.3	45	Yes	33.7	40	Yes	No
POR 8	Residence	POW	45.9	50	Yes	44.8	45	Yes	No
		OPR	44.4	50	Yes	43.0	45	Yes	No

Notes:

1. Performance limits are based on 1-hour equivalent sound levels, Leq.
2. The highest predicted sound level at plane of window or outdoor point of reception are provided above as these are the most critical at each point of reception. Refer to Tables A2.8.1 to A2.8.9 in Appendix 2 for more detailed sound level estimates by source.
3. Outdoor Points of Reception (OPR) are not considered noise sensitive during the nighttime period (23:00 to 07:00) as per MECP criteria.

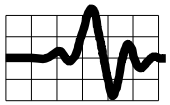


Table 6.3: Acoustic Assessment Summary Table, Scenario 3: Worst Case, Daytime, (07:00 - 19:00), Evening, (19:00 – 23:00) and Nighttime, (23:00 – 07:00) Period of Operation

Point of Reception ID	POR Description	Location	Daytime (07:00 - 19:00)			Evening and Nighttime (19:00 – 07:00)			Verified by an acoustic Audit (Yes / No)
			Estimated Sound Level at POR Daytime Period (Worst Case) (dBA)	Performance Limit* Daytime Period (dBA)	Compliance with Performance Limit (Yes/No)	Estimated Sound Level at POR Evening and Nighttime Period (Worst Case) (dBA)	Performance Limit* Evening and Nighttime Period (dBA)	Compliance with Performance Limit (Yes/No)	
POR 1	Residence	POW	43.7	50	Yes	42.5	45	Yes	No
		OPR	43.5	50	Yes	42.4	45	Yes	No
POR 2	Residence	POW	42.4	50	Yes	41.1	45	Yes	No
		OPR	41.6	50	Yes	40.3	45	Yes	No
POR 3	Residence	POW	36.7	45	Yes	35.6	40	Yes	No
		OPR	36.8	45	Yes	35.8	40	Yes	No
POR 4	Residence	POW	38.4	45	Yes	37.3	40	Yes	No
		OPR	38.3	45	Yes	37.2	40	Yes	No
POR 5	Residence	POW	37.7	45	Yes	36.6	40	Yes	No
		OPR	37.9	45	Yes	36.8	40	Yes	No
POR 6	Residence	POW	36.4	45	Yes	35.1	40	Yes	No
		OPR	36.6	45	Yes	35.3	40	Yes	No
POR 7	Residence	POW	34.4	45	Yes	33.1	40	Yes	No
		OPR	34.5	45	Yes	33.2	40	Yes	No
POR 8	Residence	POW	45.8	50	Yes	44.7	45	Yes	No
		OPR	44.7	50	Yes	43.0	45	Yes	No

Notes:

1. Performance limits are based on 1-hour equivalent sound levels, Leq.
2. The highest predicted sound level at plane of window or outdoor point of reception are provided above as these are the most critical at each point of reception. Refer to Tables A2.8.1 to A2.8.9 in Appendix 2 for more detailed sound level estimates by source.
3. Outdoor Points of Reception (OPR) are not considered noise sensitive during the nighttime period (23:00 to 07:00) as per MECP criteria.

Table 6.4: Acoustic Assessment Summary Table, Scenario 4: Worst Case, Daytime, (07:00 - 19:00), Evening, (19:00 – 23:00) and Nighttime, (23:00 – 07:00) Period of Operation

Point of Reception ID	POR Description	Location	Daytime (07:00 - 19:00)			Evening and Nighttime (19:00 – 07:00)			Verified by an acoustic Audit (Yes / No)
			Estimated Sound Level at POR Daytime Period (Worst Case) (dBA)	Performance Limit* Daytime Period (dBA)	Compliance with Performance Limit (Yes/No)	Estimated Sound Level at POR Evening and Nighttime Period (Worst Case) (dBA)	Performance Limit* Evening and Nighttime Period (dBA)	Compliance with Performance Limit (Yes/No)	
POR 1	Residence	POW	44.9	50	Yes	42.4	45	Yes	No
		OPR	44.4	50	Yes	42.4	45	Yes	No
POR 2	Residence	POW	43.4	50	Yes	41.4	45	Yes	No
		OPR	42.7	50	Yes	40.3	45	Yes	No
POR 3	Residence	POW	36.8	45	Yes	34.8	40	Yes	No
		OPR	36.9	45	Yes	35.0	40	Yes	No
POR 4	Residence	POW	37.3	45	Yes	35.9	40	Yes	No
		OPR	37.2	45	Yes	35.6	40	Yes	No
POR 5	Residence	POW	37.9	45	Yes	35.4	40	Yes	No
		OPR	36.9	45	Yes	35.5	40	Yes	No
POR 6	Residence	POW	36.6	45	Yes	35.3	40	Yes	No
		OPR	36.8	45	Yes	35.5	40	Yes	No
POR 7	Residence	POW	34.7	45	Yes	33.3	40	Yes	No
		OPR	34.8	45	Yes	33.5	40	Yes	No
POR 8	Residence	POW	46.4	50	Yes	43.4	45	Yes	No
		OPR	46.1	50	Yes	41.7	45	Yes	No

Notes:

1. Performance limits are based on 1-hour equivalent sound levels, Leq.
2. The highest predicted sound level at plane of window or outdoor point of reception are provided above as these are the most critical at each point of reception. Refer to Tables A2.8.1 to A2.8.9 in Appendix 2 for more detailed sound level estimates by source.
3. Outdoor Points of Reception (OPR) are not considered noise sensitive during the nighttime period (23:00 to 07:00) as per MECP criteria.

Table 6.5: Acoustic Assessment Summary Table, Scenario 5: Worst Case, Daytime, (07:00 - 19:00) Period of Operation

Point of Reception ID	POR Description	Location	Daytime (07:00 - 19:00)			Verified by an acoustic Audit (Yes / No)
			Estimated Sound Level at POR Daytime Period (Worst Case) (dBA)	Performance Limit* Daytime Period (dBA)	Compliance with Performance Limit (Yes/No)	
POR 1	Residence	POW	11.5	55	Yes	No
		OPR	11.9	55	Yes	No
POR 2	Residence	POW	10.9	55	Yes	No
		OPR	9.9	55	Yes	No
POR 3	Residence	POW	2.5	50	Yes	No
		OPR	2.6	50	Yes	No
POR 4	Residence	POW	4.5	50	Yes	No
		OPR	4.7	50	Yes	No
POR 5	Residence	POW	3.6	50	Yes	No
		OPR	3.8	50	Yes	No
POR 6	Residence	POW	-	50	Yes	No
		OPR	-	50	Yes	No
POR 7	Residence	POW	-	50	Yes	No
		OPR	-	50	Yes	No
POR 8	Residence	POW	17.0	55	Yes	No
		OPR	15.2	55	Yes	No

Notes:

1. Performance limits are based on 1-hour equivalent sound levels, Leq.
2. The highest predicted sound level at plane of window or outdoor point of reception are provided above as these are the most critical at each point of reception. Refer to Tables A2.8.1 to A2.8.9 in Appendix 2 for more detailed sound level estimates by source.

Table 7: Minimum Insertion Loss for Generator Exhaust Silencer

Name	Octave Band Centre Frequency, Hz Minimum Dynamic Insertion Loss (dB)								Rw
	63	125	250	500	1000	2000	4000	8000	
Silencer to be installed at the Baghouse Fan[2] (Source: AP_Baghouse_Exhaust)	5.0	10.0	15.0	19.0	20.0	17.0	18.0	14.0	24.9
Existing silencer installed on stand-by emergency diesel generator exhaust[3] (Source: STBY_Genset_1)	10.0	30.0	38.0	30.0	25.0	20.0	20.0	20.0	33.1

Notes:

1. Octave Band Centre Frequency, Hz, with minimum dynamic insertion loss in dB or dBA units re 10-12 Watts. Alternative levels at each frequency band permissible providing the overall insertion loss meets the overall insertion loss (Rw) as noted above and is not tonal in character.
2. Insertion loss based on Stoddard Silencer Model F64-5. Refer manufacturers data Appendix 3.
3. Insertion loss based on Silex Silencer Model JB-6. Refer manufacturers data Appendix 3.

FIGURES

Figure 1: Scaled Area Location Plan showing Receptor Locations

Figure 2: Site Layout & Surface Elevation Contours (site elevation contours at 0.5-meter intervals)

Figure 3: Scenario 1: Worst Case, Asphalt plant, ready-mix concrete plant, and crushing plant in operation concurrently with extraction occurring at southwest setback limit of Phase 3 closest to POR 5, 6 and 7, Day (07:00 – 19:00) and Evening and Nighttime (19:00 – 07:00) Period

Figure 4.1: Prediction Results, Scenario 1: Worst Case, Daytime, Noise Contours, (Noise levels at 4.5 m)

Figure 4.2: Prediction Results, Scenario 1: Worst Case, Evening and Nighttime, Noise Contours, (Noise levels at 4.5 m)

Figure 5: Scenario 2: Worst Case, Asphalt plant, ready-mix concrete plant, and crushing plant in operation concurrently with extraction occurring at southeast setback limit of Phase 6 closest to POR 3 and 4, Day (07:00 – 19:00) and Evening and Nighttime (19:00 – 07:00) Period

Figure 6.1: Prediction Results, Scenario 2: Worst Case, Daytime, Noise Contours, (Noise levels at 4.5 m)

Figure 6.2: Prediction Results, Scenario 2: Worst Case, Evening and Nighttime, Noise Contours, (Noise levels at 4.5 m)

Figure 7: Scenario 3: Worst Case, Asphalt plant, ready-mix concrete plant, and crushing plant in operation concurrently with extraction occurring at northeast setback limit of Phase 7 closest to POR 1, 2 and 8, Day (07:00 – 19:00) and Evening and Nighttime (19:00 – 07:00) Period - Before relocation of Asphalt plant and ready-mix concrete plant

Figure 8.1: Prediction Results, Scenario 3: Worst Case, Daytime, Noise Contours, (Noise levels at 4.5 m)

Figure 8.2: Prediction Results, Scenario 3: Worst Case, Evening and Nighttime, Noise Contours, (Noise levels at 4.5 m)

Figure 9: Scenario 4: Worst Case, Asphalt plant, ready-mix concrete plant, and crushing plant in operation concurrently with extraction occurring at northeast setback limit of Phase 7 closest to POR 1, 2 and 8, Day (07:00 – 19:00) and Evening and Nighttime (19:00 –

Figure 1: Scaled Area Location Plan showing Receptor Locations

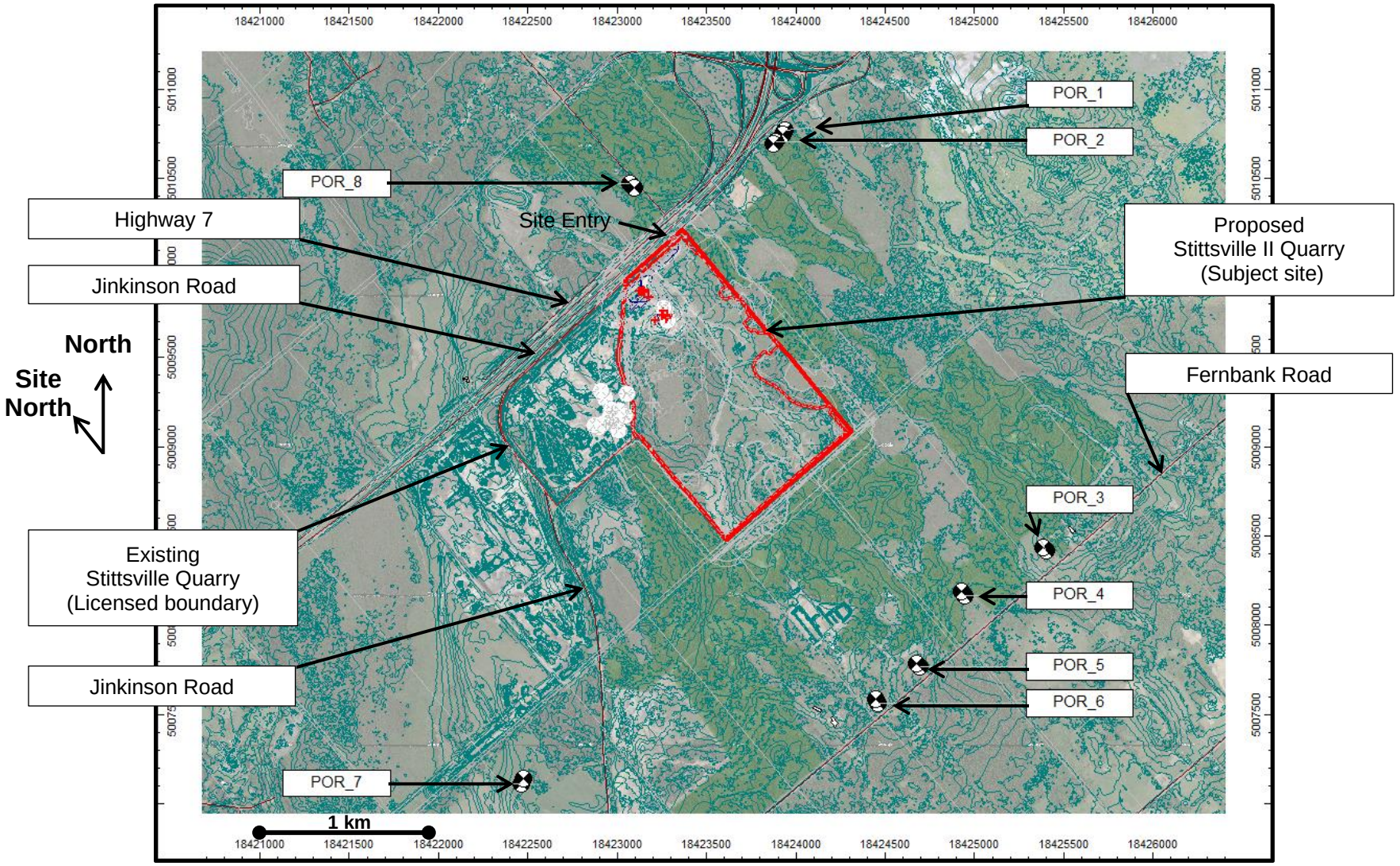


Figure 2: Site Layout & Surface Elevation Contours (elevation contours at 1-meter intervals)

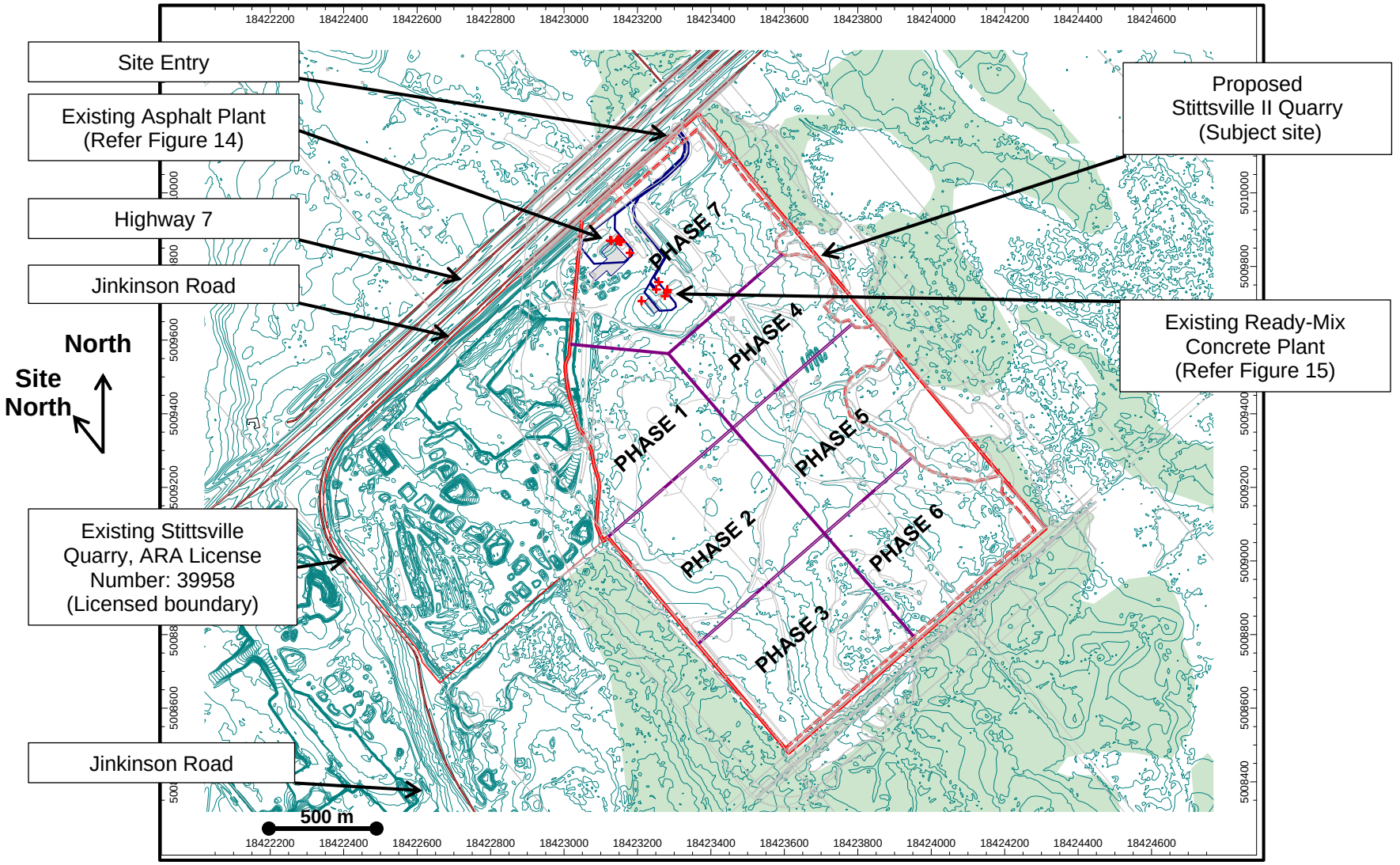


Figure 3: Scenario 1: Worst Case, Asphalt plant, ready-mix concrete plant, and crushing plant in operation concurrently with extraction occurring at southwest setback limit of Phase 3 closest to POR 5, 6 and 7, Day (07:00 – 19:00) and Evening and Nighttime (19:00 – 07:00) Period

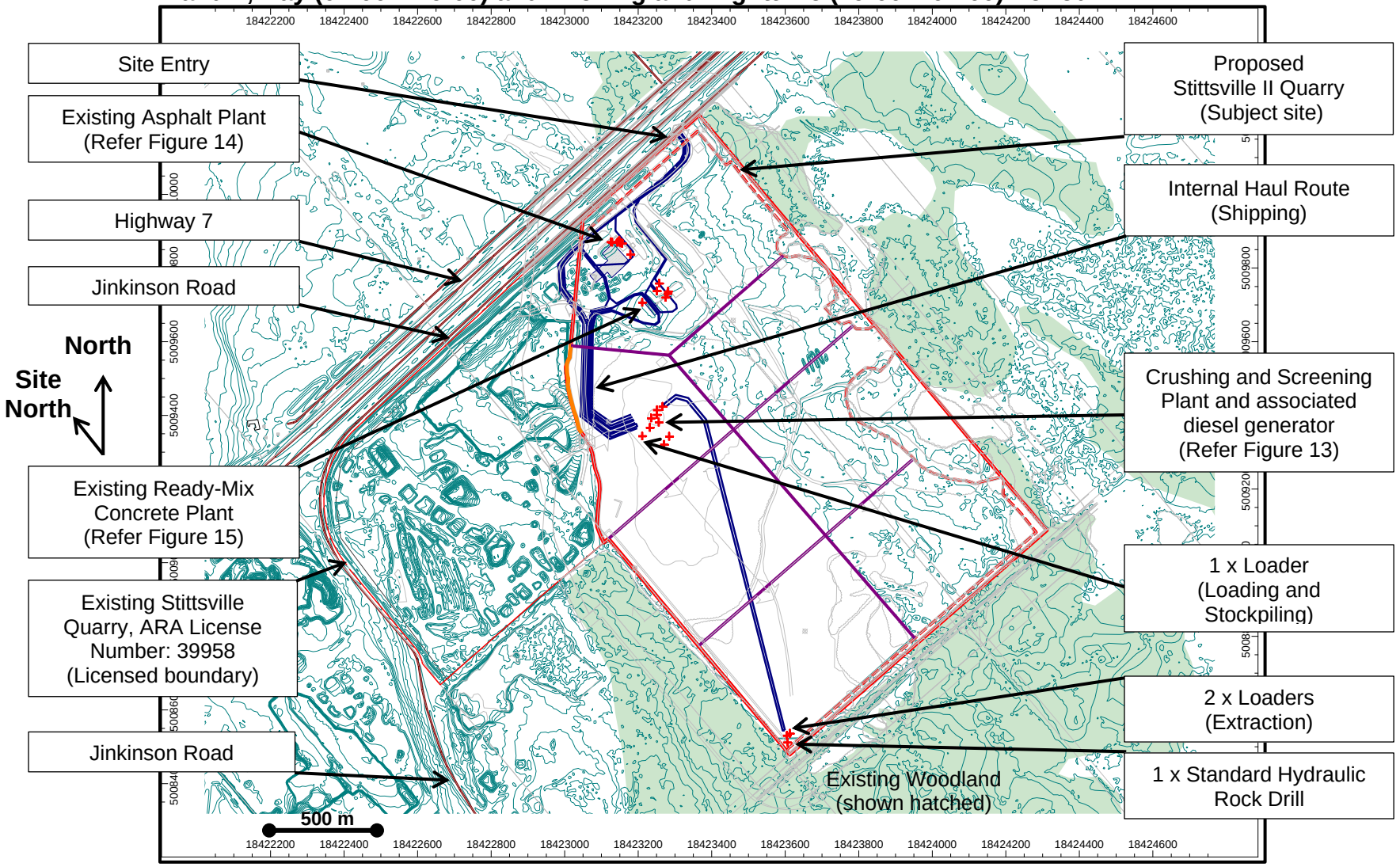


Figure 4.1: Prediction Results, Scenario 1: Worst Case, Daytime, Noise Contours, (Noise levels at 4.5 m)

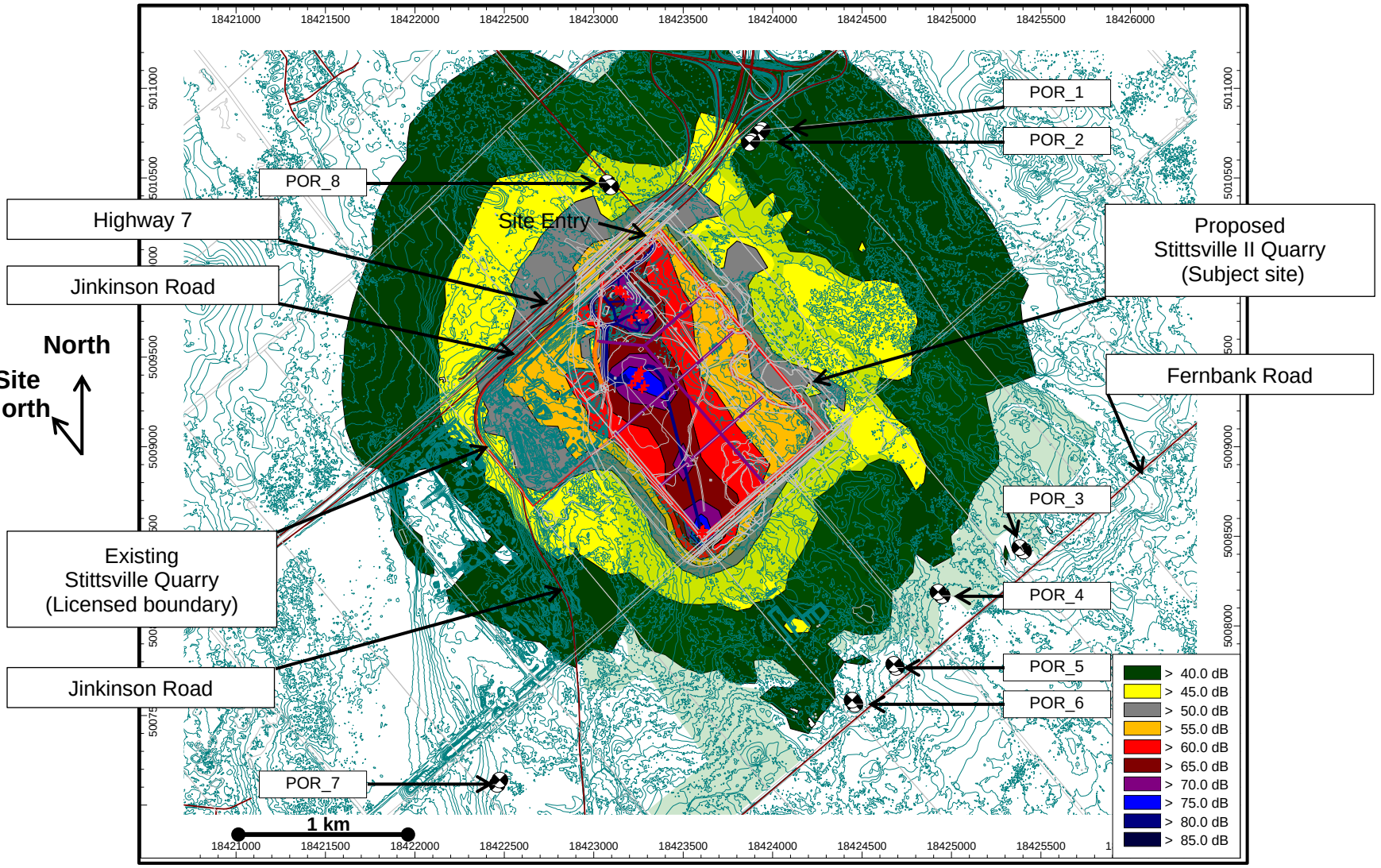


Figure 4.2: Prediction Results, Scenario 1: Worst Case, Evening and Nighttime, Noise Contours, (Noise levels at 4.5 m)

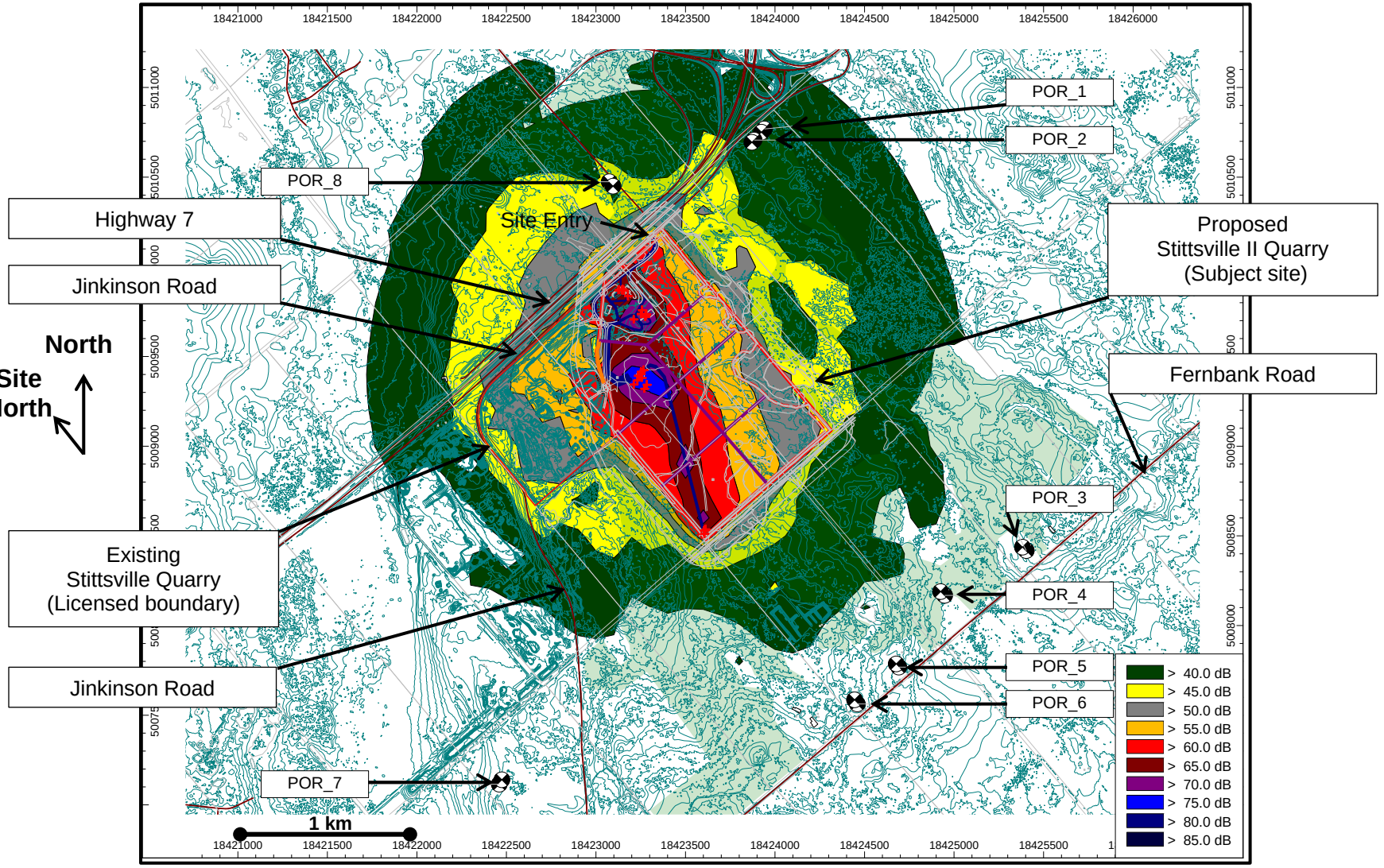


Figure 5: Scenario 2: Worst Case, Asphalt plant, ready-mix concrete plant, and crushing plant in operation concurrently with extraction occurring at southeast setback limit of Phase 6 closest to POR 3 and 4, Day (07:00 – 19:00) and Evening and Nighttime (19:00 – 07:00) Period

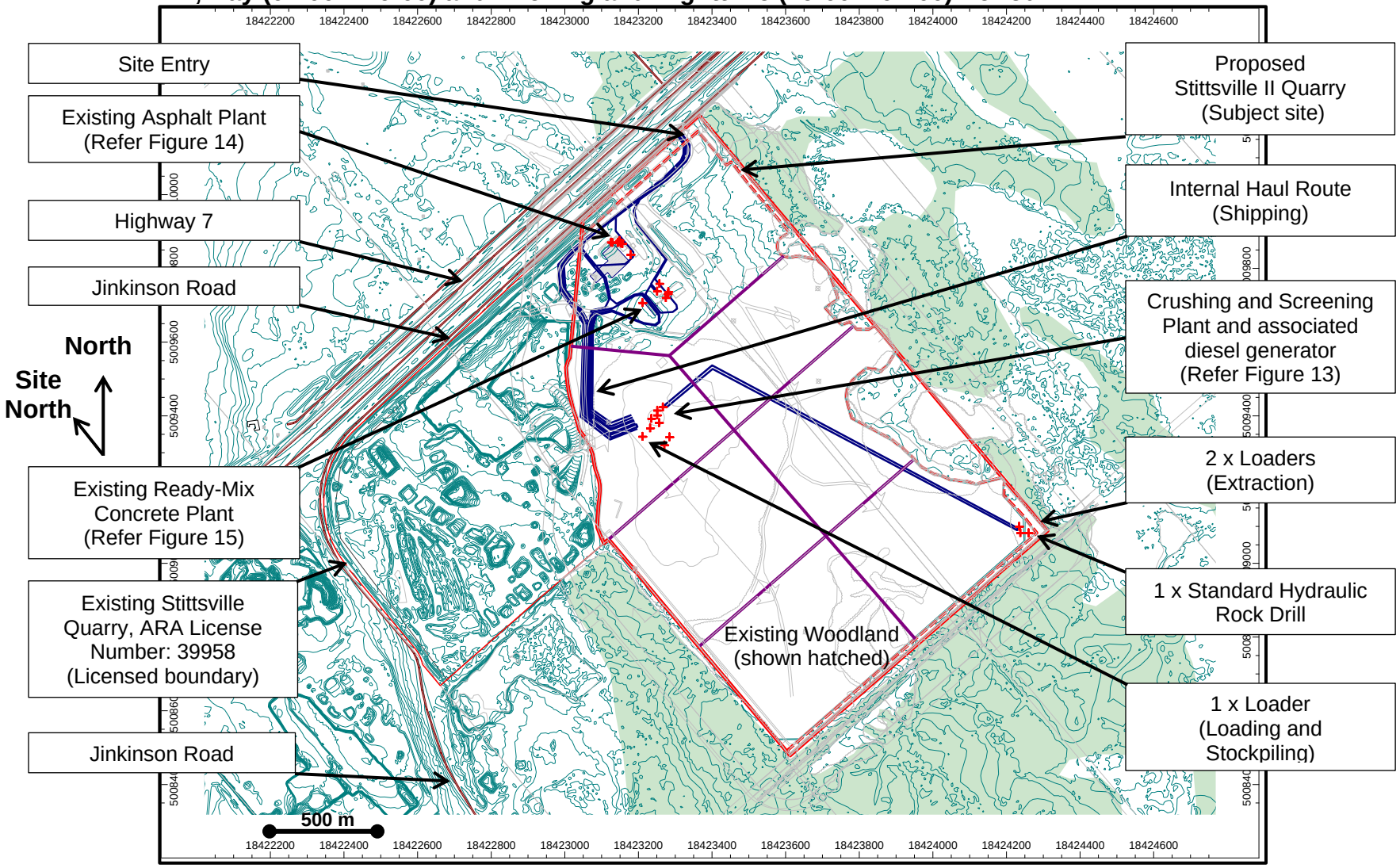


Figure 6.1: Prediction Results, Scenario 2: Worst Case, Daytime, Noise Contours, (Noise levels at 4.5 m)

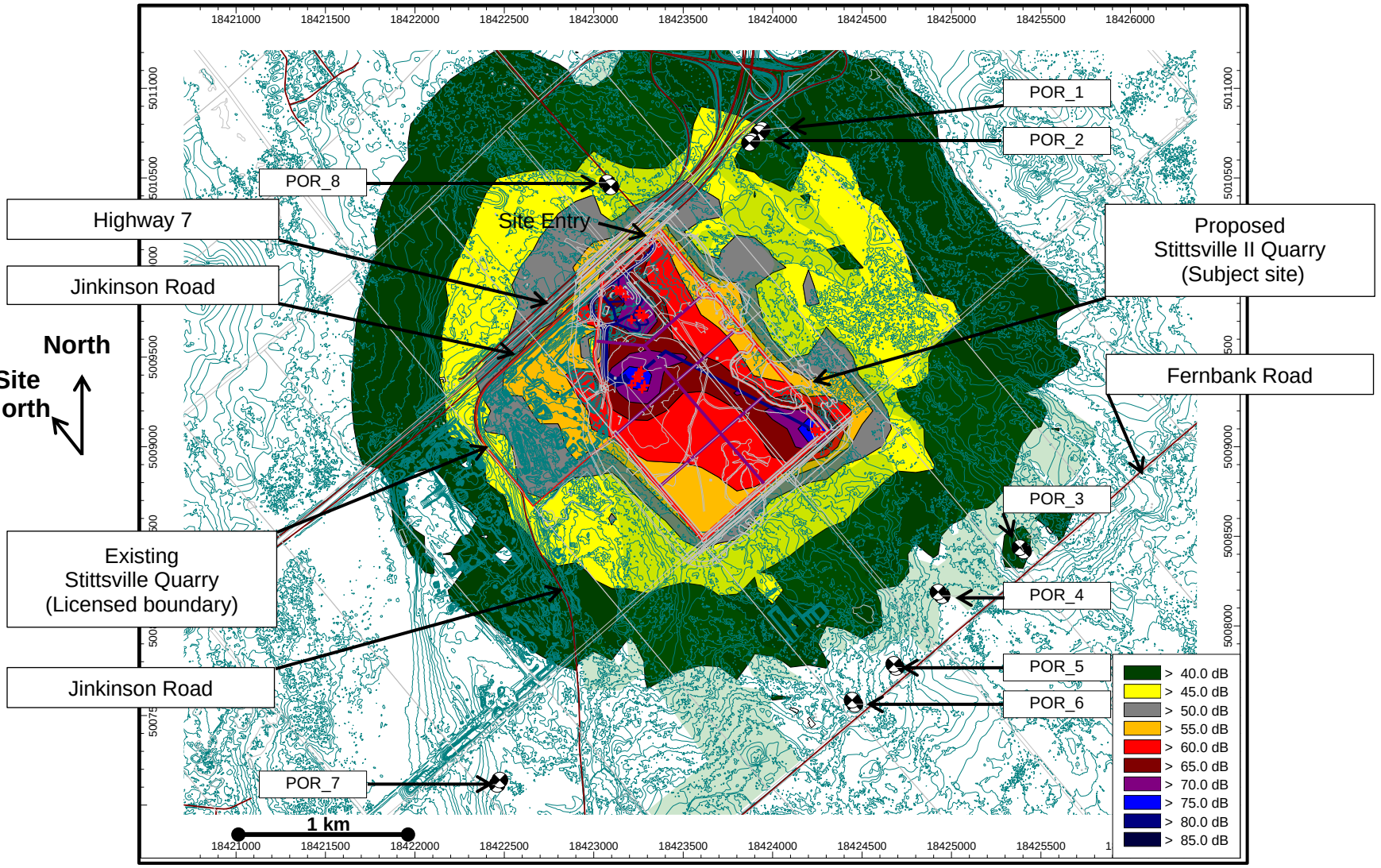


Figure 6.2: Prediction Results, Scenario 2: Worst Case, Evening and Nighttime, Noise Contours, (Noise levels at 4.5 m)

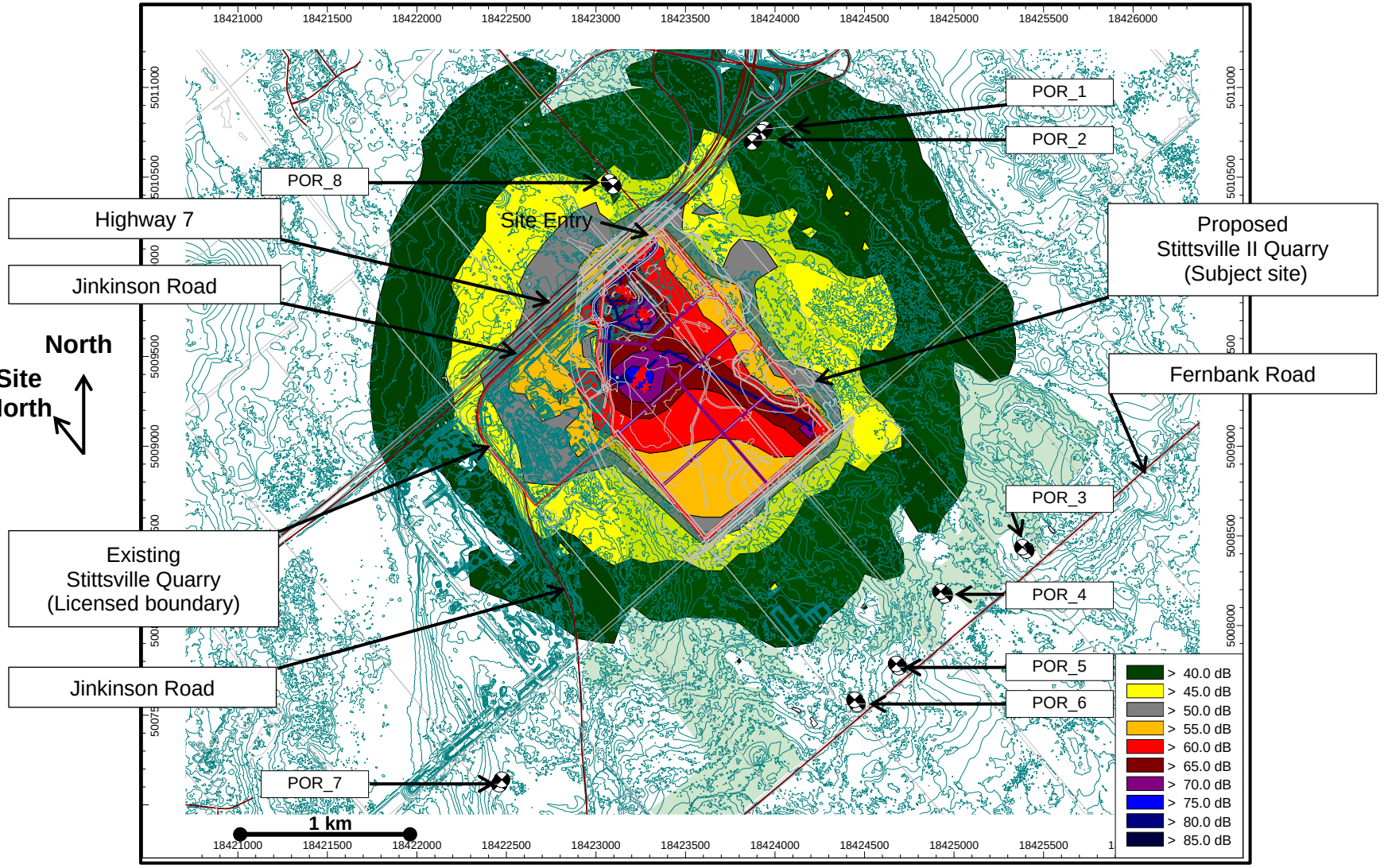


Figure 7: Scenario 3: Worst Case, Asphalt plant, ready-mix concrete plant, and crushing plant in operation concurrently with extraction occurring at northeast setback limit of Phase 7 closest to POR 1, 2 and 8, Day (07:00 – 19:00) and Evening and Nighttime (19:00 – 07:00) Period - Before relocation of plants

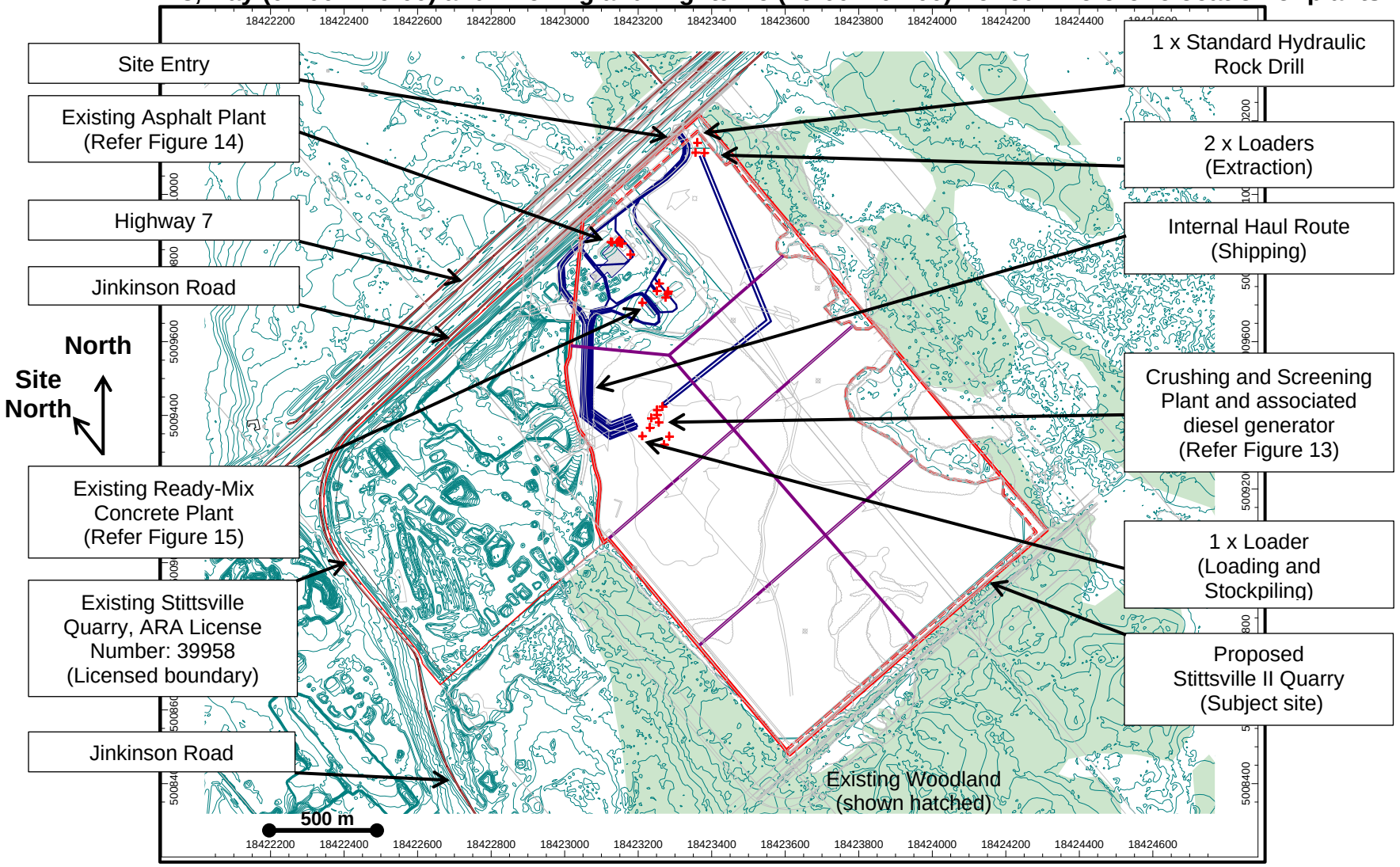


Figure 8.1: Prediction Results, Scenario 3: Worst Case, Daytime, Noise Contours, (Noise levels at 4.5 m)

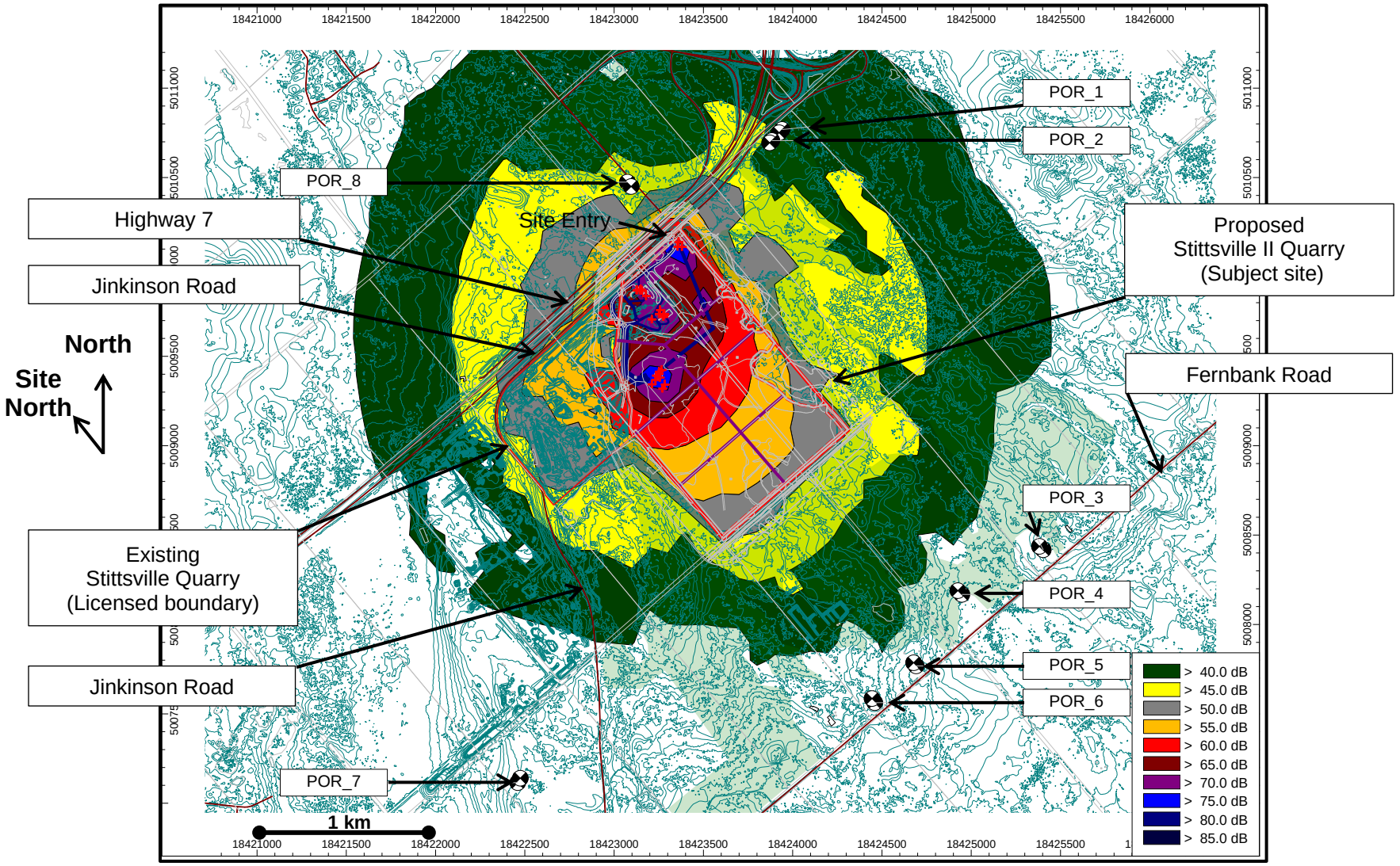


Figure 8.2: Prediction Results, Scenario 3: Worst Case, Evening and Nighttime, Noise Contours, (Noise levels at 4.5 m)

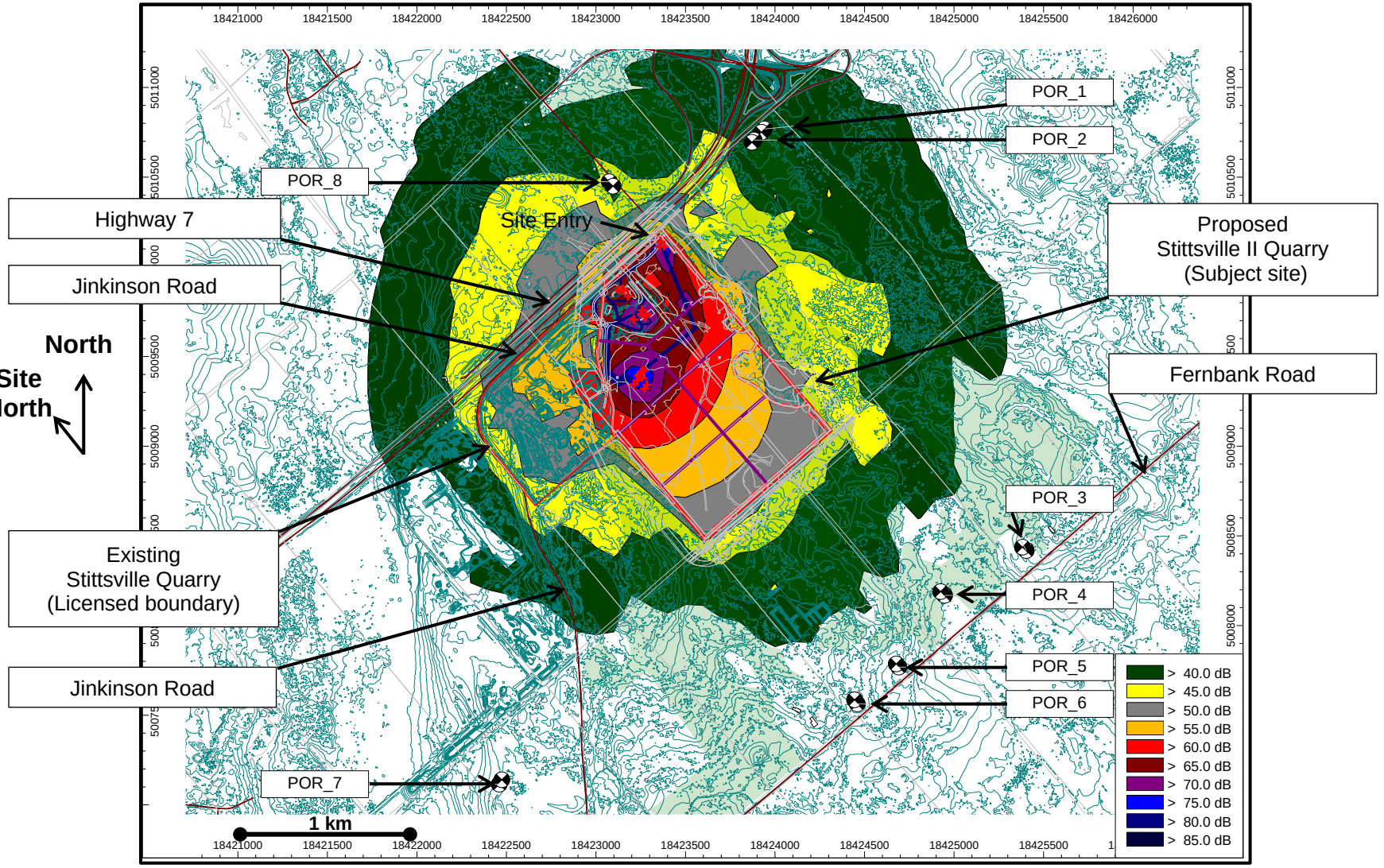


Figure 9: Scenario 4: Worst Case, Asphalt plant, ready-mix concrete plant, and crushing plant in operation concurrently with extraction occurring at northeast setback limit of Phase 7 closest to POR 1, 2 and 8, Day (07:00 – 19:00) and Evening and Nighttime (19:00 – 07:00) Period - After relocation of plants

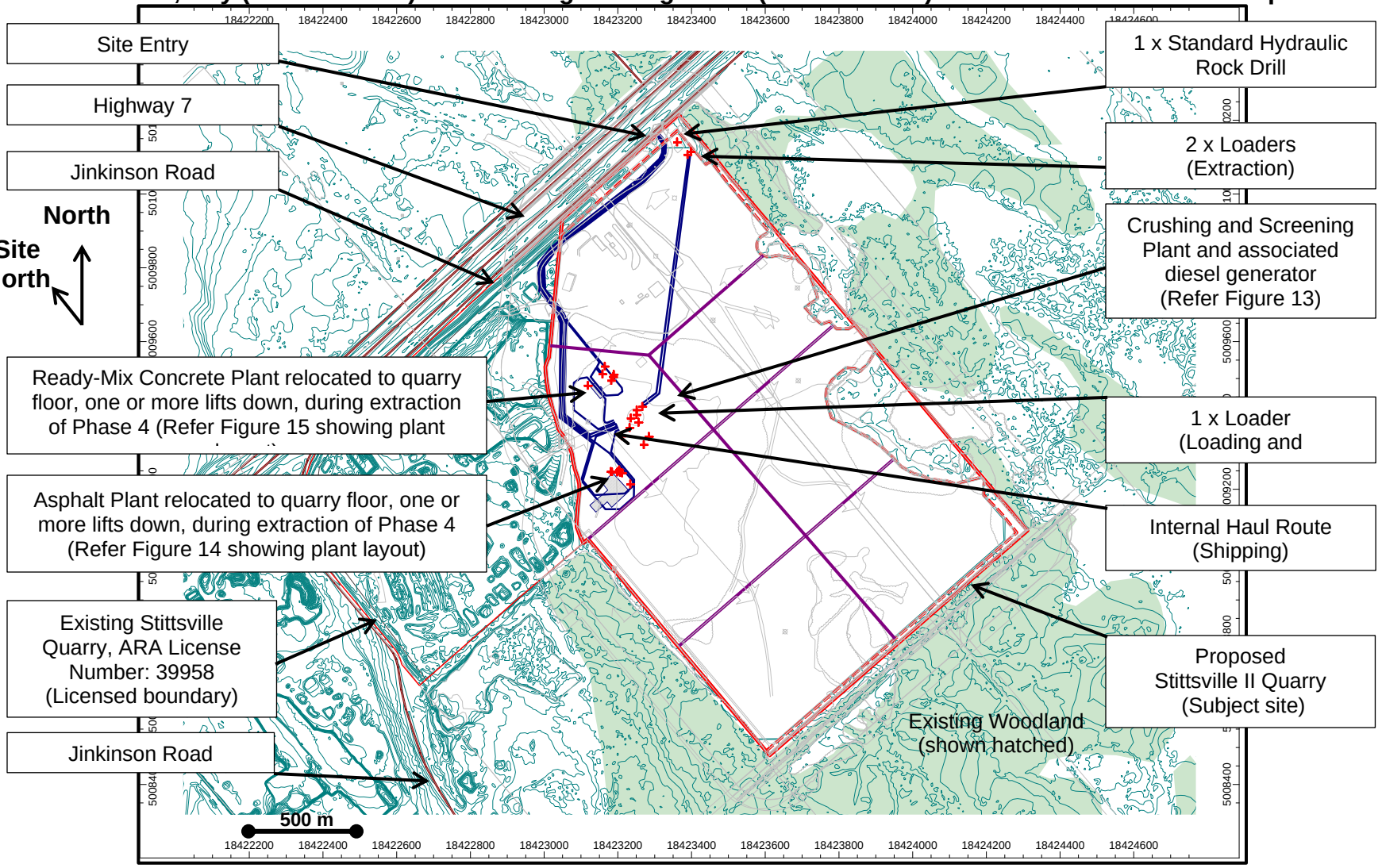


Figure 10.1: Prediction Results, Scenario 4: Worst Case, Daytime, Noise Contours, (Noise levels at 4.5 m)

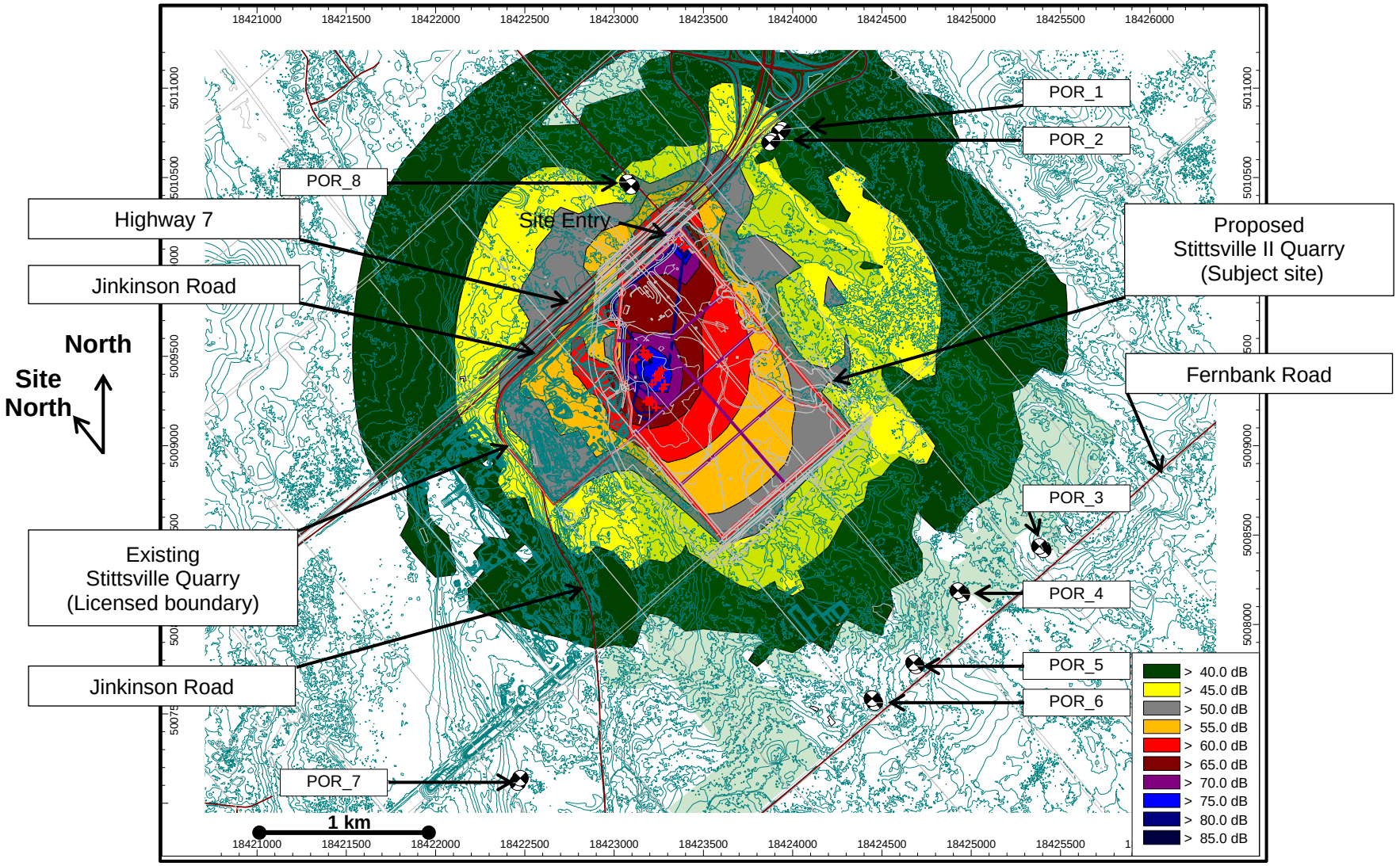


Figure 10.2: Prediction Results, Scenario 4: Worst Case, Evening and Nighttime, Noise Contours, (Noise levels at 4.5 m)

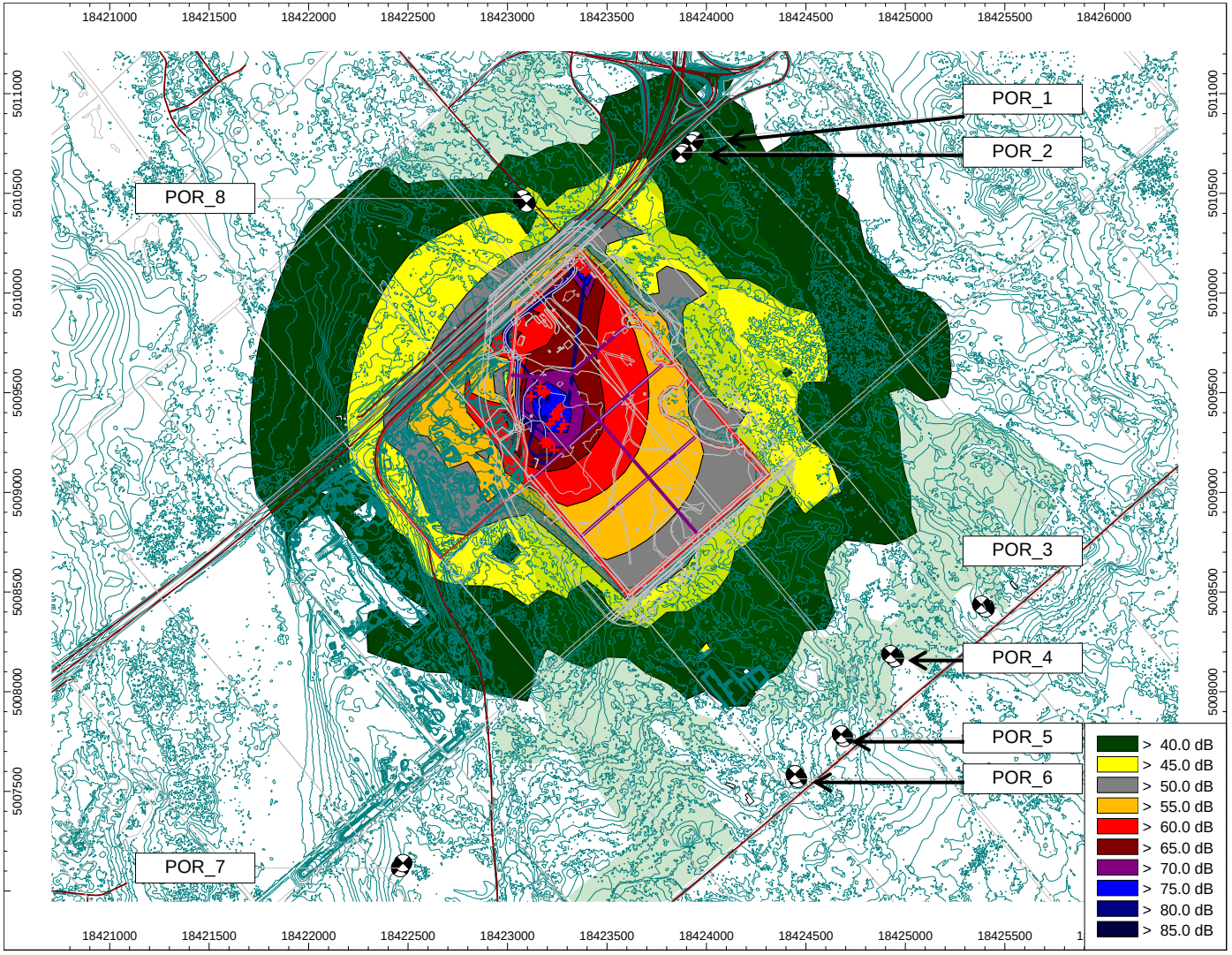


Figure 11: Scenario 5: Worst Case, Emergency power generator in operation for testing and routine maintenance (Daytime Period, 7 am to 7 pm)

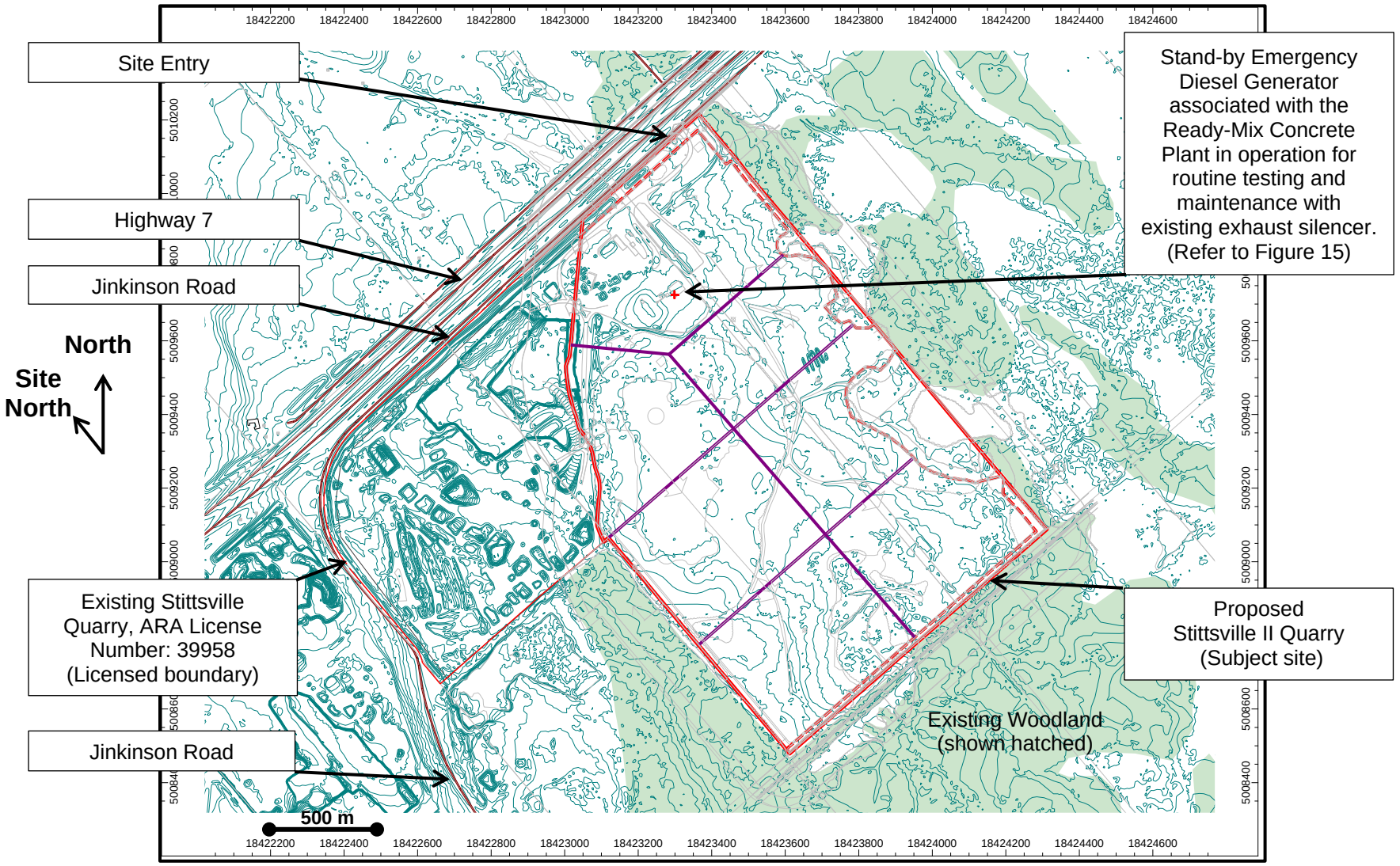


Figure 12: Prediction Results, Scenario 5: Worst Case, Daytime, Noise Contours, (Noise levels at 4.5 m)

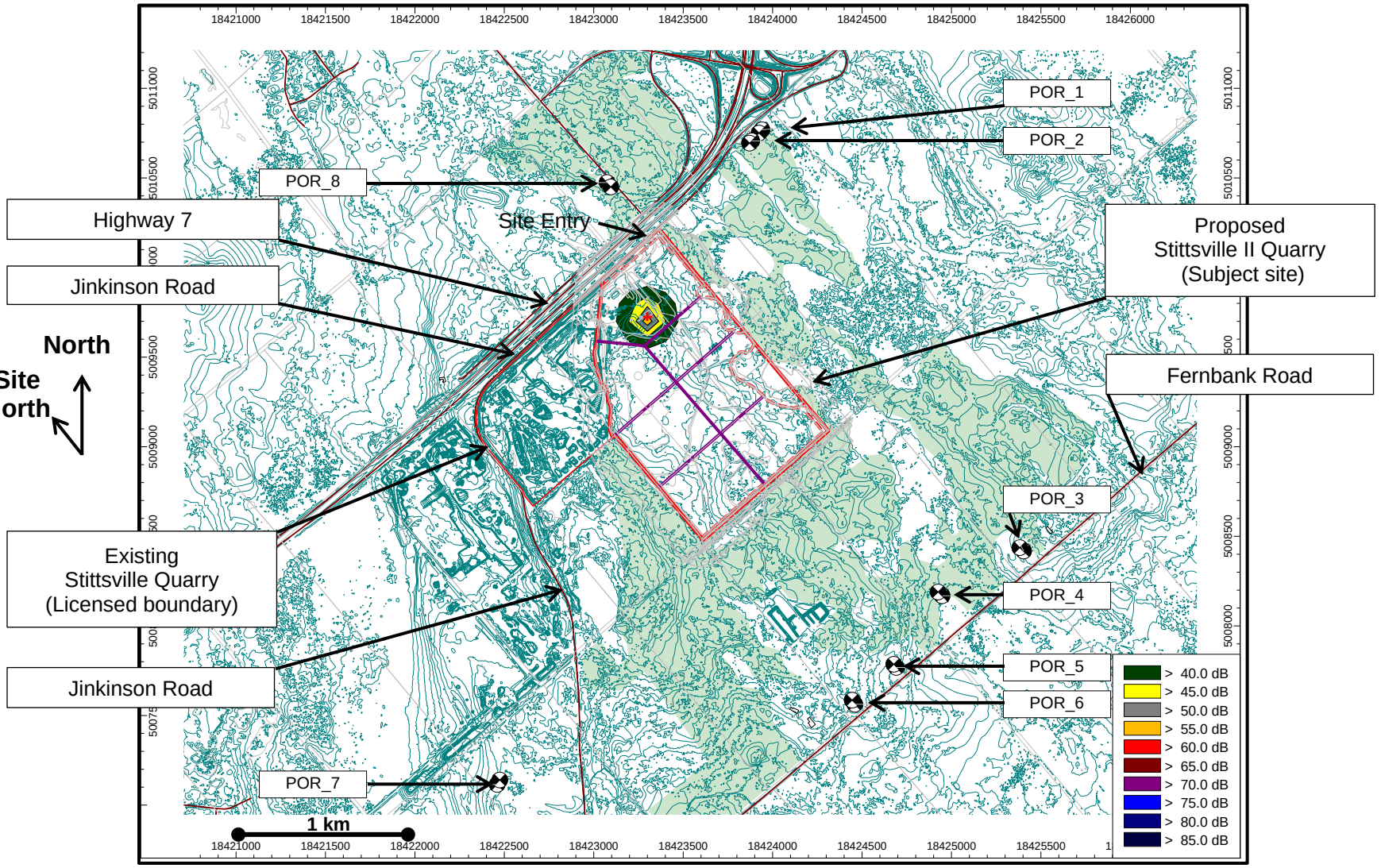


Figure 13: Detailed Plan at Portable Crushing and Screening Plant showing typical equipment layout

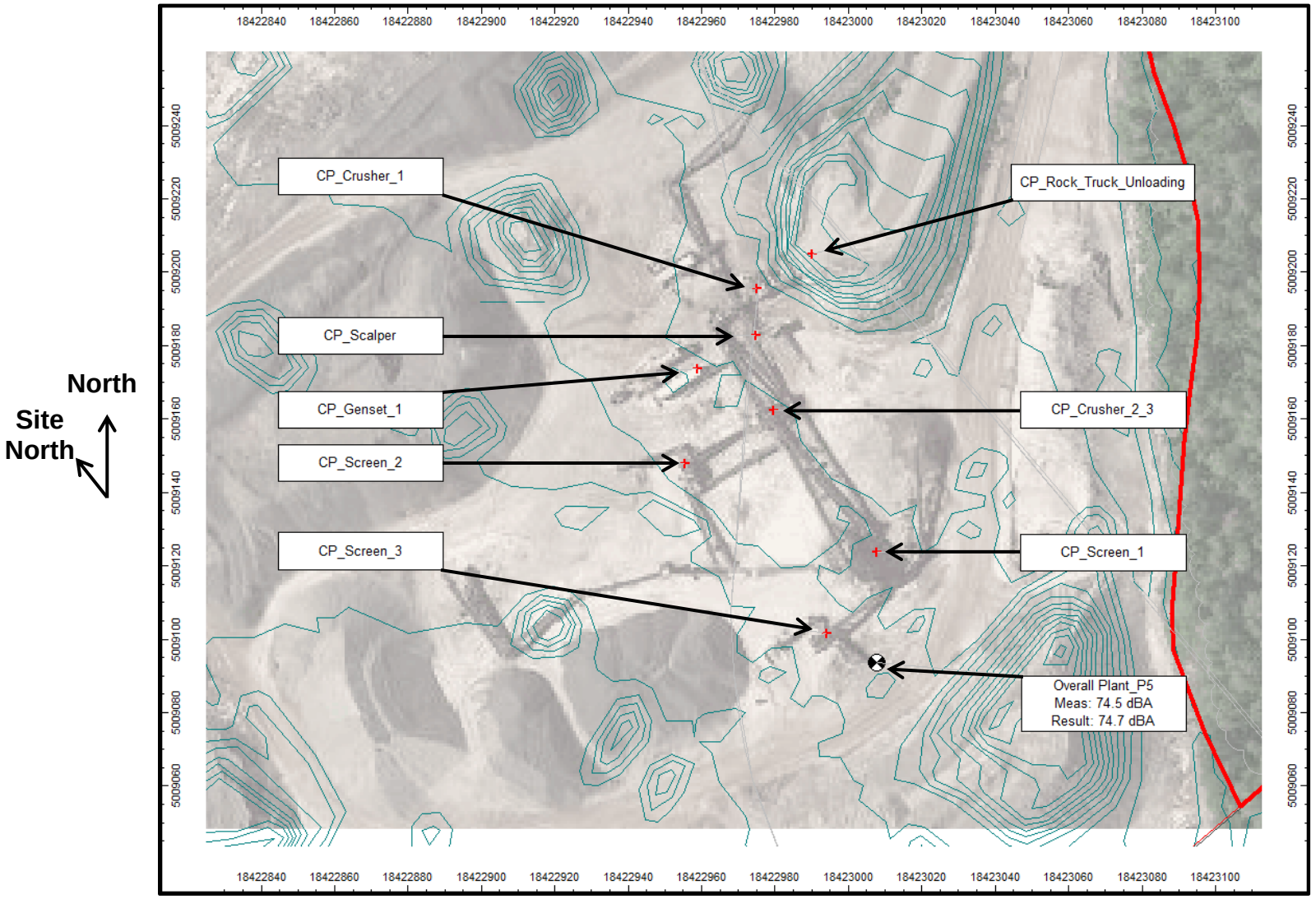


Figure 14: Detailed Plan at Asphalt Plant showing Source Locations

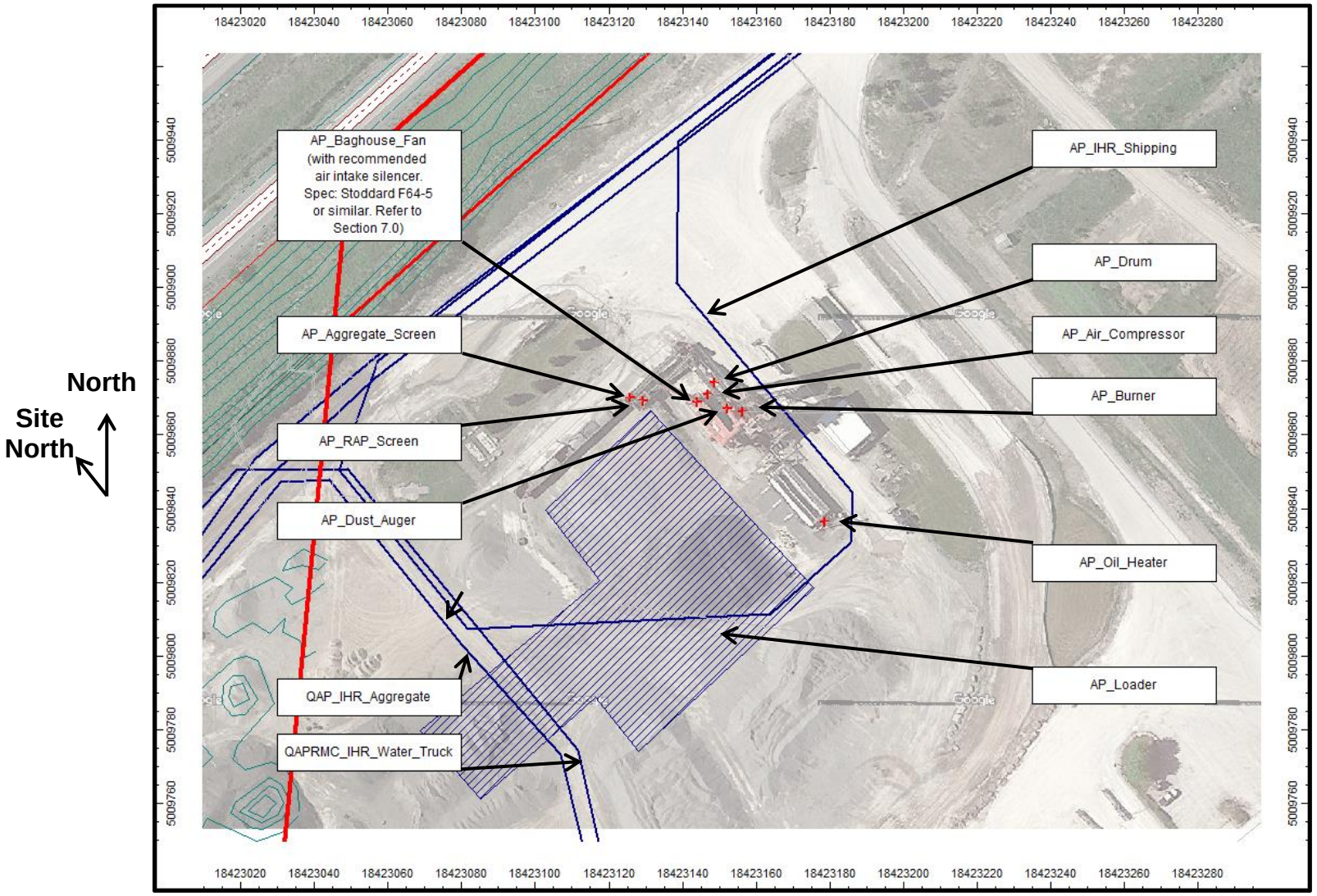
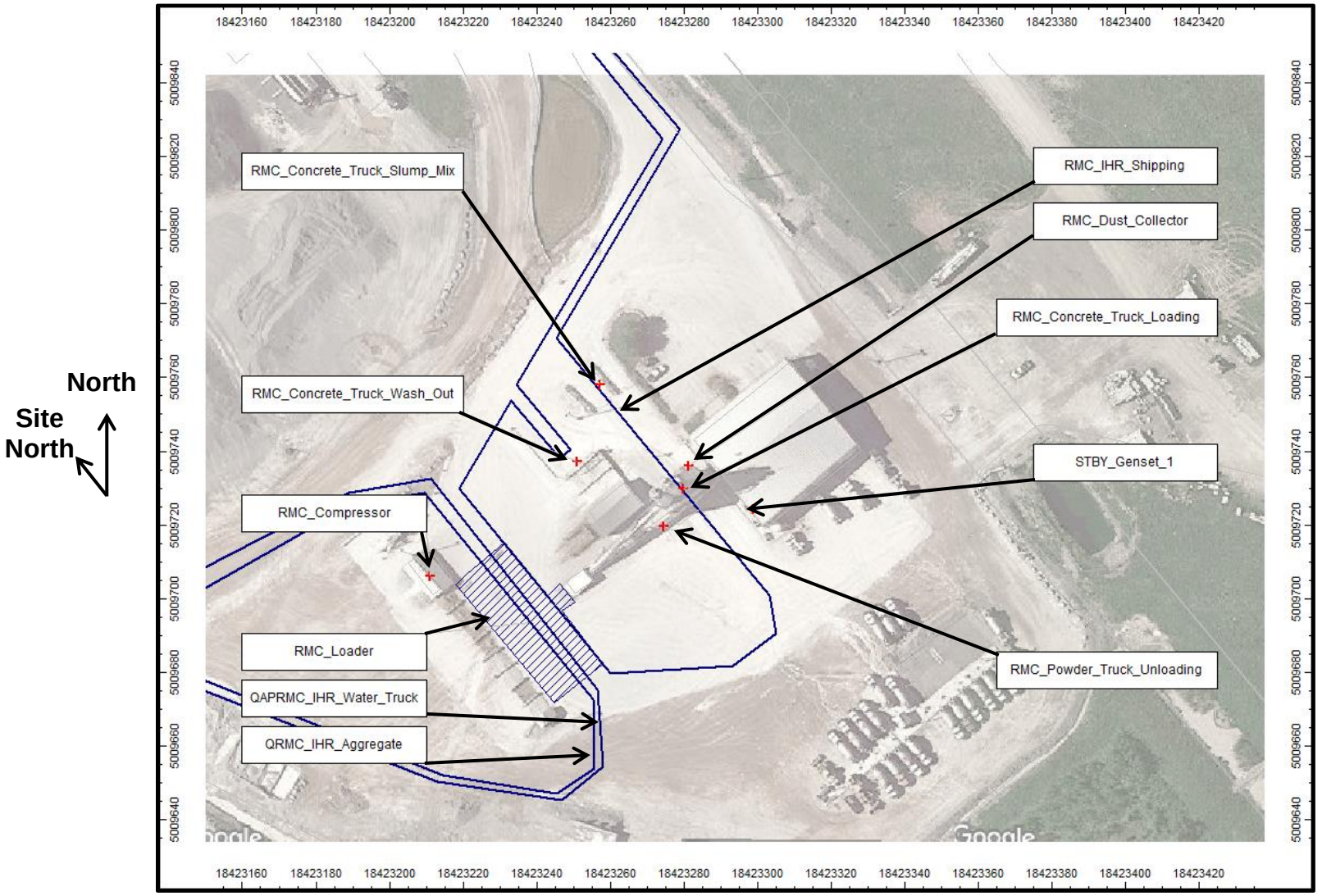


Figure 15: Detailed Plan at Ready-Mix Concrete Plant showing Source Locations



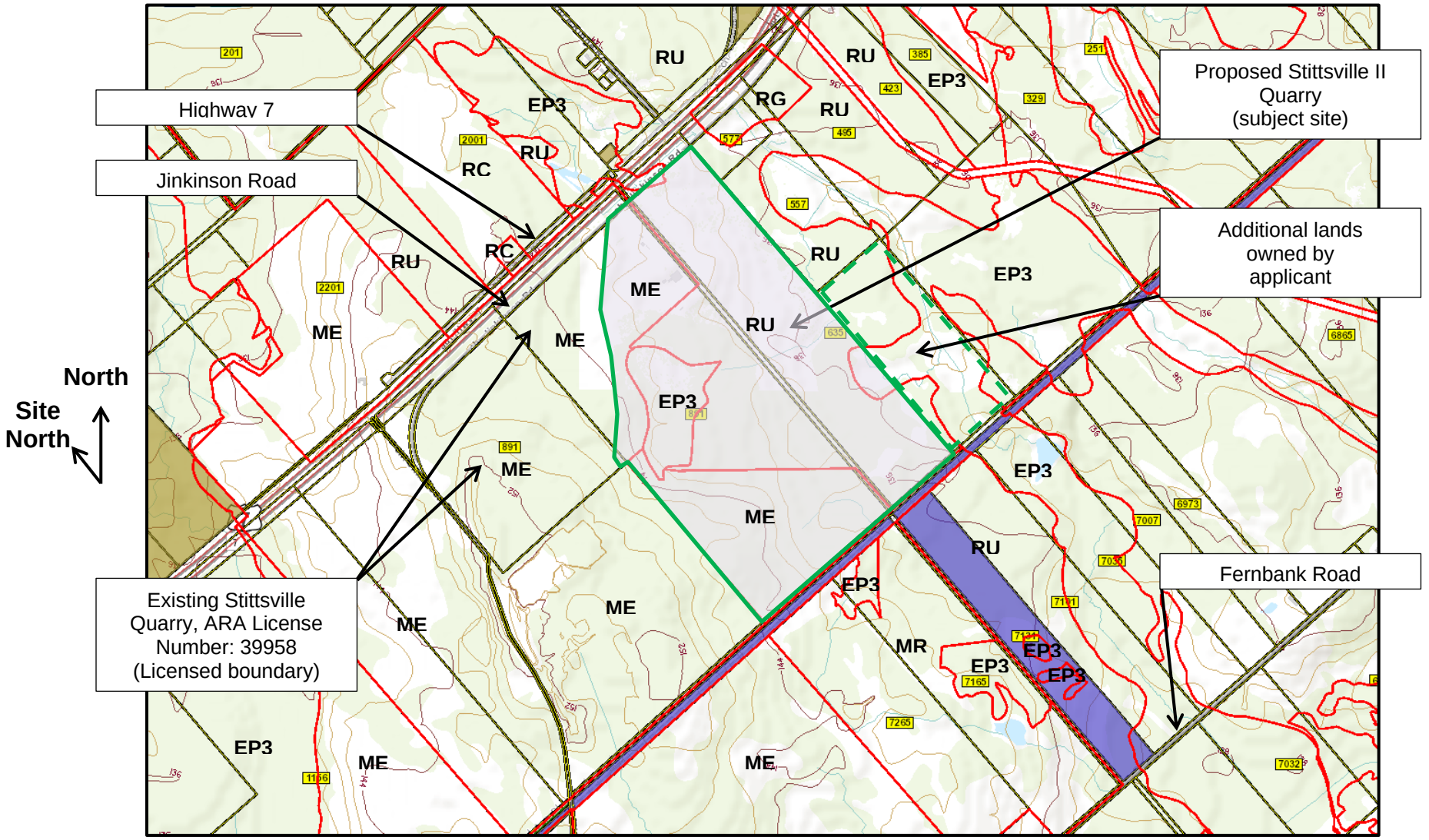
Appendix 1

Zoning Plan and Land Use Designations

Contents:

- **Zoning Plan, source: City of Ottawa Zoning By-law No. 2008-250 (Source: GeoOttawa)**

Zoning Plan, source: City of Ottawa Zoning By-law No. 2008-250 (Source: GeoOttawa)



Appendix 2

Acoustic Modelling Details

Modeling Notes:

1. Acoustic model developed uses Cadna-A software, Version 2023.
2. Sound propagation is modeled according to ISO 9613-2: 1996(E).
3. The whole of the extraction area is modeled as reflective with an absorption coefficient of 0, a conservative assumption. The surrounding area is modelled with an absorption coefficient of 1.0, indicative of a rural area.
4. MECP favoured conservative modelling assumptions are used, that is, 'no subtraction of negative ground attenuation' and 'no negative path differences'.

Contents:

Table A2.1 Point of Reception Location Table

Name	ID	Height	Coordinates, ground		
		Above Ground	X	Y	Z
		(m)	(m)	(m)	(m)
POR_1	POR_1_POW	4.5	18423940.9	5010768.7	140.5
POR_1	POR_1_OPR	4.5	18423924.7	5010750.5	140.5
POR_2	POR_2_POW	3.0	18423883.4	5010706.6	139.5
POR_2	POR_2_OPR	3.0	18423871.6	5010694.1	139.0
POR_3	POR_3_POW	2.0	18425403.5	5008417.8	136.8
POR_3	POR_3_OPR	2.0	18425382.1	5008436.7	136.6
POR_4	POR_4_POW	4.5	18424947.5	5008168.0	133.5
POR_4	POR_4_OPR	4.5	18424925.2	5008188.9	133.5
POR_5	POR_5_POW	4.5	18424691.4	5007768.0	138.5
POR_5	POR_5_OPR	4.5	18424677.4	5007785.6	138.5
POR_6	POR_6_POW	4.5	18424459.4	5007562.8	143.2
POR_6	POR_6_OPR	4.5	18424444.5	5007585.5	143.3
POR_7	POR_7_POW	4.5	18422460.1	5007115.0	150.3
POR_7	POR_7_OPR	4.5	18422474.6	5007139.8	149.5
POR_8	POR_8_POW	2.0	18423074.6	5010474.6	146.0
POR_8	POR_8_OPR	2.0	18423095.4	5010449.7	145.0

Table A2.2 Point Sources

ID	Result. PWL			Lw / Li		Attenuation	Operating Time			Direct.	Height	Coordinates		
	Day	Evening	Night	Type	Value		Day	Evening	Night			X	Y	Z
	(dBA)	(dBA)	(dBA)				(min)	(min)	(min)		(m)	(m)	(m)	(m)
AP_Drum_S1_3	105.7	105.7	105.7	Lw	AP_Burner		60	60	60	(none)	4.2	18423148.7	5009874.4	146.2
AP_Burner_S1_3	105.7	105.7	105.7	Lw	AP_Burner		60	60	60	(none)	4.2	18423156.4	5009866.5	146.2
AP_Baghouse_Fan_S1_3	99.1	99.1	99.1	Lw	AP_Baghouse_Fan	Stoddard_Silencer_F64_5	60	60	60	(none)	1.5	18423143.8	5009868.9	143.5
AP_Dust_Auger_S1_3	79.1	79.1	79.1	Lw	AP_Dust_Auger		60	60	60	(none)	1.9	18423152.3	5009867.2	143.9
AP_Oil_Heater_S1_3	89.1	89.1	89.1	Lw	AP_Oil_Heater		60	60	60	(none)	1.0	18423178.7	5009836.4	143.0
AP_Air_Compressor_S1_3	96.3	96.3	96.3	Lw	AP_Air_Compressor		60	60	60	(none)	1.5	18423146.8	5009871.0	143.5
AP_Aggregate_Screen_S1_3	102.9	102.9	102.9	Lw	AP_Aggregate_Screen		60	60	60	(none)	5.2	18423125.6	5009870.0	147.2
AP_RAP_Screen_S1_3	97.7	97.7	97.7	Lw	AP_RAP_Screen		60	60	60	(none)	5.2	18423129.2	5009869.3	147.5
AP_Drum_S4	105.7	105.7	105.7	Lw	AP_Burner		60	60	60	(none)	4.2	18423203.8	5009251.3	135.9
AP_Burner_S4	105.7	105.7	105.7	Lw	AP_Burner		60	60	60	(none)	4.2	18423211.5	5009243.4	136.0
AP_Baghouse_Fan_S4	99.1	99.1	99.1	Lw	AP_Baghouse_Fan	Stoddard_Silencer_F64_5	60	60	60	(none)	1.5	18423198.9	5009245.9	133.3
AP_Dust_Auger_S4	79.1	79.1	79.1	Lw	AP_Dust_Auger		60	60	60	(none)	1.9	18423207.3	5009244.2	133.6
AP_Oil_Heater_S4	89.1	89.1	89.1	Lw	AP_Oil_Heater		60	60	60	(none)	1.0	18423233.8	5009213.3	133.4
AP_Air_Compressor_S4	96.3	96.3	96.3	Lw	AP_Air_Compressor		60	60	60	(none)	1.5	18423201.9	5009247.9	133.3
AP_Aggregate_Screen_S4	102.9	102.9	102.9	Lw	AP_Aggregate_Screen		60	60	60	(none)	5.2	18423180.7	5009247.0	137.2
AP_RAP_Screen_S4	97.7	97.7	97.7	Lw	AP_RAP_Screen		60	60	60	(none)	5.2	18423184.3	5009246.2	137.2
RMC_Concrete_Truck_Wash_Out_S1_3	100.9	100.9	100.9	Lw	RMC_Concrete_Truck_Wash_Out		60	60	60	(none)	4.0	18423250.8	5009737.2	146.0
RMC_Concrete_Truck_Loading_S1_3	109.4	109.4	109.4	Lw	RMC_Concrete_Truck_Loading		60	60	60	(none)	4.0	18423279.8	5009729.9	146.0
RMC_Concrete_Truck_Slump_Mix_S1_3	112.9	112.9	112.9	Lw	RMC_Concrete_Truck_Slump_Mix		60	60	60	(none)	4.0	18423257.1	5009758.1	145.6
RMC_Powder_Truck_Unloading_S1_3	99.4	99.4	99.4	Lw	RMC_Powder_Truck_Unloading		60	60	60	(none)	1.5	18423274.6	5009719.7	143.5
RMC_Dust_Collector_S1_3	112.0	112.0	112.0	Lw	RMC_Dust_Collector		10.0	10.0	10.0	(none)	13.0	18423281.3	5009736.1	155.0
RMC_Compressor_S1_3	100.8	100.8	100.8	Lw	RMC_Compressor		60	60	60	(none)	1.5	18423211.1	5009706.2	145.5
RMC_Concrete_Truck_Wash_Out_S4	100.9	100.9	100.9	Lw	RMC_Concrete_Truck_Wash_Out		60	60	60	(none)	4.0	18423158.4	5009511.5	134.2
RMC_Concrete_Truck_Loading_S4	109.4	109.4	109.4	Lw	RMC_Concrete_Truck_Loading		60	60	60	(none)	4.0	18423187.3	5009504.2	134.0
RMC_Concrete_Truck_Slump_Mix_S4	112.9	112.9	112.9	Lw	RMC_Concrete_Truck_Slump_Mix		60	60	60	(none)	4.0	18423164.7	5009532.4	134.0

ID	Result. PWL			Lw / Li		Attenuation	Operating Time			Direct.	Height	Coordinates		
	Day	Evening	Night	Type	Value		Day	Evening	Night			X	Y	Z
	(dBA)	(dBA)	(dBA)				(min)	(min)	(min)		(m)	(m)	(m)	(m)
RMC_Powder_Truck_Unloading_S4	99.4	99.4	99.4	Lw	RMC_Powder_Truck_Unloading		60	60	60	(none)	1.5	18423182.1	5009494.0	131.6
RMC_Dust_Collector_S4	112.0	112.0	112.0	Lw	RMC_Dust_Collector		10.0	10.0	10.0	(none)	13.0	18423188.9	5009510.4	143.0
RMC_Compressor_S4	100.8	100.8	100.8	Lw	RMC_Compressor		60	60	60	(none)	1.5	18423118.6	5009480.4	132.2
STBY_Genset_1_S5	95.1	95.1	95.1	Lw	CP_Genset_1	Silex_Silencer_Model_JB_6	60	60	60	(none)	13.0	18423298.9	5009724.3	154.9
CP_Rock_Drill_S1	121.6	121.6	121.6	Lw	CP_Rock_Drill		60.0	0.0	0.0	(none)	1.0	18423684.7	5009823.7	136.0
CP_Rock_Drill_S2	121.6	121.6	121.6	Lw	CP_Rock_Drill		60.0	0.0	0.0	(none)	1.0	18424260.1	5009081.8	135.1
CP_Rock_Drill_S3	121.6	121.6	121.6	Lw	CP_Rock_Drill		60.0	0.0	0.0	(none)	1.0	18423606.0	5008511.3	144.6
CP_Rock_Drill_S4	121.6	121.6	121.6	Lw	CP_Rock_Drill		60.0	0.0	0.0	(none)	1.0	18423360.8	5010140.1	139.2
CP_Crusher_1	113.1	113.1	113.1	Lw	CP_Crusher_1		60	60	60	(none)	6.0	18423344.5	5009491.9	134.9
CP_Crusher_2_3	110.3	110.3	110.3	Lw	CP_Crusher_2_3		60	60	60	(none)	4.0	18423349.2	5009458.6	133.0
CP_Scalper	108.5	108.5	108.5	Lw	CP_Scalper		60	60	60	(none)	4.0	18423344.3	5009478.8	133.0
CP_Genset_1	116.4	116.4	116.4	Lw	CP_Genset_1		60	60	60	(none)	4.2	18423328.5	5009469.8	133.3
CP_Screen_1	110.0	110.0	110.0	Lw	CP_Screen_1		60	60	60	(none)	8.0	18423377.4	5009419.8	136.8
CP_Screen_2	110.0	110.0	110.0	Lw	CP_Screen_1		60	60	60	(none)	6.0	18423325.0	5009444.1	135.2
CP_Screen_3	110.0	110.0	110.0	Lw	CP_Screen_1		60	60	60	(none)	6.0	18423363.7	5009397.7	135.0
CP_Rock_Truck_Unloading	111.0	111.0	111.0	Lw	CP_Rock_Truck_Unloading		60	60	60	(none)	2.5	18423359.6	5009501.1	131.2
CP_Loader_1	107.7	107.7	107.7	Lw	CP_Loader_982M		60	60	60	(none)	2.5	18423304.2	5009420.9	132.0
CP_Loader_2_S1	113.4	113.4	113.4	Lw	CP_Loader_988K		60	60	60	(none)	2.5	18423652.72	5009804.23	127.5
CP_Loader_3_S1	113.4	113.4	113.4	Lw	CP_Loader_988K		60	0	0	(none)	2.5	18423662.2	5009793.5	127.5
CP_Loader_2_S2	113.4	113.4	113.4	Lw	CP_Loader_988K		60	60	60	(none)	2.5	18424237.8	5009082.2	127.5
CP_Loader_3_S2	113.4	113.4	113.4	Lw	CP_Loader_988K		60	0	0	(none)	2.5	18424234.4	5009099.4	127.5
CP_Loader_2_S3	113.4	113.4	113.4	Lw	CP_Loader_988K		60	60	60	(none)	2.5	18423604.6	5008530.1	137.4
CP_Loader_3_S3	113.4	113.4	113.4	Lw	CP_Loader_988K		60	0	0	(none)	2.5	18423612.9	5008535.6	137.4
CP_Loader_2_S4	113.4	113.4	113.4	Lw	CP_Loader_988K		60	60	60	(none)	2.5	18423398.2	5010113.6	130.6
CP_Loader_3_S4	113.4	113.4	113.4	Lw	CP_Loader_988K		60	0	0	(none)	2.5	18423389.1	5010105.9	130.8

Table A2.3 Line Sources

ID	Result. PWL			Lw / Li		Direct.	Moving Pt. Src			
	Day	Evening	Night	Type	Value		Number			Speed
	(dBA)	(dBA)	(dBA)				Day	Evening	Night	(km/h)
AP_IHR_Shipping_S1_3	106.9	103.4	103.4	PWL-Pt	HWYTruck_Slow58	(none)	9.0	4.0	4.0	20.0
QAP_IHR_Aggregate_S1_3	106.8	106.8	106.8	PWL-Pt	CP_Rock_Truck_Passby	(none)	4.0	4.0	4.0	20.0
AP_IHR_Shipping_S4	110.7	107.2	107.2	PWL-Pt	HWYTruck_Slow58	(none)	9.0	4.0	4.0	20.0
QAP_IHR_Aggregate_S4	104.1	104.1	104.1	PWL-Pt	CP_Rock_Truck_Passby	(none)	4.0	4.0	4.0	20.0
RMC_IHR_Shipping_S1_3	107.3	99.6	99.6	PWL-Pt	RMC_Concrete_Truck_Passby	(none)	30.0	5.0	5.0	20.0
QRMC_IHR_Aggregate_S1_3	106.7	106.7	106.7	PWL-Pt	CP_Rock_Truck_Passby	(none)	4.0	4.0	4	20
RMC_IHR_Shipping_S4	109.0	101.3	101.3	PWL-Pt	RMC_Concrete_Truck_Passby	(none)	30.0	5.0	5.0	20.0
QRMC_IHR_Aggregate_S4	102.3	102.3	102.3	PWL-Pt	CP_Rock_Truck_Passby	(none)	4.0	4.0	4.0	20.0
Q_IHR_Shipping	103.0	103.0	103.0	PWL-Pt	CP_HWY_Truck_Passby	(none)	22.0	22.0	22.0	20.0
Q_IHR_Aggregate_S1	112.3	112.3	112.3	PWL-Pt	CP_Rock_Truck_Passby	(none)	25.0	25.0	25.0	20.0
Q_IHR_Aggregate_S2	116.1	116.1	116.1	PWL-Pt	CP_Rock_Truck_Passby	(none)	25.0	25.0	25.0	20.0
Q_IHR_Aggregate_S3	116.5	116.5	116.5	PWL-Pt	CP_Rock_Truck_Passby	(none)	25.0	25.0	25.0	20.0
Q_IHR_Aggregate _S4	114.1	114.1	114.1	PWL-Pt	CP_Rock_Truck_Passby	(none)	25.0	25.0	25.0	20.0
QAPRMC_IHR_Water_Truck_S1_3	99.6	99.6	99.6	PWL-Pt	HWYTruck_Slow58	(none)	1.0	1.0	1.0	20.0

Table A2.4 Area Sources

ID	Result. PWL			Lw / Li		Direct.	Operating Time			Moving Pt. Src		
	Day	Evening	Night	Type	Value		Day	Special	Night	Number		
	(dBA)	(dBA)	(dBA)				(min)	(min)	(min)	Day	Evening	Night
AP_Loader	98.0	98.0	98.0	PWL-Pt	AP_Loader	(none)	60	60	60	1.0	1.0	1.0
RMC_Loader	103.8	103.8	103.8	PWL-Pt	RMC_Loader	(none)	60	60	60	1.0	1.0	1.0

Table A2.5 Noise Source Library

ID	Type	Spectra (dB)											Source
		31.5	63.0	125.0	250.0	500.0	1000.0	2000.0	4000.0	8000.0	A	lin	
CP_Rock_Drill	Lw	103.3	108.0	125.5	112.3	113.3	115.5	114.6	114.9	111.7	121.6	127.1	Meas. Sittsville Quarry 22-09-29 - 86.5 at 21.7 m
CP_Loader_988K	Lw	114.5	116.2	118.0	113.4	111.2	108.5	103.8	97.3	84.3	113.4	122.5	Meas. Sittsville Quarry 22-09-29 - 69.6 at 60 m
CP_Crusher_1	Lw	115.8	119.9	112.2	107.3	109.2	108.7	106.2	101.5	98.3	113.1	122.5	Meas. Sittsville Quarry 22-09-29 - 82.8 at 15.5 m
CP_Crusher_2_3	Lw	112.7	110.1	110.9	106.7	107.2	105.9	102.3	98.9	92.8	110.3	117.6	Meas. Sittsville Quarry 22-09-29 - 84.3 at 15.5 m
CP_Scalper	Lw	107.0	108.2	112.5	102.4	104.6	102.5	102.6	97.8	88.9	108.5	115.8	Meas. Sittsville Quarry 22-09-29 - 85.3 at 17.6 m
CP_Genset_1	Lw	107.2	107.4	113.8	111.7	110.4	108.5	111.6	108.6	100.0	116.4	119.6	Meas. Sittsville Quarry 22-09-29 - 99.2 at 4 m
CP_Screen_1	Lw	114.0	112.9	111.8	106.2	105.2	103.6	104.4	100.1	91.2	110.0	118.7	Meas. Sittsville Quarry 22-09-29 - 74.5 at 30 m
CP_Loader_982M	Lw	106.8	107.8	111.3	107.0	103.9	101.7	101.1	94.8	89.8	107.7	115.4	Meas. Sittsville Quarry 22-09-29 - 70.2 at 29 m
CP_Rock_Truck_Unloading	Lw	110.0	119.1	117.0	109.0	106.6	106.3	103.7	95.7	86.4	111.0	122.1	Meas. Sittsville Quarry 22-09-29 - 81.4 at 23.5 m
CP_Rock_Truck_Passby	Lw	106.0	107.6	110.8	107.7	107.1	108.2	106.0	98.9	90.2	112.2	116.5	Meas. Sittsville Q. 22-09-29 - LASmax84.8 at 15 m
CP_HWY_Truck_Passby	Lw	100.2	100.3	99.2	97.8	96.6	94.0	89.5	87.0	76.2	98.8	106.4	Meas. Sittsville Q. 22-09-29 - LASmax70.4 at 15 m
AP_Burner	Lw	92.9	98.6	107.5	108.7	105.2	97.2	94.2	87.2	81.1	105.7	112.6	Manufacturers Data - 88 dBA at 2.75 m
AP_Drum	Lw	102.5	95.5	99.9	99.9	103.9	100.5	99.0	102.1	100.2	108.0	110.5	Manufacturers Data - 78 dBA at 11 m
AP_Baghouse_Fan	Lw	103.2	104.5	106.9	107.7	108.2	110.5	100.9	102.0	83.0	112.8	115.6	Manufacturers Data - 83 dBA at 11 m
AP_RAP_Screen	Lw	98.4	91.3	94.2	90.9	90.8	90.1	91.8	91.6	85.6	97.7	102.5	Manufacturers Data - 80 dBA at 2.75 m
AP_Aggregate_Screen	Lw	103.6	96.5	99.4	96.1	96.0	95.3	97.0	96.8	90.8	102.9	107.7	Manufacturers Data - 73 dBA at 11 m
AP_Dust_Auger	Lw	70.9	68.3	66.4	71.2	69.6	70.2	66.7	76.5	63.3	79.1	80.3	Meas. St. Albert HMA Plant 21/8/2017 -72dBAat0.9m
AP_Air_Compressor	Lw	75.5	77.9	84.6	91.5	95.9	89.7	87.9	84.6	80.1	96.3	98.8	Meas. St. Albert HMA Plant 21/8/2017-84.7at 1.5m
AP_Oil_Heater	Lw	81.8	83.7	85.2	83.2	86.4	82.9	81.3	81.1	76.2	89.1	92.7	Meas. St. Albert HMA Plant 21/8/201-67.7 at 0.7m
AP_Loader	Lw	101.4	110.6	106.3	97.4	95.6	90.3	88.6	84.9	82.6	98.0	112.6	Measurements on-site 21 August 2017 -68.75at11.3m
RMC_Concrete_Truck_Wash_Out	Lw	101.8	104.5	103.4	99.4	98.6	96.3	91.9	87.1	80.3	100.9	109.4	Meas. Vars TRM 18-11-08 - 75.4 at 7.5m

ID	Type	Spectra (dB)											Source
		31.5	63.0	125.0	250.0	500.0	1000.0	2000.0	4000.0	8000.0	A	lin	
RMC_Concrete_Truck_Loading	Lw	102.8	109.3	102.9	103.3	103.5	102.5	103.4	102.5	96.9	109.4	113.6	Meas. Sittsville Quarry 22-09-29 - 71.4 at 26.1 m
RMC_Concrete_Truck_Slump_Mix	Lw	101.4	107.4	108.0	111.2	108.9	107.9	106.2	101.2	96.7	112.9	116.7	Meas. Sittsville Quarry 22-09-29 - 79.2 at 16 m
RMC_Powder_Truck_Unloading	Lw	99.3	97.7	101.7	96.7	97.7	94.0	91.3	86.5	77.6	99.4	106.4	Meas. CH Concrete 27/09/2019 - 77 dBA at 5.2 m
RMC_Dust_Collector	Lw	103.6	109.0	100.0	108.3	109.7	106.1	105.5	100.9	91.6	112.0	115.6	Meas. Alfred TRM 08/10/2021 - 75.7 dBA at 25.3 m
RMC_Compressor	Lw	88.1	86.9	89.9	95.7	100.2	95.1	93.3	84.4	74.2	100.8	103.4	Meas. Moodie HMA Plant June 2021 at 3.5 m
RMC_Loader	Lw	101.2	114.2	116.3	99.8	96.5	95.5	92.7	92.5	91.2	103.8	118.6	Meas. Alfred TRM 08/10/2021 - 72.2 dBA at 14.8 m
RMC_Concrete_Truck_Passby	Lw	100.3	110.7	104.6	104.0	103.2	97.2	95.7	92.6	86.2	104.3	113.3	Meas. CH Concrete 27/09/2019 - 74.5 dBA at 12 m
HWYTruck_Slow58	Lw	115.9	112.7	110.2	101.6	101.4	105.0	104.2	97.6	103.5	110.1	119.0	Brockville McDowell Study, 2003

Table A2.6 Noise Measurement Data

ID	Type	Spectra (dB)											Source
		31.5	63.0	125.0	250.0	500.0	1000.0	2000.0	4000.0	8000.0	A	lin	
Meas_CP_Rock_Drill	Li	68.2	72.9	90.4	77.2	78.2	80.4	79.5	79.8	76.6	86.5	92.0	Meas. Sittsville Quarry 22-09-29 - 86.5 at 21.7 m
Meas_CP_Loader_988K	Li	70.7	72.4	74.2	69.6	67.4	64.7	60.0	53.5	40.5	69.6	78.7	Meas. Sittsville Quarry 22-09-29 - 69.6 at 60 m
Meas_CP_Crusher_1	Li	85.5	89.6	81.9	77.0	78.9	78.4	75.9	71.2	68.0	82.8	92.2	Meas. Sittsville Quarry 22-09-29 - 82.8 at 15.5 m
Meas_CP_Crusher_2_3	Li	86.7	84.1	84.9	80.7	81.2	79.9	76.3	72.9	66.8	84.3	91.6	Meas. Sittsville Quarry 22-09-29 - 84.3 at 15.5 m
Meas_CP_Scalper	Li	83.8	85.0	89.3	79.2	81.4	79.3	79.4	74.6	65.7	85.3	92.6	Meas. Sittsville Quarry 22-09-29 - 85.3 at 17.6 m
Meas_CP_Screen_1	Li	78.5	77.4	76.3	70.7	69.7	68.1	68.9	64.6	55.7	74.5	83.2	Meas. Sittsville Quarry 22-09-29 - 74.5 at 30 m
Meas_CP_Genset_1	Li	90.0	90.2	96.6	94.5	93.2	91.3	94.4	91.4	82.8	99.2	102.4	Meas. Sittsville Quarry 22-09-29 - 99.2 at 4 m
Meas_CP_Loader_982M	Li	69.3	70.3	73.8	69.5	66.4	64.2	63.6	57.3	52.3	70.2	77.9	Meas. Sittsville Quarry 22-09-29 - 70.2 at 29 m
Meas_CP_Rock_Truck_Unloading	Li	80.4	89.5	87.4	79.4	77.0	76.7	74.1	66.1	56.8	81.4	92.5	Meas. Sittsville Quarry 22-09-29 - 81.4 at 23.5 m
Meas_CP_Rock_Truck_Passby	Li	74.3	75.9	79.1	76.0	75.4	76.5	74.3	67.2	58.5	80.5	84.8	Meas. Sittsville Q. 22-09-29 - LASmax84.8 at 15 m
Meas_CP_HWY_Truck_Passby	Li	68.6	68.7	67.6	66.2	65.0	62.4	57.9	55.4	44.6	67.2	74.8	Meas. Sittsville Q. 22-09-29 - LASmax70.4 at 15 m
Meas_CP_Overall_Plant_WP140	Li	73.5	71.4	75.3	66.9	63.9	62.2	61.2	55.0	44.0	68.2	79.1	Meas. Sittsville Quarry 22-09-29 - 68.2 at 91 m
Meas_CP_Overall_Plant_WP141	Li	69.9	68.4	69.8	61.8	60.7	60.6	55.5	47.2	33.9	64.3	74.8	Meas. Sittsville Quarry 22-09-29 - 64.3 at 137 m
Meas_CP_Overall_Plant_WP143	Li	79.1	76.1	80.2	71.8	68.4	66.8	67.9	63.7	54.1	73.8	84.2	Meas. Sittsville Quarry 22-09-29 - 73.8 at 83 m
Meas_CP_Overall_Plant_WP144	Li	74.0	73.5	80.1	67.4	62.4	61.4	66.4	60.1	47.0	71.0	82.1	Meas. Sittsville Quarry 22-09-29 - 71 at 103 m
Meas_AP_Burner	Li	75.2	80.9	89.8	91.0	87.5	79.5	76.5	69.5	63.4	88.0	94.9	Manufacturers Data - 88 dBA at 2.75 m
Meas_AP_Drum	Li	72.5	65.5	69.9	69.9	73.9	70.5	69.0	72.1	70.2	78.0	80.5	Manufacturers Data - 78 dBA at 8.25 m
Meas_AP_Baghouse_Fan	Li	76.4	77.7	80.1	80.9	81.5	83.7	74.1	75.2	56.2	86.0	88.8	Manufacturers Data - 83 dBA at 8.25 m
Meas_AP_RAP_Screen	Lw	80.7	73.6	76.5	73.2	73.1	72.4	74.1	73.9	67.9	80.0	84.8	Manufacturers Data - 80 dBA at 2.75 m
Meas_AP_Aggregate_Screen	Lw	73.7	66.6	69.5	66.2	66.1	65.4	67.1	66.9	60.9	73.0	77.8	Manufacturers Data - 73 dBA at 11 m
Meas_AP_Dust_Auger	Lw	63.8	61.2	59.3	64.1	62.5	63.1	59.6	69.4	56.2	72.0	73.2	Meas. St. Albert HMA Plant 21/8/2017 -72dBAat0.9m

ID	Type	Spectra (dB)											Source
		31.5	63.0	125.0	250.0	500.0	1000.0	2000.0	4000.0	8000.0	A	lin	
Meas_AP_Air_Compressor	Lw	63.9	66.3	73.0	79.9	84.3	78.1	76.3	73.0	68.5	84.7	87.2	Meas. St. Albert HMA Plant 21/8/2017-84.7at 1.5m
Meas_AP_Oil_Heater	Lw	60.4	62.3	63.8	61.8	65.0	61.5	59.9	59.7	54.8	67.7	71.3	Meas. St. Albert HMA Plant 21/8/201-67.7 at 0.7m
Meas_RMC_Meas_Concrete_Truck_Was	Li	76.3	79.0	77.9	73.9	73.1	70.8	66.4	61.6	54.8	75.4	83.9	Meas. Vars TRM 18-11-08 - 75.4 at 7.5m
Meas_RMC_Concrete_Truck_Loading	Li	64.8	71.3	64.9	65.3	65.5	64.5	65.4	64.5	58.9	71.4	75.6	Meas. Sittsville Quarry 22-09-29 - 71.4 at 26.1 m
Meas_RMC_Concrete_Truck_Slump_Mix	Li	67.7	73.7	74.3	77.5	75.2	74.2	72.5	67.5	63.0	79.2	83.0	Meas. Sittsville Quarry 22-09-29 - 79.2 at 16 m
Meas_RMC_Powder_Truck_Unloading	Li	76.9	75.3	79.3	74.3	75.3	71.6	68.9	64.1	55.2	77.0	84.0	Meas. CH Concrete 27/09/2019 - 77 dBA at 5.2 m
Meas_RMC_Dust_Collector	Li	67.3	72.7	63.7	72.0	73.4	69.8	69.2	64.6	55.3	75.7	79.3	Meas. Alfred TRM 08/10/2021 - 75.7 dBA at 25.3 m
Meas_RMC_Compressor	Li	69.2	68.0	71.0	76.8	81.3	76.2	74.4	65.5	55.3	81.9	84.5	Meas. Moodie HMA Plant June 2021 at 3.5 m
Meas_RMC_Loader	Li	69.6	82.6	84.7	68.2	64.9	63.9	61.1	60.9	59.6	72.2	87.0	Meas. Alfred TRM 08/10/2021 - 72.2 dBA at 14.8 m
Meas_RMC_Concrete_Truck_Passby	Li	70.5	80.9	74.8	74.2	73.4	67.4	65.9	62.8	56.4	74.5	83.5	Meas. CH Concrete 27/09/2019 - 74.5 dBA at 12 m
Meas_HWYTruck_Slow58	Li	67.5	64.3	61.8	53.2	53.0	56.6	55.8	49.2	55.1	61.7	70.6	adj. 90m source Brockville McDowell Study, 2003

Table A2.7 Distance Source to Point of Reception

Source ID	Coordinates		POR_1_POW	POR_1_OPR	POR_2_POW	POR_2_OPR	POR_3_POW	POR_3_OPR	POR_4_POW	POR_4_OPR	POR_5_POW	POR_5_OPR	POR_6_POW	POR_6_OPR	POR_7_POW	POR_7_OPR	POR_8_POW	POR_8_OPR
	X (m)		184239 40.86	184239 24.67	184238 83.43	184238 71.56	184254 03.49	184253 82.07	184249 47.49	184249 25.21	184246 91.4	184246 77.37	184244 59.43	184244 44.47	184224 60.13	184224 74.64	184230 74.59	184230 95.44
		Y (m)	501076 8.7	501075 0.48	501070 6.55	501069 4.09	500841 7.84	500843 6.71	500816 8.04	500818 8.9	500776 7.99	500778 5.58	500756 2.79	500758 5.54	500711 5.03	500713 9.82	501047 4.6	501044 9.74
AP_Drum_S1_3	184231 48.7	50098 74.4	1195	1170	1110	1093	2684	2656	2479	2449	2611	2588	2657	2630	2844	2816	605	578
AP_Burner_S1_3	184231 56.4	50098 66.5	1196	1171	1111	1094	2674	2645	2468	2438	2600	2578	2647	2620	2838	2811	614	586
AP_Baghouse_Fan_S1_3	184231 43.8	50098 68.9	1202	1178	1117	1100	2685	2657	2479	2449	2609	2587	2655	2628	2837	2810	610	583
AP_Dust_Auger_S1_3	184231 52.3	50098 67.2	1198	1173	1113	1096	2677	2649	2472	2441	2603	2581	2649	2622	2838	2810	612	585
AP_Oil_Heater_S1_3	184231 78.7	50098 36.4	1204	1180	1120	1103	2639	2610	2431	2401	2562	2540	2609	2582	2815	2787	647	619
AP_Air_Compressor_S1_3	184231 46.8	50098 71.0	1199	1174	1114	1097	2684	2656	2478	2448	2609	2587	2655	2628	2840	2813	608	581
AP_Aggregate_Screen_S1_3	184231 25.6	50098 70.0	1213	1189	1129	1112	2701	2673	2493	2463	2621	2599	2665	2638	2834	2807	607	581
AP_RAP_Screen_S1_3	184231 29.2	50098 69.3	1212	1187	1127	1110	2698	2670	2490	2460	2618	2596	2663	2635	2834	2807	608	581
AP_Drum_S4	184232 03.8	50092 51.3	1687	1663	1606	1590	2352	2326	2053	2023	2101	2078	2104	2077	2262	2234	1230	1203
AP_Burner_S4	184232 11.5	50092 43.4	1691	1667	1610	1594	2342	2316	2042	2012	2090	2067	2093	2066	2257	2229	1239	1212
AP_Baghouse_Fan_S4	184231 98.92	50092 45.88	1694	1670	1613	1597	2355	2328	2054	2024	2100	2078	2103	2076	2255	2227	1235	1208
AP_Dust_Auger_S4	184232 07.34	50092 44.19	1692	1668	1611	1595	2346	2320	2046	2016	2093	2071	2096	2069	2256	2228	1238	1211
AP_Oil_Heater_S4	184232 33.81	50092 13.33	1709	1685	1628	1612	2311	2284	2007	1977	2053	2030	2056	2029	2236	2208	1271	1244
AP_Air_Compressor_S4	184232 01.89	50092 47.94	1691	1667	1610	1594	2353	2326	2053	2023	2100	2077	2103	2075	2258	2230	1233	1207
AP_Aggregate_Screen_S4	184231 80.68	50092 46.96	1701	1678	1620	1604	2372	2346	2070	2040	2114	2092	2115	2087	2250	2222	1232	1206
AP_RAP_Screen_S4	184231 84.25	50092 46.24	1700	1677	1619	1603	2369	2342	2067	2037	2111	2089	2112	2085	2251	2223	1233	1207
RMC_Concrete_Truck_Wash_Out_S1_3	184232 50.82	50097 37.22	1241	1217	1157	1141	2525	2497	2311	2281	2440	2417	2488	2461	2739	2711	758	729
RMC_Concrete_Truck_Loading_S1_3	184232 79.76	50097 29.93	1231	1207	1148	1131	2496	2468	2285	2254	2417	2395	2467	2440	2740	2712	772	743
RMC_Concrete_Truck_Slump_Mix_S1_3	184232 57.11	50097 58.11	1220	1196	1137	1120	2530	2502	2321	2290	2453	2431	2503	2476	2761	2733	739	710
RMC_Powder_Truck_Unloading_S1_3	184232 74.6	50097 19.69	1243	1219	1160	1143	2495	2467	2282	2251	2412	2389	2461	2434	2729	2701	781	752
RMC_Dust_Collector_S1_3	184232 81.34	50097 36.09	1225	1201	1142	1125	2498	2470	2288	2257	2421	2399	2472	2445	2747	2719	767	737
RMC_Compressor_S1_3	184232 11.1	50097 06.18	1289	1265	1205	1188	2543	2515	2320	2289	2439	2416	2480	2453	2698	2670	780	753
RMC_Concrete_Truck_Wash_Out_S4	184231 58.36	50095 11.48	1481	1457	1398	1381	2497	2470	2237	2207	2322	2299	2343	2316	2496	2468	967	940
RMC_Concrete_Truck_Loading_S4	184231 87.3	50095 04.19	1472	1448	1389	1373	2468	2441	2210	2180	2297	2275	2321	2294	2497	2469	977	950
RMC_Concrete_Truck_Slump_Mix_S4	184231 64.65	50095 32.37	1460	1436	1377	1360	2501	2473	2245	2215	2333	2311	2357	2330	2518	2490	947	920
RMC_Powder_Truck_Unloading_S4	184231 82.14	50094 93.95	1483	1460	1401	1384	2468	2441	2208	2177	2293	2270	2315	2288	2486	2458	987	960

Source ID	Coordinates		POR_1_POW	POR_1_OPR	POR_2_POW	POR_2_OPR	POR_3_POW	POR_3_OPR	POR_4_POW	POR_4_OPR	POR_5_POW	POR_5_OPR	POR_6_POW	POR_6_OPR	POR_7_POW	POR_7_OPR	POR_8_POW	POR_8_OPR
	X (m)		184239 40.86	184239 24.67	184238 83.43	184238 71.56	184254 03.49	184253 82.07	184249 47.49	184249 25.21	184246 91.4	184246 77.37	184244 59.43	184244 44.47	184224 60.13	184224 74.64	184230 74.59	184230 95.44
		Y (m)	501076 8.7	501075 0.48	501070 6.55	501069 4.09	500841 7.84	500843 6.71	500816 8.04	500818 8.9	500776 7.99	500778 5.58	500756 2.79	500758 5.54	500711 5.03	500713 9.82	501047 4.6	501044 9.74
RMC_Dust_Collector_S4	184231 88.88	50095 10.35	1466	1442	1383	1366	2469	2442	2212	2182	2301	2278	2325	2298	2504	2476	971	944
RMC_Compressor_S4	184231 18.63	50094 80.44	1528	1504	1445	1428	2520	2492	2251	2221	2325	2303	2340	2313	2455	2428	995	970
STBY_Genset_1_S5	184232 98.93	50097 24.32	1226	1202	1143	1126	2477	2449	2267	2237	2401	2379	2453	2426	2741	2713	783	753
CP_Rock_Drill_S1	184236 06.04	50085 11.28	2282	2262	2213	2199	1800	1778	1385	1358	1315	1294	1276	1249	1806	1778	2034	2005
CP_Rock_Drill_S2	184242 60.13	50090 81.84	1717	1702	1668	1658	1322	1294	1143	1113	1383	1362	1532	1508	2666	2638	1829	1797
CP_Rock_Drill_S3	184233 60.81	50101 40.14	855	831	771	753	2672	2643	2531	2501	2720	2698	2802	2775	3156	3128	440	408
CP_Rock_Drill_S4	184233 60.81	50101 40.14	855	831	771	753	2672	2643	2531	2501	2720	2698	2802	2775	3156	3128	440	408
CP_Crusher_1	184232 51.33	50094 14.09	1520	1496	1439	1422	2372	2344	2105	2074	2187	2165	2211	2183	2431	2403	1075	1047
CP_Crusher_2_3	184232 56.01	50093 80.79	1548	1524	1467	1450	2353	2326	2081	2051	2159	2137	2180	2153	2401	2373	1109	1081
CP_Scalper	184232 51.06	50094 01.05	1532	1508	1451	1434	2366	2339	2097	2067	2177	2155	2200	2173	2419	2391	1088	1060
CP_Genset_1	184232 35.3	50093 92.05	1547	1523	1466	1449	2377	2350	2105	2074	2181	2159	2201	2174	2405	2377	1094	1067
CP_Screen_1	184232 84.23	50093 41.99	1571	1547	1490	1474	2312	2285	2036	2006	2111	2089	2132	2105	2375	2346	1152	1124
CP_Screen_2	184232 31.77	50093 66.3	1571	1548	1490	1474	2370	2343	2093	2063	2165	2142	2182	2154	2380	2352	1119	1092
CP_Screen_3	184232 70.49	50093 19.92	1596	1573	1516	1500	2316	2289	2034	2004	2104	2082	2122	2094	2349	2321	1171	1143
CP_Rock_Truck_Unloading	184232 66.36	50094 23.28	1505	1481	1424	1408	2362	2334	2098	2068	2184	2162	2210	2183	2445	2417	1069	1041
CP_Loader_1	184232 11.05	50093 43.12	1602	1578	1520	1504	2380	2353	2097	2067	2162	2139	2174	2147	2351	2323	1140	1113
CP_Loader_2_S2	184242 37.76	50090 82.17	1712	1697	1663	1653	1342	1314	1157	1127	1390	1369	1535	1511	2651	2623	1814	1782
CP_Loader_3_S2	184242 34.36	50090 99.39	1695	1680	1645	1635	1353	1325	1173	1143	1408	1386	1553	1528	2662	2634	1799	1767
CP_Loader_2_S1	184236 04.58	50085 30.06	2264	2243	2194	2180	1802	1780	1391	1364	1327	1306	1291	1264	1820	1792	2015	1986
CP_Loader_3_S1	184236 12.88	50085 35.56	2257	2237	2188	2174	1794	1772	1384	1357	1324	1302	1290	1263	1829	1801	2012	1983
CP_Loader_2_S3	184233 79.79	50101 12.53	863	839	779	762	2640	2611	2498	2468	2686	2664	2769	2742	3135	3107	474	441
CP_Loader_3_S3	184233 55.73	50101 12.88	879	855	794	777	2658	2630	2513	2483	2699	2676	2779	2752	3129	3101	458	426
CP_Loader_2_S4	184233 98.21	50101 13.58	851	826	766	749	2626	2598	2487	2457	2678	2656	2763	2736	3142	3114	485	452
CP_Loader_3_S4	184233 89.08	50101 05.93	862	838	778	761	2628	2600	2487	2457	2676	2654	2759	2732	3132	3104	485	452

Table A2.8.1 Point of Reception Impacts by Source for Scenario 1 (Daytime)

Source ID	Partial Level Day time Period (07:00 – 19:00)															
	POR_1_POW	POR_1_OPR	POR_2_POW	POR_2_OPR	POR_3_POW	POR_3_OPR	POR_4_POW	POR_4_OPR	POR_5_POW	POR_5_OPR	POR_6_POW	POR_6_OPR	POR_7_POW	POR_7_OPR	POR_8_POW	POR_8_OPR
	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
AP_Drum_S1_3	30.8	31	29.1	28.3	19.8	19.9	24.3	24.5	23.6	23.7	18.6	18.8	17.3	17.4	31.5	28.7
AP_Burner_S1_3	30.8	31	29.1	28.3	19.8	20	24.4	25	23.6	23.7	18.7	18.8	17.3	17.5	31.5	29.0
AP_Baghouse_Fan_S1_3	22.9	23.2	21.5	20.8	12.4	12.6	11.0	11	10.3	10.4	10.0	10.2	8.8	8.9	25.9	21.2
AP_Dust_Auger_S1_3	-2.7	-2.4	-4.2	-5	-13.9	-13.7	-10.3	-15	-15.9	-15.7	-16.1	-16.0	-17.6	-17.5	-0.1	-4.6
AP_Oil_Heater_S1_3	11.9	12.2	10.6	9.7	1.1	1.3	0.1	0	-0.7	-0.6	-1.0	-0.8	-2.5	-2.4	13.7	10.7
AP_Air_Compressor_S1_3	20.5	20.7	19.1	18.3	9.4	9.6	8.6	9	7.8	7.9	7.5	7.7	6.1	6.2	22.5	17.4
AP_Aggregate_Screen_S1_3	23	23.3	21.8	20.8	11.9	12.1	15.4	16	14.6	14.8	9.7	9.8	8.4	8.5	26.6	23.6
AP_RAP_Screen_S1_3	17.8	18.1	16.6	15.6	6.7	6.9	10.3	10.50	9.4	9.6	4.5	4.7	3.2	3.3	21.3	17.5
RMC_Concrete_Truck_Wash_Out_S1_3	24.6	24.9	23.5	22.5	15.4	15.5	18.9	19.1	18.1	18.2	13.1	13.3	11.3	11.5	27.1	25.5
RMC_Concrete_Truck_Loading_S1_3	30.0	30.4	29.0	27.9	20.5	20.7	23.9	24.1	23.1	23.2	18.0	18.2	16.0	16.1	33.3	31.5
RMC_Concrete_Truck_Slump_Mix_S1_3	35.6	36.0	34.3	33.3	25.6	25.8	29.4	29.6	28.6	28.7	23.5	23.7	21.6	21.8	38.2	36.4
RMC_Powder_Truck_Unloading_S1_3	23.0	23.4	21.9	20.9	13.7	13.9	17.4	12.9	11.9	12.0	11.6	11.8	9.6	9.8	25.4	23.7
RMC_Dust_Collector_S1_3	26.4	26.7	25.5	24.5	17.1	17.2	20.8	21.0	20.0	20.1	14.9	15.1	12.9	13.0	29.5	28.0
RMC_Compressor_S1_3	24.2	24.6	23.3	22.3	15.3	15.5	18.6	18.8	17.8	18.0	12.8	13.0	11.1	11.2	26.8	25.1
CP_Rock_Drill_S1	36.0	34.8	35.1	34.2	34.9	35.0	33.7	33.0	34.0	34.1	34.0	34.3	30.6	30.7	37.3	36.8
CP_Crusher_1	29.1	29.2	28.5	27.7	23.6	23.8	26.2	25.6	25.6	25.8	25.5	25.7	23.6	23.7	32.4	30.8
CP_Crusher_2_3	26.4	26.5	25.8	24.9	21.0	21.2	23.9	23.2	23.3	23.5	23.2	23.4	21.1	21.3	29.6	28.0
CP_Scalper	24.0	24.1	23.5	22.6	18.6	18.7	21.3	20.7	20.7	20.9	20.6	20.7	18.7	18.9	27.2	25.7
CP_Genset_1	29.9	30.0	29.2	28.3	24.1	24.3	27.1	26.4	26.5	26.7	26.4	26.6	24.4	24.6	33.4	31.7
CP_Screen_1	24.8	24.7	24.2	23.3	19.9	20.1	22.6	22.0	22.1	22.2	21.9	22.1	19.9	20.1	27.9	26.5
CP_Screen_2	24.9	24.9	24.3	23.4	19.7	19.8	22.3	21.7	21.8	22.0	21.7	21.9	19.9	20.1	28.2	26.7
CP_Screen_3	24.7	24.7	24.1	23.3	19.9	20.1	22.7	22.1	22.2	22.3	22.1	22.2	20.1	20.3	28.1	26.5
CP_Loader_1	23.7	23.7	23.0	22.1	18.6	18.7	21.30	20.7	20.9	21.0	20.8	21.0	19.1	19.2	26.7	25.2
CP_Loader_2_S1	27.4	26.3	26.5	25.6	26.7	26.9	25.9	25.4	20.7	20.8	20.0	20.0	17.6	17.5	32.5	31.9
CP_Loader_3_S1	27.5	26.3	26.5	25.7	26.7	26.7	26.1	25.4	23.9	24.0	23.3	23.3	21.6	21.5	32.5	31.9
AP_IHR_Shipping_S1_3	29.2	29.2	27.4	27.1	17.4	17.6	17.5	17.7	17.4	16.5	14.7	15.1	12.8	12.9	28.3	27.4
QAP_IHR_Aggregate_S1_3	24.6	24.7	23.7	22.7	15.9	16.1	17.5	17.6	17.0	17.1	18.6	18.8	15.5	15.6	27.5	25.9
RMC_IHR_Shipping_S1_3	32.4	32.4	30.6	30.2	21.5	21.6	25.1	25.1	24.3	24.5	19.3	19.5	17.6	17.8	32.1	31.2
QRMC_IHR_Aggregate_S1_3	24.8	25.0	24.0	23.0	16.6	16.8	18.5	18.6	18.6	18.5	17.4	18.1	15.4	15.6	28.1	26.2
Q_IHR_Shipping	25.2	25.2	23.5	23.1	14.4	14.6	16.8	15.4	15.5	15.7	16.1	16.3	13.2	13.3	23.6	22.9
Q_IHR_Aggregate_S1	29.8	29.6	29.4	28.5	28.0	28.2	31.3	30.4	31.0	31.2	31.0	31.3	27.5	27.7	33.5	31.8
QAPRMC_IHR_Water_Truck_S1_3	17.2	17.4	16.3	15.3	8.4	8.6	9.6	9.6	9.3	9.5	10.0	10.2	6.7	6.8	20.4	18.6
AP_Loader_S1_3	22.7	23.0	21.8	21.1	14.3	14.4	14.7	14.9	15.2	12.6	12.7	12.9	10.6	10.7	25.9	24.2
RMC_Loader_S1_3	27.4	27.7	26.7	26.1	20.6	20.7	22.8	23.0	22.2	22.3	17.8	17.9	16.7	16.8	30.5	29.6
Total	43.6	43.5	42.5	41.6	38.5	38.6	39.7	39.2	39.2	39.3	38.3	38.5	35.6	35.7	45.9	44.5

* Values at first floor window height (W) at 4.5 m or 2 m and Outdoor Point of Reception (OPR) at 1.5 m are given above as these where the most critical points at each receptor.

Table A2.8.2 Point of Reception Impacts by Source for Scenario 1 (Evening and Nighttime)

Source ID	Partial Level Evening and Nighttime Period (19:00 – 07:00)															
	POR_1_POW	POR_1_OPR	POR_2_POW	POR_2_OPR	POR_3_POW	POR_3_OPR	POR_4_POW	POR_4_OPR	POR_5_POW	POR_5_OPR	POR_6_POW	POR_6_OPR	POR_7_POW	POR_7_OPR	POR_8_POW	POR_8_OPR
	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
AP_Drum_S1_3	30.8	31	29.1	28.3	19.8	19.9	24.3	24.5	23.6	23.7	18.6	18.8	17.3	17.4	31.5	28.7
AP_Burner_S1_3	30.8	31	29.1	28.3	19.8	20	24.4	25	23.6	23.7	18.7	18.8	17.3	17.5	31.5	29.0
AP_Baghouse_Fan_S1_3	22.9	23.2	21.5	20.8	12.4	12.6	11.0	11	10.3	10.4	10.0	10.2	8.8	8.9	25.9	21.2
AP_Dust_Auger_S1_3	-2.7	-2.4	-4.2	-5	-13.9	-13.7	-10.3	-15	-15.9	-15.7	-16.1	-16.0	-17.6	-17.5	-0.1	-4.6
AP_Oil_Heater_S1_3	11.9	12.2	10.6	9.7	1.1	1.3	0.1	0	-0.7	-0.6	-1.0	-0.8	-2.5	-2.4	13.7	10.7
AP_Air_Compressor_S1_3	20.5	20.7	19.1	18.3	9.4	9.6	8.6	9	7.8	7.9	7.5	7.7	6.1	6.2	22.5	17.4
AP_Aggregate_Screen_S1_3	23	23.3	21.8	20.8	11.9	12.1	15.4	16	14.6	14.8	9.7	9.8	8.4	8.5	26.6	23.6
AP_RAP_Screen_S1_3	17.8	18.1	16.6	15.6	6.7	6.9	10.3	10.50	9.4	9.6	4.5	4.7	3.2	3.3	21.3	17.5
RMC_Concrete_Truck_Wash_Out_S1_3	24.6	24.9	23.5	22.5	15.4	15.5	18.9	19.1	18.1	18.2	13.1	13.3	11.3	11.5	27.1	25.5
RMC_Concrete_Truck_Loading_S1_3	30.0	30.4	29.0	27.9	20.5	20.7	23.9	24.1	23.1	23.2	18.0	18.2	16.0	16.1	33.3	31.5
RMC_Concrete_Truck_Slump_Mix_S1_3	35.6	36.0	34.3	33.3	25.6	25.8	29.4	29.6	28.6	28.7	23.5	23.7	21.6	21.8	38.2	36.4
RMC_Powder_Truck_Unloading_S1_3	23.0	23.4	21.9	20.9	13.7	13.9	17.4	12.9	11.9	12.0	11.6	11.8	9.6	9.8	25.4	23.7
RMC_Dust_Collector_S1_3	26.4	26.7	25.5	24.5	17.1	17.2	20.8	21.0	20.0	20.1	14.9	15.1	12.9	13.0	29.5	28.0
RMC_Compressor_S1_3	24.2	24.6	23.3	22.3	15.3	15.5	18.6	18.8	17.8	18.0	12.8	13.0	11.1	11.2	26.8	25.1
CP_Crusher_1	29.1	29.2	28.5	27.7	23.6	23.8	26.2	25.6	25.6	25.8	25.5	25.7	23.6	23.7	32.4	30.8
CP_Crusher_2_3	26.4	26.5	25.8	24.9	21	21.2	23.9	23.2	23.3	23.5	23.2	23.4	21.1	21.3	29.6	28
CP_Scalper	24.0	24.1	23.5	22.6	18.6	18.7	21.3	20.7	20.7	20.9	20.6	20.7	18.7	18.9	27.2	25.7
CP_Genset_1	29.9	30.0	29.2	28.3	24.1	24.3	27.1	26.4	26.5	26.7	26.4	26.6	24.4	24.6	33.4	31.7
CP_Screen_1	24.8	24.7	24.2	23.3	19.9	20.1	22.6	22.0	22.1	22.2	21.9	22.1	19.9	20.1	27.9	26.5
CP_Screen_2	24.9	24.9	24.3	23.4	19.7	19.8	22.3	21.7	21.8	22.0	21.7	21.9	19.9	20.1	28.2	26.7
CP_Screen_3	24.7	24.7	24.1	23.3	19.9	20.1	22.7	22.1	22.2	22.3	22.1	22.2	20.1	20.3	28.1	26.5
CP_Loader_1	23.7	23.7	23.0	22.1	18.6	18.7	21.3	20.7	20.9	21.0	20.8	21.0	19.1	19.2	26.7	25.2
CP_Loader_2_S1	27.4	26.3	26.5	25.6	26.7	26.9	25.9	25.4	20.7	20.8	20.0	20.0	17.6	17.5	32.5	31.9
AP_IHR_Shipping_S1_3	25.7	25.6	23.8	23.5	13.9	14.1	14.0	14.1	13.8	13.0	11.2	11.6	9.3	9.4	24.8	23.9
QAP_IHR_Aggregate_S1_3	24.6	24.7	23.7	22.7	15.9	16.1	17.5	17.6	17.0	17.1	18.6	18.8	15.5	15.6	27.5	25.9
RMC_IHR_Shipping_S1_3	24.6	24.6	22.8	22.5	13.7	13.8	17.3	17.4	16.6	16.7	11.5	11.7	9.8	10.0	24.3	23.4
QRMC_IHR_Aggregate_S1_3	24.8	25.0	24.0	23.0	16.6	16.8	18.5	18.6	18.6	18.5	17.4	18.1	15.4	15.6	28.1	26.2
Q_IHR_Shipping	25.2	25.2	23.5	23.1	14.4	14.6	16.8	15.4	15.5	15.7	16.1	16.3	13.2	13.3	23.6	22.9
Q_IHR_Aggregate_S1	29.8	29.6	29.4	28.5	28.0	28.2	31.3	30.4	31.0	31.2	31.0	31.3	27.5	27.7	33.5	31.8
QAPRMC_IHR_Water_Truck_S1_3	17.2	17.4	16.3	15.3	8.4	8.6	9.6	9.6	9.3	9.5	10.0	10.2	6.7	6.8	20.4	18.6
AP_Loader_S1_3	22.7	23.0	21.8	21.1	14.3	14.4	14.7	14.9	15.2	12.6	12.7	12.9	10.6	10.7	25.9	24.2
RMC_Loader_S1_3	27.4	27.7	26.7	26.1	20.6	20.7	22.8	23.0	22.2	22.3	17.8	17.9	16.7	16.8	30.5	29.6
Toital	42.1	42.3	41.1	40.2	35.2	35.4	38	37.6	37.2	37.3	35.9	36.1	33.5	33.7	44.8	43.1

* Values at first floor window height (W) at 4.5 m or 2 m and Outdoor Point of Reception (OPR) at 1.5 m are given above as these where the most critical points at each receptor.

Table A2.8.3 Point of Reception Impacts by Source for Scenario 2 (Daytime)

Source ID	Partial Level Day time Period (07:00 – 19:00)															
	POR_1_POW	POR_1_OPR	POR_2_POW	POR_2_OPR	POR_3_POW	POR_3_OPR	POR_4_POW	POR_4_OPR	POR_5_POW	POR_5_OPR	POR_6_POW	POR_6_OPR	POR_7_POW	POR_7_OPR	POR_8_POW	POR_8_OPR
	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
AP_Drum_S1_3	30.8	31	29.1	28.3	19.8	19.9	24.3	24.5	23.6	23.7	18.6	18.8	17.3	17.4	31.5	28.7
AP_Burner_S1_3	30.8	31	29.1	28.3	19.8	20	24.4	25	23.6	23.7	18.7	18.8	17.3	17.5	31.5	29.0
AP_Baghouse_Fan_S1_3	22.9	23.2	21.5	20.8	12.4	12.6	11.0	11	10.3	10.4	10.0	10.2	8.8	8.9	25.9	21.2
AP_Dust_Auger_S1_3	-2.7	-2.4	-4.2	-5	-13.9	-13.7	-10.3	-15	-15.9	-15.7	-16.1	-16.0	-17.6	-17.5	-0.1	-4.6
AP_Oil_Heater_S1_3	11.9	12.2	10.6	9.7	1.1	1.3	0.1	0	-0.7	-0.6	-1.0	-0.8	-2.5	-2.4	13.7	10.7
AP_Air_Compressor_S1_3	20.5	20.7	19.1	18.3	9.4	9.6	8.6	9	7.8	7.9	7.5	7.7	6.1	6.2	22.5	17.4
AP_Aggregate_Screen_S1_3	23	23.3	21.8	20.8	11.9	12.1	15.4	16	14.6	14.8	9.7	9.8	8.4	8.5	26.6	23.6
AP_RAP_Screen_S1_3	17.8	18.1	16.6	15.6	6.7	6.9	10.3	10.50	9.4	9.6	4.5	4.7	3.2	3.3	21.3	17.5
RMC_Concrete_Truck_Wash_Out_S1_3	24.6	24.9	23.5	22.5	15.4	15.5	18.9	19.1	18.1	18.2	13.1	13.3	11.3	11.5	27.1	25.5
RMC_Concrete_Truck_Loading_S1_3	30.0	30.4	29.0	27.9	20.5	20.7	23.9	24.1	23.1	23.2	18.0	18.2	16.0	16.1	33.3	31.5
RMC_Concrete_Truck_Slump_Mix_S1_3	35.6	36.0	34.3	33.3	25.6	25.8	29.4	29.6	28.6	28.7	23.5	23.7	21.6	21.8	38.2	36.4
RMC_Powder_Truck_Unloading_S1_3	23.0	23.4	21.9	20.9	13.7	13.9	17.4	12.9	11.9	12.0	11.6	11.8	9.6	9.8	25.4	23.7
RMC_Dust_Collector_S1_3	26.4	26.7	25.5	24.5	17.1	17.2	20.8	21.0	20.0	20.1	14.9	15.1	12.9	13.0	29.5	28.0
RMC_Compressor_S1_3	24.2	24.6	23.3	22.3	15.3	15.5	18.6	18.8	17.8	18.0	12.8	13.0	11.1	11.2	26.8	25.1
CP_Rock_Drill_S2	37.6	36.6	37.0	35.8	35.6	35.8	33.5	32.0	33.1	33.2	32.6	32.8	28.3	28.5	37.9	37.4
CP_Crusher_1	29.1	29.2	28.5	27.7	28.0	28.2	26.2	25.6	25.6	25.8	25.5	25.7	23.6	23.7	32.4	30.8
CP_Crusher_2_3	26.4	26.5	25.8	24.9	21.0	21.2	23.9	23.2	23.3	23.5	23.2	23.4	21.1	21.3	29.6	28.0
CP_Scalper	24.0	24.1	23.4	22.6	18.6	18.7	21.3	20.7	20.7	20.9	20.6	20.7	18.7	18.9	27.2	25.6
CP_Genset_1	29.9	30.0	29.2	28.3	24.1	24.3	27.1	26.4	26.5	26.7	26.4	26.6	24.4	24.6	33.4	31.7
CP_Screen_1	24.8	24.7	24.2	23.3	23.9	24.1	22.6	22.0	22.1	22.2	21.9	22.1	19.9	20.1	27.9	26.5
CP_Screen_2	24.9	24.9	24.3	23.4	23.7	23.9	22.3	21.7	21.8	22.0	21.7	21.9	19.9	20.1	28.2	26.6
CP_Screen_3	24.7	24.7	24.1	23.3	24.0	24.1	22.7	22.1	22.2	22.3	22.1	22.2	20.1	20.3	28.1	26.4
CP_Loader_1	23.7	23.7	23.0	22.1	18.6	18.7	21.3	20.7	20.9	21.0	20.8	21.0	19.1	19.2	26.7	25.2
CP_Loader_2_S2	28.7	27.9	28.4	27.4	19.8	19.7	20.2	18.9	22.8	22.7	25.9	26.0	24.4	24.5	29.0	28.4
CP_Loader_3_S2	28.5	27.7	28.2	27.2	22.2	22.2	22.7	21.3	26.2	26.2	28.0	28.1	24.4	24.6	29.1	28.5
AP_IHR_Shipping_S1_3	29.2	29.2	27.4	27.1	17.4	17.6	17.5	17.7	17.4	16.5	14.7	15.1	12.8	12.9	28.3	27.4
QAP_IHR_Aggregate_S1_3	24.6	24.7	23.7	22.7	17.7	17.9	17.5	17.6	17.0	17.1	18.6	18.8	15.5	15.6	27.6	25.9
RMC_IHR_Shipping_S1_3	32.4	32.4	30.6	30.2	21.5	21.6	25.1	25.1	24.3	24.5	19.3	19.5	17.6	17.8	32.1	31.2
QRMC_IHR_Aggregate_S1_3	24.8	25.0	24.0	23.0	18.1	18.3	18.5	18.6	18.6	18.5	17.4	18.1	15.4	15.6	28.1	26.2
Q_IHR_Shipping	25.2	25.2	23.5	23.1	15.4	15.5	16.8	15.4	15.5	15.7	16.1	16.3	13.2	13.3	23.6	22.9
Q_IHR_Aggregate_S2	31.6	31.6	30.9	29.8	29.8	30.1	32.3	31.0	30.9	31.1	30.2	30.4	25.8	26.0	34.5	33.0
QAPRMC_IHR_Water_Truck_S1_3	17.2	17.4	16.3	15.3	9.7	9.8	9.6	9.6	9.3	9.5	10.0	10.2	6.7	6.8	20.4	18.6
AP_Loader_S1_3	22.7	23.0	21.8	21.1	14.3	14.4	14.7	14.9	15.2	12.6	12.7	12.9	10.6	10.7	25.9	24.2
RMC_Loader_S1_3	27.4	27.7	26.7	26.1	20.6	20.7	22.8	23.0	22.2	22.3	17.8	17.9	16.7	16.8	30.5	29.6
Total	44.0	43.9	43.1	42.1	39.1	39.3	39.6	38.8	39.0	39.1	38.1	38.3	35.2	35.3	45.9	44.4

* Values at first floor window height (W) at 4.5 m or 2 m and Outdoor Point of Reception (OPR) at 1.5 m are given above as these where the most critical points at each receptor.

Table A2.8.4 Point of Reception Impacts by Source for Scenario 2 (Evening and Nighttime)

Source ID	Partial Level Evening and Nighttime Period (19:00 – 07:00)															
	POR_1_POW	POR_1_OPR	POR_2_POW	POR_2_OPR	POR_3_POW	POR_3_OPR	POR_4_POW	POR_4_OPR	POR_5_POW	POR_5_OPR	POR_6_POW	POR_6_OPR	POR_7_POW	POR_7_OPR	POR_8_POW	POR_8_OPR
	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
AP_Drum_S1_3	30.8	31	29.1	28.3	19.8	19.9	24.3	24.5	23.6	23.7	18.6	18.8	17.3	17.4	31.5	28.7
AP_Burner_S1_3	30.8	31	29.1	28.3	19.8	20	24.4	25	23.6	23.7	18.7	18.8	17.3	17.5	31.5	29.0
AP_Baghouse_Fan_S1_3	22.9	23.2	21.5	20.8	12.4	12.6	11.0	11	10.3	10.4	10.0	10.2	8.8	8.9	25.9	21.2
AP_Dust_Auger_S1_3	-2.7	-2.4	-4.2	-5	-13.9	-13.7	-10.3	-15	-15.9	-15.7	-16.1	-16.0	-17.6	-17.5	-0.1	-4.6
AP_Oil_Heater_S1_3	11.9	12.2	10.6	9.7	1.1	1.3	0.1	0	-0.7	-0.6	-1.0	-0.8	-2.5	-2.4	13.7	10.7
AP_Air_Compressor_S1_3	20.5	20.7	19.1	18.3	9.4	9.6	8.6	9	7.8	7.9	7.5	7.7	6.1	6.2	22.5	17.4
AP_Aggregate_Screen_S1_3	23	23.3	21.8	20.8	11.9	12.1	15.4	16	14.6	14.8	9.7	9.8	8.4	8.5	26.6	23.6
AP_RAP_Screen_S1_3	17.8	18.1	16.6	15.6	6.7	6.9	10.3	10.50	9.4	9.6	4.5	4.7	3.2	3.3	21.3	17.5
RMC_Concrete_Truck_Wash_Out_S1_3	24.6	24.9	23.5	22.5	15.4	15.5	18.9	19.1	18.1	18.2	13.1	13.3	11.3	11.5	27.1	25.5
RMC_Concrete_Truck_Loading_S1_3	30.0	30.4	29.0	27.9	20.5	20.7	23.9	24.1	23.1	23.2	18.0	18.2	16.0	16.1	33.3	31.5
RMC_Concrete_Truck_Slump_Mix_S1_3	35.6	36.0	34.3	33.3	25.6	25.8	29.4	29.6	28.6	28.7	23.5	23.7	21.6	21.8	38.2	36.4
RMC_Powder_Truck_Unloading_S1_3	23.0	23.4	21.9	20.9	13.7	13.9	17.4	12.9	11.9	12.0	11.6	11.8	9.6	9.8	25.4	23.7
RMC_Dust_Collector_S1_3	26.4	26.7	25.5	24.5	17.1	17.2	20.8	21.0	20.0	20.1	14.9	15.1	12.9	13.0	29.5	28.0
RMC_Compressor_S1_3	24.2	24.6	23.3	22.3	15.3	15.5	18.6	18.8	17.8	18.0	12.8	13.0	11.1	11.2	26.8	25.1
CP_Crusher_1	29.1	29.2	28.5	27.7	28.0	28.2	26.2	25.6	25.6	25.8	25.5	25.7	23.6	23.7	32.4	30.8
CP_Crusher_2_3	26.4	26.5	25.8	24.9	21.0	21.2	23.9	23.2	23.3	23.5	23.2	23.4	21.1	21.3	29.6	28.0
CP_Scalper	24.0	24.1	23.4	22.6	18.6	18.7	21.3	20.7	20.7	20.9	20.6	20.7	18.7	18.9	27.2	25.6
CP_Genset_1	29.9	30.0	29.2	28.3	24.1	24.3	27.1	26.4	26.5	26.7	26.4	26.6	24.4	24.6	33.4	31.7
CP_Screen_1	24.8	24.7	24.2	23.3	23.9	24.1	22.6	22.0	22.1	22.2	21.9	22.1	19.9	20.1	27.9	26.5
CP_Screen_2	24.9	24.9	24.3	23.4	23.7	23.9	22.3	21.7	21.8	22.0	21.7	21.9	19.9	20.1	28.2	26.6
CP_Screen_3	24.7	24.7	24.1	23.3	24.0	24.1	22.7	22.1	22.2	22.3	22.1	22.2	20.1	20.3	28.1	26.4
CP_Loader_1	23.7	23.7	23.0	22.1	18.6	18.7	21.3	20.7	20.9	21.0	20.8	21.0	19.1	19.2	26.7	25.2
CP_Loader_2_S2	28.7	27.9	28.4	27.4	19.8	19.7	20.2	18.9	22.8	22.7	25.9	26.0	24.4	24.5	29.0	28.4
AP_IHR_Shipping_S1_3	25.7	25.6	23.8	23.5	13.9	14.1	14.0	14.1	13.8	13.0	11.2	11.6	9.3	9.4	24.8	23.9
QAP_IHR_Aggregate_S1_3	24.6	24.7	23.7	22.7	17.7	17.9	17.5	17.6	17.0	17.1	18.6	18.8	15.5	15.6	27.6	25.9
RMC_IHR_Shipping_S1_3	24.6	24.6	22.8	22.5	13.7	13.8	17.3	17.4	16.6	16.7	11.5	11.7	9.8	10.0	24.3	23.4
QRMC_IHR_Aggregate_S1_3	24.8	25.0	24.0	23.0	18.1	18.3	18.5	18.6	18.6	18.5	17.4	18.1	15.4	15.6	28.1	26.2
Q_IHR_Shipping	25.2	25.2	23.5	23.1	15.4	15.5	16.8	15.4	15.5	15.7	16.1	16.3	13.2	13.3	23.6	22.9
Q_IHR_Aggregate_S2	31.6	31.6	30.9	29.8	29.8	30.1	32.3	31.0	30.9	31.1	30.2	30.4	25.8	26.0	34.5	33.0
QAPRMC_IHR_Water_Truck_S1_3	17.2	17.4	16.3	15.3	9.7	9.8	9.6	9.6	9.3	9.5	10.0	10.2	6.7	6.8	20.4	18.6
AP_Loader_S1_3	22.7	23.0	21.8	21.1	14.3	14.4	14.7	14.9	15.2	12.6	12.7	12.9	10.6	10.7	25.9	24.2
RMC_Loader_S1_3	27.4	27.7	26.7	26.1	20.6	20.7	22.8	23.0	22.2	22.3	17.8	17.9	16.7	16.8	30.5	29.6
Total	42.3	42.5	41.3	40.4	36.2	36.4	38.0	37.5	37.2	37.3	36.0	36.2	33.6	33.7	44.8	43.0

* Values at first floor window height (W) at 4.5 m or 2 m and Outdoor Point of Reception (OPR) at 1.5 m are given above as these where the most critical points at each receptor.

Table A2.8.5 Point of Reception Impacts by Source for Scenario 3 (Daytime)

Source ID	Partial Level Day time Period (07:00 – 19:00)															
	POR_1_POW	POR_1_OPR	POR_2_POW	POR_2_OPR	POR_3_POW	POR_3_OPR	POR_4_POW	POR_4_OPR	POR_5_POW	POR_5_OPR	POR_6_POW	POR_6_OPR	POR_7_POW	POR_7_OPR	POR_8_POW	POR_8_OPR
	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
AP_Drum_S1_3	30.8	31	29.1	28.3	19.8	19.9	24.3	24.5	23.6	23.7	18.6	18.8	17.3	17.4	31.5	28.7
AP_Burner_S1_3	30.8	31	29.1	28.3	19.8	20	24.4	25	23.6	23.7	18.7	18.8	17.3	17.5	31.5	29.0
AP_Baghouse_Fan_S1_3	22.9	23.2	21.5	20.8	12.4	12.6	11.0	11	10.3	10.4	10.0	10.2	8.8	8.9	25.9	21.2
AP_Dust_Auger_S1_3	-2.7	-2.4	-4.2	-5	-13.9	-13.7	-10.3	-15	-15.9	-15.7	-16.1	-16.0	-17.6	-17.5	-0.1	-4.6
AP_Oil_Heater_S1_3	11.9	12.2	10.6	9.7	1.1	1.3	0.1	0	-0.7	-0.6	-1.0	-0.8	-2.5	-2.4	13.7	10.7
AP_Air_Compressor_S1_3	20.5	20.7	19.1	18.3	9.4	9.6	8.6	9	7.8	7.9	7.5	7.7	6.1	6.2	22.5	17.4
AP_Aggregate_Screen_S1_3	23	23.3	21.8	20.8	11.9	12.1	15.4	16	14.6	14.8	9.7	9.8	8.4	8.5	26.6	23.6
AP_RAP_Screen_S1_3	17.8	18.1	16.6	15.6	6.7	6.9	10.3	10.50	9.4	9.6	4.5	4.7	3.2	3.3	21.3	17.5
RMC_Concrete_Truck_Wash_Out_S1_3	24.6	24.9	23.5	22.5	15.4	15.5	18.9	19.1	18.1	18.2	13.1	13.3	11.3	11.5	27.1	25.5
RMC_Concrete_Truck_Loading_S1_3	30.0	30.4	29.0	27.9	20.5	20.7	23.9	24.1	23.1	23.2	18.0	18.2	16.0	16.1	33.3	31.5
RMC_Concrete_Truck_Slump_Mix_S1_3	35.6	36.0	34.3	33.3	25.6	25.8	29.4	29.6	28.6	28.7	23.5	23.7	21.6	21.8	38.2	36.4
RMC_Powder_Truck_Unloading_S1_3	23.0	23.4	21.9	20.9	13.7	13.9	17.4	12.9	11.9	12.0	11.6	11.8	9.6	9.8	25.4	23.7
RMC_Dust_Collector_S1_3	26.4	26.7	25.5	24.5	17.1	17.2	20.8	21.0	20.0	20.1	14.9	15.1	12.9	13.0	29.5	28.0
RMC_Compressor_S1_3	24.2	24.6	23.3	22.3	15.3	15.5	18.6	18.8	17.8	18.0	12.8	13.0	11.1	11.2	26.8	25.1
CP_Rock_Drill_S3	36.4	35.3	34.9	34.3	27.9	28.1	29.6	29.8	29.0	29.1	28.6	28.7	26.6	26.7	38.1	38.8
CP_Crusher_1	29.1	29.2	28.5	27.7	28.0	28.2	26.2	25.6	25.6	25.8	25.5	25.7	23.6	23.7	32.4	30.8
CP_Crusher_2_3	26.4	26.5	25.8	24.9	21.0	21.2	23.9	23.2	23.3	23.5	23.2	23.4	21.1	21.3	29.6	28.0
CP_Scalper	24.0	24.1	23.4	22.6	18.6	18.7	21.3	20.7	20.7	20.9	20.6	20.7	18.7	18.9	27.2	25.6
CP_Genset_1	29.9	30.0	29.2	28.3	24.1	24.3	27.1	26.4	26.5	26.7	26.4	26.6	24.4	24.6	33.4	31.7
CP_Screen_1	29.4	24.7	24.2	23.3	23.9	24.1	22.6	22.0	22.1	22.2	21.9	22.1	19.9	20.1	27.9	26.5
CP_Screen_2	24.9	24.9	24.3	23.4	23.7	23.9	22.3	21.7	21.8	22.0	21.7	21.9	19.9	20.1	28.2	26.6
CP_Screen_3	24.7	24.7	24.1	23.3	24.0	24.1	22.7	22.1	22.2	22.3	22.1	22.2	20.1	20.3	28.1	26.4
CP_Loader_1	23.7	23.7	23.0	22.1	18.6	18.7	21.3	20.7	20.9	21.0	20.8	21.0	19.1	19.2	26.7	25.2
CP_Loader_2_S3	29.7	28.6	28.5	27.0	23.7	23.9	25.8	25.9	25.2	25.4	24.8	25.0	22.8	22.9	27.0	27.5
CP_Loader_3_S3	26.0	25.0	25.0	23.4	23.7	23.8	25.8	26.0	25.2	25.3	24.8	24.9	22.9	23.0	30.6	31.1
AP_IHR_Shipping_S1_3	24.7	24.5	23.1	22.4	14.8	14.9	15.7	15.9	14.4	13.8	13.7	14.2	11.8	11.9	26.7	24.8
QAP_IHR_Aggregate_S1_3	24.6	24.7	23.7	22.7	17.7	17.9	17.5	17.6	17.0	17.1	18.6	18.8	15.5	15.6	27.6	25.9
RMC_IHR_Shipping_S1_3	31.4	31.5	29.7	29.3	21.1	21.3	24.0	24.2	23.4	23.6	19.3	19.5	17.6	17.8	31.5	30.4
QRMC_IHR_Aggregate_S1_3	24.8	25.0	24.0	23.0	18.1	18.3	18.5	18.6	18.6	18.5	17.4	18.1	15.4	15.6	28.1	26.2
Q_IHR_Shipping	21.6	21.5	20.2	19.5	13.9	14.0	14.3	14.4	14.0	14.1	15.6	15.7	12.3	12.5	22.7	21.6
QAPRMC_IHR_Water_Truck_S1_3	17.2	17.4	16.3	15.3	9.7	9.8	9.6	9.6	9.3	9.5	10.0	10.2	6.7	6.8	20.4	18.6
Q_IHR_Aggregate _S3	32.4	32.1	30.7	30.2	25.1	25.3	27.5	27.2	26.6	26.8	26.2	26.4	23.5	23.7	34.3	33.0
AP_Loader_S1_3	22.7	23.0	21.8	21.1	14.3	14.4	14.7	14.9	15.2	12.6	12.7	12.9	10.6	10.7	25.9	24.2
RMC_Loader_S1_3	27.4	27.7	26.7	26.1	20.6	20.7	22.8	23.0	22.2	22.3	17.8	17.9	16.7	16.8	30.5	29.6
Total	43.7	43.5	42.4	41.6	36.7	36.8	38.4	38.3	37.7	37.9	36.4	36.6	34.4	34.5	45.8	44.7

* Values at first floor window height (W) at 4.5 m or 2 m and Outdoor Point of Reception (OPR) at 1.5 m are given above as these where the most critical points at each receptor.

Table A2.8.6 Point of Reception Impacts by Source for Scenario 3 (Evening and Nighttime)

Source ID	Partial Level Evening and Nighttime Period (19:00 – 07:00)															
	POR_1_POW	POR_1_OPR	POR_2_POW	POR_2_OPR	POR_3_POW	POR_3_OPR	POR_4_POW	POR_4_OPR	POR_5_POW	POR_5_OPR	POR_6_POW	POR_6_OPR	POR_7_POW	POR_7_OPR	POR_8_POW	POR_8_OPR
	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
AP_Drum_S1_3	30.8	31	29.1	28.3	19.8	19.9	24.3	24.5	23.6	23.7	18.6	18.8	17.3	17.4	31.5	28.7
AP_Burner_S1_3	30.8	31	29.1	28.3	19.8	20	24.4	25	23.6	23.7	18.7	18.8	17.3	17.5	31.5	29.0
AP_Baghouse_Fan_S1_3	22.9	23.2	21.5	20.8	12.4	12.6	11.0	11	10.3	10.4	10.0	10.2	8.8	8.9	25.9	21.2
AP_Dust_Auger_S1_3	-2.7	-2.4	-4.2	-5	-13.9	-13.7	-10.3	-15	-15.9	-15.7	-16.1	-16.0	-17.6	-17.5	-0.1	-4.6
AP_Oil_Heater_S1_3	11.9	12.2	10.6	9.7	1.1	1.3	0.1	0	-0.7	-0.6	-1.0	-0.8	-2.5	-2.4	13.7	10.7
AP_Air_Compressor_S1_3	20.5	20.7	19.1	18.3	9.4	9.6	8.6	9	7.8	7.9	7.5	7.7	6.1	6.2	22.5	17.4
AP_Aggregate_Screen_S1_3	23	23.3	21.8	20.8	11.9	12.1	15.4	16	14.6	14.8	9.7	9.8	8.4	8.5	26.6	23.6
AP_RAP_Screen_S1_3	17.8	18.1	16.6	15.6	6.7	6.9	10.3	10.50	9.4	9.6	4.5	4.7	3.2	3.3	21.3	17.5
RMC_Concrete_Truck_Wash_Out_S1_3	24.6	24.9	23.5	22.5	15.4	15.5	18.9	19.1	18.1	18.2	13.1	13.3	11.3	11.5	27.1	25.5
RMC_Concrete_Truck_Loading_S1_3	30.0	30.4	29.0	27.9	20.5	20.7	23.9	24.1	23.1	23.2	18.0	18.2	16.0	16.1	33.3	31.5
RMC_Concrete_Truck_Slump_Mix_S1_3	35.6	36.0	34.3	33.3	25.6	25.8	29.4	29.6	28.6	28.7	23.5	23.7	21.6	21.8	38.2	36.4
RMC_Powder_Truck_Unloading_S1_3	23.0	23.4	21.9	20.9	13.7	13.9	17.4	12.9	11.9	12.0	11.6	11.8	9.6	9.8	25.4	23.7
RMC_Dust_Collector_S1_3	26.4	26.7	25.5	24.5	17.1	17.2	20.8	21.0	20.0	20.1	14.9	15.1	12.9	13.0	29.5	28.0
RMC_Compressor_S1_3	24.2	24.6	23.3	22.3	15.3	15.5	18.6	18.8	17.8	18.0	12.8	13.0	11.1	11.2	26.8	25.1
CP_Crusher_1	29.1	29.2	28.5	27.7	28.0	28.2	26.2	25.6	25.6	25.8	25.5	25.7	23.6	23.7	32.4	30.8
CP_Crusher_2_3	26.4	26.5	25.8	24.9	21.0	21.2	23.9	23.2	23.3	23.5	23.2	23.4	21.1	21.3	29.6	28.0
CP_Scalper	24.0	24.1	23.4	22.6	18.6	18.7	21.3	20.7	20.7	20.9	20.6	20.7	18.7	18.9	27.2	25.6
CP_Genset_1	29.9	30.0	29.2	28.3	24.1	24.3	27.1	26.4	26.5	26.7	26.4	26.6	24.4	24.6	33.4	31.7
CP_Screen_1	29.4	24.7	24.2	23.3	23.9	24.1	22.6	22.0	22.1	22.2	21.9	22.1	19.9	20.1	27.9	26.5
CP_Screen_2	24.9	24.9	24.3	23.4	23.7	23.9	22.3	21.7	21.8	22.0	21.7	21.9	19.9	20.1	28.2	26.6
CP_Screen_3	24.7	24.7	24.1	23.3	24.0	24.1	22.7	22.1	22.2	22.3	22.1	22.2	20.1	20.3	28.1	26.4
CP_Loader_1	23.7	23.7	23.0	22.1	18.6	18.7	21.3	20.7	20.9	21.0	20.8	21.0	19.1	19.2	26.7	25.2
CP_Loader_2_S3	29.7	28.6	28.5	27.0	23.7	23.9	25.8	25.9	25.2	25.4	24.8	25.0	22.8	22.9	27.0	27.5
AP_IHR_Shipping_S1_3	21.2	21.0	19.6	18.9	11.3	11.4	12.2	12.3	10.9	10.3	10.2	10.6	8.3	8.4	23.2	21.3
QAP_IHR_Aggregate_S1_3	24.6	24.7	23.7	22.7	17.7	17.9	17.5	17.6	17.0	17.1	18.6	18.8	15.5	15.6	27.6	25.9
RMC_IHR_Shipping_S1_3	23.6	23.7	21.9	21.5	13.3	13.5	16.3	16.4	15.7	15.8	11.6	11.7	9.9	10.0	23.7	22.6
QRMC_IHR_Aggregate_S1_3	24.8	25.0	24.0	23.0	18.1	18.3	18.5	18.6	18.6	18.5	17.4	18.1	15.4	15.6	28.1	26.2
Q_IHR_Shipping	21.6	21.5	20.2	19.5	13.9	14.0	14.3	14.4	14.0	14.1	15.6	15.7	12.3	12.5	22.7	21.6
QAPRMC_IHR_Water_Truck_S1_3	17.2	17.4	16.3	15.3	9.7	9.8	9.6	9.6	9.3	9.5	10.0	10.2	6.7	6.8	20.4	18.6
Q_IHR_Aggregate _S3	32.4	32.1	30.7	30.2	25.1	25.3	27.5	27.2	26.6	26.8	26.2	26.4	23.5	23.7	34.3	33.0
AP_Loader_S1_3	22.7	23.0	21.8	21.1	14.3	14.4	14.7	14.9	15.2	12.6	12.7	12.9	10.6	10.7	25.9	24.2
RMC_Loader_S1_3	27.4	27.7	26.7	26.1	20.6	20.7	22.8	23.0	22.2	22.3	17.8	17.9	16.7	16.8	30.5	29.6
Total	42.5	42.4	41.1	40.3	35.6	35.8	37.3	37.2	36.6	36.8	35.1	35.3	33.1	33.2	44.7	43.0

* Values at first floor window height (W) at 4.5 m or 2 m and Outdoor Point of Reception (OPR) at 1.5 m are given above as these where the most critical points at each receptor.

Table A2.8.7 Point of Reception Impacts by Source for Scenario 4 (Daytime)

Source ID	Partial Level Day time Period (07:00 – 19:00)															
	POR_1_POW	POR_1_OPR	POR_2_POW	POR_2_OPR	POR_3_POW	POR_3_OPR	POR_4_POW	POR_4_OPR	POR_5_POW	POR_5_OPR	POR_6_POW	POR_6_OPR	POR_7_POW	POR_7_OPR	POR_8_POW	POR_8_OPR
	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
AP_Drum_S4	27.7	27.7	26.7	25.8	18.3	18.5	21.6	20.8	21.2	21.3	21.2	21.4	19.5	19.6	25.2	24.1
AP_Burner_S4	27.7	27.7	26.6	25.8	18.4	18.5	21.6	20.9	21.3	21.4	21.2	21.4	19.5	19.6	25.2	24.0
AP_Baghouse_Fan_S4	19.7	19.5	18.8	18.0	10.6	10.7	13.2	12.6	12.9	13.0	12.9	13.1	11.2	11.4	18.3	16.8
AP_Dust_Auger_S4	-6.2	-6.4	-7.0	-7.9	-15.8	-15.6	-12.7	-13.4	-13.1	-12.9	-13.1	-12.9	-15.0	-14.8	-7.6	-9.1
AP_Oil_Heater_S4	8.4	8.3	7.8	6.9	-1.0	-0.9	2.4	1.6	2.0	2.2	2.0	2.2	0.0	0.2	6.5	5.1
AP_Air_Compressor_S4	17.1	17.0	16.5	15.6	7.1	7.3	10.7	10.0	10.4	10.5	10.3	10.5	8.5	8.7	14.9	13.5
AP_Aggregate_Screen_S4	19.6	19.4	18.9	18.0	10.0	10.1	13.0	12.3	12.6	12.8	12.6	12.8	10.9	11.1	18.4	16.9
AP_RAP_Screen_S4	14.4	14.2	13.7	12.8	4.8	5.0	7.8	7.1	7.5	7.6	7.4	7.6	5.7	5.9	13.2	11.7
RMC_Concrete_Truck_Wash_Out_S4	22.9	23.1	17.6	16.7	11.8	12.0	14.5	14.7	14.0	14.1	13.8	14.0	12.4	12.6	21.2	19.4
RMC_Concrete_Truck_Loading_S4	28.2	28.4	27.4	21.8	16.8	17.0	19.6	19.8	19.0	19.1	18.8	19.0	17.1	17.3	26.9	24.9
RMC_Concrete_Truck_Slump_Mix_S4	29.1	29.3	28.3	27.4	22.2	22.4	25.1	25.3	24.5	24.6	24.3	24.5	22.7	22.9	32.2	30.2
RMC_Powder_Truck_Unloading_S4	16.6	16.8	15.9	15.0	10.1	10.3	13.1	12.4	12.5	12.6	12.3	12.5	10.8	10.9	19.3	17.5
RMC_Dust_Collector_S4	24.9	25.0	24.1	23.1	17.7	17.9	16.4	16.6	15.8	16.0	20.4	20.6	14.0	14.1	27.6	25.9
RMC_Compressor_S4	17.9	18.0	17.2	16.2	10.9	11.0	14.2	14.4	13.7	13.8	13.6	13.8	12.2	12.3	20.6	18.9
CP_Rock_Drill_S4	40.8	39.3	38.6	38.4	31.2	31.4	29.6	29.8	33.5	29.1	28.6	28.7	26.6	26.7	43.1	43.9
CP_Crusher_1	33.8	33.9	33.2	32.3	28.0	28.2	26.2	25.6	25.6	25.8	25.5	25.7	23.6	23.7	36.9	35.3
CP_Crusher_2_3	31.1	31.2	30.4	29.5	21.0	21.2	23.9	23.2	23.3	23.5	23.2	23.4	21.1	21.3	29.6	28.0
CP_Scalper	28.6	28.7	27.9	27.0	18.6	18.7	21.3	20.7	20.7	20.9	20.6	20.7	18.7	18.9	27.2	25.6
CP_Genset_1	34.6	34.7	33.8	32.8	24.1	24.3	27.1	26.4	26.5	26.7	26.4	26.6	24.4	24.6	33.4	31.6
CP_Screen_1	29.4	29.4	28.6	27.7	23.9	24.1	22.6	22.0	22.1	22.2	21.9	22.1	19.9	20.1	32.2	26.5
CP_Screen_2	29.5	29.5	28.7	27.9	23.7	23.9	22.3	21.7	21.8	22.0	21.7	21.9	19.9	20.1	32.5	30.9
CP_Screen_3	29.4	29.3	28.6	27.7	24.0	24.1	22.7	22.1	22.2	22.3	22.1	22.2	20.1	20.3	32.4	30.7
CP_Loader_1	28.3	28.3	27.4	22.1	18.6	18.7	21.3	20.7	20.9	21.0	20.8	21.0	19.1	19.2	26.7	25.2
CP_Loader_2_S4	21.7	20.8	20.9	20.1	23.8	23.9	25.8	26.0	25.2	25.3	24.9	25.0	22.8	22.9	27.0	27.5
CP_Loader_3_S4	26.3	25.3	25.5	24.2	23.8	23.9	25.8	26.0	25.3	25.4	24.9	25.0	22.8	22.9	29.3	29.8
AP_IHR_Shipping_S4	27.8	27.6	26.4	25.7	18.8	19.0	19.9	19.9	19.4	19.6	19.9	20.1	17.8	17.8	27.6	26.5
QAP_IHR_Aggregate_S4	22.3	22.1	21.6	20.6	12.7	12.8	15.6	14.9	15.3	15.4	15.3	15.4	13.6	13.7	21.7	20.7
RMC_IHR_Shipping_S4	29.4	29.4	27.6	27.1	21.2	20.9	21.9	22.1	22.1	21.8	21.9	22.0	19.7	19.8	28.6	27.8
QRMC_IHR_Aggregate_S4	19.9	19.9	18.5	15.1	10.5	10.7	13.3	13.2	12.8	12.9	12.7	12.9	11.3	11.5	20.4	18.7
Q_IHR_Shipping	22.5	22.5	20.6	20.1	13.2	13.3	15.0	15.1	14.5	14.6	15.1	15.3	12.9	13.0	21.5	20.5
Q_IHR_Aggregate _S4	32.5	32.2	30.3	29.7	23.5	23.7	26.4	26.5	25.4	25.5	25.0	25.2	22.6	22.8	32.9	31.9
RMC_Loader_S4	23.1	23.3	21.6	21.0	17.4	17.5	18.9	19.0	18.5	18.6	18.4	18.6	17.7	17.8	25.2	24.2
AP_Loader_S4	20.0	19.7	19.3	18.6	11.8	12.0	14.2	13.8	13.9	14.1	14.0	14.1	12.8	13.0	18.0	17.0
Total	44.9	44.4	43.4	42.7	36.8	36.9	37.3	37.2	37.9	36.9	36.6	36.8	34.7	34.8	46.4	46.1

* Values at first floor window height (W) at 4.5 m or 2 m and Outdoor Point of Reception (OPR) at 1.5 m are given above as these where the most critical points at each receptor.

Table A2.8.8 Point of Reception Impacts by Source for Scenario 4 (Evening and Nighttime)

Source ID	Partial Level Evening and Nighttime Period (19:00 – 07:00)															
	POR_1 _POW	POR_1 _OPR	POR_2 _POW	POR_2 _OPR	POR_3 _POW	POR_3 _OPR	POR_4 _POW	POR_4 _OPR	POR_5 _POW	POR_5 _OPR	POR_6 _POW	POR_6 _OPR	POR_7 _POW	POR_7 _OPR	POR_8 _POW	POR_8 _OPR
	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
AP_Drum_S4	27.7	27.7	26.7	25.8	18.3	18.5	21.6	20.8	21.2	21.3	21.2	21.4	19.5	19.6	25.2	24.1
AP_Burner_S4	27.7	27.7	26.6	25.8	18.4	18.5	21.6	20.9	21.3	21.4	21.2	21.4	19.5	19.6	25.2	24.0
AP_Baghouse_Fan_S4	19.7	19.5	18.8	18.0	10.6	10.7	13.2	12.6	12.9	13.0	12.9	13.1	11.2	11.4	18.3	16.8
AP_Dust_Auger_S4	-6.2	-6.4	-7.0	-7.9	-15.8	-15.6	-12.7	-13.4	-13.1	-12.9	-13.1	-12.9	-15.0	-14.8	-7.6	-9.1
AP_Oil_Heater_S4	8.4	8.3	7.8	6.9	-1.0	-0.9	2.4	1.6	2.0	2.2	2.0	2.2	0.0	0.2	6.5	5.1
AP_Air_Compressor_S4	17.1	17.0	16.5	15.6	7.1	7.3	10.7	10.0	10.4	10.5	10.3	10.5	8.5	8.7	14.9	13.5
AP_Aggregate_Screen_S4	19.6	19.4	18.9	18.0	10.0	10.1	13.0	12.3	12.6	12.8	12.6	12.8	10.9	11.1	18.4	16.9
AP_RAP_Screen_S4	14.4	14.2	13.7	12.8	4.8	5.0	7.8	7.1	7.5	7.6	7.4	7.6	5.7	5.9	13.2	11.7
RMC_Concrete_Truck_Wash_Out_S4	22.9	23.1	17.6	16.7	11.8	12.0	14.5	14.7	14.0	14.1	13.8	14.0	12.4	12.6	21.2	19.4
RMC_Concrete_Truck_Loading_S4	28.2	28.4	27.4	21.8	16.8	17.0	19.6	19.8	19.0	19.1	18.8	19.0	17.1	17.3	26.9	24.9
RMC_Concrete_Truck_Slump_Mix_S 4	29.1	29.3	28.3	27.4	22.2	22.4	25.1	25.3	24.5	24.6	24.3	24.5	22.7	22.9	32.2	30.2
RMC_Powder_Truck_Unloading_S4	16.6	16.8	15.9	15.0	10.1	10.3	13.1	12.4	12.5	12.6	12.3	12.5	10.8	10.9	19.3	17.5
RMC_Dust_Collector_S4	24.9	25.0	24.1	23.1	17.7	17.9	16.4	16.6	15.8	16.0	20.4	20.6	14.0	14.1	27.6	25.9
RMC_Compressor_S4	17.9	18.0	17.2	16.2	10.9	11.0	14.2	14.4	13.7	13.8	13.6	13.8	12.2	12.3	20.6	18.9
CP_Crusher_1	33.8	33.9	33.2	32.3	28.0	28.2	26.2	25.6	25.6	25.8	25.5	25.7	23.6	23.7	36.9	35.3
CP_Crusher_2_3	31.1	31.2	30.4	29.5	21.0	21.2	23.9	23.2	23.3	23.5	23.2	23.4	21.1	21.3	29.6	28.0
CP_Scalper	28.6	28.7	27.9	27.0	18.6	18.7	21.3	20.7	20.7	20.9	20.6	20.7	18.7	18.9	27.2	25.6
CP_Genset_1	34.6	34.7	33.8	32.8	24.1	24.3	27.1	26.4	26.5	26.7	26.4	26.6	24.4	24.6	33.4	31.6
CP_Screen_1	29.4	29.4	28.6	27.7	23.9	24.1	22.6	22.0	22.1	22.2	21.9	22.1	19.9	20.1	32.2	26.5
CP_Screen_2	29.5	29.5	28.7	27.9	23.7	23.9	22.3	21.7	21.8	22.0	21.7	21.9	19.9	20.1	32.5	30.9
CP_Screen_3	29.4	29.3	28.6	27.7	24.0	24.1	22.7	22.1	22.2	22.3	22.1	22.2	20.1	20.3	32.4	30.7
CP_Loader_1	28.3	28.3	27.4	22.1	18.6	18.7	21.3	20.7	20.9	21.0	20.8	21.0	19.1	19.2	26.7	25.2
CP_Loader_2_S4	21.7	20.8	20.9	20.1	23.8	23.9	25.8	26.0	25.2	25.3	24.9	25.0	22.8	22.9	27.0	27.5
AP_IHR_Shipping_S4	24.3	24.1	22.8	22.2	15.3	15.5	16.4	16.4	15.9	16.1	16.4	16.6	14.3	14.3	24.1	23.0
QAP_IHR_Aggregate_S4	22.3	22.1	21.6	20.6	12.7	12.8	15.6	14.9	15.3	15.4	15.3	15.4	13.6	13.7	21.7	20.7
RMC_IHR_Shipping_S4	21.6	21.7	19.8	19.4	13.4	13.2	14.2	14.3	14.4	14.0	14.1	14.3	11.9	12.0	20.8	20.0
QRMC_IHR_Aggregate_S4	19.9	19.9	18.5	15.1	10.5	10.7	13.3	13.2	12.8	12.9	12.7	12.9	11.3	11.5	20.4	18.7
Q_IHR_Shipping	22.5	22.5	20.6	20.1	13.2	13.3	15.0	15.1	14.5	14.6	15.1	15.3	12.9	13.0	21.5	20.5
Q_IHR_Aggregate _S4	32.5	32.2	30.3	29.7	23.5	23.7	26.4	26.5	25.4	25.5	25.0	25.2	22.6	22.8	32.9	31.9
RMC_Loader_S4	23.1	23.3	21.6	21.0	17.4	17.5	18.9	19.0	18.5	18.6	18.4	18.6	17.7	17.8	25.2	24.2
AP_Loader_S4	20.0	19.7	19.3	18.6	11.8	12.0	14.2	13.8	13.9	14.1	14.0	14.1	12.8	13.0	18.0	17.0
Total	42.4	42.4	41.4	40.3	34.8	35.0	35.9	35.6	35.4	35.5	35.3	35.5	33.3	33.5	43.4	41.7

* Values at first floor window height (W) at 4.5 m or 2 m and Outdoor Point of Reception (OPR) at 1.5 m are given above as these where the most critical points at each receptor.

Table A2.8.9 Point of Reception Impacts by Source for Scenario 5 (Daytime)

Source ID	Partial Level Day time Period (07:00 – 19:00)															
	POR_1_POW	POR_1_OPR	POR_2_POW	POR_2_OPR	POR_3_POW	POR_3_OPR	POR_4_POW	POR_4_OPR	POR_5_POW	POR_5_OPR	POR_6_POW	POR_6_OPR	POR_7_POW	POR_7_OPR	POR_8_POW	POR_8_OPR
	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
STBY_Genset_1_S5	11.5	11.9	10.9	9.9	2.5	2.6	4.5	4.7	3.6	3.8	-	-	-	-	17.0	15.2
Total	11.5	11.9	10.9	9.9	2.5	2.6	4.5	4.7	3.6	3.8	-	-	-	-	17.0	15.2

* Values at first floor window height (W) at 4.5 m or 2 m and Outdoor Point of Reception (OPR) at 1.5 m are given above as these where the most critical points at each receptor.

Table A2.9 Sample Calculations – Scenario 1

Receiver
Name: POR_1
ID: POR_1_POW
X: 18423940.86 m
Y: 5010768.70 m
Z: 140.50 m

Point Source, ISO 9613, Name: "CP_Genset_1", ID: "CP_Genset_1_S1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
1	18423350.41	5010041.68	130.26	0	DEN	32	67.8	0.0	0.0	0.0	0.0	70.4	0.0	-5.2	2.2	0.0	4.8	0.0	0.0	-4.5
1	18423350.41	5010041.68	130.26	0	DEN	63	81.2	0.0	0.0	0.0	0.0	70.4	0.1	-5.2	2.2	0.0	4.8	0.0	0.0	8.8
1	18423350.41	5010041.68	130.26	0	DEN	125	97.7	0.0	0.0	0.0	0.0	70.4	0.4	3.6	3.3	0.0	1.2	0.0	0.0	18.8
1	18423350.41	5010041.68	130.26	0	DEN	250	103.1	0.0	0.0	0.0	0.0	70.4	1.0	0.7	4.4	0.0	4.1	0.0	0.0	22.5
1	18423350.41	5010041.68	130.26	0	DEN	500	107.2	0.0	0.0	0.0	0.0	70.4	1.8	-1.1	5.5	0.0	4.8	0.0	0.0	25.8
1	18423350.41	5010041.68	130.26	0	DEN	1000	108.5	0.0	0.0	0.0	0.0	70.4	3.4	-1.1	6.6	0.0	4.8	0.0	0.0	24.3
1	18423350.41	5010041.68	130.26	0	DEN	2000	112.8	0.0	0.0	0.0	0.0	70.4	9.1	-1.1	8.8	0.0	4.9	0.0	0.0	20.7
1	18423350.41	5010041.68	130.26	0	DEN	4000	109.6	0.0	0.0	0.0	0.0	70.4	30.7	-1.1	10.0	0.0	5.0	0.0	0.0	-5.4
1	18423350.41	5010041.68	130.26	0	DEN	8000	98.9	0.0	0.0	0.0	0.0	70.4	109.5	-1.1	13.3	0.0	5.2	0.0	0.0	-98.4

Point Source, ISO 9613, Name: "CP_Rock_Drill", ID: "CP_Rock_Drill_S1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
2	18423389.42	5010122.68	139.00	0	D	32	63.9	0.0	0.0	0.0	0.0	69.6	0.0	-5.4	2.1	0.0	0.0	0.0	0.0	-2.4
2	18423389.42	5010122.68	139.00	0	D	63	81.8	0.0	0.0	0.0	0.0	69.6	0.1	-5.4	2.1	0.0	0.0	0.0	0.0	15.5
2	18423389.42	5010122.68	139.00	0	D	125	109.4	0.0	0.0	0.0	0.0	69.6	0.3	6.3	3.1	0.0	0.0	0.0	0.0	30.1
2	18423389.42	5010122.68	139.00	0	D	250	103.7	0.0	0.0	0.0	0.0	69.6	0.9	5.8	4.1	0.0	0.0	0.0	0.0	23.3
2	18423389.42	5010122.68	139.00	0	D	500	110.1	0.0	0.0	0.0	0.0	69.6	1.6	5.1	5.2	0.0	0.0	0.0	0.0	28.6
2	18423389.42	5010122.68	139.00	0	D	1000	115.5	0.0	0.0	0.0	0.0	69.6	3.1	0.7	6.2	0.0	0.0	0.0	0.0	35.9
2	18423389.42	5010122.68	139.00	0	D	2000	115.8	0.0	0.0	0.0	0.0	69.6	8.2	-0.5	8.3	0.0	0.0	0.0	0.0	30.3
2	18423389.42	5010122.68	139.00	0	D	4000	115.9	0.0	0.0	0.0	0.0	69.6	27.8	-0.5	9.3	0.0	0.0	0.0	0.0	9.7
2	18423389.42	5010122.68	139.00	0	D	8000	110.6	0.0	0.0	0.0	0.0	69.6	99.3	-0.5	12.4	0.0	0.0	0.0	0.0	-70.1
2	18423389.42	5010122.68	139.00	0	N	32	63.9	0.0	-188.0	0.0	0.0	69.6	0.0	-5.4	2.1	0.0	0.0	0.0	0.0	-190.4
2	18423389.42	5010122.68	139.00	0	N	63	81.8	0.0	-188.0	0.0	0.0	69.6	0.1	-5.4	2.1	0.0	0.0	0.0	0.0	-172.5
2	18423389.42	5010122.68	139.00	0	N	125	109.4	0.0	-188.0	0.0	0.0	69.6	0.3	6.3	3.1	0.0	0.0	0.0	0.0	-157.9
2	18423389.42	5010122.68	139.00	0	N	250	103.7	0.0	-188.0	0.0	0.0	69.6	0.9	5.8	4.1	0.0	0.0	0.0	0.0	-164.7
2	18423389.42	5010122.68	139.00	0	N	500	110.1	0.0	-188.0	0.0	0.0	69.6	1.6	5.1	5.2	0.0	0.0	0.0	0.0	-159.4
2	18423389.42	5010122.68	139.00	0	N	1000	115.5	0.0	-188.0	0.0	0.0	69.6	3.1	0.7	6.2	0.0	0.0	0.0	0.0	-152.1
2	18423389.42	5010122.68	139.00	0	N	2000	115.8	0.0	-188.0	0.0	0.0	69.6	8.2	-0.5	8.3	0.0	0.0	0.0	0.0	-157.7
2	18423389.42	5010122.68	139.00	0	N	4000	115.9	0.0	-188.0	0.0	0.0	69.6	27.8	-0.5	9.3	0.0	0.0	0.0	0.0	-178.3
2	18423389.42	5010122.68	139.00	0	N	8000	110.6	0.0	-188.0	0.0	0.0	69.6	99.3	-0.5	12.4	0.0	0.0	0.0	0.0	-258.1
2	18423389.42	5010122.68	139.00	0	E	32	63.9	0.0	-188.0	0.0	0.0	69.6	0.0	-5.4	2.1	0.0	0.0	0.0	0.0	-190.4
2	18423389.42	5010122.68	139.00	0	E	63	81.8	0.0	-188.0	0.0	0.0	69.6	0.1	-5.4	2.1	0.0	0.0	0.0	0.0	-172.5
2	18423389.42	5010122.68	139.00	0	E	125	109.4	0.0	-188.0	0.0	0.0	69.6	0.3	6.3	3.1	0.0	0.0	0.0	0.0	-157.9
2	18423389.42	5010122.68	139.00	0	E	250	103.7	0.0	-188.0	0.0	0.0	69.6	0.9	5.8	4.1	0.0	0.0	0.0	0.0	-164.7
2	18423389.42	5010122.68	139.00	0	E	500	110.1	0.0	-188.0	0.0	0.0	69.6	1.6	5.1	5.2	0.0	0.0	0.0	0.0	-159.4
2	18423389.42	5010122.68	139.00	0	E	1000	115.5	0.0	-188.0	0.0	0.0	69.6	3.1	0.7	6.2	0.0	0.0	0.0	0.0	-152.1
2	18423389.42	5010122.68	139.00	0	E	2000	115.8	0.0	-188.0	0.0	0.0	69.6	8.2	-0.5	8.3	0.0	0.0	0.0	0.0	-157.7
2	18423389.42	5010122.68	139.00	0	E	4000	115.9	0.0	-188.0	0.0	0.0	69.6	27.8	-0.5	9.3	0.0	0.0	0.0	0.0	-178.3
2	18423389.42	5010122.68	139.00	0	E	8000	110.6	0.0	-188.0	0.0	0.0	69.6	99.3	-0.5	12.4	0.0	0.0	0.0	0.0	-258.1

Point Source, ISO 9613, Name: "CP_Loader_2_Extraction", ID: "CP_Loader_2_S1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
3	18423398.21	5010113.58	127.59	0	DEN	32	75.1	0.0	0.0	0.0	0.0	69.6	0.0	-5.3	2.8	0.0	9.0	0.0	0.0	-1.1
3	18423398.21	5010113.58	127.59	0	DEN	63	90.0	0.0	0.0	0.0	0.0	69.6	0.1	-5.3	2.8	0.0	11.2	0.0	0.0	11.6
3	18423398.21	5010113.58	127.59	0	DEN	125	101.9	0.0	0.0	0.0	0.0	69.6	0.3	7.2	4.1	0.0	6.4	0.0	0.0	14.2
3	18423398.21	5010113.58	127.59	0	DEN	250	104.8	0.0	0.0	0.0	0.0	69.6	0.9	5.5	5.5	0.0	10.9	0.0	0.0	12.5
3	18423398.21	5010113.58	127.59	0	DEN	500	108.0	0.0	0.0	0.0	0.0	69.6	1.6	0.5	6.9	0.0	18.7	0.0	0.0	10.7
3	18423398.21	5010113.58	127.59	0	DEN	1000	108.5	0.0	0.0	0.0	0.0	69.6	3.1	-0.2	8.3	0.0	20.0	0.0	0.0	7.7
3	18423398.21	5010113.58	127.59	0	DEN	2000	105.0	0.0	0.0	0.0	0.0	69.6	8.2	-0.2	11.0	0.0	20.0	0.0	0.0	-3.6
3	18423398.21	5010113.58	127.59	0	DEN	4000	98.3	0.0	0.0	0.0	0.0	69.6	27.9	-0.2	12.4	0.0	20.0	0.0	0.0	-31.4
3	18423398.21	5010113.58	127.59	0	DEN	8000	83.2	0.0	0.0	0.0	0.0	69.6	99.4	-0.2	16.5	0.0	20.0	0.0	0.0	-122.1

Point Source, ISO 9613, Name: "CP_Loader_3_Extraction", ID: "CP_Loader_3_S1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5	18423389.08	5010105.93	127.73	0	DEN	32	75.1	0.0	0.0	0.0	0.0	69.7	0.0	-5.3	2.6	0.0	6.6	0.0	0.0	1.4

Appendix 3

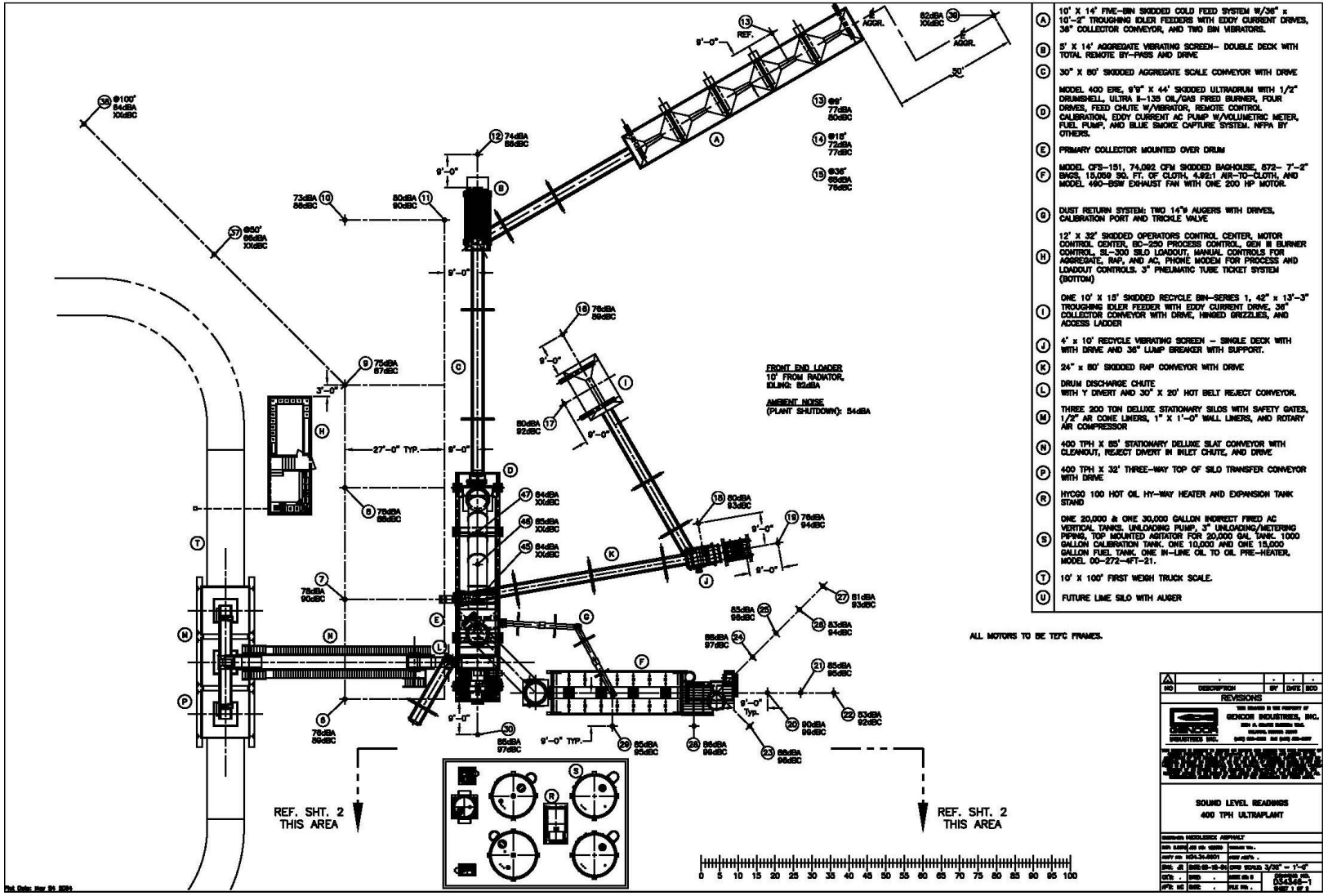
Manufacturer's Data

Notes:

1. The strengths of the noise sources for the asphalt plant, i.e. the sound powers shown in Table 2 and Table A2.6, are based on manufacturers data. The sound powers where calculated for each of the individual noise sources using a combination of both near and far field measurement data provided by the manufacturer. Following calibration, noise from the overall asphalt plant was compared to the far field measurement data at location 38 and location 39 at 100ft and 50 ft respectively, refer to manufacturers sound data in Appendix 3, Figure A3.1. The results indicted that the predicted results, after calibration, exceed the manufacturers measurement data at these far field measurement locations, hence, the calculated sound levels are considered conservative.

Contents:

Figure A3.1: Manufacturers Noise Data for Gencor HMA Plant 400 Ton per hour - D34346-1
(Refer measurement location 30 relating to the burner)



Manufacturers Data for Stoddard Air Intake Silencer Model F64-5.

F64 Air Intake Filters and Filter Silencers

Air Intake Filter and Filter Silencer

The Series F64 Air Intake Filter and Filter Silencer is designed to mount directly on the inlet of an engine, blower or compressor. It will provide 16dB to 20dB noise reduction and the paper filter media has an efficiency of 99% on 1 micron particles.

SERVICE LIFE & CLEANING: The service life of the element is dependent upon the surrounding environment and cannot be predicted.

To prevent COLLAPSING of the filter element, STODDARD SILENCERS recommends the differential pressure across the filter element NOT exceed 15 inches of water column. Positive indication that the element requires cleaning or replacement can be provided with STODDARD SILENCERS model A40-108 Pressure Drop Indicator, at an extra charge.

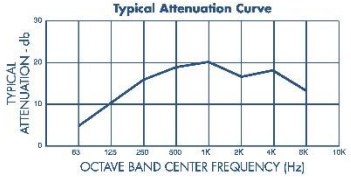
To extend service life, rap element gently to dislodge accumulated dirt. An alternate method is to direct compressed air (75 PSIG max) through the element opposite to the direction of air flow. THE FILTER ELEMENT MUST EVENTUALLY BE REPLACED.

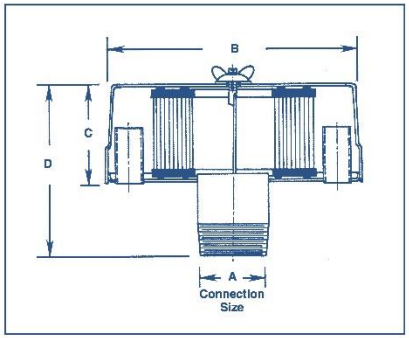
ALTERNATE FILTRATION MEDIA
AVAILABLE FOR F64

REFER TO PAGE FOUR

Pre-Filter wrap available at added cost
Consult Factory
(90% on 75 micron particles and larger)

Typical Attenuation Curve





F64 shown with optional A40-108 Pressure Drop Indicator.

F64 Series

Model	A Connection Size	B	C	D	Rated CFM	Wt.	Replacement Element Number
F64-1	1" NPT	10	4	7	35	9	F8-108
F64-1½	1½" NPT	10	4	7	80	9	F8-108
F64-2	2" NPT	10	4	7	135	10	F8-108
F64-2½	2½" NPT	10	4	7	180	10	F8-108
F64-3	3" NPT	16	5	8	285	20	F8-109
F64-4	4" NPT	16	5	8	520	20	F8-109
F64-5	5" NPT/FLG	16	5	8	750	23	F8-109
F64-6	6" Flange	20	5	8	1235	40	F8-110
F64-8	8" Flange	20	10	13	2125	50	F8-111
F64-10	10" Flange	26	15½	20	3335	95	F8-137
F64-12	12" Flange	26	15½	20	4675	100	F8-137
F64-14	14" Flange	26	15½	20	5655	115	F8-137

Sizes 10", 12" and 14" are FILTERS only

2

Appendix 4

Measurements of Noise from the Overall Portable Crushing and Screening Plant

Notes:

1. The strengths of the noise sources for the portable crushing and screening plant, i.e. the sound powers shown in Table 2 and Table A2.6, are based on measurement data carried out on-site in September 2022. The sound powers where calculated for each of the individual noise sources based on a combination of both near and far field measurement data. Following calibration, the individual sources where further calibrated such that noise from the overall plant was in line with the noise measurement data at far field measurement locations P1 to P5 as shown in Appendix 4, Figure A4.1. The results shown in Figure A4.1, exceed the measurement data at all locations, hence, the calculated sound levels are considered conservative.

Contents:

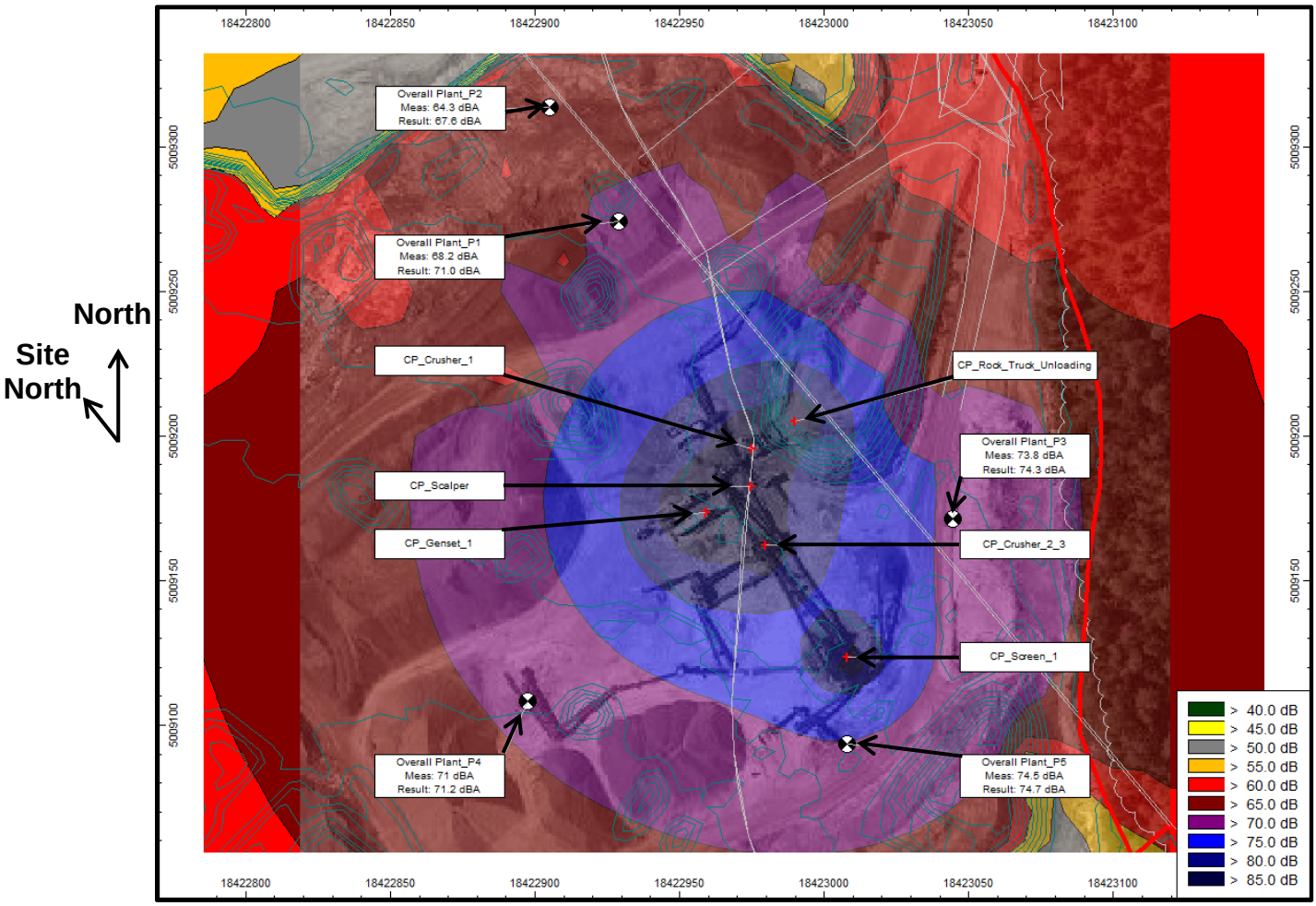
Table A4.1 Measured Sound Pressure Level of Noise from the Overall Plant at Far Field Measurements Locations

Location	Type	Spectra (dB)											Description
		31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
Meas_CP_Overall_Plant_P1	Li	73.5	71.4	75.3	66.9	63.9	62.2	61.2	55.0	44.0	68.2	79.1	Meas. Sittsville Quarry 22-09-29 - 68.2 at 91 m
Meas_CP_Overall_Plant_P2	Li	69.9	68.4	69.8	61.8	60.7	60.6	55.5	47.2	33.9	64.3	74.8	Meas. Sittsville Quarry 22-09-29 - 64.3 at 137 m
Meas_CP_Overall_Plant_P3	Li	79.1	76.1	80.2	71.8	68.4	66.8	67.9	63.7	54.1	73.8	84.2	Meas. Sittsville Quarry 22-09-29 - 73.8 at 83 m
Meas_CP_Overall_Plant_P4	Li	74.0	73.5	80.1	67.4	62.4	61.4	66.4	60.1	47.0	71.0	82.1	Meas. Sittsville Quarry 22-09-29 - 71 at 103 m
Meas_CP_Overall_Plant_P5	Li	78.5	77.4	76.3	70.7	69.7	68.1	68.9	64.6	55.7	74.5	83.2	Meas. Sittsville Quarry 22-09-29 - 74.5 at 30 m

Table A4.2 Prediction Results with comparison to Measured Sound Pressure Level of Noise from the Overall Plant at Far Field Measurements Locations

Location	Measured Sound Pressure Level	Predicted Sound Pressure Level
	dBA	dBA
P1	68.2	71.0
P2	64.3	67.6
P3	73.8	74.3
P4	71.0	71.2
P5	74.5	74.7

Figure A4.1 Prediction Results with comparison to Measured Sound Pressure Level at Far Field Measurements Locations



Appendix 5

Instrument Calibration Certificates

www.pylonelectronics.com

Pylon Electronics Inc.
147 Colonnade Road
Ottawa, ON K2E 7L9

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CERTIFICATE OF CALIBRATION

Description	**SOUND LEVEL CALIBRATOR**	**Work Order**	**N0996745**
Model Number	**4231**	**Serial Number**	**2730374**
Instrument Id	**N/A**	**Cal Procedure**	**33K3-4-2871-1**
Manufacturer	**BRUEL & KJAER**	**Cal Date**	**4 Mar 2022**
Customer Name	**FREEFIELD LTD.**	**Recall Cycle**	**52 Weeks**
		Next Cal Date	**4 Mar 2023**
		Purchase Order	**Credit Card**

Calibration Environment: Temperature **22.8 °C** Relative Humidity **35.5 %RH**

Received Condition: **Within Tolerance**

Completed Condition: **Within Tolerance**

Standards Used to Establish Traceability

Instrument Type	Model	Asset #	Cal Due Date
3550 B&K, SIGNAL ANALYZER	3550	240-1202	11 Nov 2022
4220 BRUEL&KJAER PISTONPHONE	4220	240-1378	4 Jan 2023
4190 BRUEL & KJAER, MICROPHONE	4190	240-1398	14 Oct 2022
2669 BRUEL & KJAER, PREAMPLIFIER	2669	240-1399	14 Oct 2022

Pylon certifies that, at the time of calibration, the above listed instrument meets or exceeds all of the specifications defined on the Test Data Sheet (TDS), unless otherwise indicated. The Certificate received and completed conditions and the TDS specifications are based on the procedure(s) and/or specification(s) referenced on the TDS unless otherwise indicated. Any statement of compliance is made without taking measurement uncertainty into account and is based on the instrument's performance against the test limits documented on the test data sheet.

The above listed instrument has been calibrated using standards that are traceable to the International System of Units (SI) through a National Metrological Institute (such as NRC or NIST). Pylon's quality system meets the requirements of ISO/IEC 17025:2017. Unless otherwise specified, Pylon maintains a minimum of a 4:1 ratio between the equipment under test and the measurement system.

Test data As Found and Final (as left) results are the same unless reported otherwise. Certificate remarks identify if adjustments were performed.

Metrologist : ***146*** Quality Assurance: ***301*** Date of Issue: **7 Mar 2022** F083 Rev 16

pylcert1

HALIFAX MONTREAL OTTAWA TORONTO EDMONTON CALGARY

PYLON

Calibration Test Data

Page 1 of 1

Description:	**SOUND LEVEL CALIBRATOR**	Work order:	**N0996745**
Model:	**4231**	Serial:	**2730374**
Customer ID.:	**N/A**	Procedure:	**33K3-4-2871-1**
Manufacturer:	**BRUEL & KJAER**	Proc. Rev.:	**30-Oct-2006**
Customer:	**FREEFIELD LTD.**	Cal Date:	**04-Mar-2022**

Rev:03Jul2009 AF=0 F=0

4231 BRÜEL & KJÆR.xls Temp 006 Appr 062 23-Oct-2018

TEST REF.	TEST DESCRIPTION	RESULTS MIN	AS FOUND	FINAL	MAX
4.1	**Sound Level Calibration:**				
	Nominal dB_{SPL}	dB_{SPL}	dB_{SPL}		dB_{SPL}
	94.0	93.80	93.97		94.20
	(+20 dB Button) 114.0	113.80	113.95		114.20
4.2	**Frequency Calibration:**				
	Nominal (Hz)	Hz	Hz		Hz
	1 k	999.0	1000.0		1001.0
4.3	**Distortion Calibration :**				
	Measured Value	-	0.38 %		1.00 %
	ADDITIONAL TEST:				
	AUTO SHUT OFF	Pass / Fail	Pass		

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Pylon Electronics Inc.
147 Colonnade Road
Ottawa, ON K2E 7L9

Page 1 of 1

CERTIFICATE OF CALIBRATION

Description	**SOUND ANALYZER**	**Work Order**	**N0996743**
Model Number	**2270**	**Serial Number**	**3008643**
Instrument Id	**N/A**	**Cal Procedure**	**BE1713-32**
Manufacturer	**BRUEL & KJAER**	**Cal Date**	**4 Mar 2022**
Customer Name	**FREEFIELD LTD.**	**Recall Cycle**	**52 Weeks**
		Next Cal Date	**4 Mar 2023**
		Purchase Order	**Credit Card**

Calibration Environment: Temperature **22.8 °C** Relative Humidity **32.6 %RH**

Received Condition: **Within Tolerance**

Completed Condition: **Within Tolerance**

Remarks: **The unit calibrated with Preamp ZC 0032 S/N 23073 and Mic 4189 S/N 2985656**

Standards Used to Establish Traceability

Instrument Type	Model	Asset #	Cal Due Date
SOUND LEVEL CALIBRATOR	4231	240-1151	23 Sep 2022

Pylon certifies that, at the time of calibration, the above listed instrument meets or exceeds all of the specifications defined on the Test Data Sheet (TDS), unless otherwise indicated. The Certificate received and completed conditions and the TDS specifications are based on the procedure(s) and/or specification(s) referenced on the TDS unless otherwise indicated. Any statement of compliance is made without taking measurement uncertainty into account and is based on the instrument's performance against the test limits documented on the test data sheet.

The above listed instrument has been calibrated using standards that are traceable to the International System of Units (SI) through a National Metrological Institute (such as NRC or NIST). Pylon's quality system meets the requirements of ISO/IEC 17025:2017. Unless otherwise specified, Pylon maintains a minimum of a 4:1 ratio between the equipment under test and the measurement system.

Test data As Found and Final (as left) results are the same unless reported otherwise. Certificate remarks identify if adjustments were performed.

Metrologist : *146* Quality Assurance: *301* Date of Issue: **7 Mar 2022** F083 Rev 16
pylcert1

HALIFAX MONTREAL OTTAWA TORONTO EDMONTON CALGARY

Page 1 of 1

PYLON

Calibration Test Data

Description:	**SOUND ANALYZER**	Work order:	**N0996743**
Model:	**2270**	Serial:	**3008643**
Customer ID.:	**N/A**	Procedure:	**BE1713-32**
Manufacturer:	**BRUEL & KJAER**	Proc. Rev.:	**23-Feb-2016**
Customer:	**FREEFIELD LTD.**	Cal Date:	**04-Mar-2022**

Rev:25Jan2007
AF=0
F=0

2270 BRÜEL & KJÆR.xls Temp 006 Appr 062 27-Mar-2017

TEST REF.	TEST DESCRIPTION	RESULTS MIN	AS FOUND	FINAL	MAX
P. 52	**SOUND LEVEL CALIBRATION**				
	CONNECT TI TO SOUND CALIBRATOR MODEL 4231,				
	SWITCH ON THE CALIBRATOR, PRESS "START" ON TI,				
	NOTE THAT TI INDICATING "DETECTING LEVEL"	Pass / Fail	Pass		
	WHILE TI SEARCHING FOR SIGNAL & SIGNAL IS				
	STABILISING, THE "TRAFFIC LIGHT" INDICATES				
	SHORT GREEN FLASH EVERY SECOND	Pass / Fail	Pass		
	WHEN SIGNAL IS STABLE, THE GREEN LIGHT IS				
	STABLE	Pass / Fail	Pass		
	WHEN CALIBRATION IS COMPLETED SUCCESSFULLY				
	THE TRAFFIC LIGHT INDICATES A SHORT YELLOW				
	FLASH EVERY 5 SECONDS	Pass / Fail	Pass		
	Nominal SPL with 4189 Microphone attached	dB	dB		dB
	93.8 dB	92.8	93.8		94.8
	CALIBRATION COMPLETED	Pass / Fail	Pass		

Appendix 6

Meteorological Data during Noise Measurements

Government of Canada / Gouvernement du Canada

Home > Environment and natural resources > Weather information > Weather > Local forecasts > Ontario > Provincial summary

Ottawa Macdonald-Cartier Int'l Airport, Ontario

Latitude 45.32° N | Longitude 75.67° W

Past 24 Hour Conditions Imperial units | Graphic

Date / Time (EDT)	Conditions	Temperature (°C)	Wind (km/h)	Relative humidity (%)	Dew point (°C)	Pressure (kPa)	Visibility (km)
30 September 2022							
08:00	Sunny	4 (4.2)	calm	98	4	103.0	24
07:00	Sunny	3 (3.3)	WNW 4	95	3	103.0	24
06:00	Mainly Clear	2 (2.2) ↓	SE 3	97	2	103.0	24
05:00	Mainly Clear	4 (3.7)	N 3	95	3	103.0	24
04:00	Mainly Clear	3 (3.3)	ESE 4	97	3	102.9	24
03:00	Mainly Clear	4 (4.2)	NE 4	93	3	102.9	24

Date / Time (EDT)	Conditions	Temperature (°C)	Wind (km/h)	Relative humidity (%)	Dew point (°C)	Pressure (kPa)	Visibility (km)
02:00	Mainly Clear	5 (5.1)	calm	94	4	103.0	24
01:00	Mainly Clear	4 (4.0)	SW 3	96	3	103.0	24
00:00	Mainly Clear	4 (4.4)	SSW 7	97	4	103.1	24
29 September 2022							
23:00	Mainly Clear	6 (5.7)	SSW 4	87	4	103.1	24
22:00	Clear	6 (5.6)	SW 5	88	4	103.1	24
21:00	Clear	7 (7.1)	WSW 4	81	4	103.1	24
20:00	Clear	9 (8.6)	WSW 7	71	4	103.0	24
19:00	Mainly Clear	10 (9.8)	W 9	68	4	103.0	24
18:00	Mainly Sunny	12 (12.2)	WSW 10	56	4	103.0	24

Date / Time (EDT)	Conditions	Temperature (°C)	Wind (km/h)	Relative humidity (%)	Dew point (°C)	Pressure (kPa)	Visibility (km)
17:00	Mainly Sunny	13 (13.2)	SW 4	50	3	103.0	24
16:00	Mainly Sunny	13 (13.4) ↑	WNW 10	48	3	103.1	24
15:00	Mainly Sunny	13 (12.9)	WNW 4	55	4	103.1	24
14:00	Mainly Sunny	12 (12.0)	WNW 7	56	4	103.2	24
13:00	Mainly Sunny	11 (11.1)	NW 10	57	3	103.3	24
12:00	Mainly Sunny	10 (10.3)	NW 11	61	3	103.3	24
11:00	Partly Cloudy	10 (9.8)	N 10	63	3	103.3	24
10:00	Mostly Cloudy	9 (9.1)	NW 14	62	2	103.3	24
09:00	Mainly Sunny	8 (8.3)	NW 18	69	3	103.3	24
08:00	Partly Cloudy	7 (7.0)	NNW 15	77	3	103.2	24

RESUME: Dr. HUGH WILLIAMSON, P.Eng.

QUALIFICATIONS:

Ph.D. Mechanical Engineering, University of New South Wales, 1972

B.Sc. Mechanical Engineering, (with Distinction), University of Alberta, 1967

Member, Professional Engineers, Ontario

Member, Canadian Acoustical Association

KEY COMPETENCIES:

- Environmental noise and vibration assessments, Environmental Compliance Approval (ECA). Noise assessment for land use planning
- Noise impact assessments for the Aggregates Industry.
- Architectural and building acoustics, acoustics of office spaces, meeting rooms, auditoriums and studios, noise and vibration control of building mechanical services.
- Industrial noise and vibration assessment and control.
- Transportation noise and vibration.
- Noise and vibration aspects of Occupational Health and Safety (OH&S).

PROFESSIONAL EXPERIENCE:

Hugh Williamson is a professional engineer with many years of experience in the measurement, analysis and control of noise and vibration. Freefield Ltd. was incorporated in 2017 and provides consulting services in architectural, building, industrial, transportation and environmental acoustics and vibration. Clients include architects, engineering firms, industrial firms and government departments. Prior to joining Freefield Ltd. Hugh Williamson founded and directed Hugh Williamson Associates Inc. which specialized in consulting services in architectural, building, industrial, transportation and environmental acoustics and vibration. His career included extensive periods in industry as well as university level research and teaching. He is a former Director of the Acoustics and Vibration Unit at the Australian Defence Force Academy. He has published over 50 engineering and scientific papers and has been an invited speaker on noise and vibration at national and international conferences. He has more than 27 years of experience as a consultant.

CLIENT LIST:

Hugh Williamson has provided consulting services to large and small clients including National Research Council, J. L. Richards & Associates, Barry Padolsky Associates, Atkinson Schroeter Design Group, R. W. Tomlinson Limited, Geo. Tackaberry Construction, Miller Paving, City of Ottawa and Government of Canada.

Postal Address: PO Box 74056, RPO Beechwood, Ottawa, Ontario, K1M 2H9, Canada
Phone: 613-747-0983, Email: hugh@freefieldacoustics.com, http://www.freefieldacoustics.com

RESUMÉ: MICHAEL WELLS

QUALIFICATIONS:	Limited Engineering Licensee*, Professional Engineers Ontario *Limitation: Environmental acoustic assessments and recommendations to mitigate noise and vibration; acoustical engineering services for land-use planning, architectural and building acoustics, industrial acoustics, and occupational health and safety audits. Registered Architect of NSW, Registration Number: 8111 B. Architecture (Hons), University of Sydney, 2002 B.Sc. Architecture, University of Sydney, 1999 Member, Canadian Acoustical Association Associate Member, INCE-USA
KEY COMPETENCIES:	• Environmental noise and vibration assessments, Environmental Compliance Approval (ECA). Noise assessment for land use planning. • Architectural and building acoustics, acoustics of office spaces, meeting rooms, auditoriums and studios, noise and vibration control of building mechanical services. • Industrial noise and vibration assessment and control. • Noise assessments for Occupational Health and Safety.

PROFESSIONAL EXPERIENCE:

Michael Wells is a Limited Engineering Licensee, Professional Engineers Ontario, in the field of acoustic engineering as described above. He is also a professional Architect registered in NSW, Australia. Michael. He has more than 10 years of experience in Canada in the measurement, analysis and control of noise and vibration. Michael is a founding Director of Freefield Ltd., incorporated in 2017, which provides consulting services in architectural, building, industrial, transportation and environmental acoustics and vibration. Prior to establishing Freefield Ltd., he worked for the Ontario acoustic consulting firm Hugh Williamson Associates Inc. Previously, Michael worked in Sydney, Australia, specializing in the design of institutional, commercial and residential projects. He is the former Director of Architectural Workshops Australia and Vision Blue Pty Ltd.

CLIENT LIST:

Michael Wells has provided consulting services to large and small clients including: National Research Council, R. W. Tomlinson, G. Tackaberry & Sons Construction, Heidelberg Materials, Miller Paving, J. L. Richards & Associates, Barry Padolsky Associates, Atkinson Schroeter Design Group and Industry Canada.