FREEFIELD LTD.
Ottawa, Ontario

ACOUSTIC ASSESSMENT FOR THE HIGHLAND LINE PIT LANARK HIGHLAND TOWNSHIP LANARK COUNTY ONTARIO

Prepared for

Thomas Cavanagh Construction Limited

Prepared by

Freefield Ltd.

5th September 2025

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ACOUSTIC ASSESSMENT FOR THE HIGHLAND LINE PIT LANARK HIGHLAND TOWNSHIP, LANARK COUNTY, ONTARIO

Executive Summary

Thomas Cavanagh Construction Limited (Cavanagh) is applying to the Ministry of Natural Resources and Forestry, MNRF, for a license under the Aggregate Resources Act, ARA, for the Highland Line Pit, Class A, Sand Pit (below water), to be located at Part of Lot 5, Concession 10, Lanark Highland Township, Lanark County, Ontario, as shown in Figures 1 and 2.

The North American Industry Classification System (NAICS) code of the facility is 212323.

The MNRF license application requires the submission of an Acoustic Assessment Report of the proposed operation. Freefield Ltd. has been retained by Cavanagh to complete this acoustic assessment.

The acoustic assessment has been carried out according to the applicable Ministry of Environment, Conservation and Parks (MECP) Noise Assessment Guidelines, including NPC-300, published August 2013. The assessment considers the impact on nearby noise sensitive lands, including existing residences and vacant land zoned for potential noise sensitive use, of noise generated by all on-site equipment operations, including extraction operations by loaders or excavators, aggregate processing operations by a crushing plant, screening plant and wash plant, loading operations by loaders, site preparation and maintenance by an excavator and truck movements used for the shipping of product off-site on a 24-hour basis. The site is not a significant source of vibration hence an assessment of vibrations is not required.

Noise impacts have been predicted and compared to the MECP sound level limits as set out in NPC-300. Where applicable, noise mitigation measures such as barriers and limits to operations have been designed to ensure all operations comply 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 pit are summarized in Section 3. Noise sensitive receptors are described in Section 1 and Section 4, with Section 5, 6 and 7 detailing applicable assessment criteria, an assessment of noise impacts and recommended mitigation measures.

Version Control

Title	Comments	Prepared By	Issue Date
Acoustic Assessment for the Proposed Highland Line Pit Lanark Highland Township, Ontario	Submitted with initial ARA License Application	Freefield Ltd.	23rd September 2022
Acoustic Assessment for the Proposed Highland Line Pit Lanark Highland Township, Ontario	Updated to address MNRF comments related to recommended enclosure and silencer at generator	Freefield Ltd.	29th April 2024
Acoustic Assessment for the Proposed Highland Line Pit Lanark Highland Township, Ontario	Updated to address Peer Review comments, dated 14th April 2025.	Freefield Ltd.	5th September 2025 (This version)

ACOUSTIC ASSESSMENT FOR THE HIGHLAND LINE PIT LANARK HIGHLAND TOWNSHIP, LANARK COUNTY, ONTARIO

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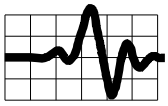
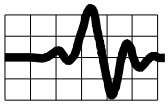


Appendix 1 Zoning Maps

Appendix 2 Acoustic Modeling Details



ACOUSTIC ASSESSMENT FOR THE HIGHLAND LINE PIT LANARK HIGHLAND TOWNSHIP, LANARK COUNTY, ONTARIO

1.0 Introduction

Thomas Cavanagh Construction Limited (Cavanagh) is applying to the Ministry of Natural Resources and Forestry, MNRF, for a license under the Aggregate Resources Act, ARA, for the Highland Line Pit, Class A, Sand Pit (below water), to be located at Part of Lot 5, Concession 10, Lanark Highland Township, Lanark County, Ontario, as shown in Figures 1 and 2 (the facility).

The North American Industry Classification System (NAICS) code of the facility is 212323.

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

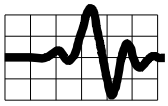
This report has been prepared in accordance with the MECP Document NPC-233, *Information to be Submitted for Approval of Stationary Sources of Sound*, October 1995. Noise from the facility is assessed according to MECP Documents: NPC-300, *Stationary and Transportation Sources – Approval and Planning*,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

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 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 noise measurements of the proposed equipment in operation at the Cavanagh Pine Grove Pit carried out in October 2019 and from a database of noise measurements of similar operations at other aggregate operations 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 sound level limits. Where appropriate mitigation measures are recommended such that compliance, with MECP sound level limits, is achieved at all receptors.

Note that this assessment considers all significant noise sources in operation on the site. The site is not a significant source of vibration; hence, an assessment of vibrations is not required.

Surrounding Lands, Acoustic Environment and Noise Sensitive Receptors

The facility is located in a predominantly rural area, on the south sides of Highland Line Road, approximately 2.8 km west of Country Road 12, in Lanark Highland Township, Lanark, Ontario.

The site is bisected by Anderson Lane into an east and west extraction area. The extraction areas consist of an unexcavated sand deposit. The site rises in a southerly direction from Highland Line Road to a ridge approximately 20 m high located in the southern portion of each extraction area. The land surrounding the facility consists of undulating topography with moderate changes in elevation, plus minus 20 m.

Note that directions in this report are referenced to site north as shown in Figure 1.

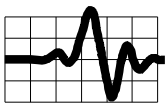
The legal description of the land occupied by the facility is as follows:

Part of Lot 5,
Concession 10,
Lanark Highland Township,
Lanark County, Ontario

A location plan showing the site with respect to the surrounding area is provided in Figure 1. A site layout plan, showing the sites detailed arrangement and elevation contours, is provided in Figure 2. A land use zoning map is provided in Appendix 1.

The site is zoned Mineral Aggregate Reserve – Holding Zone (MAR-h) and Rural (RU) as shown on the Zoning Map, Appendix 1. It is noted, while the proposed licensed area will be located fully within Part of Lot 5 the property boundary incorporates an area to the south located on Part of Lot 4, as shown on Figure 1, 2 and Appendix 1.

To the north of the site the land is zoned Rural (RU) with areas of Limited Services Rural (LSR) and Mineral Aggregate Resources Reserve – Holding Zone (MAR-h) and Environmental Protection (Organic Soils) zoned land. An existing pit lies immediately north of the site on the northern side of Highland Line Road with a number of existing residences, and vacant lots zoned



for potential noise sensitive use, located in this direction with access via McDonalds Corner Road, 10th Concession Road, 11th Concession Road Dalhousie, Camerons Place and Highland Line Road. The closest existing residences and potential future residences, on vacant land zoned RU and LSR, in this direction have been selected as noise sensitive receptors in the following assessment.

To the east of the site the land is zoned Mineral Aggregate Resources Pit (MXP) and Limited Services Rural (LSR). An existing licensed pit on land zoned MXP and a small number of residences and seasonal hunt camps, fronting Barbers Lake with access via Leo Jay Road, exist in this direction. The closest existing residences and seasonal hunt camps in this direction have been selected as noise sensitive receptors in the following assessment.

To the south of the site the land is zoned Rural (RU) and Limited Services Rural (LSR). An existing residence and a vacant lot zoned for potential noise sensitive use lie in this direction with access via Anderson Lane and Concession Road 11 Dalhousie respectively. The closest existing residence and vacant lot zoned for potential noise sensitive use in this direction have been selected as noise sensitive receptors in the following assessment.

To the west of the site the land is zoned Rural (RU) with pockets of Mineral Aggregate Resources Reserve – Holding Zone (MAR-h). A small number of residences exist in this direction fronting Highland Line Road. In addition, Wheelers Pancake House and Sugar Camp (camp) lie in this direction, while primarily a restaurant and day camp for school tours, also provides opportunities for accommodation in the historic farmhouse. As such the closest existing residence and camp in this direction have been selected as noise sensitive receptors in the following assessment.

Where receptors have been located on vacant land zoned for potential noise sensitive use 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.

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

Table 1 lists the noise sensitive receptors selected for analysis.

2.0 Facility Description

The proposed Highland Line Pit will produce various grades of sand and aggregate with an annual production limit of 500,000 tonnes per year.

The site is divided into an east extraction area (Extraction Area 1) and west extraction area (Extraction Area 2) by Anderson Lane as shown on Figure 1 and 2.

Excavated raw material will be extracted in each extraction area by excavators and loaders which transport the raw material to a screening plant located near the lift face. After screening processed sand is stockpiled using conveyors and stackers. A loader or excavator then loads the processed sand from stockpiles onto highway trucks which are used to deliver the product off-site. The screening plant has a maximum throughput capacity of 200 tonnes per hour.

At certain times a wash plant may be used in place of the mobile screening plant to process raw material. The wash plant has a maximum throughput capacity of 200 tonnes per hour.

The larger stones and rocks which are separated by the screening plant or wash plant will be stockpiled before being transferred to a mobile crushing plant which is brought to site as needed. After crushing, processed aggregate will be stockpiled using conveyors and stackers. A loader or excavator then loads the processed aggregate from stockpiles onto highway trucks which are used to deliver the product off-site.

Additional material may be brought on site as needed, stored and processed, before being shipped off site.

Extraction of the pit will take place in a number of lifts up to 20 m in height, possibly in benches.

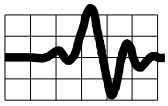
The existing ground elevation and pit floor of the first lift down in each extraction area will be at an approximate elevation of 188 mASL. The ground water table lies at an approximate elevation of 186 mASL.

Extraction will commence in the north of each extraction area in the area adjacent to Highland Line Road near the site entries as shown on Figure 2 and proceed to the setback limits in a south, east and west direction in each extraction area.

Access for shipping processed sand and aggregate, in each extraction area, is from the site entrances off Highland Line Road as shown in Figure 2.

The following equipment will be operated on-site and is included in this assessment as significant sources of noise:

- One mobile screening plant, with associated conveyors and stackers,
- One wash plant, with associated conveyors, stackers and diesel generator,
- One mobile crushing plant, brought to site occasionally, when required,



- Up to six loaders or excavators,
- Highway trucks used to ship the product off site,
- Portable equipment for site preparation and rehabilitation, including excavators, hydraulic shovels, dozers and scrapers.

A description of each operation follows:

Mobile Screening Plant

A mobile screening plant (mobile screener) will be brought to site as needed and located near the extraction face. The mobile screener consists of a hopper (feed bin), screen deck, diesel engine, magnetic separator and conveyors. Overburden, soil, sand and aggregate are fed through the screening plant to produce various grades of product before being stockpiled, using stackers and conveyors, and processed for shipping off site. Oversized aggregates separated in the screening process are stockpiled before being taken to the mobile crushing plant for further processing. Typically, two loaders and two excavators are used to extract material from the lift face to feed the screening plant and fill trucks from the stockpiles for shipment off-site.

The mobile screening plant operates only during daytime hours (07:00 – 19:00).

Wash Plant

A wash plant is used to process extracted sand and separate it into various grades of aggregate. The major components of the wash plant include a hopper (feed bin), dry screen deck, a wet screen deck, a classifier, two double screw material washers, a dewatering derrick and conveyors and stackers. Typically, associated operations include loaders used to supply raw material to the plant and to load trucks from stockpiles for delivery off-site and a diesel generator used to provide power to the plant.

The wash plant operates only during daytime hours (07:00 – 19:00).

Mobile Crushing Plant

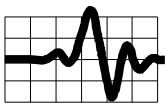
A mobile crushing plant (crusher) is brought to site as needed and located in each extraction area in location shown on Figure 2. The plant consists of a hopper (feed bin), primary and secondary crushing units, a diesel engine, vibrating screens, a magnetic separator and conveyors. Typically, associated operations include one loader and excavator.

The mobile crushing plant operates only during daytime hours (07:00 – 19:00).

Loaders and Excavators

Typically, loaders and excavators are required on-site for the following:

- Extracting raw material from the extraction face,
- Loading extracted material onto trucks for delivery to the mobile crushing plant,
- Loading sand from stockpiles into the hoppers to feed the mobile screening plant,
- Loading processed sand and aggregate on to trucks for shipping off-site,
- Generally pushing around rock and aggregate to maintain the site in a safe state,



- Removing overburden and site preparation,

The loaders and excavators operate only during daytime hours (07:00 – 19:00).

Highway Trucks

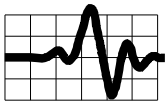
Highway trucks are used for shipping processed sand and aggregate off site and as needed to deliver oversized material separated in the screening process to stockpiles located near the mobile crushing plant in each extraction area. Based on the annual tonnage it is assumed 15 loads per hour in total are shipped off-site from the screening plant, wash plant and / or mobile crushing plant during periods of maximum capacity during the proposed daytime period of operation. The speed limit for trucks on site is 30 km/h. The use of jake brakes (compression assisted brakes) is forbidden on site.

Trucks used for shipping and delivery of product and the associated on-site truck movements take place only during daytime hours (07:00 – 19:00).

Portable equipment for site preparations and rehabilitation

Portable construction equipment will be used occasionally for site preparation (e.g. land clearing and construction of berms) and rehabilitation. This equipment would typically include excavators, hydraulic shovels, dozers and scrapers. To minimize the impact of noise during site preparation and rehabilitation, the construction equipment used, excavators, bulldozers, etc., will comply with MECP Publication NPC-115,[5] Construction Equipment, August 1978. This publication gives noise standards to be met by construction equipment in Ontario.

Site preparation and rehabilitation activities will take place only during daytime hours (07:00 – 19:00).



Hours of Operation

Daytime Operations (07:00 – 19:00) - During the daytime period, all significant noise sources are assumed to be in operation and include the following:

- One Mobile Screening Plant,
- One Wash Plant,
- One Mobile Crushing plant,
- Up to six loaders or excavators carrying out extraction, stockpiling and loading operations,
- On-site truck movements used to deliver material to the mobile crushing plant and ship processed product off-site.

Evening and Nighttime Operations (19:00 – 07:00) – During the evening and nighttime period the pit does not operate.

3.0 Noise Source Summary

The following noise sources have been used to model noise generated by operations at the Highland Line Pit. 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 2.

- One Mobile Screening Plant (Source: Screener),
- One Wash Plant (Source: Washplant),
- One diesel generator used to provide power to the wash plant (Source: Generator),
- One Mobile Crushing Plant (Source: Crusher),
- Three Loaders (Source: Loader_1, Loader_2 and Loader_3)
- Three Excavators (Source: Excavator_1, Excavator _2 and Excavator _3)
- On-site truck movements (Source: IHR_1 and IHR_2).

The noise modelling considers various scenarios relating to different areas of operation as described in Section 6.0. For each scenario, the locations of the noise sources are selected for worst case noise impacts.

The strengths of the noise sources, i.e. the sound powers shown in Table 2 and used in this analysis, are taken from noise measurements of the mobile screening plant in operation at the Cavanagh Pine Grove Pit in October 2019, the wash plant in operation at Cavanagh Lanark Quarry in August 2020 and from a database of noise measurements by Freefield Ltd. of similar operations made at other aggregate operations in Ontario.

A Brüel & Kjær Type 2270 sound level meter was used for all noise measurements. 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.

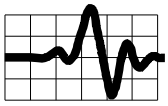
The weather conditions during the measurements were suitable for outdoor noise measurements (variable winds of less than 20 km/h, skies generally clear with relatively low humidity). A windshield was used during noise measurements.

Noise from the highway trucks, and associated on-site haul routes, are estimated using the moving point source method and modelled as a loop indicating the worst-case on-site truck movements.

Insignificant noise sources:

Conveyors, stackers and noise from employee or service vehicles have been assessed as insignificant noise sources in this analysis.

Refer to Figures 3, 5, 7, 9, 11, 13, 15, 17, 19 and 21 for locations of sources for the worst-case modes of operation analysed.



4.0 Point of Reception Summary

A total of fifteen nearby noise sensitive receptors have been selected for detailed noise evaluation.

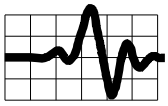
These existing and potential future residences on vacant land zoned for potential noise sensitive use are those closest to the proposed pit in all directions and represent the worst-case noise impacts in comparison to other nearby or more distant noise sensitive receptors.

The fifteen points of reception selected for analysis, POR 1 to POR 15, 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 noise sensitive receptor 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 use i.e. a possible future residence located on land zoned rural, the location selected for assessment are 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], 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.'

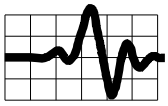
Due to the relatively low levels of road traffic along Highland Line Road and other nearby roads the area in which all receptors are located is classified as Class 3 Area.

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.

A background noise assessment was not carried out, hence, the levels given in the Tables 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 3 Area.

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.



6.0 Impact Assessment

Noise levels have been predicted at the noise sensitive receptors using "predictable worst case" assumptions under normal operations and using ISO 9613-2 sound propagation methodology[6] as implemented in the sound prediction software Cadna-A, Version 2025. 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, ten operational scenarios have been modeled. In general, the worst impacts are those which occur when all equipment is operating concurrently.

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

*Scenario 1: Worst Case, **Extraction Area 1** – Crushing Plant and Screening Plant in operation concurrently with extraction occurring closest to POR 1 & 12 (Day only) – Figure 3 and 4.*

*Scenario 2: Worst Case, **Extraction Area 1** - Crushing Plant and Screening Plant in operation concurrently with extraction occurring closest to POR 5 (Day only) – Figure 5 and 6.*

*Scenario 3: Worst Case, **Extraction Area 2** - Crushing Plant and Screening Plant in operation concurrently with extraction occurring closest to POR 6 & 7 (Day only) – Figure 7 and 8.*

*Scenario 4: Worst Case, **Extraction Area 2** - Crushing Plant and Screening Plant in operation concurrently with extraction occurring closest to POR 8 & 13 (Day only) – Figure 9 and 10.*

*Scenario 5: Worst Case, **Extraction Area 1** – Crushing Plant and Wash Plant in operation concurrently with extraction occurring closest to POR 1 & 12 (Day only) – Figure 11 and 12.*

*Scenario 6: Worst Case, **Extraction Area 1** - Crushing Plant and Wash Plant in operation concurrently with extraction occurring closest to POR 5 (Day only) – Figure 13 and 14.*

*Scenario 7: Worst Case, **Extraction Area 2** - Crushing Plant and Wash Plant in operation concurrently with extraction occurring closest to POR 6 & 7 (Day only) – Figure 15 and 16.*

*Scenario 8: Worst Case, **Extraction Area 2** - Crushing Plant and Wash Plant in operation concurrently with extraction occurring closest to POR 8 & 13 (Day only) – Figure 17 and 18.*

*Scenario 9: Worst Case, **Extraction Area 1** – Crushing Plant and Screening Plant in operation concurrently with extraction occurring closest to POR 2, 3, 4, 14 & 15 (Day only) – Figure 19 and 20.*

*Scenario 10: Worst Case, **Extraction Area 1** – Crushing Plant and Wash Plant in operation concurrently with extraction occurring closest to POR 2, 3, 4, 14 & 15 (Day only) – Figure 21 and 22.*

In Table 6.1 and 6.2, estimated noise levels at the nearest receptors for the worst-case scenarios, before and after mitigation, are compared with the applicable sound level limits. More detailed estimates, for all sources and scenarios, are contained in the Point of Reception Noise Impact Tables in Appendix 2, Tables A2.7.1 to A2.7.10 and Table A2.8.

It can be seen that the sound level limits are met at all noise sensitive points of reception, POR 1 to POR 15, for worst case operating conditions during the proposed daytime period of operation 7 am to 7 pm (07:00 to 19:00).

Details of acoustic modeling are provided in Appendix 2. Figures 4, 6, 8, 10, 12, 14, 16, 18, 20 and 22 show predicted noise contours, after mitigation, for each mode of operation analyzed.

Statement of Compliance

It is concluded that, with the recommended mitigation measures detailed in section 7.0, noise impacts from operations at the Highland Line Pit will be in compliance with MECP Environmental Noise Guidelines[1] for the proposed daytime period of operation 7 am to 7 pm (07:00 to 19:00).

7.0 Mitigation Measures (Site Plan Recommendations)

Noise mitigation measures for the Highland Line Pit operations are detailed below.

The predicted noise impacts in Tables A2.7.1 to A2.7.10 are based on the implementation of the following mitigation measures:

7.1 Noise Barriers and Berms:

7.1.1 Noise barriers and berms are to be provided as per Table 7 and Figure 23, 24, 25, 26 and 27

7.1.2 Noise barriers and berms are to be solid, having no gaps, and are to have a surface density of no less than 20 kg/m2. Examples of suitable barriers or berms are as follow:

- 7.1.2.1 Lift face or existing terrain;
- 7.1.2.2 Earth, gravel or aggregate berms or stockpiles;
- 7.1.2.3 Concrete or brick walls;
- 7.1.2.4 Commercial noise barriers;
- 7.1.2.5 Shipping containers or buildings,
- 7.1.2.6 A portable barrier such as a truck trailer equipped with movable flaps to block the space between the ground and the bottom of the trailer and increase height if required.

7.1.3 Noise barriers shielding portable equipment may be progressively established to provide shielding from location of operation to the identified noise sensitive point of reception (POR).

7.2 Mobile Screening Plant

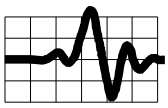
7.2.1 The operation of the mobile screening plant (screener) shall take place only during the daytime period (07:00 to 19:00) and shall comply with the following:

- 7.2.1.1 The screener is to be located on the pit floor at a maximum elevation of 188 mASL.
- 7.2.1.2 Noise barriers are to be provided as per Table 7 and Figure 24.

7.3 Wash Plant

7.3.1 The operation of the wash plant and associated diesel generator shall take place only during the daytime period (07:00 to 19:00) and shall comply with the following:

- 7.3.1.1 The wash plant is to be located on the pit floor at a maximum elevation of 188 mASL in locations shown in Figure 2.
- 7.3.1.2 Noise barriers are to be provided as per Table 7 and Figure 25.
- 7.3.1.3 The generator is to be housed inside a trailer and fitted with an exhaust silencer that meets the minimum insertion loss requirements listed in Table 8. The silencer is to be located inside the trailer or as close as possible to the location where the exhaust exits the trailer with the duct material between the silencer and the generator constructed of 16-gauge weather resistant metal. The silencers shall have a high transmission loss casing.
- 7.3.1.4 Item 7.2.1.3 above does not apply if hydro is used to provide power to the plant.



7.4 Mobile Crushing Plant

7.4.1 The operation of the mobile crushing plant (crusher) shall take place only during the daytime period (07:00 to 19:00) and shall comply with the following:

7.4.1.1 The crusher is to be located on the pit floor at a maximum elevation of 188 mASL in locations shown in Figure 2.

7.4.1.2 Noise barriers are to be provided as per Table 7 and Figure 26 and 27.

7.5 Loaders and Excavators

7.5.1 The operation of the loaders and excavators shall take place only during the daytime period (07:00 – 19:00), anywhere in the extraction area, and shall comply with the following:

7.5.1.1 A maximum of six (6) loaders or excavators may be in operation carrying out extraction, stockpiling and loading operations concurrently with other pit operations.

7.6 Highway Trucks

7.6.1 The loading and shipping of product using highway trucks shall take place only during the daytime period (07:00 – 19:00), and shall comply with the following:

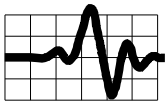
7.6.1.1 When operating on-site, highway trucks shall not exceed 30 km/h and shall not use compression braking (Jake Brakes).

7.7 Portable construction equipment

7.7.1 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).

7.8 New Process

7.8.1 If a new process is introduced to the site that is not currently included in the site plan, then this 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 and the site plan shall be amended as required by the MNR.



8.0 Conclusions

An acoustic assessment of operations at the Proposed Highland Line Pit has been conducted according to MECP noise assessment procedures. Operations include extraction by loaders or excavators, aggregate processing operations by a mobile screening plant, a wash plant and a mobile crushing plant, loading processed sand and aggregate from stockpiles using loaders or excavators, and delivery and shipping of product using highway trucks.

It has been found that noise levels from the operations at nearby receptors are in compliance with MECP sound level limits as set out in publication NPC-300[1], provided that the noise mitigation measures described in Section 7.0 of this report are followed.

Professional Engineers Ontario 5th September 2025

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

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, *Sample Application Package, Basic Comprehensive Certificate of Approval (Air and Noise)*, July 2009.

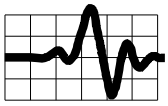
3. Ministry of Environment, Conservation and Parks Publication NPC-206, *Sound Levels due to Road Traffic,* October 1995.

4. Ministry of Environment, Conservation and Parks, Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT), 1989.

5. Ministry of Environment, Conservation and Parks, STAMSON Software, Version 5.03, 1996. (Software implementation of reference 4).

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

7. Jade Acoustics, *Re: Acoustic Assessment Peer Review Highland Line Pit Part of Lot 5, Concession 10 Lanark Highland Township, Lanark County, Ontario, Pit Licence Number 626599, Our File: 25-016*, 14 April 2025.



TABLES

Table 1: Point of Reception Summary Table*

Point of Reception	Location*
POR 1	Residence 626 Highland Line Road (2 storey)
POR 2	Hunting Camp 273 Leo Jay Road (1 storey)
POR 3	Residence 255 Leo Jay Road (2 storey)
POR 4	Residence 229 Leo Jay Road (1 storey) (also represents houses further east on Leo Jay Road)
POR 5	Residence 137 Anderson Lane (2 storey)
POR 6	Vacant Lot to the South via Concession Road 11 Dalhousie (2 storey)
POR 7	Wheelers Pancake House and Sugar Camp 1001 Highland Line Road (2 storey)
POR 8	Residence 1025 Highland Line Road (1.5 storey)
POR 9	Residence 804 Concession Road 11 Dalhousie (2 storey) (Also represents residence at 811 Concession Road 11)
POR 10	Residence 805 Concession Road 10 Dalhousie (2 storey) (Also represents residence at 811 Concession Road 11 Dalhousie)
POR 11	Residence 102 Camerons Road (2 storey)
POR 12	Vacant Lot 610 Highland Line Road (2 storey)
POR 13	Vacant Lot to the North Concession Road 11 Dalhousie (2 storey)

* For assessment purposes, points of reception, (POR), have been taken as upper floor windows (2 m above grade for single storey and 4.5 m above grade to represent two storey residences) and Outdoor Point of Reception (30 m from residence, 1.5 m above grade) in acoustic calculations. POR's located on vacant land have been assessed at 2 stories in height.

Table 2: Noise Source Summary Table

Source ID	Source Description	Sound Power (dBA)	Source Location Ht. above ground* (m)	Sound Character-istics	Noise Control Measures
Screener	Mobile Screening Plant	111.0	3.0	Steady, no significant tonality, non-directional	Refer Section 7.0
Wash Plant	Wash Plant	109.9	4.3	Steady, non-tonal, non-directional	As noted in section 7.0
Generator	Generator	108.5**	4	Steady, non-tonal, non-directional	As noted in section 7.0
Crusher	Mobile Crushing Plant	120.0	3.0	Steady, no significant tonality, non-directional	Refer Section 7.0
Loader_1 Loader_2 Loader_3	Loaders used for loading trucks or feeding the screener or crusher (CAT982M or similar)	103	2.5	Steady, moving, no significant tonality, non-directional	Refer Section 7.0
Excavator_1 Excavator _2 Excavator_3	Excavators for extraction or loading the screener or crusher (CAT345DL or similar)	103.2	2.5	Steady, moving, no significant tonality, non-directional	Refer Section 7.0
IHR_1 IHR_2	On-site truck movements for shipping	110.1	2.5	Steady, moving, no significant tonality, non-directional	Refer Section 7.0

*Height measured from finished grade at location of equipment operation.
**Includes attenuation provided by silencer as noted in Table 8.

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 Daytime Period (07:00 – 19:00)

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	45	40	40
POR_1_OPR	45	40	-
POR_2_POW	45	40	40
POR_2_OPR	45	40	-
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	45	40	40
POR_8_OPR	45	40	-
POR_9_POW	45	40	40
POR_9_OPR	45	40	-
POR_10_POW	45	40	40
POR_10_OPR	45	40	-
POR_11_POW	45	40	40
POR_11_OPR	45	40	-
POR_12_POW	45	40	40
POR_12_OPR	45	40	-
POR_13_POW	45	40	40
POR_13_OPR	45	40	-

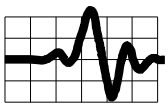
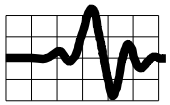


Table 6.1: Acoustic Assessment Summary Table, Worst Case, Daytime Period of Operation, 7 am to 7 pm (07:00 - 19:00) – Before Mitigation

Point of Reception ID	Location	Scenario 1 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 2 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 3 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 4 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 5 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 6 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 7 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 8 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 9 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 10 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Performance Limit* Day-time Period (dBA)	Compliance with Performance Limit (Yes / No)
POR 1	POW	52	50.6	40.8	40.9	51.6	51.3	46.5	46.5	50.5	51.2	45	No
	OPR	51.4	49.2	40.1	40.2	51	50.5	46.5	46.5	49.5	50.5	45	No
POR 2	POW	44	44.2	39.5	39.4	44.8	44.8	42.1	42	44.2	44.8	45	Yes
	OPR	47.5	47.9	42.1	42.1	48.2	48.3	44.8	44.8	47.9	48.3	45	No
POR 3	POW	45.5	50.6	44.8	45	45.6	50	45	45	49.6	49.6	45	No
	OPR	42	46.6	37.8	37.7	42.1	46	38	38	45.5	45.6	45	No
POR 4	POW	44.7	50.1	40.5	40.5	44.8	49.5	40.5	40.5	49.3	49.3	45	No
	OPR	44.5	49.6	40.2	40.2	44.5	49	40.1	40.1	48.7	48.7	45	No
POR 5	POW	46.2	50.9	39.5	39.9	46.8	51.3	44.1	44.2	50.8	51.3	45	No
	OPR	42.8	49.3	42.9	43.3	42.9	49.3	43.4	43.5	49.2	49.2	45	No
POR 6	POW	30.5	28.6	37.7	38.1	31	30.6	38	38	30.2	31	45	Yes
	OPR	29.1	27.4	36.1	36.4	29.8	29.4	36.4	36.4	28.7	29.7	45	Yes
POR 7	POW	36.3	36.3	37.7	37.6	36.4	36.4	37.9	37.8	36.3	36.4	45	Yes
	OPR	30.5	29.8	34.2	34	30.9	30.7	34.5	34.4	30.6	30.9	45	Yes
POR 8	POW	41.4	41.6	46.5	46.5	41.5	41.5	46.5	46.4	41.4	41.5	45	No
	OPR	40.7	40.8	46.1	46.1	40.8	40.8	46.1	46.1	40.7	40.8	45	No
POR 9	POW	34.6	33.4	35.1	35.3	34.9	34.6	35.9	35.9	33.4	34.6	45	Yes
	OPR	33.5	32.5	34.6	34.5	33.9	33.6	35.1	35.1	32.5	33.6	45	Yes



Point of Reception ID	Location	Scenario 1 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 2 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 3 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 4 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 5 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 6 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 7 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 8 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 9 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 10 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Performance Limit* Day-time Period (dBA)	Compliance with Performance Limit (Yes / No)
POR 10	POW	26.5	16.9	0.8	0	27.2	25.9	25.4	25.4	18.1	26	45	Yes
	OPR	25.4	15.5	12.3	4.7	26.4	25.2	25	24.8	16.9	25.3	45	Yes
POR 11	POW	35.8	33.8	-**	-**	36.3	36	31.9	31.9	35.5	36.2	45	Yes
	OPR	33.9	33.4	-**	-**	34.1	34.1	27.5	27.5	33.8	34.2	45	Yes
POR 12	POW	47.2	44.2	42.5	42.1	47.9	47.2	46.5	46.4	46.3	47.7	45	No
	OPR	46.5	43.7	41.7	41.5	47.3	46.7	45.9	45.9	45.4	47	45	No
POR 13	POW	38.1	38.1	40.7	40.4	38.7	38.8	41	40.9	38	38.7	45	Yes
	OPR	37.2	37.3	40.1	39.7	37.6	37.7	40.2	40.1	37.2	37.6	45	Yes
POR 14	POW	26.3	19.6	-**	-**	27.8	26.9	26.1	26.1	27.8	28.1	45	Yes
	OPR	25.3	24.7	-**	-**	27.1	26.7	25.7	25.7	26.8	27.5	45	Yes
POR 15	POW	25.4	24.1	-**	-**	26.3	25.7	24.5	24.5	26.6	26.7	45	Yes
	OPR	26	24.8	-**	-**	27	26.8	25.4	25.4	26.8	27.4	45	Yes

*Performance limits are based on 1-hour equivalent sound levels, Leq.
**Noise impacts insignificant.

Table 6.2: Acoustic Assessment Summary Table, Worst Case, Daytime Period of Operation, 7 am to 7 pm (07:00 - 19:00) – After Mitigation

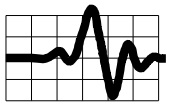
Point of Reception ID	Location	Scenario 1 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 2 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 3 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 4 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 5 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 6 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 7 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 8 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 9 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 10 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Performance Limit* Day-time Period (dBA)	Compliance with Performance Limit (Yes / No)
POR 1	POW	42.9	42.2	40.7	40.8	44	43.9	43.8	43.8	44.2	44.3	45	Yes
	OPR	41.7	39.5	39	39.1	43.2	42.9	43.1	43.2	43.1	43.5	45	Yes
POR 2	POW	39.9	40.4	39.4	39.4	40.5	40.7	40.9	40.9	40.4	40.6	45	Yes
	OPR	41.8	41.7	39	38.9	42.4	42.8	41.7	41.7	43.1	42.9	45	Yes
POR 3	POW	39.1	43.9	40.7	41.1	39.5	43.5	41	41.1	41.6	41.6	45	Yes
	OPR	34.3	40.3	37.7	37.7	34.4	39.5	37.7	37.7	37.5	37.4	45	Yes
POR 4	POW	37.2	42.7	40.4	40.5	37.5	41.9	40.4	40.4	40.3	40.3	45	Yes
	OPR	36.9	42.7	40.1	40.1	36.7	41.8	40	40	39.8	39.8	45	Yes
POR 5	POW	43.8	41.9	36.7	37.5	44	42.9	40.7	40.7	43.1	43.9	45	Yes
	OPR	40.5	40.8	38.3	39.2	40.5	40.4	39	39.3	41.4	41.4	45	Yes
POR 6	POW	30.5	28.4	37.7	38.1	31	30.5	38	38	30.1	31	45	Yes
	OPR	29.1	27.3	36.1	36.4	29.6	29.2	36.3	36.4	28.6	29.6	45	Yes
POR 7	POW	36.3	36.3	37.7	37.6	36.4	36.4	37.9	37.8	36.3	36.4	45	Yes
	OPR	30.5	29.8	34.2	34	30.9	30.7	34.5	34.4	30.6	30.9	45	Yes
POR 8	POW	41.3	41.5	44.3	44.3	41.4	41.5	44.3	44.3	41.4	41.4	45	Yes
	OPR	40.6	40.7	42.9	42.9	40.7	40.8	42.9	42.9	40.7	40.8	45	Yes
POR 9	POW	34	33.4	35.1	35.3	34.2	34	35.5	35.5	33.4	34	45	Yes
	OPR	33.1	32.5	34.6	34.5	33.3	33.1	34.7	34.7	32.5	33.1	45	Yes

Point of Reception ID	Location	Scenario 1 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 2 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 3 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 4 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 5 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 6 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 7 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 8 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 9 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Scenario 10 Estimated Sound Level Daytime Period (Worst Case) (dBA)	Performance Limit* Day-time Period (dBA)	Compliance with Performance Limit (Yes / No)
POR 10	POW	26	16.9	0.8	0	27	25.9	25.4	25.4	18.1	26	45	Yes
	OPR	24.7	15.5	12.3	4.7	26.2	25.2	25	24.8	16.8	25.3	45	Yes
POR 11	POW	32.1	30.2	-**	-**	32.6	32.2	28.1	28.1	32.2	32.7	45	Yes
	OPR	31.2	30.8	-**	-**	31.9	32	27.5	27.5	31.6	32.2	45	Yes
POR 12	POW	41.9	40.8	42.5	42.1	43.3	43.1	44.3	44.2	42	43.4	45	Yes
	OPR	41.1	40	41.7	41.5	43.1	42.9	44	43.9	41.3	43.1	45	Yes
POR 13	POW	38.1	38.1	40.7	40.4	38.2	38.2	40.7	40.6	38	38.2	45	Yes
	OPR	37.2	37.3	40.1	39.7	37.4	37.5	40	39.9	37.2	37.4	45	Yes
POR 14	POW	26.6	19.2	-**	-**	27.3	26.3	25.5	25.5	27.8	27.7	45	Yes
	OPR	25.5	24.5	-**	-**	26.7	26.2	25	25	26.8	27	45	Yes
POR 15	POW	25.3	23.8	-**	-**	26.1	25.4	24.3	24.3	26.6	26.6	45	Yes
	OPR	25.9	24.5	-**	-**	26.8	26.4	25	25	26.8	27.1	45	Yes

*Performance limits are based on 1-hour equivalent sound levels, Leq.
**Noise impacts insignificant.

Table 7: Recommended Noise Barriers

Barrier	Minimum Height (m / mASL)	Minimum Length (m)	Maximum Distance from Source (m)	Location	Required to shield Line of Sight from Identified Source ID	Required to shield Line of Sight to Identified Receptor/s	Description
Barrier_1 (Site berm)	196 mASL	Up to 100 m	-	As per: Figure 25	Mobile Screening Plant and extraction operations occurring in Extraction Area 1 East of Line AA	POR_12*	New barrier (berm / lift face): Required to shield noise impacts to the identified receptors when operating in Extraction Area 1 East of Line AA (Only required following development of a new noise sensitive development at POR 12)
Barrier_2 (Site berm)	196 mASL	Up to 400 m	-	As per: Figure 25	Mobile Screening Plant and extraction operations occurring in Extraction Area 1 East of Line AA	POR_1 POR_2 POR_3 POR_4	New barrier (berm / lift face): Required to shield noise impacts to the identified receptors when operating in Extraction Area 1 East of Line AA
Barrier_3 (Site berm)	3 m	Up to 285 m	-	As per: Figure 25	Mobile Screening Plant and extraction operations occurring in Extraction Area 1 South of Line BB	POR_5	New barrier (berm): Required to shield noise impacts at the identified receptor when operating in Extraction Area 1 South of Line BB
Barrier_SP1 (Stockpile)	4 m	10 m	20 m	As per: Figure 26	Screener when operating in Extraction Area 1	POR_5	New barrier (stockpile): Required to be maintained to shield noise impacts at the identified receptors when operating greater than 20 m from a lift face or site berm that otherwise shields in the direction of the identified receptors
Barrier_WP1 (Stockpile)	7 m	20 m	25 m	As per: Figure 27	Wash Plant and associated generator when operating in Extraction Area 1	POR_2	New barrier (stockpile): Required to be maintained to shield noise impacts at the identified receptor



Barrier	Minimum Height (m / mASL)	Minimum Length (m)	Maximum Distance from Source (m)	Location	Required to shield Line of Sight from Identified Source ID	Required to shield Line of Sight to Identified Receptor/s	Description
Barrier_WP2 (Stockpile)	6 m	30 m	25 m	As per: Figure 27	Wash Plant and associated generator when operating in Extraction Area 1	POR_5	New barrier (stockpile): Required to be maintained to shield noise impacts at the identified receptor
Barrier_CP1 (Stockpile)	10 m	47 m (55 m)*	20 m	As per: Figure 28	Crusher when operating in Extraction Area 1	POR_1 POR_2 POR_3 POR_5 POR_12*	New barrier (stockpile): Required to be maintained to shield noise impacts at the identified receptor. Required to be extended to minimum 55 m in length following development of a new noise sensitive development at POR 12.
Barrier_CP2 (Stockpile)	6 m	20 m	25 m	As per: Figure 29	Crusher when operating in Extraction Area 2	POR_8	New barrier (stockpile): Required to be maintained to shield noise impacts at the identified receptor
Barrier_CP3 (Stockpile)	6 m	30 m	25 m	As per: Figure 29	Crusher when operating in Extraction Area 2	POR_1 POR_2 POR_3 POR_4 POR_5	New barrier (stockpile): Required to be maintained to shield noise impacts at the identified receptor

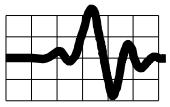
*Shielding of receptors representing vacant lots only required following development of a new noise sensitive development.

Table 8: 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 generator exhaust[2] (Source: Generator)	10	30	38	30	25	20	20	20	24

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 Silex Silencer Model JB 6. Refer manufacturers data Appendix 4.



FIGURES

Figure 1: Scaled Area Location Plan showing Receptor Locations

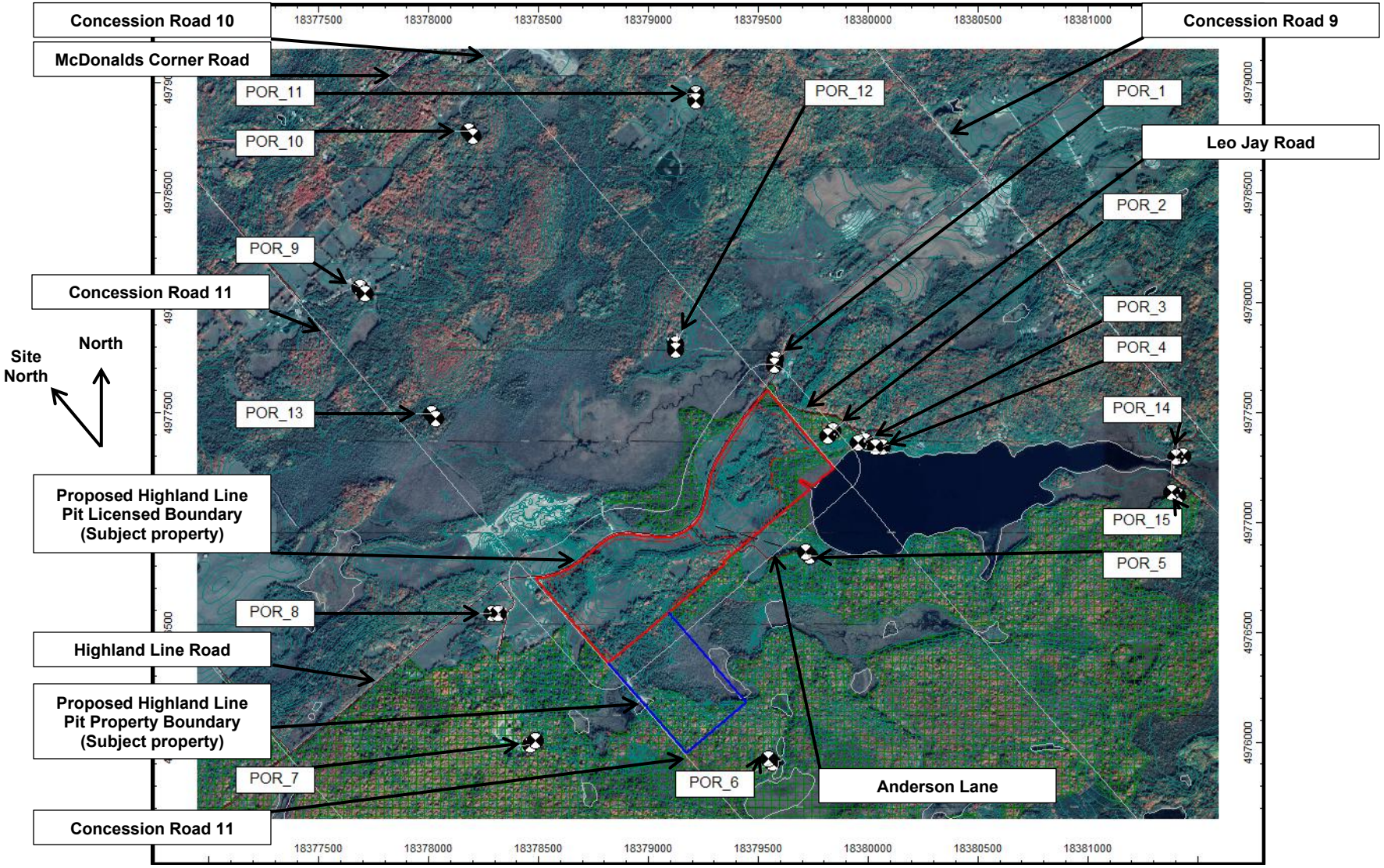


Figure 2: **Detail Site Layout & Surface Elevation Contours** (elevation contours based on Land Information Ontario (LIO), Provincial Digital Elevation Model, at 2-meter intervals)

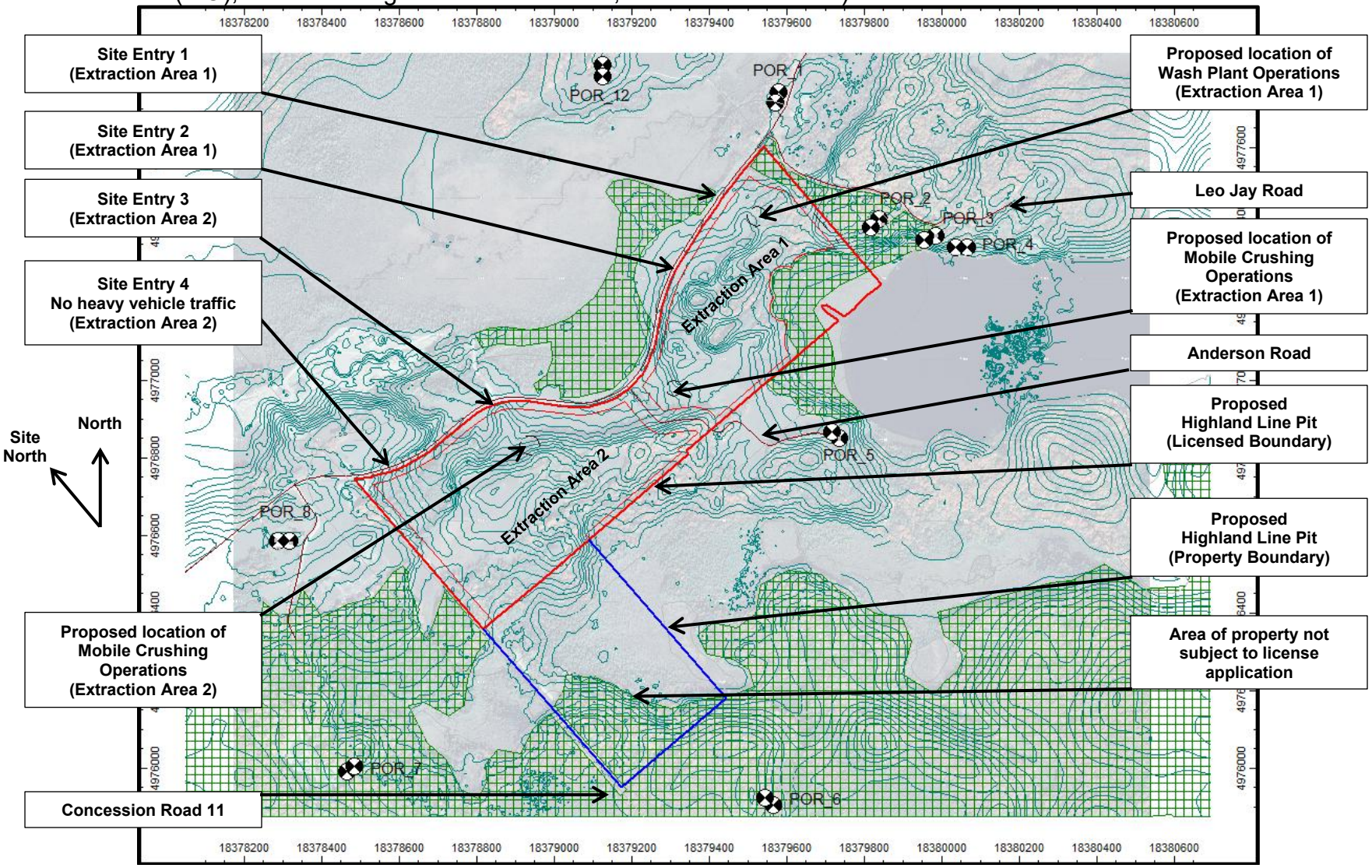


Figure 3: Scenario 1: Worst Case, Extraction Area 1 – Crushing Plant and Screening Plant in operation concurrently with extraction occurring closest to POR 1 & 12 (Day only)

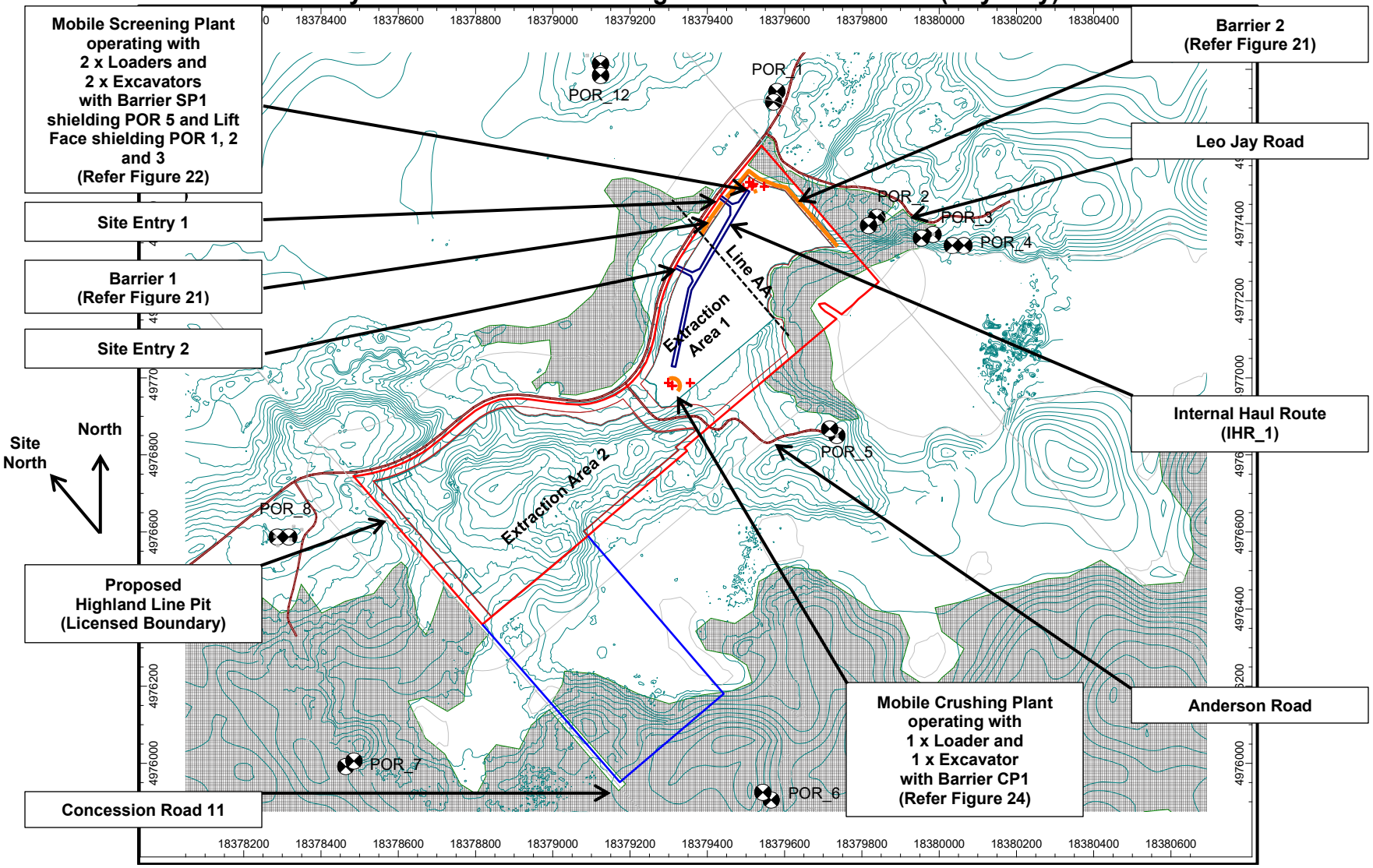


Figure 4: Prediction Results, Scenario 1 - Day only (07:00 to 19:00): Noise Contours, (Noise levels at 4.5 m) – After Mitigation

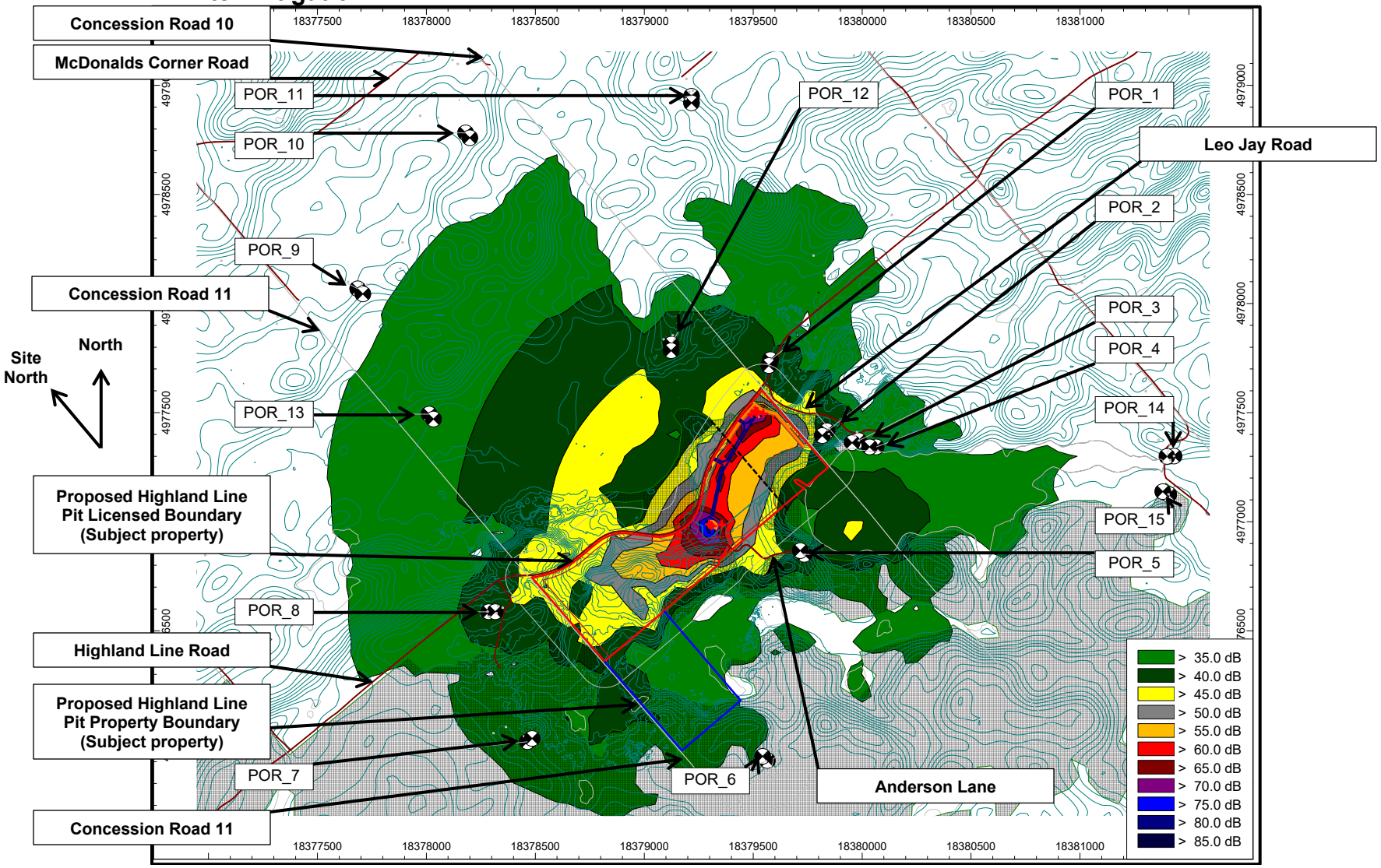


Figure 5: Scenario 2: Worst Case, Extraction Area 1 - Crushing Plant and Screening Plant in operation concurrently with extraction occurring closest to POR 5 – (Day only)

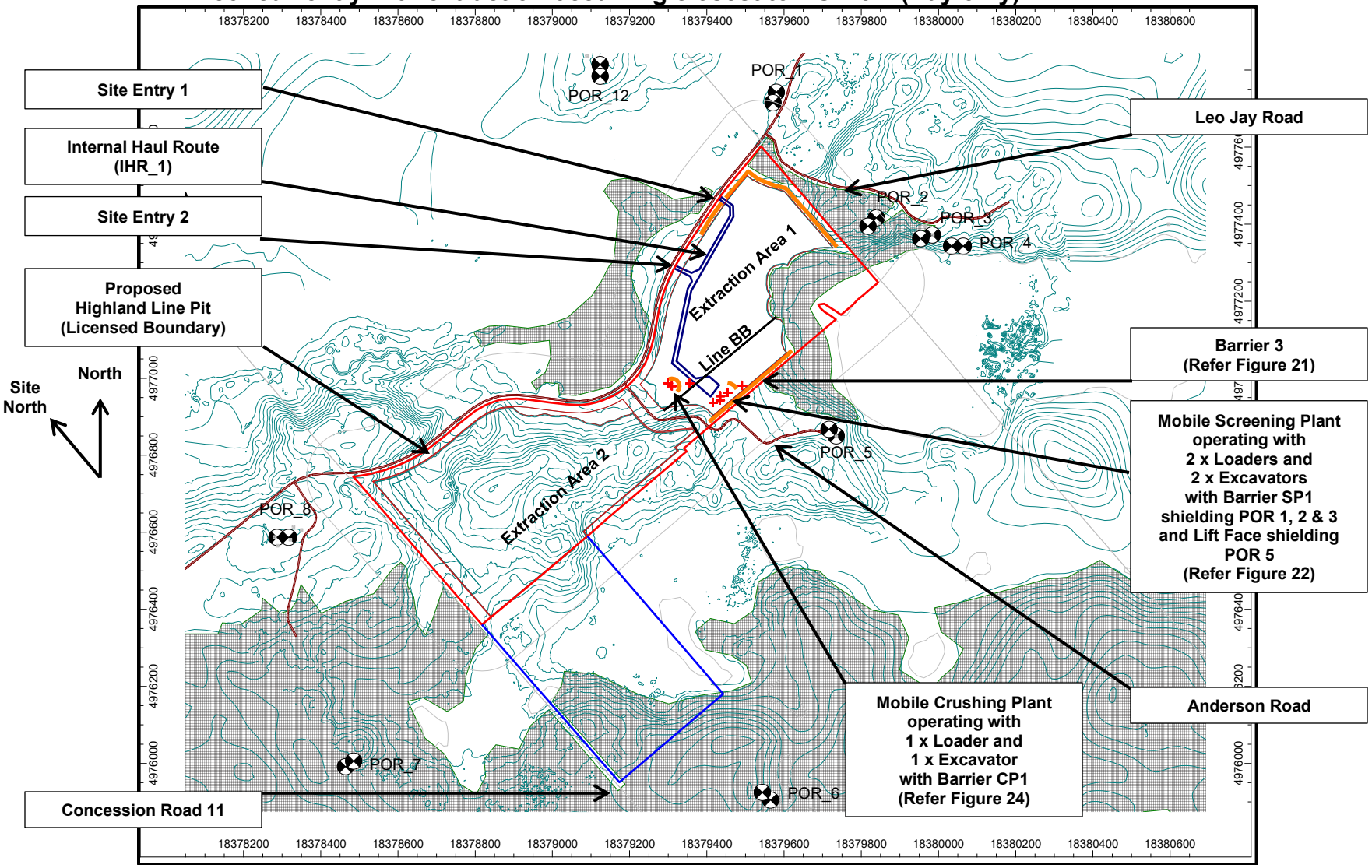


Figure 6: Prediction Results, Scenario 2 - Day only (07:00 to 19:00): Noise Contours, (Noise levels at 4.5 m) – After Mitigation

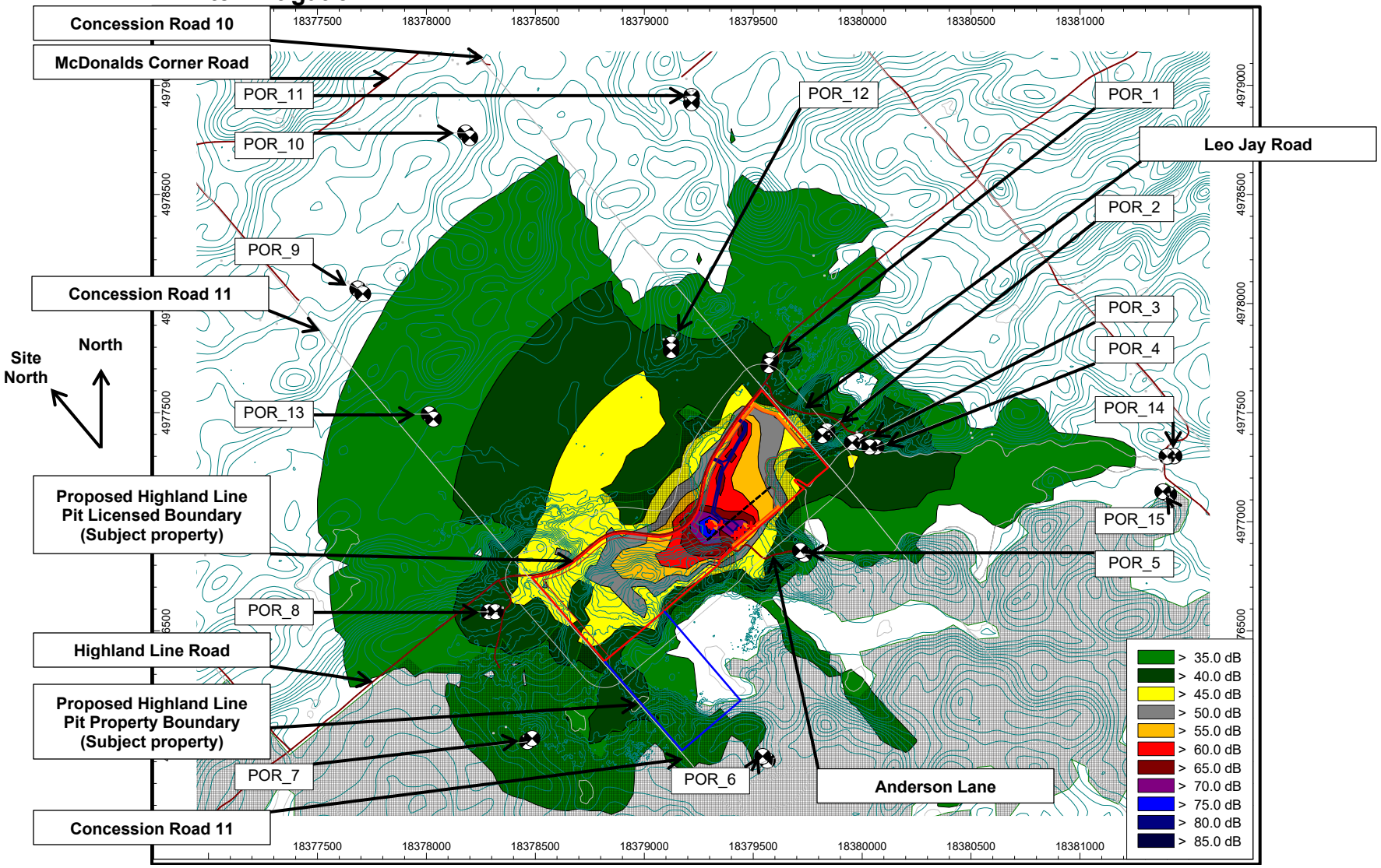


Figure 7: Scenario 3: Worst Case, Extraction Area 2 - Crushing Plant and Screening Plant in operation concurrently with extraction occurring closest to POR 6 & 7 – (Day only)

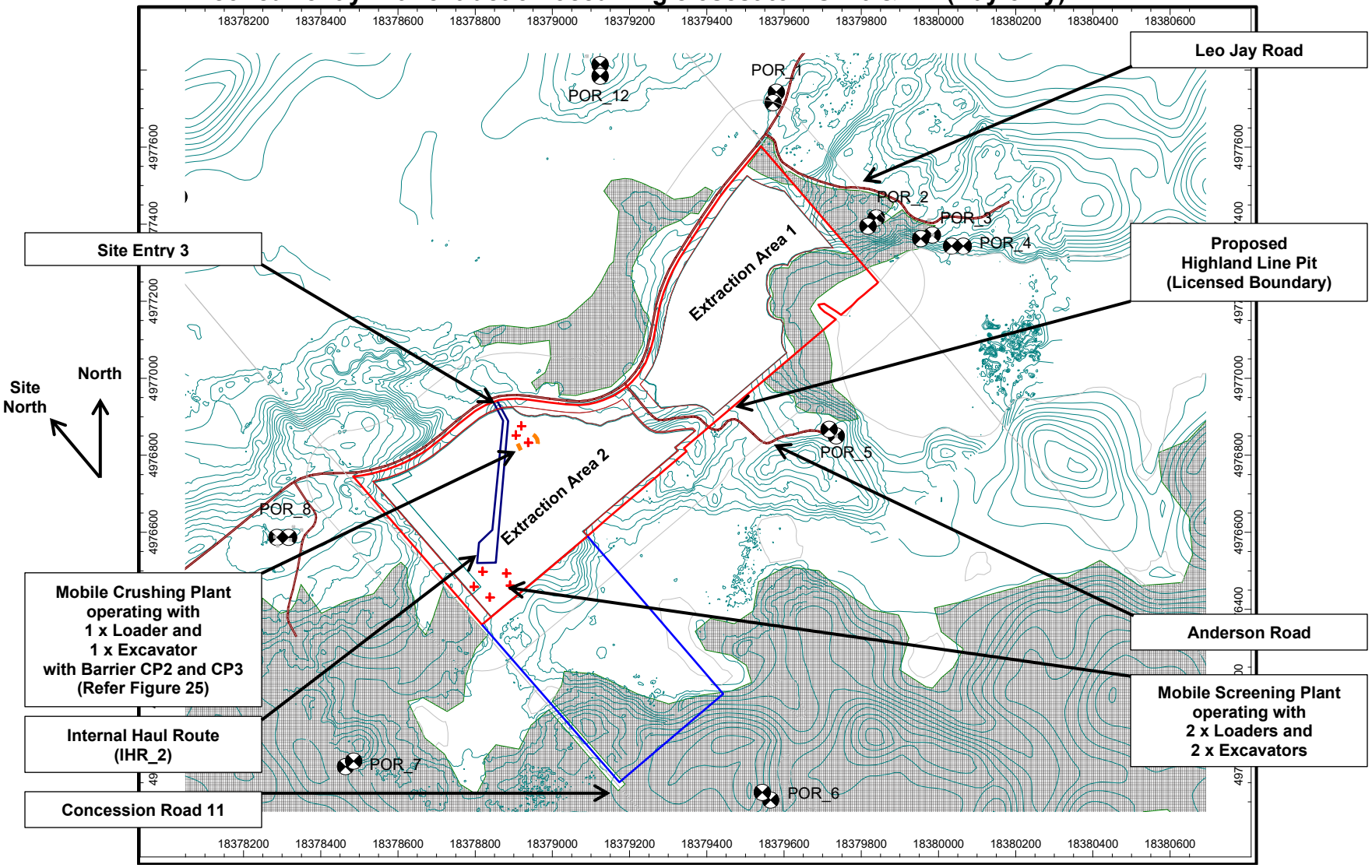


Figure 8: Prediction Results, Scenario 3 - Day only (07:00 to 19:00): Noise Contours, (Noise levels at 4.5 m) – After Mitigation

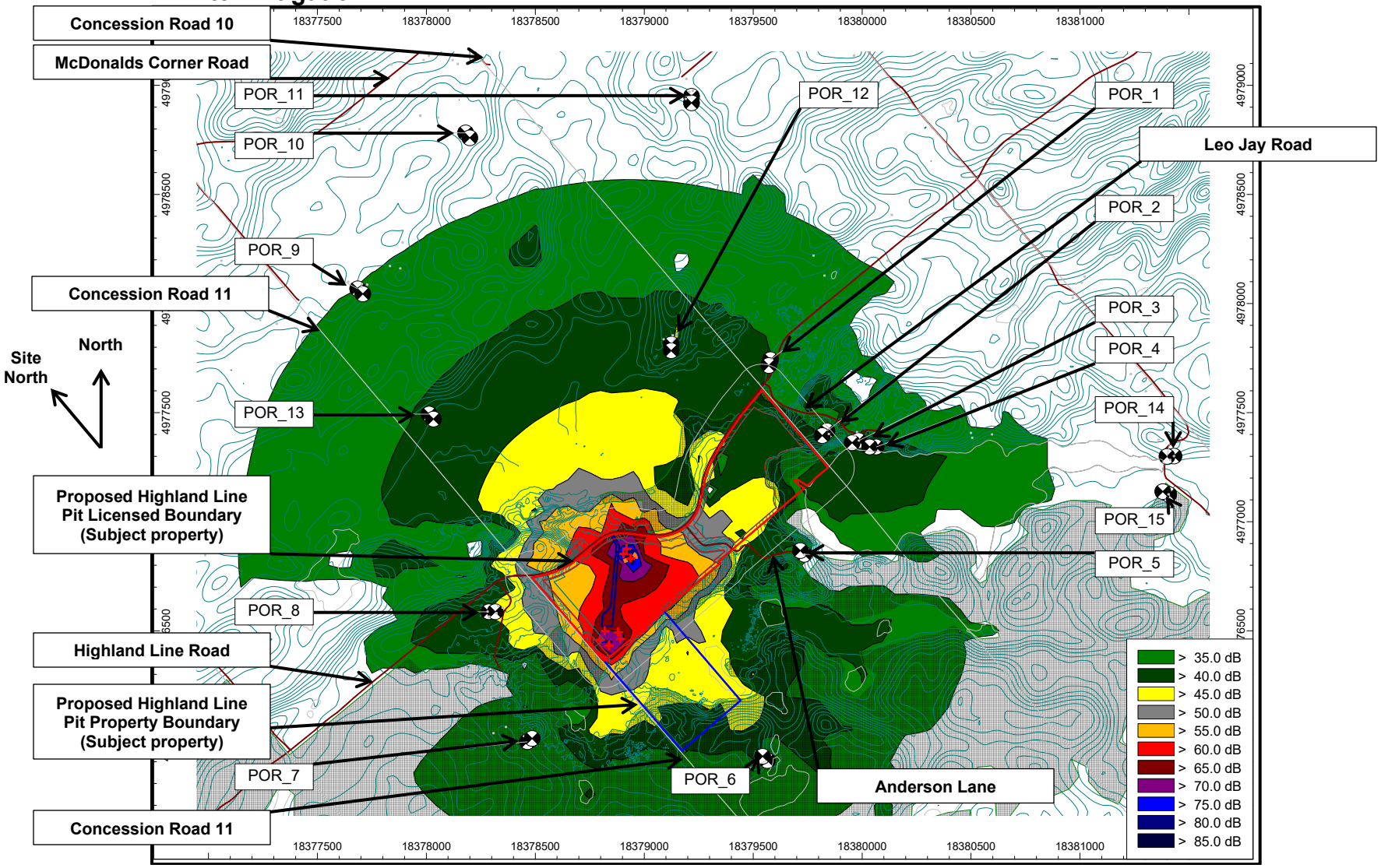


Figure 9: Scenario 4: Worst Case, Extraction Area 2 - Crushing Plant and Screening Plant in operation concurrently with extraction occurring closest to POR 8 & 13 (Day only)

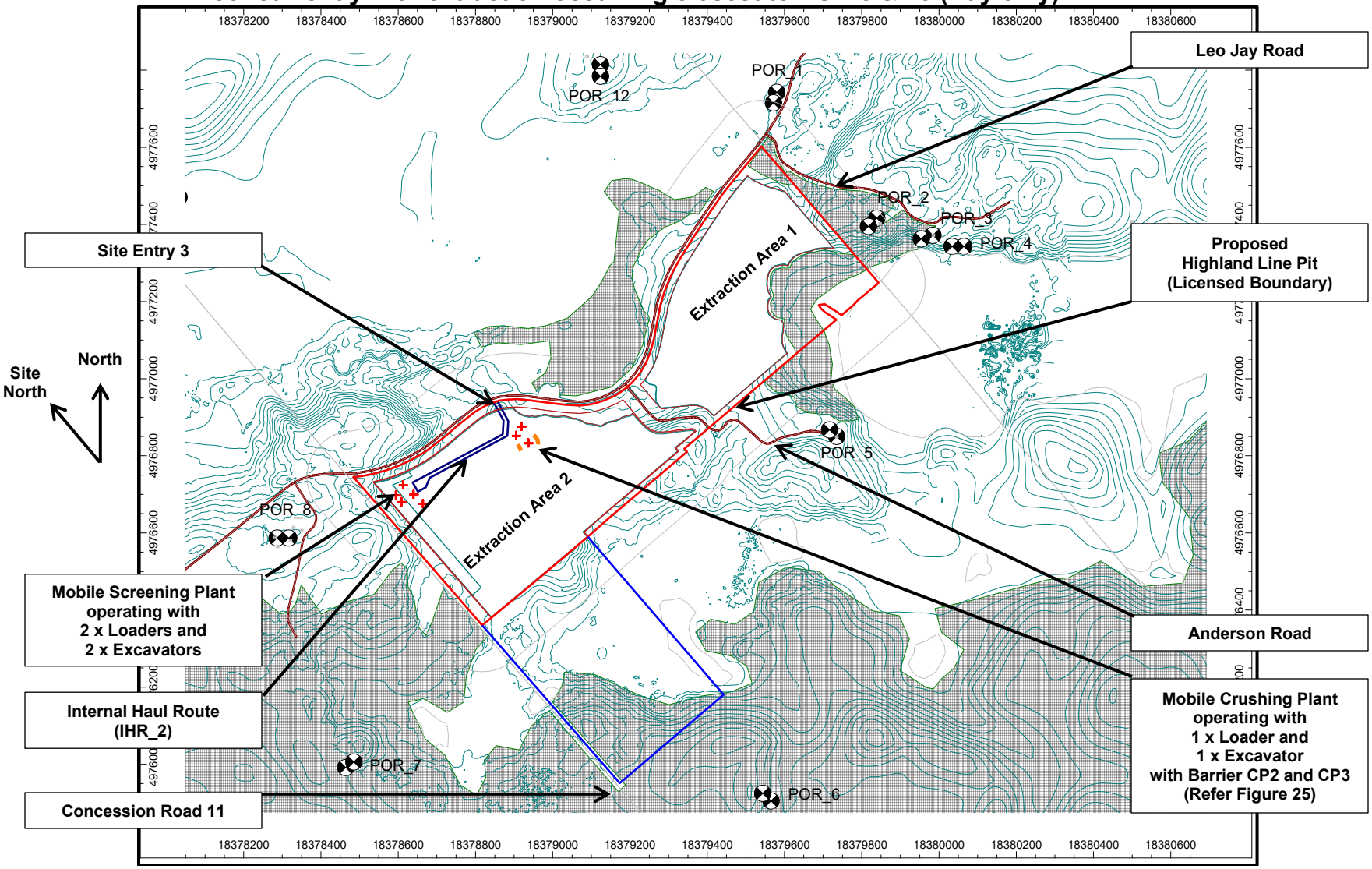


Figure 10: Prediction Results, Scenario 4 - Day only (07:00 to 19:00): Noise Contours, (Noise levels at 4.5 m) – After Mitigation

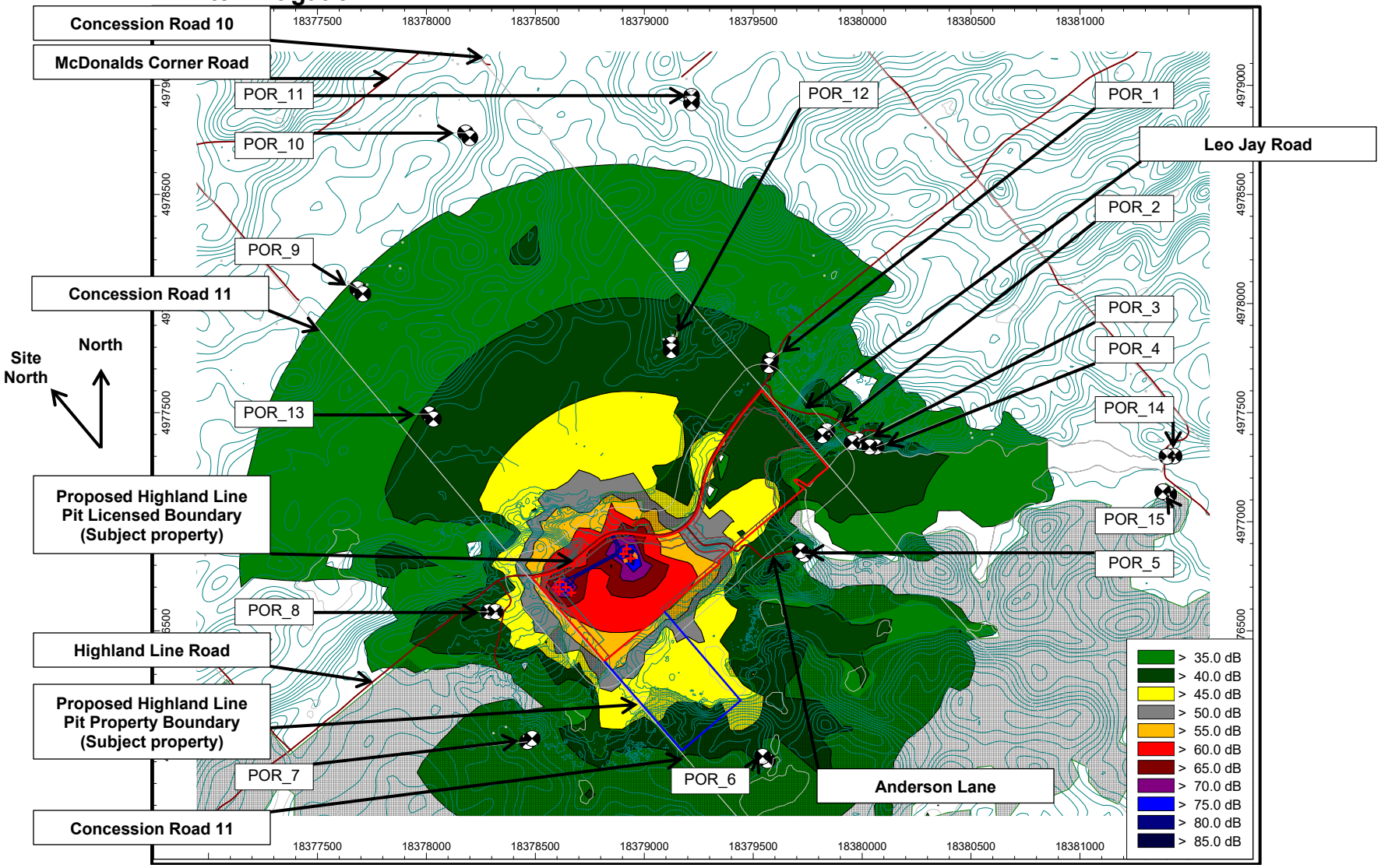


Figure 11: Scenario 5: Worst Case, Extraction Area 1 – Crushing Plant and Wash Plant in operation concurrently with extraction occurring closest to POR 1 & 12 (Day only)

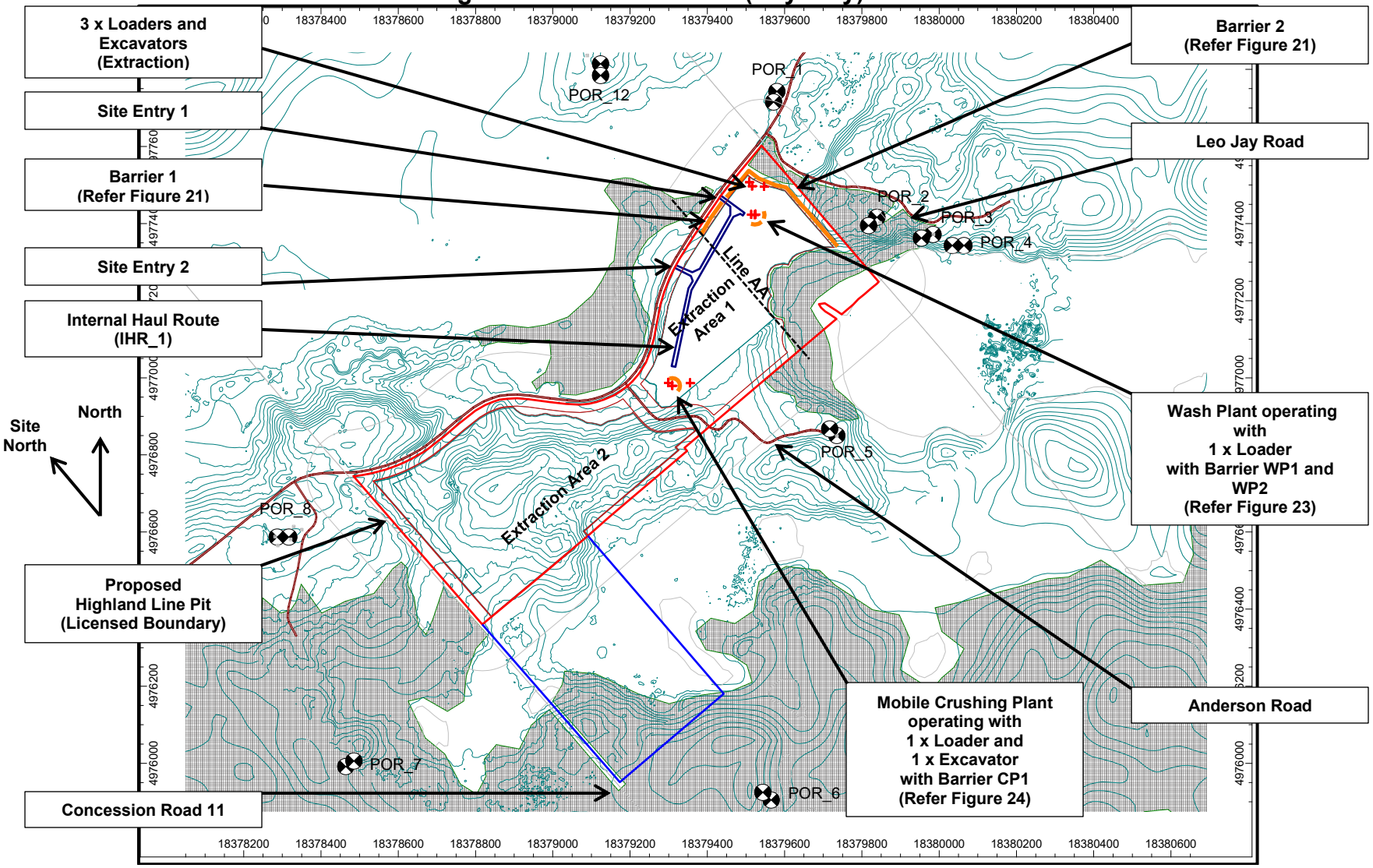


Figure 12: Prediction Results, Scenario 5 - Day only (07:00 to 19:00): Noise Contours, (Noise levels at 4.5 m) – After Mitigation

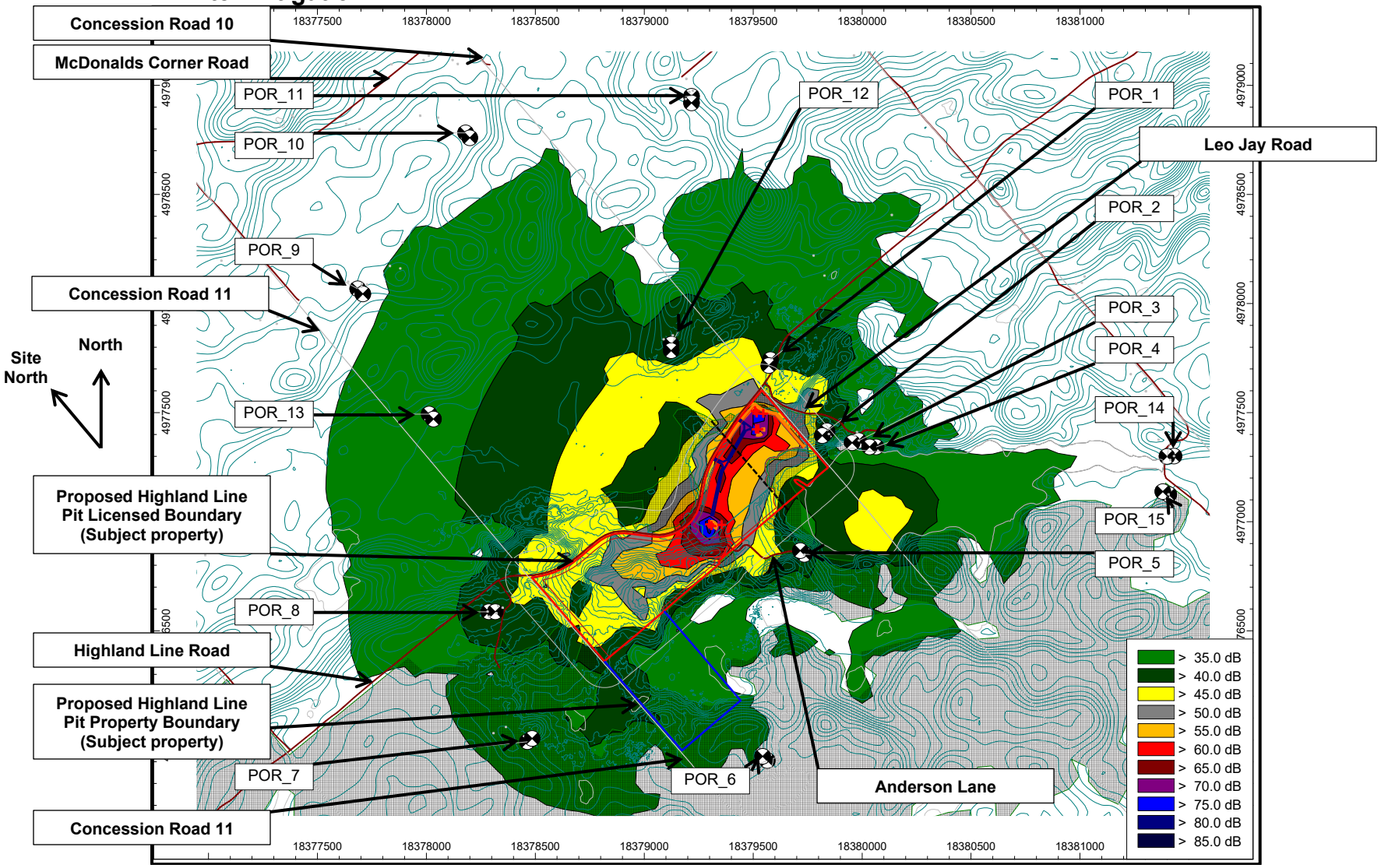


Figure 13: Scenario 6: Worst Case, Extraction Area 1 - Crushing Plant and Wash Plant in operation concurrently with extraction occurring closest to POR 5 – (Day only)

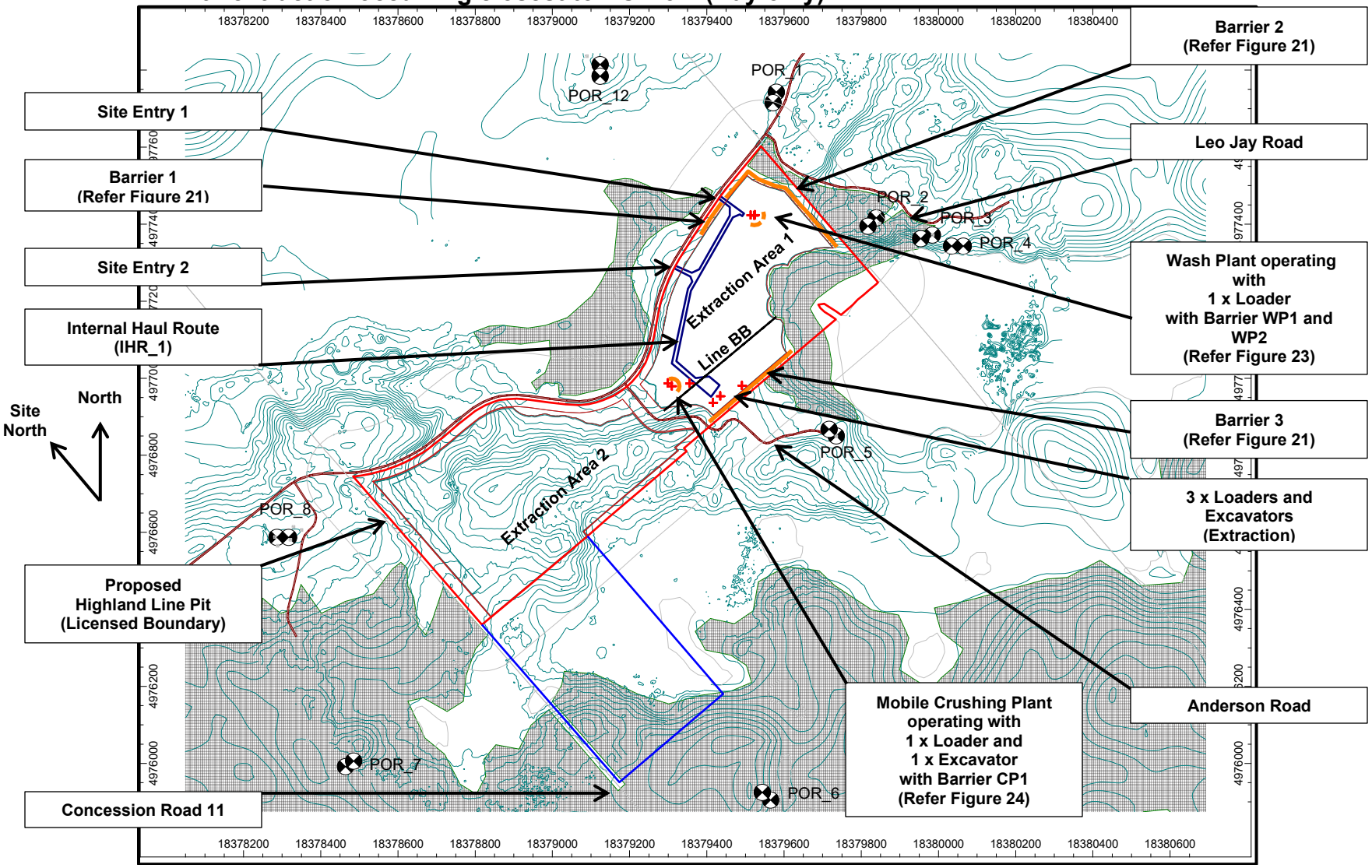


Figure 14: Prediction Results, Scenario 6 - Day only (07:00 to 19:00): Noise Contours, (Noise levels at 4.5 m) – After Mitigation

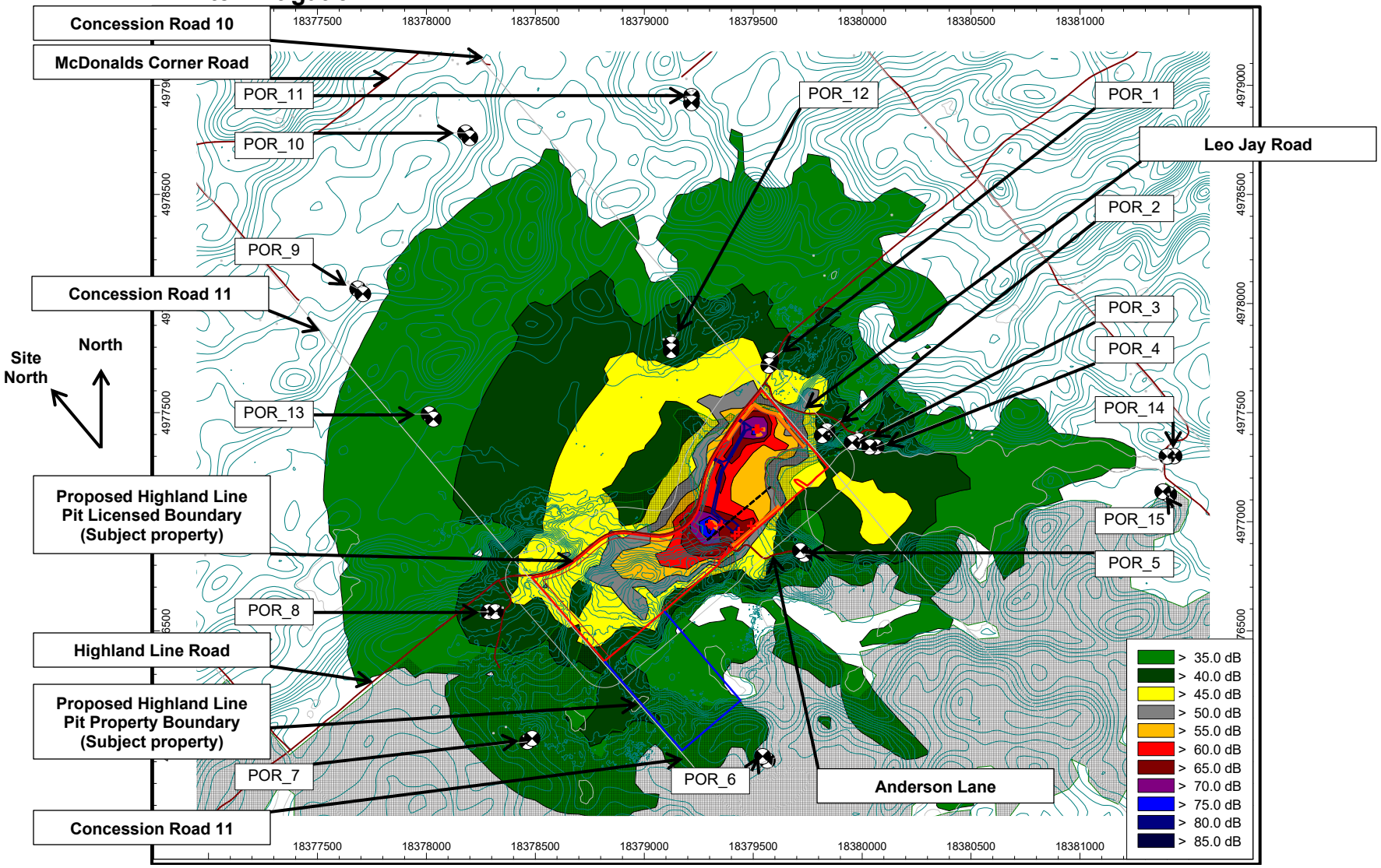


Figure 15: Scenario 7: Worst Case, Extraction Area 2 - Crushing Plant and Wash Plant in operation concurrently with extraction occurring closest to POR 6 & 7 – (Day only)

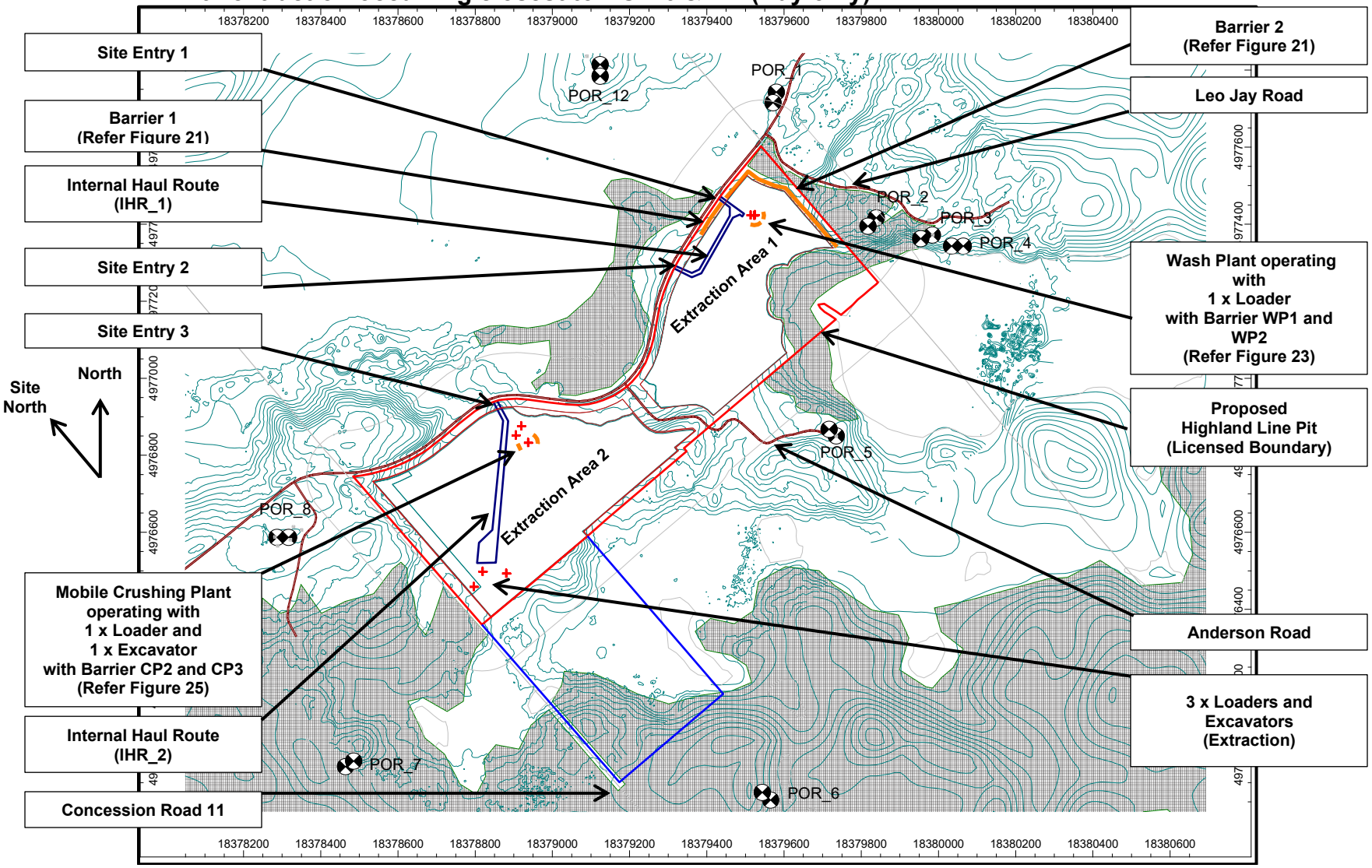


Figure 16: Prediction Results, Scenario 7 - Day only (07:00 to 19:00): Noise Contours, (Noise levels at 4.5 m) – After Mitigation

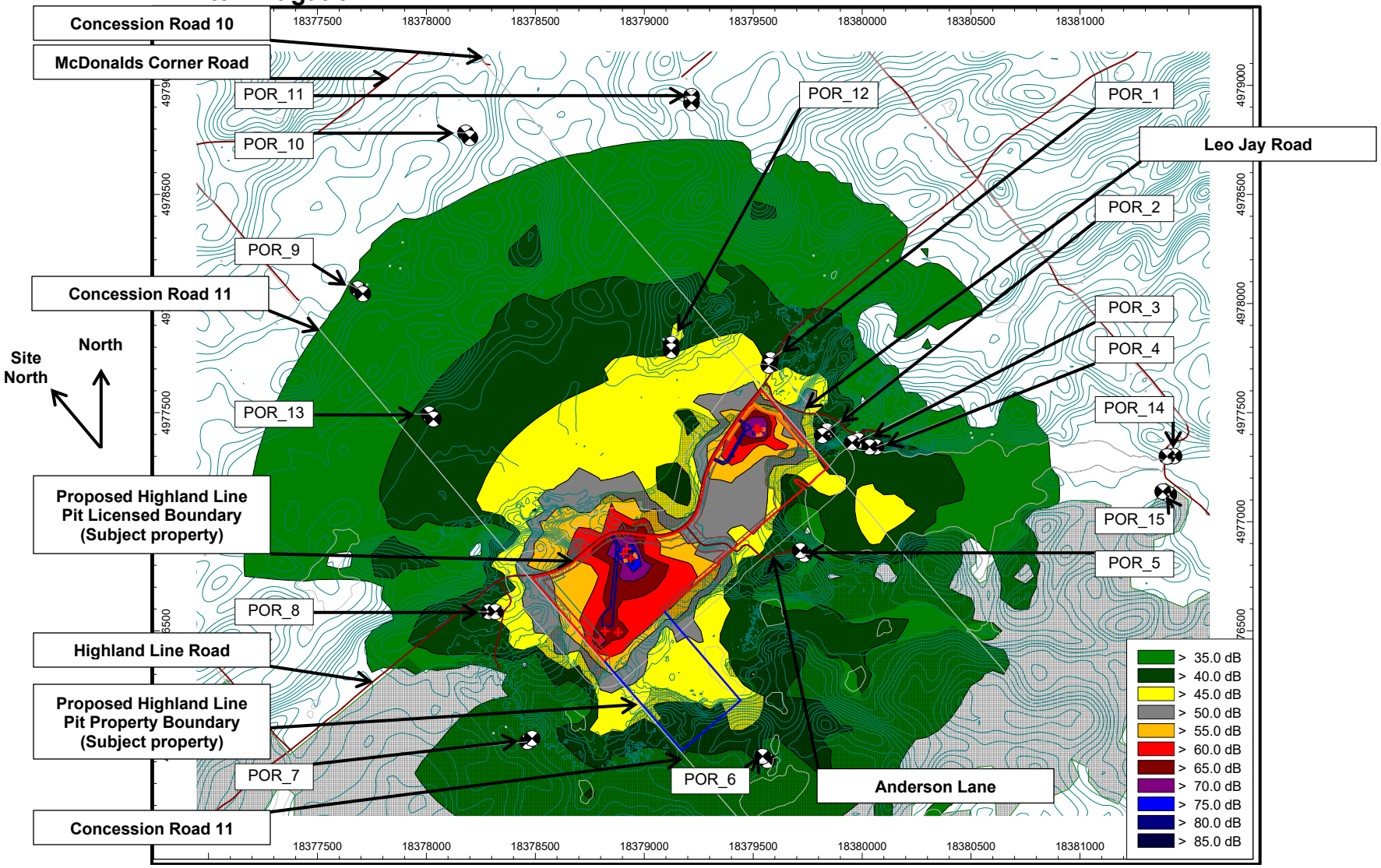


Figure 17: Scenario 8: Worst Case, Extraction Area 2 - Crushing Plant and Wash Plant in operation concurrently with extraction occurring closest to POR 8 & 13 (Day only)

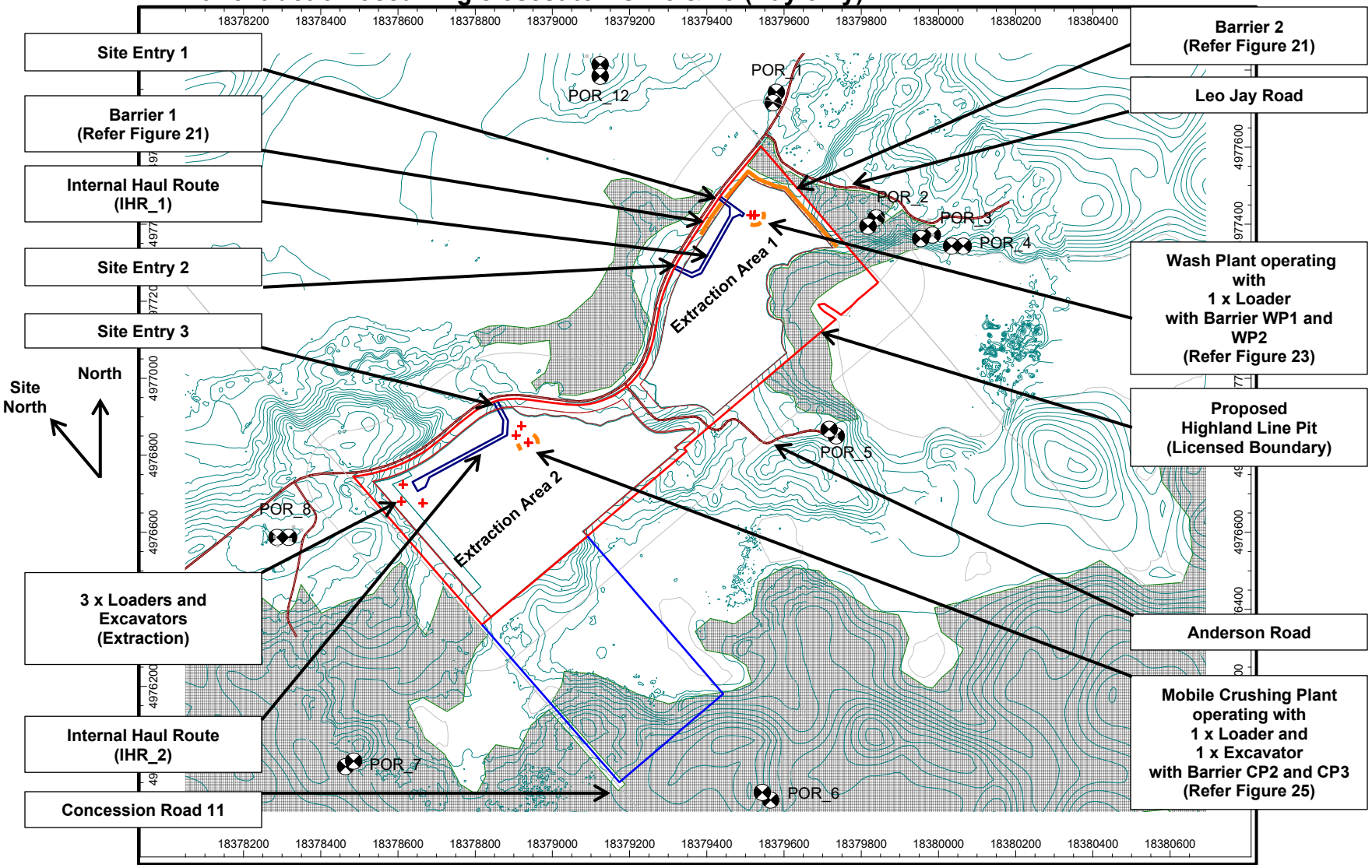


Figure 18: Prediction Results, Scenario 8 - Day only (07:00 to 19:00): Noise Contours, (Noise levels at 4.5 m) – After Mitigation

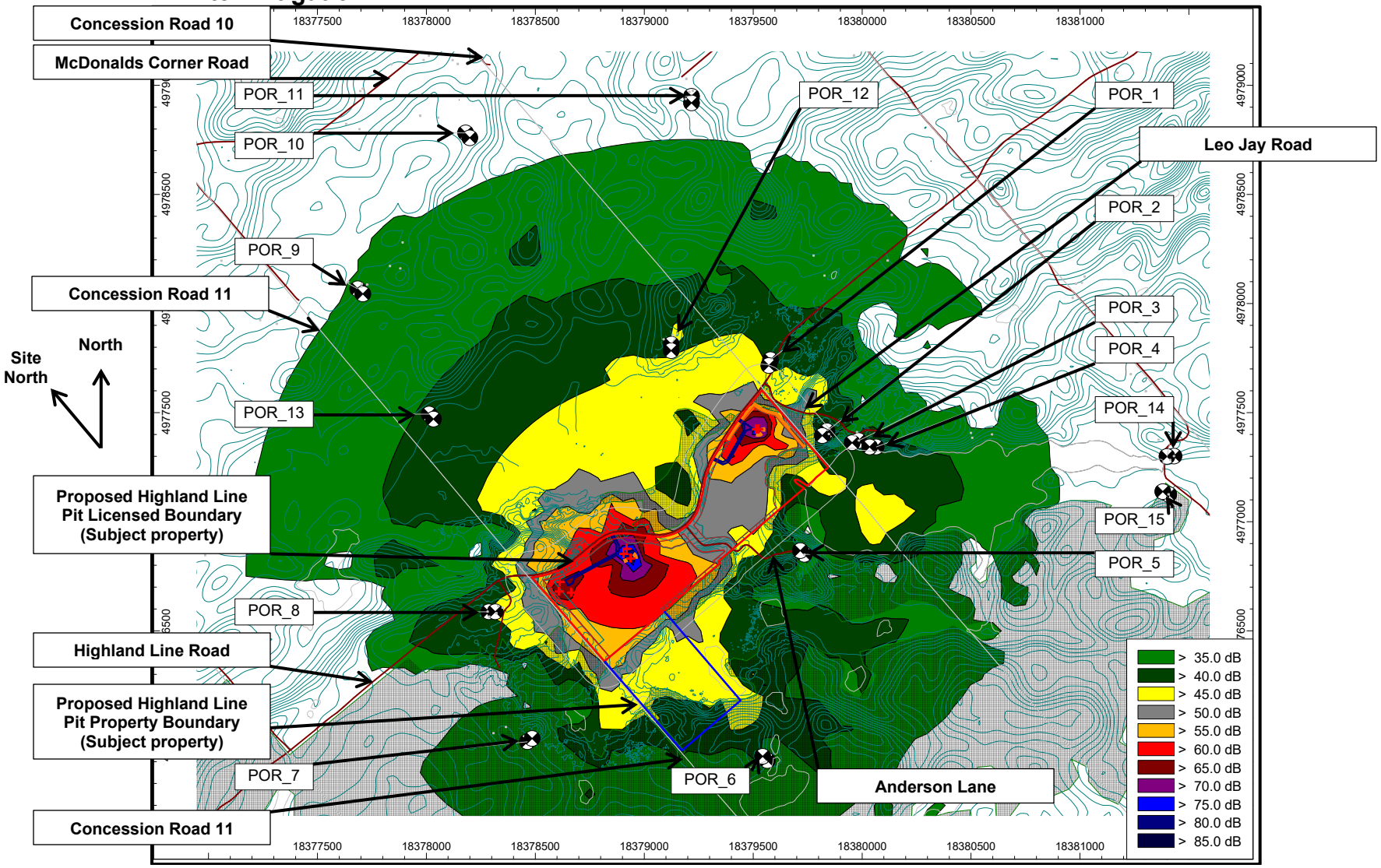


Figure 19: Scenario 9: Worst Case, Extraction Area 1 – Crushing Plant and Screening Plant in operation concurrently with extraction occurring closest to POR 2, 3, 4, 14 & 15 (Day only)

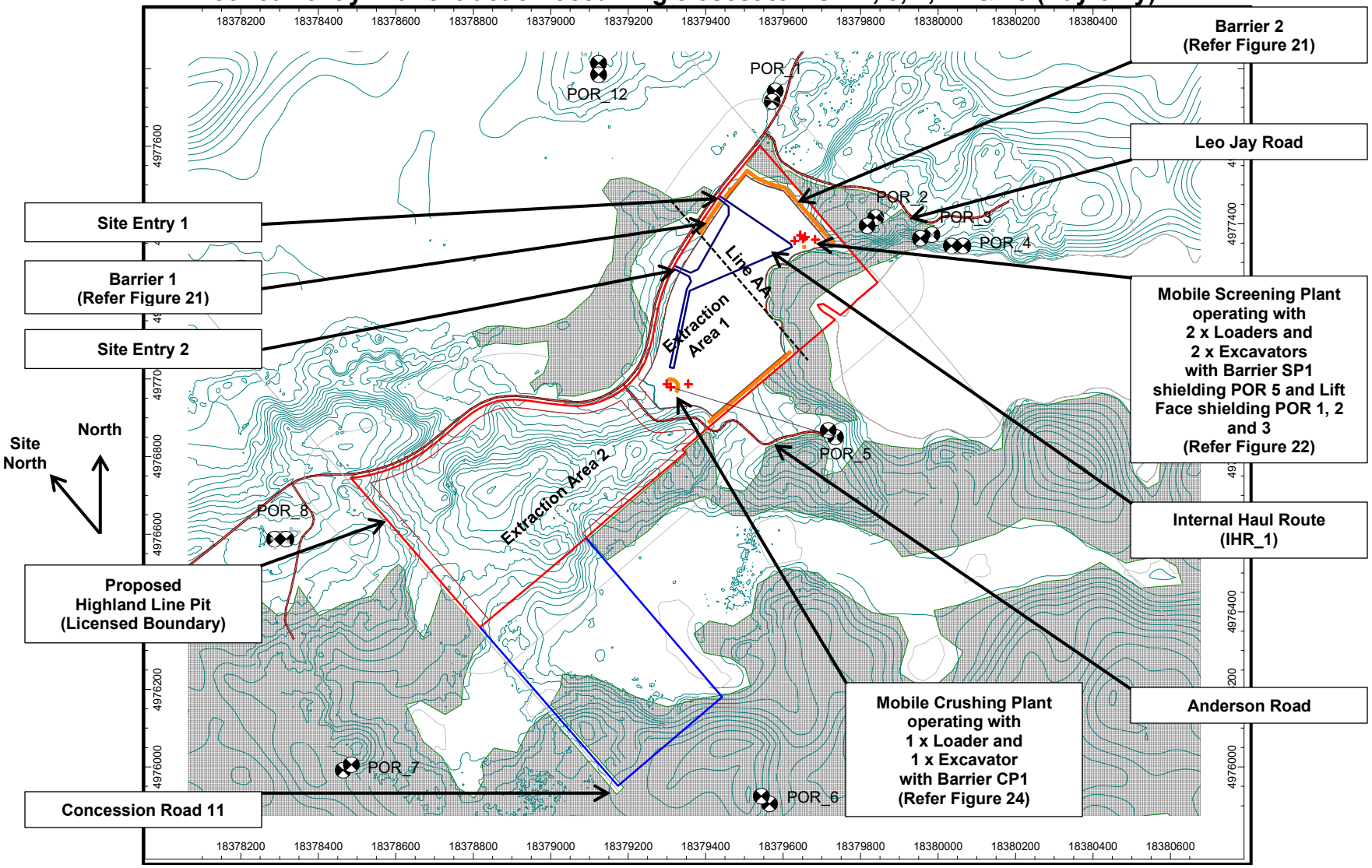


Figure 20: Prediction Results, Scenario 9 - Day only (07:00 to 19:00): Noise Contours, (Noise levels at 4.5 m) – After Mitigation

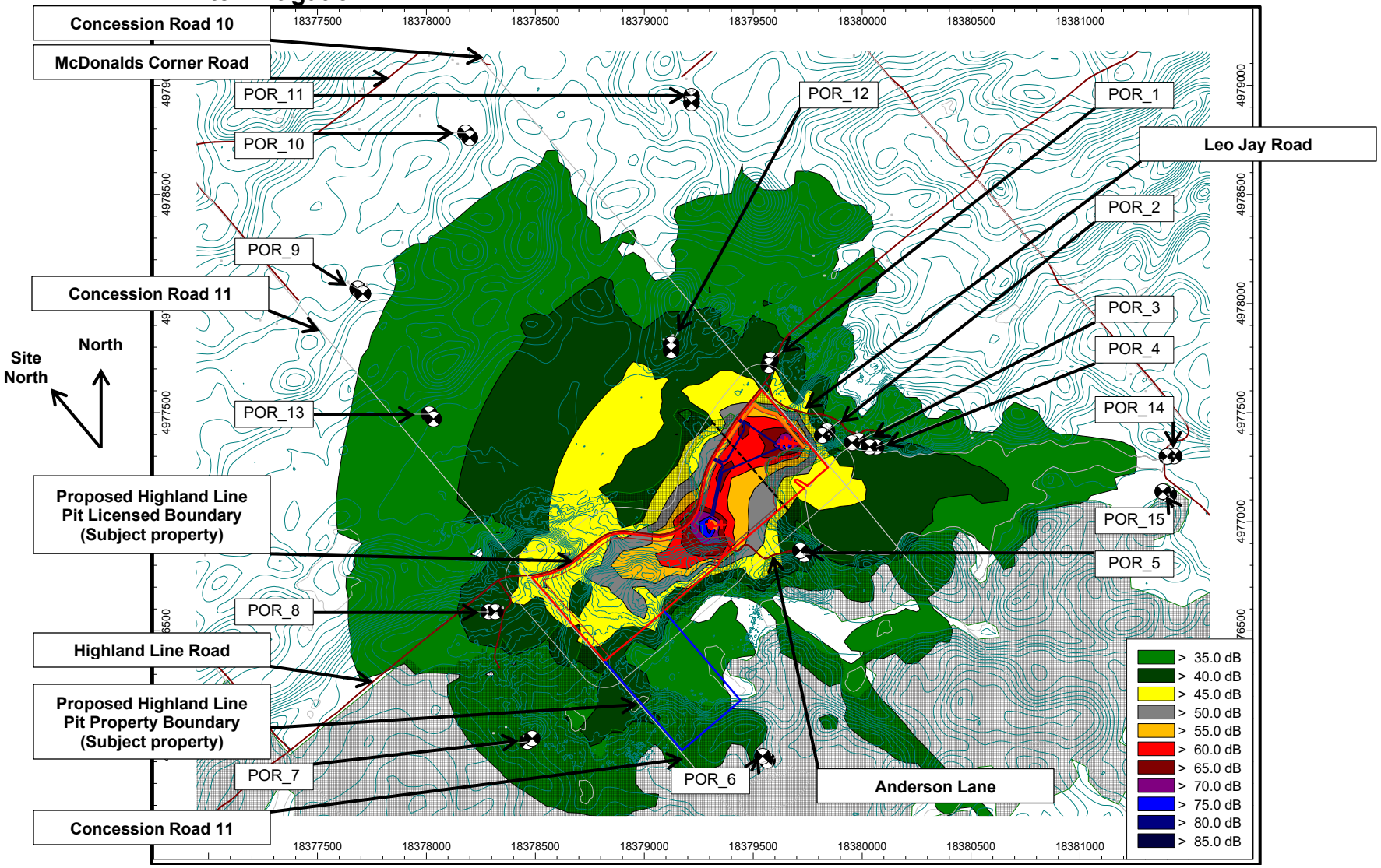


Figure 21: Scenario 10: Worst Case, Extraction Area 1 – Crushing Plant and Wash Plant in operation concurrently with extraction occurring closest to POR 2, 3, 4, 14 & 15 (Day only)

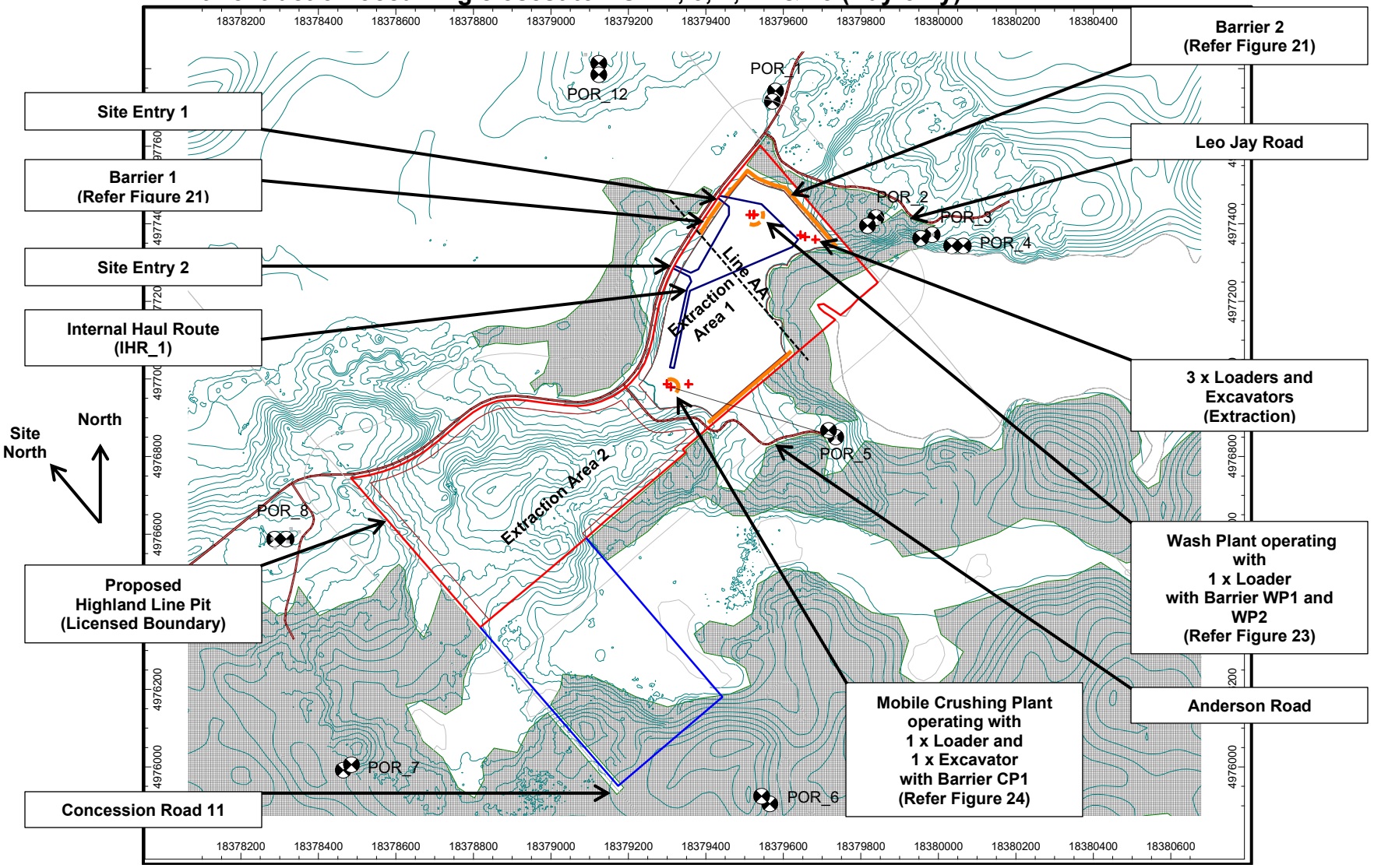


Figure 22: Prediction Results, Scenario 10 - Day only (07:00 to 19:00): Noise Contours, (Noise levels at 4.5 m) – After Mitigation

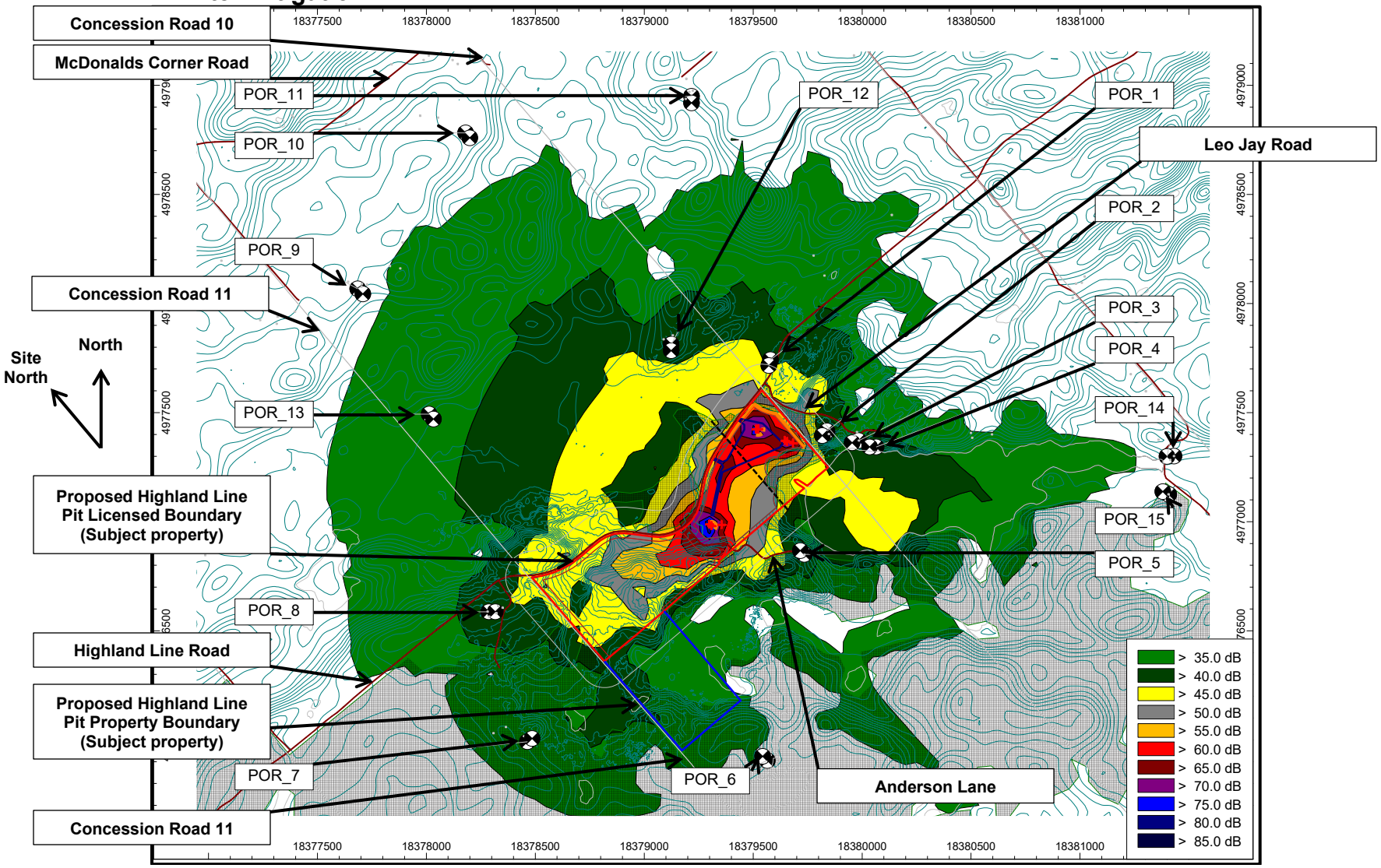


Figure 23: Detail site plan showing location of site berms and barrier requirements

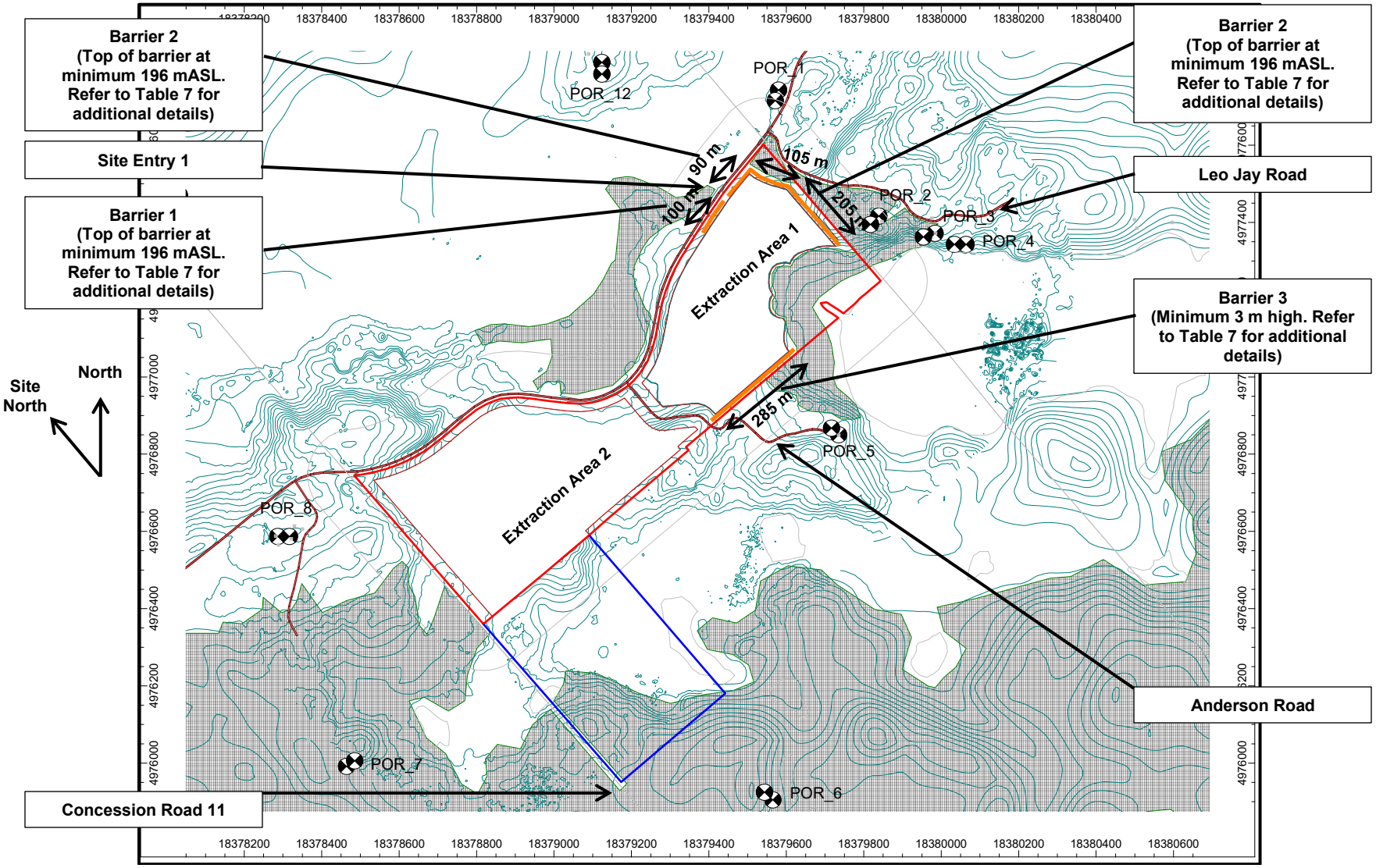


Figure 24: Detail plan at Mobile Screening Plant showing location of noise barriers (stockpiles) when operating in Extraction Area 1

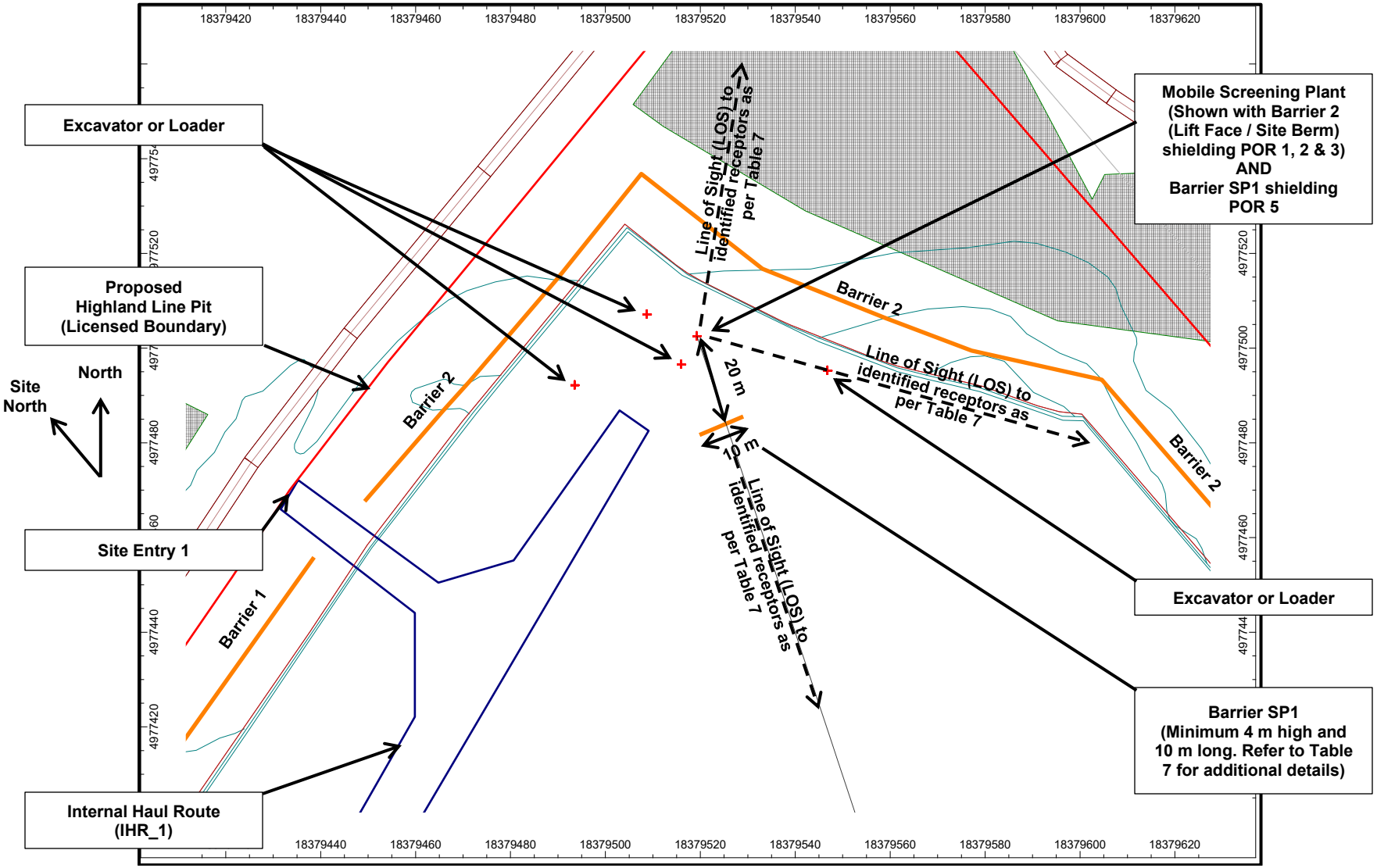


Figure 25: Detail plan at Wash Plant showing location of noise barriers (stockpiles) when operation in Extraction Area 1

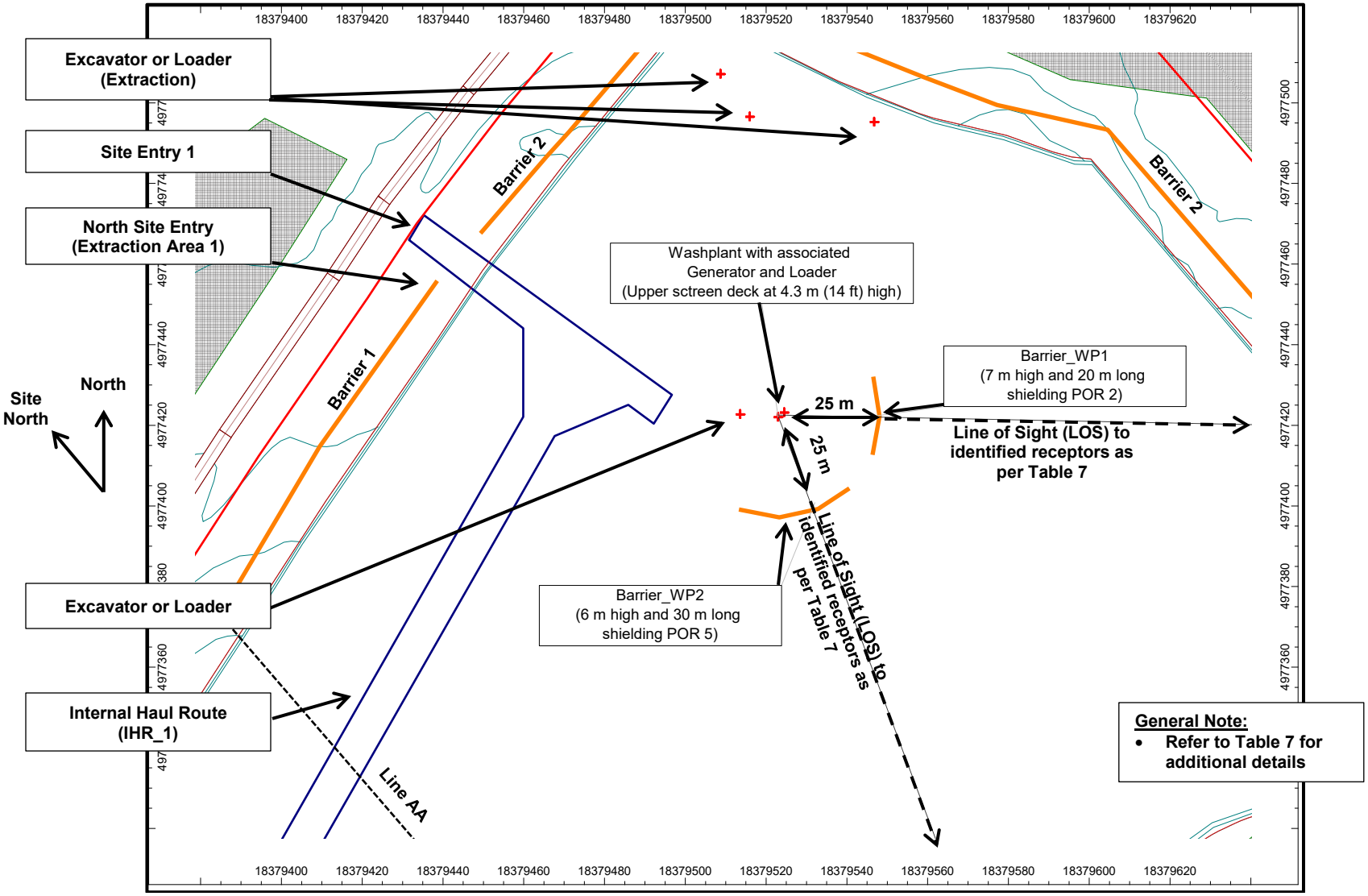


Figure 26: Detail plan at Mobile Crushing Plant showing location of noise barrier (stockpile) when operating in Extraction Area 1

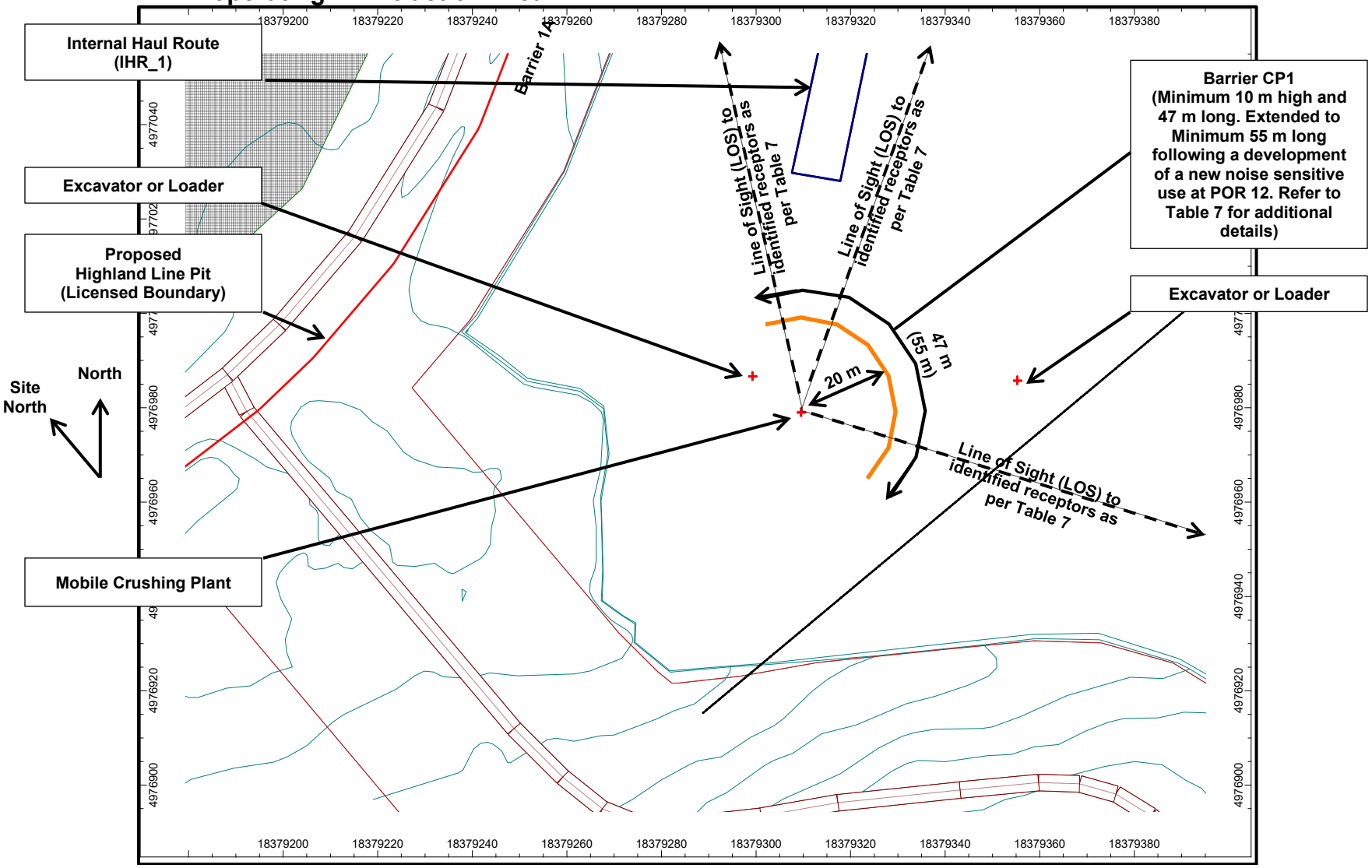
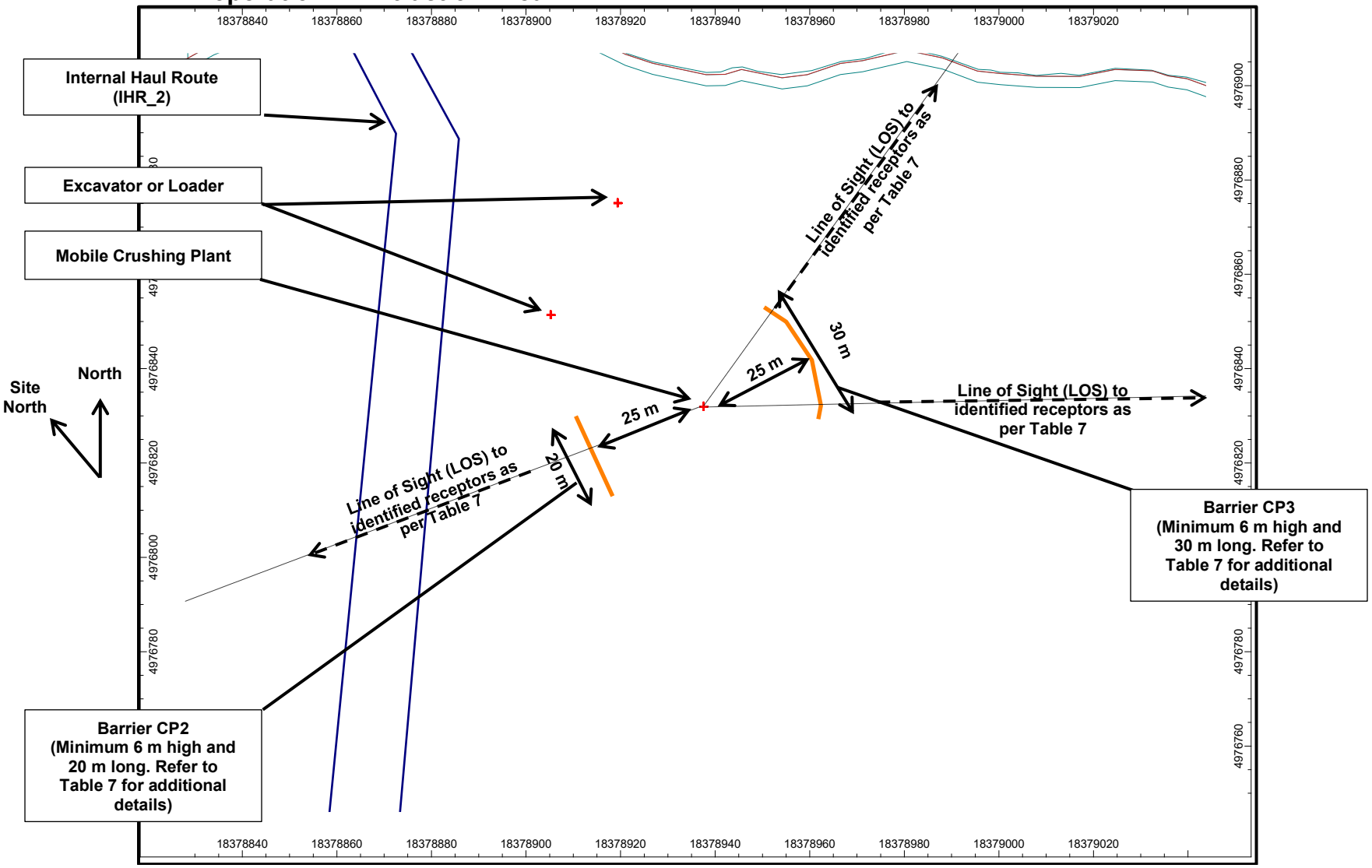


Figure 27: Detail plan at Mobile Crushing Plant showing location of noise barriers (stockpiles) when operation in Extraction Area 2



Appendix 1

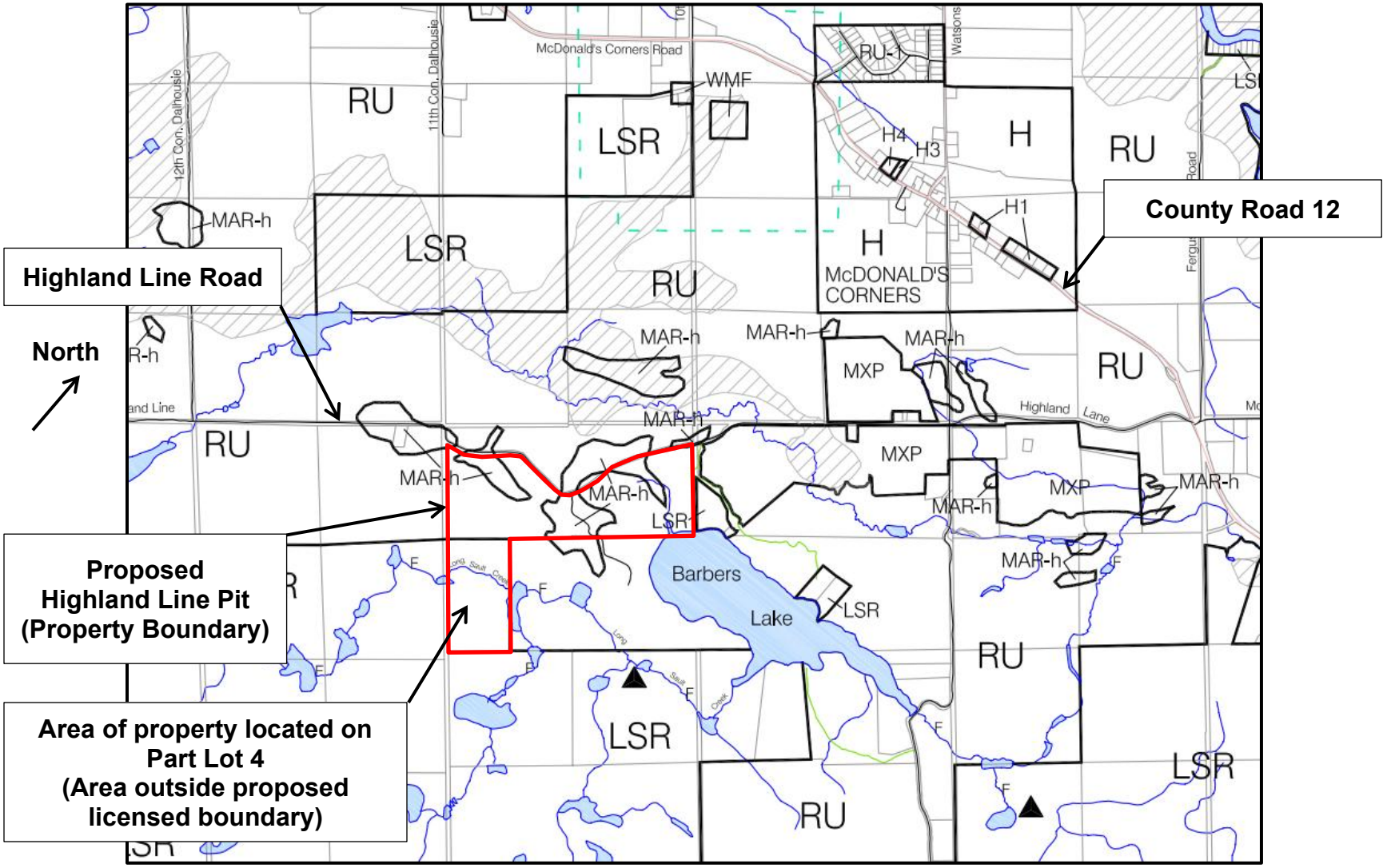
Zoning Plan and Land Use Designations

Contents:

- **Zoning Map**: Zoning By-law for the Township of Lanark Highlands, Dalhousie and North Sherbrooke, Schedule A2, By-law no. 2003-451 (source: Township of Lanark Highlands)

Legend:

Zoning Map: Zoning By-law for the Township of Lanark Highlands, Dalhousie and North Sherbrooke, Schedule A2, By-law no. 2003-451 (source: Township of Lanark Highlands)



Appendix 2
Acoustic Modelling Details

Modeling Notes:

1. Acoustic model developed uses Cadna-A software, Version 2025.
2. Sound propagation is modeled according to ISO 9613-2: 1996(E).
3. The whole of the extraction area is modelled with an absorption coefficient of 0.35 representative of exposed earth. Barbers Lake has been modelled as 100% reflective with an absorption coefficient of 0.0. The surrounding area is modeled with an absorption coefficient of 1.0 indicative of a Class 3 Area.
4. MECP favoured conservative modelling assumptions are used, that is, 'no subtraction of negative ground attenuation' and 'no negative path differences'.

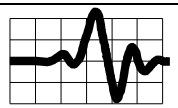
Contents:

Table A2.1 Point of Reception Location Table

Name	ID	Height	Coordinates		
			X	Y	Z
		(m)	(m)	(m)	(m)
POR_1_POW	POR_1_POW	4.5	18379580.1	4977742.32	196.59
POR_1_OPR	POR_1_OPR	1.5	18379571.9	4977715.22	193.5
POR_2_POW	POR_2_POW	2	18379839.3	4977415.89	202.34
POR_2_OPR	POR_2_OPR	1.5	18379817.4	4977394.72	203.42
POR_3_POW	POR_3_POW	4.5	18379984.5	4977371.54	202.5
POR_3_OPR	POR_3_OPR	1.5	18379954.5	4977361.94	193.41
POR_4_POW	POR_4_POW	2	18380064.5	4977342.74	192.17
POR_4_OPR	POR_4_OPR	1.5	18380034.5	4977342.74	191.8
POR_5_POW	POR_5_POW	4.5	18379735.4	4976850.07	202.5
POR_5_OPR	POR_5_OPR	1.5	18379716.7	4976867.27	197.47
POR_6_POW	POR_6_POW	4.5	18379565.3	4975904.68	208.47
POR_6_OPR	POR_6_OPR	1.5	18379543.8	4975924.38	207.99
POR_7_POW	POR_7_POW	4.5	18378464.3	4975991.28	212.5
POR_7_OPR	POR_7_OPR	1.5	18378485.6	4976005.73	210.11
POR_8_POW	POR_8_POW	3	18378286.9	4976586.73	217
POR_8_OPR	POR_8_OPR	1.5	18378316.9	4976586.73	215.5
POR_9_POW	POR_9_POW	4.5	18377685.2	4978067.51	211.83
POR_9_OPR	POR_9_OPR	1.5	18377708.6	4978043.38	206.85
POR_10_POW	POR_10_POW	4.5	18378180.5	4978781.85	211.92
POR_10_OPR	POR_10_OPR	1.5	18378199.5	4978759.04	208.56
POR_11_POW	POR_11_POW	4.5	18379217.5	4978949.27	209.33
POR_11_OPR	POR_11_OPR	1.5	18379217.5	4978919.27	204.61
POR_12_POW	POR_12_POW	4.5	18379123.8	4977813.76	203.62
POR_12_OPR	POR_12_OPR	1.5	18379123.8	4977783.76	199.57
POR_13_POW	POR_13_POW	4.5	18378013.4	4977492.92	195.23
POR_13_OPR	POR_13_OPR	1.5	18378032.9	4977470.48	191.45
POR_14_POW	POR_14_POW	4.5	18381431.4	4977300.6	189.44
POR_14_OPR	POR_14_OPR	1.5	18381399.4	4977298.6	186.14
POR_15_POW	POR_15_POW	4.5	18381407.9	4977124.18	188.82
POR_15_OPR	POR_15_OPR	1.5	18381380.8	4977137.46	185.2

Table A2.2 Point Sources

ID	Result. PWL			Lw / Li	Noise Source Library File	Operating Time			Direct.	Attenuation	Height	Coordinates		
	Day	Evening	Night	Type	Value	Day	Evening	Night				X	Y	Z
	(dBA)	(dBA)	(dBA)			(min/hr)	(min/hr)	(min/hr)			(m)	(m)	(m)	(m)
Crusher_S1_2_5_6	120	120	120	Lw	Crusher_KPI_JCI	60	0	0	(none)		3	18379309.54	4976978.97	191
Crusher_S3_4_7_8	120	120	120	Lw	Crusher_KPI_JCI	60	0	0	(none)		3	18378937.53	4976831.94	191
Crusher_S10_11	120	120	120	Lw	Crusher_KPI_JCI	60	0	0	(none)		3	18379309.54	4976978.97	191
Screener_S1	111	111	111	Lw	Powerscreen_Chiefton_1700	60	0	0	(none)		3	18379519.24	4977502.51	191
Screener_S2	111	111	111	Lw	Powerscreen_Chiefton_1700	60	0	0	(none)		3	18379453.94	4976961.84	191
Screener_S3	111	111	111	Lw	Powerscreen_Chiefton_1700	60	0	0	(none)		3	18378838.02	4976430.73	191
Screener_S4	111	111	111	Lw	Powerscreen_Chiefton_1700	60	0	0	(none)		3	18378640.03	4976699.08	191
Screener_S10	111	111	111	Lw	Powerscreen_Chiefton_1700	60	0	0	(none)		3	18379651.64	4977360.53	191
Washplant	109.9	109.9	109.9	Lw	Washplant	60	0	0	(none)		4.3	18379523	4977422	192.3
Generator	107.4	107.4	107.4	Lw	Generator_600kW	60	0	0	Chimney (VDI 3733 (1996))	Silex_Silencer_Model_JB_6	4	18379524.5	4977423.15	192
Excavator_1_S1_2_5_6	103.2	103.2	103.2	Lw	Excavator	60	60	60	(none)		2.5	18379355.25	4976985.73	190.5
Excavator_1_S3_4_7_8_9	103.2	103.2	103.2	Lw	Excavator	60	60	60	(none)		2.5	18378919.39	4976875.07	190.5
Excavator_1_S10_11	103.2	103.2	103.2	Lw	Excavator	60	60	60	(none)		2.5	18379355.25	4976985.73	190.5
Excavator_2_S1_5	103.2	103.2	103.2	Lw	Excavator	60	0	0	(none)		2.5	18379546.79	4977495.21	190.5
Excavator_2_S2_6	103.2	103.2	103.2	Lw	Excavator	60	0	0	(none)		2.5	18379491.02	4976980.28	190.5
Excavator_2_S3_7	103.2	103.2	103.2	Lw	Excavator	60	0	0	(none)		2.5	18378796.71	4976458.1	200.5
Excavator_2_S4_8_9	103.2	103.2	103.2	Lw	Excavator	60	0	0	(none)		2.5	18378608.55	4976679.46	200.5
Excavator_2_S10_11	103.2	103.2	103.2	Lw	Excavator	60	0	0	(none)		2.5	18379682.82	4977358.58	190.5
Excavator_3_S1_5_9	103.2	103.2	103.2	Lw	Excavator	60	0	0	(none)		2.5	18379515.95	4977496.51	190.5
Excavator_3_S2_6	103.2	103.2	103.2	Lw	Excavator	60	0	0	(none)		2.5	18379416.12	4976935.86	190.5
Excavator_3_S3_7	103.2	103.2	103.2	Lw	Excavator	60	0	0	(none)		2.5	18378819.42	4976497.67	190.5
Excavator_3_S4_8	103.2	103.2	103.2	Lw	Excavator	60	0	0	(none)		2.5	18378664.54	4976674.71	190.5
Excavator_3_S10_11	103.2	103.2	103.2	Lw	Excavator	60	0	0	(none)		2.5	18379656.42	4977365.67	190.5



ID	Result. PWL			Lw / Li	Noise Source Library File	Operating Time			Direct.	Attenuation	Height	Coordinates		
	Day	Evening	Night	Type	Value	Day	Evening	Night				X	Y	Z
	(dBA)	(dBA)	(dBA)			(min/hr)	(min/hr)	(min/hr)			(m)	(m)	(m)	(m)
Loader_1__S1_2_5_6_9	103	103	103	Lw	Loader	60	60	60	(none)		2.5	18379299.24	4976986.65	190.5
Loader_1_S3_4_7_8	103	103	103	Lw	Loader	60	60	60	(none)		2.5	18378905.23	4976851.35	190.5
Loader_1__S10_11	103	103	103	Lw	Loader	60	60	60	(none)		2.5	18379299.24	4976986.65	190.5
Loader_2_S1_5	103	103	103	Lw	Loader	60	0	0	(none)		2.5	18379508.72	4977507.08	190.5
Loader_2_S2_6	103	103	103	Lw	Loader	60	0	0	(none)		2.5	18379434.91	4976952.97	190.5
Loader_2_S3_7	103	103	103	Lw	Loader	60	0	0	(none)		2.5	18378880.45	4976492.73	190.5
Loader_2_S4_8_9	103	103	103	Lw	Loader	60	0	0	(none)		2.5	18378612.65	4976723.09	190.5
Loader_2_S9	103	103	103	Lw	Loader				(none)		2.5	18378612.65	4976723.09	190.5
Loader_2_S10_11	103	103	103	Lw	Loader	60	0	0	(none)		2.5	18379644.75	4977370.45	190.5
Loader_3_S1	103	103	103	Lw	Loader	60	0	0	(none)		2.5	18379493.51	4977492.14	190.5
Loader_3_S2	103	103	103	Lw	Loader	60	0	0	(none)		2.5	18379434	4976942.1	190.5
Loader_3_S3	103	103	103	Lw	Loader	60	0	0	(none)		2.5	18378890.39	4976461.66	190.5
Loader_3_S4	103	103	103	Lw	Loader	60	0	0	(none)		2.5	18378594.36	4976697.66	200.5
Loader_3_S5_6_7_8_9	103	103	103	Lw	Loader	60	0	0	(none)		2.5	18379513.6	4977422.68	190.5
Loader_3_S9	103	103	103	Lw	Loader				(none)		2.5	18379513.6	4977422.68	190.5
Loader_3_S10	103	103	103	Lw	Loader	60	0	0	(none)		2.5	18379629.55	4977355.51	190.5
Loader_3_S11	103	103	103	Lw	Loader	60	0	0	(none)		2.5	18379513.6	4977422.68	190.5

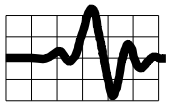


Table A2.3 Line Sources

ID	Result. PWL			Lw / Li	Noise Source Library File	Direct.	Moving Pt. Src			
	Day	Evening	Night	Type	Value		Number			Speed
	(dBA)	(dBA)	(dBA)				Day	Evening	Night	(km/h)
IHR_1_S1	107.9	103.1	103.1	PWL-Pt	HWYTruck_Slow58	(none)	15	5	5	30
IHR_1_S2	108.4	103.6	103.6	PWL-Pt	HWYTruck_Slow58	(none)	15	5	5	30
IHR_1_S5	107.6	102.9	102.9	PWL-Pt	HWYTruck_Slow58	(none)	15	5	5	30
IHR_1_S6	108.6	103.8	103.8	PWL-Pt	HWYTruck_Slow58	(none)	15	5	5	30
IHR_1_S7_8	100.5	100.5	100.5	PWL-Pt	HWYTruck_Slow58	(none)	5	5	5	30
IHR_1_S9	103.1	103.1	103.1	PWL-Pt	HWYTruck_Slow58	(none)	5	5	5	30
IHR_2_S3_7	105	105	105	PWL-Pt	HWYTruck_Slow58	(none)	10	10	10	30
IHR_2_S4_8	104.1	104.1	104.1	PWL-Pt	HWYTruck_Slow58	(none)	10	10	10	30
IHR_2_S9	104.1	104.1	104.1	PWL-Pt	HWYTruck_Slow58	(none)	10	10	10	30
IHR_1_S10	108.3	103.5	103.5	PWL-Pt	HWYTruck_Slow58	(none)	15	5	5	30
IHR_1_S11	108.4	103.6	103.6	PWL-Pt	HWYTruck_Slow58	(none)	15	5	5	30

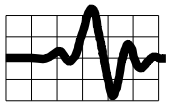


Table A2.4 Noise Barriers

ID	Height
	(m)
Barrier_1	196 mASL
Barrier_2	196 mASL
Barrier_3	3
Barrier_SP1	4
Barrier_SP1	4
Barrier_SP1	4
Barrier_CP1	10
Barrier_CP2	6
Barrier_CP3	6
Barrier_WP1	7
Barrier_WP2	6

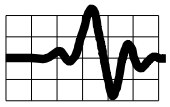


Table A2.5 Noise Source Library

ID	Type	Spectra (dB)											Source
		31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
Powerscreen_Chiefton_1700	Lw	106.9	110.7	112.9	110.6	104.8	105.2	104.9	101	92	111	117.7	Measured 21 Oct 2019, Cavanaugh Pine Grove Pit
Washplant	Lw	112.8	116.6	117.9	105.6	103.6	104	103.3	99.9	88.2	109.9	121.4	Measured Lanark Quarry 14 Oct 2020 72 at 73 m
Generator_600kW	Lw	65	97.5	112.6	120.3	121.9	123	125	121.2	109.4	129.7	134.2	Manufacturers Data - Cummins600DQPAA-Open Exhaust
Crusher_KPI_JCI	Lw	115.5	123.3	122.3	118.8	114.9	116.5	111.7	105.9	96.4	120	127.7	Measured 18 March 2019, KNL Construction Site
Loader	Lw	107.3	109.5	107.1	101.8	99.4	97.6	95.9	90.1	82.9	103	113.6	Meas. Howe-Ross Pit 20-05-13 72dBA at 14m
Excavator	Lw	100	110.2	109	100.8	98.5	98	95.2	92.6	87.7	103.2	113.5	Meas. OTR 23rd August 2017 at 13.0m
HWYTruck_Slow58	Lw	115.9	112.7	110.2	101.6	101.4	105	104.2	97.6	103.5	110.1	119	Brockville McDowell Study, 2003

Table A2.6 Noise Measurement Data

ID	Type	Spectra (dB)											Source*
		31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
Meas_Washplant	Li	74.9	78.7	80	67.7	65.7	66.1	65.4	62	50.3	72	83.5	Measured Lanark Quarry 14 Oct 2020 72 at 73 m
Meas_Powerscreen_Chiefton_1700	Li	66.2	70	72.2	69.9	64.1	64.5	64.2	60.3	51.3	70.3	77	Measured 21 Oct 2019, Cavanaugh Pine Grove Pit
Meas_Crusher_KPI_JCI	Li	67.3	77	71.3	72.5	65.4	70	65.1	57.7	48.1	72.9	80.2	Measured 18 March 2019, KNL Construction Site@50m
Meas_Loader	Li	76.3	78.5	76.1	70.8	68.4	66.6	64.9	59.1	51.9	72	82.6	Meas. Howe-Ross Pit 20-05-13 72dBA at 14m
Meas_Excavator_CAT345DL	Li	69.6	79.8	78.6	70.4	68.1	67.6	64.8	62.2	57.3	72.8	83.1	Meas. OTR 23rd August 2017 at 13.0m
Meas_HWYTruck_Slow58	Li	67.5	64.3	61.8	53.2	53	56.6	55.8	49.2	55.1	61.7	70.6	adj. 90m source Brockville McDowell Study, 2003

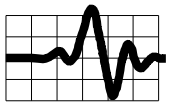


Table A2.7.1 Point of Reception Impacts by Source for Scenario 1* - After Mitigation

Source	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	POR_9_POW	POR_9_OPR	POR_10_POW	POR_10_OPR	POR_11_POW	POR_11_OPR	POR_12_POW	POR_12_OPR	POR_13_POW	POR_13_OPR	POR_14_POW	POR_14_OPR	POR_15_POW	POR_15_OPR
	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
Crusher_S1_2_5_6	38	31.9	36.5	36.7	34.3	31.6	33.8	33.5	40	38.8	27.1	26	35.6	29.2	40.9	40.3	33.1	32.1			29	28.7	38.1	37	37.3	36.5				
IHR_1_S1	36.4	36.4	30.1	34.5	35.1	26.1	33.6	33.4	36.1	31.3	20.2	18.8	19.2	14.9	20.3	19.6	17.9	17.3	17.5	16	20	19	31.7	31.2	20.4	19.8	17.7	16.8	17	17.2
Screener_S1	35.6	35.9	33.1	35.3	29.2	24.2	21.8	20.5	35.7	29.5	24	22.2	22.6	20.4	26.3	25.3	22.9	21.6	23.1	21.7	25.9	24.7	36.1	35.2	26	24.7	23.3	21.9	21.8	22.5
Loader_3_S1	33.3	32.9	26.6	28.8	22.2	18.1	15.9	14.8	32.3	24.8	17.4	15.9	16.1	13.8	19	18.5	15.4	14.6	13.6	12.7	18.3	14.1	25.7	25.5	18.2	17.4	17	16.2	15.2	15.6
Loader_2_S1_5	29.9	30.2	25.7	28.3	22.4	18.4	16.1	15	32.2	25.1	17.3	15.8	16	13.8	19.2	18.6	15.6	14.8	14.3	13.3	18.7	14.8	26.3	25.9	18.5	17.6	16.4	15.5	15.1	15.8
Excavator_3_S1_5_9	29.8	30.2	27	29.1	22.8	18.9	16.6	15.5	30.1	24	17.5	16.1	16.1	14.3	19.5	18.9	16.2	15.3	16.3	15.5	19.1	17.2	28.7	28.3	19.1	18.3	17.1	16.4	15.5	15.9
Excavator_1_S1_2_5_6	27.8	26.7	26.5	30.1	27.3	23.2	21.9	22.2	21.5	18.7	5.7	5.3	19	13	15.5	14.8	16.5	15.8			16.8	16	26.3	25.9	20.4	19.7				
Excavator_2_S1_5	26.4	27.2	26	29.3	22.1	17.8	15.5	14.8	32	25.6	17.5	16.1	16.1	14.4	19.4	18.8	16.5	15.6	16.2	15.4	15.9	14.9	30.3	30.1	19.5	18.7	15.9	14.9	15.5	16.2
Loader_1__S1_2_5_6_9	18.9	14.2	20.2	20.4	22	19.5	18.3	18	25	23.8	12	11	18.9	14	24	23.2	16.5	15.6			16.6	15.8	26.2	25.7	20.5	19.7				
Total	42.9	41.7	39.9	41.8	39.1	34.3	37.2	36.9	43.8	40.5	30.5	29.1	36.3	30.5	41.3	40.6	34	33.1	26	24.7	32.1	31.2	41.9	41.1	38.1	37.2	26.6	25.5	25.3	25.9

* 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 A2.7.2 Point of Reception Impacts by Source for Scenario 2* - After Mitigation

Source	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	POR_9_POW	POR_9_OPR	POR_10_POW	POR_10_OPR	POR_11_POW	POR_11_OPR	POR_12_POW	POR_12_OPR	POR_13_POW	POR_13_OPR	POR_14_POW	POR_14_OPR	POR_15_POW	POR_15_OPR
	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
Crusher_S1_2_5_6	38	31.9	36.5	36.7	38.2	35.5	37.8	37.5	37.2	36.7	27.1	26	35.6	29.2	40.9	40.3	33.1	32.1			29	28.7	38.1	37	37.3	36.5				
IHR_1_S2	36.4	36.3	30.7	35	37	29.4	35.2	34.2	37.2	34.2	20.2	18.7	19.7	14.4	22.1	21.5	18	17.6	16.9	15.5	20.1	19.3	31.4	30.8	21.4	20.9	18	15.4	17.3	18.1
Screener_S2	34.9	31.5	34.3	34.5	36.9	34.3	36.4	37.1	32.7	33.1	13.9	13	23.7	14.2	29.7	27.3						22.2	32.8	32.3	26.4	25.4		22	20.9	20.8
Excavator_2_S2_6	28.1	24.6	27.9	31.6	34.9	31.2	29.7	29.8	23.2	24	6.3	5.8	18.5	11.4	22	19.2					16.7	16	25.8	25.4	19.5	18.7	12.9	12.5	10.3	11.3
Excavator_1_S12_5_6	27.8	26.7	26.5	30.1	32.4	28.8	32.4	31.8	32.1	31	11.7	10.9	19	13	15.5	14.8	16.5	15.8			16.8	16	26.3	25.9	20.4	19.7				
Loader_2_S2_6	27.7	24.7	27	27.2	29.4	26.7	28.9	29.4	26.2	26.4	8.3	8	14.8	7	22.1	17.9						15.7	25.8	25.3	19.7	18.9		15.8	14.7	14.8
Loader_3_S2	27.6	24.7	26.9	27.1	31	27.6	28.7	28.7	24.9	24.7	6.7	6.4	13.2	6.1	19.1	15						15.6	25.7	25.2	19.7	18.9		14.9	13.6	13.7
Excavator_3_S2_6	27.4	25	26.8	26.9	29	26.5	28.5	30	25.9	25.6	8.1	7.7	9.9	4.7	15.4	12.3						15.7	25.6	25.2	19.8	19.1				14.8
Loader_1__S1_2_5_6_9	18.9	14.2	20.2	20.4	22	19.5	21.6	21.4	23.1	22.3	12	11	18.9	14	24	23.2	16.5	15.6			16.6	15.8	26.2	25.7	20.5	19.7				
Total	42.2	39.5	40.4	41.7	43.9	40.3	42.7	42.7	41.9	40.8	28.4	27.3	36.3	29.8	41.5	40.7	33.4	32.5	16.9	15.5	30.2	30.8	40.8	40	38.1	37.3	19.2	24.5	23.8	24.5

* 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 A2.7.3 Point of Reception Impacts by Source for Scenario 3* - After Mitigation

Source	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	POR_9_POW	POR_9_OPR	POR_10_POW	POR_10_OPR	POR_11_POW	POR_11_OPR	POR_12_POW	POR_12_OPR	POR_13_POW	POR_13_OPR	POR_14_POW	POR_14_OPR	POR_15_POW	POR_15_OPR
	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
Crusher_S3_4_7_8	40.1	38.2	38.6	38.2	40	36.9	39.8	39.4	35.8	37.6	37.2	35.6	37.3	33.7	43.7	42.1	34.6	33.8					41.4	40.9	40	39.3				
Screener_S3	26.9	26	26.4	25.8	28.2	25.8	27.1	27	21.3	18.9	20.2	18.2	15.8	15.4	24	24		22.2					31.9	29.9	28.2	27.3				
Excavator_2_S3_7	24.2	19.5	23.4	22.3	21.1	19.3	20.3	20.1	20.4	17	21.7	20	19.4	17.7	23.8	23.4	16.9	16.1					25.1	23.4	21.8	21.1				
Excavator_1_S3_4_7_8_9	23.2	22.6	21.8	21.5	23	20.1	22.5	22.2	24.2	26.2	20.3	18.9	20.5	17.7	28.9	28.7	18.2	17.4					24.5	24	23.4	22.7				
Loader_1_S3_4_7_8	23.2	22.6	21.5	21.2	22.8	19.9	22.3	22	22.2	21.7	20.3	18.8	20.4	17.1	29.3	28.9	18.2	17.4					24.6	24.1	23.4	22.8				
IHR_2_S3_7	21.2	20.8	23.3	22.6	22.8	19.3	21.5	21.2	21.2	22	18.1	15.2	17.6	13.4	29	28.1	16.2	15.6	0.8	12.3			26.5	22.7	22	21.5				
Loader_2_S3_7	20.7	19.9	20.1	19.6	21.9	19.7	21	20.7	14.8	16.9	14.6	13.1	16.8	15.2	25.4	24.5	16.6	15.8					25.6	23.7	21.5	20.7				
Excavator_3_S3_7	20.5	19.8	19.9	19.5	21.3	19.6	20.7	20.5	18.8	17.6	18.9	16.9	12	11.4	21.3	20.7	17	16.2					25.4	23.8	21.8	21.1				
Loader_3_S3	20.5	19.8	20	19.5	21.5	19.6	20.7	20.5	10.4	11.4	11.4	10.2	16.7	15.3	24.6	23.6		15.7					25.4	20.5	21.2	20.5				
Total	40.7	39	39.4	39	40.7	37.7	40.4	40.1	36.7	38.3	37.7	36.1	37.7	34.2	44.3	42.9	35.1	34.6	0.8	12.3	-80.2	-80.2	42.5	41.7	40.7	40.1	-80.2	-80.2	-80.2	-80.2

* 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 A2.7.4 Point of Reception Impacts by Source for Scenario 4* - After Mitigation

Source	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	POR_9_POW	POR_9_OPR	POR_10_POW	POR_10_OPR	POR_11_POW	POR_11_OPR	POR_12_POW	POR_12_OPR	POR_13_POW	POR_13_OPR	POR_14_POW	POR_14_OPR	POR_15_POW	POR_15_OPR
	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
Crusher_S3_4_7_8	40.1	38.2	38.6	38.2	40	36.9	39.8	39.4	35.8	37.6	37.2	35.6	37.3	33.7	43.7	42.1	34.6	33.8					41.4	40.9	40	39.3				
Screener_S4	27.6	26.7	26.1	25.5	31.5	24.7	26.9	26.6	28.3	30.2	26.6	24.7	15.6	11.6	27.7	27.7	20.7	20.3					29.2	28.3	20.6	20.1				
Excavator_2_S4_8_9	24.4	22.8	22.9	21.8	24.3	21.1	24	23	21.6	23	20	18.6	11.9	9.2	23.4	23.8	18.5	17.8					26	24.4	21.3	20.8				
Loader_3_S4	24.4	22.4	22.7	21.5	24.3	20.8	23.7	22.6	21.7	22.8	19.8	18.3	11.3	8.5	23.7	23.9	16.9	15.9					22	21.3	18.3	17.9				
Excavator_1_S3_4_7_8_9	23.2	22.6	21.8	21.5	23	20.1	22.5	22.2	24.2	26.2	20.3	18.9	20.5	17.7	28.9	28.7	18.2	17.4					24.5	24	23.4	22.7				
Loader_1_S3_4_7_8	23.2	22.6	21.5	21.2	22.8	19.9	22.3	22	22.2	21.7	20.3	18.8	20.4	17.1	29.3	28.9	18.2	17.4					24.6	24.1	23.4	22.8				
Excavator_3_S4_8	20.8	20.1	19.6	19.1	20.5	18.4	20.2	20	21.3	23.5	20.2	18.5	12.2	8.2	21.6	21.8	17.8	17					22.2	21.6	18.8	18.3				
IHR_2_S4_8	20.3	19.9	19.1	18.6	23.9	17.6	20	19.7	22.1	23.9	18.1	16	16.4	12.1	28.8	28.2	15.5	15	0	4.7			21.9	21.6	20.4	19.3				
Loader_2_S4_8_9	19.4	19.8	19.2	18.6	24.5	17.9	19.7	19.4	21.6	23	19.7	18	7.8	5.6	19.9	20.3	5.8	5.8					13.7	13.9	8.6	8.7				
Total	40.8	39.1	39.4	38.9	41.1	37.7	40.5	40.1	37.5	39.2	38.1	36.4	37.6	34	44.3	42.9	35.3	34.5	0	4.7	-80.2	-80.2	42.1	41.5	40.4	39.7	-80.2	-80.2	-80.2	-80.2

* 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 A2.7.5 Point of Reception Impacts by Source for Scenario 5* - After Mitigation

Source	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	POR_9_POW	POR_9_OPR	POR_10_POW	POR_10_OPR	POR_11_POW	POR_11_OPR	POR_12_POW	POR_12_OPR	POR_13_POW	POR_13_OPR	POR_14_POW	POR_14_OPR	POR_15_POW	POR_15_OPR
	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
Crusher_S1_2_5_6	38	31.9	36.5	36.7	34.3	31.6	33.8	33.5	40	38.8	27.1	26	35.6	29.2	40.9	40.3	33.1	32.1			29	28.7	38.1	37	37.3	36.5				
Washplant	37.7	37.9	34.2	36.5	28.3	23.9	22.4	22.2	34.9	28	24.6	23.2	23.2	22.1	26.5	26	23.1	22.3	23.3	22.5	25.9	25.1	37	37.2	26.1	25.3	23.6	23.2	22.3	23.1
Generator	36.4	36.6	29.9	32.6	23.8	20.3	18.7	18.6	33.8	25	20.4	18.8	18.6	17.5	22.7	22.6	18.5	18.3	18.7	18.6	21.9	21.9	36.3	36.8	22.3	22.2	18.5	18	17.3	18.1
IHR_1_S5	36.3	36.3	29.9	33.7	35.9	26.1	34.2	32.7	36	31.5	20.1	18.6	19	14.7	19.9	19.2	17.7	17.1	17.3	15.9	19.6	18.8	31.6	31.2	20.1	19.5	18	17.1	16.9	17.2
Loader_3_S5_6_7_8_9	30.9	30.7	25.4	28.2	19.4	15.7	13.7	13.4	27.5	20.3	17.4	14	16.4	14.3	19.9	19.2	16.7	15.9	16.9	16.1	19.4	18.6	31.1	30.5	19.8	19	16.6	15.7	15.3	15.6
Loader_2_S1_5	29.9	30.2	25.7	28.3	22.4	18.4	16.1	15	32.2	25.1	17.3	15.8	16	13.8	19.2	18.6	15.6	14.8	14.3	13.3	18.7	14.8	26.3	25.9	18.5	17.6	16.4	15.5	15.1	15.8
Excavator_3_S1_5_9	29.8	30.2	27	29.1	22.8	18.9	16.6	15.5	32.2	25.3	17.5	16.1	16.1	14.3	19.5	18.9	16.2	15.3	16.3	15.5	19.1	17.2	28.7	28.3	19.1	18.3	17.1	16.4	15.5	15.9
Excavator_1_S1_2_5_6	27.8	26.7	26.5	30.1	27.3	23.2	21.9	22.2	21.5	18.7	5.7	5.3	19	13	15.5	14.8	16.5	15.8			16.8	16	26.3	25.9	20.4	19.7				
Excavator_2_S1_5	26.4	27.2	26	29.3	22.1	17.8	15.5	14.8	32	25.6	17.5	15.7	16.1	14.4	19.4	18.8	16.5	15.6	16.2	15.4	15.9	14.9	30.3	30.1	19.5	18.7	15.9	14.9	15.5	16.2
Loader_1__S1_2_5_6_9	18.9	14.2	20.2	20.4	22	19.5	18.3	18	25	23.8	12	11	18.9	14	24	23.2	16.5	15.6			16.6	15.8	26.2	25.7	20.5	19.7				
Total	44	43.2	40.5	42.4	39.5	34.4	37.5	36.7	44	40.5	31	29.6	36.4	30.9	41.4	40.7	34.2	33.3	27	26.2	32.6	31.9	43.3	43.1	38.2	37.4	27.3	26.7	26.1	26.8

* 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 A2.7.6 Point of Reception Impacts by Source for Scenario 6* - After Mitigation

Source	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	POR_9_POW	POR_9_OPR	POR_10_POW	POR_10_OPR	POR_11_POW	POR_11_OPR	POR_12_POW	POR_12_OPR	POR_13_POW	POR_13_OPR	POR_14_POW	POR_14_OPR	POR_15_POW	POR_15_OPR
	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
Crusher_S1_2_5_6	38	31.9	36.5	36.7	38.2	35.5	37.8	37.5	37.2	36.7	27.1	26	35.6	29.2	40.9	40.3	33.1	32.1			29	28.7	38.1	37	37.3	36.5				
Washplant	37.7	37.9	34.2	36.5	28.3	23.9	22.4	22.2	34.9	28	24.6	23.2	23.2	22.1	26.5	26	23.1	22.3	23.3	22.5	25.9	25.1	37	37.2	26.1	25.3	23.6	23.2	22.3	23.1
IHR_1_S6	36.6	36.5	30.8	34.7	36.9	29.4	35.6	34.5	37.2	34.3	20.3	18.8	19.8	14.6	22.3	21.7	18.5	18	17.2	15.8	20.3	19.5	32.2	31.8	21.6	21	18	17.5	17.2	18
Generator	36.4	36.6	29.9	32.6	23.8	20.3	18.7	18.6	33.8	25	20.4	18.8	18.6	17.5	22.7	22.6	18.5	18.3	18.7	18.6	21.9	21.9	36.3	36.8	22.3	22.2	18.5	18	17.3	18.1
Loader_3_S5_6_7_8_9	30.9	30.7	25.4	28.2	19.4	15.7	13.7	13.4	27.5	20.3	17.4	14	16.4	14.3	19.9	19.2	16.7	15.9	16.9	16.1	19.4	18.6	31.1	30.5	19.8	19	16.6	15.7	15.3	15.6
Excavator_2_S2_6	28.1	24.6	27.9	31.6	34.9	31.2	29.7	29.8	23.2	24	6.3	5.8	18.5	11.4	22.5	21.8					16.7	16	25.8	25.4	19.5	18.7	12.9	12.5	10.3	11.3
Excavator_1_S12_5_6	27.8	26.7	26.5	30.1	32.4	28.8	32.4	31.8	32.1	31	11.7	10.9	19	13	15.5	14.8	16.5	15.8			16.8	16	26.3	25.9	20.4	19.7				
Loader_2_S2_6	27.7	24.7	27	30.5	34.1	30	33.4	33.2	26.2	26.4	8.3	8	14.8	7	22.1	17.9						15.7	25.8	25.3	19.7	18.9		15.8	14.7	14.8
Excavator_3_S2_6	27.4	25	26.8	30.4	33.6	29.9	28.5	32.8	25.9	25.6	8.1	7.7	9.9	4.7	15.4	12.3						15.7	25.6	25.2	19.8	19.1				14.8
Loader_1__S1_2_5_6_9	18.9	14.2	20.2	20.4	22	19.5	21.6	21.4	23.1	22.3	12	11	18.9	14	24	23.2	16.5	15.6			16.6	15.8	26.2	25.7	20.5	19.7				
Total	43.9	42.9	40.7	42.8	43.5	39.5	41.9	41.8	42.9	40.4	30.5	29.2	36.4	30.7	41.5	40.8	34	33.1	25.9	25.2	32.2	32	43.1	42.9	38.2	37.5	26.3	26.2	25.4	26.4

* 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 A2.7.7 Point of Reception Impacts by Source for Scenario 7* - After Mitigation

Source	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	POR_9_POW	POR_9_OPR	POR_10_POW	POR_10_OPR	POR_11_POW	POR_11_OPR	POR_12_POW	POR_12_OPR	POR_13_POW	POR_13_OPR	POR_14_POW	POR_14_OPR	POR_15_POW	POR_15_OPR
	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
Crusher_S3_4_7_8	40.1	38.2	38.6	38.2	40	36.9	39.8	39.4	35.8	37.6	37.2	35.6	37.3	33.7	43.7	42.1	34.6	33.8					41.4	40.9	40	39.3				
Washplant	37.7	37.9	34.2	36.5	28.3	23.9	22.4	22.2	34.9	28	24.6	23.2	23.2	22.1	26.5	26	23.1	22.3	23.3	22.5	25.9	25.1	37	37.2	26.1	25.3	23.6	23.2	22.3	23.1
Generator	36.4	36.6	29.9	32.6	23.8	20.3	18.7	18.6	33.8	25	20.4	18.8	18.6	17.5	22.7	22.6	18.5	18.3	18.7	18.6	21.9	21.9	36.3	36.8	22.3	22.2	18.5	18	17.3	18.1
Loader_3_S5_6_7_8_9	30.9	30.7	25.4	28.2	19.4	15.7	13.7	13.4	27.5	20.3	17.4	14	16.4	14.7	19.9	19.2	16.7	15.9	16.9	16.1	19.4	18.6	31.1	30.5	19.8	19	16.6	15.7	15.3	15.6
IHR_1_S7_8	30.6	30.7	22.9	26.3	26.7	16.4	23.7	22.4	30.1	24.7	12.7	11.3	10.3	7.3	13.4	12.8	10.9	10.3	10.2	9.7	12.8	11.9	25.9	25.5	14	13.5	10.3	9.9	11.6	12.1
Excavator_2_S3_7	24.2	19.5	23.4	22.3	21.1	19.3	20.3	20.1	20.4	17	21.7	20	19.4	17.7	23.8	23.4	16.9	16.1					25.1	23.4	21.8	21.1				
Excavator_1_S3_4_7_8_9	23.2	22.6	21.8	21.5	23	20.1	22.5	22.2	24.2	26.2	20.3	18.9	20.5	17.7	28.9	28.7	18.2	17.4					24.5	24	23.4	22.7				
Loader_1_S3_4_7_8	23.2	22.6	21.5	21.2	22.8	19.9	22.3	22	22.2	21.7	20.3	18.8	20.4	17.1	29.3	28.9	18.2	17.4					24.6	24.1	23.4	22.8				
IHR_2_S3_7	21.2	20.8	23.3	22.6	22.8	19.3	21.5	21.2	21.2	22	18.1	15.2	17.6	13.4	29	28.1	16.2	15.6	0.8	12.3			26.5	22.7	22	21.5				
Loader_2_S3_7	20.7	19.9	20.1	19.6	21.9	19.7	21	20.7	14.8	16.9	14.6	13.1	16.8	15.2	25.4	24.5	16.6	15.8					25.6	23.7	21.5	20.7				
Excavator_3_S3_7	20.5	19.8	19.9	19.5	21.3	19.6	20.7	20.5	18.8	17.6	18.9	16.9	12	11.4	21.3	20.7	17	16.2					25.4	23.8	21.8	21.1				
Total	43.8	43.1	40.9	41.7	41	37.7	40.4	40	40.7	39	38	36.3	37.9	34.5	44.3	42.9	35.5	34.7	25.4	25	28.1	27.5	44.3	44	40.7	40	25.5	25	24.3	25

* 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 A2.7.8 Point of Reception Impacts by Source for Scenario 8* - After Mitigation

Source	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	POR_9_POW	POR_9_OPR	POR_10_POW	POR_10_OPR	POR_11_POW	POR_11_OPR	POR_12_POW	POR_12_OPR	POR_13_POW	POR_13_OPR	POR_14_POW	POR_14_OPR	POR_15_POW	POR_15_OPR
	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
Crusher_S3_4_7_8	40.1	38.2	38.6	38.2	40	36.9	39.8	39.4	35.8	37.6	37.2	35.6	37.3	33.7	43.7	42.1	34.6	33.8					41.4	40.9	40	39.3				
Washplant	37.7	37.9	34.2	36.5	28.3	23.9	22.4	22.2	34.9	28	24.6	23.2	23.2	22.1	26.5	26	23.1	22.3	23.3	22.5	25.9	25.1	37	37.2	26.1	25.3	23.6	23.2	22.3	23.1
Generator	36.4	36.6	29.9	32.6	23.8	20.3	18.7	18.6	33.8	25	20.4	18.8	18.6	17.5	22.7	22.6	18.5	18.3	18.7	18.6	21.9	21.9	36.3	36.8	22.3	22.2	18.5	18	17.3	18.1
Loader_3_S5_6_7_8_9	30.9	30.7	25.4	28.2	19.4	15.7	13.7	13.4	27.5	20.3	17.4	14	16.4	14.7	19.9	19.2	16.7	15.9	16.9	16.1	19.4	18.6	31.1	30.5	19.8	19	16.6	15.7	15.3	15.6
IHR_1_S7_8	30.6	30.7	22.9	26.3	26.7	16.4	23.7	22.4	30.1	24.7	12.7	11.3	10.3	7.3	13.4	12.8	10.9	10.3	10.2	9.7	12.8	11.9	25.9	25.5	14	13.5	10.3	9.9	11.6	12.1
Excavator_2_S4_8_9	24.4	22.8	22.9	21.8	24.3	21.1	24	23	21.6	23	20	18.6	11.9	9.2	23.4	23.8	18.5	17.8					26	24.4	21.3	20.8				
Excavator_1_S3_4_7_8_9	23.2	22.6	21.8	21.5	23	20.1	22.5	22.2	24.2	26.2	20.3	18.9	20.5	17.7	28.9	28.7	18.2	17.4					24.5	24	23.4	22.7				
Loader_1_S3_4_7_8	23.2	22.6	21.5	21.2	22.8	19.9	22.3	22	22.2	21.7	20.3	18.8	20.4	17.1	29.3	28.9	18.2	17.4					24.6	24.1	23.4	22.8				
Excavator_3_S4_8	20.8	20.1	19.6	19.1	20.5	18.4	20.2	20	21.3	23.5	20.2	18.5	12.2	8.2	21.6	21.8	17.8	17					22.2	21.6	18.8	18.3				
IHR_2_S4_8	20.3	19.9	19.1	18.6	23.9	17.6	20	19.7	22.1	23.9	18.1	16	16.4	12.1	28.8	28.2	15.5	15	0	4.7			21.9	21.6	20.4	19.3				
Loader_2_S4_8_9	19.4	19.8	19.2	18.6	24.5	17.9	19.7	19.4	21.6	23	19.7	18	7.8	5.6	19.9	20.3	5.8	5.8					13.7	13.9	8.6	8.7				
Total	43.8	43.2	40.9	41.7	41.1	37.7	40.4	40	40.7	39.3	38	36.4	37.8	34.4	44.3	42.9	35.5	34.7	25.4	24.8	28.1	27.5	44.2	43.9	40.6	39.9	25.5	25	24.3	25

* 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 A2.7.9 Point of Reception Impacts by Source for Scenario 9* - After Mitigation

Source	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	POR_9_POW	POR_9_OPR	POR_10_POW	POR_10_OPR	POR_11_POW	POR_11_OPR	POR_12_POW	POR_12_OPR	POR_13_POW	POR_13_OPR	POR_14_POW	POR_14_OPR	POR_15_POW	POR_15_OPR
	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
Screener_S10	39.8	39.4	33.5	37.8	29.4	25.7	23.6	23.5	31.8	27.9	22.8	20	22.9	21.1	26.4	25.6					25.5	24.5	35.8	35.3	25.6	24.6	24.7	23.5	23.2	23.4
Crusher_S10_11	38	31.9	36.5	36.7	38.2	35.5	37.8	37.5	39.7	39	27.1	26	35.6	29.2	40.9	40.3	33.1	32.1			29	28.7	38.1	37	37.3	36.5				
IHR_1_S10	36	36	31.5	35.9	36.5	27.3	33.9	33	36.7	33.5	20.8	19.3	19.6	16.4	21.3	20.8	18.4	17.8	18.1	16.8	20.4	19.7	32.6	32.4	21.2	20.6	20.1	19.1	18.4	18.7
Loader_2_S10_11	32.7	32.4	26.6	29.5	21.4	18.4	16.3	16.3	27.3	24	16.7	15.1	16.3	14.8	19.5	18.9					18.8	18	28.8	28.4	18.9	18	17.5	16.5	16.5	16.8
Loader_3_S10	32.7	32.7	29.8	32.5	24.7	21.6	20.1	19.8	25.1	24.1	16.7	15	16.4	14.9	19.7	19.1					18.7	18	28.9	28.4	19	18.1	18.3	17.5	16.6	17
Excavator_3_S10_11	32.5	32.1	27.1	30.2	22.1	19.2	17	17.1	28.6	24.5	16.3	14.3	16.4	15	19.6	19					18.8	18.1	28.6	28.2	18.9	18.1	17.3	16.3	16.6	17
Excavator_2_S10_11	28.2	29	24.9	29.6	21.5	18.4	15.8	16.2	28.2	24.5	15.8	13.7	15.8	14	19.5	19					18.2	17.5	28.3	27.9	18.7	17.9	14.3	13.8	16	16.3
Excavator_1_S10_11	27.8	26.7	26.5	30.1	32.4	28.8	32.4	31.8	33.6	32.2	11.7	10.9	19	13	15.5	14.8	16.5	15.8			16.8	16	26.3	25.9	20.4	19.7				
Loader_1__S10_11	18.9	14.2	20.2	20.4	22	19.5	21.6	21.4	24.7	24	12	11	18.9	14	24	23.2	16.5	15.6			16.6	15.8	26.2	25.7	20.5	19.7				
Total	44.2	43.1	40.4	43.1	41.6	37.5	40.3	39.8	43.1	41.4	30.1	28.6	36.3	30.6	41.4	40.7	33.4	32.5	18.1	16.8	32.2	31.6	42	41.3	38	37.2	27.8	26.8	26.6	26.8

* 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 A2.7.10 Point of Reception Impacts by Source for Scenario 10* - After Mitigation

Source	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	POR_9_POW	POR_9_OPR	POR_10_POW	POR_10_OPR	POR_11_POW	POR_11_OPR	POR_12_POW	POR_12_OPR	POR_13_POW	POR_13_OPR	POR_14_POW	POR_14_OPR	POR_15_POW	POR_15_OPR
	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
Crusher_S10_11	38	31.9	36.5	36.7	38.2	35.5	37.8	37.5	39.7	39	27.1	26	35.6	29.2	40.9	40.3	33.1	32.1			29	28.7	38.1	37	37.3	36.5				
Washplant	37.7	37.9	34.2	36.5	28.3	23.9	22.4	22.2	34.9	28	24.6	23.2	23.2	22.1	26.5	26	23.1	22.3	23.3	22.5	25.9	25.1	37	37.2	26.1	25.3	23.6	23.2	22.3	23.1
Generator	36.4	36.6	29.9	32.6	23.8	20.3	18.7	18.6	33.8	25	20.4	18.8	18.6	17.5	22.7	22.6	18.5	18.3	18.7	18.6	21.9	21.9	36.3	36.8	22.3	22.2	18.5	18	17.3	18.1
IHR_1_S11	36.2	36.2	31.3	36	36.5	27.3	33.9	33	36.6	33.6	20.8	19.3	19.6	16.4	21.3	20.8	18.2	17.6	18.1	16.8	20.6	19.9	32.5	32.1	21.1	20.5	20.2	19.2	18.4	18.8
Loader_2_S10_11	32.7	32.4	26.6	29.5	21.4	18.4	16.3	16.3	28.8	24	16.7	15.1	16.3	14.8	19.5	18.9					18.8	18	28.8	28.4	18.9	18	17.5	16.5	16.5	16.8
Excavator_3_S10_11	32.5	32.1	27.1	30.2	22.1	19.2	17	17.1	28.6	24.5	16.4	14.7	16.4	15	19.6	19					18.8	18.1	28.6	28.2	18.9	18.1	17.3	16.3	16.6	17
Loader_3_S11	30.9	30.7	25.4	28.2	19.4	15.7	13.7	13.4	27.5	20.3	17.4	14	16.4	14.3	19.9	19.2	16.7	15.9	16.9	16.1	19.4	18.6	31.1	30.5	19.8	19	16.6	15.7	15.3	15.6
Excavator_2_S10_11	28.2	29	24.9	29.6	21.5	18.4	15.8	16.2	28.2	24.5	15.8	13.7	15.8	14	19.5	19					18.2	17.5	28.3	27.9	18.7	17.9	14.3	13.8	16	16.3
Excavator_1_S10_11	27.8	26.7	26.5	30.1	32.4	28.8	32.4	31.8	33.6	32.2	11.7	10.9	19	13	15.5	14.8	16.5	15.8			16.8	16	26.3	25.9	20.4	19.7				
Loader_1__S10_11	18.9	14.2	20.2	20.4	22	19.5	21.6	21.4	24.7	24	12	11	18.9	14	24	23.2	16.5	15.6			16.6	15.8	26.2	25.7	20.5	19.7				
Total	44.3	43.5	40.6	42.9	41.6	37.4	40.3	39.8	43.9	41.4	31	29.6	36.4	30.9	41.4	40.8	34	33.1	26	25.3	32.7	32.2	43.4	43.1	38.2	37.4	27.7	27	26.6	27.1

* 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 Distance Source to Point of Reception

Source	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	POR_9_POW	POR_9_OPR	POR_10_POW	POR_10_OPR	POR_11_POW	POR_11_OPR	POR_12_POW	POR_12_OPR	POR_13_POW	POR_13_OPR	POR_14_POW	POR_14_OPR	POR_15_POW	POR_15_OPR
	183795 80.07	183795 71.88	183798 39.3	183798 17.37	183799 84.46	183799 54.46	183800 64.47	183800 34.47	183797 35.39	183797 16.72	183795 65.25	183795 43.8	183784 64.29	183784 85.55	183782 86.86	183783 16.86	183776 85.16	183777 08.64	183781 80.46	183781 99.52	183792 17.49	183792 17.49	183791 23.79	183791 23.79	183780 13.41	183780 32.89	183814 31.4	183813 99.4	183814 07.9	183813 80.8
	4977742.32	4977715.22	4977415.89	4977394.72	4977371.54	4977361.94	4977342.74	4977342.74	4976850.07	4976867.27	4975904.68	4975924.38	4975991.28	4976005.73	4976586.73	4976586.73	4978067.51	4978043.38	4978781.85	4978759.04	4978941.27	4978927.27	4977813.76	4977783.76	4977492.92	4977470.48	4978300.6	4977298.6	4977128.46	4977137.46
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
Crusher_S1_2_5_6	810	782	687	656	781	750	838	811	445	422	1104	1080	1300	1275	1095	1067	1955	1922	2127	2098	1972	1942	855	826	1394	1368	2146	2114	2103	2077
Crusher_S3_4_7_8	1114	1087	1074	1044	1178	1147	1237	1210	798	780	1120	1091	965	942	695	667	1759	1726	2092	2064	2136	2106	999	970	1136	1107	2538	2506	2488	2462
Crusher_S10_11	810	782	687	656	781	750	838	811	445	422	1104	1080	1300	1275	1095	1067	1955	1922	2127	2098	1972	1942	855	826	1394	1368	2146	2114	2103	2077
Screener_S1	247	219	332	317	483	457	568	539	687	665	1598	1578	1843	1819	1535	1511	1919	1890	1852	1822	1478	1449	503	485	1506	1487	1923	1891	1926	1897
Screener_S2	791	763	596	565	670	641	720	694	303	279	1063	1041	1386	1361	1226	1197	2086	2053	2221	2192	2001	1972	914	886	1535	1509	2006	1974	1974	1961
Screener_S3	1507	1479	1405	1374	1483	1454	1528	1504	991	981	898	869	577	552	573	544	2002	1969	2441	2414	2547	2517	1412	1383	1345	1315	2735	2704	2662	2639
Screener_S4	1404	1379	1397	1367	1503	1472	1563	1536	1106	1090	1219	1190	729	710	371	342	1669	1635	2133	2107	2323	2294	1215	1188	1011	982	2855	2824	2804	2776
Screener_S10	388	364	196	169	333	303	413	383	517	498	1458	1440	1812	1788	1569	1543	2090	2059	2046	2016	1647	1618	696	677	1644	1622	1781	1749	1772	1743
Washplant	325	297	316	296	464	436	547	518	610	588	1518	1498	1780	1756	1492	1467	1948	1918	1911	1881	1558	1528	559	539	1511	1491	1912	1880	1908	1879
Generator	324	296	315	294	463	434	546	516	611	588	1519	1499	1782	1757	1494	1469	1949	1919	1911	1882	1557	1527	560	539	1513	1492	1911	1879	1907	1878
Excavator_1_S1_2_5_6	789	761	648	617	738	708	794	767	404	380	1101	1078	1335	1310	1140	1112	1990	1957	2146	2117	1968	1938	860	831	1434	1408	2100	2068	2057	2031
Excavator_1_S3_4_7_8_9	1090	1064	1067	1037	1175	1144	1237	1209	816	797	1166	1137	994	972	695	668	1716	1683	2045	2017	2096	2066	961	931	1097	1068	2548	2516	2501	2475
Excavator_1_S10_11	789	761	648	617	738	708	794	767	404	380	1101	1078	1335	1310	1140	1112	1990	1957	2146	2117	1968	1938	860	831	1434	1408	2100	2068	2057	2031
Excavator_2_S1_5	249	221	303	289	455	429	540	511	672	651	1591	1571	1853	1829	1553	1529	1948	1918	1877	1847	1491	1462	530	512	1533	1514	1895	1863	1898	1869
Excavator_2_S2_6	767	739	558	528	630	600	678	653	277	252	1078	1057	1426	1400	1267	1238	2088	2055	2228	2198	1988	1958	911	883	1564	1538	1967	1935	1932	1906
Excavator_2_S3_7	1504	1477	1416	1385	1498	1469	1546	1521	1017	1007	947	918	573	549	526	497	1956	1923	2404	2377	2526	2496	1395	1365	1298	1268	2766	2735	2695	2672
Excavator_2_S4_8_9	1440	1414	1434	1405	1540	1509	1600	1573	1140	1124	1231	1202	703	685	335	306	1667	1634	2146	2119	2350	2321	1246	1219	1008	978	2890	2859	2859	2834
Excavator_2_S10_11	397	373	167	139	302	272	382	352	511	492	1459	1441	1831	1807	1595	1569	2120	2090	2069	2040	1657	1629	721	702	1675	1654	1750	1718	1741	1712
Excavator_3_S1_5_9	254	226	333	318	485	459	570	541	683	660	1593	1572	1836	1812	1529	1505	1918	1888	1854	1824	1483	1454	504	486	1503	1483	1925	1894	1898	1869
Excavator_3_S2_6	823	795	640	610	716	687	765	740	331	308	1042	1020	1341	1316	1182	1153	2068	2035	2221	2192	2023	1993	925	897	1509	1483	2048	2016	2001	1975

Source	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	POR_9_POW	POR_9_OPR	POR_10_POW	POR_10_OPR	POR_11_POW	POR_11_OPR	POR_12_POW	POR_12_OPR	POR_13_POW	POR_13_OPR	POR_14_POW	POR_14_OPR	POR_15_POW	POR_15_OPR
	183795 80.07	183795 71.88	183798 39.3	183798 17.37	183799 84.46	183799 54.46	183800 64.47	183800 34.47	183797 35.39	183797 16.72	183795 65.25	183795 43.8	183784 64.29	183784 85.55	183782 86.86	183783 16.86	183776 85.16	183777 08.64	183781 80.46	183781 99.52	183792 17.49	183792 17.49	183791 23.79	183791 23.79	183780 13.41	183780 32.89	183814 31.4	183813 99.4	183814 07.9	183813 80.8
	4977742.32	4977715.22	4977415.89	4977394.72	4977371.54	4977361.94	4977342.74	4977342.74	4976850.07	4976867.27	4975904.68	4975924.38	4975991.28	4976005.73	4976586.73	4976586.73	4978067.51	4978043.38	4978781.85	4978759.04	4978949.27	4978919.27	4977813.76	4977783.76	4977492.92	4977470.48	4977300.6	4977298.6	4977124.18	4977137.46
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
Excavator_3_S3_7	1459	1431	1372	1342	1456	1427	1505	1480	981	970	953	924	619	595	540	510	1937	1903	2372	2345	2484	2454	1351	1322	1281	1251	2733	2701	2663	2640
Excavator_3_S4_8	1406	1381	1389	1359	1493	1462	1551	1524	1085	1070	1185	1156	712	693	388	359	1703	1669	2162	2136	2341	2312	1228	1200	1046	1016	2837	2805	2780	2755
Excavator_3_S10_11	384	360	190	164	328	298	409	379	522	502	1464	1446	1819	1795	1576	1550	2092	2062	2045	2016	1643	1614	696	677	1648	1627	1776	1744	1768	1739
Loader_1__S1_2_5_6_9	806	778	690	660	786	755	844	817	457	434	1114	1090	1299	1274	1089	1061	1943	1910	2115	2086	1964	1934	846	816	1382	1356	2155	2123	2123	2087
Loader_1_S3_4_7_8	1118	1091	1091	1062	1198	1167	1259	1232	830	812	1154	1126	967	944	673	645	1723	1689	2062	2034	2121	2091	987	958	1099	1070	2566	2534	2517	2492
Loader_1__S10_11	806	778	690	660	786	755	844	817	457	434	1114	1090	1299	1274	1089	1061	1943	1910	2115	2086	1964	1934	846	816	1382	1356	2155	2123	2123	2087
Loader_2_S15	246	218	343	328	495	469	580	551	695	673	1603	1583	1841	1817	1530	1506	1908	1878	1841	1811	1471	1442	492	474	1495	1476	1934	1902	1937	1908
Loader_2_S26	803	774	615	584	691	661	740	715	318	295	1056	1034	1366	1341	1205	1177	2075	2042	2218	2188	2008	1978	915	887	1521	1494	2027	1995	1990	1955
Loader_2_S37	1432	1404	1331	1301	1411	1382	1458	1433	927	916	903	874	652	627	601	571	1977	1944	2394	2366	2480	2450	1343	1314	1324	1294	2676	2645	2605	2582
Loader_2_S48_9	1405	1380	1409	1379	1517	1486	1579	1551	1130	1113	1256	1227	747	729	353	326	1633	1600	2104	2077	2307	2278	1205	1177	976	946	2877	2846	2824	2799
Loader_2_S9	1405	1380	1409	1379	1517	1486	1579	1551	1130	1113	1256	1227	747	729	353	326	1633	1600	2104	2077	2307	2278	1205	1177	976	946	2877	2846	2824	2799
Loader_2_S10_11	377	352	200	174	340	310	421	391	528	508	1468	1450	1815	1791	1568	1542	2080	2050	2034	2004	1636	1607	684	665	1636	1615	1788	1756	1780	1752
Loader_3_S1	265	236	354	338	506	479	590	561	686	664	1589	1569	1820	1796	1509	1485	1898	1868	1841	1811	1483	1454	490	471	1480	1461	1947	1916	1949	1920
Loader_3_S2	813	785	623	593	698	669	747	722	315	292	1046	1024	1358	1333	1201	1172	2080	2047	2226	2197	2019	1989	925	897	1524	1497	2029	1997	1977	1945
Loader_3_S3	1455	1427	1346	1315	1423	1394	1468	1444	930	921	875	846	635	610	616	587	2008	1974	2426	2399	2509	2479	1372	1343	1354	1324	2676	2644	2603	2580
Loader_3_S4	1436	1411	1437	1408	1545	1514	1605	1578	1151	1135	1254	1224	718	700	327	299	1644	1611	2125	2099	2336	2307	1235	1208	985	955	2900	2869	2866	2821
Loader_3_S5_6_7_8_9	326	298	326	305	474	445	557	527	614	591	1519	1499	1775	1751	1484	1460	1939	1909	1904	1874	1555	1526	552	531	1502	1481	1922	1890	1918	1889
Loader_3_S9	326	298	326	305	474	445	557	527	614	591	1519	1499	1775	1751	1484	1460	1939	1909	1904	1874	1555	1526	552	531	1502	1481	1922	1890	1918	1889
Loader_3_S10	390	364	218	192	355	325	435	405	516	496	1452	1434	1794	1769	1547	1521	2071	2040	2033	2004	1646	1617	682	663	1622	1601	1803	1771	1793	1765
Loader_3_S11	326	298	326	305	474	445	557	527	614	591	1519	1499	1775	1751	1484	1460	1939	1909	1904	1874	1555	1526	552	531	1502	1481	1922	1890	1918	1889

Table A2.9 Sample Calculations – Scenario 1

Receiver
Name: POR_1
ID: POR_1_POW
X: 18379580.07 m
Y: 4977742.32 m
Z: 196.59 m

Line Source, ISO 9613, Name: "IHR_1", ID: "IHR_1_S1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/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	18379471.61	4977418.62	190.50	0	D	32	43.5	21.7	0.0	0.0	0.0	61.7	0.0	-4.2	0.7	0.0	4.8	0.0	0.0	2.2
2	18379471.61	4977418.62	190.50	0	D	63	53.5	21.7	0.0	0.0	0.0	61.7	0.0	-4.2	0.7	0.0	4.8	0.0	0.0	12.2
2	18379471.61	4977418.62	190.50	0	D	125	61.1	21.7	0.0	0.0	0.0	61.7	0.1	2.8	1.0	0.0	2.0	0.0	0.0	15.2
2	18379471.61	4977418.62	190.50	0	D	250	60.0	21.7	0.0	0.0	0.0	61.7	0.4	1.9	1.3	0.0	2.9	0.0	0.0	13.5
2	18379471.61	4977418.62	190.50	0	D	500	65.2	21.7	0.0	0.0	0.0	61.7	0.7	-0.9	1.7	0.0	4.8	0.0	0.0	19.0
2	18379471.61	4977418.62	190.50	0	D	1000	72.0	21.7	0.0	0.0	0.0	61.7	1.2	-1.2	2.0	0.0	4.9	0.0	0.0	25.1
2	18379471.61	4977418.62	190.50	0	D	2000	72.4	21.7	0.0	0.0	0.0	61.7	3.3	-1.2	2.7	0.0	5.0	0.0	0.0	22.6
2	18379471.61	4977418.62	190.50	0	D	4000	65.6	21.7	0.0	0.0	0.0	61.7	11.2	-1.2	3.0	0.0	5.2	0.0	0.0	7.4
2	18379471.61	4977418.62	190.50	0	D	8000	69.4	21.7	0.0	0.0	0.0	61.7	39.9	-1.2	4.0	0.0	5.5	0.0	0.0	-18.9
2	18379471.61	4977418.62	190.50	0	N	32	38.7	21.7	0.0	0.0	0.0	61.7	0.0	-4.2	0.7	0.0	4.8	0.0	0.0	-2.5
2	18379471.61	4977418.62	190.50	0	N	63	48.7	21.7	0.0	0.0	0.0	61.7	0.0	-4.2	0.7	0.0	4.8	0.0	0.0	7.4
2	18379471.61	4977418.62	190.50	0	N	125	56.3	21.7	0.0	0.0	0.0	61.7	0.1	2.8	1.0	0.0	2.0	0.0	0.0	10.4
2	18379471.61	4977418.62	190.50	0	N	250	55.2	21.7	0.0	0.0	0.0	61.7	0.4	1.9	1.3	0.0	2.9	0.0	0.0	8.8
2	18379471.61	4977418.62	190.50	0	N	500	60.4	21.7	0.0	0.0	0.0	61.7	0.7	-0.9	1.7	0.0	4.8	0.0	0.0	14.2
2	18379471.61	4977418.62	190.50	0	N	1000	67.2	21.7	0.0	0.0	0.0	61.7	1.2	-1.2	2.0	0.0	4.9	0.0	0.0	20.3
2	18379471.61	4977418.62	190.50	0	N	2000	67.6	21.7	0.0	0.0	0.0	61.7	3.3	-1.2	2.7	0.0	5.0	0.0	0.0	17.9
2	18379471.61	4977418.62	190.50	0	N	4000	60.8	21.7	0.0	0.0	0.0	61.7	11.2	-1.2	3.0	0.0	5.2	0.0	0.0	2.6
2	18379471.61	4977418.62	190.50	0	N	8000	64.6	21.7	0.0	0.0	0.0	61.7	39.9	-1.2	4.0	0.0	5.5	0.0	0.0	-23.7
2	18379471.61	4977418.62	190.50	0	E	32	38.7	21.7	0.0	0.0	0.0	61.7	0.0	-4.2	0.7	0.0	4.8	0.0	0.0	-2.5
2	18379471.61	4977418.62	190.50	0	E	63	48.7	21.7	0.0	0.0	0.0	61.7	0.0	-4.2	0.7	0.0	4.8	0.0	0.0	7.4
2	18379471.61	4977418.62	190.50	0	E	125	56.3	21.7	0.0	0.0	0.0	61.7	0.1	2.8	1.0	0.0	2.0	0.0	0.0	10.4
2	18379471.61	4977418.62	190.50	0	E	250	55.2	21.7	0.0	0.0	0.0	61.7	0.4	1.9	1.3	0.0	2.9	0.0	0.0	8.8
2	18379471.61	4977418.62	190.50	0	E	500	60.4	21.7	0.0	0.0	0.0	61.7	0.7	-0.9	1.7	0.0	4.8	0.0	0.0	14.2
2	18379471.61	4977418.62	190.50	0	E	1000	67.2	21.7	0.0	0.0	0.0	61.7	1.2	-1.2	2.0	0.0	4.9	0.0	0.0	20.3
2	18379471.61	4977418.62	190.50	0	E	2000	67.6	21.7	0.0	0.0	0.0	61.7	3.3	-1.2	2.7	0.0	5.0	0.0	0.0	17.9
2	18379471.61	4977418.62	190.50	0	E	4000	60.8	21.7	0.0	0.0	0.0	61.7	11.2	-1.2	3.0	0.0	5.2	0.0	0.0	2.6
2	18379471.61	4977418.62	190.50	0	E	8000	64.6	21.7	0.0	0.0	0.0	61.7	39.9	-1.2	4.0	0.0	5.5	0.0	0.0	-23.7
5	18379396.58	4977290.83	190.50	0	D	32	43.5	21.7	0.0	0.0	0.0	64.8	0.0	-4.7	0.0	0.0	2.9	0.0	0.0	2.2
5	18379396.58	4977290.83	190.50	0	D	63	53.5	21.7	0.0	0.0	0.0	64.8	0.1	-4.7	0.0	0.0	3.4	0.0	0.0	11.7
5	18379396.58	4977290.83	190.50	0	D	125	61.1	21.7	0.0	0.0	0.0	64.8	0.2	2.8	0.0	0.0	1.4	0.0	0.0	13.6
5	18379396.58	4977290.83	190.50	0	D	250	60.0	21.7	0.0	0.0	0.0	64.8	0.5	1.5	0.0	0.0	2.9	0.0	0.0	12.0
5	18379396.58	4977290.83	190.50	0	D	500	65.2	21.7	0.0	0.0	0.0	64.8	0.9	-1.3	0.0	0.0	4.5	0.0	0.0	18.0
5	18379396.58	4977290.83	190.50	0	D	1000	72.0	21.7	0.0	0.0	0.0	64.8	1.8	-1.6	0.0	0.0	4.6	0.0	0.0	24.1
5	18379396.58	4977290.83	190.50	0	D	2000	72.4	21.7	0.0	0.0	0.0	64.8	4.7	-1.6	0.0	0.0	4.7	0.0	0.0	21.5
5	18379396.58	4977290.83	190.50	0	D	4000	65.6	21.7	0.0	0.0	0.0	64.8	16.0	-1.6	0.0	0.0	4.7	0.0	0.0	3.4
5	18379396.58	4977290.83	190.50	0	D	8000	69.4	21.7	0.0	0.0	0.0	64.8	57.0	-1.6	0.0	0.0	4.8	0.0	0.0	-33.8
5	18379396.58	4977290.83	190.50	0	N	32	38.7	21.7	0.0	0.0	0.0	64.8	0.0	-4.7	0.0	0.0	2.9	0.0	0.0	-2.5
5	18379396.58	4977290.83	190.50	0	N	63	48.7	21.7	0.0	0.0	0.0	64.8	0.1	-4.7	0.0	0.0	3.4	0.0	0.0	6.9
5	18379396.58	4977290.83	190.50	0	N	125	56.3	21.7	0.0	0.0	0.0	64.8	0.2	2.8	0.0	0.0	1.4	0.0	0.0	8.8
5	18379396.58	4977290.83	190.50	0	N	250	55.2	21.7	0.0	0.0	0.0	64.8	0.5	1.5	0.0	0.0	2.9	0.0	0.0	7.3
5	18379396.58	4977290.83	190.50	0	N	500	60.4	21.7	0.0	0.0	0.0	64.8	0.9	-1.3	0.0	0.0	4.5	0.0	0.0	13.2
5	18379396.58	4977290.83	190.50	0	N	1000	67.2	21.7	0.0	0.0	0.0	64.8	1.8	-1.6	0.0	0.0	4.6	0.0	0.0	19.3
5	18379396.58	4977290.83	190.50	0	N	2000	67.6	21.7	0.0	0.0	0.0	64.8	4.7	-1.6	0.0	0.0	4.7	0.0	0.0	16.7
5	18379396.58	4977290.83	190.50	0	N	4000	60.8	21.7	0.0	0.0	0.0	64.8	16.0	-1.6	0.0	0.0	4.7	0.0	0.0	-1.4
5	18379396.58	4977290.83	190.50	0	N	8000	64.6	21.7	0.0	0.0	0.0	64.8	57.0	-1.6	0.0	0.0	4.8	0.0	0.0	-38.6
5	18379396.58	4977290.83	190.50	0	E	32	38.7	21.7	0.0	0.0	0.0	64.8	0.0	-4.7	0.0	0.0	2.9	0.0	0.0	-2.5
5	18379396.58	4977290.83	190.50	0	E	63	48.7	21.7	0.0	0.0	0.0	64.8	0.1	-4.7	0.0	0.0	3.4	0.0	0.0	6.9
5	18379396.58	4977290.83	190.50	0	E	125	56.3	21.7	0.0	0.0	0.0	64.8	0.2	2.8	0.0	0.0	1.4	0.0	0.0	8.8
5	18379396.58	4977290.83	190.50	0	E	250	55.2	21.7	0.0	0.0	0.0	64.8	0.5	1.5	0.0	0.0	2.9	0.0	0.0	7.3
5	18379396.58	4977290.83	190.50	0	E	500	60.4	21.7	0.0	0.0	0.0	64.8	0.9	-1.3	0.0	0.0	4.5	0.0	0.0	13.2
5	18379396.58	4977290.83	190.50	0	E	1000	67.2	21.7	0.0	0.0	0.0	64.8	1.8	-1.6	0.0	0.0	4.6	0.0	0.0	19.3
5	18379396.58	4977290.83	190.50	0	E	2000	67.6	21.7	0.0	0.0	0.0	64.8	4.7	-1.6	0.0	0.0	4.7	0.0	0.0	16.7
5	18379396.58	4977290.83	190.50	0	E	4000	60.8	21.7	0.0	0.0	0.0	64.8	16.0	-1.6	0.0	0.0	4.7	0.0	0.0	-1.4
5	18379396.58	4977290.83	190.50	0	E	8000	64.6	21.7	0.0	0.0	0.0	64.8	57.0	-1.6	0.0	0.0	4.8	0.0	0.0	-38.6
43	18379420.14	4977352.39	190.50	0	D	32	43.5	22.1	0.0	0.0	0.0	63.5	0.0	-4.5	0.0	0.0	3.0	0.0	0.0	3.5

Appendix 3

Instrument Calibration Certificates

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

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CERTIFICATE OF CALIBRATION

Description	**SOUND LEVEL CALIBRATOR**	**Work Order**	**N0833134**
Model Number	**4231**	**Serial Number**	**2730374**
Instrument Id	**N/A**	**Cal Procedure**	**33K3-4-2871-1**
Manufacturer	**BRUEL & KJAER**	**Cal Date**	**30 Jan 2020**
Customer Name	**FREEFIELD LTD.**	**Recall Cycle**	**52 Weeks**
		Next Cal Date	**30 Jan 2021**
		Purchase Order	**Credit Card**

Calibration Environment: Temperature **23.0 °C** Relative Humidity **35.2 %RH**

Received Condition: **Within Tolerance**

Completed Condition: **Within Tolerance**

Remarks: **Optimized sound level.**

Standards Used to Establish Traceability

Instrument Type	Model	Asset #	Cal Due Date
4145 BRUEL&KJAER 1" MICROPHONE	4145	240-054	4 Dec 2020
1/2" MICROPHONE	4166	240-709	18 Jun 2020
PISTONPHONE	4220	354-017	1 Apr 2020
FFT SIGNAL ANALYZER SYSTEM	3550	354-759	10 Oct 2020
MICROPHONE PREAMP	2639T	355-164	27 Feb 2020

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 17025:2005. 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.

pylcert1

Metrologist : ***062*** Quality Assurance: ***301*** Date of Issue: **30 Jan 2020** F083 Rev 15

HALIFAX MONTREAL OTTAWA TORONTO EDMONTON CALGARY

PYLON

Calibration Test Data

Page 1 of 1

Description:	**SOUND LEVEL CALIBRATOR**	Work order:	**N0833134**
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:	**30-Jan-2020**

TEST REF.	TEST DESCRIPTION	RESULTS MIN	AS FOUND	FINAL	MAX
4.1	**Sound Level Calibration:**				
	Nominal dB_{SPL}	dB_{SPL}	dB_{SPL}	dB_{SPL}	dB_{SPL}
	94.0	93.80	94.15	94.02	94.20
	(+20 dB Button) 114.0	113.80	114.13	114.01	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	-	0.37 %		1.00 %
	ADDITIONAL TEST:				
	AUTO SHUT OFF	Pass / Fail	Pass		

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

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CERTIFICATE OF CALIBRATION

Description	**SOUND ANALYZER**	**Work Order**	**N0833130**
Model Number	**2270**	**Serial Number**	**3008643**
Instrument Id	**N/A**	**Cal Procedure**	**BE1713-32**
Manufacturer	**BRUEL & KJAER**	**Cal Date**	**30 Jan 2020**
Customer Name	**FREEFIELD LTD.**	**Recall Cycle**	**52 Weeks**
		Next Cal Date	**30 Jan 2021**
		Purchase Order	**Credit Card**

Calibration Environment: Temperature **23.0 °C** Relative Humidity **35.2 %RH**

Received Condition: **Within Tolerance**

Completed Condition: **Within Tolerance**

Remarks: **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	17 Sep 2020
PISTONPHONE	4220	354-017	1 Apr 2020

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 17025:2005. 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.

pylcert1

Metrologist : *062* Quality Assurance: *301* Date of Issue: **30 Jan 2020** F083 Rev 15

HALIFAX MONTREAL OTTAWA TORONTO EDMONTON CALGARY

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PYLON

Calibration Test Data

Description:	**SOUND ANALYZER**	Work order:	**N0833130**
Model:	**2270**	Serial:	**3008643**
Customer ID.:	**N/A**	Procedure:	**BE1713-32**
Manufacturer:	**BRUEL & KJAER**	Proc. Rev.:	**23-Feb-2016**
Customer:	**FREEFIELD LTD.**	Cal Date:	**30-Jan-2020**

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 4

Manufacturers Data

Contents:

- Manufacturers Data for Cummins 600kW diesel generator used to provide power to the wash plant
- Manufacturers Data for Silex Silencer Model JB 6.

Manufacturers Data for Cummins 600kW diesel generator.

Sound data

600DQPAA 60 Hz

Sound pressure level @ 7 meters, dB(A)

See notes 1-8 listed below

Configuration		Measurement location number								Average
		1	2	3	4	5	6	7	8	
Standard - unhoused	Infinite exhaust	86.70	91.40	89.80	93.30	91.10	93.10	93.20	92.10	91.70
F200 weather	Mounted muffler	93.50	89.30	83.60	89.10	89.10	89.70	81.10	87.20	89.10
F201 – quiet site II first stage	Mounted muffler	87.30	78.60	77.60	77.40	78.60	77.70	74.10	78.00	80.70
F202 – quiet site II second stage	Mounted muffler	72.60	72.10	75.20	72.70	77.80	75.90	72.50	75.30	74.70

Sound power level, dB(A)

See notes 2-6, 9 and 10 listed below

Configuration		Octave band center frequency (Hz)								Overall sound power level
		31.5	63	125	250	500	1000	2000	4000	8000	
Standard - unhoused	Infinite exhaust	66.00	93.80	105.10	109.10	112.40	112.90	114.40	110.90	111.80	120.20
F200 weather	Mounted muffler	73.10	94.00	104.20	109.50	109.70	111.00	111.50	109.90	109.10	118.30
F201 – quiet site II first stage	Mounted muffler	73.50	93.20	103.10	104.80	102.10	101.70	105.50	101.30	100.40	111.70
F202 – quiet site II second stage	Mounted muffler	66.10	93.30	102.90	97.50	92.50	98.10	98.80	94.00	88.40	106.70

Exhaust sound power level, dB(A)

Open exhaust (no muffler rated load)	RPM	Applied load	Octave band center frequency (Hz)									Overall sound power level
			31.5	63	125	250	500	1000	2000	4000	8000	
	1800	600KW	64.90	97.40	112.50	120.20	121.80	122.90	124.90	121.10	109.30	129.70

Note:

1. Position 1 faces the generator front. The positions proceed around the generator set in a counter-clockwise direction in 45° increments. All positions are at 7 m (23 ft) from the surface of the generator set and 1.2 m (48 in) from floor level.
2. Sound levels are subject to instrumentation, measurement, installation and manufacturing variability.
3. Sound data with remote-cooled generator sets are based on rated loads without cooling fan noise.
4. Sound levels for aluminium enclosure are approximately 2 dB(A)s higher than listen sound levels for steel enclosures.
5. Sound data for generator set with infinite exhaust do not include exhaust noise.
6. Data is based on full rated load with standard radiator-cooling fan package.
7. Sound pressure levels are measured per ANSI S1.13 and ANSI S12.18, as applicable.
8. Reference sound pressure is 20 µPa.
9. Sound power levels per ISO 3744 and ISO 8528-10, as applicable.
10. Reference power = 1 pw (10^{-12} W).
11. Exhaust sound power levels are per ISO 6798, as applicable.

Cummins Inc. Data and specification subject to change without notice MSP-1206 (10/17)

Manufacturers Data for Silex Silencer Model JB 6.

www.silex.com JB

CRITICAL CYLINDRICAL SILENCERS

25 to 32 dBA Noise Reduction

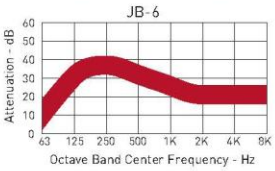
SILENCER SELECTION

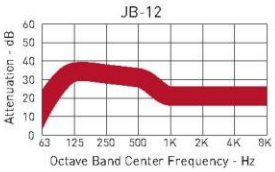
For immediate assistance to select the appropriate silencer that best suits your application's acoustical and backpressure requirements contact Silex Innovations. Or, use our exclusive silencer sizing and selection program, found at www.silex.com.

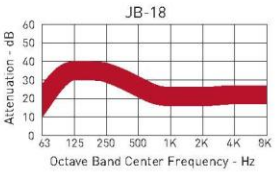
PERFORMANCE & MATERIALS

The critical grade series are reactive silencers with good acoustical performance. All of the silencers are manufactured from light to heavy gauge steel and finished with high temperature black paint. A drain is included as a standard component on the silencer.

TYPICAL ATTENUATION CURVE







DIMENSIONS

Model	ØA in(mm)	ØB in(mm)	C in(mm)	D in(mm)	F** in(mm)	G in(mm)	H in(mm)	Wgt lb(kg)
JB-1.5	1.5	9(229)	24(610)	30(762)	4(102)	7.5(191)	27(686)	23(10)
JB-2	2	9(229)	24(610)	30(762)	4.5(114)	7.5(191)	27(686)	24(11)
JB-2.5	2.5	10(254)	28(711)	34(864)	5(127)	8(203)	31(787)	34(15)
JB-3	3	12(305)	32(813)	38(660)	5.5(140)	9(229)	35(889)	46(21)
JB-3.5	3.5	14(356)	36(914)	42(1067)	6(152)	10(254)	39(991)	65(29)
JB-4	4	14(356)	40(1016)	48(1219)	6(152)	11(279)	44(1118)	77(35)
JB-5	5	16(406)	49(1245)	57(1448)	7(178)	12(305)	53(1346)	107(49)
JB-6	6	18(457)	55(1397)	63(1600)	8(203)	13(330)	59(1499)	135(61)
JB-8	8	22(559)	66(1676)	74(1880)	9.5(241)	15(381)	70(1778)	208(94)
JB-10	10	26(660)	81(2057)	89(2261)	11.5(292)	17(432)	85(2159)	370(168)
JB-12	12	30(762)	94(2388)	102(2591)	13(330)	19(483)	98(2489)	505(229)
JB-14	14	36(914)	99(2515)	109(2769)	15.5(394)	23(584)	104(2642)	642(291)
JB-16	16	40(1016)	109(2769)	119(3023)	16.5(419)	25(635)	114(2896)	971(440)
JB-18	18	45(1143)	117(2972)	127(3226)	18(457)	27.5(699)	122(3099)	1167(529)
JB-20	20	50(1270)	127(3226)	137(3480)	20.5(521)	30(762)	132(3353)	1669(757)
JB-22	22	54(1372)	139(3531)	149(3785)	22.5(572)	32(813)	144(3658)	1972(894)
JB-24	24	60(1524)	152(3861)	162(4115)	24(610)	35(889)	157(3988)	2384(1081)
JB-26	26	64(1626)	173(4394)	183(4648)	25.5(648)	37(940)	178(4521)	2854(1295)
JB-28	28	68(1727)	190(4826)	200(5080)	26.5(673)	39(991)	195(4953)	3278(1487)
JB-30	30	72(1829)	206(5232)	216(5486)	28(711)	41(1041)	211(5359)	3777(1713)

**For F dimension other than that specified, please contact Silex Innovations.
Available in sizes up to 60" inlet.

TYPICAL ORIENTATIONS

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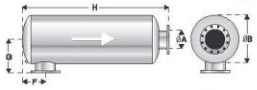
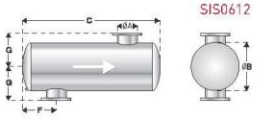
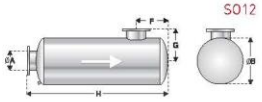


SIS0612



SO12



OPTIONS

- Aluminized steel, 304L or 316L stainless steel
- Dual inlet or custom inlet / outlet configurations
- Thermal insulation blankets to suit all configurations
- Mounting brackets, gussets and lifting lugs

Metric dimensions rounded to nearest mm. Dimensions and weights are nominal and may vary slightly in production models. On silencers 4" and larger the inlet and outlet are flanged, manufactured from minimum ½" thick plate and drilled to ANSI class 150.
The default material used is aluminized steel, however NGP reserves the right to substitute to carbon steel due to material availability, gauge and size limitations.

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