

## NOISE IMPACT STUDY – Project: 18200.00

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### **Goodwood Pit Extension** Township of Uxbridge, Ontario

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Prepared for:

**Lafarge Canada**  
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Mississauga, Ontario  
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## Revision History

Version	Description	Author	Reviewed	Date
--	Initial Report	RAM	DF	April 16, 2023

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## 1 Introduction

Lafarge Canada (Lafarge) is applying for a Class “A” licence (below water) under the Ministry of Natural Resources and Forestry (MNRF) Aggregate Resources Act (ARA) and also a Township of Uxbridge and Region of Durham Zoning By-law Amendment under the Planning Act to permit the proposed Goodwood Pit Extension.

The existing Goodwood Pit is licensed by the MNRF under the ARA Licence No. 6593. The Goodwood Pit Extension area is located southwest of the intersection of Concession Road 4 and Wagg Road, northeast of the existing pit and south of the existing Canadian National Railway. The area proposed to be licensed is 17.9 hectares with an area of extraction of 15.4 hectares.

Aercoustics Engineering Limited (Aercoustics) has been retained to prepare a Noise Impact Study for Lafarge. The purpose of this study is to provide noise control recommendations in order that the operations within the proposed pit extension will satisfy the MNRF and the Township of Uxbridge requirements, based on the Ontario Ministry of the Environment, Conservation and Parks (MECP) noise guidelines (NPC-300).

Figure 1 provides a key plan showing the location of the proposed pit operations, the surrounding area, and the locations of nearby local residences (receptors).

The existing Goodwood Pit will be receiving the extracted material from the extension and utilize the existing haul route for off site shipment. No processing of the material will occur within the existing licensed area grounds. It is understood that a portable plant which includes a primary and secondary crusher, a rock screen, conveyer, and a portable diesel generator will be used for processing the material within the proposed extension.

## 2 Site Description

The Goodwood Pit property is located on the west side of Concession Road 4 (CR-4), south of Wagg Road, in Lots 18, 19, and 20 of Concession 3 in the Community of Goodwood, Township of Uxbridge. The proposed Goodwood Pit Extension is located on Lot 20, Concession 3, Community of Goodwood, Township of Uxbridge on the north side of Highway 47 and south of Wagg Road, between Concession Road 3 (CR-3) and CR-4. The proposed extension is in a rural area where agriculture, aggregate and rural residential are the dominant land uses. The lands in the area of the site are of essentially flat or gently rolling terrain. The single family residential dwellings in the vicinity of the pit are identified as Receptors R01 to R18 as seen in Figure 1.

The proposed aggregate pit extension addressed by this noise impact study consists of operations within the lands outlined in Figure 1. These operations include excavation, processing and aggregate hauling.

## 3 Noise Criteria

### 3.1 Acoustical Classification

The appropriate noise criteria for the receptors in the vicinity of Goodwood Pit Extension was based on the MECP Noise Pollution Control publication NPC-300 “*Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning*” (MECP, August 2013).

Points of reception R01 to R10 have an acoustical environment consistent with the Class 2 designation as defined by the MECP Publication NPC-300. In a Class 2 area, the background sound levels during the daytime (07:00 to 19:00) are defined by urban hum and in the evening and nighttime periods, natural sounds are typically dominant. In this case, the urban hum includes road traffic on CR-4 and Highway 47. Road traffic on Highway 47 and CR-4 will typically establish the character of the ambient daytime acoustical environment at these residences. It should also be noted that the existing aggregate operations in the area involve longstanding operations and the sound from these operations will contribute to the man-made character of the ambient acoustical environment at the residences in the vicinity.

Points of reception R11 to R18 have an ambient acoustical environment consistent with the Class 3 designation as defined by the MECP Publication NPC-300. This is reserved for a rural area with a prevailing acoustical environment that is dominated by natural sounds with little or no road traffic. These receptor locations can be seen in Figure 1.

### 3.2 MECP Sound Level Limits

The applicable limits for noise from a stationary source at a sensitive point of reception (receptor) in a Class 2 area and a Class 3 area are outlined in Table 1.

Table 1 : Sound Level Limits for Stationary Sources – Hourly L<sub>EQ</sub> (dBA)

Time of Day	Class 2 Area	Class 3 Area
Daytime (07:00 to 19:00)	50*	45*
Evening and Nighttime (19:00 to 07:00)	45*	40*

\*or background sound level if higher

The noise from a stationary source should not exceed these limits in any hour.

## 4 Aggregate Pit Operation Extension

The proposed site plans outline the phases of extraction and the sequence and direction of operations in each phase. In general terms, the types of work consist of site preparation, extraction and processing, on-site aggregate hauling, and finally, rehabilitation.

### 4.1 Hours of Operation

The proposed hours of operation for the proposed pit extension are summarized below in Table 2. Maintenance operations are limited to small vehicles and are considered acoustically insignificant. From time to time, to meet the requirements of the Ministry of Transportation (MTO) and public tender contracts, it may be required to ship material outside of the regular hours of operation. There are no restrictions on the hours of operation for the existing Goodwood Pit licence 6593.

Table 2 : Operating Hours for the proposed Goodwood Pit Extension

Time of Day	Day of Week	Operations
06:00 to 07:00	Monday to Saturday	Shipping and Loading Operations Only
07:00 to 19:00	Monday to Saturday	Full Operation – Extraction, Processing, Loading & Shipping

### 4.2 Site Preparation and Rehabilitation

Site preparation includes the construction of the perimeter berms and visual screens specified on the site plan. Topsoil and overburden will be removed, and initial sinking cuts made. This work will be done primarily with bulldozers, scrapers, trucks, loaders and excavators. Rehabilitation phases will involve similar equipment in establishing the final grading for the site. Rehabilitation of the site will be progressive, and the site is planned to become a large pond with naturalized side slopes.

The site preparation and rehabilitation work described above is not part of the daily operation of the extension and is of short duration. These construction activities are not considered in the noise control analysis. The equipment used for these activities must satisfy the noise emission requirements of the MECP document NPC-115 “*Construction Equipment*”. By defining a maximum permissible noise emission for construction equipment rather than directly limiting the noise impact at a sensitive point of reception, the MECP is recognizing that construction is a temporary and largely unavoidable source of noise.

### 4.3 Extraction, Processing & Transport

Extraction for the Goodwood Pit Extension is proposed above and below the water table and extraction and rehabilitation will be phased. The proposed maximum tonnage limit for the Goodwood Pit Extension, in combination with the existing licensed pit, is 1,177,000 tonnes per annum.

The aggregate will be extracted in three lifts, two (2) lifts above the water table and one (1) lift below the water table. The aggregate material will be loaded by front end loader into pit trucks for transport to the portable crushing and screening equipment located within the extension.

Loaders will be used to load highway trucks for haulage off site.

### 4.4 Equipment

The extraction, processing and shipment equipment operating in the proposed pit is limited to:

- One (1) Portable Processing Plant
- One (1) Dragline or Excavator
- Two (2) Extraction Loaders
- One (2) Shipment Loaders
- Conveyors
- Highway Trucks

If desired, an Extraction Loader (maximum 74 dBA) may be replaced with two Quiet Extraction Loaders (maximum 70 dBA) wherever an Extraction Loader is permitted.

Furthermore, the single Portable Processing Plant may consist of multiple pieces of equipment for purposes such as crushing, and screening. Since the noise predictions considered a single worst-case location for all the plant equipment, the distribution of the plant equipment is permitted at various locations. However, the combined sum sound power from all equipment locations must be equal to or lower than the permitted sound power for the Portable Processing Plant, and any local noise controls specific to the Portable Processing Plant shall apply at each location.

No limit on the number of highway truck passes or highway truck reference sound level has been indicated. Since the truck route is internal and through the existing adjacent pit, the highway truck noise was determined to be acoustically insignificant.

## 5 Noise Predictions & Controls

### 5.1 Noise Prediction Methodology

The aggregate operations described in the previous section were modelled. Noise predictions were conducted based on the predictable worst case noise impact for each of the aggregate pit operation areas at each of the receptors. This represents a design case where the pit is running at full capacity with all of the equipment operating simultaneously and at locations where noise impact is highest for each receptor. The majority of the time, work would be occurring in other areas of the site and there will be fewer trucks per hour, resulting in lower associated noise impacts.

The noise impact calculations were performed using DataKustik's CadnaA environmental noise prediction software. The calculations are based on established prediction methods including the standard ISO 9613-2: "A Standard for Outdoor Noise Propagation".

Noise levels were predicted using existing topography under conditions of downwind propagation, generally with hard ground modelled in the pit area and soft ground conditions near the points of reception. Appendix B contains sample stationary noise source calculations.

The noise impact of the operation was predicted. Where the MECP sound level limits were calculated to be exceeded, noise control measures were modelled and the noise impact recalculated. This process was repeated until the sound level limits were satisfied.

### 5.2 Aggregate Pit Noise Sources

The reference sound levels used for the pit equipment are outlined in Table 3. These were based on Aercoustics database and on assumed future equipment sound levels.

Table 3: Reference Sound Pressure Levels of Aggregate Pit Equipment within Extension

Equipment	Reference Sound Pressure Level at 30 m (dBA)
Portable Processing Plant	85
Extraction Loader	70
Shipment Loader	67*
Dragline or Excavator	73
Conveyors	44†
Highway Trucks	66

\* The shipment loaders were assumed to operate at a 50% duty cycle.

† Reference sound level for conveyors is reported in dBA per metre at a distance of 30 m.

### 5.3 Recommended Noise Controls

The recommended noise controls presented in this section have been determined through noise impact predictions to be effective in controlling the noise generated by the aggregate

pit activity, satisfying the MECP sound level limits. It should be noted that there may be other effective noise controls that could replace or revise some of the recommended controls of this report. Prior to implementing any changes to the noise controls, appropriate studies should be undertaken to demonstrate that the MECP sound level limits will be satisfied.

An acoustic barrier is required to be solid, with no gaps or openings, and shall satisfy a minimum area density of 20 kg/m<sup>2</sup>. It could take the form of a pit face, stockpile, acoustic fence, ISO containers, a combination of these, or any other construction satisfying the requirements of an acoustic barrier.

Refer to Figures 2 to 5 for an illustration of the proposed Goodwood Pit Extension timing and implementation of noise controls at each of Phases 1 to 2. Noise controls include local plant acoustic barriers, perimeter berms, equipment limitations and extraction direction.

Refer to Appendix A for a comprehensive summary of the recommended noise controls for the proposed Goodwood Pit Extension.

**5.4 Predicted Sound Levels with Noise Controls Implemented**

The predicted worst-case noise levels produced by operations within the Goodwood Pit Extension are summarized in Table 4.

Table 4 : Worst Case Predicted Sound Levels and Criteria – Hourly L<sub>EQ</sub> (dBA)

Point of Reception	Extraction, Processing, Loading, & Hauling (06:00 to 19:00)	
	Sound Level Limit	Predicted Maximum Sound Level
R01	50	47
R02	50	48
R03	50	50
R04	50	48
R05	50	47
R06	50	47
R07	50	47
R08	50	49
R09	50	41
R10	50	41
R11	45	41
R12	45	45
R13	45	41
R14	45	44

Point of Reception	Extraction, Processing, Loading, & Hauling (06:00 to 19:00)	
	Sound Level Limit	Predicted Maximum Sound Level
R15	45	40
R16	45	39
R17	45	42
R18	45	40

With the above noise predictions, the worst case has been assessed for all planned operations within the proposed Goodwood Pit Extension.

With the incorporation of the recommended noise controls, the predicted noise impact will satisfy the MECP sound level limits.

**5.5 Cumulative Noise Impact**

The predictable worst case of operation of the proposed pit was designed to satisfy the MECP sound level limits. This represents an operating condition when the equipment in the pit is positioned such that the noise impact at a given residential receptor is highest. This generally occurs when the pit's extraction operation is at a location in the pit that is closest to the receptor. This condition will only occur for a small part of the pit's life. For the other times of the pit's life, the predicted noise level will be lower.

Given the timing of operations and setback distance of the existing Goodwood Pit (Licence No. 6593) and other commercial operations, it is unlikely that their respective operation cycle will occur where noise impact is highest at the same receptor at the same time.

In the unlikely event that this overlap occurs between two sites, a combined noise level of 3 dB above the sound level limits is possible. In environmental noise, a change in sound level of 3 dB is perceived as minor. It is a change in sound level that most people would just barely notice. This analysis assumes that the neighbouring pit is designed with the same MECP noise limits.

**6 Truck Traffic Noise on Haul Route**

The noise impact of truck traffic on public roadways is not addressed by the MECP in their noise guidelines. However, the MECP requires consideration of noise impact in choosing the off-property haul route.

The aggregate from the proposed Goodwood Pit Extension will be shipped to market through the existing Goodwood Pit via the existing entrance & exit onto Durham 47 and will utilize existing aggregate haul routes.

Since the pit extension truck traffic will use the same haul routes and there is no increase to the annual permitted tonnage, no significant change in truck trips is expected to be generated compared to the operation of the existing Goodwood Pit.

With this, the proposed haul route will not result in an increase in road traffic noise and is considered the preferred haul route in the context of noise impact.

## 7 Conclusions

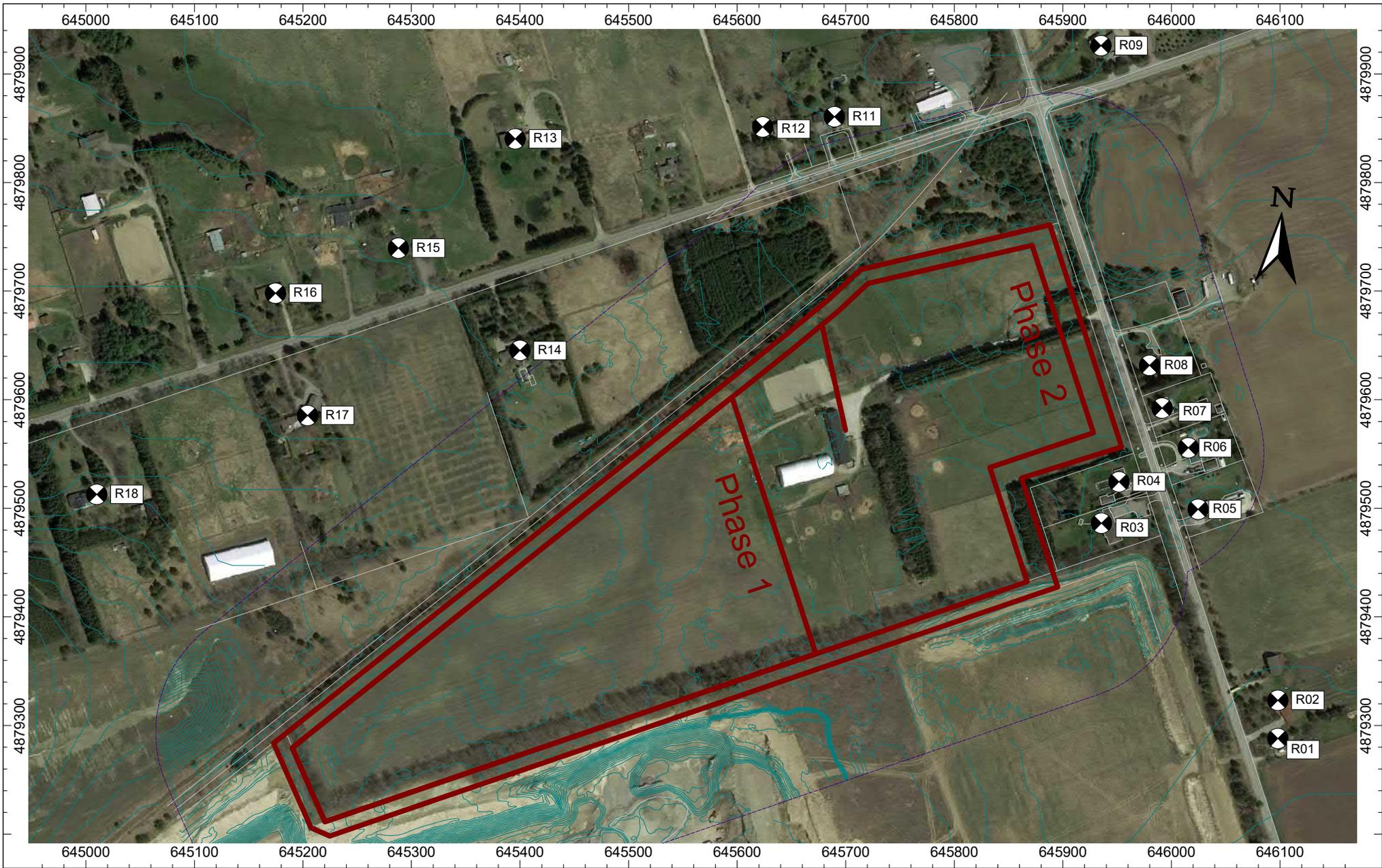
Aercoustics has conducted a noise impact study for the proposed Goodwood Pit Extension. The purpose of this noise impact study was to determine if operations within the proposed pit extension will satisfy the Ontario Ministry of the Environment, Conservation and Parks (MECP) noise guidelines. Figure 1 provides the extent of the Goodwood Pit Extension operations and the locations of local residences (receptors).

Sound level limits were developed based on the MECP noise guidelines and noise sensitive receptors. Calculations were then carried out to determine the worst case noise for each of the aggregate pit operation areas at each of the receptors. Where noise was predicted to exceed the MECP sound level limits, noise control recommendations and required equivalent source reference sound levels were provided.

The predictable worst case has been assessed for all planned operations within the pit extension.

Refer to Appendix C for a summary of the qualifications of the authors.

With the implementation of the recommended noise controls, the predicted noise impact on the noise sensitive receptors surrounding the pit extension are predicted to satisfy the MECP noise guidelines.



Scale: NTS  
 Drawn: RAM  
 Eng: DF  
 Date: Nov 26, 2020

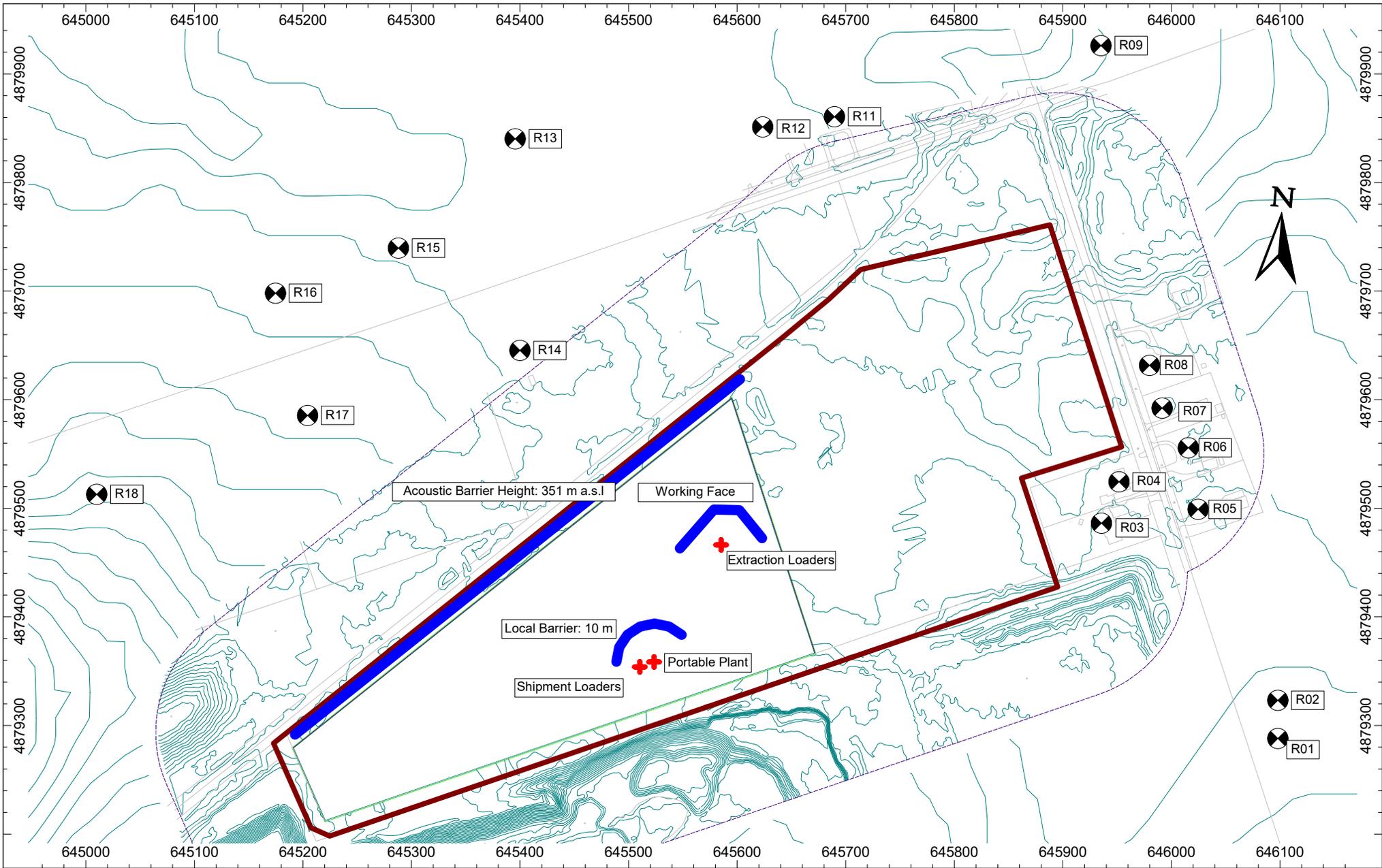
The scope of the work outlined in this document is limited to the acoustic, noise, and/or vibration control aspects of the design. Contractors to verify all dimensions

Project Name:  
 Goodwood Pit Extension NIS

AEL Project Number 18200

Figure Title:  
 Goodwood Pit Extension- Subject Lands

Figure 1



Scale: NTS  
 Drawn: RAM  
 Eng: DF  
 Date: Dec 23, 2020

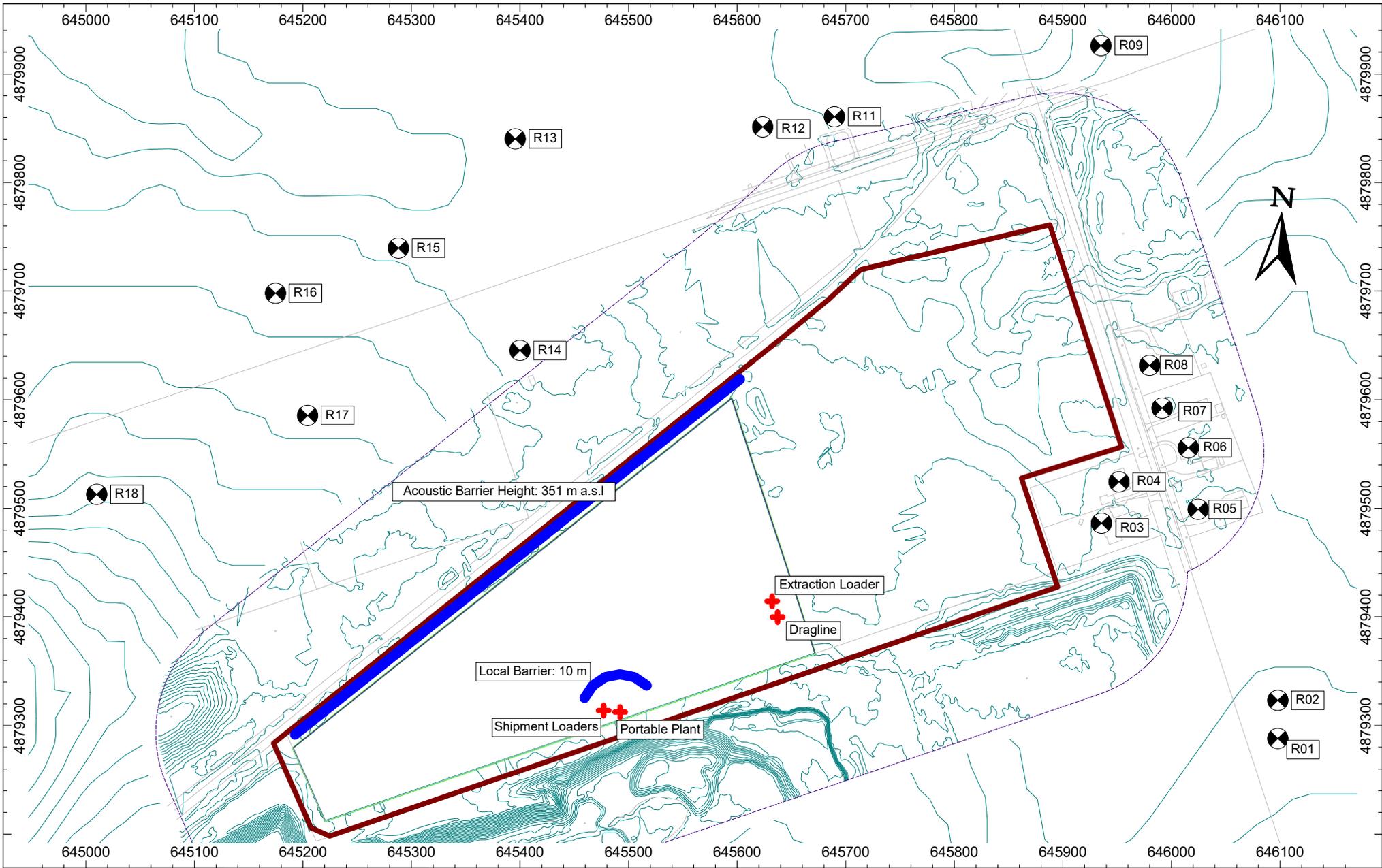
The scope of the work outlined in this document is limited to the acoustic, noise, and/or vibration control aspects of the design. Contractors to verify all dimensions

Project Name:  
 Goodwood Pit Extension NIS

AEL Project Number 18200

Figure Title:  
 Goodwood Pit Extension- Phase 1, Above Water Table

Figure 2



Scale: NTS  
 Drawn: RAM  
 Eng: DF  
 Date: Dec 23, 2020

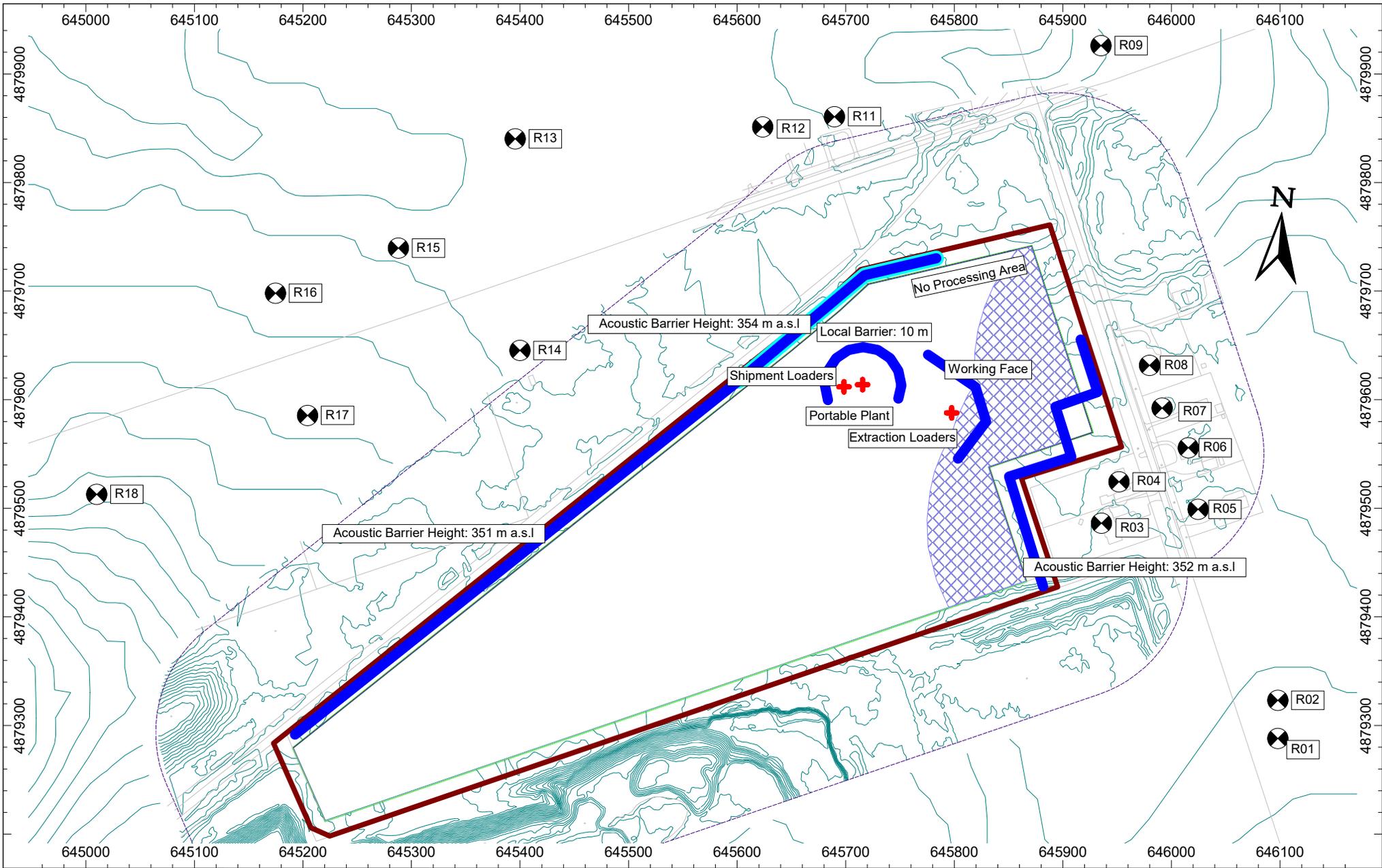
The scope of the work outlined in this document is limited to the acoustic, noise, and/or vibration control aspects of the design. Contractors to verify all dimensions

Project Name:  
 Goodwood Pit Extension NIS

AEL Project Number 18200

Figure Title:  
 Goodwood Pit Extension- Phase 1, Below Water Table

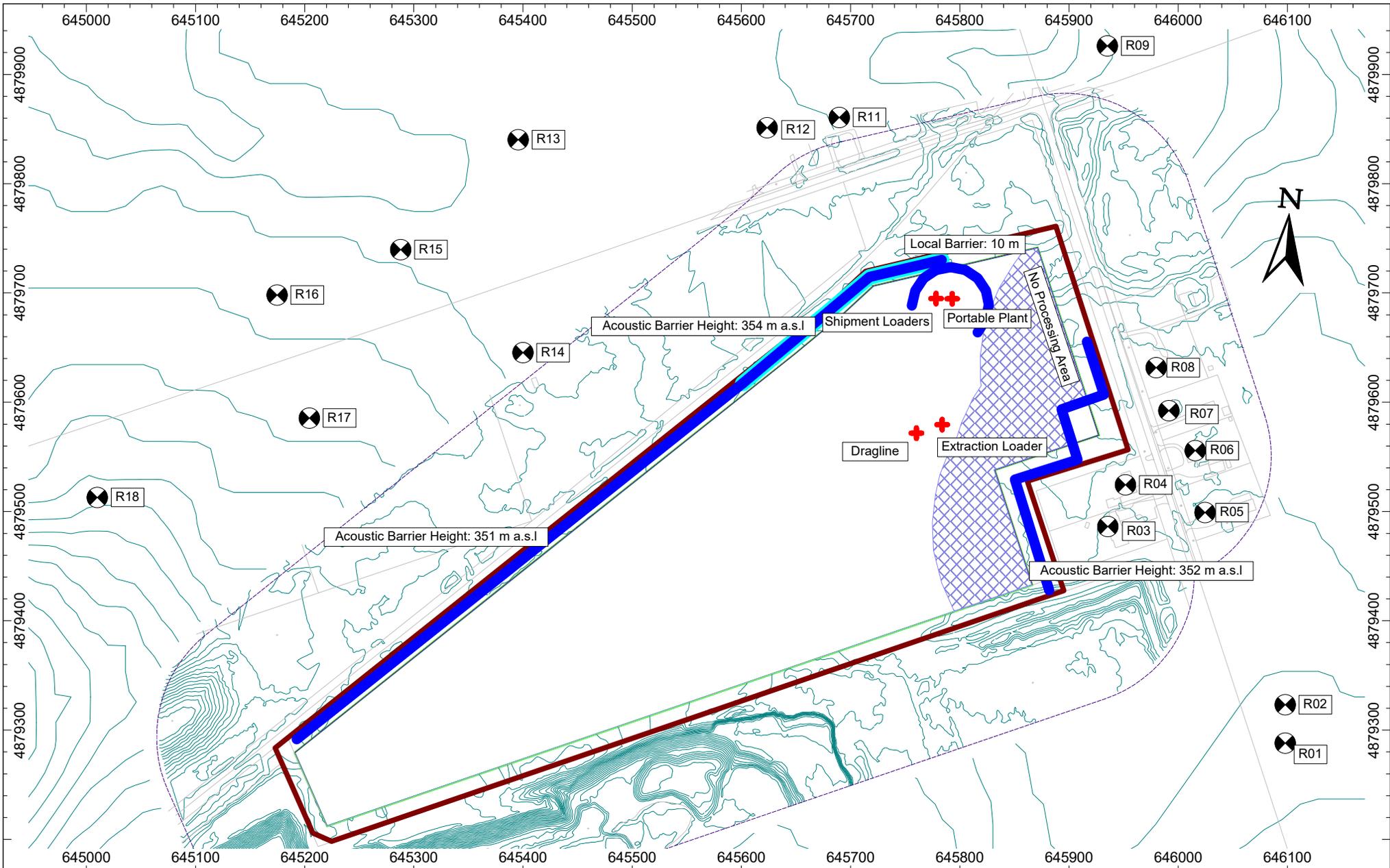
Figure 3




 Scale: NTS  
 Drawn: RAM  
 Eng: DF  
 Date: Jan 5, 2021  
 The scope of the work outlined in this document is limited to the acoustic, noise, and/or vibration control aspects of the design.  
 Contractors to verify all dimensions

Project Name:  
 Goodwood Pit Extension NIS  
 AEL Project Number 18200

Figure Title:  
 Goodwood Pit Extension- Phase 2, Above Water Table  
 Figure 4



 Scale: NTS  
 Drawn: RAM  
 Eng: DF  
 Date: Jan 5, 2021

The scope of the work outlined in this document is limited to the acoustic, noise, and/or vibration control aspects of the design.  
 Contractors to verify all dimensions

Project Name:  
 Goodwood Pit Extension NIS

Figure Title:  
 Goodwood Pit Extension- Phase 2, Below Water Table

AEL Project Number 18200

Figure 5

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**Appendix A**  
Noise Control Recommendations

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General:

1. The hours of operation are limited as described in Table A. There will be no operations on Statutory Holidays. The pit will not operate on Sundays except as required by a specific contract. A response to emergencies is not limited by the hours of operations shown on the site plan.

Table A: Operating Hours

Time of Day	Day of Week	Operations
06:00 to 07:00	Monday to Saturday	Shipping and Loading Operations Only
07:00 to 19:00	Monday to Saturday	Full Operation - Extraction, Processing (Crushing & Screening), Loading, & Shipping

2. The aggregate pit equipment shall satisfy the noise emissions levels listed in Table B. If desired, the two Quiet Extraction Loaders (maximum 70 dBA each) may be replaced by a regular Extraction Loader (maximum 74 dBA) wherever the Extraction Loaders are permitted.

Table B: Reference Sound Pressure Levels of Aggregate Pit Equipment within Extension

Equipment	Number Permitted	Reference Sound Pressure Level at 30 m (dBA)
Portable Processing Plant	1	85
Extraction Loader	2	70
Shipment Loader	2	67*
Dragline or Excavator	1	73
Conveyors	-	44 <sup>†</sup>
Highway Trucks	-	66

\* The shipment loaders were assumed to operate at a 50% duty cycle.

† Reference sound level for conveyors is reported in dBA per metre at a distance of 30 m.

3. The sound emissions of all construction equipment involved in site preparation activities shall comply with the sound level limits specified in the MECP publication NPC-115 “Construction Equipment”.
4. New equipment technology or different configurations may allow proposed changes to any portion of the extraction and processing operations including additional equipment to operate on the site, equipment to be substituted, and/or different berm heights, while still meeting the applicable sound level limits. Changes may be permitted to the site operations and noise controls provided that the changes still meet the sound level limits, as confirmed through documentation prepared by a Professional Engineer specializing in noise control. Prior to any modification, notification shall be given to the MNR.

5. An acoustic barrier is required to be solid, with no gaps or openings, and shall satisfy a minimum area density of 20 kg/m<sup>2</sup>. It could take the form of a pit face, stockpile, acoustic fence, ISO containers, a combination of these, or any other construction satisfying the requirements of an acoustic barrier.
6. Extraction in Phases 1 and 2 shall proceed generally in a northeasterly direction with the extraction loaders operating within 30 m of the working face. The working face shall have a minimum height of 7 m. All equipment shall remain on the pit floor.
7. During all processing operations, a 10 m high acoustic barrier shall be located within 30 m of the Portable Processing Plant, between the plant and Receptors R11 and R14. In addition, a 9 m high acoustic barrier shall be located within 30 m of the Portable Processing Plant, between the plant and Receptors R03 and R08. These barriers can be satisfied by a working face or stockpiles.
8. During below water extraction, only a single Extraction Loader shall operate near the Dragline or Excavator, or at the working face.

Phase 1:

9. Prior to extraction in Phase 1, an acoustic barrier with a minimum top of barrier elevation of 351 m a.s.l. shall be installed, extending the full length along the north boundary of Phase 1, as shown on the site plan. This barrier shall remain in place for the remainder of the project lifetime.

Phase 2:

10. Prior to extraction in Phase 2, an acoustic barrier with a minimum top of barrier elevation of 354 m a.s.l. shall be installed, extending the length along the north boundary of Phase 2, meeting the acoustic barrier along the north boundary of Phase 1, as shown on the site plan. An acoustic barrier with a minimum top barrier elevation of 352 m a.s.l shall be installed extending the length along the east boundary of Phase 2, as shown on the site plan. A gap in the barrier extending 100 m in each direction from the northeast corner of the site is permitted. This barrier shall remain in place for the remainder of the project lifetime.
11. No processing shall occur in the lands located within a 160 m radius of Receptors R03, R04, R07, and R08 as shown on the site plan.

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**Appendix B**  
Sample Stationary Source Noise Calculations

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## Sound Power Data

Source ID	63	125	250	500	1000	2000	4000	8000	A	Lin
Portable Processing Plant (crushing & screening)	112	115	119	117	117	114	108	98	<b>121</b>	<b>124</b>
Extraction Loader	118	113	106	102	101	100	91	93	<b>107</b>	<b>120</b>
Dragline	109	105	104	107	107	101	94	86	<b>110</b>	<b>114</b>
Shipment Loader	118	113	106	102	101	100	91	93	<b>107</b>	<b>120</b>
Conveyors	93	91	84	78	72	67	61	52	<b>81</b>	<b>96</b>

Receiver: R01  
 Project: Goodwood Pit Extension  
 Project Number: 18200

Time Period	Total (dBA)
Day	43

Receiver Name	Receiver ID	X	Y	Z
R01	R01	646097.90 m	4879288.02 m	349.96 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
D06_	Conveyor	645734.3	4879467.0	332.4	0	81	20.9	A	63.2	0.0	1.1	9.3	0.7	0.0	0.0	0.0	0.0	0.0	28
D06_	Conveyor	645653.8	4879475.5	332.4	0	81	16.5	A	64.7	0.0	1.0	6.2	0.9	0.0	0.0	0.0	0.0	0.0	25
D06_	Extraction Loaders	645803.9	4879475.1	332.5	0	110	0.0	A	61.9	0.0	0.1	14.8	1.6	0.0	0.0	0.0	0.0	0.0	32
D06_	Portable Plant	645634.1	4879498.5	333.0	0	123	0.0	A	65.1	0.0	-0.3	13.0	2.4	0.0	0.0	0.0	0.0	0.0	43
D06_	Shipment Loaders	645651.8	4879494.5	332.5	0	110	0.0	A	64.8	0.0	-0.4	14.2	2.1	0.0	0.0	0.0	0.0	0.0	26

Receiver: R02  
 Project: Goodwood Pit Extension  
 Project Number: 18200

Time Period	Total (dBA)
Day	45

Receiver Name	Receiver ID	X	Y	Z
R02	R02	646097.89 m	4879323.21 m	352.59 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
D06_	Conveyor	645733.1	4879466.9	332.4	0	81	20.8	A	62.9	0.0	-0.9	8.4	0.7	0.0	0.0	0.0	0.0	0.0	31
D06_	Conveyor	645647.6	4879479.6	332.4	0	81	13.4	A	64.6	0.0	-1.3	6.5	0.9	0.0	0.0	0.0	0.0	0.0	24
D06_	Conveyor	645664.5	4879468.3	332.4	0	81	12.8	A	64.2	0.0	-1.1	7.0	0.8	0.0	0.0	0.0	0.0	0.0	23
D06_	Extraction Loaders	645803.9	4879475.1	332.5	0	110	0.0	A	61.4	0.0	-0.9	16.4	1.6	0.0	0.0	0.0	0.0	0.0	31
D06_	Portable Plant	645634.1	4879498.5	333.0	0	123	0.0	A	64.9	0.0	-2.1	13.0	2.4	0.0	0.0	0.0	0.0	0.0	45
D06_	Shipment Loaders	645651.8	4879494.5	332.5	0	110	0.0	A	64.6	0.0	-1.9	15.0	2.0	0.0	0.0	0.0	0.0	0.0	27

Receiver: R03  
 Project: Goodwood Pit Extension  
 Project Number: 18200

Time Period	Total (dBA)
Day	45

Receiver Name	Receiver ID	X	Y	Z
R03	R03	645935.53 m	4879486.36 m	348.50 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
D06_	Conveyor	645703.4	4879465.0	332.4	0	81	17.9	A	58.4	0.0	0.2	9.0	0.5	0.0	0.0	0.0	0.0	0.0	31
D06_	Conveyor	645765.3	4879469.0	332.4	0	81	17.9	A	55.7	0.0	0.7	10.9	0.3	0.0	0.0	0.0	0.0	0.0	31
D06_	Conveyor	645640.8	4879484.1	332.4	0	81	11.2	A	60.4	0.0	-0.1	14.9	0.6	0.0	0.0	0.0	0.0	0.0	16
D06_	Conveyor	645662.2	4879469.9	332.4	0	81	13.9	A	59.8	0.0	0.0	8.1	0.5	0.0	0.0	0.0	0.0	0.0	27
D06_	Extraction Loaders	645803.9	4879475.1	332.5	0	110	0.0	A	53.5	0.0	0.4	17.9	0.8	0.0	0.0	0.0	0.0	0.0	37
D06_	Portable Plant	645634.1	4879498.5	333.0	0	123	0.0	A	60.6	0.0	-1.1	18.4	1.6	0.0	0.0	0.0	0.0	0.0	44
D06_	Shipment Loaders	645651.8	4879494.5	332.5	0	110	0.0	A	60.1	0.0	-1.2	19.3	1.4	0.0	0.0	0.0	0.0	0.0	27

Receiver: R04  
 Project: Goodwood Pit Extension  
 Project Number: 18200

Time Period	Total (dBA)
Day	45

Receiver Name	Receiver ID	X	Y	Z
R04	R04	645951.71 m	4879524.35 m	347.98 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
D06_	Conveyor	645722.6	4879466.2	332.4	0	81	20.0	A	58.5	0.0	0.4	9.6	0.5	0.0	0.0	0.0	0.0	0.0	32
D06_	Conveyor	645778.0	4879469.8	332.4	0	81	10.3	A	56.2	0.0	1.0	11.7	0.4	0.0	0.0	0.0	0.0	0.0	22
D06_	Conveyor	645789.8	4879470.6	332.4	0	81	11.1	A	55.7	0.0	1.3	12.1	0.3	0.0	0.0	0.0	0.0	0.0	23
D06_	Conveyor	645641.3	4879483.8	332.4	0	81	11.6	A	60.9	0.0	0.2	14.6	0.6	0.0	0.0	0.0	0.0	0.0	16
D06_	Conveyor	645658.7	4879472.2	332.4	0	81	10.9	A	60.5	0.0	0.2	8.0	0.6	0.0	0.0	0.0	0.0	0.0	23
D06_	Conveyor	645668.2	4879465.9	332.4	0	81	10.1	A	60.2	0.0	0.2	8.2	0.6	0.0	0.0	0.0	0.0	0.0	22
D06_	Extraction Loaders	645803.9	4879475.1	332.5	0	110	0.0	A	54.9	0.0	0.5	15.7	0.9	0.0	0.0	0.0	0.0	0.0	38
D06_	Portable Plant	645634.1	4879498.5	333.0	0	123	0.0	A	61.1	0.0	-0.9	18.3	1.7	0.0	0.0	0.0	0.0	0.0	43
D06_	Shipment Loaders	645651.8	4879494.5	332.5	0	110	0.0	A	60.6	0.0	-1.1	19.2	1.4	0.0	0.0	0.0	0.0	0.0	27

Receiver: R05  
 Project: Goodwood Pit Extension  
 Project Number: 18200

Time Period	Total (dBA)
Day	43

Receiver Name	Receiver ID	X	Y	Z
R05	R05	646024.54 m	4879499.04 m	348.50 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
D06_	Conveyor	645719.3	4879466.0	332.4	0	81	19.7	A	60.8	0.0	0.7	8.3	0.6	0.0	0.0	0.0	0.0	0.0	30
D06_	Conveyor	645781.1	4879470.0	332.4	0	81	14.8	A	58.8	0.0	1.1	11.1	0.5	0.0	0.0	0.0	0.0	0.0	24
D06_	Conveyor	645643.0	4879482.6	332.4	0	81	12.7	A	62.6	0.0	0.5	14.3	0.7	0.0	0.0	0.0	0.0	0.0	16
D06_	Conveyor	645662.4	4879469.7	332.4	0	81	13.8	A	62.2	0.0	0.5	6.7	0.7	0.0	0.0	0.0	0.0	0.0	25
D06_	Extraction Loaders	645803.9	4879475.1	332.5	0	110	0.0	A	57.9	0.0	0.5	15.1	1.1	0.0	0.0	0.0	0.0	0.0	35
D06_	Portable Plant	645634.1	4879498.5	333.0	0	123	0.0	A	62.8	0.0	-0.7	17.1	2.0	0.0	0.0	0.0	0.0	0.0	42
D06_	Shipment Loaders	645651.8	4879494.5	332.5	0	110	0.0	A	62.4	0.0	-0.8	18.4	1.7	0.0	0.0	0.0	0.0	0.0	25

Receiver: R06  
 Project: Goodwood Pit Extension  
 Project Number: 18200

Time Period	Total (dBA)
Day	44

Receiver Name	Receiver ID	X	Y	Z
R06	R06	646015.59 m	4879555.69 m	351.50 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
D06_	Conveyor	645706.4	4879465.2	332.4	0	81	18.3	A	61.2	0.0	-1.2	9.0	0.6	0.0	0.0	0.0	0.0	0.0	30
D06_	Conveyor	645755.6	4879468.4	332.4	0	81	14.9	A	59.8	0.0	-0.8	11.0	0.5	0.0	0.0	0.0	0.0	0.0	25
D06_	Conveyor	645783.5	4879470.2	332.4	0	81	14.0	A	58.9	0.0	-0.4	12.4	0.5	0.0	0.0	0.0	0.0	0.0	24
D06_	Conveyor	645644.7	4879481.5	332.4	0	81	13.6	A	62.6	0.0	-1.5	15.6	0.7	0.0	0.0	0.0	0.0	0.0	17
D06_	Conveyor	645659.0	4879472.0	332.4	0	81	10.6	A	62.3	0.0	-1.4	7.9	0.7	0.0	0.0	0.0	0.0	0.0	22
D06_	Conveyor	645666.4	4879467.0	332.4	0	81	7.9	A	62.1	0.0	-1.4	8.0	0.7	0.0	0.0	0.0	0.0	0.0	20
D06_	Conveyor	645670.7	4879464.2	332.4	0	81	6.2	A	62.1	0.0	-1.4	8.0	0.7	0.0	0.0	0.0	0.0	0.0	18
D06_	Extraction Loaders	645803.9	4879475.1	332.5	0	110	0.0	A	58.1	0.0	-0.3	15.7	1.2	0.0	0.0	0.0	0.0	0.0	35
D06_	Portable Plant	645634.1	4879498.5	333.0	0	123	0.0	A	62.7	0.0	-2.2	17.1	1.9	0.0	0.0	0.0	0.0	0.0	44
D06_	Shipment Loaders	645651.8	4879494.5	332.5	0	110	0.0	A	62.4	0.0	-2.0	18.9	1.7	0.0	0.0	0.0	0.0	0.0	26

Receiver: R07  
 Project: Goodwood Pit Extension  
 Project Number: 18200

Time Period	Total (dBA)
Day	43

Receiver Name	Receiver ID	X	Y	Z
R07	R07	645991.48 m	4879592.25 m	348.48 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
D06_	Conveyor	645682.1	4879463.6	332.4	0	81	12.9	A	61.5	0.0	0.5	9.3	0.6	0.0	0.0	0.0	0.0	0.0	22
D06_	Conveyor	645699.7	4879464.7	332.4	0	81	12.0	A	61.1	0.0	0.6	9.9	0.6	0.0	0.0	0.0	0.0	0.0	21
D06_	Conveyor	645713.1	4879465.6	332.4	0	81	10.4	A	60.7	0.0	0.7	12.1	0.6	0.0	0.0	0.0	0.0	0.0	17
D06_	Conveyor	645757.4	4879468.5	332.4	0	81	18.9	A	59.5	0.0	0.9	14.2	0.5	0.0	0.0	0.0	0.0	0.0	25
D06_	Conveyor	645645.3	4879481.1	332.4	0	81	13.8	A	62.2	0.0	-0.3	15.0	0.7	0.0	0.0	0.0	0.0	0.0	17
D06_	Conveyor	645659.5	4879471.7	332.4	0	81	10.0	A	62.0	0.0	0.4	8.7	0.7	0.0	0.0	0.0	0.0	0.0	19
D06_	Conveyor	645668.1	4879465.9	332.4	0	81	10.3	A	61.8	0.0	0.5	8.9	0.6	0.0	0.0	0.0	0.0	0.0	19
D06_	Extraction Loaders	645803.9	4879475.1	332.5	0	110	0.0	A	57.9	0.0	0.5	15.2	1.1	0.0	0.0	0.0	0.0	0.0	35
D06_	Portable Plant	645634.1	4879498.5	333.0	0	123	0.0	A	62.4	0.0	-1.5	18.1	1.9	0.0	0.0	0.0	0.0	0.0	42
D06_	Shipment Loaders	645651.8	4879494.5	332.5	0	110	0.0	A	62.0	0.0	-1.6	19.1	1.6	0.0	0.0	0.0	0.0	0.0	26

Receiver: R08  
 Project: Goodwood Pit Extension  
 Project Number: 18200

Time Period	Total (dBA)
Day	44

Receiver Name	Receiver ID	X	Y	Z
R08	R08	645979.85 m	4879631.63 m	350.75 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
D06_	Conveyor	645689.1	4879464.1	332.4	0	81	15.2	A	61.5	0.0	-2.8	8.8	0.6	0.0	0.0	0.0	0.0	0.0	28
D06_	Conveyor	645720.8	4879466.1	332.4	0	81	14.8	A	60.8	0.0	-2.6	12.0	0.6	0.0	0.0	0.0	0.0	0.0	25
D06_	Conveyor	645766.0	4879469.0	332.4	0	81	17.8	A	59.6	0.0	-1.8	14.4	0.5	0.0	0.0	0.0	0.0	0.0	26
D06_	Conveyor	645648.0	4879479.3	332.4	0	81	12.9	A	62.3	0.0	-3.0	17.6	0.7	0.0	0.0	0.0	0.0	0.0	16
D06_	Conveyor	645664.3	4879468.4	332.4	0	81	12.9	A	62.0	0.0	-2.9	8.7	0.7	0.0	0.0	0.0	0.0	0.0	26
D06_	Extraction Loaders	645803.9	4879475.1	332.5	0	110	0.0	A	58.5	0.0	-1.0	20.0	1.2	0.0	0.0	0.0	0.0	0.0	31
D06_	Portable Plant	645634.1	4879498.5	333.0	0	123	0.0	A	62.4	0.0	-3.3	18.5	1.9	0.0	0.0	0.0	0.0	0.0	44
D06_	Shipment Loaders	645651.8	4879494.5	332.5	0	110	0.0	A	62.0	0.0	-3.2	19.9	1.6	0.0	0.0	0.0	0.0	0.0	26

Receiver: R09  
 Project: Goodwood Pit Extension  
 Project Number: 18200

Time Period	Total (dBA)
Day	45

Receiver Name	Receiver ID	X	Y	Z
R09	R09	645935.18 m	4879926.05 m	342.66 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr	
D06_	Conveyor	645699.7	4879464.7	332.4	0	81	17.4	A	65.3	0.0	0.5	4.7	0.9	0.0	0.0	0.0	0.0	0.0	0.0	27
D06_	Conveyor	645743.6	4879467.6	332.4	0	81	15.3	A	64.9	0.0	0.4	5.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	25
D06_	Conveyor	645778.3	4879469.8	332.4	0	81	15.5	A	64.7	0.0	0.4	9.7	0.9	0.0	0.0	0.0	0.0	0.0	0.0	21
D06_	Conveyor	645639.0	4879485.3	332.4	0	81	9.6	A	65.5	0.0	0.6	4.3	0.9	0.0	0.0	0.0	0.0	0.0	0.0	19
D06_	Conveyor	645651.1	4879477.2	332.4	0	81	13.0	A	65.5	0.0	0.6	8.7	0.9	0.0	0.0	0.0	0.0	0.0	0.0	18
D06_	Conveyor	645666.0	4879467.3	332.4	0	81	12.0	A	65.5	0.0	0.5	4.3	0.9	0.0	0.0	0.0	0.0	0.0	0.0	22
D06_	Extraction Loaders	645803.9	4879475.1	332.5	0	110	0.0	A	64.4	0.0	-0.9	12.9	2.0	0.0	0.0	0.0	0.0	0.0	0.0	31
D06_	Portable Plant	645634.1	4879498.5	333.0	0	123	0.0	A	65.4	0.0	-0.7	11.1	2.5	0.0	0.0	0.0	0.0	0.0	0.0	45
D06_	Shipment Loaders	645651.8	4879494.5	332.5	0	110	0.0	A	65.3	0.0	-0.8	10.3	2.2	0.0	0.0	0.0	0.0	0.0	0.0	30

Receiver: R10  
 Project: Goodwood Pit Extension  
 Project Number: 18200

Time Period	Total (dBA)
Day	41

Receiver Name	Receiver ID	X	Y	Z
R10	R10	645780.41 m	4879980.92 m	350.05 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
D06_	Conveyor	645702.5	4879464.9	332.4	0	81	17.8	A	65.4	0.0	-1.5	7.1	0.9	0.0	0.0	0.0	0.0	0.0	27
D06_	Conveyor	645750.1	4879468.0	332.4	0	81	15.5	A	65.2	0.0	-1.5	6.8	0.9	0.0	0.0	0.0	0.0	0.0	25
D06_	Conveyor	645791.3	4879470.7	332.4	0	81	9.9	A	65.2	0.0	-1.5	9.3	0.9	0.0	0.0	0.0	0.0	0.0	17
D06_	Conveyor	645649.0	4879478.7	332.4	0	81	11.2	A	65.3	0.0	-1.4	7.4	0.9	0.0	0.0	0.0	0.0	0.0	20
D06_	Conveyor	645668.2	4879465.9	332.4	0	81	10.2	A	65.4	0.0	-1.5	7.2	0.9	0.0	0.0	0.0	0.0	0.0	19
D06_	Extraction Loaders	645803.9	4879475.1	332.5	0	110	0.0	A	65.1	0.0	-2.1	11.2	2.1	0.0	0.0	0.0	0.0	0.0	34
D06_	Portable Plant	645634.1	4879498.5	333.0	0	123	0.0	A	65.1	0.0	-1.9	19.1	2.4	0.0	0.0	0.0	0.0	0.0	38
D06_	Shipment Loaders	645651.8	4879494.5	332.5	0	110	0.0	A	65.0	0.0	-1.8	9.1	2.1	0.0	0.0	0.0	0.0	0.0	32

Receiver: R11  
 Project: Goodwood Pit Extension  
 Project Number: 18200

Time Period	Total (dBA)
Day	40

Receiver Name	Receiver ID	X	Y	Z
R11	R11	645689.66 m	4879860.62 m	346.50 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
D06_	Conveyor	645704.1	4879465.0	332.4	0	81	18.0	A	63.0	0.0	0.5	7.6	0.7	0.0	0.0	0.0	0.0	0.0	27
D06_	Conveyor	645754.0	4879468.3	332.4	0	81	15.6	A	63.0	0.0	0.3	7.6	0.7	0.0	0.0	0.0	0.0	0.0	25
D06_	Conveyor	645784.2	4879470.2	332.4	0	81	13.8	A	63.1	0.0	0.3	14.3	0.7	0.0	0.0	0.0	0.0	0.0	16
D06_	Conveyor	645642.9	4879482.7	332.4	0	81	12.6	A	62.6	0.0	0.6	13.9	0.7	0.0	0.0	0.0	0.0	0.0	16
D06_	Conveyor	645656.0	4879474.0	332.4	0	81	11.1	A	62.8	0.0	0.5	8.0	0.7	0.0	0.0	0.0	0.0	0.0	20
D06_	Conveyor	645669.9	4879464.7	332.4	0	81	8.0	A	63.0	0.0	0.5	7.7	0.7	0.0	0.0	0.0	0.0	0.0	17
D06_	Extraction Loaders	645803.9	4879475.1	332.5	0	110	0.0	A	63.1	0.0	-1.0	16.7	1.8	0.0	0.0	0.0	0.0	0.0	29
D06_	Portable Plant	645634.1	4879498.5	333.0	0	123	0.0	A	62.3	0.0	-0.3	20.1	1.9	0.0	0.0	0.0	0.0	0.0	39
D06_	Shipment Loaders	645651.8	4879494.5	332.5	0	110	0.0	A	62.3	0.0	-0.6	18.0	1.7	0.0	0.0	0.0	0.0	0.0	26

Receiver: R12  
 Project: Goodwood Pit Extension  
 Project Number: 18200

Time Period	Total (dBA)
Day	41

Receiver Name	Receiver ID	X	Y	Z
R12	R12	645623.53 m	4879851.26 m	349.88 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
D06_	Conveyor	645706.5	4879465.2	332.4	0	81	18.1	A	62.9	0.0	-1.4	9.0	0.7	0.0	0.0	0.0	0.0	0.0	28
D06_	Conveyor	645757.1	4879468.5	332.4	0	81	15.7	A	63.2	0.0	-1.6	8.7	0.7	0.0	0.0	0.0	0.0	0.0	26
D06_	Conveyor	645786.0	4879470.3	332.4	0	81	13.1	A	63.4	0.0	-1.6	14.9	0.8	0.0	0.0	0.0	0.0	0.0	17
D06_	Conveyor	645648.1	4879479.2	332.4	0	81	14.9	A	62.4	0.0	-1.2	14.8	0.7	0.0	0.0	0.0	0.0	0.0	19
D06_	Extraction Loaders	645803.9	4879475.1	332.5	0	110	0.0	A	63.4	0.0	-2.2	16.5	1.9	0.0	0.0	0.0	0.0	0.0	30
D06_	Portable Plant	645634.1	4879498.5	333.0	0	123	0.0	A	62.0	0.0	-1.7	21.1	1.8	0.0	0.0	0.0	0.0	0.0	40
D06_	Shipment Loaders	645651.8	4879494.5	332.5	0	110	0.0	A	62.1	0.0	-1.7	18.3	1.6	0.0	0.0	0.0	0.0	0.0	27

Receiver: R13  
 Project: Goodwood Pit Extension  
 Project Number: 18200

Time Period	Total (dBA)
Day	40

Receiver Name	Receiver ID	X	Y	Z
R13	R13	645395.60 m	4879840.22 m	346.59 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
D06_	Conveyor	645689.2	4879464.1	332.4	0	81	15.2	A	64.6	0.0	1.0	12.0	0.9	0.0	0.0	0.0	0.0	0.0	18
D06_	Conveyor	645722.6	4879466.2	332.4	0	81	15.3	A	64.9	0.0	1.0	5.4	0.9	0.0	0.0	0.0	0.0	0.0	24
D06_	Conveyor	645743.5	4879467.6	332.4	0	81	9.1	A	65.2	0.0	1.0	6.3	0.9	0.0	0.0	0.0	0.0	0.0	17
D06_	Conveyor	645767.6	4879469.1	332.4	0	81	16.0	A	65.4	0.0	0.9	5.9	0.9	0.0	0.0	0.0	0.0	0.0	24
D06_	Conveyor	645653.9	4879475.4	332.4	0	81	16.5	A	64.0	0.0	1.1	6.9	0.8	0.0	0.0	0.0	0.0	0.0	25
D06_	Extraction Loaders	645803.9	4879475.1	332.5	0	110	0.0	A	65.8	0.0	-0.5	14.6	2.3	0.0	0.0	0.0	0.0	0.0	28
D06_	Portable Plant	645634.1	4879498.5	333.0	0	123	0.0	A	63.4	0.0	0.2	18.7	2.1	0.0	0.0	0.0	0.0	0.0	39
D06_	Shipment Loaders	645651.8	4879494.5	332.5	0	110	0.0	A	63.7	0.0	-0.2	15.2	1.9	0.0	0.0	0.0	0.0	0.0	26

Receiver: R14  
 Project: Goodwood Pit Extension  
 Project Number: 18200

Time Period	Total (dBA)
Day	45

Receiver Name	Receiver ID	X	Y	Z
R14	R14	645399.82 m	4879645.35 m	350.83 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
D06_	Conveyor	645678.0	4879463.4	332.4	0	81	10.5	A	61.4	0.0	-1.4	8.1	0.6	0.0	0.0	0.0	0.0	0.0	23
D06_	Conveyor	645722.4	4879466.2	332.4	0	81	18.9	A	62.4	0.0	-1.5	10.9	0.7	0.0	0.0	0.0	0.0	0.0	28
D06_	Conveyor	645768.9	4879469.2	332.4	0	81	11.9	A	63.2	0.0	-1.6	7.0	0.7	0.0	0.0	0.0	0.0	0.0	24
D06_	Conveyor	645782.2	4879470.1	332.4	0	81	10.5	A	63.5	0.0	-1.7	6.9	0.8	0.0	0.0	0.0	0.0	0.0	22
D06_	Conveyor	645792.0	4879470.7	332.4	0	81	9.2	A	63.7	0.0	-1.8	6.9	0.8	0.0	0.0	0.0	0.0	0.0	21
D06_	Conveyor	645653.9	4879475.4	332.4	0	81	16.5	A	60.7	0.0	-1.2	8.9	0.6	0.0	0.0	0.0	0.0	0.0	29
D06_	Extraction Loaders	645803.9	4879475.1	332.5	0	110	0.0	A	63.8	0.0	-2.3	12.6	1.9	0.0	0.0	0.0	0.0	0.0	34
D06_	Portable Plant	645634.1	4879498.5	333.0	0	123	0.0	A	59.9	0.0	-1.6	19.7	1.5	0.0	0.0	0.0	0.0	0.0	44
D06_	Shipment Loaders	645651.8	4879494.5	332.5	0	110	0.0	A	60.4	0.0	-1.6	15.7	1.4	0.0	0.0	0.0	0.0	0.0	31

Receiver: R15  
 Project: Goodwood Pit Extension  
 Project Number: 18200

Time Period	Total (dBA)
Day	41

Receiver Name	Receiver ID	X	Y	Z
R15	R15	645287.96 m	4879739.62 m	350.25 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
D06_	Conveyor	645677.2	4879463.3	332.4	0	81	9.8	A	64.6	0.0	-1.1	7.5	0.9	0.0	0.0	0.0	0.0	0.0	19
D06_	Conveyor	645713.9	4879465.7	332.4	0	81	18.1	A	65.1	0.0	-1.2	11.0	0.9	0.0	0.0	0.0	0.0	0.0	23
D06_	Conveyor	645750.3	4879468.0	332.4	0	81	9.6	A	65.6	0.0	-1.3	6.6	0.9	0.0	0.0	0.0	0.0	0.0	19
D06_	Conveyor	645777.0	4879469.7	332.4	0	81	15.8	A	65.9	0.0	-1.3	6.4	1.0	0.0	0.0	0.0	0.0	0.0	25
D06_	Conveyor	645653.9	4879475.4	332.4	0	81	16.5	A	64.1	0.0	-1.0	8.2	0.8	0.0	0.0	0.0	0.0	0.0	25
D06_	Extraction Loaders	645803.9	4879475.1	332.5	0	110	0.0	A	66.3	0.0	-2.0	12.3	2.4	0.0	0.0	0.0	0.0	0.0	31
D06_	Portable Plant	645634.1	4879498.5	333.0	0	123	0.0	A	63.5	0.0	-1.5	19.3	2.1	0.0	0.0	0.0	0.0	0.0	40
D06_	Shipment Loaders	645651.8	4879494.5	332.5	0	110	0.0	A	63.8	0.0	-1.5	15.2	1.9	0.0	0.0	0.0	0.0	0.0	27

Receiver: R16  
 Project: Goodwood Pit Extension  
 Project Number: 18200

Time Period	Total (dBA)
Day	40

Receiver Name	Receiver ID	X	Y	Z
R16	R16	645174.70 m	4879698.11 m	348.07 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
D06_	Conveyor	645681.8	4879463.6	332.4	0	81	12.7	A	65.9	0.0	1.1	4.8	1.0	0.0	0.0	0.0	0.0	0.0	21
D06_	Conveyor	645729.5	4879466.7	332.4	0	81	18.9	A	66.6	0.0	1.1	7.5	1.0	0.0	0.0	0.0	0.0	0.0	24
D06_	Conveyor	645770.6	4879469.3	332.4	0	81	7.3	A	67.1	0.0	1.1	3.9	1.1	0.0	0.0	0.0	0.0	0.0	15
D06_	Conveyor	645780.2	4879469.9	332.4	0	81	11.4	A	67.2	0.0	1.1	3.9	1.1	0.0	0.0	0.0	0.0	0.0	19
D06_	Conveyor	645791.6	4879470.7	332.4	0	81	9.6	A	67.4	0.0	1.1	3.9	1.1	0.0	0.0	0.0	0.0	0.0	17
D06_	Conveyor	645653.9	4879475.4	332.4	0	81	16.5	A	65.5	0.0	1.2	9.7	0.9	0.0	0.0	0.0	0.0	0.0	20
D06_	Extraction Loaders	645803.9	4879475.1	332.5	0	110	0.0	A	67.5	0.0	-0.4	5.4	2.6	0.0	0.0	0.0	0.0	0.0	35
D06_	Portable Plant	645634.1	4879498.5	333.0	0	123	0.0	A	65.0	0.0	0.2	17.3	2.4	0.0	0.0	0.0	0.0	0.0	38
D06_	Shipment Loaders	645651.8	4879494.5	332.5	0	110	0.0	A	65.3	0.0	-0.1	13.3	2.2	0.0	0.0	0.0	0.0	0.0	26

Receiver: R17  
 Project: Goodwood Pit Extension  
 Project Number: 18200

Time Period	Total (dBA)
Day	42

Receiver Name	Receiver ID	X	Y	Z
R17	R17	645204.25 m	4879585.55 m	352.27 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
D06_	Conveyor	645692.0	4879464.3	332.4	0	81	15.9	A	65.0	0.0	-1.3	6.6	0.9	0.0	0.0	0.0	0.0	0.0	26
D06_	Conveyor	645755.8	4879468.4	332.4	0	81	18.7	A	66.0	0.0	-1.5	7.7	1.0	0.0	0.0	0.0	0.0	0.0	27
D06_	Conveyor	645657.6	4879472.9	332.4	0	81	15.5	A	64.4	0.0	-1.2	7.0	0.8	0.0	0.0	0.0	0.0	0.0	26
D06_	Extraction Loaders	645803.9	4879475.1	332.5	0	110	0.0	A	66.7	0.0	-2.2	7.0	2.4	0.0	0.0	0.0	0.0	0.0	36
D06_	Portable Plant	645634.1	4879498.5	333.0	0	123	0.0	A	63.8	0.0	-1.7	18.0	2.1	0.0	0.0	0.0	0.0	0.0	41
D06_	Shipment Loaders	645651.8	4879494.5	332.5	0	110	0.0	A	64.2	0.0	-1.6	13.6	2.0	0.0	0.0	0.0	0.0	0.0	29

Receiver: R18  
 Project: Goodwood Pit Extension  
 Project Number: 18200

Time Period	Total (dBA)
Day	41

Receiver Name	Receiver ID	X	Y	Z
R18	R18	645010.13 m	4879512.87 m	355.20 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
D06_	Conveyor	645729.2	4879466.7	332.4	0	81	20.6	A	68.2	0.0	-1.3	6.1	1.2	0.0	0.0	0.0	0.0	0.0	27
D06_	Conveyor	645791.1	4879470.6	332.4	0	81	10.1	A	68.9	0.0	-1.5	6.2	1.3	0.0	0.0	0.0	0.0	0.0	16
D06_	Conveyor	645653.9	4879475.4	332.4	0	81	16.5	A	67.2	0.0	-1.1	6.1	1.1	0.0	0.0	0.0	0.0	0.0	24
D06_	Extraction Loaders	645803.9	4879475.1	332.5	0	110	0.0	A	69.0	0.0	-2.0	6.8	2.9	0.0	0.0	0.0	0.0	0.0	33
D06_	Portable Plant	645634.1	4879498.5	333.0	0	123	0.0	A	66.9	0.0	-1.7	15.9	2.8	0.0	0.0	0.0	0.0	0.0	39
D06_	Shipment Loaders	645651.8	4879494.5	332.5	0	110	0.0	A	67.2	0.0	-1.6	11.3	2.5	0.0	0.0	0.0	0.0	0.0	28

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**Appendix C**  
Qualifications of the Authors

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## **Derek Flake**     **M.Sc., P.Eng.**

### **Profile**

Derek is an employee of Aercoustics Engineering Limited, an engineering consulting company specializing in acoustics, noise and vibration. Prior to that, he worked for several years at another acoustics, noise and vibration firm and he completed a Master of Science in the field of ultrasound transducer design. Derek is a Professional Engineer with the Professional Engineers Ontario.

Derek has been recognized by the Local Planning Appeal Tribunal (LPAT) and previously by the Ontario Municipal Board (OMB) as an expert in environmental noise and has provided expert opinion testimony to the Board and in civil litigation.

### **Employment History**

2012 – Present     Acoustical Engineer, Aercoustics Engineering Limited

2009 – 2012     Engineering Intern, Jade Acoustics Incorporated

### **Additional Activities / Committees**

2019 – Present     Officer on the Board of Directors and Chair of the Membership Committee at the Air & Waste Management Association (A&WMA) Ontario Section (OS)

2018 – Present     Member of Environment Committee at the Ontario Sand, Stone and Gravel Association (OSSGA)

2014 – Present     Member of Training and Development Committee at the Ontario Sand, Stone and Gravel Association (OSSGA)

### **Education**

Master of Science (M.Sc.)     Medical Biophysics (Ultrasound Physics)  
University of Toronto

Bachelor of Applied Science (B.A.Sc.)     Engineering Physics (Mechanical)  
Queen's University

### **Professional Registration / Affiliations**

Licensed Professional Engineer with the Professional Engineers of Ontario (PEO)

### **Courses and Speaking Events**

Instructor, Municipal Law Enforcement Officers' Association (MLEOA) Environmental Noise training courses. This is an annual four-day training program which provides the officers with an understanding of sound measurement and its relationship with environmental noise impact. The officer is trained in the utilization of technical equipment required in the application of sound measurement theories. This course also covers the unique elements of qualitative noise regulations and is authorized by the Ministry of the Environment and Climate Change.

Speaker, "Overview of Noise & Vibration Issues in Land-Use Planning", A&WMA OS Environment Issues in Land-Use Planning, Guelph, October 30, 2019.

Attended A&WMA Course "Consultant Liability and Expert Witness Testimony", Guelph, 2019.

Speaker, "Environmental Noise: Modelling Techniques to Quiet your Acoustic Troubles", ACE 2019, Quebec City, 2019.

Attended PSMJ Resources Project Management Bootcamp, Toronto, 2016.

Attended OSSGA Health and Safety Seminar courses "*Aggregates 101*" and "*Aggregates 201*", Toronto, 2015. Mr. Flake both attended and aided in the development for parts of the course.

Speaker, "*The New NPC-300 Noise Guideline: What does it mean for your noise by-law?*" MLEOA Annual General Meeting, Kingston, 2014.

### **Professional Activities**

#### ***Land Use Planning***

In the field of environmental acoustics, Mr. Flake has completed numerous projects involving noise impact from planned stationary sources as well as noise impact studies for proposed new noise sensitive uses. These projects included conducting studies for proposed operations and developments and addressing noise concerns for existing operations. Peer reviews of noise studies prepared by other acoustic consultants were also conducted by Mr. Flake. In the land use planning process, Mr. Flake has completed studies which provide assessments of the noise impact on proposed residential, commercial, institutional and industrial developments from the local environment which includes noise from road, rail, and aircraft traffic and stationary noise sources such as industrial and commercial uses. Also, vibration measurements and studies were conducted to assess vibration from rail traffic such as trains, streetcars and subways. The studies include recommendations for noise control of the sources, dwelling building components, wall, window, and door constructions to satisfy the Ministry of Environment, Conservation and Parks noise guidelines.

In addition, Mr. Flake has conducted architectural drawing reviews and provided design advice for residential and commercial developments. These have ensured the construction plans will meet the municipal and Ontario Building Code requirements.

#### ***Environmental Compliance Approvals & EASR***

Mr. Flake was involved in noise and vibration impact studies for industrial, institutional and commercial uses. He has prepared Acoustic Assessment Reports for use in applications for Environmental Compliance Approvals (ECA) and the Environmental Activity & Sector Registry (EASR). These studies provided conceptual as well as detailed designs of noise mitigation to reduce in-plant noise or noise emission into the environment. In-plant projects generally involved noise surveys, detailed noise and vibration measurements of equipment, data analysis and computer modelling of noise controls to evaluate effectiveness. In some cases, detailed designs and specifications have been provided. Mr. Flake has a good record of submitting applications that are accepted as fully complete according to MECP records.

#### ***Aggregates***

Mr. Flake has done work in the aggregates industry which involved the preparation and support of noise impact studies to determine technical feasibility of aggregate licence applications to the Ministry of Natural Resources & Forestry. This work included preparing the noise impact studies, supporting the findings at public meetings, and performing acoustic audits to confirm compliance with the noise requirements.

#### ***Mining***

Mr. Flake has acted as a third-party peer reviewer for the City of Timmins, overseeing all aspects of environmental compliance (including acoustics, noise & vibration) for the Hollinger Pit Open Mine in Timmins.

Acoustic Audits were also conducted at Goldcorp's Red Lake Balmerton & Cochenour sites.

#### ***Renewable Energy***

Mr. Flake has performed IEC 61400 testing of Wind Turbines and Transformer Station noise audits.

#### ***Noise Source Investigations and Room Acoustics***

Mr. Flake has completed several projects involving design of spaces where sound privacy and room acoustics were critical. These projects have included noise complaint investigation, room acoustics, mechanical noise, noise measurements to quantify sound isolation, and environmental noise impact. Examples of spaces include cinemas, offices, hospitals and residential condominiums.

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**End of Report**

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