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PIONEER AGGREGATES SOUTH PARCEL EXPANSION PROJECT

NOISE STUDY

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1. INTRODUCTION

The Pioneer Aggregates South Parcel Project ("South Parcel Project") includes horizontal expansion of mining into approximately 188 acres previously undisturbed by mining and vertical expansion of approximately 125 acres where mining will deepen a portion of the existing mine. The South Parcel Project would extend mining at the current rate for approximately 14 additional years.

Mining under the South Parcel Project will proceed slowly from the north to the south over a period of five to eight years. The method of mining will be identical to that currently used in the permitted mine area. A dozer would push excavated material from the top of the mine face to two front-end loaders working on the mine floor. The front-end loaders would scoop-up the sand and gravel and dump it into portable hoppers that feed conveyors leading to the processing area.

A conveyor will start at the north end of the Expansion Area and will be extended south as mining progresses. The conveyor is comprised of a 48-inch-wide rubberized belt that is supported by a series of rollers, called idlers, mounted on steel framed segments that support the conveyor about five feet off the ground.

A 20-foot-high noise berm will be constructed along the southern boundary of the South Parcel behind retained vegetation and will help reduce potential noise associated with mining for adjacent land uses. The berm will be constructed prior to clearing in the adjacent portionof the South Parcel.

This analysis considers potential noise impacts to residences and other sensitive receivers nearest the expansion area. The following report reviews noise terminology, regulatory criteria applicable to the project, and the methods and findings of the analysis

2. NOISE LEVEL TERMINOLOGY AND HUMAN HEARING

Noise is sometimes defined as unwanted sound; the terms noise and sound are used more or less synonymously in this report. The human ear responds to a very wide range of sound intensities. The decibel scale (dB) used to describe sound is a logarithmic rating system which accounts for the large differences in audible sound intensities. This scale accounts for the human perception of a doubling of loudness as an increase of 10 dB. Therefore, a 70-dB sound level will sound about twice as loud as a 60-dB sound level. People generally cannot detect differences of 1 dB; in ideal laboratory stuations, differences of 2 or 3 dB can be detected by people, but such a change probably would not be detectable in an average outdoor environment. A 5-dB change would probably be perceived under normal listening conditions.

When addressing the effects of noise on people, it is useful to consider the frequency response of the human ear. Sound-measuring instruments are therefore often programmed to weight measured sounds based on the way people hear. The frequency-weighting most often used is A-weighting because it approximates the frequency response of human hearing and is highly correlated to the effects of noise on people. Measurements from instruments using this system are reported in "A-weighted decibels" or dBA. All sound levels in this evaluation are reported in A-weighted decibels.

Distance from the source, the frequency of the sound, the absorbency of the intervening ground, obstructions, and duration of the noise-producing event all affect the transmission and perception of noise. The degree of this effect also depends on who is listening and on existing sound levels.

3. AFFECTED ENVIRONMENT

3.1 Regulatory Overview

The project site is located within the City of DuPont in Pierce County. Section 9.09.040 of the DuPont Municipal Code (DMC 9.09.040) specifies noise limits based on the limits set in the Washington Administrative Code (WAC 173-60). DMC 9.09.040 establishes limits on sounds crossing property boundaries based on the Environmental Designation for Noise Abatement (EDNA) of the sound source and the receiving properties. Section 9.09.040(b) of the DuPont City Code identifies Class A EDNAs as residential areas, Class B EDNAs as commercial areas, and Class C EDNAs as industrial areas. The allowable noise level limits are displayed in **Table 1**.

Table 1. DuPont Maximum Permissible Sound Levels (dBA)

EDNA of Source Property	EDNA of Receiving Property		
	Class A Day/Night [a]	Class B	Class C
Class A	55/45	57	60
Class B	57/47	60	65
Class C	60/50	65	70

[a] The limits for noise received in Class A EDNAs are reduced by 10 dBA during nighttime hours (10 PM to 7 AM).
Source: DMC 9.09.040.

The city noise rule allows the limits presented in **Table 1** to be exceeded for certain periods of time: 5 dBA for no more than 15 minutes in any hour, 10 dBA for no more than 5 minutes of any hour, or 15 dBA for no more than 1.5 minutes of any hour. These allowed increases can be described in terms of the percentage of time a certain level is exceeded, using statistical noise descriptors (L_ns). For example, L_{25} represents a sound level that is exceeded 25 percent of the time, or 15 minutes in an hour. Similarly, $L_{8.33}$ and $L_{2.5}$ are the sound levels that are exceeded 8.33 and 2.5 percent of the time, or 5 and 1.5 minutes in an hour, respectively. At no time can the allowable sound level be exceeded by more than 15 dBA, represented by the L_{max}.

DMC Section 9.09.040(c) identifies a map that specifically designates the EDNA's for various properties within the City (Appendix A of Ordinance 208). The EDNA boundaries shown in this map identify a small Class A (Residential) EDNA on both sides of Barksdale Avenue in the historic village of DuPont, a small Class B (Commercial) EDNA between the historic village and I-5, and the remainder of the DuPont area as a Class C (Industrial) EDNA. DuPont Ordinance 208 and the associated map in Appendix A were adopted in 1978; they are no longer representative of current zoning and comprehensive land use plan designations. Furthermore, the 1978 map of EDNA designations does not adequately represent the basic uses identified in 9.09.040(b) that define EDNAs. It is, therefore, unclear whether the EDNA designations shown in the 1978 map or the EDNA identifications based on land uses in 9.09.040(b) should apply.

For this noise analysis, land use zones (as identified in Dupont's Zoning Map) were used to determine the appropriate noise limits for the various receiving properties. This approach is consistent with the more modern language and identification of EDNA designations based on actual uses and represents a more accurate reflection of current and expected future conditions. But applying either method for

identifying the appropriate EDNAs, the South Parcel would be considered a Class C EDNA, and the applicable Ln noise limits for a Class C EDNA noise source affecting different types of receiving properties are displayed in **Table 2**.

Table 2. Applicable Ln Noise Limits for Class C EDNA Noise Sources

EDNA of Source Property	Ln Limits			
	L_{25}	$L_{8.3}$	$L_{2.5}$	L_{max}
Class A [a]	60/50	65/55	70/60	75/65
Class B	65	70	75	80
Class C	70	75	80	85

[a] The limits for noise received in Class A EDNAs are reduced by 10 dBA during nighttime hours (10 PM to 7 AM) and are shown for Day/Night.
Source: DMC 9.09.040 (d)

Because noise generated by South Parcel mining would typically be fairly consistent over an hourly period, the allowances for short-term increases in the noise level limits would rarely apply. Therefore, the most stringent/conservative noise limit for the proposed mining (a Class C source) would be an L_{25} of 70 dBA at nearby Class C EDNAs, an L_{25} of 65 dBA at nearby Class B EDNAs, or an L_{25} of 60 dBA between 7 AM and 10 PM and 50 dBA between 10 PM and 7 AM at nearby Class A EDNAs.

DMC 9.09.050 exempts the following sources from the above noise limits:

- Temporary construction noise, except when received in Class A EDNA properties between the hours of 10 PM and 7 AM;
- Sounds created by motor vehicles when regulated by the state noise limit (Chapter 173-62 WAC), adopted by reference in DMC 9.09.040; and
- Sounds created by motor vehicles, licensed or unlicensed, when operated off public highways, except when such sounds are received in Class A EDNAs.

3.2 Existing Sound Levels

Ramboll measured sound levels from October 31 – November 1, 2019 to characterize the existing sound levels in the project vicinity as part of a noise study for an earlier proposal to mine the south parcel. For the measurements, Ramboll used Larson Davis LxT Class 1 sound level meters and measured hourly sound levels for a minimum of 24-hours. The meters were field-calibrated prior to the measurements and had been factory certified within the previous 12 months. The microphones were placed on tripods about 5 feet above the ground.

The sound level measurements were taken at two locations, shown in **Figure 1**. SLM1 was chosen to represent the nearest residences south of the mine on the north side of the Creekside Apartment complex. SLM2 represents the residential community across Center Drive from the South Parcel. At both measurement locations, noise from the existing Pioneer Aggregates facility was not audible and did not substantively contribute to the measured levels. A summary of the sound level measurement results is displayed in **Table 3,** and detailed information regarding the measured levels is included in Attachment A.

Table 3. Range of Existing Measured Hourly Sound Levels (dBA)

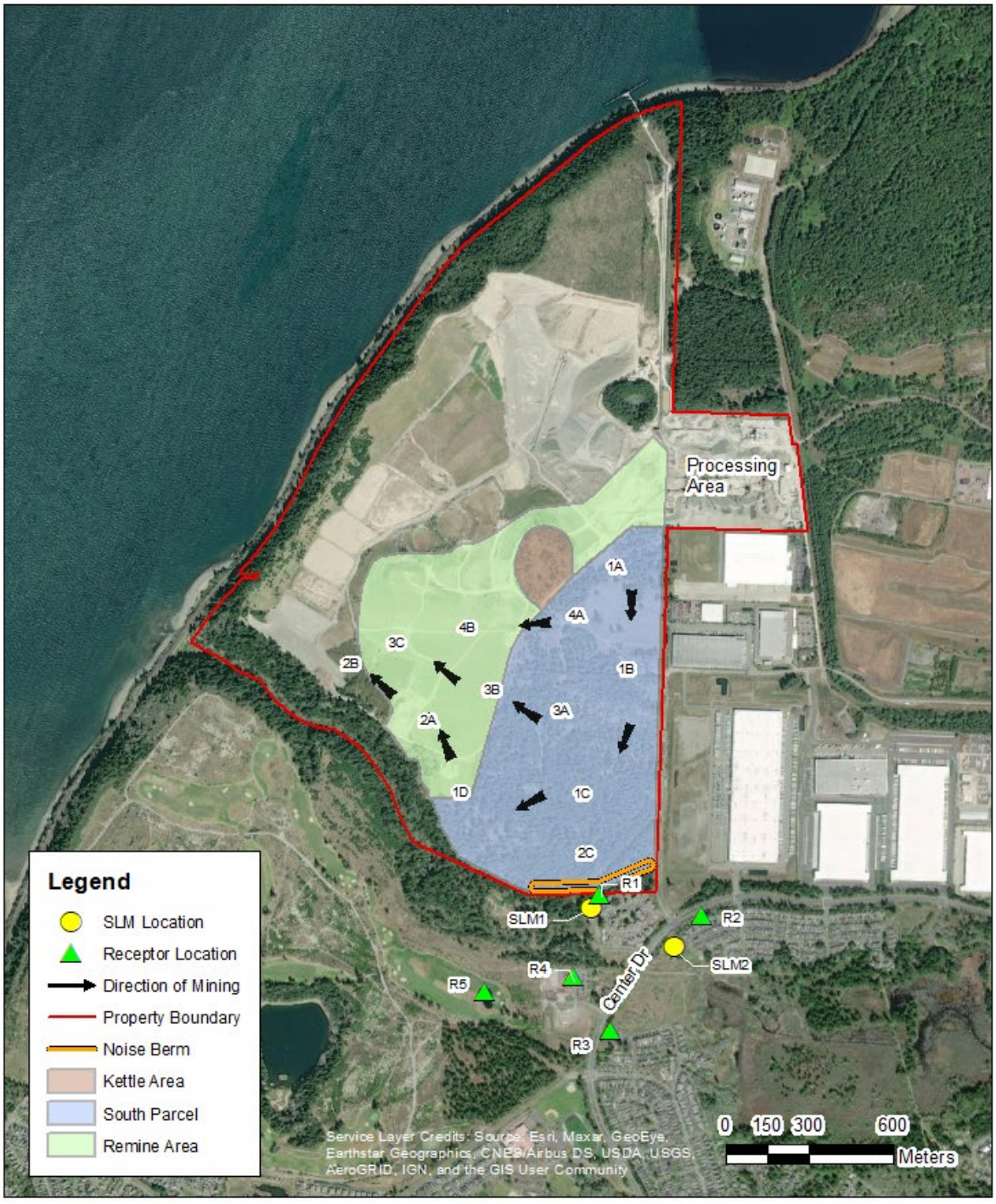
Location	Time [a]	L_{eq} [b]	L_{max}	L_2	L_8	L_{25}	L_{90}	L_{dn} [b]
SLM1	Day	39-48	52-72	43-56	42-49	37-47	33-45	47
	Early Morning	42-44	56-58	46-47	45-46	43-45	40-43	
	Night	35-44	48-58	39-47	37-46	35-45	33-43	
SLM2	Day	49-54	61-83	55-61	53-57	50-56	41-51	56
	Early Morning	52-55	69-700	57-59	56-58	53-56	45-49	
	Night	42-55	57-70	48-59	45-58	41-56	38-49	

[a] Daytime hours are defined as between 7 AM and 10 PM, early morning hours are between 5 and 7 AM, and nighttime hours are between 10 PM and 7 AM.

[b] The Leq is an energy-average sound level defined over a specified period of time, often one hour. It is useful for representing the energy of a fluctuating sound with a single number. The Ldn is a similar to a 24-hour Leq, except the Ldn includes an additional 10 dBA added to sound levels in each hour between 10 PM and 7 AM to account for increased sensitivity to noise at night.

SLM1 – Located behind the Creekside Apartment complex. Noise sources included JBLM and civilian aircraft, including helicopters. The noise environment at the apartment complex was relatively quiet during deployment and retrieval of the meters.

SLM2 – Located at the Edmond Village Park to represent the residential setbacks from Center Drive. The primary noise source was traffic along Center Drive. Sporadic noise sources included aircraft noise, both military and civilian.



RAMBOLL	Sound Level Measurement (SLM) and Model Receptor Locations Pioneer Aggregates South Parcel EIS Dupont, Washington	FIGURE 1
DRAFTED BY: AP / DATE: 1/31/2022		

Figure 1. Sound Level Measurement and Model Receptor Locations

4. OPERATIONAL NOISE IMPACTS

The South Parcel Project will not substantially alter the majority of existing mining-related operations at the facility. The method of mining will be identical to that currently used in the permitted mine area. A dozer would push excavated material from the top of the mine face to two front-end loaders working on the mine floor. The front-end loaders would scoop-up the sand and gravel and dump it into portable hoppers that feed conveyors leading to the processing area. The material processing plants and barge-loading facilities would not change.

4.1 Noise Sources

Equipment required for mining the South Parcel includes two front-end loaders, a bulldozer, and conveyors and a electric conveyor drive motor. This equipment would work in tandem; the bulldozer would push material down the mining face to the loaders, which would load the material onto a conveyor going to the existing processing plant. The bulldozer and loaders would be the dominant noise sources at the nearest sensitive receivers to the South Parcel.

Noise from the excavation equipment was considered in noise modeling to estimate future noise associated with the facility. Noise from most equipment was characterized using measurements of equipment operating at the existing Pioneer Aggregates facility. The measurement of the electric conveyor drive motor was measured at a different facility and is from Ramboll's source sound level archives. The sound levels of the representative equipment are shown in **Table 4**.

Table 4. Mining Equipment Noise Levels (L_{25}/L_{eq}, dBA)

Equipment	Sound Level at 100 feet
Bulldozer	76
Front-End Loader	75
Electric conveyor drive motor	60
Conveyor	56
Source: Ramboll US Consulting	

Because the noise from a sand and gravel operation is typically fairly constant over the course of an hour, the noise standard that would be most limiting would be the hourly L_{25} limit. In order to more closely relate the calculated sound levels with the applicable noise limits, Ramboll used the measured L_{25} of each source when this information was available. However, not all of the equipment sound level information was available as an L_{25}. Because the noise generated by mining tends to be fairly continuous over the course of an hour, the sound levels of these operations described by the L_{eq} and L_{25} tend to be very similar. Therefore, in instances where L_{25} data were not available, Ramboll used the L_{eq} to represent an L_{25}.

4.2 Noise Model

Ramboll used the CadnaA noise model to estimate sound levels expected to be generated by the proposed mining expansion equipment. CadnaA is a computer program that calculates sound levels after considering the noise reductions or enhancements caused by distance, topography, ground surfaces, atmospheric absorption, and meteorological conditions in compliance with ISO 9613-2. The

modeling process included the following steps: (1) characterizing the noise sources based on frequency-specific measurements of representative equipment; (2) creating three-dimensional maps of the site and vicinity to enable the model to evaluate effects of distance and topography on noise attenuation, (3) assigning the equipment sound levels to the appropriate locations on the site, and (4) placing model "receptors" at several model receptor locations to represent places where the noise will be received.

4.3 Modeling Assumptions

The following assumptions were used in our assessment:

- The South Parcel will be mined in phases, beginning in the northeast section of the parcel and proceeding south and then west and northwest;
- The noise model evaluated mining activities in Phases 1B, 2C, and 3B to consider the range of sound levels that might occur from the South Parcel activities;
- For Phase 1B, much of the existing topography was assumed to be intact, providing some amount of intervening topography between the excavation equipment and the receivers to the south;
- For Phases 2C and 3B, most of the South Parcel was assumed to have been mined;
- For each phase considered, the noise model included one bulldozer pushing material down the mine slope, two front-end loader sat the toe of the slope loading material into a hopper, and a conveyor transporting material from the active mining area to the processing plant area;
- All equipment was assumed to operate concurrently and continuously;
- The South Parcel Expansion will not require increased capacity of the processing plants; and
- The site plan and noise model include a 20-foot high berm, constructed prior to mining of Phase 2C, located in the southeast corner of the site between the Creekside Apartments and the South Parcel. The berm will include trees and landscaping.

4.4 Noise Modeling Results

4.4.1 Compliance Assessment

As part of the noise assessment, Ramboll first compared the model-calculated sound levels with the applicable City noise limits to assess potential compliance with the limits. Sound levels from proposed excavation activities were modeled at six receptor locations representing three residential areas, a civic center, and a golf course nearest the South Parcel. The receptor locations are shown in **Figure 1**. The predicted future sound levels and detailed descriptions of each receptor location are provided in **Table 5**. Noise from the existing Pioneer Aggregates operations does not substantively contribute to the sound levels at the receptor locations considered in this assessment, and the predicted sound levels provided in **Table 5** can be considered representative of the entire operation with mining in the South Parcel.

As can be seen by the values in **Table 5,** sound levels from the proposed mine would easily comply with the applicable noise limits during daytime hours (i.e., 7 AM to 10 PM) at all locations. However, sound levels at the upper floors of the Creekside Apartments facing the site may exceed the noise limits if full mining activity occurs in Phase 2C during early morning hours (i.e., between 5 and 7 AM).

Because the dominant noise source at the Creekside Apartments during Phase 2C excavation is the bulldozer, Ramboll considered the noise benefits of restricting bulldozer use in this phase to daytime hours only. Prohibition of bulldozer use during the early morning hours results in modeled sound levels below the nighttime noise limits applied between 5 and 7 AM at all receptor locations.

Table 5. Model-Calculated Sound Levels (L_{eq}/L_{25}, dBA)

Model Receptor Location	Modeled Sound Level				Noise Limit [a]
	Phase 1B	Phase 2C	Phase 2C (No Bulldozer)	Phase 3B	
R1a	42	55	48	43	60/50
R1b	41	46	42	40	60/50
R2	40	45	43	37	60/50
R3	36	40	37	36	60/50
R4	37	39	36	38	65
R5	36	38	37	39	65

Receptor Locations:

R1a – Upper floor of the Creekside Apartments nearest the South Parcel

R1b – Ground floor of the Creekside Apartments nearest the South Parcel

R2 – Residences in Edmond Village

R3 – Residences in Palisade Village

R4 – Dupont Civic Center

R5 – The Home Course Golf Course

(a) The noise limits shown for residential locations are for daytime/nighttime hours, where daytime hours are from 7 AM to 10 PM and nighttime hours are from 10 PM to 7 AM.

Source: Ramboll US Corporation

4.4.2 Increases over Existing Sound Levels

In addition to evaluating the potential compliance of on-site sources associated with South Parcel activities, Ramboll considered potential noise impacts caused by project-related increases over existing baseline sound levels. This assessment was restricted to residential receptor locations potentially affected by project-related increases over existing levels.

For the project sound levels during daytime hours, we used the worst-case modeled levels expected during all phases of excavation. For the project sound levels during early morning hours, we used the worst-case modeled sound levels during all phases of excavation assuming *no bulldozer* in Phase 2C. Because mining activities in Phase 2C may exceed the nighttime noise limit of 50 dBA at the upper floors of the Creekside Apartments with all equipment in operation, use of the bulldozer in Phase 2C will be restricted to daytime hours only. The resulting increases over existing levels are displayed in **Table 6**.

Table 6. Calculated Increases Over Existing Sound Levels (Leq, dBA)

Model Receptor Location	Time of Day [a]	Measured Existing Levels	Level with South Parcel Expansion		
			Project Only [b]	Cumulative [c]	Increase [d]
R1a	Day	39-48	55	55-56	8-16
	Night	42-44	48	49-50	5-7
R1b	Day	39-48	46	46-50	2-8
	Night	42-44	42	45-46	2-3
R2	Day	49-54	45	51-55	0-1
	Night	52-55	43	52-55	0
R3	Day	49-54	40	50-55	0
	Night	52-55	37	52-55	0

Notes:

(a) Daytime hours are from 7 AM to 10 PM. Nighttime hours for the purpose of this evaluation are from 5 to 7 AM, when early morning excavation may occur.

(b) The daytime project levels shown are the highest modeled sound levels from all phases of South Parcel activities considered in this assessment. The nighttime levels shown are the highest levels from all modeled phases except 2C.

(c) Cumulative levels represent the existing measured sound levels + the modeled project-related sound levels.

(d) Apparent discrepancies in any calculated increases are artifacts of rounding the displayed sound levels to the nearest whole number.

Source: Ramboll US Corporation

As can be seen in **Table 4**, the sound levels when a bulldozer is working very near the project boundaries in Phase 2C are substantially higher than the baseline sound levels at the upper floors of the Creekside Apartments (R1a), resulting in potential increases of 8 to 16 dBA. If these sound levels were experienced throughout the life of the project, they would represent a substantial increase. However, the modeled levels at the Creekside Apartments are dominated by noise from a bulldozer working on the slope of 2C very near the southern project boundary. This worst-case condition would only occur during Phase 2C excavation. Even during Phase 2C excavation, the bulldozer would split its time between excavation in Phase 2C and excavation in the existing mining areas farther north and west, and sound levels much of the time would be substantially lower than the worst-case levels identified here. The variation in sound levels over the life of the mine and the variation in day-to-day bulldozer activities would reduce the potential noise impacts at the Creekside Apartments due to increases over baseline levels.

At the more distant residential locations (R2 and R3), increases over background sound levels are 1 dBA or less during even the worst-case Phase 2C activities. Such increases would not be discernable in an active outdoor environment and would result in no impact.

5. CONSTRUCTION

The material processing infrastructure that would be used to support South Parcel mining already exists. Construction directly related to the South Parcel would be limited to logging, preparation of new mining phases/segments for excavation, expansion of the on-site conveyor system to connect the

expanded mining area to the existing processing facility, and the construction of the berm on the south side of Phase 2C for noise attenuation.

Much of the construction activity would entail heavy equipment similar to, or the same as, the equipment required during excavation. Therefore, the sound levels of construction are expected to be similar to the modeled operational sound levels identified above. The exception would be sound levels associated with construction of the berm on the south side of Phase 2C. During construction of the berm, sound levels at nearby receivers may be noticeable and, at times, intrusive. This could result in temporary and short-term noise impacts at nearby properties. Construction activity is exempt from Dupont's noise regulations during daytime hours (7 AM to 10 PM).

6. MITIGATION

6.1 Operation

The plans for the site include construction of a 20-foot high berm on the south side of Phase 2C to reduce noise at off-site locations, especially at the Creekside Apartments. With such a berm, modeled sound levels of worst-case mining activities are well below the applicable daytime noise limits at all receptor locations.

Excavation in Phase 2C during early morning hours (i.e., between 5 and 7 AM) may exceed the stricter nighttime limit of 50 dBA applicable at the Creekside Apartments. The sound levels from Phase 2C activities affecting the Creekside Apartments is dominated by a bulldozer working at the top of the slope. Restriction of the bulldozer to daytime hours only within Phase 2C reduces the modeled sound levels at the Creekside Apartments to 48 dBA or less, which would comply with Dupont's nighttime noise limit.

6.2 Construction

Construction activities (i.e., logging and construction of the southern berm) would be conducted during daytime hours only (7 AM to 10 PM) to minimize noise impacts.

7. SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

With construction of the proposed berm as noted above and with restriction of hours of bulldozer operation in Phase 2C to daytime hours only, the project is expected to fully comply with the Dupont noise limits. Furthermore, potential noise impacts at the Creekside Apartments (R1) can be mitigated by the proposed mitigation measures, although short-term unavoidable noise impacts may be expected. Due to the short-term nature of the impacts at R1, any such impacts would not be characterized as significant.

APPENDIX A
SOUND LEVEL MEASUREMENT DETAIL

SLM1: Located behind the Creekside Apartment Complex October 31- November 1, 2019								
Date	**Time**	**Leq**	**Lmax**	**Lmin**	**L2**	**L8**	**L25**	**L90**
31-Oct	12:00:00	47.4	72.0	33.1	55.5	47.2	42.0	34.7
31-Oct	13:00:00	38.7	58.6	32.1	44.9	42.7	38.8	33.3
31-Oct	14:00:00	40.3	61.4	32.3	48.9	43.3	37.4	33.6
31-Oct	15:00:00	41.3	60.2	32.2	50.9	43.7	38.6	33.7
31-Oct	16:00:00	41.8	61.1	33.1	50.1	45.3	39.7	35.1
31-Oct	17:00:00	41.0	55.6	35.0	45.6	43.5	41.8	37.4
31-Oct	18:00:00	42.2	61.2	38.3	46.0	43.8	42.4	40.3
31-Oct	19:00:00	40.8	52.3	36.9	43.2	42.3	41.3	38.8
31-Oct	20:00:00	41.1	54.0	37.6	43.3	42.4	41.5	39.6
31-Oct	21:00:00	44.2	69.3	37.0	52.6	43.0	41.4	38.8
31-Oct	22:00:00	38.1	51.5	33.6	41.3	39.8	38.5	35.9
31-Oct	23:00:00	37.7	49.7	33.6	41.9	39.7	38.0	35.3
1-Nov	0:00:00	37.2	49.9	33.2	41.9	39.5	37.6	34.5
1-Nov	1:00:00	36.1	48.2	33.1	39.7	38.5	36.3	34.3
1-Nov	2:00:00	35.2	49.1	32.1	38.9	37.3	35.4	33.3
1-Nov	3:00:00	36.8	48.5	33.3	40.3	39.1	37.3	34.6
1-Nov	4:00:00	39.1	55.3	34.3	41.9	40.7	39.6	37.2
1-Nov	5:00:00	42.4	57.9	37.5	45.8	44.5	43.2	39.7
1-Nov	6:00:00	44.3	55.5	40.8	47.0	45.9	44.9	42.5
1-Nov	7:00:00	44.8	53.5	41.0	47.4	46.5	45.4	43.1
1-Nov	8:00:00	46.8	61.7	42.9	50.3	48.7	47.0	44.7
1-Nov	9:00:00	45.3	63.5	38.6	48.8	47.0	46.1	40.9
1-Nov	10:00:00	42.5	64.9	36.4	50.0	45.6	41.1	38.1
1-Nov	11:00:00	47.9	71.8	36.2	50.2	44.1	40.4	37.6
Ldn = 47.0								

SLM2: Located at the Edmond Village Park October 31- November 1, 2019								
Date	**Time**	**Leq**	**Lmax**	**Lmin**	**L2**	**L8**	**L25**	**L90**
31-Oct	12:00:00	53.5	68.4	38.4	59.6	56.9	53.9	46.2
31-Oct	13:00:00	49.9	63.4	35.0	56.5	54.3	50.4	41.3
31-Oct	14:00:00	49.8	67.1	35.2	55.7	53.5	50.6	41.3
31-Oct	15:00:00	50.7	67.3	34.3	56.6	53.9	51.4	42.4
31-Oct	16:00:00	52.3	68.0	35.9	56.8	55.3	53.4	46.7
31-Oct	17:00:00	52.5	61.3	40.0	57.2	55.8	53.6	46.5
31-Oct	18:00:00	53.3	72.2	41.2	57.5	56.3	54.7	46.5
31-Oct	19:00:00	50.2	65.3	40.5	55.8	54.1	51.3	43.4
31-Oct	20:00:00	50.8	65.5	40.6	56.3	54.6	52.1	43.3
31-Oct	21:00:00	54.1	83.5	41.5	57.5	54.9	51.5	43.5
31-Oct	22:00:00	46.9	62.2	38.4	53.5	51.1	47.2	40.6
31-Oct	23:00:00	46.2	61.2	38.1	53.1	50.6	45.5	40.5
1-Nov	0:00:00	45.1	60.3	36.5	52.6	49.0	44.2	39.8
1-Nov	1:00:00	42.8	60.0	37.1	48.4	44.5	42.6	39.8
1-Nov	2:00:00	42.1	63.8	35.1	49.7	44.7	40.6	37.6
1-Nov	3:00:00	42.9	56.6	37.4	50.3	46.8	41.7	39.0
1-Nov	4:00:00	45.4	57.9	39.5	52.2	49.7	44.5	41.3
1-Nov	5:00:00	51.7	69.2	41.2	57.4	55.6	52.8	44.7
1-Nov	6:00:00	54.6	69.7	43.8	59.4	57.9	55.7	49.2
1-Nov	7:00:00	54.5	68.9	46.6	58.7	57.3	55.6	49.6
1-Nov	8:00:00	54.5	69.2	47.5	58.3	56.9	55.3	50.7
1-Nov	9:00:00	51.9	63.4	43.1	55.7	54.5	53.0	47.7
1-Nov	10:00:00	49.4	74.2	40.7	54.8	52.8	50.3	43.3
1-Nov	11:00:00	53.8	76.0	40.3	60.5	55.7	51.8	44.4
Ldn = 55.8								