Attachment F

SOUND ANALYSIS REPORT

Coffman Engineers, Inc.
April 2025

COFFMAN ENGINEERS

SOUND ANALYSIS

GOOD'S QUARRY TENNESSEE ROAD SPECIAL-USE PERMIT RECONSIDERATION

Lewis County, Washington

April 2025

CEI PROJECT NO. 242236

SOUND ANALYSIS

for

GOOD'S QUARRY TENNESSEE ROAD
SPECIAL-USE PERMIT RECONSIDERATION
LEWIS COUNTY, WASHINGTON

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CONTENTS

1. INTRODUCTION

This report describes sound levels associated with current mining activities and the permitted expansion of the Good's Quarry located at 699 Tennessee Road in Lewis County, Washington. The report presents noise-emission characteristics of project equipment and calculated sound levels due to the permitted expansion and to activities associated with proposed modifications to the project Special-Use Permit. The report also presents noise mitigation measures recommended for future activities to meet the conditions of the Permit.

2. PROJECT SITE AND SURROUNDING LAND USES

The Good's Quarry is located in Lewis County, north of Winlock, Washington. Currently mining takes place within Lewis County Parcel 14999000000 and the north part of Parcel 015000000000. A Special-Use Permit granted by the Lewis County Hearing Examiner's Decision dated May 18, 2021 allows expansion of mining activities further south and southeast within Parcel 015000000000, including the previously separate Johnson Quarry in the south expanded mine area.

An aerial photograph of the overall mine site, surrounding properties, and sound analysis locations are shown in Figure 2-1.

The zoning district for the mine expansion area is Rural Development District 20 Acre (RDD-20) and Mineral Resource Lands (MRL/Mine). Neighboring parcels to the north, west, and south are zoned RDD-20. Neighboring parcels to the east are zoned RDD-10. Two parcels to the west are zoned MRL/Mine. Two parcels to the south are zoned FRL-LI (Forest Land of Local Importance) and MRL/Mine.

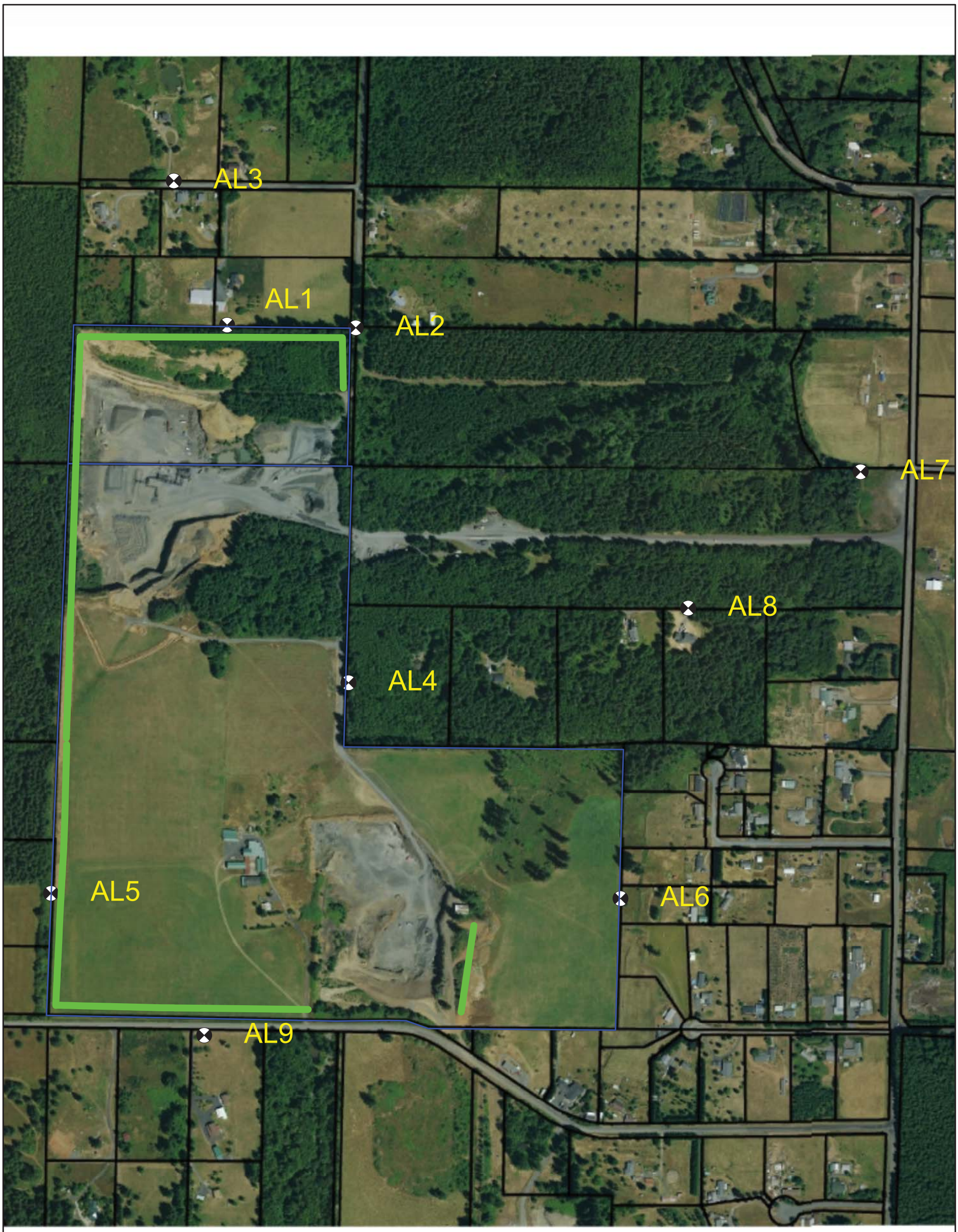

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Figure 2-1

Good's Quarry Sound Analysis

Site Plan with Sound Analysis Locations

3. SOUND LEVEL DESCRIPTORS AND CRITERIA

3.1 Sound Level Descriptors

Sound is measured as sound level in units of decibels, dB. Environmental sound is often measured as A-weighted sound level in dBA. The A-weighting is a specific weighting filter in a sound level meter that corresponds to human hearing sensitivity at the various sound frequencies. People normally experience sound levels between about 30 and 90 dBA, depending on their activity. For example, a loud nearby vehicle, radio, or power tool may produce 80 to 90 dBA, normal conversation is about 50 to 60 dBA, and a bedroom or quiet office is about 30 to 40 dBA.

Each 10 dB increase in sound level corresponds to a tenfold increase of sound energy but is judged by a listener as only a doubling of loudness. The smallest changes in sound level considered clearly noticeable are about 3 to 5 dB.

Sound levels from two or more sources are combined using logarithms, not by adding the levels. When two levels are combined, the louder level predominates, and the combined level is the louder level plus 0 to 3 dBA. Some examples: 50 dBA combined with 50 dBA is 53 dBA; 50 dBA combined with 40 dBA results in 50.4 dBA, which is rounded off to 50 dBA since fractions of a dB are negligible from the point of view of human hearing.

Because sound levels fluctuate over time, several A-weighted sound level descriptors are used to characterize the sound. In this report, the following descriptors are used:

Leq — **Equivalent sound level, Leq**, is the most commonly used descriptor for measuring fluctuating sound. The Leq is the level of a constant sound that, over a given time period, contains the same amount of sound energy as the measured fluctuating sound.

Lmax — **Maximum sound level, Lmax**, is the highest instantaneous sound level for a given sound source, event, or time period. Because the Lmax in a neighborhood will, unlike Leq, typically have large fluctuations from hour to hour and day to day, Lmax is seldom used to measure noise impact, except in cases where brief high-level sound is causing an impact such as sleep disturbance. The Lmax may be measured on the *Slow* or *Fast* setting of a sound level meter, both of which are accepted by the State of Washington *Sound Level Measurement Procedures*.

3.2 Lewis County Public Disturbance Noise Provision

Chapter 1.23 of the Lewis County Code is a qualitative provision that pertains to Public Disturbance Noises not regulated by other sections of the Code. It covers noises such as repetitive use of vehicle horns unrelated to actual warnings, frequent nighttime shouting or yelling, nighttime social gatherings, or nighttime discharge of firearms outside of authorized shooting ranges. This provision does not establish quantitative noise limits and therefore does not serve as a design criterion for limiting noise from commercial or industrial operations. It specifically excludes daytime blasting and mining, which are regulated by Lewis County Land-Use Standards and by the Washington Administrative Code (WAC). Applicable Lewis County and State of Washington noise regulations are discussed in the following section of this report.

3.3 Lewis County Noise Limits

The allowable noise limits pertaining to sound levels originating at the Good's Quarry are contained in Section 17.142.210, *Surface mining areas,* of the Lewis County Land-Use Standards. Paragraph 17.142.210.(2).(d).(i) stipulates that surface-mining developments meet Chapter 173-60 WAC. Furthermore, Condition 9 of the Hearings Examiner's Decision on the project Special-Use Permit requires that the proposal comply with the environmental noise levels established by Chapter 173-60 WAC.

Permissible sound levels in 173-60 WAC are based on the Environmental Designation for Noise Abatement (EDNA) classification of source and receiving properties, which is assigned according to land use. Class A EDNA is assigned to lands where human beings reside and sleep, such as residential uses. Class C EDNA is assigned to lands involving economic activities of such a nature that higher noise levels than experienced in other areas are to be anticipated. Examples of Class-C land uses include industrial and agricultural properties.

The Lewis County Code does not include provisions associating EDNA classifications with specific County zoning designations. Based on land use, the Good's Quarry is considered Class C EDNA and neighboring residential properties Class A EDNA.

Table 3-1 presents the allowable daytime and nighttime sound levels for each metric, applied to a mining source property Class and a residential receiver.

TABLE 3-1
LEWIS COUNTY PERMITTED SOUND LEVELS
FOR CLASS-C EDNA NOISE SOURCES AND CLASS-A EDNA RECEIVERS (dBA)

Time of Day*	**Noise Limit**	
	Leq	**Lmax**
Daytime	60	75
Nighttime	50	65

**Daytime is defined as 7 a.m. to 10 p.m.*
Nighttime is defined as 10 p.m. to 7 a.m.

The noise limits in Table 3-1 apply to mining and processing equipment at the site and to trucks operating within the project property. Noise from traffic on public roads is exempt from the noise limits of Table 3-1, according to WAC 173-60-050(4)(a).

WAC 173-60-050 (1)(c) exempts sounds created by blasting from the limits of Table 3-1 between the hours of 7 a.m. and 10 p.m. Lewis County Code Section 17.142.210.(2).(f) restricts the hours of blasting operations within surface-mining areas to 10 a.m. to 4 p.m.

4. EXISTING AND FUTURE OPERATIONS AND SOUND EMISSIONS

4.1 Existing Operations

Activities at the existing Good's Quarry consist of mineral extraction by drilling, blasting, and truck-loading, on-site transportation by truck, crushing, screening, and load-out.

Aggregate is transported off site by haul trucks, which access the site from Tennessee Road to the east. Information regarding project trip generation was obtained from representatives of Good's Quarry. Existing project truck trip generation is estimated to be 20 hourly loads (20 inbound and 20 outbound trips) between the site access and the processing area during the daytime hours of 7 a.m. to 5 p.m.

The current working face is in the south part of the existing north mining area, at an existing elevation of 575 feet above mean sea level (ASL). Mining at the working face is effected by drilling and blasting. A front-end loader loads material onto off-road trucks. Trucks transport the material to the processing plant, which is located in the center-west portion of the existing north mining area.

Up to four hourly round-trips by one in-mine truck occur occasionally for the purpose of transporting previously mined material deposited at the south mining area (former Johnson Quarry) to the active processing plant.

Current hours of mining, processing, and loadout are 7 a.m. to 5 p.m. Monday to Friday, as stipulated by Condition 23 of the Lewis County Hearing Examiner's Decision dated May 18, 2021. Blasting is limited to the hours of 10 a.m. to 4 p.m., Monday to Friday.

4.2 Permitted Quarry Expansion and Proposed Future Operations

The Hearing Examiner's Decision on the project Special-Use Permit allows for the expansion of the mine area between two preexisting surface-mine operations. There will not be an increase in intensity of the existing mining activity. The permitted expansion is intended to extend the life of the mine operation. The commercial sales area will continue to be located at its existing site within the existing Good's Quarry area.

The configuration of the topography to the north of the quarry will remain unchanged in future phases, as shown in Figures 3 and 5 of the Applicant's Reclamation Plan set.

The topography in the southerly direction will change with the excavation of mining areas M-1, M-2, and M-3 (refer to Figure 4 of the Reclamation Plan). Mineral extraction in each of the three areas will commence from the center (away from neighboring property lines) with stripping of overburden. The mining will then progress toward the periphery of each area, maintaining overburden stockpiles between the mining operations and property lines.

Existing berms up to 25 feet in height are located north and west of the existing quarry, at the west buffer zone of the permitted expansion, and at the east working face of the former Johnson Quarry. Eight-foot high topsoil-overburden berms have been constructed within the west and south buffer zones, west and south of Mining Area M-2. These berms, shown as green lines in Figure 2-1, will remain in place during future phases until reclamation. The berm east of the Johnson Quarry will be maintained during the expansion until the last phase, when the expansion reaches the southeast portion of the property. Conditions of the Hearing Examiner's Decision require that a 50-foot buffer be maintained at the perimeter of future mining areas and that a 25-foot strip within the buffer be planted with conifer and hardwood trees.

As part of the application for reconsideration, the Applicant requests that the hours of loadout be extended potentially to occur 24 hours per day, including weekends, as needed to meet project and client demands. The proposed volume of loadout operations is limited to 20 hourly truck loads during the daytime hours of 7 a.m. to 10 p.m. and 8 hourly truck loads during the nighttime hours of 10 p.m. to 7 a.m.

Proposed processing, including associated loading and hauling, would be restricted to WAC 173-60 daytime hours (7 am to 10 pm), including the option to process on weekends during those hours.

Mining at the working face and drilling for blasting would continue to be limited to the hours of 7 a.m. to 5 p.m. Monday to Friday, as required by the 2021 Special-Use Permit (SUP).

Blasting would continue to occur between 10 am and 4 pm Monday to Friday, as required by the 2021 SUP and Lewis County Code.

4.3 Equipment Sound Emissions

Reference sound levels for mining, processing, and loadout equipment were obtained from the Coffman Engineers database.

The source sound levels normalized to a reference distance of 50 feet are shown in Table 4-1.

TABLE 4-1
REFERENCE SOUND LEVELS OF PROJECT EQUIPMENT

Source	Leq at 50 Feet, dBA[4]
Rock Drill[2]	84
Caterpillar 966 Front-end Loader	78
Off-highway truck[3]	78
Highway truck[3]	78
Jaw crusher[1]	86
Cone crusher and Screen[1]	86

Notes

[1]Measured at Mountain Stone Aggregate; Roy, WA

[2]Measured at Knife River Farmington Road (formerly Baker Rock); Oregon

[3]Measured at Cadman High Rock; Monroe, WA

[4]These sound levels occur on the project site and are listed strictly for the purpose of characterizing the equipment sound emissions. Sound levels expected at neighboring properties are presented in Tables 5-3 and 6-2.

5. CALCULATED SOUND LEVELS AND EVALUATION

5.1 Methodology and Sound-Modeling Scenarios

The sound-level calculations were performed using the CadnaA program, which is based on International Standard ISO 9613 for the prediction of environmental noise. The model takes into account the sound power level, directivity, location, and height of the noise sources, distance, ground cover and topography between the noise source and receiver, atmospheric conditions, and location and height of the receiver.

Seven noise-modeling scenarios were selected for analysis in order to represent existing conditions, permitted expansion of mining, processing, and truck haul operations, and proposed nighttime loadout operations.

Table 5-1 lists the modeled scenarios and assumptions regarding topographical features and location of equipment during existing, future permitted, and proposed future activities.

TABLE 5-1
NOISE MODELING SCENARIOS FOR EXISTING AND FUTURE OPERATIONS
WITHOUT ADDITIONAL NOISE MITIGATION

Variant	Topographical Conditions	Scenario Description	Sound Source Locations
06	**Existing operations including in-mine transportation between Johnson and Tennessee Rd. Pits: Daytime only**		
	Current pit floor at existing elevation (460'')	Mining at existing south working face at elevation 574'	Rock drill, loader
	Area M-1 at existing elevations (462' to 620') Area M-2 at existing elevations (504' to 684') Area M-3 at existing elevations (460' to 518')	In-mine transportation, daytime only	Two off-highway trucks making 4 hourly roundtrips @ 12 mph between Johnson Pit and processing plant
	Existing berms and stockpiles at existing mine and Johnson Quarry	Aggregate processing at existing location at elevation 462'	Jaw crusher, cone crusher, screen
	8' high berms at west and south boundaries of Area M-2	Load-out of aggregate	20 daytime hourly roundtrips by road trucks from processing area to exit at 12 mph
72	**Beginning of mining center of area M-1**		
	Area M-1 at existing elevations (462' to 620') Area M-2 at existing elevations (504' to 684')	Mining at center of Area M-1 at existing elevation 598', daytime only	Rock drill, loader
	Area M-3 at existing elevations (460' to 518')	In-mine transportation, daytime only	Two off-highway trucks making 4 hourly roundtrips @ 12 mph between working face and processing plant
	Existing berms and stockpiles at existing mine and Johnson Quarry. 8' high berms at west and south boundaries of Area M-2	Aggregate processing at existing location at elevation 462', daytime only	Jaw crusher, cone crusher, screen
	50-foot perimeter buffers including 25-foot planting strips at future mining areas	Load-out of aggregate	20 daytime/8 nighttime hourly road-truck loads between processing and exit at 12 mph
82	**Completion of mining Area M-1**		
	Area M-1 at final elevations (462' to 530') Area M-2 at final elevations (470' to 530')	Mining at east end of Area M-1 at elevation 470', daytime only	Rock drill, loader
	Area M-3 at final elevations (460' to 490')	In-mine transportation, daytime only	Two off-highway trucks making 4 hourly roundtrips @ 12 mph between working face and processing plant
	Existing berms and stockpiles at existing mine 8' high berms at west and south boundaries of Area M-2	Aggregate processing at existing location at elevation 462', daytime only	Jaw crusher, cone crusher, screen
	50-foot perimeter buffers including 25-foot planting strips at future mining areas	Load-out of aggregate	20 daytime/8 nighttime hourly road-truck loads between processing and exit at 12 mph
73	**Beginning of mining center of area M-2**		

TABLE 5-1
NOISE MODELING SCENARIOS FOR EXISTING AND FUTURE OPERATIONS
WITHOUT ADDITIONAL NOISE MITIGATION

Variant	Topographical Conditions	Scenario Description	Sound Source Locations
	Area M-1 at existing elevations (462' to 620') Area M-2 at existing elevations (504' to 684')	Mining at center of Area M-2 at existing elevation 602', daytime only	Rock drill, loader
	Area M-3 at existing elevations (460' to 518')	In-mine transportation, daytime only	Two off-highway trucks making 4 hourly roundtrips @ 12 mph between working face and processing plant
	Existing berms and stockpiles at existing mine and Johnson Quarry 8' high berms at west and south boundaries of Area M-2	Aggregate processing at existing location at elevation 462', daytime only	Jaw crusher, cone crusher, screen
	50-foot perimeter buffers including 25-foot planting strips at future mining areas	Load-out of aggregate	20 daytime/8 nighttime hourly road-truck loads between processing and exit at 12 mph
83	**Completion of mining area M-2**		
	Area M-1 at final elevations (462' to 530') Area M-2 at final elevations (470' to 530')	Mining at west end of Area M-2 at final elevation of 605', daytime only	Rock drill, loader
	Area M-3 at final elevations (460' to 490')	In-mine transportation, daytime only	Two off-highway trucks making 4 hourly roundtrips @ 12 mph between working face and processing plant
	Existing berms and stockpiles at existing mine 8' high berms at west and south boundaries of Area M-2	Aggregate processing at existing location at elevation 462', daytime only	Jaw crusher, cone crusher, screen
	50-foot perimeter buffers including 25-foot planting strips at future mining areas	Load-out of aggregate	20 daytime/8 nighttime hourly road-truck loads between processing and exit at 12 mph
74	**Beginning of mining center of area M-3**		
	Area M-1 at existing elevations (462' to 620') Area M-2 at existing elevations (504' to 684')' Area M-3 at existing elevations (460' to 518)	Mining at center of Area M-3 at elevation 488', daytime only	Rock drill, loader
		In-mine transportation, daytime only	Two off-highway trucks making 4 hourly roundtrips @ 12 mph between working face and processing plant
	Existing berms and stockpiles at existing mine and Johnson Quarry 8' high berms at west and south boundaries of Area M-2	Aggregate processing at existing location at elevation 462', daytime only	Jaw crusher, cone crusher, screen
	50-foot perimeter buffers including 25-foot planting strips at future mining areas	Load-out of aggregate	20 daytime/8 nighttime hourly road-truck loads between processing and exit at 12 mph

TABLE 5-1
NOISE MODELING SCENARIOS FOR EXISTING AND FUTURE OPERATIONS
WITHOUT ADDITIONAL NOISE MITIGATION

Variant	Topographical Conditions	Scenario Description	Sound Source Locations
75	**Completion of mining Area M-3**		
	Area M-1 at final elevations (462' to 530') Area M-2 at final elevations (470' to 530')	Mining at east end of Area M-3 at elevation 458', daytime only	Rock drill, loader
	Area M-3 at final elevations (460' to 490')	In-mine transportation, daytime only	Two off-highway trucks making 4 hourly roundtrips @ 12 mph between working face and processing plant
	Existing berms and stockpiles at existing mine 8' high berms at west and south boundaries of Area M-2 8' high berms at north and east boundaries of Area M-3 (Reclamation Plan Figures 4, 5)	Aggregate processing at existing location at elevation 462', daytime only	Jaw crusher, cone crusher, screen
	50-foot perimeter buffers including 25-foot planting strips at future mining areas	Load-out of aggregate	20 daytime/8 nighttime hourly road-truck loads between processing and exit at 12 mph

5.2 Sound Analysis Locations

Nine locations were selected for analysis of project sound levels and are shown in Figure 2-1 as Sound Analysis Locations (AL) 1 to 9. Descriptions of the locations are shown in Table 5-2.

TABLE 5-2
DESCRIPTION OF SOUND ANALYSIS LOCATIONS

AL #	Description
1	South property line of parcel 014998002000
2	Southwest corner of parcel 014989002000
3	North property line of parcel 014998006000
4	West property line of parcel 015004004002
5	East property line of parcel 015001002000
6	West property line of Parcel 015006004012
7	South property line of Parcel 014991002000
8	North property line of Parcel 015004004004
9	North Property line of Parcel 015184007000

5.3 Calculated Sound Levels

Sound levels calculations from the operations listed in Table 5-1 were conducted for the nine Sound Analysis Locations listed in Section 5.2 and illustrated in Figure 2-1. The resulting calculated sound levels are shown in Table 5-3. The calculated sound levels are strictly attributable to activities at the Good's Quarry and do not include contributions from extraneous sources, such as traffic on public roads or aircraft flyovers. The table also shows applicable Lewis County noise limits.

TABLE 5-3
CALCULATED SOUND LEVELS (Leq, dBA)
CURRENT AND FUTURE MINING OPERATIONS
WITHOUT NOISE MITIGATION

Var.	Scenario Description	Sound Levels at Analysis Locations								
		1	2	3	4	5	6	7	8	9
06	**Existing operations including in-mine transportation between pits: daytime only**	**42**	**49**	**42**	**59**	**48**	**46**	**53**	**54**	**43**
	Mining at south working face at existing elevation	36	44	38	48	45	39	39	42	40
	In-mine transportation between pits, daytime only	26	37	30	58	34	43	30	36	35
	Aggregate processing at current location	37	38	34	39	43	36	40	43	34
	20 hourly road-truck loads at 12 mph between processing and exit	37	45	37	48	37	40	53	53	35
72	**Beginning of mining center of area M-1: day**	**41**	**48**	**42**	**53**	**51**	**46**	**53**	**54**	**45**
	Beginning of mining center of area M-1: night	**33**	**41**	**33**	**44**	**31**	**36**	**49**	**49**	**31**
	Mining at center of Area M-1, daytime only	33	43	38	51	50	43	39	43	44
	In-mine transportation, daytime only	25	32	27	39	35	29	27	30	30
	Aggregate processing at current location, daytime only	37	38	34	39	43	36	40	43	34
	20 daytime/8 nighttime hourly road truck loads at 12 mph between processing and exit	37/33	45/41	37/33	48/44	35/31	40/36	53/49	53/49	35/31
82	**Completion of mining Area M-1: day**	**41**	**48**	**42**	**59**	**48**	**44**	**53**	**54**	**44**
	Completion of mining Area M-1: night	**33**	**41**	**33**	**44**	**33**	**36**	**49**	**49**	**31**
	Mining at east end of area M-1, daytime only	36	44	39	57	44	29	27	31	43
	In-mine transportation, daytime only	25	32	27	45	32	28	26	30	30
	Aggregate processing at current location, daytime only	37	38	34	51	44	42	40	43	32
	20 daytime/8 nighttime hourly road truck loads at 12 mph between processing and exit	37/33	45/41	37/33	48/44	37/33	40/36	53/49	53/49	35/31
73	**Beginning of mining center of area M-2: day**	**41**	**47**	**41**	**52**	**55**	**46**	**53**	**54**	**54**
	Beginning of mining center of area M-2: night	**33**	**41**	**33**	**44**	**31**	**36**	**49**	**49**	**31**
	Mining at center of area M-2, daytime only	29	38	35	47	54	43	38	42	54
	In-mine transportation, daytime only	27	35	30	47	43	37	32	36	40
	Aggregate processing at current location, daytime only	37	38	34	39	43	36	40	43	34

TABLE 5-3
CALCULATED SOUND LEVELS (Leq, dBA)
CURRENT AND FUTURE MINING OPERATIONS
WITHOUT NOISE MITIGATION

Var.	Scenario Description	Sound Levels at Analysis Locations								
		1	2	3	4	5	6	7	8	9
	20 daytime/8 nighttime hourly road truck loads at 12 mph between processing and exit	37/33	45/41	37/33	48/44	35/31	40/36	53/49	53/49	35/31
83	**Completion of mining area M-2: day**	**40**	**47**	**41**	**54**	**56**	**47**	**53**	**54**	**51**
	Completion of mining area M-2: night	**33**	**41**	**33**	**44**	**33**	**36**	**49**	**49**	**31**
	Mining at west end of area M-2, daytime only	28	37	35	45	56	42	36	40	50
	In-mine transportation, daytime only	26	36	30	48	45	36	31	35	39
	Aggregate processing at current location, daytime only	37	38	34	51	44	42	40	43	32
	20 daytime/8 nighttime hourly road truck loads at 12 mph between processing and exit	37/33	45/41	37/33	48/44	37/33	40/36	53/49	53/49	35/31
74	**Beginning of mining center of area M-3: day**	**41**	**47**	**41**	**60**	**47**	**52**	**53**	**54**	**47**
	Beginning of mining center of area M-3: night	**33**	**41**	**33**	**44**	**31**	**36**	**49**	**49**	**31**
	Mining at center of area M-3, daytime only	34	40	36	55	44	52	38	44	47
	In-mine transportation, daytime only	25	37	29	58	34	38	29	34	34
	Aggregate processing at current location, daytime only	37	38	34	39	43	36	40	43	34
	20 daytime/8 nighttime hourly road truck loads at 12 mph between processing and exit	37/33	45/41	37/33	48/44	35/31	40/36	53/49	53/49	35/31
75	**Completion of mining Area M-3: day**	**41**	**47**	**41**	**55**	**47**	**54**	**53**	**54**	**46**
	Completion of mining Area M-3: night	**33**	**41**	**33**	**44**	**33**	**36**	**49**	**49**	**31**
	Mining at east end of Area M-3, daytime only	34	38	35	47	41	53	39	46	44
	In-mine transportation, daytime only	26	35	29	47	35	39	28	34	35
	Aggregate processing at current location, daytime only	37	38	34	51	44	42	40	43	32
	20 daytime/8 nighttime hourly road-truck loads at 12 mph between processing and exit	37/33	45/41	37/33	48/44	37/33	40/36	53/49	53/49	35/31
Lewis County daytime noise limits for Leq		60	60	60	60	60	60	60	60	60
Lewis County nighttime noise limit for Leq		50	50	50	50	50	50	50	50	50

Sound levels shown in Italics and underlined exceed applicable Lewis-County noise limits

5.4 Evaluation

Table 5-3 shows that calculated sound levels from existing operations at the Good's Quarry are in compliance with the Lewis County daytime noise limit of 60 dBA Leq at all Analysis Locations.

Calculated sound levels during processing, daytime loadout, and permitted mining of Areas M-1 and M-2 with associated in-mine transportation meet Lewis County daytime noise limits without additional noise mitigation and therefore comply with Condition 9 of the Hearing Examiner's Decision.

Calculated sound levels during the beginning of mining in Area M-3 of the permitted expansion without additional noise mitigation were found to exceed the daytime noise limit slightly at the properties to the east (south of Analysis Location 4). This exceedance is attributed to the combined effect of mining in Area M-3 and in-mine trucks transporting product from the area to the processing plant, passing near the east property line. Recommended sound mitigation measures for this condition are discussed in Section 6 of this Analysis.

Calculated sound levels from proposed future nighttime operations (loadout) without additional noise mitigation are expected to meet Lewis County nighttime noise limits at all Analysis Locations.

6. NOISE MITIGATION MEASURES

The existing Good's Quarry and permitted expansion incorporate noise-mitigation measures as follows:

- Existing berms up to 25 feet in height are located north and west of the existing quarry, at the west buffer zone of the permitted expansion, and at the east working face of the former Johnson Quarry.

- Eight-foot high topsoil-overburden berms have been constructed within the west and south buffer zones, west and south of Mining Area M-2. These berms will remain in place during future phases until reclamation.

- The berm east of the Johnson Quarry will be maintained during the expansion until the last phase, when the expansion reaches the southeast portion of the property.

- Conditions of the Hearing Examiner's Decision require that a 50-foot buffer be maintained at the perimeter of future mining areas and that a 25-foot strip within the buffer be planted with conifer and hardwood trees.

- There will not be an increase in intensity of the existing mining activity.

- Mining at the working face would continue to be limited to the hours of 7 a.m. to 5 p.m., Monday to Friday. Processing would be restricted to the hours of 7 a.m. to 10 p.m.

- The proposed volume of loadout operations is limited to 20 hourly truck loads during the daytime hours of 7 a.m. to 10 p.m. and 8 hourly truck loads during the nighttime hours of 10 p.m. to 7 a.m.

These measures were taken into account in the sound-level calculations of Section 5.

The evaluation of results discussed in Section 5.4 indicated that calculated sound levels from the beginning of mining in Area M-3 of the future permitted expansion are expected to exceed applicable noise limits at nearby residential receivers unless additional noise mitigation measures are implemented.

Prior to commencing mining in Area M-3, construct berms at the north boundary of Area M-3 and the east boundary of Area M-1. The height of the berms should be 15 feet.

The recommended berms are shown in Figure 6-1. In the figure, the berm outlines are shown in pink. The location of the berm at the north boundary of Area M-3 is consistent with the topsoil storage berm shown on Figures 4 and 5 of the approved Reclamation Figure Set for the expanded mine. The berm height of 15 feet is required to achieve the necessary noise-reduction performance. Other berm parameters, such as the berm width and side slopes, are dictated by structural and other non-acoustical imperatives and should be reviewed by qualified professionals. For the purpose of the acoustical calculations, the assumption is a berm with a 5-foot wide flat top and with sides sloped at maximum 1:2.

The noise-modeling scenario presented in Table 5-1 describing the beginning of mining in Area M-3 was modified to reflect the recommended noise mitigation. The modified noise-modeling scenario with mitigation is listed in Table 6-1.

The calculated sound levels at Analysis Locations during the beginning of mining in Area M-3 with noise mitigation in place are presented in Table 6-2.

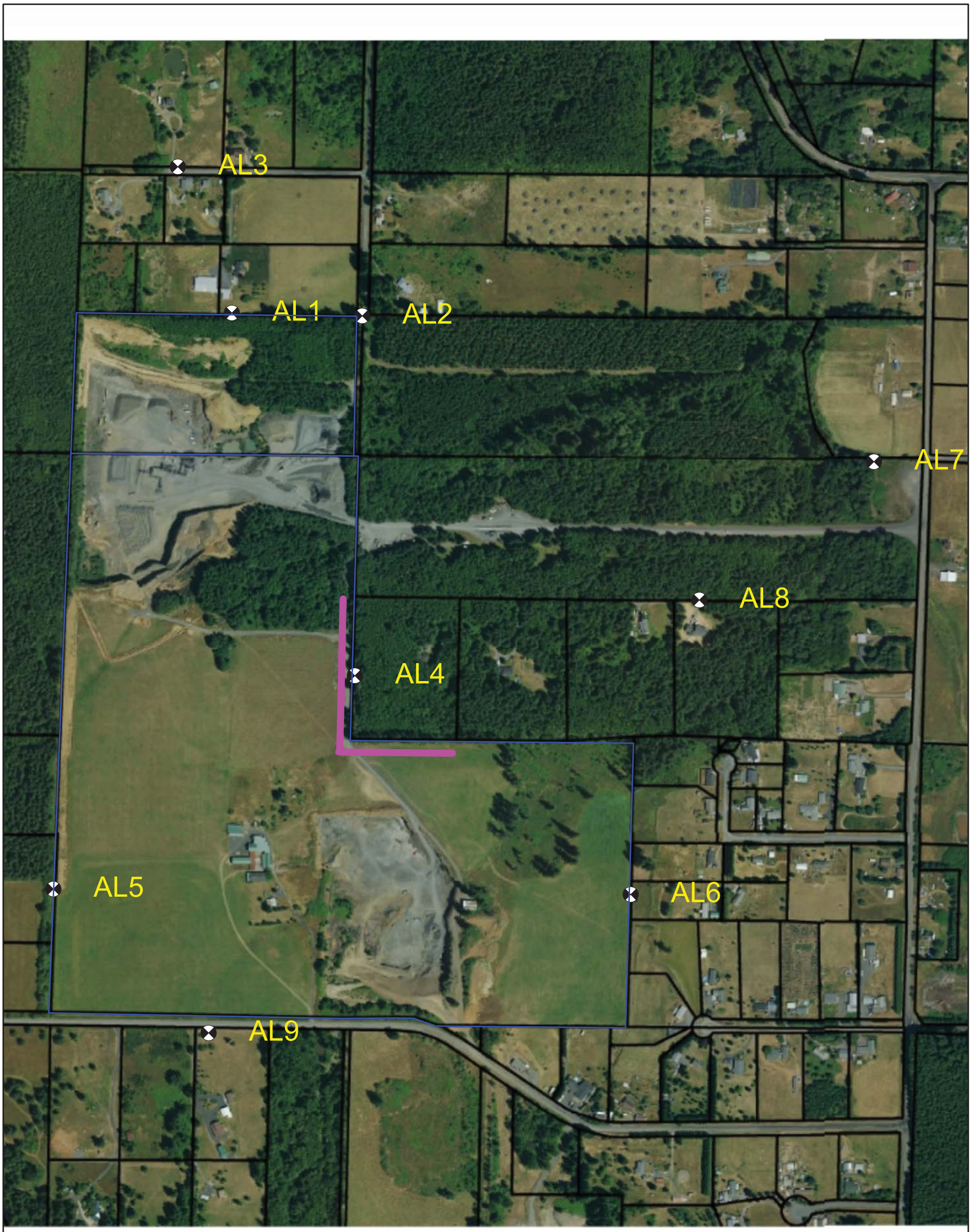

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Figure 6-1

Good's Quarry Sound Analysis

Recommended Sound Berm Locations

TABLE 6-1
NOISE MODELING SCENARIOS FOR FUTURE OPERATIONS
WITH RECOMMENDED NOISE MITIGATION

Variant	Topographical Conditions	Scenario Description	Sound Source Locations
94	**Beginning of mining Area M-3 with recommended noise mitigation**		
	Area M-1 at existing elevations (462' to 620') Area M-2 at existing elevations (504' to 684') Area M-3 at existing elevations (460' to 518)'	Mining at center of Area M-3 at elevation 488', daytime only	Rock drill, loader
	Existing berms and stockpiles at existing mine and Johnson Quarry 8' high berms at west and south boundaries of Area M-2 50-foot perimeter buffers including 25-foot planting strips at future mining areas	In-mine transportation, daytime only	Two off-highway trucks making 4 hourly roundtrips @ 12 mph between working face and processing plant
	Recommended berms: • 15' high east end of M-1	Aggregate processing at existing location at elevation 462'	Jaw crusher, cone crusher, screen
	• 15' high north end of M-3	Load-out of aggregate	20 daytime/8 nighttime hourly road-truck loads between processing and exit at 12 mph

TABLE 6-2
CALCULATED SOUND LEVELS (Leq, dBA)
FUTURE DAYTIME MINING OPERATIONS
WITH RECOMMENDED NOISE MITIGATION

Var.	Scenario Description	Sound Levels at Analysis Locations								
		1	2	3	4	5	6	7	8	9
94	**Beginning of mining Area M-3 with recommended noise mitigation: Day**	**41**	**47**	**41**	**54**	**47**	**52**	**53**	**54**	**47**
	Beginning of mining Area M-3 with recommended noise mitigation: Night	**33**	**41**	**33**	**44**	**31**	**36**	**49**	**49**	**31**
	Mining at center of Area M-3, daytime only	31	39	36	51	44	52	38	44	47
	In-mine transportation, daytime only	25	37	29	49	34	37	28	34	34
	Aggregate processing at current location, daytime only	37	38	34	36	43	35	40	43	34
	20 daytime/8 nighttime hourly road-truck loads between processing and exit	37/33	45/41	37/33	48/44	35/31	40/36	53/49	53/49	35/31
Lewis County daytime noise limits for Leq		60	60	60	60	60	60	60	60	60
Lewis County nighttime noise limit for Leq		50	50	50	50	50	50	50	50	50

The results of Table 6-2 show that, with the recommended noise mitigation measures in place, calculated sound levels due to future permitted and proposed operations meet Lewis County daytime and nighttime noise limits at all sound-analysis locations.

7. SUMMARY AND CONCLUSIONS

The findings of the Sound Analysis are summarized as follows:

- Calculated sound levels from existing Good's Quarry operations are in compliance with Lewis County daytime noise limits at all Analysis Locations in the vicinity of the project site.

- Calculated sound levels during processing, daytime loadout, and permitted mining of Areas M-1 and M-2 with associated in-mine transportation meet Lewis County daytime noise limits without additional noise mitigation and therefore comply with Condition 9 of the Hearing Examiner's Decision.

- Calculated sound levels during the beginning of mining in Area M-3 of the permitted expansion without additional noise mitigation exceed the daytime noise limit slightly at the properties north of Area M-3 (east of Area M-1) due to the combination of mining in Area M-3 and in-mine truck transportation from Area M-3 to the processing plant.

- Calculated sound levels from proposed future nighttime operations (loadout) without additional noise mitigation are expected to meet Lewis County nighttime noise limits at all Analysis Locations.

- The project includes noise mitigation measures such as existing berms located north and west of the existing quarry, at the west buffer zone of the permitted expansion, within the west and south buffer zones, and at the east working face of the former Johnson Quarry. Conditions of the Hearing Examiner's Decision require that a 50-foot buffer be maintained at the perimeter of future mining areas and that a 25-foot strip within the buffer be planted with conifer and hardwood trees. There will not be an increase in intensity of the existing mining activity. Mining at the working face would continue to be limited to the hours of 7 a.m. to 5 p.m. weekdays, and processing would be limited to the hours of 7 a.m. to 10 p.m.

- Additional recommended noise mitigation consists of constructing additional sound berms north of Mining Area M-3 and east of Area M-1 during mining of Area M-3.

- With the recommended noise mitigation measures in place, calculated sound levels due to future permitted and proposed operations meet Lewis County daytime and nighttime noise limits at all sound-analysis locations.

--- End of Report Text ---