Lake Erie PIT Expansion
Noise Study

Prepared for:
Stephen Taylor
McLucas & Associates
P.O. Box 5352
Lacey, WA 98509

Prepared by:
ROBERT WOO – Principal Acoustical Consultant, INCE
ANGELICA NGUYEN – Associate Acoustical Consultant

ACOUSTICS GROUP, INC.
CONSULTANTS IN ACOUSTICS, NOISE & VIBRATION
(877) 595-9988

TABLE OF CONTENTS

EXECUTIVE SUMMARY 1
INTRODUCTION 2
NOISE 2
NOISE STANDARDS 3
NOISE SENSITIVE RECEIVERS 4
NOISE ANALYSIS 4
Existing Operations 5
Future Operations 5
IMPACT ASSESSMENT 6
NOISE CONTROL RECOMMENDATIONS 7
CONCLUSION 9
REFERENCES 10
APPENDIX 11

Figures

Figure 1. Location of the Lake Erie PIT Expansion Site and Vicinity Map 2
Figure 2. Typical A-weighted Noise Levels 3

Tables

Table 1. State of Washington Exterior Noise Standards 4
Table 2. Summary of Noise Sensitive Receiver Location 4
Table 3. Acoustical Source Data 5
Table 4. Existing and Future Mining Operations Noise Levels 6
Table 5. Summary of Future Operations Noise Impact Assessment 7
Table 6. Summary of Operations Noise Impact Assessment with Noise Control 8

EXECUTIVE SUMMARY

Acoustics Group, Inc., (AGI) was retained to conduct a noise study of the existing and future Lake Erie PIT Expansion operations located at 13540 Rosario Rd in Anacortes, WA. AGI has reviewed the State of Washington Noise Standards, analyzed the noise levels from future noise sources around the site, assessed the impact of the future noise to determine compliance with the Exterior Noise Standards, and recommended noise control measures.

Lake Erie PIT currently performs mining operations at their site. The existing operation involves mining equipment and trucking operations, loading/unloading, and employee parking. Current Lake Erie PIT operations are at Parcels P19108, P19162, and P19165. Future operations will involve expansion into Parcels P19155, P19158, P90028, P19161, and P19164. The future Lake Erie PIT Expansion operations would produce noise levels as high as 60.1, 63.5, 55.5, 52.5, 51.7, 55.7, 57.7, 69.8, 65.8, 64.3, 53.8, and 43.8 at noise sensitive receivers R1 through R12, respectively. Future operations would exceed the State of Washington's residential noise standards at noise sensitive receivers R1, R2, R8, R9, and R10. Noise control recommendations have been identified to reduce operations noise below the State of Washington's Noise Standards.

This report has been organized into multiple sections for ease of reference. Section 1 introduces the Project and provides a general discussion on the Project Components. Section 2 discusses Noise Fundamentals, and Section 3 presents the Noise Standards. Section 4 discusses the Noise Analysis and Section 5 discusses the Impact Assessment. Section 6 presents the Noise Control Measures. Section 7 discusses the Conclusion.

INTRODUCTION

Lake Erie PIT Expansion proposes continued and expanded mining operations at their facility at 13540 Rosario Rd in Anacortes, WA. Current Lake Erie PIT operations are at Parcels P19108, P19162, and P19165. Future operations will involve Parcels P19155, P19158, P90028, P19161, and P19164. Lake Erie PIT Expansion will operate from 7:30 AM to 5:30 PM Monday through Saturday. Refer to Figure 1 for the general location of the Lake Erie PIT Expansion Site and Vicinity Map. Land uses immediately surrounding the site are residential. The main noise concern is facility operations affecting neighboring properties. Noise sensitive receivers R1 through R12 were identified as the nearest residential receivers to the project site. Refer to the Appendix for the Project Drawings.

Figure 1. Location of the Lake Erie PIT Expansion Site and Vicinity Map

NOISE

The magnitude by which noise affects its surrounding environment is measured on a logarithmic scale in decibels (dB). Because the human ear is limited to hearing a specific range of frequencies, the A-weighted filter system is used to form relevant results. A-weighted sound levels are represented as dBA. Figure 2 shows typical A-weighted exterior and interior noise levels that occur in human environments.

Several noise metrics have been developed to evaluate noise. L_{eq} is the energy average noise level and corresponds to a steady-state sound level that has the same acoustical energy as the sum of all the time varying noise events. L_{max} is the maximum noise level measured during a sampling period, and L_{xx} are the statistical noise levels that are exceeded xx-% of the time of the measurement. L_{50} is the average noise level that is exceeded 50% of the time, 30 minutes in a 60 minute period.

Common Outdoor Activities	Noise Level dBA	Common Indoor Activities
	--- 110 ---	Rock Band
Jet Fly-over at 300 m (1000 ft)		
	--- 100 ---	
Gas Lawn Mower at 1 m (3 ft)		
	--- 90 ---	
Diesel Truck at 15 m (50 ft),		Food Blender at 1 m (3 ft)
at 80 km/hr (50 mph)	--- 80 ---	Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime		
Gas Lawn Mower at 30 m (100 ft)	--- 70 ---	Vacuum Cleaner at 3 m (10 ft)
Commercial Area		Normal Speech at 1 m (3 ft)
Heavy Traffic at 90 m (300 ft)	--- 60 ---	
		Large Business Office
Quiet Urban Daytime	--- 50 ---	Dishwasher Next Room
Quiet Urban Nighttime	--- 40 ---	Theater, Large Conference Room
Quiet Suburban Nighttime		(Background)
	--- 30 ---	Library
Quiet Rural Nighttime		Bedroom at Night, Concert Hall
	--- 20 ---	(Background)
		Broadcast/Recording Studio
	--- 10 ---	
Lowest Threshold of Human Hearing	--- 0 ---	Lowest Threshold of Human Hearing

Source: TNS, 1998

Figure 2. Typical A-weighted Noise Levels

NOISE STANDARDS

The City of Anacortes Municipal Code has adopted the State of Washington regulations for the purpose of protecting citizens from potential hearing damage and from various other adverse physiological, psychological, and social effects associated with noise. The State of Washington Administrative Code Chapter 173-60 limits noise levels from industrial land uses to 60 dBA at residential receiving land uses. Table 1 summarizes the State of Washington Exterior Noise Standards. Refer to the Appendix for the noise standards.

Table 1. State of Washington Exterior Noise Standards

Noise Source Land Use Category	Receiving Property		
	Residential	Commercial	Industrial
Residential	55 dBA	57 dBA	60 dBA
Commercial	57 dBA	60 dBA	65 dBA
Industrial	60 dBA	65 dBA	70 dBA

NOISE SENSITIVE RECEIVERS

Land uses immediately surrounding the site are residential. The main noise concern is facility operations affecting neighboring properties. Noise sensitive receivers R1 through R12 were identified as the nearest residential receivers to the project site. Refer to Figure 1 for the location of the noise sensitive receivers. Refer to Table 2 for a description of the noise sensitive receivers relative to the site.

Table 2. Summary of Noise Sensitive Receiver Location

Noise Sensitive Receiver	Land Use	Location
R1	Residential	West of Parcel P19158
R2	Residential	West of Parcel P19158
R3	Residential	West of Parcel P19155
R4	Residential	West of Parcel P19108
R5	Residential	North West of Parcel P19108
R6	Residential	North of Parcel P19108
R7	Residential	North of Parcel P19161
R8	Residential	East of Parcel P19161
R9	Residential	East of Parcel P19164
R10	Residential	East of Parcel P19164
R11	Residential	South East of Parcel P19164
R12	Residential	South of Parcel P19164

NOISE ANALYSIS

The future noise generated from Lake Erie PIT Expansion's mining operations has the potential to impact nearby residential properties. The methodology used to analyze and predict operations noise from Lake Erie PIT Expansion involved the use of the CadnaA computer noise model. CadnaA can simulate the physical environment by factoring in x, y, and z geometrics of a particular site to simulate the buildings, obstacles, and typography. The model uses industry recognized algorithms (ISO 9613) to perform

acoustical analyses. The noise generated by future operations was calculated by inputting acoustical sources at the project site. AGI's industry acoustical database was used for the modeling inputs. Refer to Table 3 for the acoustical source data used in the analysis.

Table 3. Acoustical Source Data

Description	Distance, ft	Leq, dBA
Loader (CAT 980C, JD 844, CAT 980B)	50	76.0
Screen (Power Screen-Chiefton)	50	85.6
Excavator (Hitachi EX31) Beaker	50	89.1
Excavator (Hitachi EX31) Loader	50	54.4
Dump Truck (Kenworth W900)	50	80.6

Source: Acoustics Group, Inc. Data Base and Washington Basalt Rock Quarry Field Data

Existing Operations

Lake Erie PIT Expansion's existing operations were modeled with all mining machinery and trucking operations operating simultaneously and continuously over a one hour period at the existing parcels (P19108, P19162, and P19165). The hourly Leq from existing facility operations is estimated to be as high as 39.2, 41.4, 45.1, 47.9, 46.4, 58.3, 57.5, 58.7, 51.7, 50.1, 42.3, and 37.9 dBA at R1 through R12, respectively. Refer to Table 4 for a list of the predicted existing operations noise levels.

Future Operations

Lake Erie PIT Expansion's future operations were modeled at each of the new parcels (P19155, P19158/P90028, P19161, and P19164) to determine worst case operations. Parcels P19158 and P90028 were modeled together due to the layout and proximity to each other. Machinery and trucking operations are all assumed to be operating simultaneously and continuously over a one hour period at each new parcel. Rock crushing and screening operations were also modeled simultaneously at the processing area. The hourly Leq from future facility operations is estimated to be as high as 60.1, 63.5, 55.5, 52.5, 51.7, 55.7, 57.7, 69.8, 65.8, 64.3, 53.8, and 43.8 dBA at R1 through R12, respectively. Refer to Table 4 for the predicted future operations noise levels.

Table 4. Existing and Future Mining Operations Noise Levels

Noise Sensitive Receiver	Existing Operations Noise Level, dBA	Future Operations Noise Level, dBA
R1	39.2	60.1
R2	41.4	63.5
R3	45.1	55.5
R4	47.9	52.5
R5	46.4	51.7
R6	58.3	55.7
R7	57.5	57.7
R8	58.7	69.8
R9	51.7	65.8
R10	50.1	64.3
R11	42.3	53.8
R12	37.9	43.8

IMPACT ASSESSMENT

The peak hour noise level from future operations will be as high as 60.1, 63.5, 55.5, 52.5, 51.7, 55.7, 57.7, 69.8, 65.8, 64.3, 53.8, and 43.8 dBA at R1 through R12, respectively. The future operations noise levels at noise sensitive receivers R1, R2, R8, R9 and R10 would exceed the residential exterior noise standards of 60 dBA. The future operations noise levels at R3 through R7, R11, and R12 would comply with the exterior noise standard of 60 dBA. Noise control measures are required to reduce operations noise levels to comply with the exterior noise standards. Refer to Table 5 for a summary of the future Lake Erie PIT Expansion noise levels and impact assessment.

Table 5. Summary of Future Operations Noise Impact Assessment

Noise Sensitive Receiver	Future Operations Noise Level, dBA	Washington Noise Standard, dBA	Increase above Standard, dB	Impact Assessment
R1	60.1	60	0.1	Exceedance
R2	63.5	60	3.5	Exceedance
R3	55.5	60	-	Compliance
R4	52.5	60	-	Compliance
R5	51.7	60	-	Compliance
R6	55.7	60	-	Compliance
R7	57.7	60	-	Compliance
R8	69.8	60	9.8	Exceedance
R9	65.8	60	5.8	Exceedance
R10	64.3	60	4.3	Exceedance
R11	53.8	60	-	Compliance
R12	43.8	60	-	Compliance

NOISE CONTROL RECOMMENDATIONS

The following noise control measures are recommended in order to comply with the State of Washington's noise standards:

1. A 100-ft setback from Rosario Road and all property lines shall be maintained.
2. Parcel P19108 shall not be mined.
3. When mining Parcel P19158 and Parcel 90028, a 14-ft high earthen Berm or noise barrier should be installed to shield the excavation site on the western side of the site to minimize excavation noise.
4. When mining Parcel P19161, a 16-ft high earthen Berm or noise barrier should be installed to shield the excavation equipment on the northern and eastern side of the parcel.
5. When mining Parcel P19164, a 12-foot high earthen berm or noise barrier should be installed to shield the excavation equipment at the northern and eastern side of the site.
6. All barrier heights are relative to the equipment excavation site grade elevation.
7. Rock Crushing and Screening operations should be performed solely at the processing area.

Upon implementation of the noise control recommendations, the future noise levels from operations will be reduced to 56.4, 58.7, 55.5, 52.5, 51.7, 53.8, 55.0, 59.0, 58.1, 55.8, 53.1, and 43.8 dBA at R1 through R12, respectively. The future Lake Erie PIT Expansion operations noise levels with noise control would be reduced to below 60 dBA and would comply with the State of Washington's noise standards for industrial land uses affecting residential land uses. However, compliance with the Noise Standards would not reduce the operations noise to inaudible levels. Refer to Table 6 for a summary of the future Lake Erie PIT Expansion with noise control noise levels and impact assessment.

Table 6. Summary of Operations Noise Impact Assessment with Noise Control

Noise Sensitive Receiver	Future Noise Level with Noise Control, dBA	Washington Standard, dBA	Increase above Standard, dB	Impact Assessment
R1	56.4	60	-	Compliance
R2	58.7	60	-	Compliance
R3	55.5	60	-	Compliance
R4	52.5	60	-	Compliance
R5	51.7	60	-	Compliance
R6	53.8	60	-	Compliance
R7	55.0	60	-	Compliance
R8	59.0	60	-	Compliance
R9	58.1	60	-	Compliance
R10	55.8	60	-	Compliance
R11	53.1	60	-	Compliance
R12	43.8	60	-	Compliance

CONCLUSION

AGI has conducted a noise study of the Lake Erie PIT Expansion Project in Anacortes, WA. Lake Erie PIT Expansion's Site Plan has been reviewed, noise levels analyzed and an impact assessment performed to determine compliance with the State of Washington Noise Standards.

Lake Erie PIT Expansion proposes continued and expanded mining operations at their site. Current Lake Erie PIT operations are at Parcels P19108, P19162, and P19165. Future operations will involve mining and trucking operations at Parcels P19155, P19158, P90028, P19161, and P19164. Noise from future operations would produce noise levels as high as 60.1, 63.5, 55.5, 52.5, 51.7, 55.7, 57.7, 69.8, 65.8, 64.3, 53.8, and 43.8 dBA at R1 through R12, respectively Future operations would not comply with the State of Washington's residential noise standards. Noise control measures are recommended herein for compliance with the Noise Standards. Upon implementation of the noise control recommendations, the future noise levels from operations will be reduced to below 60 dBA. The final engineering design should be reviewed by a qualified acoustical consultant to ensure compliance with the noise standards.

REFERENCES

1. Bid Specifications dated July 13, 2016.
2. State of Washington Noise Standards.
3. Washington Basalt Rock Quarry Field Data.

APPENDIX

STATE OF WASHINGTON EXTERIOR NOISE STANDARDS

MODELING INPUT & OUTPUT

PROJECT DRAWINGS

STATE OF WASHINGTON NOISE STANDARDS

ATTACHMENT D

LAKE ERIE PIT EXPANSION
NOISE STUDY

ACOUSTICS GROUP, INC.

Chapter 173-60 WAC

MAXIMUM ENVIRONMENTAL NOISE LEVELS

Chapter Listing

WAC Sections

173-60-010	Authority and purpose.
173-60-020	Definitions.
173-60-030	Identification of environments.
173-60-040	Maximum permissible environmental noise levels.
173-60-050	Exemptions.
173-60-060	Nuisance regulations not prohibited.
173-60-070	Reserved.
173-60-080	Variances and implementation schedules.
173-60-090	Enforcement policy.
173-60-100	Appeals.
173-60-110	Cooperation with local government.
173-60-120	Effective date.

173-60-010
Authority and purpose.

These rules are adopted pursuant to chapter 70.107 RCW, the Noise Control Act of 1974, in order to establish maximum noise levels permissible in identified environments, and thereby to provide use standards relating to the reception of noise within such environments. Vessels, as defined in RCW 88.12.010(21) and regulated for noise under chapter 88.12 RCW (Regulation of recreational vessels), shall be exempt from chapter 173-60 WAC.

[Statutory Authority: Chapter 70.107 RCW. WSR 94-12-001 (Order 92-41), § 173-60-010, filed 5/18/94, effective 6/18/94; Order 74-32, § 173-60-010, filed 4/22/75, effective 9/1/75.]

173-60-020
Definitions.

(1) "Background sound level" means the level of all sounds in a given environment, independent of the specific source being measured.

(2) "dBA" means the sound pressure level in decibels measured using the "A" weighting network on a sound level meter. The sound pressure level, in decibels, of a sound is 20 times the logarithm to the base 10 of the ratio of the pressure of the sound to a reference pressure of 20 micropascals.

(3) "Department" means the department of ecology.

(4) "Director" means the director of the department of ecology.

(5) "Distribution facilities" means any facility used for distribution of commodities to final consumers, including facilities of utilities that convey water, waste water, natural gas, and electricity.

(6) "EDNA" means the environmental designation for noise abatement, being an area or zone (environment) within which maximum permissible noise levels are established.

(7) "Existing" means a process, event, or activity in an established area, producing sound subject to or exempt from this chapter, prior to the effective date of September 1, 1975.

(8) "Local government" means county or city government or any combination of the two.

(9) "Noise" means the intensity, duration and character of sounds, from any and all sources.

(10) "Person" means any individual, corporation, partnership, association, governmental body, state agency or other entity whatsoever.

(11) "Property boundary" means the surveyed line at ground surface, which separates the real property owned, rented, or leased by one or more persons, from that owned, rented, or leased by one or more other persons, and its vertical extension.

(12) "Racing event" means any motor vehicle competition conducted under a permit issued by a governmental authority having jurisdiction or, if such permit is not required, then under the auspices of a recognized sanctioning body.

(13) "Receiving property" means real property within which the maximum permissible noise levels specified herein shall not be exceeded from sources outside such property.

(14) "Sound level meter" means a device which measures sound pressure levels and conforms to Type 1 or Type 2 as specified in the American National Standards Institute Specification S1.4-1971.

[Statutory Authority: Chapter **70.107** RCW. WSR 94-12-001 (Order 92-41), § 173-60-020, filed 5/18/94, effective 6/18/94; WSR 83-15-046 (Order DE 82-42), § 173-60-020, filed 7/19/83; Order DE 77-1, § 173-60-020, filed 6/1/77; Order 74-32, § 173-60-020, filed 4/22/75, effective 9/1/75.]

173-60-030
Identification of environments.

(1) Except when included within specific prior designations as provided in subsections (2), (3), and (4) of this section, the EDNA of any property shall be based on the following typical uses, taking into consideration the present, future, and historical usage, as well as the usage of adjacent and other lands in the vicinity.

(a) Class A EDNA - Lands where human beings reside and sleep. Typically, Class A EDNA will be the following types of property used for human habitation:

(i) Residential

(ii) Multiple family living accommodations

(iii) Recreational and entertainment, (e.g., camps, parks, camping facilities, and resorts)

(iv) Community service, (e.g., orphanages, homes for the aged, hospitals, health and correctional facilities)

(b) Class B EDNA - Lands involving uses requiring protection against noise interference with speech. Typically, Class B EDNA will be the following types of property:

(i) Commercial living accommodations

(ii) Commercial dining establishments

(iii) Motor vehicle services

(iv) Retail services

(v) Banks and office buildings

(vi) Miscellaneous commercial services, property not used for human habitation

(vii) Recreation and entertainment, property not used for human habitation (e.g., theaters, stadiums, fairgrounds, and amusement parks)

(viii) Community services, property not used for human habitation (e.g., educational, religious, governmental, cultural and recreational facilities).

(c) Class C EDNA - Lands involving economic activities of such a nature that higher noise levels than experienced in other areas is normally to be anticipated. Persons working in these areas are normally covered by noise control regulations of the department of labor and industries. Uses typical of Class A EDNA are generally not permitted within such areas. Typically, Class C EDNA will be the following types of property:

(i) Storage, warehouse, and distribution facilities.

(ii) Industrial property used for the production and fabrication of durable and nondurable man-made goods

(iii) Agricultural and silvicultural property used for the production of crops, wood products, or livestock.

(d) Where there is neither a zoning ordinance in effect nor an adopted comprehensive plan, the legislative authority of local government may, by ordinance or resolution, designate specifically described EDNAs which conform to the above use criteria and, upon departmental approval, EDNAs so designated shall be as set forth in such local determination.

(e) Where no specific prior designation of EDNAs has been made, the appropriate EDNA for properties involved in any enforcement activity will be determined by the investigating official on the basis of the criteria of (a), (b), and (c) of this subsection.

(2) In areas covered by a local zoning ordinance, the legislative authority of the local government may, by ordinance or resolution designate EDNAs to conform with the zoning ordinance as follows:

(a) Residential zones - Class A EDNA

(b) Commercial zones - Class B EDNA

(c) Industrial zones - Class C EDNA

Upon approval by the department, EDNAs so designated shall be as set forth in such local determination. EDNA designations shall be amended as necessary to conform to zone changes under the zoning ordinance.

(3) In areas not covered by a local zoning ordinance but within the coverage of an adopted comprehensive plan the legislative authority of the local government may, by ordinance or resolution designate EDNAs to conform with the comprehensive plan as follows:

(a) Residential areas - Class A EDNA

(b) Commercial areas - Class B EDNA

(c) Industrial areas - Class C EDNA

Upon approval by the department EDNAs so designated shall be as set forth in such local determination. EDNA designations shall be amended as necessary to conform to changes in the comprehensive plan.

(4) The department recognizes that on certain lands, serenity, tranquillity, or quiet are an essential part of the quality of the environment and serve an important public need. Special designation of such lands with appropriate noise level standards by local government may be adopted subject to approval by the department. The director may make such special designation pursuant to the procedures of the Administrative Procedure Act, chapter **34.04** RCW.

[Order 74-32, § 173-60-030, filed 4/22/75, effective 9/1/75.]

173-60-040
Maximum permissible environmental noise levels.

(1) No person shall cause or permit noise to intrude into the property of another person which noise exceeds the maximum permissible noise levels set forth below in this section.

(2)(a) The noise limitations established are as set forth in the following table after any applicable adjustments provided for herein are applied.

EDNA OF	EDNA OF

NOISE SOURCE	RECEIVING PROPERTY		
	Class A	Class B	Class C
CLASS A	55 dBA	57 dBA	60 dBA
CLASS B	57	60	65
CLASS C	60	65	70

(b) Between the hours of 10:00 p.m. and 7:00 a.m. the noise limitations of the foregoing table shall be reduced by 10 dBA for receiving property within Class A EDNAs.

(c) At any hour of the day or night the applicable noise limitations in (a) and (b) above may be exceeded for any receiving property by no more than:

(i) 5 dBA for a total of 15 minutes in any one-hour period; or

(ii) 10 dBA for a total of 5 minutes in any one-hour period; or

(iii) 15 dBA for a total of 1.5 minutes in any one-hour period.

[Order 74-32, § 173-60-040, filed 4/22/75, effective 9/1/75.]

173-60-050
Exemptions.

(1) The following shall be exempt from the provisions of WAC **173-60-040** between the hours of 7:00 a.m. and 10:00 p.m.:

(a) Sounds originating from residential property relating to temporary projects for the maintenance or repair of homes, grounds and appurtenances.

(b) Sounds created by the discharge of firearms on authorized shooting ranges.

(c) Sounds created by blasting.

(d) Sounds created by aircraft engine testing and maintenance not related to flight operations: Provided, That aircraft testing and maintenance shall be conducted at remote sites whenever possible.

(e) Sounds created by the installation or repair of essential utility services.

(2) The following shall be exempt from the provisions of WAC **173-60-040** (2)(b):

(a) Noise from electrical substations and existing stationary equipment used in the conveyance of water, waste water, and natural gas by a utility.

(b) Noise from existing industrial installations which exceed the standards contained in these regulations and which, over the previous three years, have consistently operated in excess of 15 hours per day as a consequence of process necessity and/or demonstrated routine normal operation. Changes in working hours, which would affect exemptions under this regulation, require approval of the department.

(3) The following shall be exempt from the provisions of WAC **173-60-040**, except insofar as such provisions relate to the reception of noise within Class A EDNAs between the hours of 10:00 p.m. and 7:00 a.m.

(a) Sounds originating from temporary construction sites as a result of construction activity.

(b) Sounds originating from forest harvesting and silvicultural activity.

(4) The following shall be exempt from all provisions of WAC **173-60-040**:

(a) Sounds created by motor vehicles when regulated by chapter **173-62** WAC.

(b) Sounds originating from aircraft in flight and sounds that originate at airports which are directly related to flight operations.

(c) Sounds created by surface carriers engaged in interstate commerce by railroad.

(d) Sounds created by warning devices not operating continuously for more than five minutes, or bells, chimes, and carillons.

(e) Sounds created by safety and protective devices where noise suppression would defeat the intent of the device or is not economically feasible.

(f) Sounds created by emergency equipment and work necessary in the interests of law enforcement or for health safety or welfare of the community.

(g) Sounds originating from motor vehicle racing events at existing authorized facilities.

(h) Sounds originating from officially sanctioned parades and other public events.

(i) Sounds emitted from petroleum refinery boilers during startup of said boilers: Provided, That the startup operation is performed during daytime hours whenever possible.

(j) Sounds created by the discharge of firearms in the course of hunting.

(k) Sounds caused by natural phenomena and unamplified human voices.

(l) Sounds created by motor vehicles, licensed or unlicensed, when operated off public highways EXCEPT when such sounds are received in Class A EDNAs.

(m) Sounds originating from existing natural gas transmission and distribution facilities. However, in circumstances where such sounds impact EDNA Class A environments and complaints are received, the director or his designee may take action to abate by application of EDNA Class C source limits to the facility under the requirements of WAC 173-60-050(5).

(6) Nothing in these exemptions is intended to preclude the department from requiring installation of the best available noise abatement technology consistent with economic feasibility. The establishment of any such requirement shall be subject to the provisions of the Administrative Procedure Act, chapter **34.04** RCW.

[Statutory Authority: Chapter **70.107** RCW. WSR 94-12-001 (Order 92-41), § 173-60-050, filed 5/18/94, effective 6/18/94; WSR 83-15-046 (Order DE 82-42), § 173-60-050, filed 7/19/83; Order DE 77-1, § 173-60-050, filed 6/2/77; Order 75-18, § 173-60-050, filed 8/1/75; Order 74-32, § 173-60-050, filed 4/22/75, effective 9/1/75.]

173-60-060
Nuisance regulations not prohibited.

Nothing in this chapter or the exemptions provided herein, shall be construed as preventing local government from regulating noise from any source as a nuisance. Local resolutions, ordinances, rules or regulations regulating noise on such a basis shall not be deemed inconsistent with this chapter by the department.

[Order 74-32, § 173-60-060, filed 4/22/75, effective 9/1/75.]

173-60-070
Reserved.

Reserved.

[Statutory Authority: Chapter **70.107** RCW. WSR 00-24-134 (Order 00-24), § 173-60-070, filed 12/6/00, effective 1/6/01; WSR 94-12-001 (Order 92-41), § 173-60-070, filed 5/18/94, effective 6/18/94; Order DE 77-1, § 173-60-070, filed 6/1/77; Order 74-32, § 173-60-070, filed 4/22/75, effective 9/1/75.]

173-60-080
Variances and implementation schedules.

(1) Variances may be granted to any person from any particular requirement of this chapter, if findings are made that immediate compliance with such requirement cannot be achieved because of special circumstances rendering immediate compliance unreasonable in light of economic or physical factors, enroachment [encroachment] upon an existing noise source, or because of nonavailability of feasible technology or control methods. Any such variance or renewal thereof shall be granted only for the minimum time period found to be necessary under the facts and circumstances.

(2) An implementation schedule for achieving compliance with this chapter shall be incorporated into any variance issued.

(3) Variances shall be issued only upon application in writing and after providing such information as may be requested. No variance shall be issued for a period of more than 30 days except upon due notice to the public with opportunity to comment. Public hearings may be held, when substantial public interest is shown, at the discretion of the issuing agency.

(4) Sources of noise, subject to this chapter, upon which construction begins after the effective date hereof shall immediately comply with the requirements of this chapter, except in extraordinary circumstances where overriding considerations of public interest dictate the issuance of a variance.

[Order 74-32, § 173-60-080, filed 4/22/75, effective 9/1/75.]

173-60-090
Enforcement policy.

Noise measurement for the purposes of enforcing the provisions of WAC **173-060-040** shall be measured in dBA with a sound level meter with the point of measurement being at any point within the receiving property. Such enforcement shall be undertaken only upon receipt of a complaint made by a person who resides, owns property, or is employed in the area affected by the noise complained of, EXCEPT for parks, recreational areas, and wildlife sanctuaries. For enforcement purposes pursuant to RCW **70.107.050**, each day, defined as the 24-hour period beginning at 12:01 a.m., in which violation of the noise control regulations (chapter **173-60** WAC) occurs, shall constitute a separate violation.

[Order DE 76-5, § 173-60-090, filed 2/5/76; Order 74-32, § 173-60-090, filed 4/22/75, effective 9/1/75.]

173-60-100
Appeals.

Any person aggrieved by any decision of the department in relation to the enforcement of the maximum permissible noise levels provided for herein, the granting or denial of a variance or the approval or disapproval of a local resolution or ordinance for noise abatement and control may appeal to the pollution control hearings board pursuant to chapter **43.21B** RCW under the procedures of chapter **371-08** WAC.

[Order 74-32, § 173-60-100, filed 4/22/75, effective 9/1/75.]

173-60-110
Cooperation with local government.

(1) The department conceives the function of noise abatement and control to be primarily the role of local government and intends actively to encourage local government to adopt measures for noise abatement and control. Wherever such measures are made effective and are being actively enforced, the department does not intend to engage directly in enforcement activities.

(2) No ordinance or resolution of any local government which imposes noise control requirements differing from those adopted by the department shall be effective unless and until approved by the director. If approval is denied, the department, following submission of such local ordinance or resolution to the department, shall deliver its statement or order of denial, designating in detail the specific provision(s) found to be objectionable and the precise grounds upon which the denial is based, and shall submit to the local government, the department's suggested modification.

(3) The department shall encourage all local governments enforcing noise ordinances pursuant to this chapter to consider noise criteria and land use planning and zoning.

[Statutory Authority: Chapter **70.107** RCW. WSR 87-06-056 (Order 86-40), § 173-60-110, filed 3/4/87; Order 74-32, § 173-60-110, filed 4/22/75, effective 9/1/75.]

173-60-120
Effective date.

This chapter shall become effective on September 1, 1975. It is the intention of the department to periodically review the provisions hereof as new information becomes available for the purpose of making amendments as appropriate.

[Order 74-32, § 173-60-120, filed 4/22/75, effective 9/1/75.]

MODELING INPUT & OUTPUT

CadnaA Input Output
Project: McLaren & Associates - Lake Erie PIT Expansion
Case: Existing

Receiver

Name	M..	ID	Level Lr Day (dBA)	Night (dBA)	Limit. Value Day (dBA)	Night (dBA)	Land Use Type	Auto	Noise Type	Height (m)		Coordinates X (m)	Y (m)	Z (m)
R1			39.2	39.1	0	0		x	Total	1.5 r		328.67	478.15	97.29
R2			41.4	41.4	0	0		x	Total	1.5 r		368.7	607.92	102.78
R3			45.1	45.1	0	0		x	Total	1.5 r		632.11	860.75	101.35
R4			47.9	47.9	0	0		x	Total	1.5 r		670.92	902.8	97.85
R5			46.4	46.4	0	0		x	Total	1.5 r		668	932.95	95.34
R6			58.3	58.3	0	0		x	Total	1.5 r		912	1020.28	74.29
R7			57.5	57.5	0	0		x	Total	1.5 r		1066.42	1036.82	67.98
R8			58.7	58.7	0	0		x	Total	1.5 r		1157.04	758.73	71.22
R9			51.7	51.7	0	0		x	Total	1.5 r		1161.08	596.99	78.5
R10			50.1	50.1	0	0		x	Total	1.5 r		1157.85	544.42	80.12
R11			42.3	42.3	0	0		x	Total	1.5 r		1156.77	377.39	88.53
R12			37.9	37.9	0	0		x	Total	1.5 r		1034.05	206.67	117.32

Point Source

Name	M.	ID	Result. PWL Day (dBA)	Evening (dBA)	Night (dBA)	Lw / Li Type	Value	norm. dB(A)	Correction Day dB(A)	Evening dB(A)	Night dB(A)	Sound Reduction R	Area (m²)	Attenuatio Operating Time Day (min)	Spacial (min)	Night (min)	KO (dB)	Freq. (Hz)	Direct.	Height (m)		Coordinates X (m)	Y (m)	Z (m)
Rock Crusher			118.6	118.6	118.6	Lw	ML11		0	0	0						0	500 (none)		4 r		817.76	742.97	94.84
Rock Screen			122.9	122.9	122.9	Lw	ML12		0	0	0						0	500 (none)		4 r		826.35	749.65	93.98

Area Source

Name	M.	ID	Result. PWL Day (dBA)	Evening (dBA)	Night (dBA)	Result. PWL" Day (dBA)	Evening (dBA)	Night (dBA)	Lw / Li Type	Value	norm. dB(A)	Correction Day dB(A)	Evening dB(A)	Night dB(A)	Sound Reduction R	Area (m²)	Attenuatio Operating Time Day (min)	Spacial (min)	Night (min)	KO (dB)	Freq. (Hz)	Direct.	Moving Pt. Src Number Day	Evening	Night
P19108 No Activity			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
Processing Area Permitted Excavator			90.4	90.4	90.4	54.9	54.9	54.9	Lw	ML3		0	0	0						0		(none)			
Processing Area Permitted Dump Truck			116	116	116	80.6	80.6	80.6	Lw	RCNM6		0	0	0						0		(none)			
Processing Area Permitted Loader			113.3	113.3	113.3	77.8	77.8	77.8	Lw	RCNM5		0	0	0						0		(none)			
Processing Area Permitted Loader			113.3	113.3	113.3	77.8	77.8	77.8	Lw	RCNM5		0	0	0						0		(none)			
P19162 Permitted Excavator			124.8	124.8	124.8	80.6	80.6	80.6	Lw	ML1		0	0	0						0		(none)			
P19162 Permitted Dump Truck			116	116	116	71.8	71.8	71.8	Lw	RCNM6		0	0	0						0		(none)			
P19162 Permitted Loader			113.3	113.3	113.3	69.1	69.1	69.1	Lw	RCNM5		0	0	0						0		(none)			
P19165 Permitted & Expanded Excavator			124.8	124.8	124.8	78.5	78.5	78.5	Lw	ML1		0	0	0						0		(none)			
P19165 Permitted & Expanded Dump Truck			116	116	116	69.8	69.8	69.8	Lw	RCNM6		0	0	0						0		(none)			
P19165 Permitted & Expanded Loader			113.3	113.3	113.3	67	67	67	Lw	RCNM5		0	0	0						0		(none)			
P19155 Addin Excavator			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19155 Addin Dump Truck			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19155 Addin Loader			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19158/P90028 Addin Excavator			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19158/P90028 Addin Dump Truck			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19158/P90028 Addin Loader			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19161 Addin Excavator			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19161 Addin Dump Truck			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19161 Addin Loader			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19164 Addin Excavator			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19164 Addin Dump Truck			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19164 Addin Loader			0	0	0	0	0	0	Lw			0	0	0						0		(none)			

Area Source Coordinates

Name	x (m)	y (m)	z (m)	Ground (m)
P19108	780.6	937.33	94.71	93.21
	717.31	911.06	100.79	99.29
	710.36	874.17	112.29	110.79
	936.69	862.64	84.7	83.2
	945.36	916.89	83.58	82.08
	925.06	925.86	84.41	82.91
	823.97	957.18	90.08	88.58
Processing Area	780	775	92.94	91.44
	780	725	93.98	92.48
	850	725	95.57	94.07
	850	775	89.78	88.28
P19162 Permitted	710.74	872.97	112.78	111.28
	696.53	745.6	100.43	98.93
	779.9	744.72	92.94	91.44
	779.95	775.11	92.94	91.44
	850.34	775.36	89.75	88.25
	850.19	744.27	92.47	90.97
	921	744.11	96.5	95
	934.94	861.12	84.93	83.43
P19165 Permitted & Expanded	696.87	744.93	99.97	98.47
	676.25	557.55	123.42	121.92
	910.96	557.51	129.5	128
	920.79	743.42	96.69	95.19
	850.2	744.05	92.49	90.99
	850.22	724.85	95.63	94.13
	779.87	724.85	94.02	92.52
	779.89	744.55	92.94	91.44

P19155	605.05	745.19	120.64	119.14
	694.65	745.19	101.59	100.09
	708.12	857.28	117.16	115.66
P19158/PS0028 Addn	605.64	744.3	120.94	119.44
	686.11	744.71	101.11	99.61
	664.44	481.9	129.19	127.69
	419.58	478.03	104.86	103.36
	508	623.51	110.52	109.02
P19163 Addn	935.62	861.38	84.85	83.35
	931.54	745.18	96.2	94.7
	1111.84	746	73.88	72.38
	1132.95	781.32	72.92	71.42
	1012.3	842.82	78.79	77.29
P19164 Addn	911.58	556.22	129.49	127.99
	676.04	556.01	123.42	121.92
	665.77	482.19	128.37	126.87
	1111.2	488	90.41	88.91
	1124.01	744.29	73.34	71.84
	922.52	743.44	96.57	95.07

Roadways

Name	M.	ID	Lma Day (dBA)	Evening (dBA)	Night (dBA)	Count Data OTV	Str.class.	exact Count Data M Day	Evening	Night	p (%) Day	Evening	Night	Speed Limit Avhs (km/h)	Truck (km/h)	SCS Dist.	Surface Distro (dB)	Type	Gradient (%)	Mult. Reflection Dref (dB)	Hbuild (m)	Dist. (m)	x (m)	y (m)	z (m)	Ground (m Dist (m)	LSlope (%)
Existing			34.5	0	0			13	0	0	0	0	0	32			0	0	1	0	0		945.02	918.03	82.08	82.08	
																							873.78	847.42	85.34	85.34	
																							849.39	822.39	86.69	86.69	
																							839.76	803.14	87.53	87.53	
																							817.94	772.33	90.07	90.07	
																							779.43	755.64	91.44	91.44	
																							735.78	739.6	91.44	91.44	
																							708.19	722.91	92.18	92.18	
																							695.99	706.22	97.06	97.06	
																							693.42	690.17	100.24	100.24	
																							707.54	686.32	98.5	98.5	
																							735.14	704.94	93.67	93.67	
																							773.68	715.21	94.95	94.95	
																							798.68	722.48	92.35	92.35	
																							825.64	765.27	89.63	89.63	
																							833.34	780.3	88.37	88.37	
Existing			34.5	0	0			13	0	0	0	0	0	32			0	0	1	0	0		854.52	834.59	86.37	86.37	
																							836.55	839.72	88.4	88.4	
																							815.37	833.3	89.77	89.77	
																							799.33	821.75	90.29	90.29	
																							779.43	799.29	91.44	91.44	
																							769.8	780.67	91.44	91.44	
																							765.31	768.48	91.44	91.44	

Sound Levels

Name	ID	Type	Octave Spectrum (dB) Weight.	31.5	63	125	250	500	1000	2000	4000	8000 A	lin	Source
Front End Loader RDNM	RDNM5	Lw		0	0	0	0	116.5	0	0	0	0	113.3	116.5	
Dump Truck RDNM	RDNM6	Lw		0	120	117	111	111	111	109	107	103	116	123.1	
Excavator Breaker	ML1	Lw		0	121.2	119.2	120.2	122.2	120.2	117.2	113.2	107.2	124.8	128.9	
Excavator loading	ML3	Lw		0	95.1	90.1	89.1	89.1	85.1	81.1	76.1	70.1	90.4	98.1	
Bucket/Tractor	ML8	Lw		0	114.7	115.7	113.7	111.7	109.7	108.7	102.7	94.7	115.2	120.9	
Rock Crusher	ML11	Lw		0	0	0	0	121.8	0	0	0	0	118.6	121.8	
Screens	ML12	Lw		0	0	0	0	126.1	0	0	0	0	122.9	126.1	

Result Table

Receiver Name	ID	Land Use	Limiting Value Day dB(A)	Night dB(A)	rel. Axis Station m	Distance m	Height m	Lr w/o Noise Control Day dB(A)	Night dB(A)	dL req. Day dB(A)	Night dB(A)	Lr w/ Noise Control Day dB(A)	Night dB(A)	Exceeding Day dB(A)	Night dB(A)	passive NC dB(A)
R1			0	0	328	102.76	-7.04	39.2	39.1	39.2	39.1	0	0	-	-	-
R2			0	0	303	135.6	-1.34	41.4	41.4	41.4	41.4	0	0	-	-	-
R3			0	0	136	69.22	-14.47	45.1	45.1	45.1	45.1	0	0	-	-	-
R4			0	0	136	73.92	-17.97	47.9	47.9	47.9	47.9	0	0	-	-	-
R5			0	0	134	100.11	-20.14	46.4	46.4	46.4	46.4	0	0	-	-	-
R6			0	0	0	107.45	-7.79	58.3	58.3	58.3	58.3	0	0	-	-	-
R7			0	0	0	169.85	-14.1	57.5	57.5	57.5	57.5	0	0	-	-	-
R8			0	0	265	47.62	-0.97	58.7	58.7	58.7	58.7	0	0	-	-	-
R9			0	0	345	68.37	-6.48	51.7	51.7	51.7	51.7	0	0	-	-	-
R10			0	0	345	47.88	-4.86	50.1	50.1	50.1	50.1	0	0	-	-	-
R11			0	0	345	179.74	9.55	42.3	42.3	42.3	42.3	0	0	-	-	-
R12			0	0	150	312.01	-9.59	37.9	37.9	37.9	37.9	0	0	-	-	-

CadnaA Input Output
Project: McLaren & Associates - Lake Erie PIT Expansion
Case: Future Portal P19153 - No Noise Control

Receiver

Name	M.	ID	Level Lr Day (dBA)	Level Lr Night (dBA)	Limit. Value Day (dBA)	Limit. Value Night (dBA)	Land Use Type	Land Use Auto	Noise Type	Height (m)	Coordinates X (m)	Y (m)	Z (m)
R1			38.7	38.7	0	0	*	*	Total	1.5 r	329.67	478.25	97.29
R2			38.6	38.6	0	0	*	*	Total	1.5 r	368.7	607.92	102.78
R3			55.5	55.5	0	0	*	*	Total	1.5 r	632.11	860.75	101.35
R4			52.5	52.5	0	0	*	*	Total	1.5 r	670.93	902.8	97.85
R5			51.7	51.7	0	0	*	*	Total	1.5 r	688	932.95	95.34
R6			51.2	51.2	0	0	*	*	Total	1.5 r	912	1020.28	74.29
R7			52.1	52.1	0	0	*	*	Total	1.5 r	1066.42	1096.82	67.98
R8			48.7	48.7	0	0	*	*	Total	1.5 r	1157.04	756.73	71.22
R9			40.1	40	0	0	*	*	Total	1.5 r	1161.08	596.99	78.5
R10			37.6	37.6	0	0	*	*	Total	1.5 r	1157.85	544.42	80.12
R11			33.4	33.4	0	0	*	*	Total	1.5 r	1156.77	377.39	88.53
R12			32.3	32.3	0	0	*	*	Total	1.5 r	1084.05	206.67	117.32

Point Source

Name	M.	ID	Result. PWL Day (dBA)	Result. PWL Evening (dBA)	Result. PWL Night (dBA)	Lw / Li Type	Value	norm. dB(A)	Correction Day dB(A)	Correction Evening dB(A)	Correction Night dB(A)	Sound Reduction R	Sound Reduction Area (m²)	Attenuatio Operating Time Day (min)	Attenuatio Operating Time Special (min)	Attenuatio Operating Time Night (min)	KO (dB)	Freq. (Hz)	Direct.	Height (m)	Coordinates X (m)	Y (m)	Z (m)
Rock Crusher			118.6	118.6	118.6	Lw	ML31			0	0	0					0	500	(none)	4 r	817.76	742.97	94.84
Rock Screen			122.9	122.9	122.9	Lw	ML32			0	0	0					0	500	(none)	4 r	826.35	749.65	93.98

Area Source

Name	M.	ID	Result. PWL Day (dBA)	Result. PWL Evening (dBA)	Result. PWL Night (dBA)	Result. PWL" Day (dBA)	Result. PWL" Evening (dBA)	Result. PWL" Night (dBA)	Lw / Li Type	Value	norm. dB(A)	Correction Day dB(A)	Correction Evening dB(A)	Correction Night dB(A)	Sound Reduction R	Sound Reduction Area (m²)	Attenuatio Operating Time Day (min)	Attenuatio Operating Time Special (min)	Attenuatio Operating Time Night (min)	KO (dB)	Freq. (Hz)	Direct.	Moving Pt. Src Number Day	Moving Pt. Src Number Evening	Moving Pt. Src Number Night
P19108 No Activity			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
Processing Area Permitted Excavator			90.4	90.4	90.4	54.9	54.9	54.9	Lw	ML3		0	0	0						0		(none)			
Processing Area Permitted Dump Truck			116	116	116	80.6	80.6	80.6	Lw	RCNM6		0	0	0						0		(none)			
Processing Area Permitted Loader			113.3	113.3	113.3	77.8	77.8	77.8	Lw	RCNM5		0	0	0						0		(none)			
Processing Area Permitted Loader			113.3	113.3	113.3	77.8	77.8	77.8	Lw	RCNM5		0	0	0						0		(none)			
P19162 Permitted Loader			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19162 Permitted Dump Truck			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19162 Permitted Loader			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19165 Permitted & Expanded Excavator			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19165 Permitted & Expanded Dump Truck			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19165 Permitted & Expanded Loader			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19155 Addtn Excavator			124.8	124.8	124.8	87.6	87.6	87.6	Lw	ML1		0	0	0						0		(none)			
P19155 Addtn Dump Truck			116	116	116	78.9	78.9	78.9	Lw	RCNM6		0	0	0						0		(none)			
P19155 Addtn Loader			113.3	113.3	113.3	76.1	76.1	76.1	Lw	RCNM3		0	0	0						0		(none)			
P19158/P90028 Addtn Excavator			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19158/P90028 Addtn Dump Truck			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19158/P90028 Addtn Loader			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19161 Addtn Excavator			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19161 Addtn Dump Truck			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19161 Addtn Loader			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19164 Addtn Excavator			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19164 Addtn Dump Truck			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19164 Addtn Loader			0	0	0	0	0	0	Lw			0	0	0						0		(none)			

Area Source Coordinates

Name	x (m)	y (m)	z (m)	Ground (m)
P19108	780.6	937.33	94.71	93.21
	717.31	911.06	100.79	99.29
	710.36	874.17	112.29	110.79
	936.69	862.64	84.7	83.2
	945.36	916.89	83.58	82.08
	925.06	925.86	84.41	82.91
	823.97	937.18	90.08	88.58
Processing Area	780	775	92.94	91.44
	780	725	93.98	92.48
	850	725	95.57	94.07
	850	775	89.78	88.28
P19162 Permitted	710.74	872.97	112.78	111.28
	686.53	745.6	100.43	98.93
	779.9	744.72	92.94	91.44
	779.95	775.11	92.94	91.44
	850.34	775.36	89.75	88.25
	850.19	744.27	92.47	90.97
	921	744.11	96.5	95
	934.94	861.12	84.93	83.43
P19165 Permitted & Expanded	696.87	744.93	99.97	98.47
	678.25	557.55	123.42	121.92
	910.96	557.51	129.5	128
	920.79	743.42	96.69	95.19
	850.2	744.05	92.49	90.99
	850.22	724.85	95.63	94.13
	779.87	724.88	94.03	92.52
	779.83	744.59	92.94	91.44
P19155	605.05	745.19	120.64	119.14
	694.65	745.19	101.59	100.09
	708.12	857.28	117.16	115.66

P19158/P90028 Addin	605.64	744.3	120.94	119.44
	695.11	744.71	101.11	99.61
	644.44	481.9	129.19	127.69
	419.58	476.03	104.86	103.36
	503	623.51	110.51	109.01
P19161 Addin	935.82	881.38	84.85	83.35
	931.54	745.18	96.2	94.7
	1111.84	746	73.88	72.38
	1112.95	781.32	72.92	71.42
	1012.3	842.82	78.79	77.29
P19164 Addin	911.58	556.22	129.49	127.99
	676.04	556.01	123.42	121.92
	665.77	482.19	129.17	127.67
	1111.2	488	90.41	88.91
	1124.01	744.29	73.34	71.84
	922.52	743.44	96.57	95.07

Roadways

Name	M.	ID	Lme Day (dBA)	Evening (dBA)	Night (dBA)	Count Data DTV	Str.Veh.	exact Count Data M Day	Evening	Night	p (%) Day	Evening	Night	Speed Limit Auto (km/h)	Truck (km/h)	SCS Dist.	Surface Dstro (dB)	Type	Gradient (%)	Mult. Reflection Dref (dB)	Hbuild (m)	Dist. (m)	x (m)	y (m)	z (m)	Ground (m	Dist (m)	LSlope (%)
Existing			34.5	0	0			13	0	0	0	0	0	32			0	0	1	0	0		846.02	918.03	82.08	80.08		
																							873.78	847.42	85.34	83.34		
																							849.38	822.39	86.69	86.69		
																							839.76	803.14	87.53	87.53		
																							817.94	772.33	90.07	90.07		
																							779.43	733.64	91.44	91.44		
																							735.78	739.6	91.44	91.44		
																							708.18	722.01	92.16	92.16		
																							695.99	708.22	97.06	97.06		
																							698.42	690.17	100.24	100.24		
																							707.54	686.32	98.5	98.5		
																							736.14	704.94	93.67	93.67		
																							773.65	715.23	94.85	94.85		
																							788.68	725.48	92.35	92.35		
																							825.64	765.27	89.63	89.63		
Existing			34.5	0	0			13	0	0	0	0	0	32			0	0	1	0	0		833.34	790.3	84.37	84.37		
																							854.52	834.59	86.37	86.37		
																							836.35	839.72	88.4	88.4		
																							815.37	833.3	89.77	89.77		
																							799.33	821.75	90.29	90.29		
																							779.43	799.29	91.44	91.44		
																							769.8	780.67	91.44	91.44		
Parcel 19155			34.5	0	0			13	0	0	0	0	0	32			0	0	1	0	0		765.31	768.48	91.44	91.44		
																							760.76	773.87	91.44	91.44		
Parcel 19155			34.5	0	0			13	0	0	0	0	0	32			0	0	1	0	0		610.48	746.62	120.17	120.17		
																							831.05	845.71	89.31	89.31		
																							985.57	833.1	115.82	115.82		

Sound Levels

Name	ID	Type	Octave Spectrum (dB) Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	Source
Front End Loader RCNM	RCNM5	Lw		0	0	0	0	116.5	0	0	0	0	113.3	116.5	
Dump Truck RCNM	RCNM6	Lw		0	120	117	111	111	111	109	107	103	116	123.1	
Excavator Breaker	ML1	Lw		0	121.2	119.2	120.2	122.2	120.2	117.2	113.2	107.1	124.8	128.3	
Excavator loading	ML3	Lw		0	95.1	90.1	89.1	89.1	85.1	81.1	76.1	70.1	90.4	98.1	
Bucket/Tractor	ML8	Lw		0	114.7	115.7	113.7	111.7	109.7	108.7	102.7	94.7	115.2	120.9	
Rock Crusher	ML11	Lw		0	0	0	0	121.8	0	0	0	0	116.6	121.8	
Screens	ML12	Lw		0	0	0	0	126.1	0	0	0	0	122.9	126.1	

Result Table

Receiver Name	ID	Land Use	Limiting Value Day dB(A)	Night dB(A)	rel. Axis Station m	Distance m	Height m	Lr w/o Noise Control Day dB(A)	Night dB(A)	dL req. Day dB(A)	Night dB(A)	Lr w/ Noise Control Day dB(A)	Night dB(A)	Exceeding Day dB(A)	Night dB(A)	passive NC dB(A)
R1			0	0	153	388.43	-22.87	36.7	36.7	36.7	36.7	0	0	-	-	-
R2			0	0	153	278.74	-17.59	38.6	38.6	38.6	38.6	0	0	-	-	-
R3			0	0	136	69.22	-14.47	55.5	55.5	55.5	55.5	0	0	-	-	-
R4			0	0	136	73.92	-17.97	52.5	52.5	52.5	52.5	0	0	-	-	-
R5			0	0	154	100.11	-20.14	51.7	51.7	51.7	51.7	0	0	-	-	-
R6			0	0	0	107.45	-7.79	51.2	51.2	51.2	51.2	0	0	-	-	-
R7			0	0	0	169.85	-14.1	52.1	52.1	52.1	52.1	0	0	-	-	-
R8			0	0	0	265.19	-10.86	48.7	48.7	48.7	48.7	0	0	-	-	-
R9			0	0	513	375.29	-11.13	40.1	40	40.1	40	0	0	-	-	-
R10			0	0	515	398.92	-8.51	37.6	37.5	37.6	37.6	0	0	-	-	-
R11			0	0	467	489.38	-3.81	33.4	33.4	33.4	33.4	0	0	-	-	-
R12			0	0	467	569.7	24.97	32.3	32.3	32.3	32.3	0	0	-	-	-

CadnaA Input Output
Project: McLucas & Associates - Lake Erie PIT Expansion
Case: Future Parcels P19158/P90028 - No Noise Control

Receiver

Name	M.	ID	Level Lr Day (dBA)	Night (dBA)	Limit. Value Day (dBA)	Night (dBA)	Land Use Type	Auto	Noise Type	Height (m)	Coordinates X (m)	Y (m)	Z (m)
R1			60.1	60.1	0	0	*		Total	1.5 r	329.67	478.25	87.29
R2			63.5	63.5	0	0	*		Total	1.5 r	368.7	607.92	102.78
R3			45.2	45.2	0	0	*		Total	1.5 r	632.11	860.75	101.35
R4			43.1	43.1	0	0	*		Total	1.5 r	670.92	902.8	97.83
R5			42.7	42.7	0	0	*		Total	1.5 r	688	932.95	95.34
R6			51.8	51.8	0	0	*		Total	1.5 r	912	1020.28	74.29
R7			52.7	52.7	0	0	*		Total	1.5 r	1066.42	1036.82	57.58
R8			48.8	48.8	0	0	*		Total	1.5 r	1157.04	756.73	71.22
R9			40.1	40.1	0	0	*		Total	1.5 r	1161.08	596.89	78.5
R10			37.6	37.6	0	0	*		Total	1.5 r	1157.85	544.42	80.13
R11			33.8	33.8	0	0	*		Total	1.5 r	1156.77	377.39	88.53
R12			43.2	43.2	0	0	*		Total	1.5 r	1034.05	206.67	117.32

Point Source

Name	M.	ID	Result. PWL Day (dBA)	Evening (dBA)	Night (dBA)	Lw / Ll Type	Value	norm. dB(A)	Correction Day dB(A)	Evening dB(A)	Night dB(A)	Sound Reduction R	Area (m²)	Attenuatio Day (min)	Special (min)	Night (min)	Operating Time (min)	KO (dB)	Freq. (Hz)	Direct.	Height (m)	Coordinates X (m)	Y (m)	Z (m)
Rock Crusher			118.6	118.6	118.6	Lw	ML11			0	0	0						0	500	(none)	4 r	817.76	742.97	94.84
Rock Screen			122.9	122.9	122.9	Lw	ML12			0	0	0						0	500	(none)	4 r	826.35	749.65	93.98

Area Source

Name	M.	ID	Result. PWL Day (dBA)	Evening (dBA)	Night (dBA)	Result. PWL" Day (dBA)	Evening (dBA)	Night (dBA)	Lw / Ll Type	Value	norm. dB(A)	Correction Day dB(A)	Evening dB(A)	Night dB(A)	Sound Reduction R	Area (m²)	Attenuatio Day (min)	Special (min)	Night (min)	Operating Time (min)	KO (dB)	Freq. (Hz)	Direct.	Moving Pt. Src Number Day	Evening	Night
P19108 No Activity			0	0	0	0	0	0	Lw			0	0	0							0	(none)			
Processing Area Permitted Excavator			90.4	90.4	90.4	54.9	54.9	54.9	Lw	ML3		0	0	0							0	(none)			
Processing Area Permitted Dump Truck			116	116	116	80.6	80.6	80.6	Lw	RCNM6		0	0	0							0	(none)			
Processing Area Permitted Loader			113.3	113.3	113.3	77.8	77.8	77.8	Lw	RCNM5		0	0	0							0	(none)			
Processing Area Permitted Loader			113.3	113.3	113.3	77.8	77.8	77.8	Lw	RCNM5		0	0	0							0	(none)			
P19162 Permitted Loader			0	0	0	0	0	0	Lw			0	0	0							0	(none)			
P19162 Permitted Dump Truck			0	0	0	0	0	0	Lw			0	0	0							0	(none)			
P19162 Permitted Loader			0	0	0	0	0	0	Lw			0	0	0							0	(none)			
P19165 Permitted & Expanded Excavator			0	0	0	0	0	0	Lw			0	0	0							0	(none)			
P19165 Permitted & Expanded Dump Truck			0	0	0	0	0	0	Lw			0	0	0							0	(none)			
P19165 Permitted & Expanded Loader			0	0	0	0	0	0	Lw			0	0	0							0	(none)			
P19155 Addtn Excavator			0	0	0	0	0	0	Lw			0	0	0							0	(none)			
P19155 Addtn Dump Truck			0	0	0	0	0	0	Lw			0	0	0							0	(none)			
P19155 Addtn Loader			0	0	0	0	0	0	Lw			0	0	0							0	(none)			
P19158/P90028 Addtn Excavator			124.8	124.8	124.8	78.1	78.1	78.1	Lw	ML1		0	0	0							0	(none)			
P19158/P90028 Addtn Dump Truck			116	116	116	69.3	69.3	69.3	Lw	RCNM6		0	0	0							0	(none)			
P19158/P90028 Addtn Loader			113.3	113.3	113.3	66.6	66.6	66.6	Lw	RCNM5		0	0	0							0	(none)			
P19161 Addtn Excavator			0	0	0	0	0	0	Lw			0	0	0							0	(none)			
P19161 Addtn Dump Truck			0	0	0	0	0	0	Lw			0	0	0							0	(none)			
P19161 Addtn Loader			0	0	0	0	0	0	Lw			0	0	0							0	(none)			
P19164 Addtn Excavator			0	0	0	0	0	0	Lw			0	0	0							0	(none)			
P19164 Addtn Dump Truck			0	0	0	0	0	0	Lw			0	0	0							0	(none)			
P19164 Addtn Loader			0	0	0	0	0	0	Lw			0	0	0							0	(none)			

Area Source Coordinates

Name	x (m)	y (m)	z (m)	Ground (m)
P19108	780.6	837.33	94.71	93.21
	717.31	911.06	100.79	99.29
	710.36	874.17	112.29	110.79
	996.69	882.64	84.7	83.2
	945.36	916.89	83.58	82.08
	925.06	925.86	84.41	82.91
	823.97	937.18	90.08	88.58
Processing Area	780	775	92.94	91.44
	780	725	93.98	92.48
	850	725	95.57	94.07
	850	775	89.78	88.28
P19162 Permitted	710.74	872.97	112.78	111.28
	696.53	745.6	100.43	98.93
	779.9	744.72	92.94	91.44
	779.95	775.11	92.94	91.44
	850.34	775.36	89.75	88.25
	850.19	744.77	92.47	90.97
	921	744.11	96.5	95
	934.94	851.12	84.93	83.43
P19165 Permitted & Expanded	696.87	744.93	99.97	98.47
	676.25	557.55	123.42	121.92
	910.96	557.51	129.5	128
	920.79	743.42	96.69	95.19
	850.2	744.05	92.48	90.99
	850.22	724.83	95.63	94.13
	779.87	724.85	94.02	92.52
	779.83	744.55	92.94	91.44
P19155	605.05	745.19	120.64	119.14
	694.65	745.19	101.59	100.09
	708.12	857.28	117.16	115.66

P19158/P90028 Addtn	605.64	744.3	120.94	119.44
	695.11	744.71	105.11	99.61
	644.44	681.9	139.19	127.89
	419.58	473.03	104.86	109.36
	503	623.31	110.52	109.01
P19161 Addtn	935.62	861.38	84.85	83.35
	921.34	745.18	96.2	94.7
	1111.84	746	73.88	72.38
	1112.95	781.31	72.92	71.42
	103.23	842.82	78.79	77.29
P19164 Addtn	911.58	554.22	129.49	127.99
	676.04	556.01	123.42	121.92
	665.77	482.19	129.37	127.87
	1111.2	488	90.41	88.91
	1124.01	744.29	73.34	71.84
	922.52	743.44	96.57	95.07

Roadways

Name	M.	ID	Lme Day (dBA)	Evening (dBA)	Night (dBA)	Count Data DTV	Str.class.	exact Count Data M Day	Evening	Night	p (%) Day	Evening	Night	Speed Limit Auto (km/h)	Truck (km/h)	SCS Dist.	Surface Distro (dB)	Type	Gradient (%)	Mult. Reflection Dref (dB)	Rbuild (m)	Dist. (m)	x (m)	y (m)	z (m)	Ground (m Dist (m)	LSlope (%)
Existing			34.5	0	0			13	0	0	0	0	0	32			0	0	1	0	0		845.02	918.03	82.08	82.08	
																							873.78	847.42	85.34	85.34	
																							849.39	822.99	86.69	86.69	
																							839.76	803.14	87.53	87.53	
																							837.94	772.33	90.07	90.07	
																							779.45	755.64	91.44	91.44	
																							755.78	739.6	91.44	91.44	
																							708.19	722.91	92.18	92.18	
																							695.39	706.21	97.06	97.06	
																							650.42	690.17	100.24	100.24	
																							707.54	686.32	98.5	98.5	
																							735.14	704.94	93.67	93.67	
																							773.65	715.21	94.96	94.96	
																							798.68	725.48	92.35	92.35	
																							825.64	765.27	89.63	89.63	
																							833.34	790.3	88.37	88.37	
Existing			34.5	0	0			13	0	0	0	0	0	31			0	0	1	0	0		854.52	834.59	86.37	86.37	
																							836.55	839.72	88.4	88.4	
																							815.37	833.3	89.77	89.77	
																							799.33	821.75	90.29	90.29	
																							779.43	799.29	91.44	91.44	
																							769.8	780.67	91.44	91.44	
																							765.31	768.48	91.44	91.44	
Parcel P19158 P90028			34.5	0	0			13	0	0	0	0	0	32			0	0	1	0	0		691.48	686.76	101.55	101.55	
																							432.17	485.33	104.33	104.33	

Sound Levels

Name	ID	Type	Octave Spectrum (dB) Weight.	31.5	63	125	250	500	1000	2000	4000	8000 A	lin	Source
Front End Loader RCNM	RCNM5	Lw		0	0	0	0	116.5	0	0	0	0	113.3	116.5	
Dump Truck RCNM	RCNM6	Lw		0	120	117	111	111	111	109	107	103	116	125.1	
Excavator Breaker	ML1	Lw		0	121.2	119.2	120.2	122.2	120.2	117.2	113.2	107.2	124.8	128.3	
Excavator loading	ML3	Lw		0	95.1	90.1	89.1	89.1	85.1	81.1	76.1	70.1	90.4	98.1	
Bucket/Tractor	ML8	Lw		0	114.7	115.7	113.7	111.7	109.7	108.7	102.7	94.7	115.2	120.9	
Rock Crusher	ML11	Lw		0	0	0	0	121.6	0	0	0	0	118.6	121.8	
Screens	ML12	Lw		0	0	0	0	126.1	0	0	0	0	122.9	126.1	

Result Table

Receiver Name	ID	Land Use	Limiting Value Day dB(A)	Night dB(A)	rel. Axis Station m	Distance m	Height m	Lr w/o Noise Control Day dB(A)	Night dB(A)	dL req. Day dB(A)	Night dB(A)	Lr w/ Noise Control Day dB(A)	Night dB(A)	Exceeding Day dB(A)	Night dB(A)	passive NC dB(A)
R1			0	0	328	102.76	-7.04	60.1	60.1	60.1	60.1	0	0 -	-	-	-
R2			0	0	303	135.6	-1.34	63.5	63.5	63.5	63.5	0	0 -	-	-	-
R3			0	0	309	157.92	9.31	45.2	45.2	45.2	45.2	0	0 -	-	-	-
R4			0	0	85	149.86	6.63	43.1	43.1	43.1	43.1	0	0 -	-	-	-
R5			0	0	61	157.54	5.05	42.7	42.7	42.7	42.7	0	0 -	-	-	-
R6			0	0	0	107.45	-7.79	51.8	51.8	51.8	51.8	0	0 -	-	-	-
R7			0	0	0	169.85	-14.1	52.7	52.7	52.7	52.7	0	0 -	-	-	-
R8			0	0	0	265.19	-10.86	48.8	48.8	48.8	48.8	0	0 -	-	-	-
R9			0	0	515	375.29	-11.13	40.1	40.1	40.1	40.1	0	0 -	-	-	-
R10			0	0	515	396.92	-8.51	37.6	37.6	37.6	37.6	0	0 -	-	-	-
R11			0	0	467	489.38	-3.81	33.8	33.8	33.8	33.8	0	0 -	-	-	-
R12			0	0	467	569.7	24.97	43.2	43.2	43.2	43.2	0	0 -	-	-	-

Case: Future Parcels P19158/P90028 - Noise Control

Receiver

Name	M.	ID	Level Lr Day (dBA)	Night (dBA)	Limit. Value Day (dBA)	Night (dBA)	Land Use Type	Auto	Noise Type	Height (m)		Coordinates x (m)	y (m)	z (m)
R1			56.4	56.4	0	0	*		Total	1.5	r	329.67	478.25	97.29
R2			58.7	58.7	0	0	*		Total	1.5	r	368.7	607.92	102.76
R3			45.1	45.1	0	0	*		Total	1.5	r	632.11	860.75	101.35
R4			43.3	43.3	0	0	*		Total	1.5	r	670.92	902.6	97.85
R5			42.6	42.6	0	0	*		Total	1.5	r	688	932.95	95.34

R6	51.8	51.8	0	0	s	Total	1.5 r	910	1030.28	74.29
R7	52.7	52.7	0	0	s	Total	1.5 r	1066.42	1036.82	67.98
R8	48.8	48.8	0	0	s	Total	1.5 r	1157.04	758.73	71.23
R9	40.1	40.1	0	0	s	Total	1.5 r	1161.68	596.39	78.5
R10	37.6	37.6	0	0	s	Total	1.5 r	1157.85	544.42	80.12
R11	33.8	33.8	0	0	s	Total	1.5 r	1156.77	377.39	68.53
R12	43.2	43.2	0	0	s	Total	1.5 r	1034.09	206.67	117.32

Embankment

Name	Id	rel. Height (m)	Slope 1:00	Top Width (m)	x (m)	y (m)	z (m)	Ground (m)
Berm		4.27	0.5	s	412.85	477.2	102.81	102.81
					505.35	620.93	108.91	108.81
					599.51	744.01	117.96	117.96

Result Table

Receiver Name	ID	Land Use	Limiting Value Day dB(A)	Night dB(A)	rel. Axis Station m	Distance m	Height m	Lr w/o Noise Control Day dB(A)	Night dB(A)	dL req. Day dB(A)	Night dB(A)	Lr w/ Noise Control Day dB(A)	Night dB(A)	Expanding Day dB(A)	Night dB(A)	passive NC dB(A)
R1			0	0	328	102.76	-7.04	56.4	56.4	56.4	56.4	0	0 -	-	-	
R2			0	0	309	135.6	-1.34	58.7	58.7	58.7	58.7	0	0 -	-	-	
R3			0	0	309	157.32	9.31	45.1	45.1	45.1	45.1	0	0 -	-	-	
R4			0	0	85	149.86	6.63	43.3	43.3	43.3	43.3	0	0 -	-	-	
R5			0	0	61	157.34	5.05	42.6	42.6	42.6	42.6	0	0 +	+	+	
R6			0	0	0	107.45	-7.79	51.8	51.8	51.8	51.8	0	0 +	+	+	
R7			0	0	0	169.85	-14.1	52.7	52.7	52.7	52.7	0	0 +	+	+	
R8			0	0	0	265.19	-10.86	48.8	48.8	48.8	48.8	0	0 -	-	-	
R9			0	0	515	375.29	-11.13	40.1	40.1	40.1	40.1	0	0 -	-	-	
R10			0	0	515	398.92	-9.51	37.6	37.6	37.6	37.6	0	0 +	+	+	
R11			0	0	467	499.38	-3.81	33.8	33.8	33.8	33.8	0	0 -	-	-	
R12			0	0	467	569.7	24.97	43.2	43.2	43.2	43.2	0	0 +	+	+	

CadnaA Input Output
Project: McLaren & Associates - Lake Erie PIT Expansion
Case: Future Parcel P19161 - No Noise Control

Receiver

Name	M.	ID	Level Lr Day (dBA)	Night (dBA)	Limit. Value Day (dBA)	Night (dBA)	Land Use Type	Auto	Noise Type	Height (m)	Coordinates X (m)	Y (m)	Z (m)
R1			36.3	36.3	0	0		x	Total	1.5 r	328.67	478.25	97.29
R2			38.7	38.7	0	0		x	Total	1.5 r	348.7	607.92	102.78
R3			40.1	40.1	0	0		x	Total	1.5 r	632.11	860.73	101.35
R4			40.3	40.3	0	0		x	Total	1.5 r	670.92	902.6	97.85
R5			43.4	43.4	0	0		x	Total	1.5 r	688	932.95	95.34
R6			55.7	55.7	0	0		x	Total	1.5 r	912	1020.28	74.29
R7			57.7	57.7	0	0		x	Total	1.5 r	1056.42	1036.82	67.98
R8			69.8	69.8	0	0		x	Total	1.5 r	1157.04	756.73	71.22
R9			62.1	62.1	0	0		x	Total	1.5 r	1161.08	596.99	76.5
R10			56.5	56.5	0	0		x	Total	1.5 r	1157.65	544.42	80.12
R11			51.2	51.2	0	0		x	Total	1.5 r	1156.77	377.39	88.53
R12			41	41	0	0		x	Total	1.5 r	1084.05	206.67	117.32

Point Source

Name	M.	ID	Result. PWL Day (dBA)	Evening (dBA)	Night (dBA)	Lw / Ll Type	Value	norm. dB(A)	Correction Day dB(A)	Evening dB(A)	Night dB(A)	Sound Reduction R	Area (m²)	Attenuatio Operating Time Day (min)	Special (min)	Night (min)	KO (dB)	Freq. (Hz)	Direct.	Height (m)	Coordinates X (m)	Y (m)	Z (m)
Rock Crusher			118.6	118.6	118.6	Lw	ML11		0	0	0						0	500	(none)	4 r	817.75	742.97	94.84
Rock Screen			122.9	122.9	122.9	Lw	ML12		0	0	0						0	500	(none)	4 r	826.35	749.65	93.98

Area Source

Name	M.	ID	Result. PWL Day (dBA)	Evening (dBA)	Night (dBA)	Result. PWL" Day (dBA)	Evening (dBA)	Night (dBA)	Lw / Ll Type	Value	norm. dB(A)	Correction Day dB(A)	Evening dB(A)	Night dB(A)	Sound Reduction R	Area (m²)	Attenuatio Operating Time Day (min)	Special (min)	Night (min)	KO (dB)	Freq. (Hz)	Direct.	Moving Pt. Src Number Day	Evening	Night
P19108 No Activity			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
Processing Area Permitted Excavator			90.4	90.4	90.4	54.9	54.9	54.9	Lw	ML3		0	0	0						0		(none)			
Processing Area Permitted Dump Truck			116	116	116	80.6	80.6	80.6	Lw	RCNM6		0	0	0						0		(none)			
Processing Area Permitted Loader			113.3	113.3	113.3	77.8	77.8	77.8	Lw	RCNM5		0	0	0						0		(none)			
Processing Area Permitted Loader			113.3	113.3	113.3	77.8	77.8	77.8	Lw	RCNM5		0	0	0						0		(none)			
P19162 Permitted Loader			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19162 Permitted Dump Truck			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19162 Permitted Loader			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19165 Permitted & Expended Excavator			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19165 Permitted & Expended Dump Truck			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19165 Permitted & Expended Loader			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19155 Addin Excavator			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19155 Addin Dump Truck			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19155 Addin Loader			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19156/P90028 Addin Excavator			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19156/P90028 Addin Dump Truck			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19154/P90028 Addin Loader			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19161 Addin Excavator			124.8	124.8	124.8	82.8	82.8	82.8	Lw	ML1		0	0	0						0		(none)			
P19161 Addin Dump Truck			116	116	116	74.1	74.1	74.1	Lw	RCNM6		0	0	0						0		(none)			
P19161 Addin Loader			113.3	113.3	113.3	71.3	71.3	71.3	Lw	RCNM5		0	0	0						0		(none)			
P19164 Addin Excavator			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19164 Addin Dump Truck			0	0	0	0	0	0	Lw			0	0	0						0		(none)			
P19164 Addin Loader			0	0	0	0	0	0	Lw			0	0	0						0		(none)			

Area Source Coordinates

Name	x (m)	y (m)	z (m)	Ground (m)
P19108	780.6	937.33	94.71	93.21
	717.31	931.06	100.79	99.29
	710.38	874.17	112.29	110.79
	936.69	882.64	84.7	83.2
	945.36	916.89	83.58	82.08
	923.06	925.86	84.41	82.91
	823.97	937.18	90.08	88.58
Processing Area	780	775	92.94	91.44
	780	725	93.98	92.48
	850	725	95.57	94.07
	850	775	89.76	88.26
P19162 Permitted	710.74	872.97	112.78	111.28
	696.53	745.6	100.43	98.93
	779.9	744.72	92.94	91.44
	779.95	773.11	92.94	91.44
	850.34	775.36	89.75	88.25
	850.19	744.27	92.47	90.97
	921	744.11	96.5	95
	934.94	881.12	94.93	93.43
P19165 Permitted & Expended	696.87	744.93	99.97	98.47
	675.25	557.55	123.42	121.92
	910.96	557.53	129.5	128
	920.79	743.42	96.69	95.19
	850.2	744.05	92.49	90.99
	850.22	724.85	95.63	94.13
	779.87	724.85	94.02	92.52
	779.83	744.55	92.94	91.44
P19155	625.05	745.19	120.64	119.14
	694.65	743.19	101.59	100.09
	708.12	857.28	117.18	115.84

P19158/P9D028 Addin	605.64	744.3	120.94	119.44
	695.11	744.71	101.11	98.61
	664.44	481.9	129.19	127.69
	419.58	476.03	104.86	103.36
	503	623.51	110.52	109.02
P19161 Addin	935.82	883.38	84.85	83.35
	821.34	745.18	96.2	94.7
	1111.84	746	73.88	72.38
	1112.95	781.32	72.92	71.42
	1012.5	842.82	78.79	77.29
P19164 Addin	911.58	556.12	129.49	127.99
	676.04	556.01	123.42	121.92
	965.77	482.15	129.37	127.87
	1111.2	486	90.41	88.91
	1124.01	744.29	73.34	71.84
	922.52	743.44	96.57	95.07

Roadways

Name	M.	ID	Lme Day (dBA)	Evening (dBA)	Night (dBA)	Count Data DTV	Str.class.	esert Count Date M Day	Evening	Night	p (%) Day	Evening	Night	Speed Limit Auto (km/h)	Truck (km/h)	SCS Dist.	Surface Ostro (dB)	Type	Gradient (%)	Mult. Reflection Oneil (dB)	Hbuild (m)	Dist. (m)	x (m)	y (m)	z (m)	Ground (m	Dist (m)	LSlope (%)
Existing			34.5	0	0			13	0	0	0	0	0	32		0	0	1	0	0			945.02	914.09	62.08	62.08		
																							873.78	647.42	85.34	85.34		
																							849.39	822.39	86.69	86.69		
																							839.76	803.14	87.53	87.53		
																							817.94	772.33	90.07	90.07		
																							779.43	755.84	91.44	91.44		
																							735.78	758.6	91.44	91.44		
																							708.19	722.91	92.18	92.18		
																							668.59	705.22	97.06	97.06		
																							693.42	690.17	100.24	100.24		
																							707.54	686.32	98.5	98.5		
																							735.14	704.94	93.67	93.67		
																							773.65	715.21	94.95	94.95		
																							798.68	725.48	92.35	92.35		
																							825.64	765.27	89.63	89.63		
Existing			34.5	0	0			13	0	0	0	0	0	32		0	0	1	0	0			833.34	790.3	88.37	88.37		
																							834.52	834.59	86.37	86.37		
																							836.55	839.72	88.4	88.4		
																							815.37	833.3	89.77	89.77		
																							799.33	821.75	90.29	90.29		
																							779.43	799.29	91.44	91.44		
																							769.8	780.67	91.44	91.44		
																							765.31	768.48	91.44	91.44		
Parcel P19161			34.5	0	0			13	0	0	0	0	0	32		0	0	1	0	0			853.43	824.8	86.28	86.28		
																							1109.53	755.39	72.19	72.19		

Sound Levels

Name	ID	Type	Octave Spectrum (dB) Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	Source
Front End Loader RCNM	RCNM5	Lw		0	0	0	0	116.5	0	0	0	0	113.3	116.5	
Dump Truck RCNM	RCNM6	Lw		0	120	117	111	111	111	109	107	103	116	129.1	
Excavator Breaker	ML3	Lw		0	121.2	119.2	120.2	122.2	120.2	117.2	113.2	107.2	124.8	128.9	
Excavator loading	ML3	Lw		0	95.1	90.1	89.1	89.1	85.1	81.1	76.1	70.1	90.4	98.1	
Bucket/Tractor	ML8	Lw		0	114.7	115.7	113.7	111.7	109.7	108.7	102.7	94.7	115.2	120.9	
Rock Crusher	ML11	Lw		0	0	0	0	121.8	0	0	0	0	118.6	121.8	
Screens	ML12	Lw		0	0	0	0	126.1	0	0	0	0	122.9	126.1	

Result Table

Receiver Name	ID	Land Use	Limiting Value Day dB(A)	Night dB(A)	nal. Axis Station m	Distance m	Height m	Lr w/o Noise Control Day dB(A)	Night dB(A)	dL req. Day dB(A)	Night dB(A)	Lr w/ Noise Control Day dB(A)	Night dB(A)	Exceeding Day dB(A)	Night dB(A)	passive NC dB(A)
R1			0	0	332	420.98	-2.94	36.3	36.3	36.3	36.3	0	0	-	-	-
R2			0	0	332	334.98	2.54	38.7	38.7	38.7	38.7	0	0	-	-	-
R3			0	0	309	157.32	9.31	40.1	40.1	40.1	40.1	0	0	-	-	-
R4			0	0	85	149.86	6.65	40.3	40.3	40.3	40.3	0	0	-	-	-
R5			0	0	61	157.34	5.05	43.4	43.4	43.4	43.4	0	0	-	-	-
R6			0	0	0	107.45	-7.79	55.7	55.7	55.7	55.7	0	0	-	-	-
R7			0	0	0	169.85	-14.1	57.7	57.7	57.7	57.7	0	0	-	-	-
R8			0	0	265	47.62	-0.97	69.8	69.8	69.8	69.8	0	0	-	-	-
R9			0	0	265	166.58	6.31	62.1	62.1	62.1	62.1	0	0	-	-	-
R10			0	0	265	218.43	7.93	58.5	56.5	56.5	56.5	0	0	-	-	-
R11			0	0	265	380.93	16.34	51.2	51.2	51.2	51.2	0	0	-	-	-
R12			0	0	265	553.89	45.13	41	41	41	41	0	0	-	-	-

Case: Future Parcel P19161 - Noise Control

Receiver

Name	M.	ID	Level Lr Day (dBA)	Night (dBA)	Limit. Value Day (dBA)	Night (dBA)	Land Use Type	Auto	Height Noise Type	(m)	Coordinates R (m)	Y (m)	Z (m)
R1			36.3	36.3	0	0	x		Total	1.5 r	329.67	498.25	97.28
R2			38.7	38.7	0	0	x		Total	1.5 r	368.7	607.92	102.78
R3			40.1	40.1	0	0	x		Total	1.5 r	632.11	860.75	101.35
R4			40.3	40.3	0	0	x		Total	1.5 r	670.92	902.8	97.85
R5			43.3	43.3	0	0	x		Total	1.5 r	688	932.95	95.34
R6			53.8	53.8	0	0	x		Total	1.5 r	912	1020.26	74.29
R7			55	55	0	0	x		Total	1.5 r	1056.42	1036.62	67.88

R8		59	59	0	0	x	Total	1.5 r	1157.04	758.73	71.22
R9		57.2	57.2	0	0	x	Total	1.5 r	1101.06	596.39	78.5
R10		54.7	54.7	0	0	x	Total	1.5 r	1157.85	544.42	80.12
R11		51.2	51.2	0	0	x	Total	1.5 r	1156.77	377.39	88.53
R12		41.7	41.7	0	0	x	Total	1.5 r	1054.05	206.67	117.32

Embankment

Name	M.	ID	ref. Height	Slope 1:00 (m)	Top Width	x (m)	y (m)	z (m)	Ground (m)
			(m)						
Berm			3.66	0.5	1	1118.61	490.09	87.03	87.03
						1127.98	748.19	71.51	71.51
Berm			4.88	0.5	1	1124.65	745.36	71.81	94
						1121.33	782.19	70.77	94
						1020.58	845.93	76.69	94
						930.98	865.77	83.81	94

Result Table

Receiver		Land Use	Limiting Value		rel. Azis			Lr w/o Noise Control		cL req.		Lr w/ Noise Control		Exceeding		passive NC
Name	ID		Day	Night	Station	Distance	Height	Day	Night	Day	Night	Day	Night	Day	Night	
			dB(A)	dB(A)	m	m	m	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
R1			0	0	352	420.96	-2.94	36.3	36.3	36.3	36.3	0	0	-	-	-
R2			0	0	352	334.88	2.54	38.7	38.7	38.7	38.7	0	0	-	-	-
R3			0	0	309	157.32	9.31	40.1	40.1	40.1	40.1	0	0	-	-	-
R4			0	0	85	149.86	6.63	40.3	40.3	40.3	40.3	0	0	-	-	-
R5			0	0	61	157.34	5.05	43.3	43.3	43.3	43.3	0	0	-	-	-
R6			0	0	0	107.45	-7.79	53.8	53.8	53.8	53.8	0	0	-	-	-
R7			0	0	0	169.85	-14.1	55	55	55	55	0	0	-	-	-
R8			0	0	280	202.84	-15.16	59	59	59	59	0	0	-	-	-
R9			0	0	345	68.37	-6.48	57.2	57.2	57.2	57.2	0	0	-	-	-
R10			0	0	345	47.88	-4.86	54.7	54.7	54.7	54.7	0	0	-	-	-
R11			0	0	345	179.74	3.55	51.2	51.2	51.2	51.2	0	0	-	-	-
R12			0	0	250	312.01	-9.59	41.7	41.7	41.7	41.7	0	0	-	-	-

CadnaA Input Output
Project: McLucas & Associates - Lake Erie Pit Expansion
Case: Future Parcel P18164 - No Noise Control

Receiver

Name	M.	ID	Level Lr Day (dBA)	Level Lr Night (dBA)	Limit. Value Day (dBA)	Limit. Value Night (dBA)	Land Use Type	Land Use Auto	Noise Type	Height (m)	Coordinates X (m)	Y (m)	Z (m)
R1			39.3	39.3	0	0		x	Total	1.5 r	329.67	478.25	97.29
R2			38.2	38.2	0	0		x	Total	1.5 r	368.7	607.92	102.78
R3			39.4	39.4	0	0		x	Total	1.5 r	632.11	860.75	101.35
R4			39.1	39.1	0	0		x	Total	1.5 r	670.92	902.8	97.85
R5			39.8	39.8	0	0		x	Total	1.5 r	688	932.95	95.34
R6			52.1	52.1	0	0		x	Total	1.5 r	912	1020.28	74.29
R7			53.3	53.3	0	0		x	Total	1.5 r	1056.42	1096.82	67.98
R8			64.7	64.7	0	0		x	Total	1.5 r	1157.04	758.73	71.22
R9			65.8	65.8	0	0		x	Total	1.5 r	1161.68	536.99	74.5
R10			64.3	64.3	0	0		x	Total	1.5 r	1157.85	544.42	80.11
R11			53.8	53.8	0	0		x	Total	1.5 r	1156.77	377.39	88.53
R12			43.8	43.8	0	0		x	Total	1.5 r	1034.05	206.67	117.32

Point Source

Name	M.	ID	Result. PWL Day (dBA)	Result. PWL Evening (dBA)	Result. PWL Night (dBA)	Lw / Li Type	Value	norm. dB(A)	Correction Day dB(A)	Correction Evening dB(A)	Correction Night dB(A)	Sound Reduction R	Sound Reduction Area (m²)	Attenuatio Operating Time Day (min)	Attenuatio Operating Time Special (min)	Attenuatio Operating Time Night (min)	K0 (dB)	Freq. (Hz)	Direct.	Height (m)	Coordinates X (m)	Y (m)	Z (m)
Rock Crusher			118.6	118.6	118.6	Lw	ML11		0	0	0							@	500 (none)	4 r	817.76	742.97	94.84
Rock Screen			122.9	122.9	122.9	Lw	ML12		0	0	0							@	500 (none)	4 r	826.35	749.65	93.98

Area Source

Name	M.	ID	Result. PWL Day (dBA)	Result. PWL Evening (dBA)	Result. PWL Night (dBA)	Result. PWL" Day (dBA)	Result. PWL" Evening (dBA)	Result. PWL" Night (dBA)	Lw / Li Type	Value	norm. dB(A)	Correction Day dB(A)	Correction Evening dB(A)	Correction Night dB(A)	Sound Reduction R	Sound Reduction Area (m²)	Attenuatio Operating Time Day (min)	Attenuatio Operating Time Special (min)	Attenuatio Operating Time Night (min)	K0 (dB)	Freq. (Hz)	Direct.	Moving Pt. Src Number Day	Evening	Night
P13108 No Activity			0	0	0	0	0	0	Lw			0	0	0							@	(none)		
Processing Area Permitted Excavator			90.4	90.4	90.4	54.9	54.9	54.9	Lw	ML3		0	0	0							@	(none)		
Processing Area Permitted Dump Truck			116	116	116	80.6	80.6	80.6	Lw	RCNM6		0	0	0							@	(none)		
Processing Area Permitted Loader			113.3	113.3	113.3	77.8	77.8	77.8	Lw	RCNM5		0	0	0							@	(none)		
Processing Area Permitted Loader			113.3	113.3	113.3	77.8	77.8	77.8	Lw	RCNM5		0	0	0							@	(none)		
P19162 Permitted Loader			0	0	0	0	0	0	Lw			0	0	0							@	(none)		
P19162 Permitted Dump Truck			0	0	0	0	0	0	Lw			0	0	0							@	(none)		
P19162 Permitted Loader			0	0	0	0	0	0	Lw			0	0	0							@	(none)		
P19165 Permitted & Expanded Excavator			0	0	0	0	0	0	Lw			0	0	0							@	(none)		
P19165 Permitted & Expanded Dump Truck			0	0	0	0	0	0	Lw			0	0	0							@	(none)		
P19165 Permitted & Expanded Loader			0	0	0	0	0	0	Lw			0	0	0							@	(none)		
P19155 Addin Excavator			0	0	0	0	0	0	Lw			0	0	0							@	(none)		
P19155 Addin Dump Truck			0	0	0	0	0	0	Lw			0	0	0							@	(none)		
P19155 Addin Loader			0	0	0	0	0	0	Lw			0	0	0							@	(none)		
P19158/P90028 Addin Excavator			0	0	0	0	0	0	Lw			0	0	0							@	(none)		
P19158/P90028 Addin Dump Truck			0	0	0	0	0	0	Lw			0	0	0							@	(none)		
P19158/P90028 Addin Loader			0	0	0	0	0	0	Lw			0	0	0							@	(none)		
P19161 Addin Excavator			0	0	0	0	0	0	Lw			0	0	0							@	(none)		
P19161 Addin Dump Truck			0	0	0	0	0	0	Lw			0	0	0							@	(none)		
P19161 Addin Loader			0	0	0	0	0	0	Lw			0	0	0							@	(none)		
P19164 Addin Excavator			124.8	124.8	124.8	76.3	76.3	76.3	Lw	ML1		0	0	0							@	(none)		
P19164 Addin Dump Truck			116	116	116	67.5	67.5	67.5	Lw	RCNM6		0	0	0							@	(none)		
P19164 Addin Loader			113.3	113.3	113.3	64.8	64.8	64.8	Lw	RCNM5		0	0	0							@	(none)		

Area Source Coordinates

Name	x (m)	y (m)	z (m)	Ground (m)
P13108	780.6	917.33	94.71	93.21
	717.31	911.06	100.79	99.29
	710.36	874.17	112.29	110.79
	936.69	862.64	84.7	83.2
	945.36	914.89	83.58	82.08
	925.06	925.86	84.41	82.91
	823.97	937.18	90.08	88.58
Processing Area	780	775	92.94	91.44
	780	725	93.98	92.48
	850	725	95.57	94.07
	850	775	89.78	88.28
P19162 Permitted	710.74	872.97	112.78	111.28
	686.53	745.6	100.43	98.93
	779.9	744.72	92.94	91.44
	779.95	775.11	92.94	91.44
	650.34	775.36	89.75	88.25
	650.19	744.27	92.47	90.97
	921	744.11	96.5	95
	934.94	861.12	84.93	83.43
P18165 Permitted & Expanded	686.87	744.93	99.97	98.47
	676.25	357.55	123.42	121.92
	910.98	357.51	129.3	128
	920.79	743.42	96.69	95.19
	850.2	744.05	92.49	90.99
	650.22	724.85	95.63	94.13
	779.87	724.85	94.02	92.52
	779.83	744.55	92.94	91.44
P19155	605.05	745.19	120.64	119.14
	694.65	745.19	101.58	100.09
	708.12	857.28	117.16	115.66

P19158/P90228 Addin	605.84	744.3	120.94	119.44
	595.11	744.71	101.11	99.61
	664.44	681.9	129.19	127.69
	419.59	474.03	104.86	101.36
	503	623.51	110.52	109.02
P19161 Addin	935.43	861.38	84.85	83.35
	921.54	745.18	96.3	94.7
	1111.84	746	73.88	72.38
	1112.93	781.32	72.92	71.42
	1013.3	842.82	78.79	77.29
P19164 Addin	911.58	556.22	129.49	127.99
	676.04	556.01	123.42	121.93
	665.77	462.19	129.37	127.87
	1111.7	468	90.41	88.91
	1124.01	744.29	73.34	71.84
	922.52	741.44	96.37	95.07

Roadways

Name	M.	ID	Lme Day (dBA)	Evening (dBA)	Night (dBA)	Count Data DTV	Str.class.	exact Count Data M Day	Evening	Night	p (%) Day	Evening	Night	Speed Limit Auto (km/h)	Truck (km/h)	SCS Dist.	Surface Dsurb (dB)	Type	Gradient (%)	Mult. Reflection Dref (dB)	Rbuild (m)	Dist. (m)	x (m)	y (m)	z (m)	Ground (m Dist (m)	LSlope (%)
Existing			34.5	0	0			13	0	0	0	0	0	32		0	0	1	0	0			945.02	918.03	82.08	82.08	
																							879.78	847.42	85.34	85.34	
																							849.39	822.39	86.69	86.69	
																							836.76	808.14	87.53	87.53	
																							817.94	772.33	90.07	90.07	
																							779.45	759.64	91.44	91.44	
																							735.78	739.6	91.44	91.44	
																							708.19	722.91	92.18	92.18	
																							695.39	708.21	97.06	97.06	
																							686.42	690.17	100.24	100.24	
																							707.54	686.32	98.5	98.5	
																							735.14	704.94	93.67	93.67	
																							773.65	715.21	94.95	94.95	
																							798.68	725.46	92.35	92.35	
																							825.64	765.27	89.63	89.63	
																							839.34	790.3	88.37	88.37	
Existing			34.5	0	0			13	0	0	0	0	0	32		0	0	1	0	0			854.52	834.59	86.37	86.37	
																							838.55	839.72	88.4	88.4	
																							815.37	885.3	89.77	89.77	
																							799.35	831.75	90.29	90.29	
																							779.43	798.29	91.44	91.44	
																							768.8	780.67	91.44	91.44	
																							765.31	768.48	91.44	91.44	
Parcel P19164			34.5	0	0			13	0	0	0	0	0	32		0	0	1	0	0			812.67	724.95	92.42	92.42	
																							1110.43	551.06	84.98	84.98	
Parcel P19184			34.5	0	0			13	0	0	0	0	0	32		0	0	1	0	0			794.61	715.1	93.23	93.23	
																							910.14	493.02	126.91	126.91	

Sound Levels

Name	ID	Type	Octave Spectrum (dB) Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	Source Bn
Front End Loader RCNM	RCNM5	Lw		0	0	0	0	116.5	0	0	0	0	113.3	116.5
Dump Truck RCNM	RCNM6	Lw		0	120	117	111	111	111	109	107	103	116	123.1
Excavator Breaker	ML1	Lw		0	121.2	119.2	120.2	122.2	120.2	117.2	113.2	107.2	124.8	123.3
Excavator loading	ML3	Lw		0	95.1	90.1	89.1	89.1	85.1	81.1	76.1	70.1	90.4	98.1
Bucket/Tractor	ML8	Lw		0	114.7	115.7	113.7	111.7	109.7	106.7	102.7	94.7	115.2	120.9
Rock Crusher	ML11	Lw		0	0	0	0	121.8	0	0	0	0	118.6	121.8
Screens	ML12	Lw		0	0	0	0	126.1	0	0	0	0	122.9	126.1

Result Table

Receiver Name	ID	Land Use	Limiting Value Day dB(A)	Night dB(A)	rel. Axis Station m	Distance m	Height m	Lr w/o Noise Control Day dB(A)	Night dB(A)	dL req. Day dB(A)	Night dB(A)	Lr w/ Noise Control Day dB(A)	Night dB(A)	Exceeding Day dB(A)	Night dB(A)	passive NC dB(A)
R1			0	0	352	420.98	-2.94	39.3	39.3	39.3	39.3	0	0	-	-	-
R2			0	0	352	334.98	3.54	38.2	38.2	38.2	38.2	0	0	-	-	-
R3			0	0	309	157.32	9.31	39.4	39.4	39.4	39.4	0	0	-	-	-
R4			0	0	85	149.86	6.63	39.1	39.1	39.1	39.1	0	0	-	-	-
R5			0	0	61	157.34	5.05	39.8	39.8	39.8	39.8	0	0	-	-	-
R6			0	0	0	107.45	-7.79	52.1	52.1	52.1	52.1	0	0	-	-	-
R7			0	0	0	169.85	-14.1	53.3	53.3	53.3	53.3	0	0	-	-	-
R8			0	0	289	202.84	-15.16	64.7	64.7	64.7	64.7	0	0	-	-	-
R9			0	0	345	68.37	-6.48	65.8	65.8	65.8	65.8	0	0	-	-	-
R10			0	0	345	47.88	-4.86	64.3	64.3	64.3	64.3	0	0	-	-	-
R11			0	0	345	179.74	3.55	53.8	53.8	53.8	53.8	0	0	-	-	-
R12			0	0	250	312.01	-9.59	43.8	43.8	43.8	43.8	0	0	-	-	-

Case: Future Parcel P19164 - Noise Control

Receiver Name	M.	ID	Level Lr Day (dBA)	Night (dBA)	Limit. Value Day (dBA)	Night (dBA)	Land Use Type	Auto	Noise Type	Height (m)	Coordinates X (m)	Y (m)	Z (m)
R1			39.3	39.3	0	0	*		Total	1.5 r	329.67	478.25	97.29
R2			38.2	38.2	0	0	*		Total	1.5 r	368.7	607.92	102.78
R3			39.4	39.4	0	0	*		Total	1.5 r	632.11	860.75	101.35
R4			39.1	39	0	0	*		Total	1.5 r	670.92	902.8	97.85

R5	39.8	39.8	0	0	x	Total	1.5 r	688	932.95	95.34
R6	51.9	51.9	0	0	x	Total	1.5 r	912	1030.28	74.29
R7	52.4	52.4	0	0	x	Total	1.5 r	1066.42	1026.82	67.98
R8	56.7	56.7	0	0	x	Total	1.5 r	1157.04	758.73	71.22
R9	58.1	58.1	0	0	x	Total	1.5 r	1161.08	986.99	78.5
R10	55.8	55.8	0	0	x	Total	1.5 r	1157.85	544.42	80.12
R11	53.1	53.1	0	0	x	Total	1.5 r	1156.77	377.39	98.53
R12	43.8	43.8	0	0	x	Total	1.5 r	1034.05	206.67	117.32

Embankment

Name	M.	ID	rel. Height (m)	Slope 1:00 (m)	Top Width	x (m)	y (m)	z (m)	Ground (m)
Berm			3.66	0.5	1	1118.61	490.09	97.03	97.03
						1127.98	748.19	71.51	71.51
Berm			4.88	0.5	1	1124.65	745.36	71.81	94
						1121.33	782.19	70.77	94
						1020.58	645.93	76.83	94
						930.98	865.77	63.81	94

Result Table

Receiver		Land Use	Limiting Value		rel. Axis			Lr w/o Noise Control		dL req.		Lr w/ Noise Control		Exceeding		passive NC
Name	ID		Day	Night	Station	Distance	Height	Day	Night	Day	Night	Day	Night	Day	Night	
			dB(A)	dB(A)	m	m	m	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
R1			0	0	352	420.98	-2.54	39.3	39.3	39.3	39.3	0	0	-	-	-
R2			0	0	352	334.98	2.54	38.2	38.2	38.2	38.2	0	0	-	-	-
R3			0	0	308	157.32	9.31	39.4	39.4	39.4	39.4	0	0	-	-	-
R4			0	0	85	149.86	6.63	39.1	39	39.1	39	0	0	-	-	-
R5			0	0	61	157.34	5.05	39.8	39.8	39.8	39.8	0	0	-	-	-
R6			0	0	0	107.45	-7.79	51.9	51.9	51.9	51.9	0	0	-	-	-
R7			0	0	0	169.85	-14.1	52.4	52.4	52.4	52.4	0	0	-	-	-
R8			0	0	280	202.84	-15.16	56.7	56.7	56.7	56.7	0	0	-	-	-
R9			0	0	345	68.37	-6.48	58.1	58.1	58.1	58.1	0	0	-	-	-
R10			0	0	345	47.88	-4.86	55.8	55.8	55.8	55.8	0	0	-	-	-
R11			0	0	345	179.74	3.55	53.1	53.1	53.1	53.1	0	0	-	-	-
R12			0	0	250	312.01	-9.59	43.8	43.8	43.8	43.8	0	0	-	-	-

PROJECT DRAWINGS

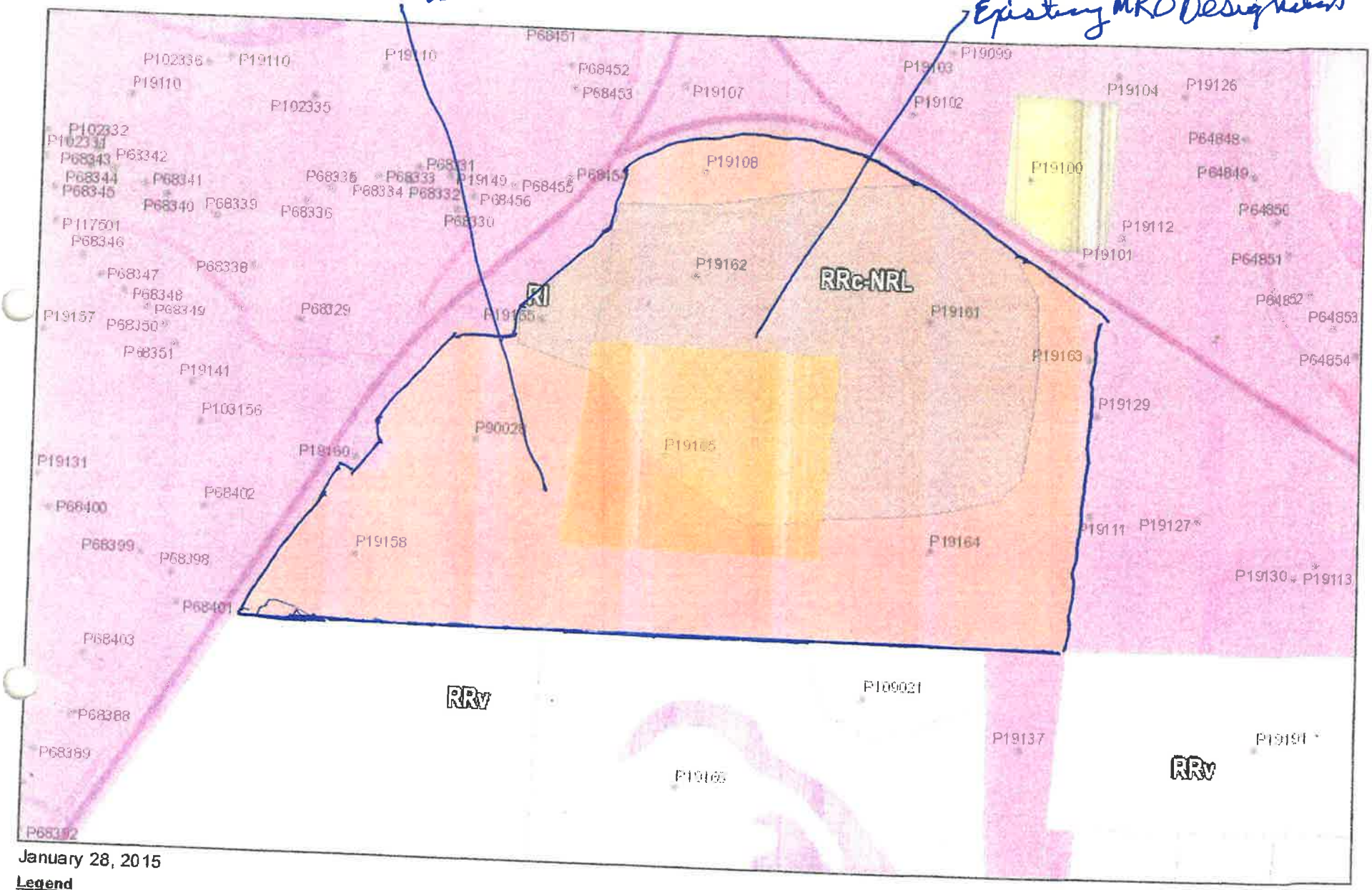
* Approved MRO Extension

Lake Erie Trucking (South Fidalgo)

Map of area with existing MRO, center, in crosshatch. MRO is expanded to entirety of parcels P19158, P90028, P19165, and P19164 highlighted in light orange.

PINK
NEW MRO EXPANSION

CROSSHATCH
Existing MRO Designation



January 28, 2015

Legend

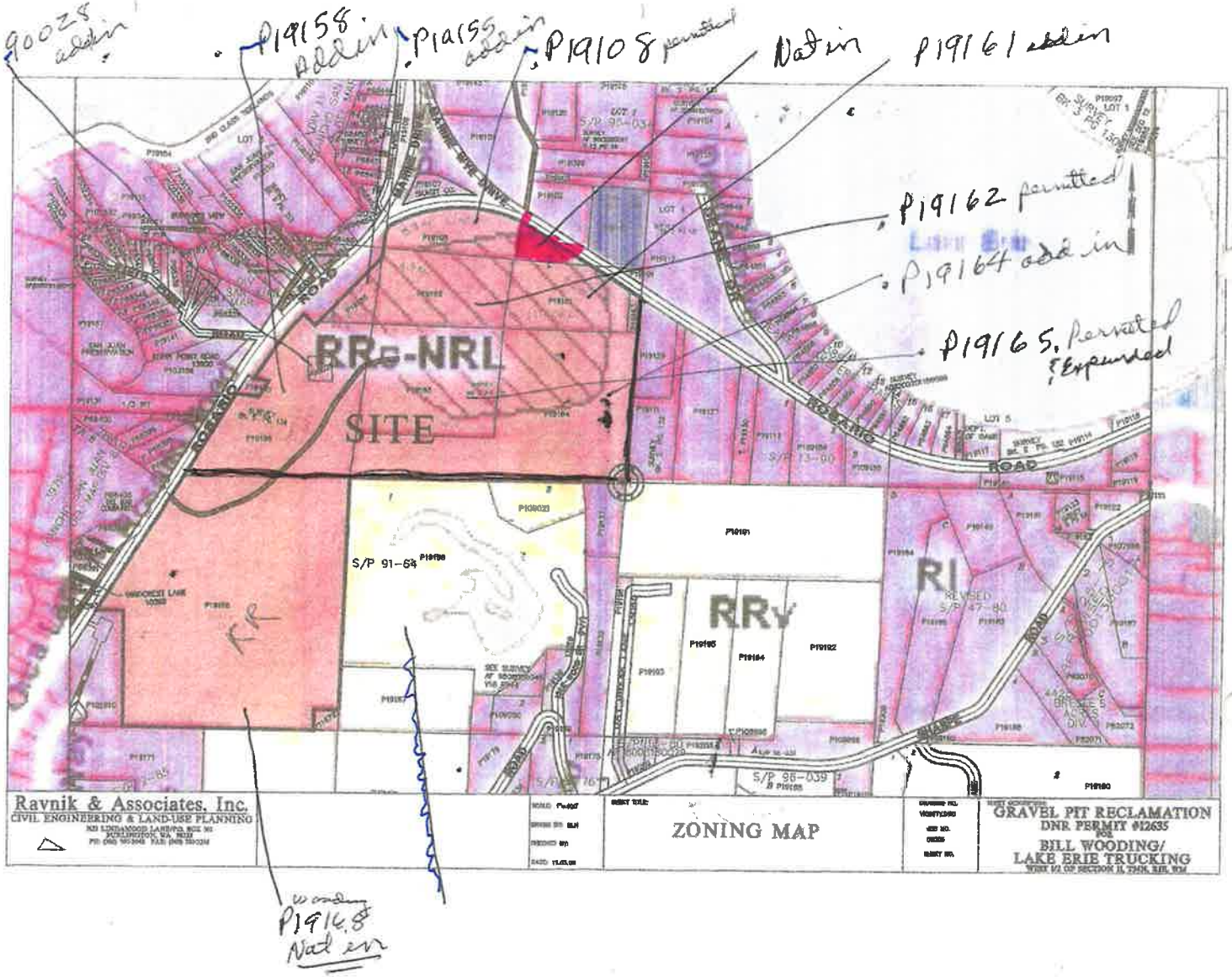
- County Boundary
- Incorporated Areas
- Airport Environs Overlay [AEO]
- UGA
- Water
- Dirt Accounts
- Senior Citizen Accounts
- Mobile Home Only Accounts
- Building Only Accounts
- Mineral Resource Overlay [MRO]
- Tax Par

1:4,514

0 0.0375 0.075 0.15 mi

0 0.05 0.1 0.2 km

Data Accuracy Warning: All GIS data was created from available public records and existing map sources. Map features have been adjusted to achieve a best-fit regi While great care was taken in this process, maps from different sources rarely agr precise bcation of geographic features. Map discrepancies can be as great as 30(


P19028 addin
P19158 addin
P19155 addin
P19108 permitted
Nat in
P19161 addin
P19162 permitted
P19164 addin
P19165 Permitted & Expanded
RRs-NRL
SITE
RRv
RI
S/P 91-84
S/P 96-039
ROSCOE ROAD
ZONING MAP
Ravnik & Associates, Inc.
CIVIL ENGINEERING & LAND-USE PLANNING
GRAVEL PIT RECLAMATION
DNR PERMIT #12635
FOR
BILL WOODING/
LAKE ERIE TRUCKING
Wooding
P19168
Nat in

WASHINGTON STATE DEPARTMENT OF
Natural Resources
Peter Goldmark - Commissioner of Public Lands

Aerial Photography Report

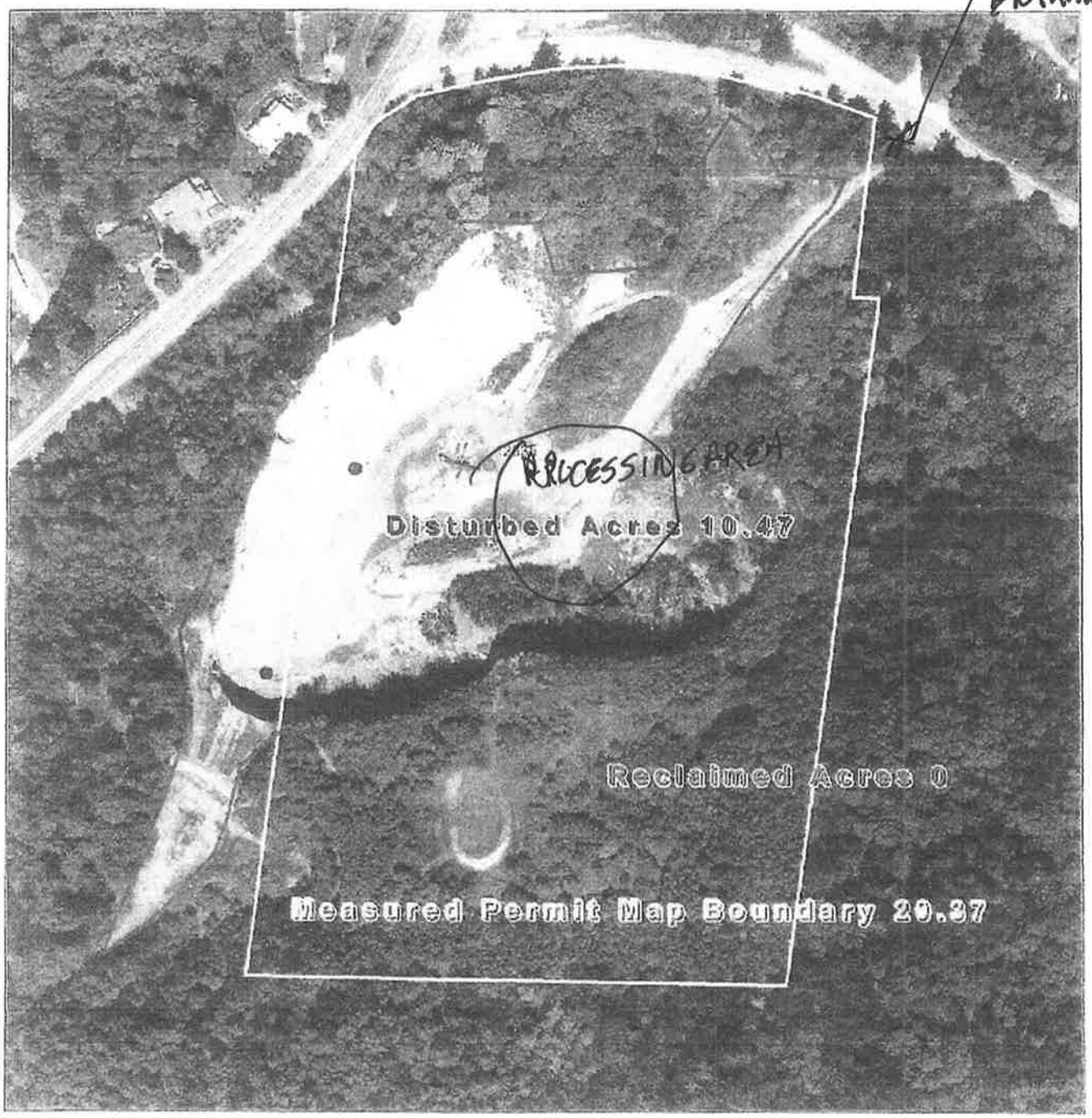


Photo Date:05/19/2011

Permit 70-0 12835

WILLIAM W WOODING
LAKE ERIE PIT

Inspected: 02/27/2013
by E. Newby

Legend

- field disturbed area
- permit boundary
- reclaimed area

0 55 110 220 330 440 Feet

N
W E
S

* Approved MRO Extension

Lake Erie Trucking (South Fidalgo)

Map of area with existing MRO, center, in crosshatch. MRO is expanded to entirety of parcels P19158, P90028, P19165, and P19164 highlighted in light orange.

BILL WOODING & Pit 1, LLC PARCEL OWNERSHIP

Current Mine Operation & Permits

(1) P19108 – 3.29 acres – Lake Erie Pit – DNR Permit # 70-012635
(2) P19162 – 4.49 acres – Lake Erie Pit – DNR Permit # 70-012635
(3) P19165 – 10.0 acres – Lake Erie Pit – DNR Permit # 70-012635
Total 17.78 acres

Over-Mining & Additional Expansion

(4) P19155 - 5.25 acres – Expansion area of existing mining permit
(5) P19158 - 8.97 acres – Expansion area of existing mining permit
(6) P90028 - .37 acres – Expansion area of existing mining permit
Total 14.59 acres

Additional Expansion

(7) P19161 – 4.27 acres – Additional expansion of existing mining permit (Note Eric Wooding part owner with Pit 1, LLC)
(8) P19164 – 16.86 acres – Additional expansion of existing mining permit

Total Acres: 53.5 acres
Land Use All 8 Parcels: Mining Activities & Related Services
Zoning All 8 Parcels: RRc-NRL

#1 - Mining Equipment

Cat 980C Loader

JD 844 "

Cat 980B "

Power Screen - Mdl Chieftan

Hitachi EX310 Excavator

Kenworth W900 Dump Trucks (Cummins E

ATTACHMENT E

LAKE ERIE PIT EXPANSION
AIR QUALITY MEMORANDUM

MAUL FOSTER ALONGI