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Mineral Resource Impact Assessment

Proposed Residential Development
Half Moon Bay South and
Quinn's Pointe Stage 2
Greenbank Road - Ottawa

Prepared For

Minto Communities

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May 25, 2018

Report PG4525-1

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Golder Associates Ltd. - Assessment of Dust Impacts from Aggregate Pits on Minto Communities Canada and Mattamy Homes Proposed Developments - Minto and Mattamy Dust Study - Project 1897372 - dated March 2018

1.0 Introduction

Paterson Group (Paterson) was commissioned by Minto Communities to conduct a mineral resource impact assessment for the proposed residential development at the aforementioned site and is required by Section 3.7.4 of the City of Ottawa Official Plan.

The objective of the current assessment was to evaluate the potential for land use impacts relating to land use compatibility between the proposed residential development and the adjacent mineral aggregate resources currently in operation. It is noted in Schedule A of the City of Ottawa Official Plan, the proposed development is located within the urban boundary expansion study area. The primary purpose of this area is to accommodate residential population growth.

Based on Section 2.5 of the Provincial Policy Statement 2014, mineral aggregate resources shall be protected from long term use and, where provincial information is available, deposits of mineral aggregate resources shall be identified.

2.0 Proposed Development

It is understood that the proposed residential development will consist of townhouses, singles, schools, parks, residential dwellings with attached garages, associated driveways, local roadways and landscaping areas. It is further understood that the proposed development will be serviced by future municipal water, sanitary and storm services.

3.0 Location and Surface Conditions

The subject site is bordered to the west by undeveloped land and the existing mineral resource pits, to the north by existing residential development, to the east by existing residential and Greenbank Road and to the south by Barnsdale Road. The subject locations are identified in Drawing PG4525-1 - Existing Conditions.

The subject site is a mix of undeveloped, former agricultural land and forested areas. The subject site has significant topographical relief. The ground surface elevation within the central portion of the subject site is approximately ±110 m at its highest, along the west side is at 107 to ±109 m, and drops to 101 to ±104 m in the southeast portion of the site. Multiple fill piles and large areas currently excavated to several meters below original grade were observed within the east portion of the subject site in the Brazeau Pit.

4.0 Adjacent Sand and Gravel Pit

4.1 Status, Type and Location of Pit Operation

Costello Pit (Drummond Pit)

The sand and gravel pit, also known as the Costello Pit, to the west of the subject site is located at 3713 Borrisokane Road and is owned by George W. Drummond Limited. Details of the pit are provided below and attached to the current report. A series of historical aerial photographs have been attached to the present letter to provide an extraction history of the aggregate resource.

The legal description of the pit is CON 3RF PT LOT 9 RP 5R-6254; PART 2 LESS RP 5R-13374 PTS; 9 & 10 RD WIDENING, PIN 045920035.

The site consists of approximately 79.5 acres with a frontage of approximately 310 m along Borrisokane Road. Based on the Ministry of Natural Resources and Forestry database, the following information has been provided for the pit:

- ❏ Site ID: 4074
- ❏ Approval Type: Class A Licence
- ❏ Operation Type: Pit
- ❏ Max. Annual Tonnage: 350,000
- ❏ Licenced Area: 22.3 ha
- ❏ Location Name: n/a

Marcel Brazeau Pit (Todd Pit)

The sand and gravel pit, also known as the Todd Pit owned by Marcel Brazeau, is located to the south of the Costello Pit, and west of the subject site and is located at 3809 Borrisokane Road. Details of the pit are provided below and attached to the current report. A series of historical aerial photographs have been attached to the present letter to provide an extraction history of the aggregate resource.

The legal description of the pit is CON 3 RF W PT LOT 8;RP5R-13403 PARTS 2 AND 3;LESS RP 5R-13374 PARTS 15 &;16, PIN 045920037.

The site consists of approximately 93.39 acres. Based on the Ministry of Natural Resources and Forestry database, the following information has been provided for the pit:

- ❏ Site ID: 4219
- ❏ Approval Type: Class A Licence
- ❏ Operation Type: Pit
- ❏ Max. Annual Tonnage: 300,000
- ❏ Licenced Area: 43.7 ha
- ❏ Location Name: n/a

4.2 City of Ottawa Official Plan

The subject site is designated General Rural Area on Schedule A - 'Rural Policy Plan' of the City's Official Plan. The properties north and east of the subject site are designated as General Urban Area and to the west as General Rural Area on Schedule A of the Official Plan. The property to the northwest of the subject site is designated Sand and Gravel Resource Area on Schedule A of the Official Plan. It should be noted that an Urban Expansion Study Area has also been designated to the subject site.

Given the subject sites proximity to a designated Sand and Gravel Resource Area on Schedule A of the City's Official Plan, the proposed residential development is required to adhere to restrictions outlined in Policies 10, 11, 12 and 13 of Section 3.7.4 of the City's Official Plan - Development Restriction on Adjacent Lands listed below.

Policy 10:
Limited types of new development may be approved within 500 metres of a Bedrock Resource Area or within 300 metres of a Sand and Gravel Resource Area, provided such development does not conflict with future mineral aggregate extraction.

Policy 11:
Where there is an existing licensed pit or quarry, development may be approved within the area of potential impact, referenced in policy 10, where an impact assessment study is completed and demonstrates that the mineral aggregate operation, including future expansion in depth or extent, will not be affected by the development.

Policy 12:
The Ministry of Natural Resources will be consulted in review of studies necessary.

***Policy 13**:*
Where the City approves the development of land in accordance with policies above, the City may impose conditions to ensure the development provides adequate buffering and/or separation between the new proposed use and the mineral aggregate area/operation.

4.3 Provincial Standards - Aggregate Resources of Ontario

The existing sand and gravel pit northwest of the subject site is currently being developed as an open pit. For the purpose of this report, it is understood that the future development of the sand and gravel pit will be on the basis of a licence for a pit to extract resources to an elevation below the water table (Category 1 Licence - Class "A" pit below water).

Based on the Operational Standards Section of the Aggregate Resources of Ontario: Provincial Standards, Version 1.0, excavation setbacks are required for all licenced mineral aggregate operations. Excavation setbacks are defined in **Section 5.10** of the Operational Standards for a Category 1 Licence as the following:

5.10.1 fifteen metres from the boundary of the site;
5.10.2 thirty metres from any part of the boundary of the site that abuts:
- ***5.10.2.1*** a highway,
- ***5.10.2.2*** land in use for residential purposes at the time the licence was issued, or
- ***5.10.2.3*** land restricted to residential use by a zoning by-law when the licence was issued; or

5.10.3 thirty metres from any body of water that is not the result of excavation below the water table; "

Based on Section 5.10 of the Operational Standards for a Category 1 Licence, a minimum setback of 15 m will be required from the property boundary of the pit operation along the western and northern border of the proposed residential development. It is understood that the 15 m setback will be applied on the adjacent owner's land.

5.0 Compatibility and Mitigation Analysis

Based on recent discussions with the Owner of the Costello Pit (Drummond Pit), it is understood that the aggregate resource located at 3713 Borrisokane Road and adjacent to the northwest property boundary of the proposed residential development is currently in operation and is expected to continue for 5 to 7 years. However, upon review of the Brazeau Pit, the above water table extraction has been completed for the eastern portion of the pit, extending the extraction westward. It is unknown if any below water table extraction will take place. As a worst case scenario, it is it be assumed that the Brazeau Pit will continue to be in operation for the foreseeable future.

An existing residential development is located to the east of the two aforementioned sand and gravel pits. It should be noted that the two pits are already impacted by the adjacent land uses of the existing residential development. Therefore, the proposed development will not add to the additional burden on the continued operation of the sand and gravel pits.

5.1 Noise

A Stationary Noise Source Study was completed for Quinn's Pointe Stage 2 by Valcoustics Canada Ltd and can be found in Appendix 2.

Brazeau Pit

Information included in the noise impact assessment indicates that the Brazeau Pit has completed the above water table extraction of the eastern portion of the pit. It is further understood that the working face is currently at about the midpoint of the site, heading west. At the time of writing the report, it was unknown if below the water table extraction was to be completed. The conservative approach would be to assume that below water extraction may occur in the future. Due to the anticipated noise levels generated by the continued extraction on the Brazeau Pit, mitigation measures will be required for dwellings in close proximity to this pit. Based on the analysis, a sound barrier may be constructed to reduce the noise levels to an acceptable limit, but would need to be unreasonably high. Therefore, it was proposed that the first row of dwellings to the south and east of the Brazeau Pit be held, in addition to the construction of sound barriers that range in height from 4.5 m to 9 m. Once the operations at the pit have been completed, the sound barrier requirement can be removed and the dwellings on hold can be constructed.

Drummond Pit

Information included in the noise impact assessment indicates that the Drummond Pit (Costello Pit) has sufficient aggregate for approximately 5 additional years of operation. Therefore, it is assumed that this pit is nearing the end of their operations. Additionally, it was noted that all extraction along the western portion has been completed and has been rehabilitated. For the noise analysis, a worst case scenario was devised in order to obtain a conservative result. This scenario indicates that the noise levels of the closest dwellings to Drummond Pit will be exceeded, requiring sound mitigation measures to be implemented. However, provided the noise mitigation measures outlined for the Costello Pit are abided by, no additional mitigation measures will be required.

5.2 Traffic

It is understood that the current truck route for the operation at the Costello Pit and Todd Pit is Borrisokane Road and will continue utilizing the road for future operations, while the proposed residential development will be accessed primarily from the realigned Greenbank Road. It should be noted that the proposed development is not anticipating to have any frontage along Borrisokane Road. As such, the additional traffic generated by the proposed development will not preclude or hinder future pit operations, nor will truck traffic generated by the pit operation interfere with the proposed development. Therefore, no potential compatibility impacts are anticipated between the proposed residential development and the current and future operation of the Costello Pit or Todd Pit.

5.3 Dust

A Dust impact assessment was completed by Golder Associates Ltd and can be referenced in Appendix 2. This report indicates that the estimated dust emissions are below the Schedule 3 TSP limit at the adjacent property boundary of the proposed residential development. Therefore, provided that the resource pits continue to operate in a similar manner and they implement their BMP Plan to minimize dust migration off-site, the levels are anticipated to remain at acceptable levels. Therefore, additional dust mitigation measures for the current and future operations of the sand and gravel pits will not be required.

5.4 Vibration

It is understood that current and future operations for the sand and gravel pits will not require blasting for excavation purpose. As a result, sources of vibration from the operation are limited to hauling and excavation equipment only, and have minimal impact on the proposed residential development. Similarly, blasting will not be required for excavation purposes during the construction stages of the proposed residential development, as such, sources of vibrations will be limited to oversized vehicles and construction equipment. Therefore, additional vibration mitigation measures will not be required for the sand and gravel pit or the proposed residential development as the potential impact of vibrations will be minimal.

5.5 Groundwater

It is understood that the subject site will be connected to municipal water and sewer services and will not adversely impact the groundwater levels of the current and future operations of the sand and gravel pit. Based on recent discussions with the Owner of the Brazeau Pit, excavation work below the groundwater table was completed in select areas of the deposit and may continue in the future. Based on the Operation Plan of the Costello Pit and Todd Pit attached to the current report, it is understood that the long-term groundwater level is expected to be at a geodetic elevation of approximately 95 m. The owner noted that excavation methods below the groundwater table at the sand and gravel pit consists of dredging techniques. Due to dredging techniques implemented at the sand and gravel pit, the operation will not adversely impact the groundwater levels within the proposed residential development.

6.0 Conclusions

Based on the technical studies relating to noise and dust by others, as well as Paterson's review of the subject site, the proposed residential development will not negatively impact the current and future operation of the aggregate resource pit. Provided that the sound mitigation measures outlined in the Stationary Noise Source Study Report, prepared by Valcoustics Canada Inc and is located in Appendix 2, any excessive noise will be mitigated to acceptable levels and should not negatively impact the proposed development. However, all houses within the 300 m area of influence should contain the following warning clause:

> "Purchasers are advised that due to the proximity of the adjacent gravel pit operations, sound from the gravel pits may, at times, be audible"

It is expected that the operation of the aggregate resource pit will continue to adhere to the Aggregate Resources of Ontario Provincial Standards, Version 1, as well as the adjacent property owners.

7.0 Statement of Limitations

The recommendations provided in this report are in accordance with our present understanding of the project.

The present report applies only to the project described in this document. Use of this report for purposes other than those described herein or by person(s) other than Minto Communities, or their agent(s) is not authorized without review by Paterson Group for the applicability of our recommendations to the altered use of the report.

Paterson Group Inc.

May 25, 2018

Stephanie A. Boisvenue,P.Eng.

David J. Gilbert, P.Eng.

Report Distribution:

- ❑ Minto Communities (3 copies)
- ❑ Paterson Group (1 copy)

APPENDIX 1

DRAWING PG4525-1 - Existing Conditions

Historical Aerial Photographs

Aggregate Resource - Drummond Pit

Aggregate Resource - Brazeau Pit

The Base Mapping Co. Ltd.- Existing Features Plan - Costello Pit - Project No. C 419-90 - Page No. 1 of 2 - Revision 1 dated September 9, 1996

The Base Mapping Co. Ltd. - Operation and Rehabilitation Plan - Costello Pit - Project No. C 419-90 - Page 2 of 2 - Revision 2 dated May 17, 1999

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NO.	REVISIONS	DATE	INITIAL
0			

MINTO COMMUNITIES

MINERAL RESOURCE IMPACT ASSESSMENT
HALF MOON BAY SOUTH & QUINN'S POINT STAGE 2

OTTAWA, ONTARIO

Title:

EXISTING CONDITIONS

Scale: 1:10000	Date: 05/2018
Drawn by: MPG	Report No.: PG4525-1
Checked by: SB	Dwg. No.: PG4525-1
Approved by: DJG	Revision No.: 0

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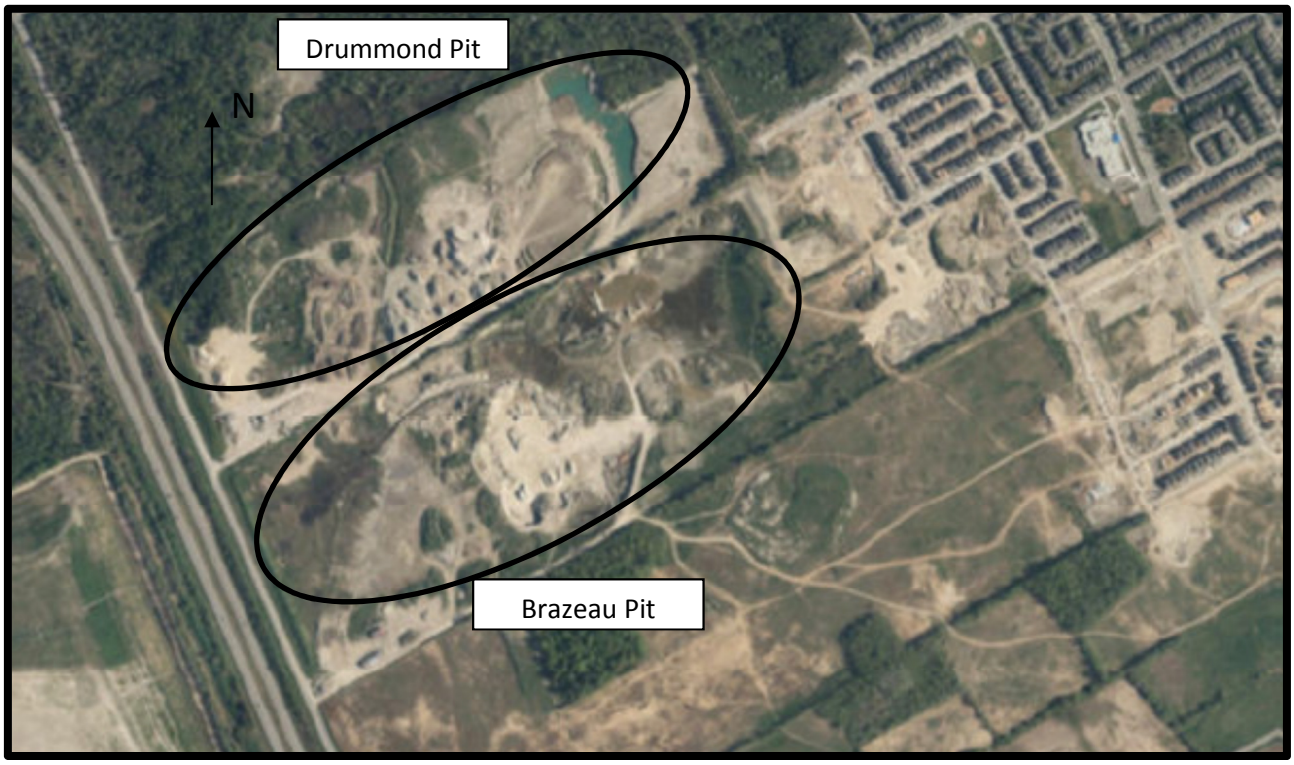


FIGURE 1

HISTORICAL PHOTOGRAPH - 2017

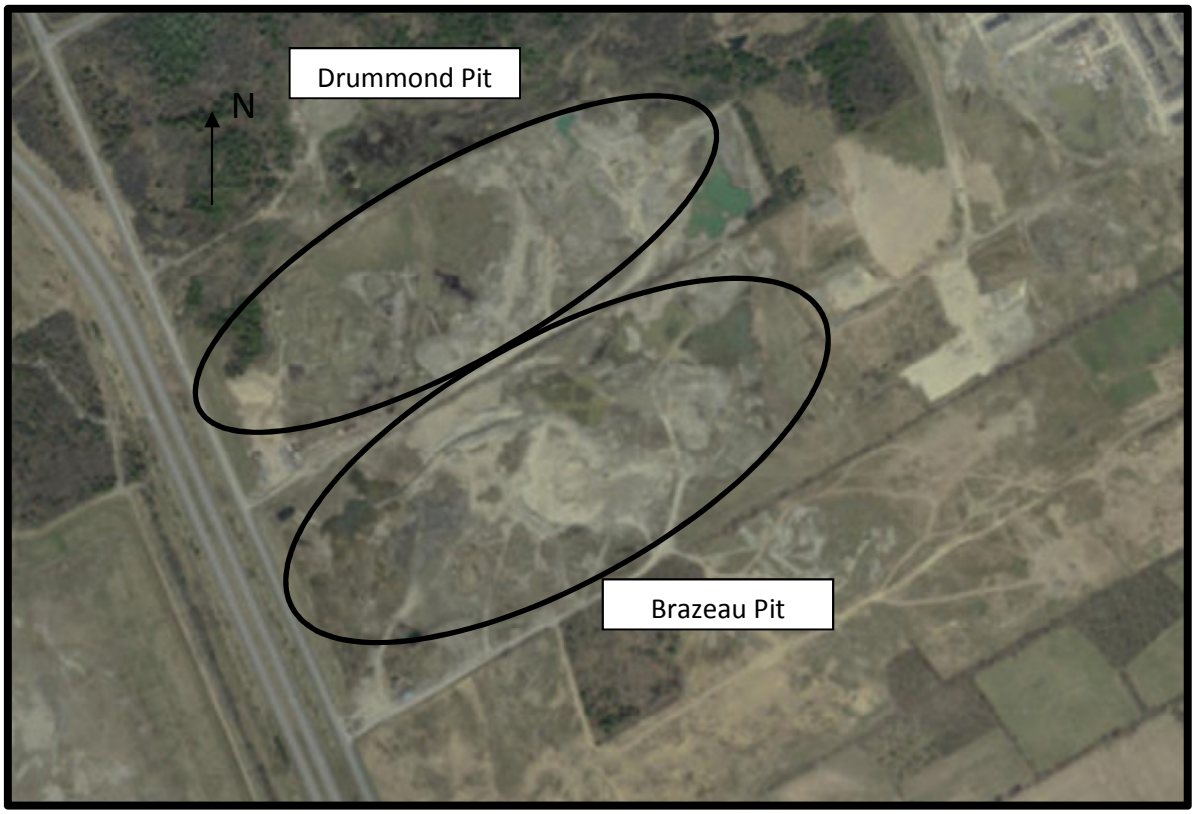


FIGURE 2

HISTORICAL PHOTOGRAPH - 2014

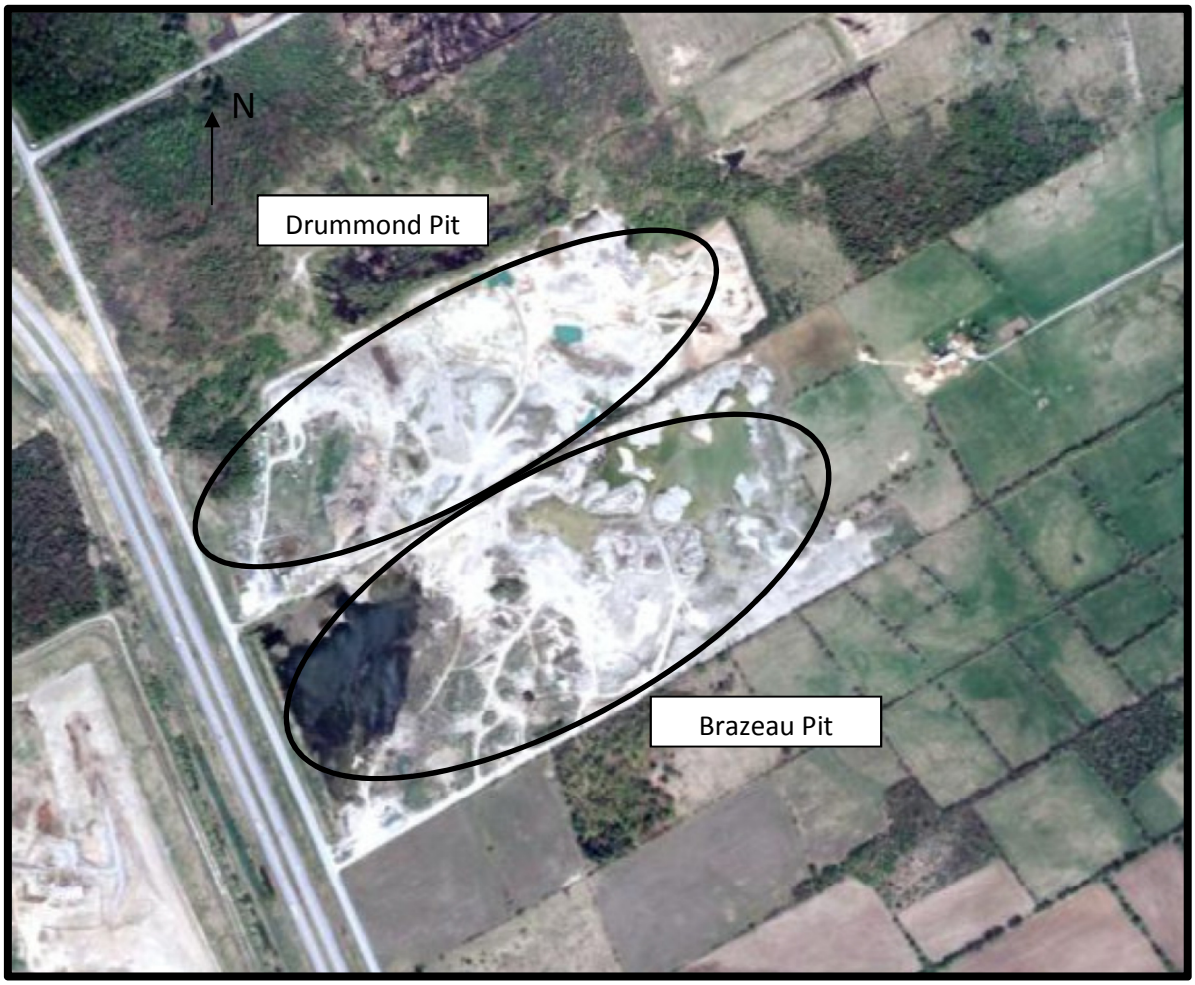


FIGURE 3

HISTORICAL PHOTOGRAPH - 2008

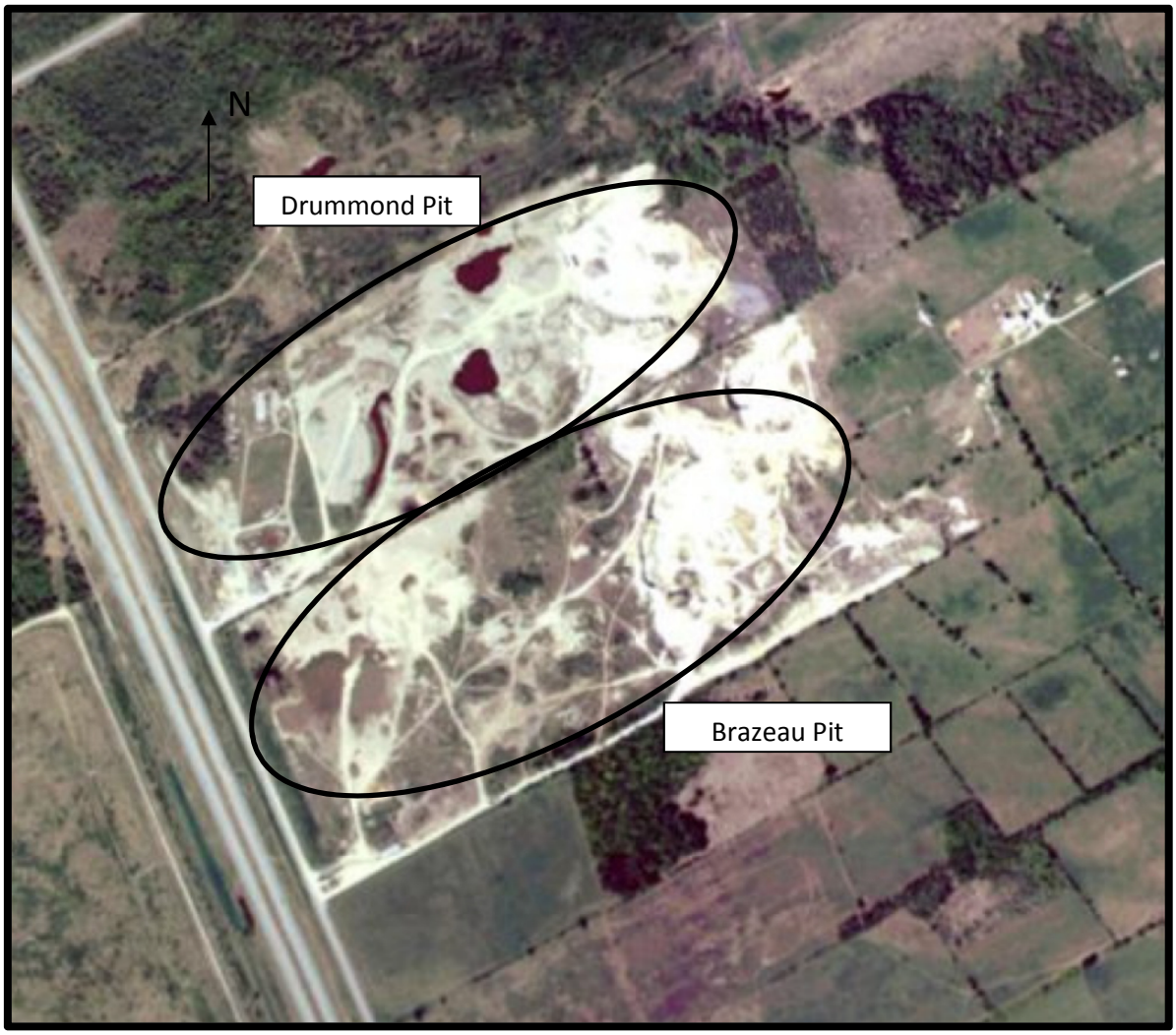


FIGURE 4

HISTORICAL PHOTOGRAPH - 1999

Ontario

PRINT

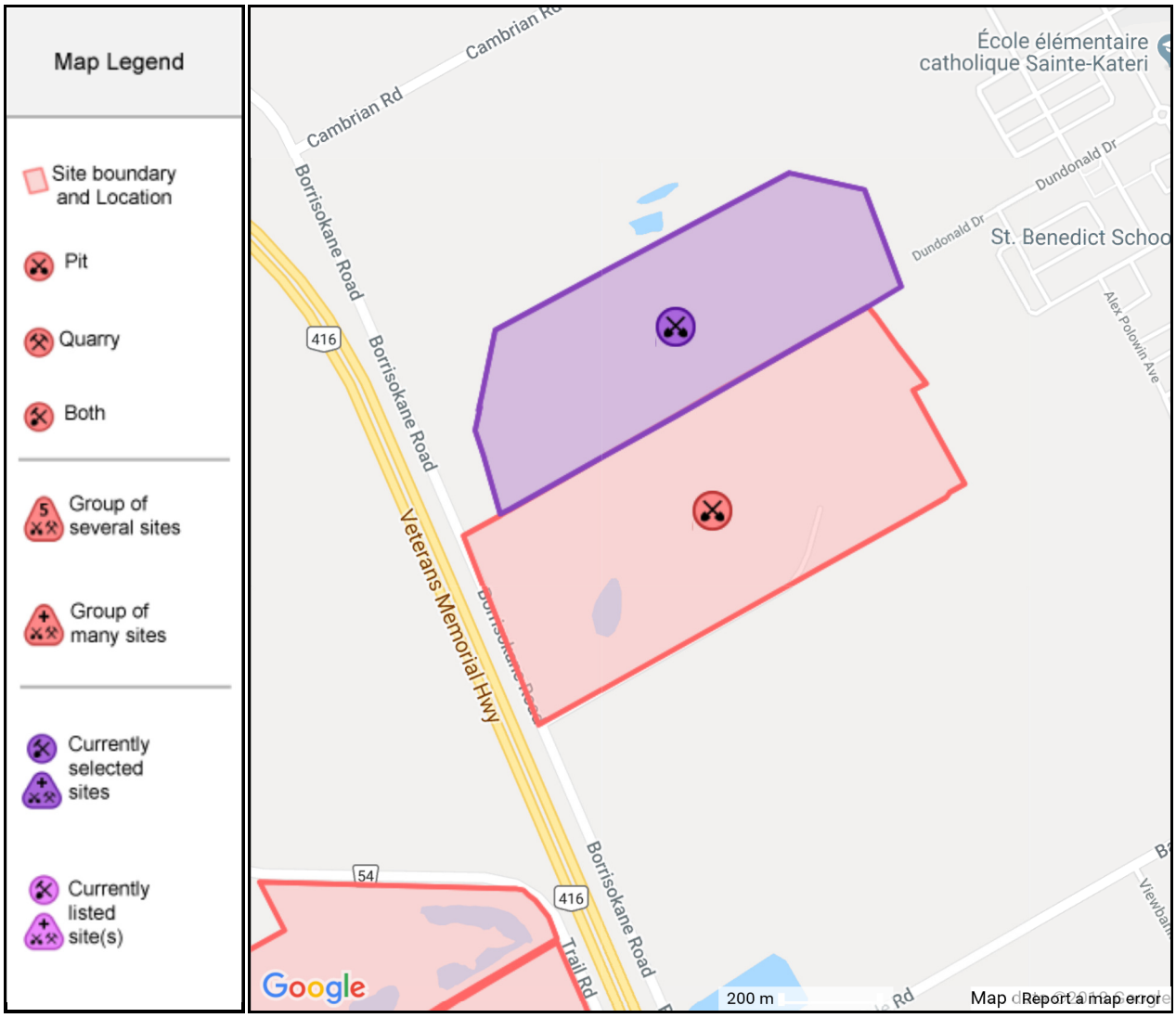
Search Criteria

Geographic Location: Cluster selected. Centre of map is: -75.747927°N,45.237616°W

Approval Type: Class A Licence-or-Class B Licence-or-Aggregate Permit-or-Wayside Permit-or-MTO Permit

Operation Type: Pit-or-Quarry

Search Results (1)



Site ID	Client Name	Approval Type	Operation Type
4074	George W. Drummond Limited	Class A Licence	Pit
	Location Name	**Max. Annual Tonnage**	**Licenced Area (ha)**
		350000	22.3

Created on Friday, May 18, 2018

Ontario

PRINT

Marcel Brazeau Limited

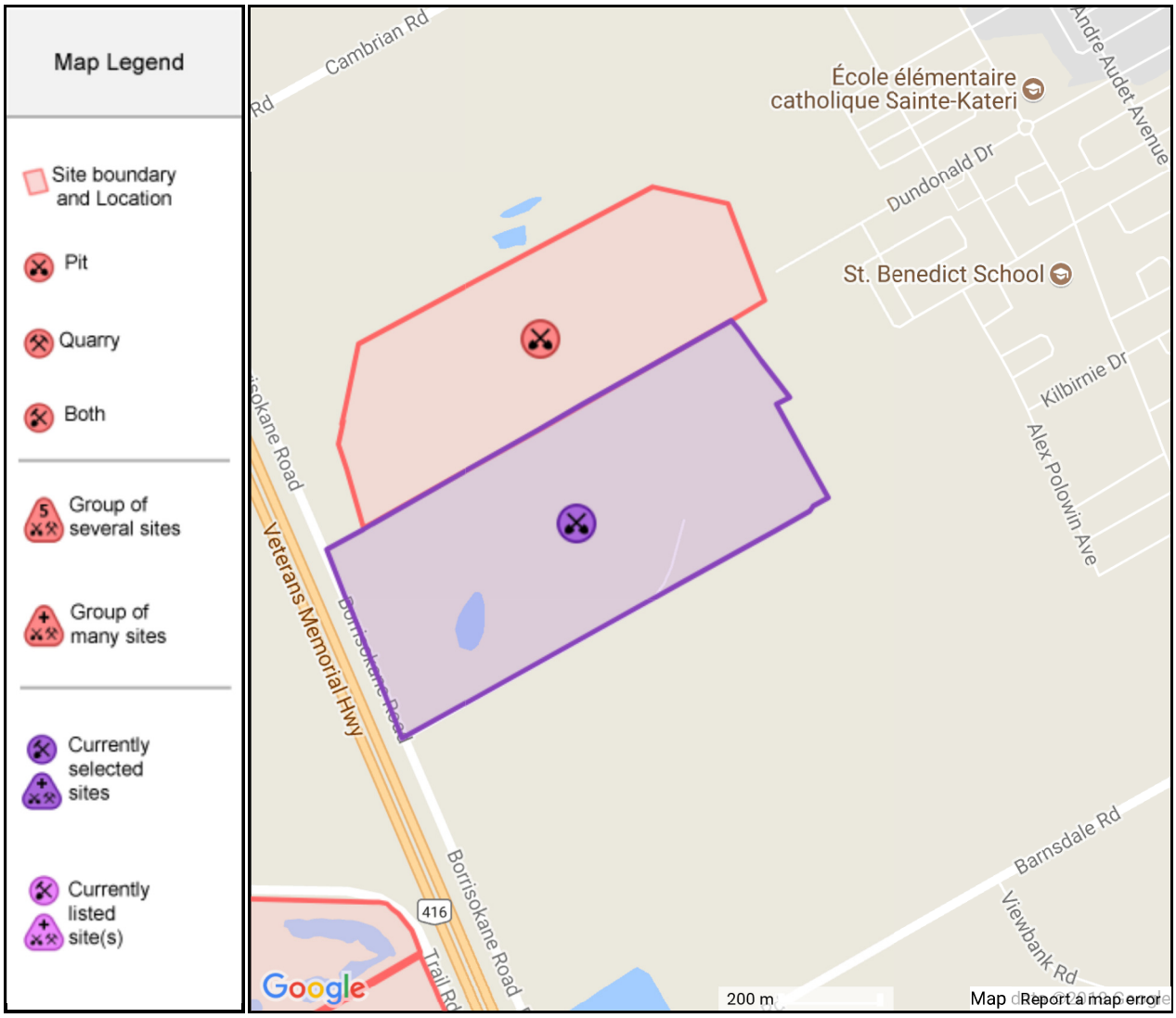
Search Criteria

Geographic Location: Cluster selected. Centre of map is: -75.744434°N,45.237844°W

Approval Type: Class A Licence-or-Class B Licence-or-Aggregate Permit-or-Wayside Permit-or-MTO Permit

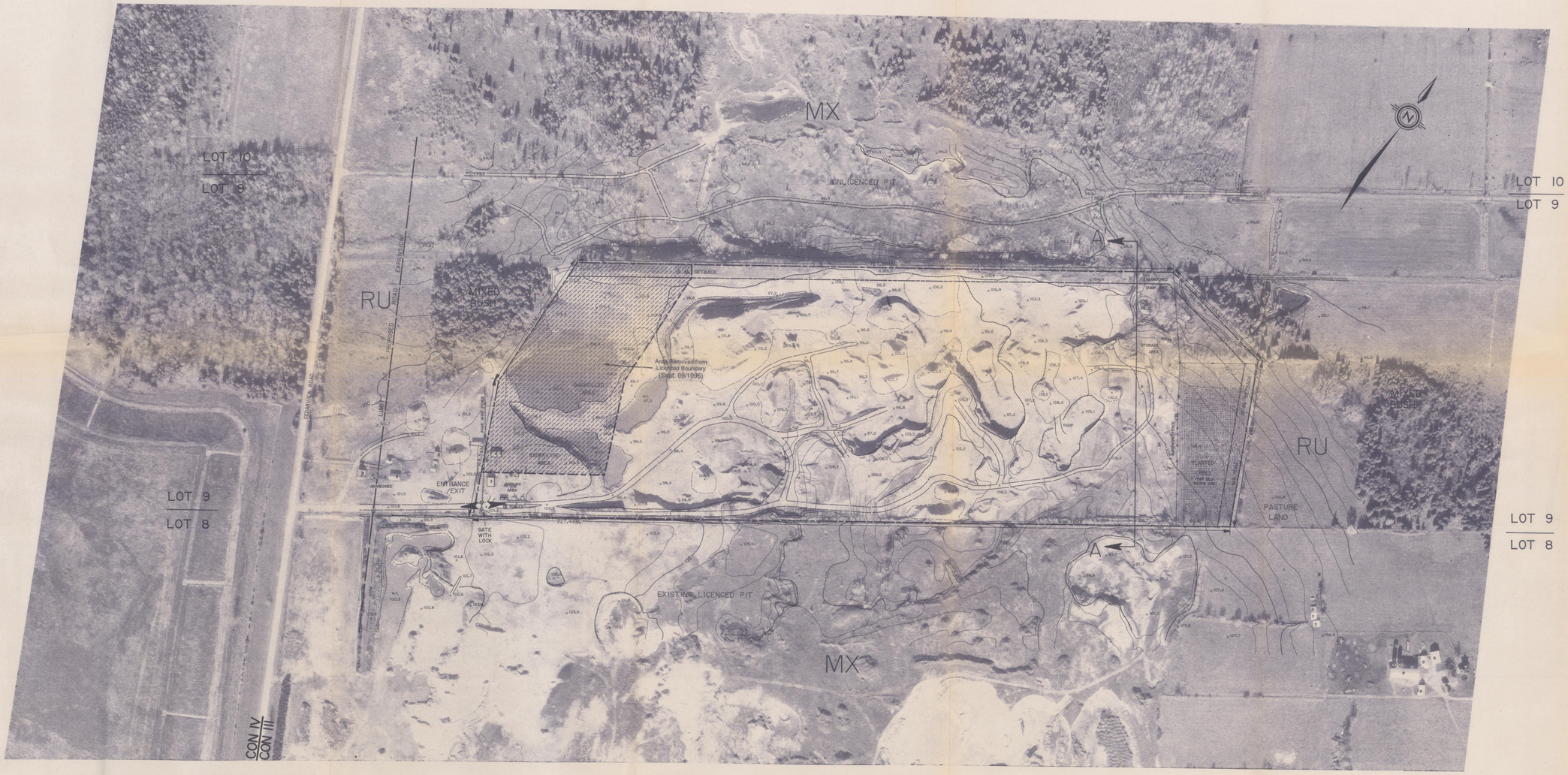
Operation Type: Pit-or-Quarry

Search Results (1)



Site ID	Client Name	Approval Type	Operation Type
4219	Marcel Brazeau Limited	Class A Licence	Pit
	Location Name	**Max. Annual Tonnage**	**Licenced Area (ha)**
		300000	43.7

Created on Monday, May 14, 2018



EXISTING FEATURES

Property licenced for pit operation as designated under the authority of the Aggregate Resources Act 1989.

A pit area presently exists on the majority of the licenced area. Natural drainage of the property is by seepage into the soil and surface drainage to the east.

A weigh scale, garage, office and barn all present on the site near the entrance/exit to the pit.

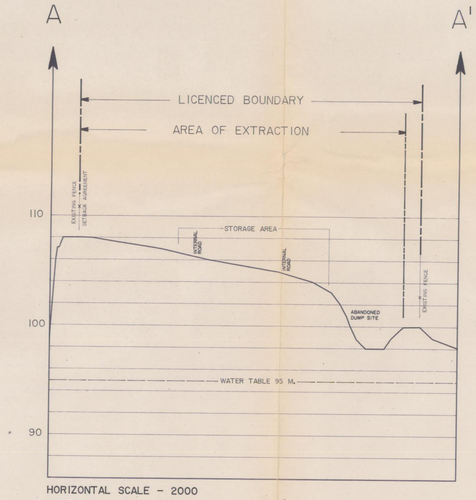
Fencing is not required along the north boundary. Fencing and setback is not required along the south boundary as there exists a boundary agreement between Brazeau and George W. Drummond Ltd., owners of the two properties in concern.

There is no setback along the west boundary as the adjacent property is owned by George Drummond.

A tree plantation of 7 year old Scots pine exists on the licenced property located at the east end. This area has been leased out by Drummond until 2002.

INDEX OF SITE BUILDINGS

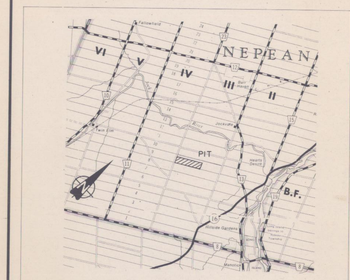
	Classification	Area (m²)
1.	Weigh Scale Office	12.8
2.	Office Trailer	25.0
3.	Storage Garage	109.6
4.	Barn	98.6



HORIZONTAL SCALE - 2000
VERTICAL SCALE - 200

M.O.E. Well Water Data 1991 (in metres)

Con.	Lot	Well No.	Elevation Ft.	Water Found	Static Water Level
III	8	15-6040	97m	20.4	6.4



KEY MAP CITY OF NEPEAN

EXISTING FEATURES

NOTES

	Revision Values as of Sept. 09/1996
1. LICENCED AREA 27.5 ± HECTARES.	23.5 ± ha
2. AREA OF OPERATION 25.8 ± HECTARES.	22.3 ± ha
3. EXISTING DISTURBED AREA 22 ± HECTARES.	20.5± ha.

4. THIS SITE PLAN IS PREPARED FOR SUBMISSION TO THE MINISTRY OF NATURAL RESOURCES IN CONJUNCTION WITH AN APPLICATION FOR A CLASS 'A' LICENCE UNDER THE AGGREGATE RESOURCES ACT & REGULATIONS.
5. THIS PLAN WAS PREPARED USING PHOTOGRAMMETRIC METHODS FROM AERIAL PHOTOGRAPHS.
6. LOT, CONCESSION AND BOUNDARY LINES ON THIS PLAN ARE APPROXIMATE.
7. THIS IS NOT A LEGAL SURVEY DRAWING IN ACCORDANCE WITH THE PROVINCE OF ONTARIO SURVEYORS ACT 1987.

OFFICE COPY

COSTELLO PIT

ARA No. 4074

PART OF LOT 9, CONCESSION III
CITY OF NEPEAN

GEORGE W. DRUMMOND LIMITED
30 RIDEAU HEIGHTS DRIVE
NEPEAN, ONTARIO K2E 7A6

LEGEND

- BOUNDARY OF AREA TO BE LICENCED
- LIMIT OF EXTRACTION (SETBACK LINE)
- ENTRANCE AND OR EXIT
- PIT/QUARRY FACE EXISTING/PROPOSED
- STOCKPILE: EXISTING/PROPOSED
- DIRECTION OF OPERATION AND PHASE
- WELL
- STANDING WATER
- TEST HOLE
- BUILDING: S-SILO, H-HOUSE, G-GARAGE B-BARN, S-SHED.
- FENCE/GATE
- ROAD: PAVED, UNPAVED
- RAILWAY
- POLE: HYDRO/TELEPHONE
- HYDRO TOWER
- LAKE/POND
- WATERCOURSE: DOUBLE, SINGLE, FLOW ARROW
- BRIDGE, CULVERT
- MARSH
- EXISTING CONTOURS
- PROPOSED CONTOURS
- SPOT ELEVATION
- BUSH: DECIDUOUS/CONIFEROUS
- EXISTING BERM
- PROPOSED BERM
- CROSS SECTION
- Area Removed from Licenced Boundary

PHOTO SCALE	ROLL No.	EXPOSURE No.	LINE No.	PHOTO DATE
1:15000	90066	37-39	1	NOV. 1990
MAP SCALE 1:2000	CONTOUR INTERVAL 1 METRE	DATE OF SITE PLAN DEC. 1990		

0 50 100 150 metres

AMENDMENTS	DATE
Modified licenced boundary and corresponding calculations and notes.	Sept. 09, 1996

SITE PLANS APPROVED BY MINISTRY OF NATURAL RESOURCES
SIGNATURE
DATE Sept 17/96

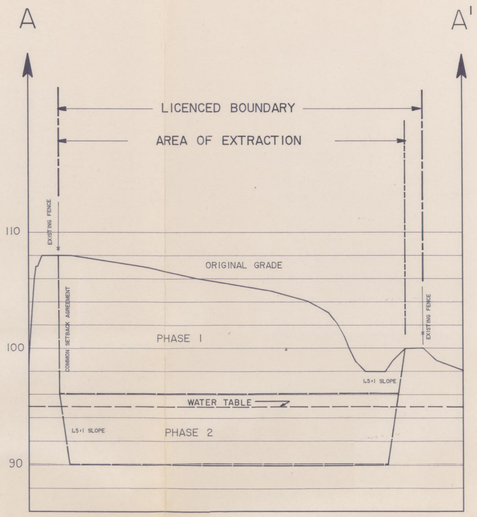
PAGE 1 of 2 | CONTRACT C 419 - 90

THIS IS NOT A CERTIFIED COPY UNLESS EMBOSSED WITH SEAL

THE BASE MAPPING CO. LTD.
UNIT 37 - 81 AURIGA DRIVE, NEPEAN, ONTARIO K2E 7Y3
(613) 723-8100 FAX: (613) 723-8569

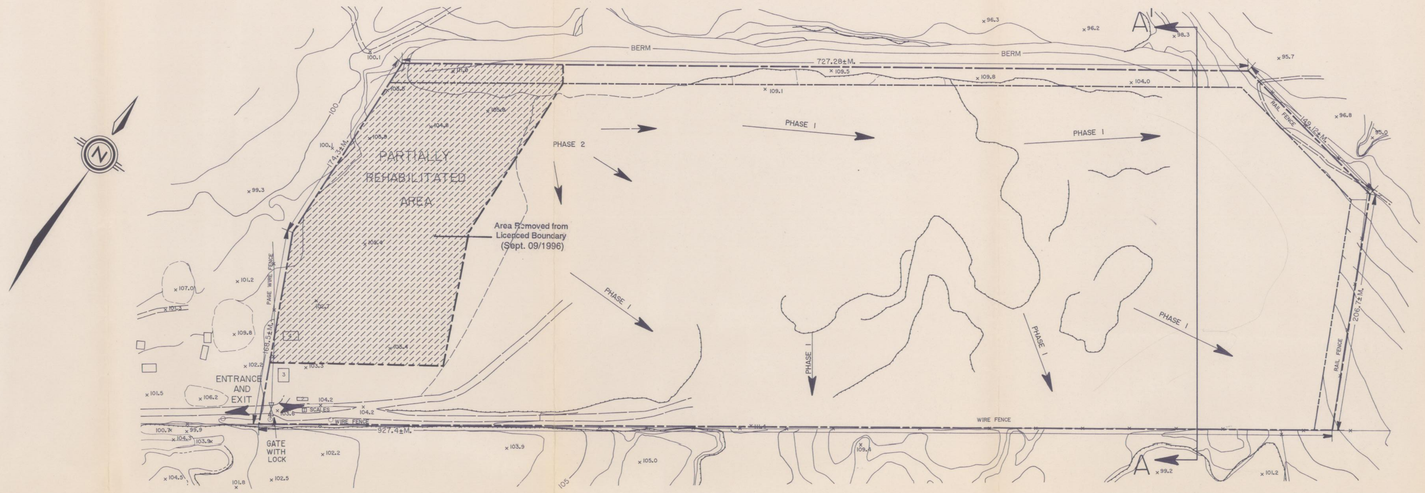
D. Lebrash
SEP 10 1996

OPERATION PLAN



HORIZONTAL SCALE - 2000

VERTICAL SCALE - 200



GENERAL

The pit will operate in accordance with the Aggregate Resources Act 1989.

Fencing and setback is not required along the south limits of the pit as agreed upon by Marcel Irazeau (pit owner to the south of Drummond) and George W. Drummond Ltd. Fencing is also not required for the north boundary. Various locations, where fences need not be established, have been agreed upon by the Ministry of Natural Resources.

The entrance/exit to the pit has a gate with a lock on it.

The entrance/exit to the pit is from Cedarview Road.

There exists no limitations to the types or location of excavation equipment which may operate on the site. All machinery is equipped with noise and dust suppressors.

Information pertaining to water wells is indicated on the Existing Features Plan.

Product stockpiles are stored within the confines of the limit of extraction.

Recycling of asphalt is permitted within the extraction limits. Area for recycling will be kept 10 metres from any open water.

The tree plantation area lease, upon its expiry date, will be subject to mining activity. Operation of this area will fall into regular mining phases as described within the Operation notes.

OPERATION

The licenced pit hectarage will be mined in two phases of operation. Phase 1 above water table, Phase 2 below water table.

Phase 1 mining is active, operating to a depth of approximately 95 metres as indicated on the Operation Plan. Direction of operation moves from the west towards the east.

Phase 2 mining will follow the Phase 1 mining pattern beginning from the westerly limits of the licenced property and proceeding in a easterly direction, as indicated on the Operation Plan.

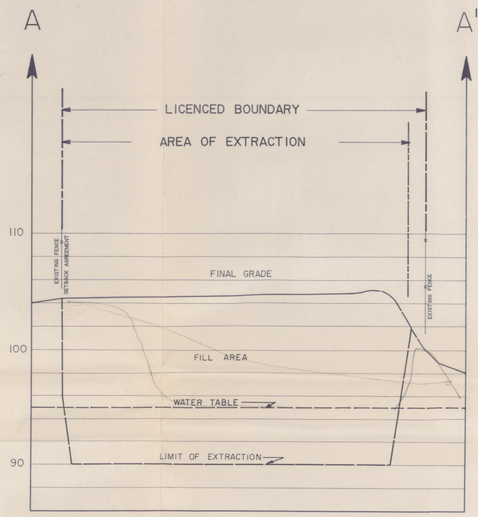
Phase 2 will begin mining operation upon completion of Phase 1. Mining will be below the water table. Extraction of the material will be by dragline methods. No pumping or letting of water will be needed. Final operation depth will be approximately 90 metres.

Amendment – April 29/99

Import topsoil to process for resale.

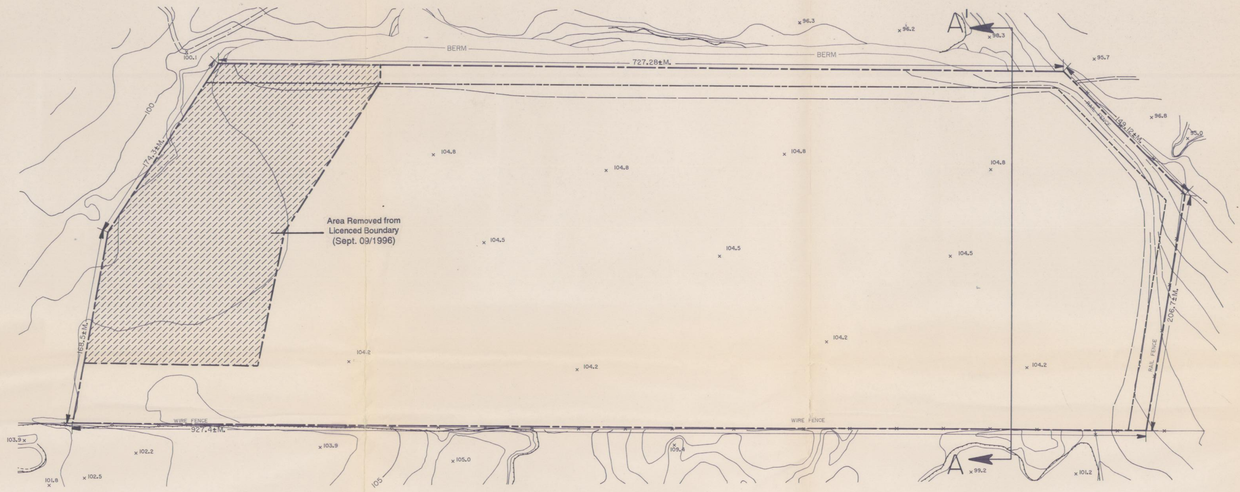
To allow Phases 1 & 2 to operate concurrently and simultaneous in various locations due to the differently quality of material throughout the site and also the high concentration of clay ridges.

PROGRESSIVE REHABILITATION AND FINAL REHABILITATION PLAN



HORIZONTAL SCALE - 2000

VERTICAL SCALE - 200



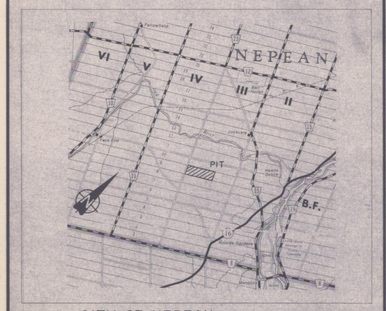
REHABILITATION

Maximum hectarage to be rehabilitated is approximately 22.3 hectares. Progressive rehabilitation will be carried out on the site. In the general this would be carried out by filling from a westerly to easterly direction.

The pit will be backfilled with acceptable inert material. The final site elevation will be approximately 104 metres, sloping slightly to the south, as indicated on the Rehabilitation Plan. The sloped surface will then be sewn with a grass legume mixture.

Adequate soil would be spread on the site to facilitate an adequate growth for grass legume mixture.

The site can then be adequately utilized for building development or pasture.



KEY MAP CITY OF NEPEAN

OPERATION & REHAB. PLANS

NOTES

	Revision Values as of Sept. 09/1996
1. LICENCED AREA 27.5± HECTARES.	23.5 ± ha
2. AREA OF OPERATION 25.9± HECTARES.	22.3 ± ha
3. EXISTING DISTURBED AREA 16.4± HECTARES.	16.4 ± ha

4. THIS SITE PLAN IS PREPARED FOR SUBMISSION TO THE MINISTRY OF NATURAL RESOURCES IN CONJUNCTION WITH AN APPLICATION FOR A CLASS 'A' LICENCE UNDER THE AGGREGATE RESOURCES ACT & REGULATIONS.
5. THIS PLAN WAS PREPARED USING PHOTOGRAMMETRIC METHODS FROM AERIAL PHOTOGRAPHS.
6. LOT, CONCESSION AND BOUNDARY LINES ON THIS PLAN ARE APPROXIMATE.
7. THIS IS NOT A LEGAL SURVEY DRAWING IN ACCORDANCE WITH THE PROVINCE OF ONTARIO SURVEYORS ACT 1987.

COSTELLO PIT

ARA No. 4074

PART OF LOT 9, CONCSSION III

CITY OF NEPEAN

GEORGE W. DRUMMOND LIMITED
30 RIDEAU HEIGHTS DRIVE
NEPEAN, ONTARIO K2E 7A6

LEGEND

- BOUNDARY OF AREA TO BE LICENCED
- LIMIT OF EXTRACTION (SETBACK LINE)
- ENTRANCE AND OR EXIT
- PIT/QUARRY FACE EXISTING/PROPOSED
- STOCKPILE: EXISTING/PROPOSED
- DIRECTION OF OPERATION AND PHASE
- WELL
- STANDING WATER
- TEST HOLE
- BUILDING: S-SILO, H-HOUSE, G-GARAGE, B-BARN, S-SHED.
- FENCE/GATE
- ROAD: PAVED, UNPAVED
- RAILWAY
- POLE: HYDRO/TELEPHONE
- HYDRO TOWER
- LAKE/POND
- WATERCOURSE: DOUBLE, SINGLE, FLOW ARROW
- BRIDGE, CULVERT
- MARSH
- EXISTING CONTOURS
- PROPOSED CONTOURS
- SPOT ELEVATION
- BUSH: DECIDUOUS/CONIFEROUS
- EXISTING BERM
- PROPOSED BERM
- CROSS SECTION
- Area Removed from Licenced Boundary

PHOTO SCALE	ROLL No.	EXPOSURE No.	LINE No.	PHOTO DATE
1:15000	90066	37-39	1	NOV. 1990
MAP SCALE	CONTOUR INTERVAL	DATE OF SITE PLAN		
1:2000	1 METRE	DEC. 1990		

0 50 100 150 metres

AMENDMENTS	DATE
Modified licenced boundary and corresponding, calculations and notes.	Sept. 09, 1996
See amendment dated April 29/99	May 17/99

SITE PLANS APPROVED BY MINISTRY OF NATURAL RESOURCES.

SIGNATURE DATE

PAGE 2 of 2	CONTRACT C 419 - 90

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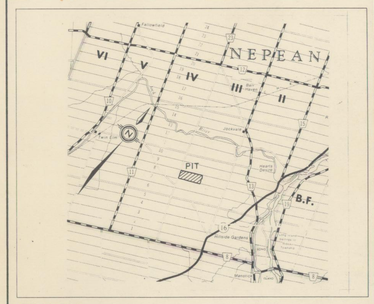
SEP 10 1996

UNIT 37 - 81 AURIGA DRIVE, NEPEAN, ONTARIO K2E 7V3
(613) 723 - 8100 FAX: (613) 723 - 8569

1991 M.O.E. WELL DATA

Con.	Lot	Well No.	Well Elev.	Water Found	Static Water
4	8	15-17287	106.68m	82.46m	10.36m
3	8	15-6040	107.90m	20.42m	6.40m
3	9	15-6037	92.96m	36.58m	5.79m



KEY MAP

EXISTING FEATURES - GENERAL

NOTES

1. LICENCED AREA 40.2 HECTARES.
2. AREA OF OPERATION 35.5 HECTARES.
3. EXISTING DISTURBED AREA 40.2 HECTARES.
4. THIS SITE PLAN IS PREPARED FOR SUBMISSION TO THE MINISTRY OF NATURAL RESOURCES IN CONJUCTION WITH AN APPLICATION FOR A CLASS A LICENCE UNDER THE AGGREGATE RESOURCES ACT AND REGULATIONS.
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TODD PIT

PART OF LOT 8, CONCESSION III
CITY OF NEPEAN

MARCEL BRAZEAU
BOX 231, R.R. 9
GLOUCESTER, ONTARIO
K1G 3N5

MINISTRY OF NATURAL RESOURCES
CAMPBELLFORD, ONT.
JUN 15 1992
RECEIVED

ARA No. 4219

LEGEND

- BOUNDARY OF AREA TO BE LICENCED
- ENTRANCE AND OR EXIT
- PIT/QUARRY FACE EXISTING/PROPOSED
- STOCKPILE: EXISTING/PROPOSED
- W — WELL
- STANDING WATER
- TEST HOLE
- S H G B S O — BUILDING: S-SILO, H-HOUSE, G-GARAGE, B-BARN, S-SHED, O-OFFICE.
- W/L 35.3 — LAKE/POND AND WATER LEVEL
- WATERCOURSE: DOUBLE, SINGLE. FLOW ARROW.
- MIXED FOREST — CONIFEROUS AND DECIDUOUS FOREST - M/F
- CON. FOREST — CONIFEROUS FOREST - C/F
- DEC. FOREST — DECIDUOUS FOREST - D/F
- A A' — CROSS SECTION

LANDUSE:

AGRI	AGRICULTURE
RES	RESIDENTIAL

ZONING CLASSIFICATION:

MX	MINERAL EXTRACTION
C	COMMERCIAL GENERAL
I	INSTITUTIONAL
RU	RURAL
SR	SPECIAL RURAL - PIT

OFFICE COPY

PHOTO SCALE	ROLL NO.	EXPOSURE NO.	LINE NO.	PHOTO DATE
1:15000	CAS90066	37-39		NOV. 1990
MAP SCALE	CONTOUR INTERVAL	DATE OF SITE PLAN		
1:2000	1 METRE	SEPT. 1991		

SCALE IS APPROXIMATE

AMENDMENTS	DATE
indicate existing scrap area + fuel tanks inside storage shed. JM	~~Oct 7/91~~ Nov 20/91

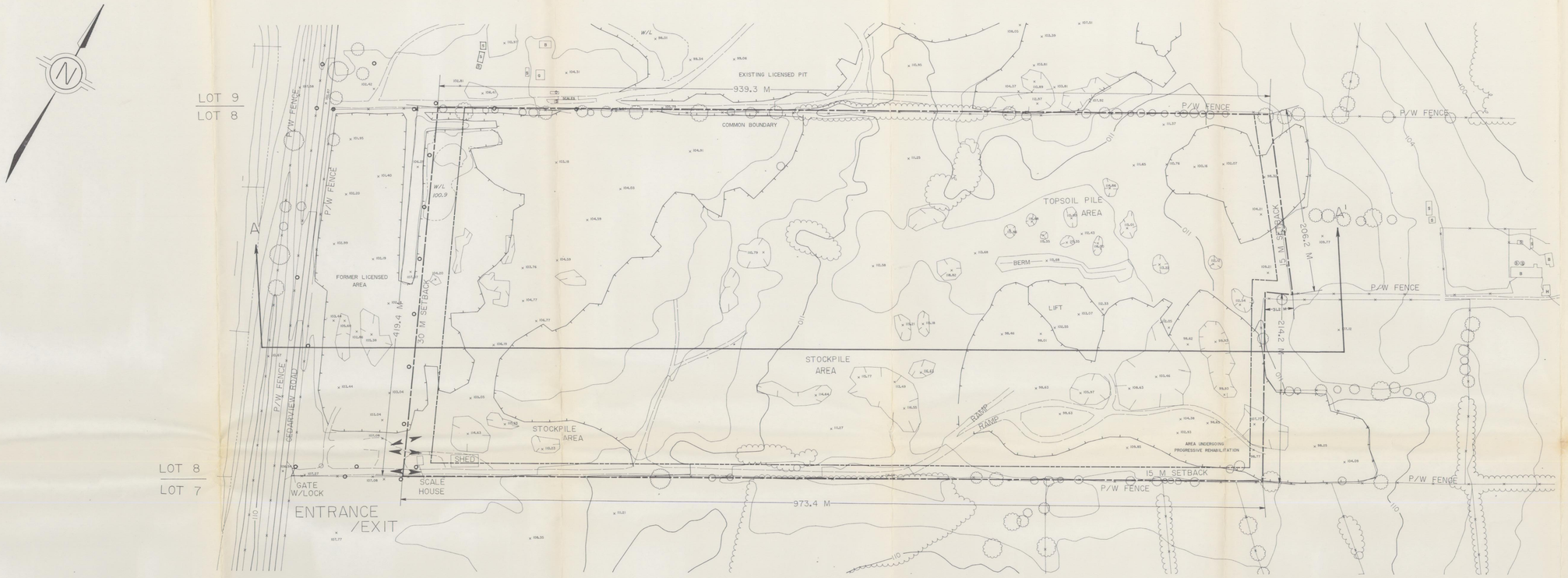
SITE PLANS APPROVED BY MINISTRY OF NATURAL RESOURCES.

SIGNATURE — DATE: June 17/92

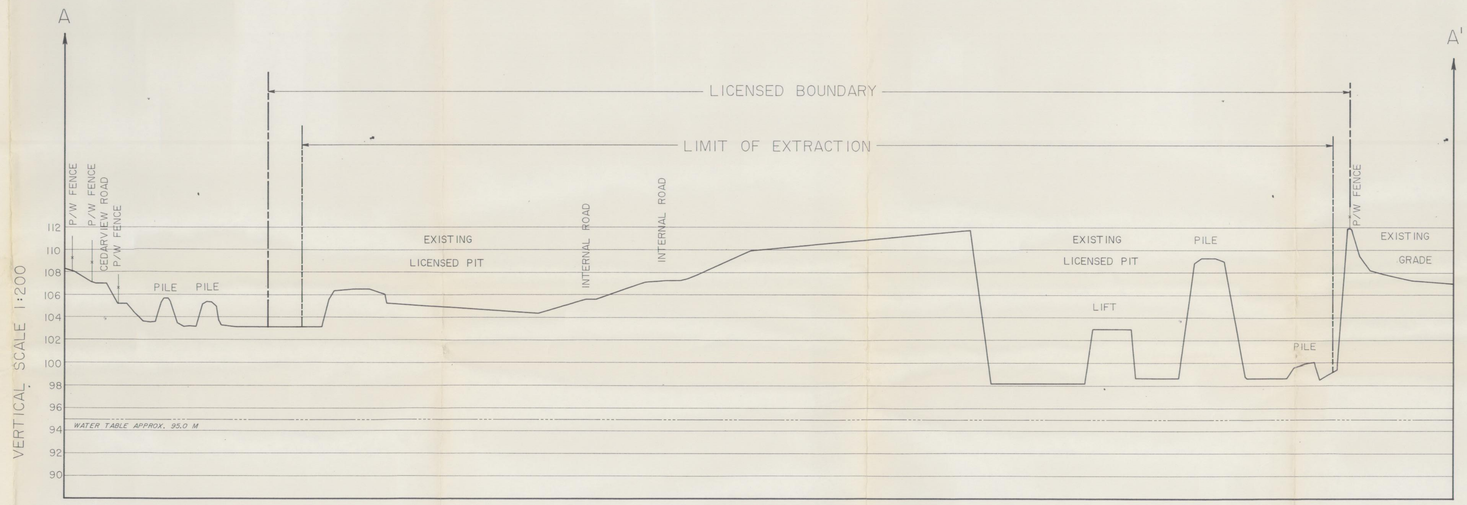
PAGE 1 OF 4 | CONTRACT C459-90

SIGNATURE OF LICENSEE — DATE: June 17/92 — THIS IS NOT A CERTIFIED COPY UNLESS EMBOSSED WITH SEAL.

THE BASE MAPPING CO. LTD.
"I hereby certify that this site plan has been prepared under my direction." Douglas J. Sadowski, O.L.S. Ontario Land Surveyor
UNIT 37 - 81 AURIGA DRIVE, NEPEAN, ONTARIO K2E 7Y3
(613) 723-8100 FAX: (613) 723-8569



BUILDINGS	SIZE IN M^2
1. SCALE HOUSE	70
2. MAINTENANCE BUILDING	436



HORIZONTAL SCALE 1:2000

EXISTING FEATURES

The entrance/exit is off Cedarview Road. There is a licensed pit directly adjacent to the north (George Drummond). There is a common boundary agreement on file with M.N.R.. There is a fair to good post and wire fence along this boundary. The west boundary has a post and wire fence in fair to very poor condition. There is an existing post and wire fence along the south boundary in poor condition. There is an electric, single strand fence, just outside the east boundary, used to keep cattle away.

The Regional Municipality of Ottawa Carleton operate the land-fill site to the west. The property to the south are vacant fields. The fields to the east are used for pasturing cattle.

The easterly portion of the south boundary is presently being backfilled with clean material excavated from construction sites off the property. It is being backfilled to the original ground elevation and width to restore the setback in that area and then sloped.

Rehabilitation has already begun along the east face.

Surface drainage is via natural seepage into the granular sub-base.

The scale house and maintenance building are located on part of the 30 metres setback along the south boundary.

There are several stockpiles of peat located behind the scale house and maintenance building. Several small stockpiles of topsoil are located in the northeast area of the licensed property.

To establish the water elevation of ±95.0 meters we have utilized information from test hole data rather than the data from M.O.E. well records.

KEY MAP

EXISTING FEATURES - SITE

NOTES

1. LICENCED AREA 40.2 HECTARES.
2. AREA OF OPERATION 38.1 HECTARES.
3. EXISTING DISTURBED AREA 40.2 HECTARES.
4. THIS SITE PLAN IS PREPARED FOR SUBMISSION TO THE MINISTRY OF NATURAL RESOURCES IN CONJUCTION WITH AN APPLICATION FOR A CLASS A LICENCE UNDER THE AGGREGATE RESOURCES ACT AND REGULATIONS.
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7. THIS IS NOT A LEGAL SURVEY DRAWING IN ACCORDANCE WITH THE PROVINCE OF ONTARIO SURVEYORS ACT 1987.

TODD PIT

PART OF LOT 8, CONCESSION III
CITY OF NEPEAN

MARCEL BRAZEAU
BOX 231, R.R. 9
GLOUCESTER, ONTARIO
K1G 3N5

LICENCE NUMBER **ARA No. 4219**

LEGEND

- BOUNDARY OF AREA TO BE LICENCED
- LIMIT OF EXTRACTION/SETBACK LINE
- ENTRANCE AND OR EXIT
- PIT/QUARRY FACE EXISTING/PROPOSED
- STOCKPILE: EXISTING/PROPOSED
- DIRECTION OF OPERATION AND PHASE
- WELL
- STANDING WATER
- TEST HOLE
- BUILDING: S-SILO, H-HOUSE, G-GARAGE, B-BARN, S-SHED.
- FENCE/GATE
- ROAD: PAVED, UNPAVED
- RAILWAY
- POLE: HYDRO/TELEPHONE
- HYDRO TOWER
- LAKE/POND AND WATER LEVEL
- WATERCOURSE: DOUBLE,SINGLE. FLOW ARROW.
- BRIDGE/CULVERT
- MARSH
- EXISTING CONTOURS
- PROPOSED CONTOURS
- SPOT ELEVATION
- BUSH: DECIDUOUS/CONIFEROUS
- EXISTING BERM
- PROPOSED BERM
- CROSS SECTION

PHOTO SCALE	ROLL NO.	EXPOSURE NO.	LINE NO.	PHOTO DATE
1:15000	CAS90066	37-39		JUNE 1991

MAP SCALE	CONTOUR INTERVAL	DATE OF SITE PLAN
1:2000	2 METRE	SEPT. 1991

0 20 40 60 80 100 120 METRES

AMENDMENTS	DATE

SITE PLANS APPROVED BY MINISTRY OF NATURAL RESOURCES.

SIGNATURE Guy McManus DATE June 17/92

PAGE 2 OF 4 | CONTRACT C459-91

SIGNATURE OF LICENSEE M. Brazeau DATE June 17/92

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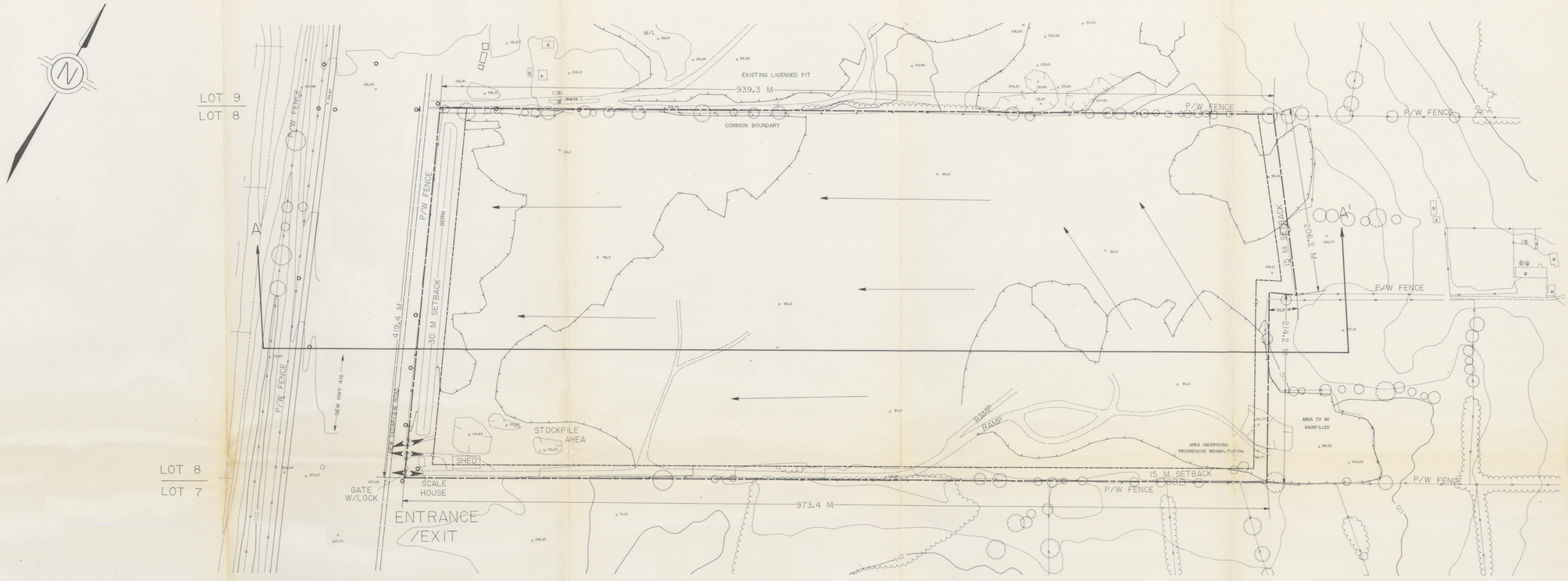
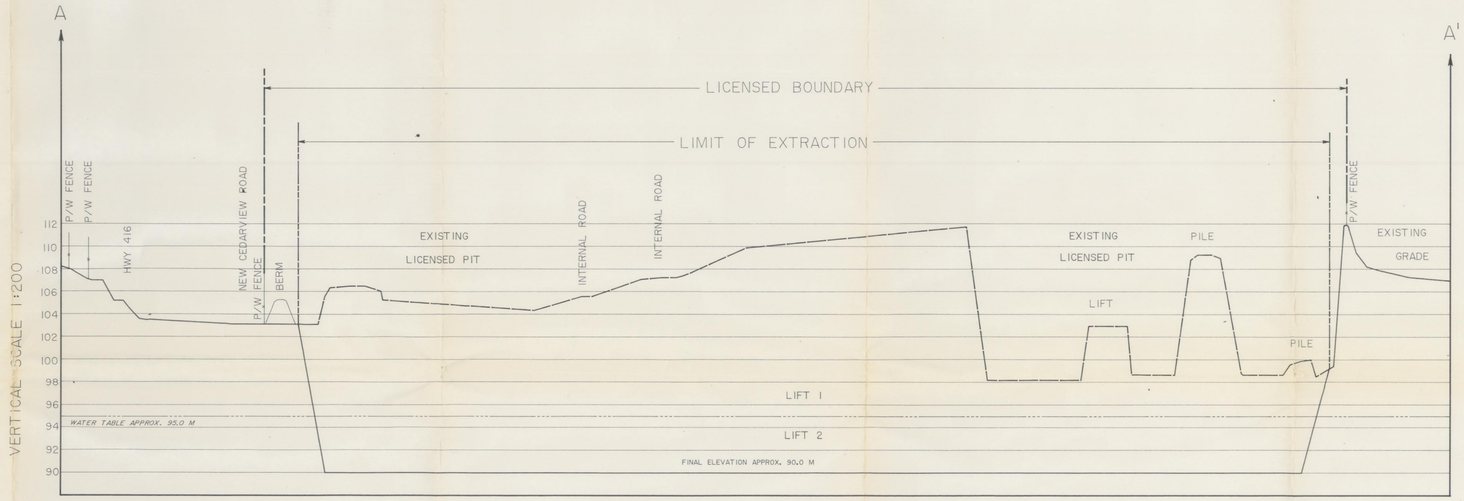
"I hereby certify that this site plan has been prepared under my direction." Douglas J. Sadowski, O.L.S. Ontario Land Surveyor

UNIT 37 - 81 AURIGA DRIVE, NEPEAN, ONTARIO K2E 7V3
(613) 723-8100 FAX: (613) 723-8569





HORIZONTAL SCALE 1:2000

OPERATION PLAN

Portable equipment will be used on the site and will include trucks, bulldozers, front-end loaders, and screening equipment and will be moved as needed around the site.

A new berm will be constructed along the newly located west boundary during the construction of Highway 416 in the summer/fall of 1992. The berm will be approximately 5.5 metres high and width of approximately 23 metres with 2:1 slope. Berm will be topsoiled and seeded to prevent erosion. A new post and wire fence will be placed along the western boundary. Two double sets of farm gates will go at the two entrances/exits as shown on the plan.

The existing fence along the south boundary adequately marks this area.

Gravel is located on the easterly half of the site. Most of the sand is located on the remaining west half of the property. Generally the pit will operate from an east to west direction, however, sand is being removed from the western part at the same time, at a higher elevation. The excavation for the most part will be carried out in 2 lifts to a final floor elevation of 90.0 metres. Lift 1 will mine down to approximately 1 metre above the water table at 95.0 metres. Material below the water will be removed using a hihoe. This operation above and below the water may be carried out simultaneously.

The area below water will be backfilled to an elevation approximately 2 metres above the water table (97.0 metres). Backfillling will follow operations as closely as possible in order that final rehabilitation can be completed progressively.

Minor Site Plan Amendment
Lic. 4219, Marcel Brazeau Ltd., Lot 8, Con. III, Nepean. Manufacturing of topsoil for resale and rehabilitation needs permitted on site. 46,000 m3 of topsoil will be produced and/or retained by the year 2011 for rehabilitation purposes. The rehabilitation topsoil will be stored in the berm along Cedarview Rd. and in a stockpile in the southwest corner of the site.

Marcel Brazeau Ltd. Date: 1992/06/17

MNR, R.A. Paquette Date: June 17/92

4219

SEE PAGE 1 OF 4

KEY MAP

OPERATIONAL PLAN

NOTES

1. LICENCED AREA 40.2 HECTARES.
2. AREA OF OPERATION 38.1 HECTARES.
3. EXISTING DISTURBED AREA 40.2 HECTARES.
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TODD PIT

PART OF LOT 8, CONCESSION III
CITY OF NEPEAN

MARCEL BRAZEAU
BOX 231, R.R. 9
GLOUCESTER, ONTARIO
K1G 3N5

LICENCE NUMBER **ARA No. 4219**

LEGEND

- BOUNDARY OF AREA TO BE LICENCED
- LIMIT OF EXTRACTION/SETBACK LINE
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PHOTO SCALE	ROLL NO.	EXPOSURE NO.	LINE NO.	PHOTO DATE
1:15000	CAS90066	37-39		JUNE 1991
MAP SCALE	CONTOUR INTERVAL	DATE OF SITE PLAN		
1:2000	2 METRE	SEPT. 1991		

0 20 40 60 80 100 120 METRES

AMENDMENTS	DATE

SITE PLANS APPROVED BY MINISTRY OF NATURAL RESOURCES.

SIGNATURE June 17/92 DATE

PAGE 3 OF 4 | CONTRACT C459-91

SIGNATURE OF LICENSEE June 17/92 DATE

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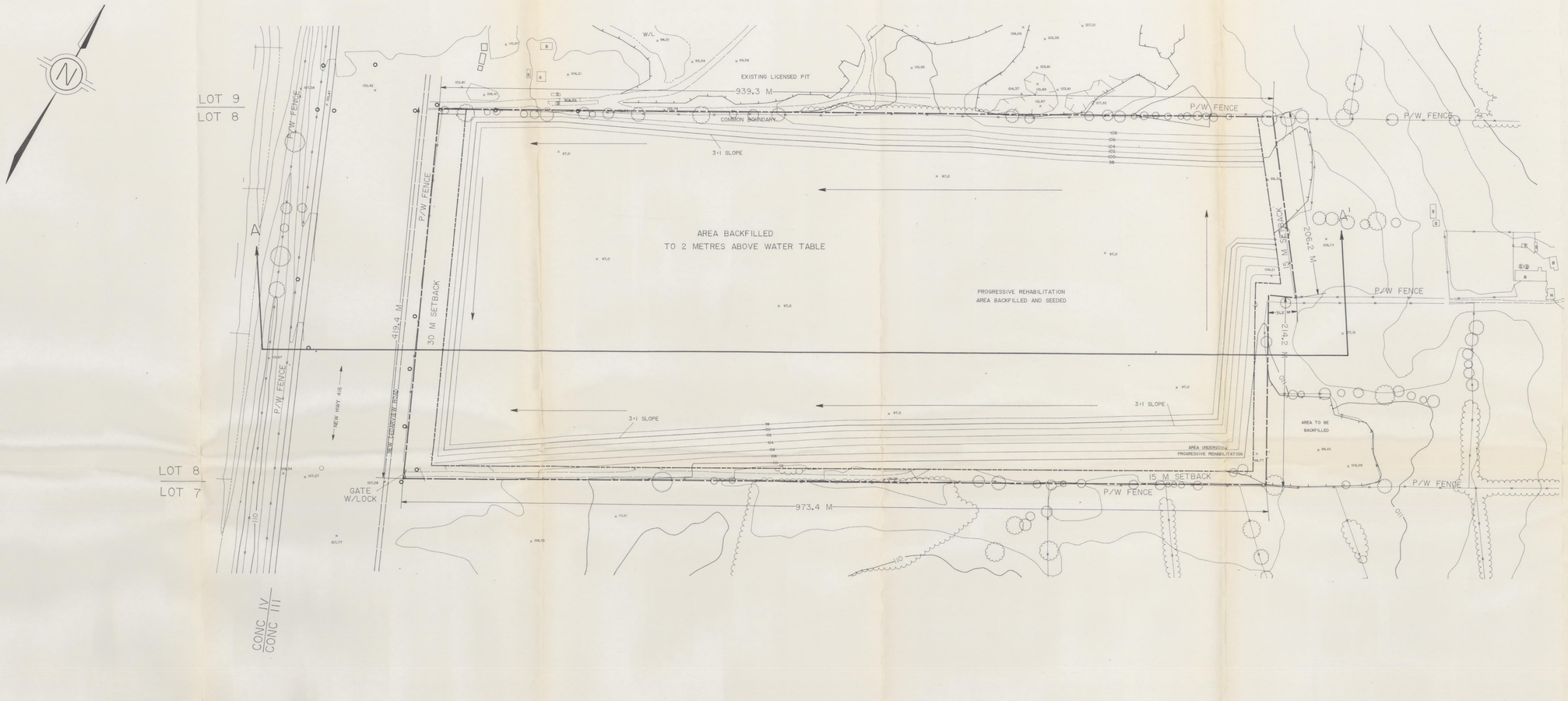
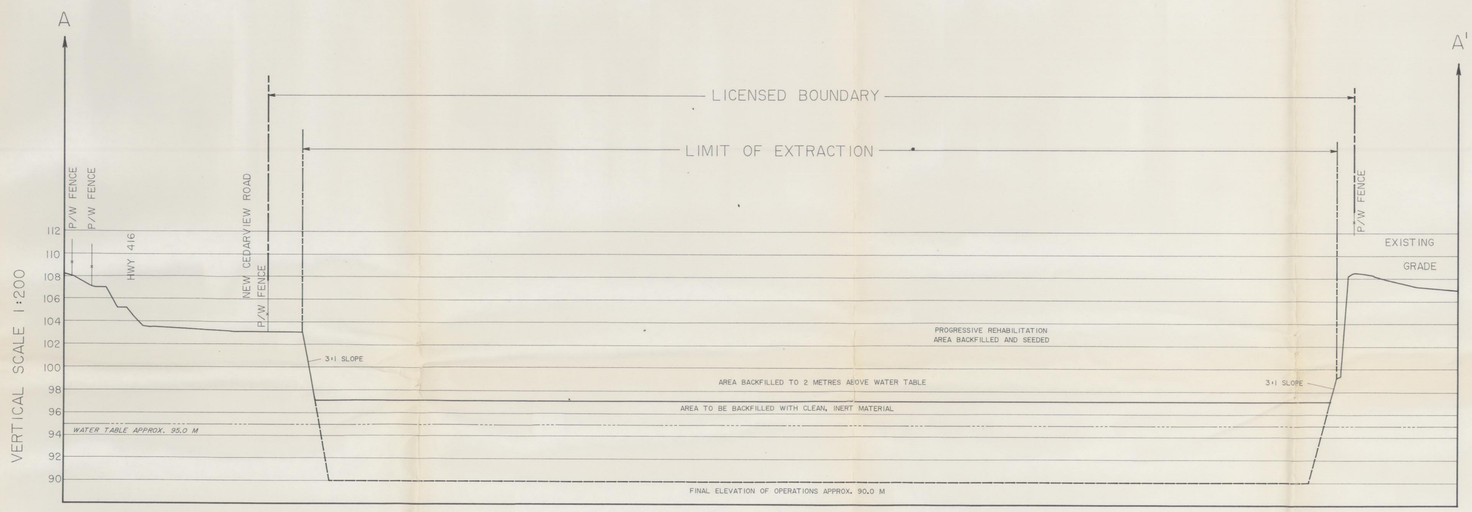
UNIT 37 - 81 AURIGA DRIVE, NEPEAN, ONTARIO K2E 7Y3
(613) 723-8100 FAX: (613) 723-8569





HORIZONTAL SCALE 1:2000

REHABILITATION

The backfill will be imported onto the site from excavated material from construction sites or other clean fill from ditching.

The north face will be backfilled to meet the final floor of the adjacent pit (104 metres). Most of the east face, except the south east corner, has been sloped.

The backfilling of the open water will commence at the east end once the operation has progressed sufficiently west so that product below water is not contaminated by the backfill.

When enough area has been backfilled to above water, it will be topsoiled/seeded to reduce the open area requiring rehabilitation as quickly as possible. The area will be seeded with a grass/legume mixture suitable for the backfilled material. It will be maintained to ensure healthy growth.

All pit faces will be sloped to a 3:1 gradient, topsoiled, and seeded.

The drainage will continue as seepage into the subsoil. The property will remain as a grassy field. Future use will be determined by the City of Nepean at a later date.

SEE PAGE 1 OF 4

KEY MAP

PROGRESSIVE REHABILITATION AND FINAL REHABILITATION PLANS

NOTES

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2. AREA OF OPERATION 38.1 HECTARES.
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TODD PIT

PART OF LOT 8, CONCESSION III
CITY OF NEPEAN

MARCEL BRAZEAU
BOX 231, R.R. 9
GLOUCESTER, ONTARIO
K1G 3N5

LICENCE NUMBER **ARA No. 4219**

LEGEND

- BOUNDARY OF AREA TO BE LICENCED
- LIMIT OF EXTRACTION/SETBACK LINE
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PHOTO SCALE	ROLL NO.	EXPOSURE NO.	LINE NO.	PHOTO DATE
1:15000	CAS90066	37-39		JUNE 1991
MAP SCALE	CONTOUR INTERVAL	DATE OF SITE PLAN		
1:2000	2 METRE	SEPT. 1991		

0 20 40 60 80 100 120 METRES

AMENDMENTS	DATE

SITE PLANS APPROVED BY MINISTRY OF NATURAL RESOURCES.

SIGNATURE _____ DATE June 17/92

PAGE 4 OF 4 | CONTRACT C459-91

SIGNATURE OF LICENSEE _____ DATE June 17/92

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UNIT 37 - 81 AURIGA DRIVE, NEPEAN, ONTARIO K2E 7V3
(613) 723-8100 FAX: (613) 723-8569

APPENDIX 2

Valcoustics Canada Ltd - Stationary Noise Source Study - Half Moon Bay South and Quinn's Pointe Stage 2 - Project 118-0052 dated May 3, 2018

Golder Associates Ltd. - Assessment of Dust Impacts from Aggregate Pits on Minto Communities Canada and Mattamy Homes Proposed Developments - Minto and Mattamy Dust Study - Project 1897372 - dated March 2018

Stationary Noise Source Study

Half Moon Bay South and Quinn's Pointe Stage 2

Proposed Residential Development

Greenbank Road South of Cambrian Road
City of Ottawa

May 3, 2018
Project: 118-0052

Prepared for

Mattamy Homes and Minto Developments

Prepared by

Anthony Amarra, M.Sc.

Reviewed by

John Emeljanow, B.Eng., P.Eng.

VALCOUSTICS
Canada Ltd.

Revision History

Revision #	Date	Comments
1.0	May 3, 2018	Issued to Client

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

Stationary Noise Source Study

Half Moon Bay South and Quinn's Pointe Stage 2

Proposed Residential Development

Greenbank Road South of Cambrian Road
City of Ottawa

1.0 INTRODUCTION

1.1 PURPOSE

Valcoustics Canada Ltd. (VCL) has prepared this stationary noise source study for the proposed Mattamy Half Moon Bay South Phase 5 and Minto Quinn's Pointe Stage 2 residential developments in the City of Ottawa.

The potential sound levels and noise mitigation needed to comply with the Ministry of the Environment and Climate Change (MOE) stationary source noise guidelines are outlined herein.

1.2 SITE

The site is part of the Barrhaven South Urban Expansion Area, which is proposed to be developed mainly for residential dwellings. The proposed developments will include school blocks, neighbourhood parks, a commercial block, park & ride block, and storm water management facilities. The noise study was prepared using the Concept Plan.

The overall site is bounded by:

- Future (under construction) residential uses to the east (other lands within the Half Moon Bay South development);
- Existing aggregate extraction operations to the north and northwest; and
- Vacant lands to the west and south.

Figure 1 shows a Key Plan. Figure 2 shows the Site Plan.

Note, there is an existing berm to the east of Brazeau Pit. This existing berm is part of the noise mitigation recommended for northern portion of the Half Moon Bay South development (Phase 4). This berm overlaps with some of the low and medium-density blocks, as shown on Figure 3. It is

understood that the intent is for the berm to remain until the extraction and processing operations at the aggregate pits are completed.

2.0 ENVIRONMENTAL NOISE GUIDELINES

The applicable noise guidelines are those in MOE Publication NPC-300, *"Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning"*. These guidelines address both transportation sources of sound as well as stationary noise sources.

NPC-300 is also referenced in the City of Ottawa Environmental Noise Control Guidelines.

2.1 MOE PUBLICATION NPC-300

NPC-300 defines a "stationary noise source" as sources of sound normally operated within the property lines of a facility, including on-site vehicle movements. Industrial and commercial facilities are considered stationary sources of sound. An aggregate extraction facility is specifically listed in NPC-300 as being a stationary noise source. The MOE sound level limits are summarized in Appendix A and discussed below.

For this study, the site is considered a Class 2 area due to the density of the adjacent developments as well as the proximity to nearby roadways (i.e. Greenbank Road).

The sound level limits for Class 2 areas are the higher of the ambient sound level or the minimum exclusion limits which are:

- 50 dBA during the daytime (between 0700 and 1900 hours) and evening (between 1900 and 2300 hours) and 45 dBA during the nighttime (between 2300 and 0700 hours) at an exterior plane of window; and

- 50 dBA during the daytime and 45 dBA during the evening at an outdoor point of reception.

2.2 CITY OF OTTAWA ENVIRONMENTAL NOISE CONTROL GUIDELINES

The 2016 City of Ottawa Environmental Noise Control Guidelines provide guidance on how to assess noise from stationary sources onto proposed noise-sensitive developments.

The guidelines reference MOE Publication NPC-300, which establishes the sound level limits based on the area class. Thus, the City of Ottawa requirements are consistent with the MOE requirements.

3.0 NOISE IMPACT ASSESSMENT

The stationary noise sources with the potential to adversely impact the proposed development are the existing (active) sand and gravel pits to the west of Future Greenbank Road. There are two areas licensed for extraction. The Brazeau Pit is immediately northwest of the proposed development, while the Drummond Pit is north of Brazeau Pit.

Staff of VCL previously met with the owners of the Brazeau and Drummond Pits on July 18, 2013. The purpose of the meetings was to obtain an understanding of the operations at both pits, to determine the predictable worst-case operations and to understand the areas that remain to be extracted.

Memorandums outlining the operations at the two pits (as discussed during the meeting) were prepared and circulated to the owners. These are included as Appendix B. To date, only the owners of Brazeau Pit have responded, indicating there could be up to 50 loads shipped in an hour occasionally.

3.1 METHOD

The noise analysis was done using CadnaA V4.6 environmental acoustics modelling software. The 3-D model follows the procedures of ISO 9613 Part 2.

Receptors representing the worst-case dwelling locations in the proposed development were chosen. The receptors were taken at a height of 4.5 m above grade for the exterior plane-of-window receptors, representing windows on the second storey, and 1.5 m above grade for the outdoor points of reception, representing the rear yards.

The noise sources were modelled as operating at the base of the extraction pits, at an elevation of approximately 97 m asl. This represents both the current and future operations, including below water table extraction.

3.2 BRAZEAU PIT

The Brazeau Pit has a Class A licence to extract up to 300,000 tonnes of aggregate per year.

Above water table extraction of the eastern portion of the Brazeau Pit has been completed. The working face is currently at about the midpoint of the site and is progressing westerly. It was also noted that below water table extraction is also permitted over the entire site. During the meeting with VCL staff, the operators were not certain whether below water table extraction would occur.

The operations that typically occur on the site are outlined in Appendix B. The information in Appendix B was also confirmed via phone calls in 2018. Note that the worst-case assessment has assumed that all operations, including below water table extraction could occur anywhere on the site (that has not already been extracted). It was also assumed that the processing plant and additional screens only operate during the daytime, and all other sources can operate at any time during the day, evening or night.

Typical maximum sound emission levels for the equipment was used based on experience as well as measurements performed during the on-site meeting. The emission levels for the Brazeau Pit are outlined in Table 1.

Detailed noise analyses of the worst-case gravel pit activities were done at the proposed dwellings closest to the gravel pits. Compliance with the noise guidelines at these receptors would inherently result in compliance at all dwellings within the proposed development.

3.2.1 Analysis Results

Figure 3 and Table 2 show the predicted unmitigated sound levels due to the worst-case operations at Brazeau Pit.

The sound levels exceed the MOE noise guideline limits by up to 21 dBA during the daytime and 18 dBA during the evening/nighttime at R13. This is due to the direct line of sight between the first row of dwellings and the pit.

The operational locations shown on Figure 3 represent the worst-case in terms of exposure of the dwellings to the sources.

3.2.2 Mitigation Requirements

Due to the significant excesses at the closest receptors, mitigation measures are required to comply with the MOE noise guideline limits.

To meet the noise guideline limits at the closest proposed dwellings to the Brazeau Pit, unreasonably high sound barriers are required.

To reduce the height of sound barrier required to a more reasonable level, portions of the site could be held until operations at Brazeau Pit have ended. Specifically, the portions that could be held are the first row of dwellings to the south and east of Brazeau Pit. This is in addition to the dwellings which overlap with the existing berm. Where dwellings are to be held, sound barriers could be constructed to provide sufficient screening for the remaining dwellings.

Figure 4 shows the extents and heights of the sound barriers. Table 3 summarizes the mitigated sound levels. Once operations at the pit have been exhausted, the sound barriers can be removed and the remaining dwellings constructed.

Note that the sound barrier must be of solid construction with no gaps, cracks or holes (except for small openings required for water drainage) and must have a minimum surface weight of 20 kg/m^2. A variety of materials are available, including concrete, wood, earthen berms or a combination of the above.

3.3 DRUMMOND PIT

The Drummond Pit has a Class A licence to extract up to 350,000 tonnes of aggregate per year. From discussions with the owner as of 2015, the pit has enough aggregate for approximately five more years of operation. Thus, this pit is nearing the end of operations on the site.

Extraction of the western portion of the Drummond Pit has been completed. In fact, the furthest western portion of the site has been removed from the licenced area and extraction there is no longer permitted. The remaining portion of the western part of the pit has been rehabilitated. Thus, the only active area is at the eastern end of the site. Extraction is still occurring in the (original) setback along the northern boundary of the site. The other area where extraction could occur is the southeastern corner of the site.

The operations that typically occur on the site are outlined in Appendix B. Note that the worst-case assessment has assumed that all operations, including below water table extraction, could occur anywhere on site. As in the Brazeau Pit, it was also assumed that the processing plant does not need to operate during the nighttime period; all other sources were assumed to operate at any time of the day, evening or night.

3.3.1 Analysis Results

Figure 5 and Table 4 show the predicted unmitigated sound levels due to the worst-case operations at Drummond Pit. Since Drummond Pit is significantly further from the proposed dwellings compared to Brazeau Pit, the noise guideline limits are met at all locations except R13 and R14. However, assuming the mitigation for Brazeau Pit is implemented (i.e. these dwellings are held until extraction and processing at the pits is completed), then the excesses at these receptors would also be addressed.

4.0 DISCUSSION

The results outlined above indicate that the noise guideline limits from worst case operations will be exceeded at the closest dwelling units within the proposed development. The only activity assumed to not occur at night is the processing of aggregate. All other activities, which include extraction (both above and below water table), material movement, loading of shipping trucks and the movement of shipping trucks, are assumed to occur at night. If processing were permitted at night, additional noise mitigation would need to be incorporated into the gravel pit operations since the sound levels would exceed the applicable guideline limits at the dwellings currently under construction to the north. Mitigation measures implemented for the gravel pits to comply at the dwellings to the north could also benefit the proposed dwellings to the south.

It must also be noted that the proposed dwellings are exposed to the Future Greenbank Road. This road will eventually carry significant road traffic volumes and will have dedicated bus lanes. Using ultimate traffic volumes for Future Greenbank Road (AADT of 35,000), the minimum daytime ambient sound level at the dwellings east of Greenbank Road is predicted to be 66 dBA at R01 and R05, and 64 dBA at R03 and R04 during the daytime. This is higher than the sound levels due to Brazeau Pit.

It is recognized that it may take a considerable amount of time for the road traffic on Future Greenbank Road to reach the ultimate volume. However, if half the ultimate volume were used, the minimum sound levels would only be reduced by 3 dBA; if one quarter of the ultimate volume were used, the minimum predicted sound levels would be reduced by 6 dBA. These sound levels are still higher than the predicted sound levels from the gravel pit operations.

5.0 CONCLUSIONS

A detailed assessment of the noise impact from the gravel pit operations onto the proposed Mattamy Half Moon Bay South Phase 5 and Minto Quinn's Pointe Stage 2 residential development has been completed. In accordance with the MOE requirements, a predictable worst-case scenario was assessed.

The results of the stationary noise impact assessment indicate that, with the mitigation measures outlined above, the MOE noise guideline limits will be met at all dwellings. Future homeowners within approximately 300 m of the property line of the licensed gravel pits should be made aware of the potential noise situation by including the following warning clause in all Offers of Purchase and Sale and by registering it on title:

> *"Purchasers are advised that due to the proximity of the adjacent gravel pit operations, sound from the gravel pits may, at times, be audible".*

6.0 REFERENCES

1. "Environmental Noise Guidelines, Stationary and Transportation Sources – Approval and Planning", Ontario Ministry of the Environment and Climate Change, Publication NPC-300, October 2013.

2. "Environmental Noise Control Guidelines", City of Ottawa Planning and Growth Management Department, January 2016.

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TABLE 1

EQUIPMENT SOUND EMISSION LEVELS

Equipment	Sound Emission Level (dBA) at 15 m Reference Distance
BRAZEAU PIT	
Front End Loader	75
Excavator	80
Processing Plant	91
Screen	75
Shipping Trucks	78
DRUMMOND PIT	
Front End Loader	75
Excavator	70
Processing Plant	91
Shipping Trucks	78

TABLE 2

BRAZEAU PIT – PREDICTED UNMITIGATED SOUND LEVELS

Receptor	Description	Time Period	Predicted Sound Level (dBA)(1)	Performance Limit (dBA)	Compliance with Performance Limit?
R01	West-facing window on the dwelling to the east	Daytime	54	50	NO
		Evening	48	50	YES
		Nighttime	48	45	NO
R02	Rear yard of dwelling to the east	Daytime	48	50	NO
		Evening	44	45	YES
		Nighttime	—	—	N/A(2)
R03	West-facing window on the dwelling to the east	Daytime	51	50	NO
		Evening	47	50	YES
		Nighttime	47	45	NO
R04	West-facing window on the dwelling to the east	Daytime	50	50	YES
		Evening	47	50	YES
		Nighttime	47	45	NO
R05	West-facing window on the townhouse block to the east	Daytime	49	50	YES
		Evening	46	50	YES
		Nighttime	46	45	NO
R06	West-facing window on the dwelling to the south	Daytime	50	50	YES
		Evening	44	50	YES
		Nighttime	44	45	YES
R07	West-facing window on the dwelling to the south	Daytime	52	50	NO
		Evening	46	50	YES
		Nighttime	46	45	NO
R08	West-facing window on the dwelling to the south	Daytime	58	50	NO
		Evening	50	50	YES
		Nighttime	50	45	NO
R09	North-facing window on dwelling to the south	Daytime	70	50	NO
		Evening	60	50	NO
		Nighttime	60	45	NO
R10	North-facing window on dwelling to the south	Daytime	68	50	NO
		Evening	59	50	NO
		Nighttime	59	45	NO
R11	Rear yard of dwelling to the south	Daytime	70	50	NO
		Evening	60	45	NO
		Nighttime	—	—	N/A(2)
R12	Rear yard of dwelling to the south	Daytime	67	50	NO
		Evening	58	45	NO
		Nighttime	—	—	N/A(2)
R13	West-facing window of dwelling to the west of Future Greenbank Road	Daytime	71	50	NO
		Evening	63	50	NO
		Nighttime	63	45	NO
R14	Rear yard of dwelling to the west of Future Greenbank Road	Daytime	69	50	NO
		Evening	59	45	NO
		Nighttime	54	—	N/A(2)

Notes:
(1) See Figure 3.
(2) Nighttime sound level limits do not apply to outdoor points of reception.

TABLE 3

BRAZEAU PIT – PREDICTED MITIGATED SOUND LEVELS(1)

Receptor	Description	Time Period	Predicted Sound Level (dBA)(2)	Performance Limit (dBA)	Compliance with Performance Limit?
R01	West-facing window on the dwelling to the east	Daytime	50	50	YES
		Evening	45	50	YES
		Nighttime	45	45	YES
R02	Rear yard of dwelling to the east	Daytime	49	50	YES
		Evening	43	45	YES
		Nighttime	—	—	N/A(3)
R03	West-facing window on the dwelling to the east	Daytime	45	50	YES
		Evening	43	50	YES
		Nighttime	43	45	YES
R04	West-facing window on the dwelling to the east	Daytime	44	50	YES
		Evening	42	50	YES
		Nighttime	42	45	YES
R05	West-facing window on the townhouse block to the east	Daytime	44	50	YES
		Evening	43	50	YES
		Nighttime	43	45	YES
R06	West-facing window on the dwelling to the south	Daytime	47	50	YES
		Evening	43	50	YES
		Nighttime	43	45	YES
R07	West-facing window on the dwelling to the south	Daytime	48	50	YES
		Evening	43	50	YES
		Nighttime	43	45	YES
R08	West-facing window on the dwelling to the south	Daytime	50	50	NO
		Evening	42	50	YES
		Nighttime	42	50	YES

Notes:

(1) As part of the mitigation, receptors R09 to R14 cannot be constructed until after the Brazeau Pit operations cease
(2) See Figure 4.
(3) Nighttime sound level limits do not apply to outdoor points of reception.

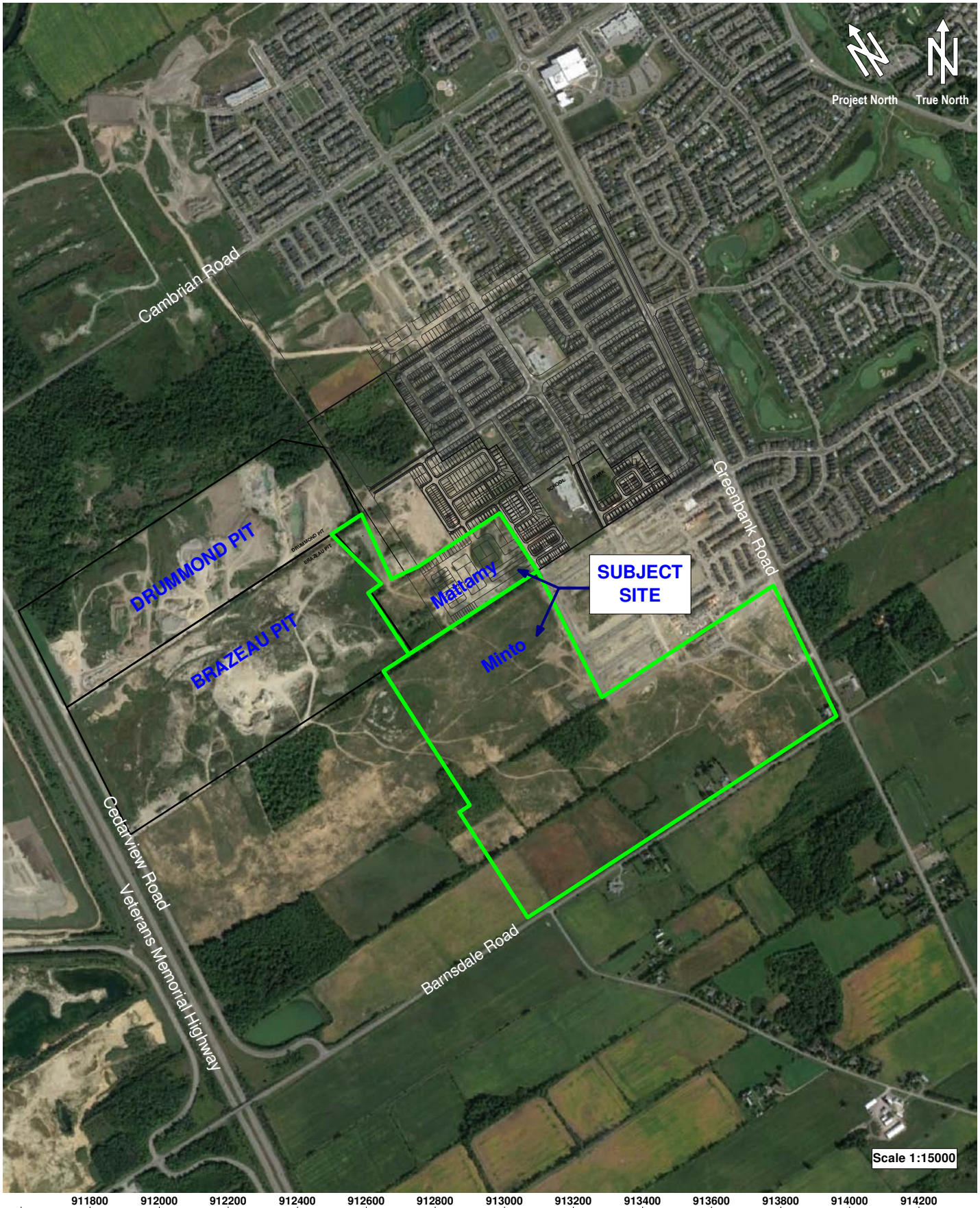
TABLE 4

DRUMMOND PIT – PREDICTED UNMITIGATED SOUND LEVELS

Receptor	Description	Time Period	Predicted Sound Level (dBA)[1]	Performance Limit (dBA)	Compliance with Performance Limit?
R01	West-facing window on the dwelling to the east	Daytime	44	50	YES
		Evening	41	50	YES
		Nighttime	41	45	YES
R02	Rear yard of dwelling to the east	Daytime	42	50	YES
		Evening	39	45	YES
		Nighttime	—	—	N/A[2]
R03	West-facing window on the dwelling to the east	Daytime	42	50	YES
		Evening	38	50	YES
		Nighttime	38	45	YES
R04	West-facing window on the dwelling to the east	Daytime	46	50	YES
		Evening	41	50	YES
		Nighttime	41	45	YES
R05	West-facing window on the townhouse block to the east	Daytime	46	50	YES
		Evening	41	50	YES
		Nighttime	41	45	YES
R06	West-facing window on the dwelling to the south	Daytime	37	50	YES
		Evening	36	50	YES
		Nighttime	36	45	YES
R07	West-facing window on the dwelling to the south	Daytime	40	50	YES
		Evening	38	50	YES
		Nighttime	38	45	YES
R08	West-facing window on the dwelling to the south	Daytime	44	50	YES
		Evening	40	50	YES
		Nighttime	40	45	YES
R09	North-facing window on dwelling to the south	Daytime	49	50	YES
		Evening	42	50	YES
		Nighttime	42	45	YES
R10	North-facing window on dwelling to the south	Daytime	49	50	YES
		Evening	42	50	YES
		Nighttime	42	45	YES
R11	Rear yard of dwelling to the south	Daytime	50	50	YES
		Evening	43	45	YES
		Nighttime	—	—	N/A[2]
R12	Rear yard of dwelling to the south	Daytime	50	50	YES
		Evening	43	45	YES
		Nighttime	—	—	N/A[2]
R13	West-facing window of dwelling to the west of Future Greenbank Road	Daytime	52	50	NO
		Evening	45	50	YES
		Nighttime	45	45	YES
R14	Rear yard of dwelling to the west of Future Greenbank Road	Daytime	54	50	NO
		Evening	46	45	NO
		Nighttime	—	—	N/A[2]

Notes:

(1) See Figure 5.
(2) Nighttime sound level limits do not apply to outdoor points of reception.



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Title	Date	Figure
Key Plan	2018-05-01	1
Project Name	Project No.	
Half Moon Bay South and Quinn's Pointe Stage 2	118-0052	

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Date Plotted: 01.05.18

legend

- CDP Boundary
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Commercial
- Park & Ride
- Storm Water Management Facility
- School Site / Library Site
- Park
- Active Sand & Gravel Pits
- Urban Expansion Study Area
- Existing Woodlot
- 300m Extraction Site Buffer
- 500m Land Fill Buffer
- 1000m Land Fill Buffer
- Possible Tree Retention
- Proposed Splash Pad
- Transit Platform
- BRT Route
- BRT Station
- Property Ownership Boundary
- 1 Minto Lands
- 2 Moloughney Property West
- 3 Moloughney Property East
- 4 Boyle Property
- 5 Mattamy Lands
- 6 Brazeau Lands
- 7 Drummond Lands

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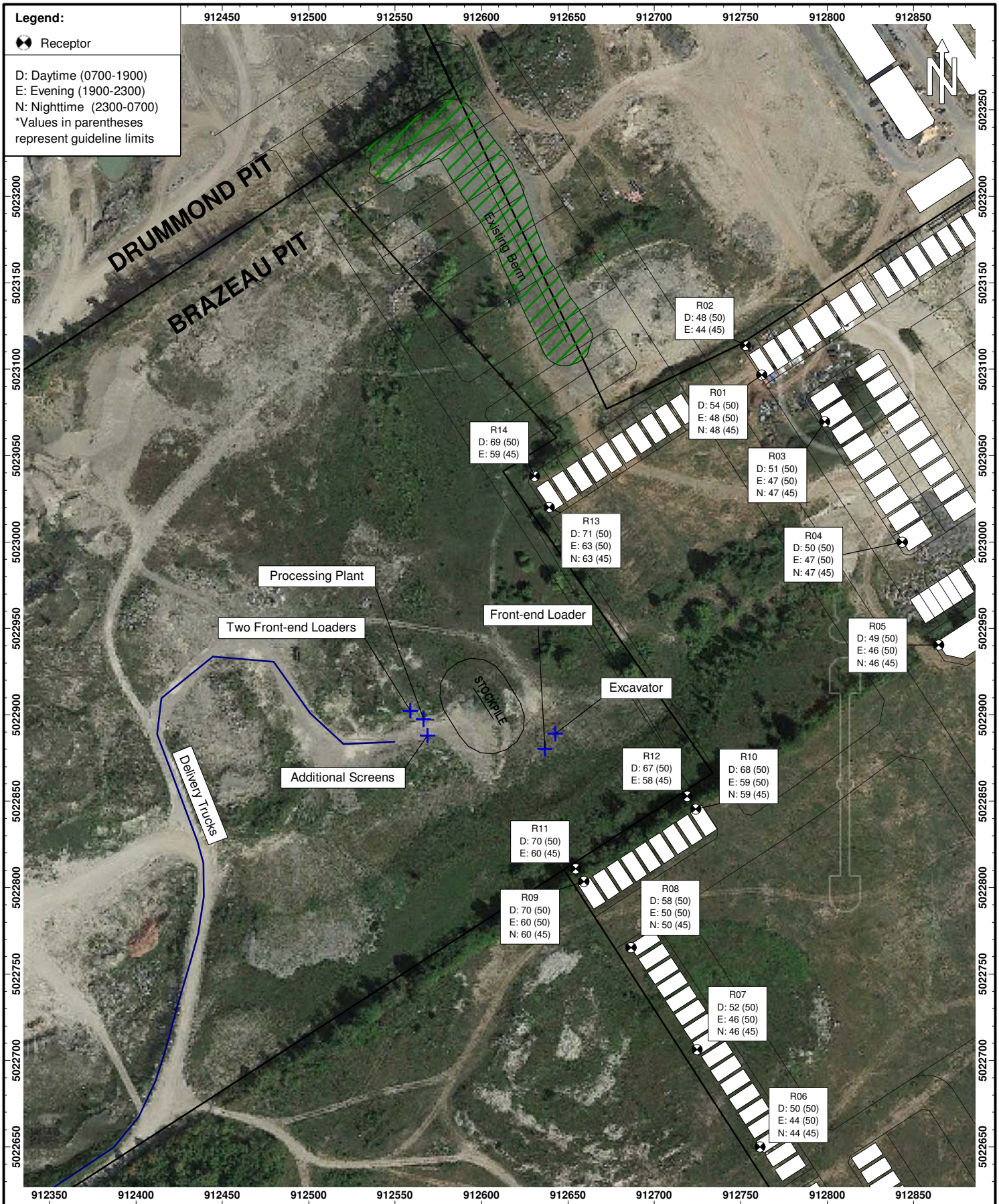
Title: Site Plan

Project Name: Half Moon Bay South and Quinn's Pointe Stage 2

Date: 2018-05-01

Project No.: 118-0052

Figure: 2



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Title	Date	Figure
Brazeau Pit - Predicted Worst-Case Sound Levels (dBA)	**2018-05-01**	**3**
Project Name	Project No.	
Half Moon Bay South and Quinn's Pointe Stage 2	**118-0052**	

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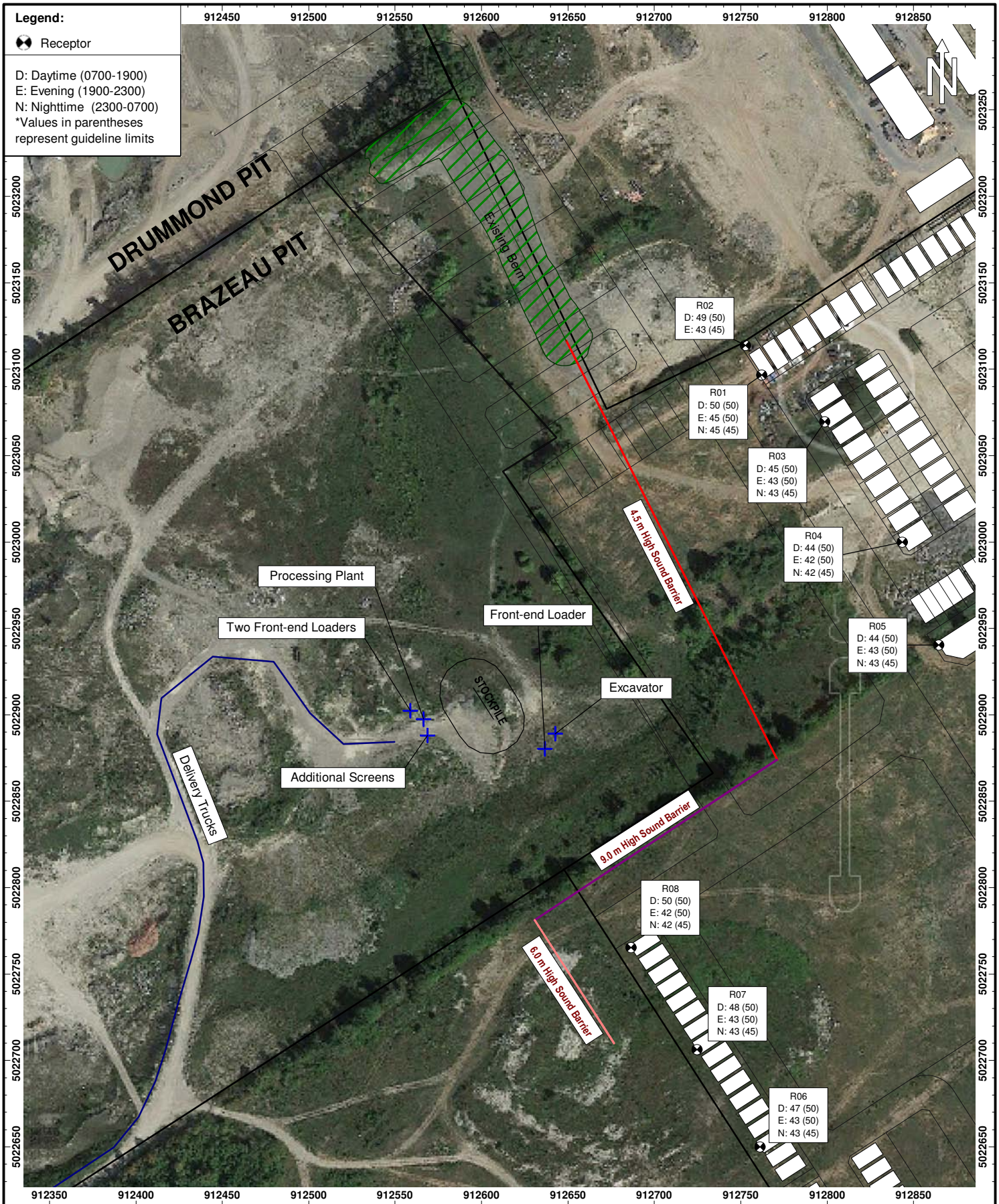
Date Plotted: 01.05.18



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Title	Date	Figure
Brazeau Pit - Predicted Worst-Case Sound Levels (dBA) with Mitigation	**2018-05-01**	**4**
Project Name	Project No.	
Half Moon Bay South and Quinn's Pointe Stage 2	**118-0052**	

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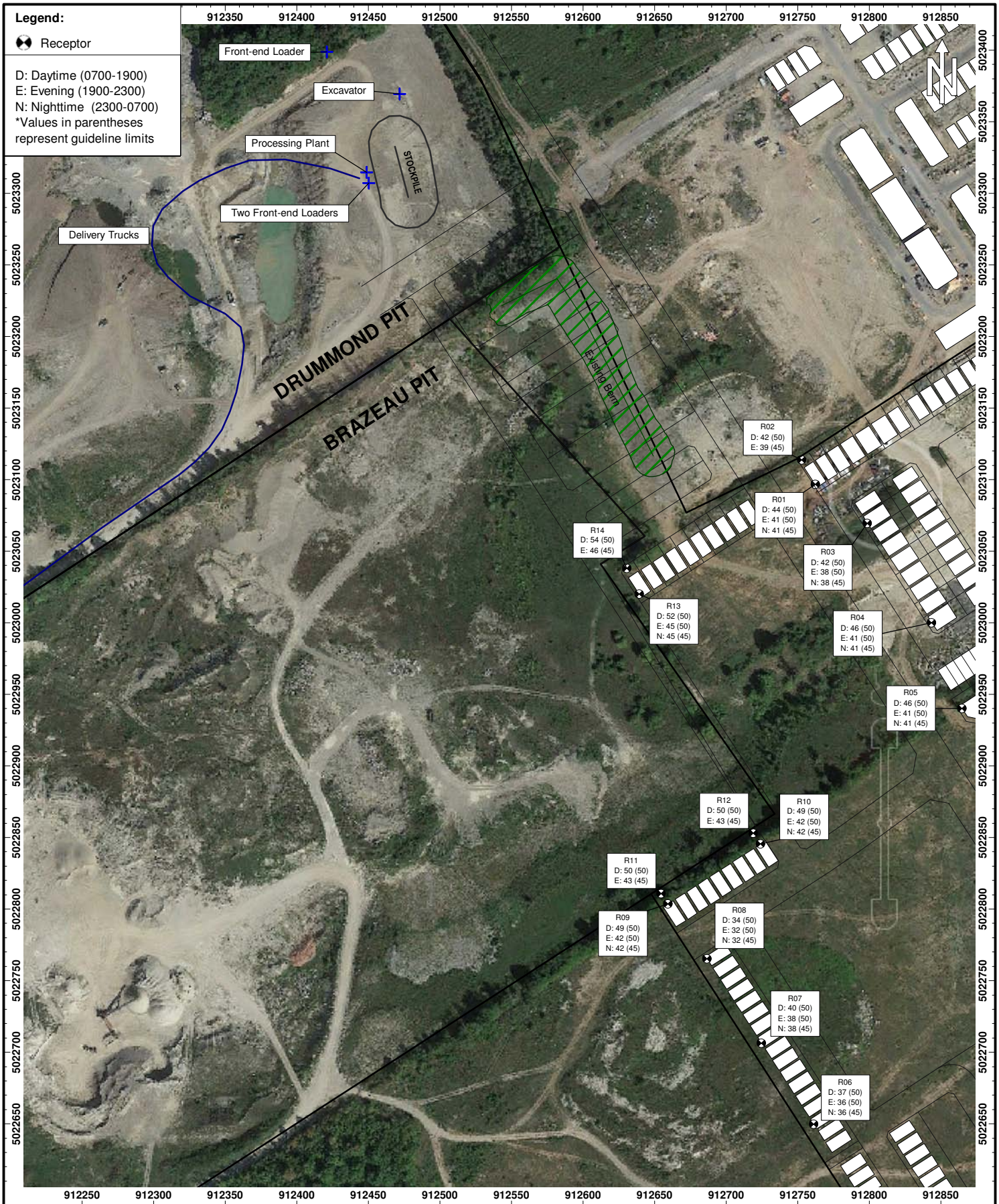
Date Plotted: 01.05.18



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Title	Date	Figure
Drummond Pit - Predicted Worst-Case Sound Levels (dBA)	**2018-05-01**	**5**
Project Name: **Half Moon Bay South and Quinn's Pointe Stage 2**	Project No.: **118-0052**	

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Date Plotted: 01.05.18

APPENDIX A

ENVIRONMENTAL NOISE GUIDELINES

APPENDIX A

ENVIRONMENTAL NOISE GUIDELINES

MINISTRY OF THE ENVIRONMENT AND CLIMATE CHANGE (MOE)

Reference: MOE Publication NPC-300, October 2013: *"Environmental Noise Guideline, Stationary and Transportation Source – Approval and Planning"*.

SPACE	SOURCE	TIME PERIOD	CRITERION
Living/dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, etc.	Road	07:00 to 23:00	45 dBA
	Rail	07:00 to 23:00	40 dBA
	Aircraft	24-hour period	NEF/NEP 5
Living/dining, den areas of residences, hospitals, nursing homes, etc. (except schools or daycare centres)	Road	23:00 to 07:00	45 dBA
	Rail	23:00 to 07:00	40 dBA
	Aircraft	24-hour period	NEF/NEP 5
Sleeping quarters	Road	07:00 to 23:00	45 dBA
	Rail	07:00 to 23:00	40 dBA
	Aircraft	24-hour period	NEF/NEP 0
Sleeping quarters	Road	23:00 to 07:00	40 dBA
	Rail	23:00 to 07:00	35 dBA
	Aircraft	24-hour period	NEF/NEP 0
Outdoor Living Areas	Road and Rail	07:00 to 23:00	55 dBA
Outdoor Point of Reception	Aircraft	24-hour period	NEF/NEP 30#
	Stationary Source		
	Class 1 Area	07:00 to 19:00(1)	50* dBA
		19:00 to 23:00(1)	50* dBA
	Class 2 Area	07:00 to 19:00(2)	50* dBA
		19:00 to 23:00(2)	45* dBA
	Class 3 Area	07:00 to 19:00(3)	45* dBA
		19:00 to 23:00(3)	40* dBA
	Class 4 Area	07:00 to 19:00(4)	55* dBA
		19:00 to 23:00(4)	55* dBA

…./cont'd

SPACE	SOURCE	TIME PERIOD	CRITERION
Plane of a Window of Noise Sensitive Spaces	Stationary Source		
	Class 1 Area	07:00 to 19:00(1)	50* dBA
		19:00 to 23:00(1)	50* dBA
		23:00 to 07:00(1)	45* dBA
	Class 2 Area	07:00 to 19:00(2)	50* dBA
		19:00 to 23:00(2)	50* dBA
		23:00 to 07:00(2)	45* dBA
	Class 3 Area	07:00 to 19:00(3)	45* dBA
		19:00 to 23:00(3)	45* dBA
		23:00 to 07:00(3)	40* dBA
	Class 4 Area	07:00 to 19:00(4)	60* dBA
		19:00 to 23:00(4)	60* dBA
		23:00 to 07:00(4)	55* dBA

\# may not apply to in-fill or re-development.
* or the minimum hourly background sound exposure $L_{eq(1)}$, due to road traffic, if higher.
(1) Class 1 Area: Urban.
(2) Class 2 Area: Urban during day; rural-like evening and night.
(3) Class 3 Area: Rural.
(4) Class 4 Area: Subject to land use planning authority's approval.

Reference: MOE Publication ISBN 0-7729-2804-5, 1987: *"Environmental Noise Assessment in Land-Use Planning"*.

EXCESS ABOVE RECOMMENDED SOUND LEVEL LIMITS (dBA)(1)	CHANGE IN SUBJECTIVE LOUDNESS ABOVE	MAGNITUDE OF THE NOISE PROBLEM	NOISE CONTROL MEASURES (OR ACTION TO BE TAKEN)
No excess (<55 dBA)	—	No expected noise problem	None
1 to 5 inclusive (56 to 60 dBA)	Noticeably louder	Slight noise impact	If no physical measures are taken, then prospective purchasers or tenants should be made aware by suitable warning clauses.
6 to 10 inclusive (61 - 65 dBA)	Almost twice as loud	Definite noise impact	Recommended.
11 to 15 inclusive (66 - 70 dBA)	Almost three times as loud	Serious noise impact	Strongly Recommended.
16 and over (>70 dBA)	Almost four times as loud	Very serious noise impact	Strongly Recommended (may be mandatory).

(1) Potential excess above noise guideline limit, as outlined in the table below, applies only to the criterion for an outdoor living area from road and rail noise sources.

APPENDIX B

OPERATIONAL MEMORANDA

VALCOUSTICS
Canada Ltd.
Sound solutions to acoustical challenges

MEMORANDUM

TO: Marcel Brazeau **VIA EMAIL**

FROM: John Emeljanow/Ian Matthew

DATE: August 8, 2013

RE: Operations Review
Brazeau Pit

FILE: 108363.100

As per our on site meeting on July 18, 2013, outlined below is our understanding of the permitted operations at the above noted gravel pit. If there is anything within this memorandum that is incorrect, please let us know as soon as possible.

As you are aware, residential development is proposed to the east of your site. As part of the approvals process, a noise study is needed demonstrating that the predictable worst case operations of the gravel pit site comply with the Ministry of Environment (MOE) noise guidelines. The applicable guideline is MOE Publication NPC-205 as an aggregate extraction and processing facility is considered a stationary noise source. Note that construction and rehabilitation activities are excluded from assessment under NPC-205. Equipment used for construction and rehabilitation simply needs to comply with the noise emission limits in MOE Publication NPC-115. Thus, the noise assessment is applicable to the extraction, processing and shipping activities that occur on your site.

Based on our meeting to review your operations, our understanding of the predictable worst case operations are:

- Regular operating hours are during the daytime period (i.e. 0700 to 1900 hours). However, the pit is licensed to operate 24 hours per day. Thus, nighttime operations were also considered in the assessment;
- The approximate location of the current extraction face is shown on Figure 1. Extraction is progressing from east to west across the site;
- Above water table extraction to the east of the current face has been completed;

- Other than the trucks travelling along the southern boundary of the site, which are at undisturbed grade, all equipment operates at the bottom elevation of the pit (at an elevation of approximately 97.5 m);

- The typical operation that occurs on the site is shipping. Trucks enter the site, travel to the aggregate stockpile location (which is close to the working face) where they are loaded by a front end loader and then they leave the site;

- Once the stockpiles are depleted, a portable processing plant (which includes a crusher, vibratory screen and stacker) are brought to the site. The processing plant operates in close proximity to the working face to minimize the distance material needs to be transported. Aggregate is extracted from the face using up to 2 front end loaders which directly feed the processing plant which replenishes the stockpiles;

- For dust control purposes, the processing plant is always located to the west of the stockpiles. Thus, the stockpiles would be in between the proposed residential development and the processing equipment. The stockpiles would be 40 to 50 feet in height;

- The processing plant only operates during the daytime period (i.e. 0700 to 1900 hours);

- Two additional screens could operate on the site in close proximity to the working face;

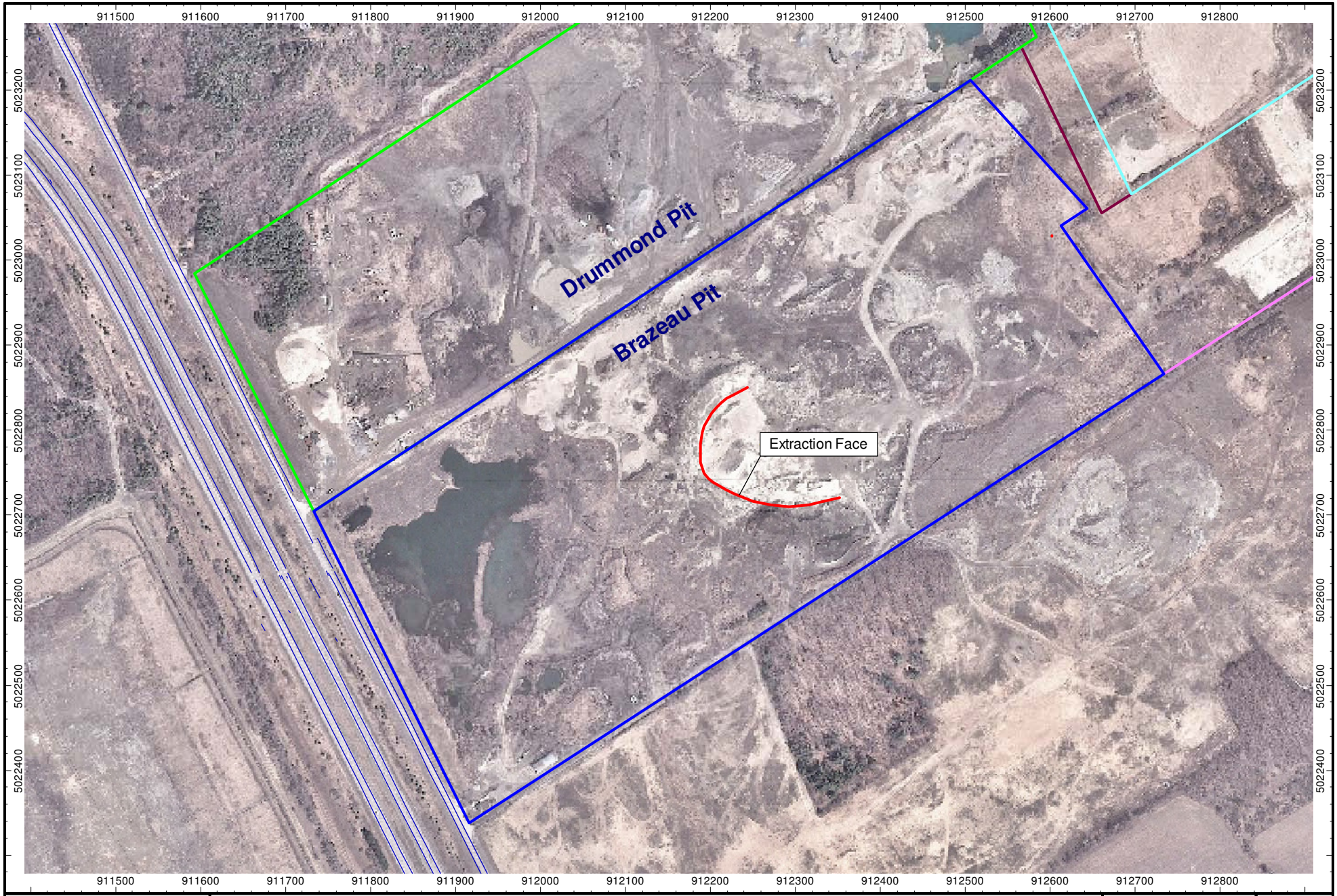
- As the site is licensed to ship up to 300,000 tonnes of material per year, we estimate in a worst case hour there could be 25 loads of aggregate leaving the site. Thus, there would be 25 trucks coming to and leaving the site in a predictable worst case hour;

- If below water table extraction were to be done, an excavator would be added to the equipment operating on the site. Extraction would be from the east to west across the site. Other than the excavator extracting material from below the water table, all other equipment and its operation would be similar to what was outlined above;

- During the winter time, the site is used for snow storage. Snow is hauled to the site and is piled using a front end loader. The snow pile will always be in between the loader and the proposed residential development. This activity primarily occurs on the western end of the site.

As indicated above, please let us know if we have misinterpreted your operations in any way. If there are any questions, please do not hesitate to call (Valcoustics, 905-764-5223).

J:\2008\108363\100\Memos\M1 - Brazeau.wpd



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Title: **Current Extraction Face - Brazeau Pit**	Date: **August 7, 2013**	Figure: **1**
Project Name: **Half Moon Bay South - Pit Assessment**	Project No.: **108-363.100**	

J:\2008\108363\100\Analysis\Cadna\2013-08-02 Half Moon Bay Pits.cna

Date Plotted: 07.08.13

VALCOUSTICS
Canada Ltd.
Sound solutions to acoustical challenges

MEMORANDUM

TO: Scott Drummond **VIA EMAIL**

FROM: John Emeljanow/Ian Matthew

DATE: August 8, 2013

RE: Operations Review
Drummond Pit

FILE: 108363.100

As per our on site meeting on July 18, 2013, outlined below is our understanding of the permitted operations at the above noted gravel pit. If there is anything within this memorandum that is incorrect, please let us know as soon as possible.

As you are aware, residential development is proposed to the east of your site. As part of the approvals process, a noise study is needed demonstrating that the predictable worst case operations of the gravel pit site comply with the Ministry of Environment (MOE) noise guidelines. The applicable guideline is MOE Publication NPC-205 as an aggregate extraction and processing facility is considered a stationary noise source. Note that construction and rehabilitation activities are excluded from assessment under NPC-205. Equipment used for construction and rehabilitation simply needs to comply with the noise emission limits in MOE Publication NPC-115. Thus, the noise assessment is applicable to the extraction, processing and shipping activities that occur on your site.

Based on our meeting to review your operations, our understanding of the predictable worst case operations are:

- There is approximately 5 years of pit operations remaining;
- Operating hours are during the daytime period (i.e. 0700 to 1700 hours);
- There are two extraction locations remaining on the site. One is along the 15 m setback to the north and the other is the northeast corner of the site. For the northeast corner, extraction would be from west to east;
- Other than the trucks travelling along the southern boundary of the site, which are at undisturbed grade, all equipment operates at the bottom elevation of the pit (at an elevation of approximately 97.5 m);

- The typical operation that occurs on the site is shipping. Trucks enter the site, travel to the aggregate stockpile location (which is close to the working face) where they are loaded by a front end loader and then they leave the site;

- Once the stockpiles are depleted, a portable processing plant (which includes a crusher, vibratory screen and stacker) are brought to the site. The processing plant operates in close proximity to the working face to minimize the distance material needs to be transported. Aggregate is extracted from the face using up to 2 front end loaders which directly feed the processing plant which replenishes the stockpiles;

- For dust control purposes, the processing plant is always located to the west of the stockpiles. Thus, the stockpiles would be in between the proposed residential development and the processing equipment. The stockpiles would be 40 to 50 feet in height;

- As the site is licensed to ship up to 350,000 tonnes of material per year, we estimate in a worst case hour there could be 25 loads of aggregate leaving the site. Thus, there would be 25 trucks coming to and leaving the site in a predictable worst case hour. The trucks would be loaded from the west side of the stockpiles;

- If below water table extraction were to be done, an excavator would be added to the equipment operating on the site. Other than the excavator extracting material from below the water table, all other equipment and its operation would be similar to what was outlined above;

As indicated above, please let us know if we have misinterpreted your operations in any way. If there are any questions, please do not hesitate to call (Valcoustics, 905-764-5223).

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APPENDIX C
SAMPLE CALCULATIONS

118-0052 Half Moon Bay South Phase 5 and Quinn's Pointe Stage 2

Point Source Table

Name	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night						X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		(m)		(m)	(m)	(m)
Processing Plant	~	DrCVS_PRCS	122.5	122.5	122.5	Lw	CRV		0.0	0.0	0.0				60.00	0.00	0.00	0.0		(none)	3.50	r	912448.77	5023314.62	100.50
Two Front-end Loaders	~	DrFEL_PRCS	109.4	109.4	109.4	Lw	FEL950 + 10*log10(2)		0.0	0.0	0.0				60.00	0.00	60.00	0.0		(none)	2.50	r	912450.35	5023307.10	99.50
Front-end Loader	~	DrFEL_TYP	106.4	106.4	106.4	Lw	FEL950		0.0	0.0	0.0				60.00	0.00	60.00	0.0		(none)	2.50	r	912421.08	5023398.87	99.50
Excavator	~	DrExc	101.9	101.9	101.9	Lw	EXC330		0.0	0.0	0.0				60.00	0.00	60.00	0.0		(none)	2.50	r	912471.92	5023369.38	99.50
Excavator		BrEXC	111.1	111.1	111.1	Lw	EXC350		0.0	0.0	0.0				60.00	0.00	60.00	0.0		(none)	2.50	r	912642.72	5022888.94	100.00
Processing Plant		BrCVS	122.5	122.5	122.5	Lw	CRV		0.0	0.0	0.0				60.00	0.00	0.00	0.0		(none)	3.50	r	912566.43	5022897.59	100.50
Front-end Loader		BrFEL	106.4	106.4	106.4	Lw	FEL950		0.0	0.0	0.0				60.00	0.00	60.00	0.0		(none)	2.50	r	912636.73	5022880.26	99.50
Additional Screens		BrSCR	109.5	109.5	109.5	Lw	SCR + 10*log10(2)		0.0	0.0	0.0				60.00	0.00	0.00	0.0		(none)	3.50	r	912568.83	5022888.17	100.50
Two Front-end Loaders		BrFEL	109.4	109.4	109.4	Lw	FEL950 + 10*log10(2)		0.0	0.0	0.0				60.00	0.00	60.00	0.0		(none)	2.50	r	912558.76	5022902.49	99.50

Line Source Table

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src			
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number			Speed
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night	(km/h)
Delivery Trucks		BrTrkC1	116.8	-3.2	116.8	86.8	-33.2	86.8	PWL-Pt	vclHvyTrkA		0.0	0.0	0.0							0.0		(none)	100.0	0.0	100.0	20.0
Delivery Trucks	~	DrTrk	114.1	-2.9	114.1	83.7	-33.2	83.7	PWL-Pt	vclHvyTrkA		0.0	0.0	0.0							0.0		(none)	50.0	0.0	50.0	20.0

Sound Power Levels

Name	ID	Type	Oktave Spectrum (dB)												Source
			Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
Heavy Truck Movement	vclHvyTrkA	Lw		101.7	98.2	97.3	91.3	95.0	97.2	101.8	105.7	104.3	109.8	110.6	MTO long truck at 20 kph
Front End Loader (CAT950)	FEL950	Lw		109.0	109.0	114.0	109.0	100.0	99.0	96.0	97.0	94.0	106.4	117.2	FHWA Const. Noise Handbook Table 9.4
Excavator (Deere 350G)	EXC350	Lw		100.1	108.8	108.1	110.7	108.0	106.9	102.5	97.0	92.2	111.1	116.1	7/18/2013 Measurement
Excavator (CAT 330)	EXC330	Lw		100.0	97.0	102.0	99.0	98.0	97.0	96.0	88.0	80.0	101.9	107.4	Noise and Dust Study
Screen (non-vibratory)	SCR	Lw		108.4	116.8	110.4	103.0	102.6	101.2	99.1	94.9	90.9	106.4	118.6	7/18/2013 Measurement
Crusher + Vibratory Screen	CRV	Lw		110.9	119.5	122.9	114.8	116.7	116.2	116.4	115.1	109.7	122.5	127.0	7/18/2013 Measurement

Calculation Configuration

Configuration	
Parameter	Value
General	
Country	International
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	1000.00
Min. Length of Section (#(Unit,LEN))	1.00
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	60.00
Reference Time Night (min)	60.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	0.00
Night-time Penalty (dB)	0.00
DTM	
Standard Height (m)	100.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	2
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (#(Unit,TEMP))	10
rel. Humidity (%)	70
Ground Absorption G	0.00
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (RLS-90)	
Strictly acc. to RLS-90	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

Receiver
Name: R08
ID: R08
X: 912686.47 m
Y: 5022765.42 m
Z: 115.28 m

Point Source, ISO 9613, Name: "Processing Plant", ID: "BrCVS"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
6	912566.43	5022897.59	100.50	0	D	A	122.5	0.0	0.0	0.0	0.0	56.1	1.9	-1.2	0.0	0.0	9.1	0.0	0.0	56.6
6	912566.43	5022897.59	100.50	0	N	A	122.5	0.0	-188.0	0.0	0.0	56.1	1.9	-1.2	0.0	0.0	9.1	0.0	0.0	-131.4
6	912566.43	5022897.59	100.50	0	E	A	122.5	0.0	-188.0	0.0	0.0	56.1	1.9	-1.2	0.0	0.0	9.1	0.0	0.0	-131.4
11	912566.43	5022897.59	100.50	1	D	A	122.5	0.0	0.0	0.0	0.0	56.4	2.0	-1.2	0.0	0.0	23.8	0.0	5.6	35.9
11	912566.43	5022897.59	100.50	1	N	A	122.5	0.0	-188.0	0.0	0.0	56.4	2.0	-1.2	0.0	0.0	23.8	0.0	5.6	-152.1
11	912566.43	5022897.59	100.50	1	E	A	122.5	0.0	-188.0	0.0	0.0	56.4	2.0	-1.2	0.0	0.0	23.8	0.0	5.6	-152.1

Point Source, ISO 9613, Name: "Excavator", ID: "BrEXC"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
19	912642.72	5022888.94	100.00	0	D	A	111.1	0.0	0.0	0.0	0.0	53.4	0.7	0.0	0.0	0.0	18.3	0.0	0.0	38.7
19	912642.72	5022888.94	100.00	0	N	A	111.1	0.0	0.0	0.0	0.0	53.4	0.7	0.0	0.0	0.0	18.3	0.0	0.0	38.7
19	912642.72	5022888.94	100.00	0	E	A	111.1	0.0	-188.0	0.0	0.0	53.4	0.7	0.0	0.0	0.0	18.3	0.0	0.0	-149.3

Point Source, ISO 9613, Name: "Front-end Loader", ID: "BrFEL"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
31	912636.73	5022880.26	99.50	0	D	A	106.4	0.0	0.0	0.0	0.0	53.0	0.9	1.1	0.0	0.0	12.8	0.0	0.0	38.5
31	912636.73	5022880.26	99.50	0	N	A	106.4	0.0	0.0	0.0	0.0	53.0	0.9	1.1	0.0	0.0	12.8	0.0	0.0	38.5
31	912636.73	5022880.26	99.50	0	E	A	106.4	0.0	-188.0	0.0	0.0	53.0	0.9	1.1	0.0	0.0	12.8	0.0	0.0	-149.5

Point Source, ISO 9613, Name: "Two Front-end Loaders", ID: "BrFEL"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
51	912558.76	5022902.49	99.50	0	D	A	109.4	0.0	0.0	0.0	0.0	56.5	1.2	-1.2	0.0	0.0	7.7	0.0	0.0	45.2
51	912558.76	5022902.49	99.50	0	N	A	109.4	0.0	0.0	0.0	0.0	56.5	1.2	-1.2	0.0	0.0	7.7	0.0	0.0	45.2
51	912558.76	5022902.49	99.50	0	E	A	109.4	0.0	-188.0	0.0	0.0	56.5	1.2	-1.2	0.0	0.0	7.7	0.0	0.0	-142.8
56	912558.76	5022902.49	99.50	1	D	A	109.4	0.0	0.0	0.0	0.0	56.8	1.2	-1.2	0.0	0.0	20.3	0.0	12.3	20.0
56	912558.76	5022902.49	99.50	1	N	A	109.4	0.0	0.0	0.0	0.0	56.8	1.2	-1.2	0.0	0.0	20.3	0.0	12.3	20.0
56	912558.76	5022902.49	99.50	1	E	A	109.4	0.0	-188.0	0.0	0.0	56.8	1.2	-1.2	0.0	0.0	20.3	0.0	12.3	-168.0

Point Source, ISO 9613, Name: "Additional Screens", ID: "BrSCR"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
61	912568.83	5022888.17	100.50	0	D	A	109.5	0.0	0.0	0.0	0.0	55.6	1.1	-1.0	0.0	0.0	8.9	0.0	0.0	44.8
61	912568.83	5022888.17	100.50	0	N	A	109.5	0.0	-188.0	0.0	0.0	55.6	1.1	-1.0	0.0	0.0	8.9	0.0	0.0	-143.2
61	912568.83	5022888.17	100.50	0	E	A	109.5	0.0	-188.0	0.0	0.0	55.6	1.1	-1.0	0.0	0.0	8.9	0.0	0.0	-143.2

Line Source, ISO 9613, Name: "Delivery Trucks", ID: "BrTrkC1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
67	912423.87	5022857.79	99.50	0	D	A	86.8	18.2	0.0	0.0	0.0	59.9	6.3	-2.2	0.0	0.0	7.0	0.0	0.0	34.0
67	912423.87	5022857.79	99.50	0	N	A	86.8	18.2	0.0	0.0	0.0	59.9	6.3	-2.2	0.0	0.0	7.0	0.0	0.0	34.0
67	912423.87	5022857.79	99.50	0	E	A	-33.2	18.2	0.0	0.0	0.0	59.9	6.3	-2.2	0.0	0.0	7.0	0.0	0.0	-86.0
85	912417.10	5022875.90	99.50	1	D	A	86.8	8.4	0.0	0.0	0.0	62.1	7.3	-2.8	0.0	0.0	26.8	0.0	4.6	-2.9
85	912417.10	5022875.90	99.50	1	N	A	86.8	8.4	0.0	0.0	0.0	62.1	7.3	-2.8	0.0	0.0	26.8	0.0	4.6	-2.9
85	912417.10	5022875.90	99.50	1	E	A	-33.2	8.4	0.0	0.0	0.0	62.1	7.3	-2.8	0.0	0.0	26.8	0.0	4.6	-122.9
93	912422.62	5022861.13	99.50	1	D	A	86.8	10.3	0.0	0.0	0.0	61.2	6.9	-2.6	0.0	0.0	26.8	0.0	3.1	1.7
93	912422.62	5022861.13	99.50	1	N	A	86.8	10.3	0.0	0.0	0.0	61.2	6.9	-2.6	0.0	0.0	26.8	0.0	3.1	1.7
93	912422.62	5022861.13	99.50	1	E	A	-33.2	10.3	0.0	0.0	0.0	61.2	6.9	-2.6	0.0	0.0	26.8	0.0	3.1	-118.3
98	912418.00	5022873.51	99.50	1	D	A	86.8	12.0	0.0	0.0	0.0	61.4	7.0	-2.7	0.0	0.0	26.8	0.0	3.1	3.1
98	912418.00	5022873.51	99.50	1	N	A	86.8	12.0	0.0	0.0	0.0	61.4	7.0	-2.7	0.0	0.0	26.8	0.0	3.1	3.1

Line Source, ISO 9613, Name: "Delivery Trucks", ID: "BrTrkC1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
98	912418.00	5022873.51	99.50	1	E	A	-33.2	12.0	0.0	0.0	0.0	61.4	7.0	-2.7	0.0	0.0	26.8	0.0	3.1	-116.9
100	912413.76	5022884.84	99.50	1	D	A	86.8	9.3	0.0	0.0	0.0	61.6	7.1	-2.8	0.0	0.0	26.9	0.0	3.2	0.1
100	912413.76	5022884.84	99.50	1	N	A	86.8	9.3	0.0	0.0	0.0	61.6	7.1	-2.8	0.0	0.0	26.9	0.0	3.2	0.1
100	912413.76	5022884.84	99.50	1	E	A	-33.2	9.3	0.0	0.0	0.0	61.6	7.1	-2.8	0.0	0.0	26.9	0.0	3.2	-119.9
103	912434.59	5022829.10	99.50	1	D	A	86.8	7.0	0.0	0.0	0.0	61.2	6.9	-2.4	0.0	0.0	26.6	0.0	3.1	-1.7
103	912434.59	5022829.10	99.50	1	N	A	86.8	7.0	0.0	0.0	0.0	61.2	6.9	-2.4	0.0	0.0	26.6	0.0	3.1	-1.7
103	912434.59	5022829.10	99.50	1	E	A	-33.2	7.0	0.0	0.0	0.0	61.2	6.9	-2.4	0.0	0.0	26.6	0.0	3.1	-121.7
107	912433.38	5022832.35	99.50	1	D	A	86.8	2.9	0.0	0.0	0.0	61.2	6.9	-2.4	0.0	0.0	26.6	0.0	3.1	-5.8
107	912433.38	5022832.35	99.50	1	N	A	86.8	2.9	0.0	0.0	0.0	61.2	6.9	-2.4	0.0	0.0	26.6	0.0	3.1	-5.8
107	912433.38	5022832.35	99.50	1	E	A	-33.2	2.9	0.0	0.0	0.0	61.2	6.9	-2.4	0.0	0.0	26.6	0.0	3.1	-125.8
112	912430.86	5022839.08	99.50	1	D	A	86.8	10.9	0.0	0.0	0.0	61.3	6.9	-2.5	0.0	0.0	26.7	0.0	3.1	2.2
112	912430.86	5022839.08	99.50	1	N	A	86.8	10.9	0.0	0.0	0.0	61.3	6.9	-2.5	0.0	0.0	26.7	0.0	3.1	2.2
112	912430.86	5022839.08	99.50	1	E	A	-33.2	10.9	0.0	0.0	0.0	61.3	6.9	-2.5	0.0	0.0	26.7	0.0	3.1	-117.8
115	912426.02	5022852.03	99.50	1	D	A	86.8	11.8	0.0	0.0	0.0	61.5	7.0	-2.6	0.0	0.0	26.7	0.0	3.1	2.8
115	912426.02	5022852.03	99.50	1	N	A	86.8	11.8	0.0	0.0	0.0	61.5	7.0	-2.6	0.0	0.0	26.7	0.0	3.1	2.8
115	912426.02	5022852.03	99.50	1	E	A	-33.2	11.8	0.0	0.0	0.0	61.5	7.0	-2.6	0.0	0.0	26.7	0.0	3.1	-117.2
118	912421.28	5022864.72	99.50	1	D	A	86.8	10.7	0.0	0.0	0.0	61.6	7.1	-2.7	0.0	0.0	26.8	0.0	3.2	1.5
118	912421.28	5022864.72	99.50	1	N	A	86.8	10.7	0.0	0.0	0.0	61.6	7.1	-2.7	0.0	0.0	26.8	0.0	3.2	1.5
118	912421.28	5022864.72	99.50	1	E	A	-33.2	10.7	0.0	0.0	0.0	61.6	7.1	-2.7	0.0	0.0	26.8	0.0	3.2	-118.5
122	912417.20	5022875.63	99.50	1	D	A	86.8	10.6	0.0	0.0	0.0	61.8	7.2	-2.8	0.0	0.0	26.8	0.0	3.2	1.1
122	912417.20	5022875.63	99.50	1	N	A	86.8	10.6	0.0	0.0	0.0	61.8	7.2	-2.8	0.0	0.0	26.8	0.0	3.2	1.1
122	912417.20	5022875.63	99.50	1	E	A	-33.2	10.6	0.0	0.0	0.0	61.8	7.2	-2.8	0.0	0.0	26.8	0.0	3.2	-118.9
125	912413.74	5022884.91	99.50	1	D	A	86.8	9.2	0.0	0.0	0.0	61.9	7.2	-2.8	0.0	0.0	26.9	0.0	3.2	-0.4
125	912413.74	5022884.91	99.50	1	N	A	86.8	9.2	0.0	0.0	0.0	61.9	7.2	-2.8	0.0	0.0	26.9	0.0	3.2	-0.4
125	912413.74	5022884.91	99.50	1	E	A	-33.2	9.2	0.0	0.0	0.0	61.9	7.2	-2.8	0.0	0.0	26.9	0.0	3.2	-120.4
133	912346.01	5022622.36	115.15	0	D	A	86.8	20.0	0.0	0.0	0.0	62.3	7.4	-1.9	0.0	0.0	0.0	0.0	0.0	38.8
133	912346.01	5022622.36	115.15	0	N	A	86.8	20.0	0.0	0.0	0.0	62.3	7.4	-1.9	0.0	0.0	0.0	0.0	0.0	38.8
133	912346.01	5022622.36	115.15	0	E	A	-33.2	20.0	0.0	0.0	0.0	62.3	7.4	-1.9	0.0	0.0	0.0	0.0	0.0	-81.2
137	912534.80	5022883.72	99.50	0	D	A	86.8	14.7	0.0	0.0	0.0	56.7	5.0	-1.7	0.0	0.0	8.2	0.0	0.0	33.3
137	912534.80	5022883.72	99.50	0	N	A	86.8	14.7	0.0	0.0	0.0	56.7	5.0	-1.7	0.0	0.0	8.2	0.0	0.0	33.3
137	912534.80	5022883.72	99.50	0	E	A	-33.2	14.7	0.0	0.0	0.0	56.7	5.0	-1.7	0.0	0.0	8.2	0.0	0.0	-86.7
141	912534.80	5022883.72	99.50	1	D	A	86.8	14.7	0.0	0.0	0.0	57.6	5.3	-1.8	0.0	0.0	26.3	0.0	2.7	11.3
141	912534.80	5022883.72	99.50	1	N	A	86.8	14.7	0.0	0.0	0.0	57.6	5.3	-1.8	0.0	0.0	26.3	0.0	2.7	11.3
141	912534.80	5022883.72	99.50	1	E	A	-33.2	14.7	0.0	0.0	0.0	57.6	5.3	-1.8	0.0	0.0	26.3	0.0	2.7	-108.7
145	912521.60	5022883.24	99.50	1	D	A	86.8	4.9	0.0	0.0	0.0	58.4	5.7	-2.0	0.0	0.0	26.5	0.0	2.8	0.3
145	912521.60	5022883.24	99.50	1	N	A	86.8	4.9	0.0	0.0	0.0	58.4	5.7	-2.0	0.0	0.0	26.5	0.0	2.8	0.3
145	912521.60	5022883.24	99.50	1	E	A	-33.2	4.9	0.0	0.0	0.0	58.4	5.7	-2.0	0.0	0.0	26.5	0.0	2.8	-119.7
148	912529.55	5022883.53	99.50	1	D	A	86.8	11.1	0.0	0.0	0.0	58.2	5.5	-1.9	0.0	0.0	26.4	0.0	2.8	6.9
148	912529.55	5022883.53	99.50	1	N	A	86.8	11.1	0.0	0.0	0.0	58.2	5.5	-1.9	0.0	0.0	26.4	0.0	2.8	6.9
148	912529.55	5022883.53	99.50	1	E	A	-33.2	11.1	0.0	0.0	0.0	58.2	5.5	-1.9	0.0	0.0	26.4	0.0	2.8	-113.1
156	912251.22	5022561.80	112.98	0	D	A	86.8	21.0	0.0	0.0	0.0	64.6	8.6	-2.5	0.0	0.0	0.0	0.0	0.0	37.1
156	912251.22	5022561.80	112.98	0	N	A	86.8	21.0	0.0	0.0	0.0	64.6	8.6	-2.5	0.0	0.0	0.0	0.0	0.0	37.1
156	912251.22	5022561.80	112.98	0	E	A	-33.2	21.0	0.0	0.0	0.0	64.6	8.6	-2.5	0.0	0.0	0.0	0.0	0.0	-82.9
160	912490.18	5022915.83	99.50	0	D	A	86.8	15.6	0.0	0.0	0.0	58.9	5.8	-2.3	0.0	0.0	7.0	0.0	0.0	32.9
160	912490.18	5022915.83	99.50	0	N	A	86.8	15.6	0.0	0.0	0.0	58.9	5.8	-2.3	0.0	0.0	7.0	0.0	0.0	32.9
160	912490.18	5022915.83	99.50	0	E	A	-33.2	15.6	0.0	0.0	0.0	58.9	5.8	-2.3	0.0	0.0	7.0	0.0	0.0	-87.1
171	912481.79	5022927.69	99.50	1	D	A	86.8	8.8	0.0	0.0	0.0	59.9	6.3	-2.6	0.0	0.0	26.8	0.0	3.0	2.1
171	912481.79	5022927.69	99.50	1	N	A	86.8	8.8	0.0	0.0	0.0	59.9	6.3	-2.6	0.0	0.0	26.8	0.0	3.0	2.1
171	912481.79	5022927.69	99.50	1	E	A	-33.2	8.8	0.0	0.0	0.0	59.9	6.3	-2.6	0.0	0.0	26.8	0.0	3.0	-117.9
174	912492.37	5022912.73	99.50	1	D	A	86.8	14.6	0.0	0.0	0.0	59.4	6.1	-2.4	0.0	0.0	26.7	0.0	2.9	8.7
174	912492.37	5022912.73	99.50	1	N	A	86.8	14.6	0.0	0.0	0.0	59.4	6.1	-2.4	0.0	0.0	26.7	0.0	2.9	8.7
174	912492.37	5022912.73	99.50	1	E	A	-33.2	14.6	0.0	0.0	0.0	59.4	6.1	-2.4	0.0	0.0	26.7	0.0	2.9	-111.3
179	912510.41	5022892.03	99.50	0	D	A	86.8	14.2	0.0	0.0	0.0	57.7	5.4	-1.9	0.0	0.0	6.7	0.0	0.0	33.0
179	912510.41	5022892.03	99.50	0	N	A	86.8	14.2	0.0	0.0	0.0	57.7	5.4	-1.9	0.0	0.0	6.7	0.0	0.0	33.0
179	912510.41	5022892.03	99.50	0	E	A	-33.2	14.2	0.0	0.0	0.0	57.7	5.4	-1.9	0.0	0.0	6.7	0.0	0.0	-87.0
184	912510.41	5022892.03	99.50	1	D	A	86.8	14.2	0.0	0.0	0.0	58.5	5.7	-2.1	0.0	0.0	26.5	0.0	2.8	9.4
184	912510.41	5022892.03	99.50	1	N	A	86.8	14.2	0.0	0.0	0.0	58.5	5.7	-2.1	0.0	0.0	26.5	0.0	2.8	9.4
184	912510.41	5022892.03	99.50	1	E	A	-33.2	14.2	0.0	0.0	0.0	58.5	5.7	-2.1	0.0	0.0	26.5	0.0	2.8	-110.6
186	912505.65	5022896.39	99.50	1	D	A	86.8	3.4	0.0	0.0	0.0	59.1	5.9	-2.2	0.0	0.0	26.6	0.0	2.9	-2.2
186	912505.65	5022896.39	99.50	1	N	A	86.8	3.4	0.0	0.0	0.0	59.1	5.9	-2.2	0.0	0.0	26.6	0.0	2.9	-2.2
186	912505.65	5022896.39	99.50	1	E	A	-33.2	3.4	0.0	0.0	0.0	59.1	5.9	-2.2	0.0	0.0	26.6	0.0	2.9	-122.2
188	912512.07	5022890.50	99.50	1	D	A	86.8	11.8	0.0	0.0	0.0	58.8	5.8	-2.2	0.0	0.0	26.5	0.0	2.9	6.7

Line Source, ISO 9613, Name: "Delivery Trucks", ID: "BrTrkC1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
188	912512.07	5022890.50	99.50	1	N	A	86.8	11.8	0.0	0.0	0.0	58.8	5.8	-2.2	0.0	0.0	26.5	0.0	2.9	6.7
188	912512.07	5022890.50	99.50	1	E	A	-33.2	11.8	0.0	0.0	0.0	58.8	5.8	-2.2	0.0	0.0	26.5	0.0	2.9	-113.3
191	912518.88	5022884.27	99.50	1	D	A	86.8	5.1	0.0	0.0	0.0	58.5	5.7	-2.0	0.0	0.0	26.5	0.0	2.8	0.3
191	912518.88	5022884.27	99.50	1	N	A	86.8	5.1	0.0	0.0	0.0	58.5	5.7	-2.0	0.0	0.0	26.5	0.0	2.8	0.3
191	912518.88	5022884.27	99.50	1	E	A	-33.2	5.1	0.0	0.0	0.0	58.5	5.7	-2.0	0.0	0.0	26.5	0.0	2.8	-119.7
193	912462.09	5022932.23	99.50	0	D	A	86.8	15.5	0.0	0.0	0.0	59.9	6.3	-2.5	0.0	0.0	0.0	0.0	0.0	38.5
193	912462.09	5022932.23	99.50	0	N	A	86.8	15.5	0.0	0.0	0.0	59.9	6.3	-2.5	0.0	0.0	0.0	0.0	0.0	38.5
193	912462.09	5022932.23	99.50	0	E	A	-33.2	15.5	0.0	0.0	0.0	59.9	6.3	-2.5	0.0	0.0	0.0	0.0	0.0	-81.5
204	912458.11	5022932.56	99.50	1	D	A	86.8	14.3	0.0	0.0	0.0	60.6	6.6	-2.7	0.0	0.0	26.9	0.0	3.1	6.6
204	912458.11	5022932.56	99.50	1	N	A	86.8	14.3	0.0	0.0	0.0	60.6	6.6	-2.7	0.0	0.0	26.9	0.0	3.1	6.6
204	912458.11	5022932.56	99.50	1	E	A	-33.2	14.3	0.0	0.0	0.0	60.6	6.6	-2.7	0.0	0.0	26.9	0.0	3.1	-113.4
207	912475.63	5022931.11	99.50	1	D	A	86.8	9.0	0.0	0.0	0.0	60.2	6.4	-2.6	0.0	0.0	26.8	0.0	3.0	2.0
207	912475.63	5022931.11	99.50	1	N	A	86.8	9.0	0.0	0.0	0.0	60.2	6.4	-2.6	0.0	0.0	26.8	0.0	3.0	2.0
207	912475.63	5022931.11	99.50	1	E	A	-33.2	9.0	0.0	0.0	0.0	60.2	6.4	-2.6	0.0	0.0	26.8	0.0	3.0	-118.0
247	912429.66	5022921.63	99.50	0	D	A	86.8	15.8	0.0	0.0	0.0	60.6	6.6	-2.6	0.0	0.0	0.0	0.0	0.0	38.0
247	912429.66	5022921.63	99.50	0	N	A	86.8	15.8	0.0	0.0	0.0	60.6	6.6	-2.6	0.0	0.0	0.0	0.0	0.0	38.0
247	912429.66	5022921.63	99.50	0	E	A	-33.2	15.8	0.0	0.0	0.0	60.6	6.6	-2.6	0.0	0.0	0.0	0.0	0.0	-82.0
264	912417.28	5022911.63	99.50	1	D	A	86.8	8.1	0.0	0.0	0.0	61.4	7.0	-2.8	0.0	0.0	26.9	0.0	3.2	-0.7
264	912417.28	5022911.63	99.50	1	N	A	86.8	8.1	0.0	0.0	0.0	61.4	7.0	-2.8	0.0	0.0	26.9	0.0	3.2	-0.7
264	912417.28	5022911.63	99.50	1	E	A	-33.2	8.1	0.0	0.0	0.0	61.4	7.0	-2.8	0.0	0.0	26.9	0.0	3.2	-120.7
267	912432.19	5022923.68	99.50	1	D	A	86.8	15.0	0.0	0.0	0.0	61.2	6.9	-2.8	0.0	0.0	26.9	0.0	3.1	6.5
267	912432.19	5022923.68	99.50	1	N	A	86.8	15.0	0.0	0.0	0.0	61.2	6.9	-2.8	0.0	0.0	26.9	0.0	3.1	6.5
267	912432.19	5022923.68	99.50	1	E	A	-33.2	15.0	0.0	0.0	0.0	61.2	6.9	-2.8	0.0	0.0	26.9	0.0	3.1	-113.5
271	912418.43	5022912.56	99.50	1	D	A	86.8	9.8	0.0	0.0	0.0	61.7	7.1	-2.9	0.0	0.0	26.9	0.0	3.2	0.5
271	912418.43	5022912.56	99.50	1	N	A	86.8	9.8	0.0	0.0	0.0	61.7	7.1	-2.9	0.0	0.0	26.9	0.0	3.2	0.5
271	912418.43	5022912.56	99.50	1	E	A	-33.2	9.8	0.0	0.0	0.0	61.7	7.1	-2.9	0.0	0.0	26.9	0.0	3.2	-119.5
275	912424.59	5022917.54	99.50	1	D	A	86.8	8.1	0.0	0.0	0.0	61.6	7.1	-2.9	0.0	0.0	26.9	0.0	3.2	-1.0
275	912424.59	5022917.54	99.50	1	N	A	86.8	8.1	0.0	0.0	0.0	61.6	7.1	-2.9	0.0	0.0	26.9	0.0	3.2	-1.0
275	912424.59	5022917.54	99.50	1	E	A	-33.2	8.1	0.0	0.0	0.0	61.6	7.1	-2.9	0.0	0.0	26.9	0.0	3.2	-121.0
277	912430.43	5022922.26	99.50	1	D	A	86.8	9.4	0.0	0.0	0.0	61.5	7.0	-2.8	0.0	0.0	26.9	0.0	3.2	0.4
277	912430.43	5022922.26	99.50	1	N	A	86.8	9.4	0.0	0.0	0.0	61.5	7.0	-2.8	0.0	0.0	26.9	0.0	3.2	0.4
277	912430.43	5022922.26	99.50	1	E	A	-33.2	9.4	0.0	0.0	0.0	61.5	7.0	-2.8	0.0	0.0	26.9	0.0	3.2	-119.6
279	912434.22	5022925.32	99.50	1	D	A	86.8	0.5	0.0	0.0	0.0	61.4	7.0	-2.8	0.0	0.0	26.9	0.0	3.2	-8.3
279	912434.22	5022925.32	99.50	1	N	A	86.8	0.5	0.0	0.0	0.0	61.4	7.0	-2.8	0.0	0.0	26.9	0.0	3.2	-8.3
279	912434.22	5022925.32	99.50	1	E	A	-33.2	0.5	0.0	0.0	0.0	61.4	7.0	-2.8	0.0	0.0	26.9	0.0	3.2	-128.3
282	912427.84	5022744.68	99.87	0	D	A	86.8	14.5	0.0	0.0	0.0	59.3	6.0	-0.4	0.0	0.0	8.5	0.0	0.0	27.8
282	912427.84	5022744.68	99.87	0	N	A	86.8	14.5	0.0	0.0	0.0	59.3	6.0	-0.4	0.0	0.0	8.5	0.0	0.0	27.8
282	912427.84	5022744.68	99.87	0	E	A	-33.2	14.5	0.0	0.0	0.0	59.3	6.0	-0.4	0.0	0.0	8.5	0.0	0.0	-92.2
287	912144.36	5022493.45	110.37	0	D	A	86.8	21.1	0.0	0.0	0.0	66.7	9.7	-3.0	0.0	0.0	7.7	0.0	0.0	26.7
287	912144.36	5022493.45	110.37	0	N	A	86.8	21.1	0.0	0.0	0.0	66.7	9.7	-3.0	0.0	0.0	7.7	0.0	0.0	26.7
287	912144.36	5022493.45	110.37	0	E	A	-33.2	21.1	0.0	0.0	0.0	66.7	9.7	-3.0	0.0	0.0	7.7	0.0	0.0	-93.3
290	912420.49	5022718.72	103.14	0	D	A	86.8	14.2	0.0	0.0	0.0	59.6	6.2	-0.2	0.0	0.0	7.4	0.0	0.0	28.0
290	912420.49	5022718.72	103.14	0	N	A	86.8	14.2	0.0	0.0	0.0	59.6	6.2	-0.2	0.0	0.0	7.4	0.0	0.0	28.0
290	912420.49	5022718.72	103.14	0	E	A	-33.2	14.2	0.0	0.0	0.0	59.6	6.2	-0.2	0.0	0.0	7.4	0.0	0.0	-92.0
292	912437.74	5022784.09	99.50	0	D	A	86.8	13.3	0.0	0.0	0.0	59.0	5.9	-1.2	0.0	0.0	9.2	0.0	0.0	27.2
292	912437.74	5022784.09	99.50	0	N	A	86.8	13.3	0.0	0.0	0.0	59.0	5.9	-1.2	0.0	0.0	9.2	0.0	0.0	27.2
292	912437.74	5022784.09	99.50	0	E	A	-33.2	13.3	0.0	0.0	0.0	59.0	5.9	-1.2	0.0	0.0	9.2	0.0	0.0	-92.8
297	912439.17	5022804.61	99.50	0	D	A	86.8	12.9	0.0	0.0	0.0	59.0	5.9	-1.6	0.0	0.0	7.8	0.0	0.0	28.6
297	912439.17	5022804.61	99.50	0	N	A	86.8	12.9	0.0	0.0	0.0	59.0	5.9	-1.6	0.0	0.0	7.8	0.0	0.0	28.6
297	912439.17	5022804.61	99.50	0	E	A	-33.2	12.9	0.0	0.0	0.0	59.0	5.9	-1.6	0.0	0.0	7.8	0.0	0.0	-91.4
309	912439.09	5022808.84	99.50	1	D	A	86.8	7.2	0.0	0.0	0.0	61.5	7.0	-2.3	0.0	0.0	26.5	0.0	3.1	-1.9
309	912439.09	5022808.84	99.50	1	N	A	86.8	7.2	0.0	0.0	0.0	61.5	7.0	-2.3	0.0	0.0	26.5	0.0	3.1	-1.9
309	912439.09	5022808.84	99.50	1	E	A	-33.2	7.2	0.0	0.0	0.0	61.5	7.0	-2.3	0.0	0.0	26.5	0.0	3.1	-121.9
314	912406.43	5022677.64	112.04	0	D	A	86.8	13.6	0.0	0.0	0.0	60.4	6.5	-0.5	0.0	0.0	0.0	0.0	0.0	34.1
314	912406.43	5022677.64	112.04	0	N	A	86.8	13.6	0.0	0.0	0.0	60.4	6.5	-0.5	0.0	0.0	0.0	0.0	0.0	34.1
314	912406.43	5022677.64	112.04	0	E	A	-33.2	13.6	0.0	0.0	0.0	60.4	6.5	-0.5	0.0	0.0	0.0	0.0	0.0	-85.9
320	912414.15	5022697.08	107.96	0	D	A	86.8	12.9	0.0	0.0	0.0	60.0	6.3	-0.3	0.0	0.0	5.1	0.0	0.0	28.6
320	912414.15	5022697.08	107.96	0	N	A	86.8	12.9	0.0	0.0	0.0	60.0	6.3	-0.3	0.0	0.0	5.1	0.0	0.0	28.6
320	912414.15	5022697.08	107.96	0	E	A	-33.2	12.9	0.0	0.0	0.0	60.0	6.3	-0.3	0.0	0.0	5.1	0.0	0.0	-91.4
330	912433.97	5022765.78	99.50	0	D	A	86.8	12.0	0.0	0.0	0.0	59.1	5.9	-0.8	0.0	0.0	10.8	0.0	0.0	23.8
330	912433.97	5022765.78	99.50	0	N	A	86.8	12.0	0.0	0.0	0.0	59.1	5.9	-0.8	0.0	0.0	10.8	0.0	0.0	23.8
330	912433.97	5022765.78	99.50	0	E	A	-33.2	12.0	0.0	0.0	0.0	59.1	5.9	-0.8	0.0	0.0	10.8	0.0	0.0	-96.2

Line Source, ISO 9613, Name: "Delivery Trucks", ID: "BrTrkC1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
333	912394.38	5022658.60	114.90	0	D	A	86.8	13.6	0.0	0.0	0.0	60.9	6.7	-1.0	0.0	0.0	0.0	0.0	0.0	33.8
333	912394.38	5022658.60	114.90	0	N	A	86.8	13.6	0.0	0.0	0.0	60.9	6.7	-1.0	0.0	0.0	0.0	0.0	0.0	33.8
333	912394.38	5022658.60	114.90	0	E	A	-33.2	13.6	0.0	0.0	0.0	60.9	6.7	-1.0	0.0	0.0	0.0	0.0	0.0	-86.2
334	911973.77	5022377.21	108.04	0	D	A	86.8	21.2	0.0	0.0	0.0	69.2	11.1	-3.3	0.0	0.0	0.0	0.0	0.0	31.1
334	911973.77	5022377.21	108.04	0	N	A	86.8	21.2	0.0	0.0	0.0	69.2	11.1	-3.3	0.0	0.0	0.0	0.0	0.0	31.1
334	911973.77	5022377.21	108.04	0	E	A	-33.2	21.2	0.0	0.0	0.0	69.2	11.1	-3.3	0.0	0.0	0.0	0.0	0.0	-88.9
343	912413.51	5022899.20	99.50	0	D	A	86.8	13.2	0.0	0.0	0.0	60.7	6.6	-2.5	0.0	0.0	7.3	0.0	0.0	27.9
343	912413.51	5022899.20	99.50	0	N	A	86.8	13.2	0.0	0.0	0.0	60.7	6.6	-2.5	0.0	0.0	7.3	0.0	0.0	27.9
343	912413.51	5022899.20	99.50	0	E	A	-33.2	13.2	0.0	0.0	0.0	60.7	6.6	-2.5	0.0	0.0	7.3	0.0	0.0	-92.1
348	912414.64	5022908.68	99.50	1	D	A	86.8	2.6	0.0	0.0	0.0	61.4	7.0	-2.8	0.0	0.0	26.9	0.0	3.2	-6.3
348	912414.64	5022908.68	99.50	1	N	A	86.8	2.6	0.0	0.0	0.0	61.4	7.0	-2.8	0.0	0.0	26.9	0.0	3.2	-6.3
348	912414.64	5022908.68	99.50	1	E	A	-33.2	2.6	0.0	0.0	0.0	61.4	7.0	-2.8	0.0	0.0	26.9	0.0	3.2	-126.3
349	912413.51	5022899.20	99.50	1	D	A	86.8	13.2	0.0	0.0	0.0	61.7	7.1	-2.8	0.0	0.0	26.9	0.0	3.2	3.9
349	912413.51	5022899.20	99.50	1	N	A	86.8	13.2	0.0	0.0	0.0	61.7	7.1	-2.8	0.0	0.0	26.9	0.0	3.2	3.9
349	912413.51	5022899.20	99.50	1	E	A	-33.2	13.2	0.0	0.0	0.0	61.7	7.1	-2.8	0.0	0.0	26.9	0.0	3.2	-116.1
371	912412.69	5022892.30	99.50	1	D	A	86.8	8.5	0.0	0.0	0.0	62.0	7.3	-2.8	0.0	0.0	26.9	0.0	3.2	-1.3
371	912412.69	5022892.30	99.50	1	N	A	86.8	8.5	0.0	0.0	0.0	62.0	7.3	-2.8	0.0	0.0	26.9	0.0	3.2	-1.3
371	912412.69	5022892.30	99.50	1	E	A	-33.2	8.5	0.0	0.0	0.0	62.0	7.3	-2.8	0.0	0.0	26.9	0.0	3.2	-121.3
378	912413.55	5022899.47	99.50	1	D	A	86.8	8.7	0.0	0.0	0.0	62.0	7.3	-2.9	0.0	0.0	26.9	0.0	3.2	-1.0
378	912413.55	5022899.47	99.50	1	N	A	86.8	8.7	0.0	0.0	0.0	62.0	7.3	-2.9	0.0	0.0	26.9	0.0	3.2	-1.0
378	912413.55	5022899.47	99.50	1	E	A	-33.2	8.7	0.0	0.0	0.0	62.0	7.3	-2.9	0.0	0.0	26.9	0.0	3.2	-121.0
385	912437.23	5022820.62	99.50	0	D	A	86.8	11.1	0.0	0.0	0.0	59.2	6.0	-1.8	0.0	0.0	7.0	0.0	0.0	27.4
385	912437.23	5022820.62	99.50	0	N	A	86.8	11.1	0.0	0.0	0.0	59.2	6.0	-1.8	0.0	0.0	7.0	0.0	0.0	27.4
385	912437.23	5022820.62	99.50	0	E	A	-33.2	11.1	0.0	0.0	0.0	59.2	6.0	-1.8	0.0	0.0	7.0	0.0	0.0	-92.6
391	912435.52	5022826.58	99.50	1	D	A	86.8	-4.1	0.0	0.0	0.0	61.2	6.9	-2.4	0.0	0.0	26.6	0.0	3.1	-12.7
391	912435.52	5022826.58	99.50	1	N	A	86.8	-4.1	0.0	0.0	0.0	61.2	6.9	-2.4	0.0	0.0	26.6	0.0	3.1	-12.7
391	912435.52	5022826.58	99.50	1	E	A	-33.2	-4.1	0.0	0.0	0.0	61.2	6.9	-2.4	0.0	0.0	26.6	0.0	3.1	-132.7
402	912060.11	5022435.94	109.02	0	D	A	86.8	18.8	0.0	0.0	0.0	68.0	10.4	-3.2	0.0	0.0	8.0	0.0	0.0	22.4
402	912060.11	5022435.94	109.02	0	N	A	86.8	18.8	0.0	0.0	0.0	68.0	10.4	-3.2	0.0	0.0	8.0	0.0	0.0	22.4
402	912060.11	5022435.94	109.02	0	E	A	-33.2	18.8	0.0	0.0	0.0	68.0	10.4	-3.2	0.0	0.0	8.0	0.0	0.0	-97.6
407	911914.05	5022335.69	107.50	0	D	A	86.8	11.3	0.0	0.0	0.0	69.9	11.5	-3.4	0.0	0.0	0.0	0.0	0.0	20.0
407	911914.05	5022335.69	107.50	0	N	A	86.8	11.3	0.0	0.0	0.0	69.9	11.5	-3.4	0.0	0.0	0.0	0.0	0.0	20.0
407	911914.05	5022335.69	107.50	0	E	A	-33.2	11.3	0.0	0.0	0.0	69.9	11.5	-3.4	0.0	0.0	0.0	0.0	0.0	-100.0

Receiver
Name: R08
ID: R08
X: 912686.47 m
Y: 5022765.42 m
Z: 115.28 m

Point Source, ISO 9613, Name: "Processing Plant", ID: "BrCVS_C1_unmit"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
55	912566.43	5022897.59	100.50	0	D	A	122.5	0.0	0.0	0.0	0.0	56.1	1.9	-1.2	0.0	0.0	17.4	0.0	0.0	48.3
55	912566.43	5022897.59	100.50	0	N	A	122.5	0.0	-188.0	0.0	0.0	56.1	1.9	-1.2	0.0	0.0	17.4	0.0	0.0	-139.7
55	912566.43	5022897.59	100.50	0	E	A	122.5	0.0	-188.0	0.0	0.0	56.1	1.9	-1.2	0.0	0.0	17.4	0.0	0.0	-139.7

Point Source, ISO 9613, Name: "Excavator", ID: "BrEXC_C1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
62	912642.72	5022888.94	100.00	0	D	A	111.1	0.0	0.0	0.0	0.0	53.4	0.7	0.0	0.0	0.0	23.6	0.0	0.0	33.3
62	912642.72	5022888.94	100.00	0	N	A	111.1	0.0	0.0	0.0	0.0	53.4	0.7	0.0	0.0	0.0	23.6	0.0	0.0	33.3
62	912642.72	5022888.94	100.00	0	E	A	111.1	0.0	-188.0	0.0	0.0	53.4	0.7	0.0	0.0	0.0	23.6	0.0	0.0	-154.7

Point Source, ISO 9613, Name: "Front-end Loader", ID: "BrFEL_C1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
75	912636.73	5022880.26	99.50	0	D	A	106.4	0.0	0.0	0.0	0.0	53.0	0.9	1.2	0.0	0.0	20.3	0.0	0.0	31.0
75	912636.73	5022880.26	99.50	0	N	A	106.4	0.0	0.0	0.0	0.0	53.0	0.9	1.2	0.0	0.0	20.3	0.0	0.0	31.0
75	912636.73	5022880.26	99.50	0	E	A	106.4	0.0	-188.0	0.0	0.0	53.0	0.9	1.2	0.0	0.0	20.3	0.0	0.0	-157.0

Point Source, ISO 9613, Name: "Two Front-end Loaders", ID: "BrFEL_C1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
83	912558.76	5022902.49	99.50	0	D	A	109.4	0.0	0.0	0.0	0.0	56.5	1.2	-1.1	0.0	0.0	13.9	0.0	0.0	39.0
83	912558.76	5022902.49	99.50	0	N	A	109.4	0.0	0.0	0.0	0.0	56.5	1.2	-1.1	0.0	0.0	13.9	0.0	0.0	39.0
83	912558.76	5022902.49	99.50	0	E	A	109.4	0.0	-188.0	0.0	0.0	56.5	1.2	-1.1	0.0	0.0	13.9	0.0	0.0	-149.0

Point Source, ISO 9613, Name: "Additional Screens", ID: "BrSCR_C1_unmit"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
102	912568.83	5022888.17	100.50	0	D	A	109.5	0.0	0.0	0.0	0.0	55.6	1.1	-1.0	0.0	0.0	15.6	0.0	0.0	38.1
102	912568.83	5022888.17	100.50	0	N	A	109.5	0.0	-188.0	0.0	0.0	55.6	1.1	-1.0	0.0	0.0	15.6	0.0	0.0	-149.9
102	912568.83	5022888.17	100.50	0	E	A	109.5	0.0	-188.0	0.0	0.0	55.6	1.1	-1.0	0.0	0.0	15.6	0.0	0.0	-149.9

Line Source, ISO 9613, Name: "Delivery Trucks", ID: "BrTrkC1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
109	912433.60	5022831.75	99.50	0	D	A	86.8	10.3	0.0	0.0	0.0	59.4	6.1	-1.9	0.0	0.0	14.5	0.0	0.0	19.0
109	912433.60	5022831.75	99.50	0	N	A	86.8	10.3	0.0	0.0	0.0	59.4	6.1	-1.9	0.0	0.0	14.5	0.0	0.0	19.0
109	912433.60	5022831.75	99.50	0	E	A	-33.2	10.3	0.0	0.0	0.0	59.4	6.1	-1.9	0.0	0.0	14.5	0.0	0.0	-101.0
117	912431.47	5022837.45	99.50	0	D	A	86.8	1.9	0.0	0.0	0.0	59.5	6.1	-2.0	0.0	0.0	18.4	0.0	0.0	6.6
117	912431.47	5022837.45	99.50	0	N	A	86.8	1.9	0.0	0.0	0.0	59.5	6.1	-2.0	0.0	0.0	18.4	0.0	0.0	6.6
117	912431.47	5022837.45	99.50	0	E	A	-33.2	1.9	0.0	0.0	0.0	59.5	6.1	-2.0	0.0	0.0	18.4	0.0	0.0	-113.4
121	912421.74	5022863.49	99.50	0	D	A	86.8	17.3	0.0	0.0	0.0	60.0	6.3	-2.2	0.0	0.0	18.1	0.0	0.0	21.8
121	912421.74	5022863.49	99.50	0	N	A	86.8	17.3	0.0	0.0	0.0	60.0	6.3	-2.2	0.0	0.0	18.1	0.0	0.0	21.8
121	912421.74	5022863.49	99.50	0	E	A	-33.2	17.3	0.0	0.0	0.0	60.0	6.3	-2.2	0.0	0.0	18.1	0.0	0.0	-98.2
128	912346.01	5022622.36	115.15	0	D	A	86.8	20.0	0.0	0.0	0.0	62.3	7.4	-1.0	0.0	0.0	5.8	0.0	0.0	32.1
128	912346.01	5022622.36	115.15	0	N	A	86.8	20.0	0.0	0.0	0.0	62.3	7.4	-1.0	0.0	0.0	5.8	0.0	0.0	32.1
128	912346.01	5022622.36	115.15	0	E	A	-33.2	20.0	0.0	0.0	0.0	62.3	7.4	-1.0	0.0	0.0	5.8	0.0	0.0	-87.9
149	912534.80	5022883.72	99.50	0	D	A	86.8	14.7	0.0	0.0	0.0	56.7	5.0	-1.7	0.0	0.0	20.2	0.0	0.0	21.3
149	912534.80	5022883.72	99.50	0	N	A	86.8	14.7	0.0	0.0	0.0	56.7	5.0	-1.7	0.0	0.0	20.2	0.0	0.0	21.3
149	912534.80	5022883.72	99.50	0	E	A	-33.2	14.7	0.0	0.0	0.0	56.7	5.0	-1.7	0.0	0.0	20.2	0.0	0.0	-98.7
159	912251.22	5022561.80	112.98	0	D	A	86.8	21.0	0.0	0.0	0.0	64.6	8.6	-1.5	0.0	0.0	6.2	0.0	0.0	29.8
159	912251.22	5022561.80	112.98	0	N	A	86.8	21.0	0.0	0.0	0.0	64.6	8.6	-1.5	0.0	0.0	6.2	0.0	0.0	29.8

Line Source, ISO 9613, Name: "Delivery Trucks", ID: "BrTrkC1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
159	912251.22	5022561.80	112.98	0	E	A	-33.2	21.0	0.0	0.0	0.0	64.6	8.6	-1.5	0.0	0.0	6.2	0.0	0.0	-90.2
162	912490.18	5022915.83	99.50	0	D	A	86.8	15.6	0.0	0.0	0.0	58.9	5.8	-2.3	0.0	0.0	19.1	0.0	0.0	20.9
162	912490.18	5022915.83	99.50	0	N	A	86.8	15.6	0.0	0.0	0.0	58.9	5.8	-2.3	0.0	0.0	19.1	0.0	0.0	20.9
162	912490.18	5022915.83	99.50	0	E	A	-33.2	15.6	0.0	0.0	0.0	58.9	5.8	-2.3	0.0	0.0	19.1	0.0	0.0	-99.1
167	912510.41	5022892.03	99.50	0	D	A	86.8	14.2	0.0	0.0	0.0	57.7	5.4	-1.9	0.0	0.0	19.6	0.0	0.0	20.1
167	912510.41	5022892.03	99.50	0	N	A	86.8	14.2	0.0	0.0	0.0	57.7	5.4	-1.9	0.0	0.0	19.6	0.0	0.0	20.1
167	912510.41	5022892.03	99.50	0	E	A	-33.2	14.2	0.0	0.0	0.0	57.7	5.4	-1.9	0.0	0.0	19.6	0.0	0.0	-99.9
170	912462.09	5022932.23	99.50	0	D	A	86.8	15.5	0.0	0.0	0.0	59.9	6.3	-2.5	0.0	0.0	18.4	0.0	0.0	20.1
170	912462.09	5022932.23	99.50	0	N	A	86.8	15.5	0.0	0.0	0.0	59.9	6.3	-2.5	0.0	0.0	18.4	0.0	0.0	20.1
170	912462.09	5022932.23	99.50	0	E	A	-33.2	15.5	0.0	0.0	0.0	59.9	6.3	-2.5	0.0	0.0	18.4	0.0	0.0	-99.9
178	912429.66	5022921.63	99.50	0	D	A	86.8	15.8	0.0	0.0	0.0	60.6	6.6	-2.6	0.0	0.0	17.8	0.0	0.0	20.2
178	912429.66	5022921.63	99.50	0	N	A	86.8	15.8	0.0	0.0	0.0	60.6	6.6	-2.6	0.0	0.0	17.8	0.0	0.0	20.2
178	912429.66	5022921.63	99.50	0	E	A	-33.2	15.8	0.0	0.0	0.0	60.6	6.6	-2.6	0.0	0.0	17.8	0.0	0.0	-99.8
192	912427.84	5022744.68	99.87	0	D	A	86.8	14.5	0.0	0.0	0.0	59.3	6.0	-0.4	0.0	0.0	17.6	0.0	0.0	18.6
192	912427.84	5022744.68	99.87	0	N	A	86.8	14.5	0.0	0.0	0.0	59.3	6.0	-0.4	0.0	0.0	17.6	0.0	0.0	18.6
192	912427.84	5022744.68	99.87	0	E	A	-33.2	14.5	0.0	0.0	0.0	59.3	6.0	-0.4	0.0	0.0	17.6	0.0	0.0	-101.4
196	912144.36	5022493.45	110.37	0	D	A	86.8	21.1	0.0	0.0	0.0	66.7	9.7	-1.7	0.0	0.0	6.5	0.0	0.0	26.7
196	912144.36	5022493.45	110.37	0	N	A	86.8	21.1	0.0	0.0	0.0	66.7	9.7	-1.7	0.0	0.0	6.5	0.0	0.0	26.7
196	912144.36	5022493.45	110.37	0	E	A	-33.2	21.1	0.0	0.0	0.0	66.7	9.7	-1.7	0.0	0.0	6.5	0.0	0.0	-93.3
198	912420.49	5022718.72	103.14	0	D	A	86.8	14.2	0.0	0.0	0.0	59.6	6.2	-0.2	0.0	0.0	16.1	0.0	0.0	19.3
198	912420.49	5022718.72	103.14	0	N	A	86.8	14.2	0.0	0.0	0.0	59.6	6.2	-0.2	0.0	0.0	16.1	0.0	0.0	19.3
198	912420.49	5022718.72	103.14	0	E	A	-33.2	14.2	0.0	0.0	0.0	59.6	6.2	-0.2	0.0	0.0	16.1	0.0	0.0	-100.7
200	912437.74	5022784.09	99.50	0	D	A	86.8	13.3	0.0	0.0	0.0	59.0	5.9	-1.2	0.0	0.0	14.2	0.0	0.0	22.3
200	912437.74	5022784.09	99.50	0	N	A	86.8	13.3	0.0	0.0	0.0	59.0	5.9	-1.2	0.0	0.0	14.2	0.0	0.0	22.3
200	912437.74	5022784.09	99.50	0	E	A	-33.2	13.3	0.0	0.0	0.0	59.0	5.9	-1.2	0.0	0.0	14.2	0.0	0.0	-97.7
220	912439.17	5022804.61	99.50	0	D	A	86.8	12.9	0.0	0.0	0.0	59.0	5.9	-1.6	0.0	0.0	14.7	0.0	0.0	21.7
220	912439.17	5022804.61	99.50	0	N	A	86.8	12.9	0.0	0.0	0.0	59.0	5.9	-1.6	0.0	0.0	14.7	0.0	0.0	21.7
220	912439.17	5022804.61	99.50	0	E	A	-33.2	12.9	0.0	0.0	0.0	59.0	5.9	-1.6	0.0	0.0	14.7	0.0	0.0	-98.3
224	912406.43	5022677.64	112.04	0	D	A	86.8	13.6	0.0	0.0	0.0	60.4	6.5	-0.5	0.0	0.0	5.8	0.0	0.0	28.2
224	912406.43	5022677.64	112.04	0	N	A	86.8	13.6	0.0	0.0	0.0	60.4	6.5	-0.5	0.0	0.0	5.8	0.0	0.0	28.2
224	912406.43	5022677.64	112.04	0	E	A	-33.2	13.6	0.0	0.0	0.0	60.4	6.5	-0.5	0.0	0.0	5.8	0.0	0.0	-91.8
227	912414.15	5022697.08	107.96	0	D	A	86.8	12.9	0.0	0.0	0.0	60.0	6.3	-0.3	0.0	0.0	12.4	0.0	0.0	21.3
227	912414.15	5022697.08	107.96	0	N	A	86.8	12.9	0.0	0.0	0.0	60.0	6.3	-0.3	0.0	0.0	12.4	0.0	0.0	21.3
227	912414.15	5022697.08	107.96	0	E	A	-33.2	12.9	0.0	0.0	0.0	60.0	6.3	-0.3	0.0	0.0	12.4	0.0	0.0	-98.7
231	912433.97	5022765.78	99.50	0	D	A	86.8	12.0	0.0	0.0	0.0	59.1	5.9	-0.8	0.0	0.0	18.2	0.0	0.0	16.4
231	912433.97	5022765.78	99.50	0	N	A	86.8	12.0	0.0	0.0	0.0	59.1	5.9	-0.8	0.0	0.0	18.2	0.0	0.0	16.4
231	912433.97	5022765.78	99.50	0	E	A	-33.2	12.0	0.0	0.0	0.0	59.1	5.9	-0.8	0.0	0.0	18.2	0.0	0.0	-103.6
263	912394.38	5022658.60	114.90	0	D	A	86.8	13.6	0.0	0.0	0.0	60.9	6.7	-1.0	0.0	0.0	5.9	0.0	0.0	27.9
263	912394.38	5022658.60	114.90	0	N	A	86.8	13.6	0.0	0.0	0.0	60.9	6.7	-1.0	0.0	0.0	5.9	0.0	0.0	27.9
263	912394.38	5022658.60	114.90	0	E	A	-33.2	13.6	0.0	0.0	0.0	60.9	6.7	-1.0	0.0	0.0	5.9	0.0	0.0	-92.1
278	911973.77	5022377.21	108.04	0	D	A	86.8	21.2	0.0	0.0	0.0	69.2	11.1	-2.4	0.0	0.0	7.2	0.0	0.0	22.9
278	911973.77	5022377.21	108.04	0	N	A	86.8	21.2	0.0	0.0	0.0	69.2	11.1	-2.4	0.0	0.0	7.2	0.0	0.0	22.9
278	911973.77	5022377.21	108.04	0	E	A	-33.2	21.2	0.0	0.0	0.0	69.2	11.1	-2.4	0.0	0.0	7.2	0.0	0.0	-97.1
289	912413.51	5022899.20	99.50	0	D	A	86.8	13.2	0.0	0.0	0.0	60.7	6.6	-2.5	0.0	0.0	17.7	0.0	0.0	17.5
289	912413.51	5022899.20	99.50	0	N	A	86.8	13.2	0.0	0.0	0.0	60.7	6.6	-2.5	0.0	0.0	17.7	0.0	0.0	17.5
289	912413.51	5022899.20	99.50	0	E	A	-33.2	13.2	0.0	0.0	0.0	60.7	6.6	-2.5	0.0	0.0	17.7	0.0	0.0	-102.5
291	912437.23	5022820.62	99.50	0	D	A	86.8	11.1	0.0	0.0	0.0	59.2	6.0	-1.8	0.0	0.0	14.7	0.0	0.0	19.8
291	912437.23	5022820.62	99.50	0	N	A	86.8	11.1	0.0	0.0	0.0	59.2	6.0	-1.8	0.0	0.0	14.7	0.0	0.0	19.8
291	912437.23	5022820.62	99.50	0	E	A	-33.2	11.1	0.0	0.0	0.0	59.2	6.0	-1.8	0.0	0.0	14.7	0.0	0.0	-100.2
295	912060.11	5022435.94	109.02	0	D	A	86.8	18.8	0.0	0.0	0.0	68.0	10.4	-2.1	0.0	0.0	6.9	0.0	0.0	22.4
295	912060.11	5022435.94	109.02	0	N	A	86.8	18.8	0.0	0.0	0.0	68.0	10.4	-2.1	0.0	0.0	6.9	0.0	0.0	22.4
295	912060.11	5022435.94	109.02	0	E	A	-33.2	18.8	0.0	0.0	0.0	68.0	10.4	-2.1	0.0	0.0	6.9	0.0	0.0	-97.6
298	911914.05	5022335.69	107.50	0	D	A	86.8	11.3	0.0	0.0	0.0	69.9	11.5	-2.6	0.0	0.0	7.3	0.0	0.0	11.8
298	911914.05	5022335.69	107.50	0	N	A	86.8	11.3	0.0	0.0	0.0	69.9	11.5	-2.6	0.0	0.0	7.3	0.0	0.0	11.8
298	911914.05	5022335.69	107.50	0	E	A	-33.2	11.3	0.0	0.0	0.0	69.9	11.5	-2.6	0.0	0.0	7.3	0.0	0.0	-108.2

Receiver
Name: R08
ID: R08
X: 912686.47 m
Y: 5022765.42 m
Z: 115.28 m

Point Source, ISO 9613, Name: "Processing Plant", ID: "DrCVS_PRCS"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
8	912448.77	5023314.62	100.50	0	D	A	122.5	0.0	0.0	0.0	0.0	66.5	4.3	-3.6	0.0	0.0	14.0	0.0	0.0	41.3
8	912448.77	5023314.62	100.50	0	N	A	122.5	0.0	-188.0	0.0	0.0	66.5	4.3	-3.6	0.0	0.0	14.0	0.0	0.0	-146.7
8	912448.77	5023314.62	100.50	0	E	A	122.5	0.0	-188.0	0.0	0.0	66.5	4.3	-3.6	0.0	0.0	14.0	0.0	0.0	-146.7

Point Source, ISO 9613, Name: "Two Front-end Loaders", ID: "DrFEL_PRCS"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
33	912450.35	5023307.10	99.50	0	D	A	109.4	0.0	0.0	0.0	0.0	66.4	2.3	-3.1	0.0	0.0	12.1	0.0	0.0	31.6
33	912450.35	5023307.10	99.50	0	N	A	109.4	0.0	0.0	0.0	0.0	66.4	2.3	-3.1	0.0	0.0	12.1	0.0	0.0	31.6
33	912450.35	5023307.10	99.50	0	E	A	109.4	0.0	-188.0	0.0	0.0	66.4	2.3	-3.1	0.0	0.0	12.1	0.0	0.0	-156.4

Point Source, ISO 9613, Name: "Front-end Loader", ID: "DrFEL_TYP"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
140	912421.08	5023398.87	99.50	0	D	A	106.4	0.0	0.0	0.0	0.0	67.7	2.5	-3.2	0.0	0.0	11.3	0.0	0.0	28.0
140	912421.08	5023398.87	99.50	0	N	A	106.4	0.0	0.0	0.0	0.0	67.7	2.5	-3.2	0.0	0.0	11.3	0.0	0.0	28.0
140	912421.08	5023398.87	99.50	0	E	A	106.4	0.0	-188.0	0.0	0.0	67.7	2.5	-3.2	0.0	0.0	11.3	0.0	0.0	-160.0

Point Source, ISO 9613, Name: "Excavator", ID: "DrExc"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
251	912471.92	5023369.38	99.50	0	D	A	101.9	0.0	0.0	0.0	0.0	67.1	3.0	-3.4	0.0	0.0	17.0	0.0	0.0	18.2
251	912471.92	5023369.38	99.50	0	N	A	101.9	0.0	0.0	0.0	0.0	67.1	3.0	-3.4	0.0	0.0	17.0	0.0	0.0	18.2
251	912471.92	5023369.38	99.50	0	E	A	101.9	0.0	-188.0	0.0	0.0	67.1	3.0	-3.4	0.0	0.0	17.0	0.0	0.0	-169.8

Line Source, ISO 9613, Name: "Delivery Trucks", ID: "DrTrk"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
54	912148.62	5022985.31	108.50	0	D	A	83.7	20.8	0.0	0.0	0.0	66.3	9.5	-3.4	0.0	0.0	0.0	0.0	0.0	32.2
54	912148.62	5022985.31	108.50	0	N	A	83.7	20.8	0.0	0.0	0.0	66.3	9.5	-3.4	0.0	0.0	0.0	0.0	0.0	32.2
54	912148.62	5022985.31	108.50	0	E	A	-33.2	20.8	0.0	0.0	0.0	66.3	9.5	-3.4	0.0	0.0	0.0	0.0	0.0	-84.8
102	912191.47	5023013.38	108.50	1	D	A	83.7	12.4	0.0	0.0	0.0	66.2	9.4	-3.7	0.0	0.0	26.7	0.0	4.0	-6.6
102	912191.47	5023013.38	108.50	1	N	A	83.7	12.4	0.0	0.0	0.0	66.2	9.4	-3.7	0.0	0.0	26.7	0.0	4.0	-6.6
102	912191.47	5023013.38	108.50	1	E	A	-33.2	12.4	0.0	0.0	0.0	66.2	9.4	-3.7	0.0	0.0	26.7	0.0	4.0	-123.6
108	912177.48	5023004.22	108.50	1	D	A	83.7	12.1	0.0	0.0	0.0	66.4	9.5	-3.7	0.0	0.0	26.7	0.0	4.0	-7.1
108	912177.48	5023004.22	108.50	1	N	A	83.7	12.1	0.0	0.0	0.0	66.4	9.5	-3.7	0.0	0.0	26.7	0.0	4.0	-7.1
108	912177.48	5023004.22	108.50	1	E	A	-33.2	12.1	0.0	0.0	0.0	66.4	9.5	-3.7	0.0	0.0	26.7	0.0	4.0	-124.1
119	912192.70	5023014.19	108.50	1	D	A	83.7	11.6	0.0	0.0	0.0	66.4	9.5	-3.7	0.0	0.0	26.7	0.0	4.0	-7.6
119	912192.70	5023014.19	108.50	1	N	A	83.7	11.6	0.0	0.0	0.0	66.4	9.5	-3.7	0.0	0.0	26.7	0.0	4.0	-7.6
119	912192.70	5023014.19	108.50	1	E	A	-33.2	11.6	0.0	0.0	0.0	66.4	9.5	-3.7	0.0	0.0	26.7	0.0	4.0	-124.6
123	912181.65	5023006.95	108.50	1	D	A	83.7	10.8	0.0	0.0	0.0	66.5	9.6	-3.7	0.0	0.0	26.7	0.0	4.0	-8.6
123	912181.65	5023006.95	108.50	1	N	A	83.7	10.8	0.0	0.0	0.0	66.5	9.6	-3.7	0.0	0.0	26.7	0.0	4.0	-8.6
123	912181.65	5023006.95	108.50	1	E	A	-33.2	10.8	0.0	0.0	0.0	66.5	9.6	-3.7	0.0	0.0	26.7	0.0	4.0	-125.5
128	912140.90	5022980.25	108.50	1	D	A	83.7	19.3	0.0	0.0	0.0	66.9	9.8	-3.7	0.0	0.0	26.7	0.0	4.1	-0.7
128	912140.90	5022980.25	108.50	1	N	A	83.7	19.3	0.0	0.0	0.0	66.9	9.8	-3.7	0.0	0.0	26.7	0.0	4.1	-0.7
128	912140.90	5022980.25	108.50	1	E	A	-33.2	19.3	0.0	0.0	0.0	66.9	9.8	-3.7	0.0	0.0	26.7	0.0	4.1	-117.7
130	912101.88	5022954.68	108.50	1	D	A	83.7	9.0	0.0	0.0	0.0	67.4	10.0	-3.7	0.0	0.0	26.6	0.0	4.2	-11.7
130	912101.88	5022954.68	108.50	1	N	A	83.7	9.0	0.0	0.0	0.0	67.4	10.0	-3.7	0.0	0.0	26.6	0.0	4.2	-11.7
130	912101.88	5022954.68	108.50	1	E	A	-33.2	9.0	0.0	0.0	0.0	67.4	10.0	-3.7	0.0	0.0	26.6	0.0	4.2	-128.7
133	912128.82	5022972.33	108.50	1	D	A	83.7	12.6	0.0	0.0	0.0	67.2	10.0	-3.7	0.0	0.0	26.6	0.0	6.9	-10.6
133	912128.82	5022972.33	108.50	1	N	A	83.7	12.6	0.0	0.0	0.0	67.2	10.0	-3.7	0.0	0.0	26.6	0.0	6.9	-10.6
133	912128.82	5022972.33	108.50	1	E	A	-33.2	12.6	0.0	0.0	0.0	67.2	10.0	-3.7	0.0	0.0	26.6	0.0	6.9	-127.6

Line Source, ISO 9613, Name: "Delivery Trucks", ID: "DrTrk"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
136	912109.87	5022959.92	108.50	1	D	A	83.7	14.3	0.0	0.0	0.0	67.4	10.1	-3.8	0.0	0.0	26.6	0.0	7.0	-9.3
136	912109.87	5022959.92	108.50	1	N	A	83.7	14.3	0.0	0.0	0.0	67.4	10.1	-3.8	0.0	0.0	26.6	0.0	7.0	-9.3
136	912109.87	5022959.92	108.50	1	E	A	-33.2	14.3	0.0	0.0	0.0	67.4	10.1	-3.8	0.0	0.0	26.6	0.0	7.0	-126.3
159	912231.64	5023042.42	109.49	0	D	A	83.7	19.1	0.0	0.0	0.0	65.5	9.0	-3.5	0.0	0.0	0.0	0.0	0.0	31.8
159	912231.64	5023042.42	109.49	0	N	A	83.7	19.1	0.0	0.0	0.0	65.5	9.0	-3.5	0.0	0.0	0.0	0.0	0.0	31.8
159	912231.64	5023042.42	109.49	0	E	A	-33.2	19.1	0.0	0.0	0.0	65.5	9.0	-3.5	0.0	0.0	0.0	0.0	0.0	-85.2
176	912256.21	5023060.55	110.23	1	D	A	83.7	12.6	0.0	0.0	0.0	65.7	9.1	-3.6	0.0	0.0	26.8	0.0	3.9	-5.5
176	912256.21	5023060.55	110.23	1	N	A	83.7	12.6	0.0	0.0	0.0	65.7	9.1	-3.6	0.0	0.0	26.8	0.0	3.9	-5.5
176	912256.21	5023060.55	110.23	1	E	A	-33.2	12.6	0.0	0.0	0.0	65.7	9.1	-3.6	0.0	0.0	26.8	0.0	3.9	-122.5
184	912223.83	5023036.66	109.25	1	D	A	83.7	18.0	0.0	0.0	0.0	65.9	9.3	-3.6	0.0	0.0	26.8	0.0	3.9	-0.5
184	912223.83	5023036.66	109.25	1	N	A	83.7	18.0	0.0	0.0	0.0	65.9	9.3	-3.6	0.0	0.0	26.8	0.0	3.9	-0.5
184	912223.83	5023036.66	109.25	1	E	A	-33.2	18.0	0.0	0.0	0.0	65.9	9.3	-3.6	0.0	0.0	26.8	0.0	3.9	-117.5
188	912200.95	5023019.79	108.57	1	D	A	83.7	3.1	0.0	0.0	0.0	66.3	9.5	-3.7	0.0	0.0	26.7	0.0	4.0	-16.0
188	912200.95	5023019.79	108.57	1	N	A	83.7	3.1	0.0	0.0	0.0	66.3	9.5	-3.7	0.0	0.0	26.7	0.0	4.0	-16.0
188	912200.95	5023019.79	108.57	1	E	A	-33.2	3.1	0.0	0.0	0.0	66.3	9.5	-3.7	0.0	0.0	26.7	0.0	4.0	-133.0
192	912199.41	5023018.65	108.52	1	D	A	83.7	2.5	0.0	0.0	0.0	66.3	9.5	-3.7	0.0	0.0	26.7	0.0	4.0	-16.6
192	912199.41	5023018.65	108.52	1	N	A	83.7	2.5	0.0	0.0	0.0	66.3	9.5	-3.7	0.0	0.0	26.7	0.0	4.0	-16.6
192	912199.41	5023018.65	108.52	1	E	A	-33.2	2.5	0.0	0.0	0.0	66.3	9.5	-3.7	0.0	0.0	26.7	0.0	4.0	-133.6
195	912055.26	5022922.89	108.11	0	D	A	83.7	20.2	0.0	0.0	0.0	67.3	10.0	-3.4	0.0	0.0	0.0	0.0	0.0	30.1
195	912055.26	5022922.89	108.11	0	N	A	83.7	20.2	0.0	0.0	0.0	67.3	10.0	-3.4	0.0	0.0	0.0	0.0	0.0	30.1
195	912055.26	5022922.89	108.11	0	E	A	-33.2	20.2	0.0	0.0	0.0	67.3	10.0	-3.4	0.0	0.0	0.0	0.0	0.0	-86.9
217	912064.63	5022929.31	108.19	1	D	A	83.7	12.5	0.0	0.0	0.0	68.1	10.5	-3.8	0.0	0.0	26.5	0.0	7.3	-12.3
217	912064.63	5022929.31	108.19	1	N	A	83.7	12.5	0.0	0.0	0.0	68.1	10.5	-3.8	0.0	0.0	26.5	0.0	7.3	-12.3
217	912064.63	5022929.31	108.19	1	E	A	-33.2	12.5	0.0	0.0	0.0	68.1	10.5	-3.8	0.0	0.0	26.5	0.0	7.3	-129.3
240	912086.83	5022944.48	108.39	1	D	A	83.7	14.5	0.0	0.0	0.0	67.5	10.1	-3.8	0.0	0.0	26.6	0.0	4.2	-6.4
240	912086.83	5022944.48	108.39	1	N	A	83.7	14.5	0.0	0.0	0.0	67.5	10.1	-3.8	0.0	0.0	26.6	0.0	4.2	-6.4
240	912086.83	5022944.48	108.39	1	E	A	-33.2	14.5	0.0	0.0	0.0	67.5	10.1	-3.8	0.0	0.0	26.6	0.0	4.2	-123.4
242	912063.73	5022928.69	108.18	1	D	A	83.7	14.4	0.0	0.0	0.0	67.8	10.3	-3.8	0.0	0.0	26.6	0.0	4.2	-6.9
242	912063.73	5022928.69	108.18	1	N	A	83.7	14.4	0.0	0.0	0.0	67.8	10.3	-3.8	0.0	0.0	26.6	0.0	4.2	-6.9
242	912063.73	5022928.69	108.18	1	E	A	-33.2	14.4	0.0	0.0	0.0	67.8	10.3	-3.8	0.0	0.0	26.6	0.0	4.2	-123.9
244	912094.56	5022949.77	108.46	1	D	A	83.7	9.9	0.0	0.0	0.0	67.6	10.2	-3.8	0.0	0.0	26.6	0.0	7.1	-14.1
244	912094.56	5022949.77	108.46	1	N	A	83.7	9.9	0.0	0.0	0.0	67.6	10.2	-3.8	0.0	0.0	26.6	0.0	7.1	-14.1
244	912094.56	5022949.77	108.46	1	E	A	-33.2	9.9	0.0	0.0	0.0	67.6	10.2	-3.8	0.0	0.0	26.6	0.0	7.1	-131.0
245	912079.17	5022939.25	108.32	1	D	A	83.7	14.4	0.0	0.0	0.0	67.8	10.3	-3.8	0.0	0.0	26.6	0.0	7.1	-9.8
245	912079.17	5022939.25	108.32	1	N	A	83.7	14.4	0.0	0.0	0.0	67.8	10.3	-3.8	0.0	0.0	26.6	0.0	7.1	-9.8
245	912079.17	5022939.25	108.32	1	E	A	-33.2	14.4	0.0	0.0	0.0	67.8	10.3	-3.8	0.0	0.0	26.6	0.0	7.1	-126.8
246	912054.84	5022922.61	108.10	1	D	A	83.7	15.0	0.0	0.0	0.0	68.0	10.4	-3.8	0.0	0.0	26.5	0.0	4.3	-6.8
246	912054.84	5022922.61	108.10	1	N	A	83.7	15.0	0.0	0.0	0.0	68.0	10.4	-3.8	0.0	0.0	26.5	0.0	4.3	-6.8
246	912054.84	5022922.61	108.10	1	E	A	-33.2	15.0	0.0	0.0	0.0	68.0	10.4	-3.8	0.0	0.0	26.5	0.0	4.3	-123.8
248	912026.92	5022903.52	107.85	1	D	A	83.7	15.6	0.0	0.0	0.0	68.3	10.6	-3.8	0.0	0.0	26.5	0.0	4.4	-6.6
248	912026.92	5022903.52	107.85	1	N	A	83.7	15.6	0.0	0.0	0.0	68.3	10.6	-3.8	0.0	0.0	26.5	0.0	4.4	-6.6
248	912026.92	5022903.52	107.85	1	E	A	-33.2	15.6	0.0	0.0	0.0	68.3	10.6	-3.8	0.0	0.0	26.5	0.0	4.4	-123.6
249	912291.23	5023085.04	110.49	0	D	A	83.7	18.1	0.0	0.0	0.0	65.1	8.8	-3.6	0.0	0.0	0.0	0.0	0.0	31.5
249	912291.23	5023085.04	110.49	0	N	A	83.7	18.1	0.0	0.0	0.0	65.1	8.8	-3.6	0.0	0.0	0.0	0.0	0.0	31.5
249	912291.23	5023085.04	110.49	0	E	A	-33.2	18.1	0.0	0.0	0.0	65.1	8.8	-3.6	0.0	0.0	0.0	0.0	0.0	-85.5
252	911953.51	5022856.97	106.78	0	D	A	83.7	17.9	0.0	0.0	0.0	68.4	10.6	-3.5	0.0	0.0	0.0	0.0	0.0	26.2
252	911953.51	5022856.97	106.78	0	N	A	83.7	17.9	0.0	0.0	0.0	68.4	10.6	-3.5	0.0	0.0	0.0	0.0	0.0	26.2
252	911953.51	5022856.97	106.78	0	E	A	-33.2	17.9	0.0	0.0	0.0	68.4	10.6	-3.5	0.0	0.0	0.0	0.0	0.0	-90.8
259	911973.51	5022868.74	106.99	1	D	A	83.7	12.0	0.0	0.0	0.0	68.9	10.9	-3.9	0.0	0.0	26.4	0.0	4.5	-11.1
259	911973.51	5022868.74	106.99	1	N	A	83.7	12.0	0.0	0.0	0.0	68.9	10.9	-3.9	0.0	0.0	26.4	0.0	4.5	-11.1
259	911973.51	5022868.74	106.99	1	E	A	-33.2	12.0	0.0	0.0	0.0	68.9	10.9	-3.9	0.0	0.0	26.4	0.0	4.5	-128.1
261	911963.34	5022862.76	106.88	1	D	A	83.7	8.9	0.0	0.0	0.0	69.0	11.0	-3.9	0.0	0.0	26.3	0.0	4.5	-14.4
261	911963.34	5022862.76	106.88	1	N	A	83.7	8.9	0.0	0.0	0.0	69.0	11.0	-3.9	0.0	0.0	26.3	0.0	4.5	-14.4
261	911963.34	5022862.76	106.88	1	E	A	-33.2	8.9	0.0	0.0	0.0	69.0	11.0	-3.9	0.0	0.0	26.3	0.0	4.5	-131.3
262	911950.39	5022855.14	106.75	1	D	A	83.7	13.5	0.0	0.0	0.0	69.2	11.1	-3.9	0.0	0.0	26.3	0.0	4.5	-10.0
262	911950.39	5022855.14	106.75	1	N	A	83.7	13.5	0.0	0.0	0.0	69.2	11.1	-3.9	0.0	0.0	26.3	0.0	4.5	-10.0
262	911950.39	5022855.14	106.75	1	E	A	-33.2	13.5	0.0	0.0	0.0	69.2	11.1	-3.9	0.0	0.0	26.3	0.0	4.5	-127.0
263	912337.79	5023221.92	99.50	0	D	A	83.7	14.4	0.0	0.0	0.0	66.2	9.4	-3.8	0.0	0.0	16.4	0.0	0.0	10.0
263	912337.79	5023221.92	99.50	0	N	A	83.7	14.4	0.0	0.0	0.0	66.2	9.4	-3.8	0.0	0.0	16.4	0.0	0.0	10.0
263	912337.79	5023221.92	99.50	0	E	A	-33.2	14.4	0.0	0.0	0.0	66.2	9.4	-3.8	0.0	0.0	16.4	0.0	0.0	-107.0
266	912407.77	5023320.51	99.50	0	D	A	83.7	15.1	0.0	0.0	0.0	66.9	9.8	-3.9	0.0	0.0	15.3	0.0	0.0	10.8
266	912407.77	5023320.51	99.50	0	N	A	83.7	15.1	0.0	0.0	0.0	66.9	9.8	-3.9	0.0	0.0	15.3	0.0	0.0	10.8

Line Source, ISO 9613, Name: "Delivery Trucks", ID: "DrTrk"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
266	912407.77	5023320.51	99.50	0	E	A	-33.2	15.1	0.0	0.0	0.0	66.9	9.8	-3.9	0.0	0.0	15.3	0.0	0.0	-106.2
272	912415.03	5023319.09	99.50	2	D	A	83.7	7.1	0.0	0.0	0.0	66.8	9.7	-3.9	0.0	0.0	27.0	0.0	74.9	-83.6
272	912415.03	5023319.09	99.50	2	N	A	83.7	7.1	0.0	0.0	0.0	66.8	9.7	-3.9	0.0	0.0	27.0	0.0	74.9	-83.6
272	912415.03	5023319.09	99.50	2	E	A	-33.2	7.1	0.0	0.0	0.0	66.8	9.7	-3.9	0.0	0.0	27.0	0.0	74.9	-200.6
277	911996.15	5022883.02	107.39	0	D	A	83.7	15.8	0.0	0.0	0.0	67.9	10.3	-3.4	0.0	0.0	0.0	0.0	0.0	24.7
277	911996.15	5022883.02	107.39	0	N	A	83.7	15.8	0.0	0.0	0.0	67.9	10.3	-3.4	0.0	0.0	0.0	0.0	0.0	24.7
277	911996.15	5022883.02	107.39	0	E	A	-33.2	15.8	0.0	0.0	0.0	67.9	10.3	-3.4	0.0	0.0	0.0	0.0	0.0	-92.3
279	912008.03	5022890.73	107.63	1	D	A	83.7	9.7	0.0	0.0	0.0	68.5	10.7	-3.8	0.0	0.0	26.4	0.0	4.4	-12.8
279	912008.03	5022890.73	107.63	1	N	A	83.7	9.7	0.0	0.0	0.0	68.5	10.7	-3.8	0.0	0.0	26.4	0.0	4.4	-12.8
279	912008.03	5022890.73	107.63	1	E	A	-33.2	9.7	0.0	0.0	0.0	68.5	10.7	-3.8	0.0	0.0	26.4	0.0	4.4	-129.8
282	911992.22	5022880.47	107.31	1	D	A	83.7	14.5	0.0	0.0	0.0	68.7	10.8	-3.8	0.0	0.0	26.4	0.0	4.4	-8.3
282	911992.22	5022880.47	107.31	1	N	A	83.7	14.5	0.0	0.0	0.0	68.7	10.8	-3.8	0.0	0.0	26.4	0.0	4.4	-8.3
282	911992.22	5022880.47	107.31	1	E	A	-33.2	14.5	0.0	0.0	0.0	68.7	10.8	-3.8	0.0	0.0	26.4	0.0	4.4	-125.2
286	912359.81	5023170.60	101.48	0	D	A	83.7	12.9	0.0	0.0	0.0	65.3	8.9	-3.8	0.0	0.0	19.2	0.0	0.0	6.9
286	912359.81	5023170.60	101.48	0	N	A	83.7	12.9	0.0	0.0	0.0	65.3	8.9	-3.8	0.0	0.0	19.2	0.0	0.0	6.9
286	912359.81	5023170.60	101.48	0	E	A	-33.2	12.9	0.0	0.0	0.0	65.3	8.9	-3.8	0.0	0.0	19.2	0.0	0.0	-110.1
289	912360.67	5023174.65	101.07	1	D	A	83.7	10.5	0.0	0.0	0.0	65.4	9.0	-3.7	0.0	0.0	27.8	0.0	61.7	-66.0
289	912360.67	5023174.65	101.07	1	N	A	83.7	10.5	0.0	0.0	0.0	65.4	9.0	-3.7	0.0	0.0	27.8	0.0	61.7	-66.0
289	912360.67	5023174.65	101.07	1	E	A	-33.2	10.5	0.0	0.0	0.0	65.4	9.0	-3.7	0.0	0.0	27.8	0.0	61.7	-183.0
290	912359.07	5023167.08	101.83	1	D	A	83.7	6.5	0.0	0.0	0.0	65.3	8.9	-3.7	0.0	0.0	27.9	0.0	61.2	-69.3
290	912359.07	5023167.08	101.83	1	N	A	83.7	6.5	0.0	0.0	0.0	65.3	8.9	-3.7	0.0	0.0	27.9	0.0	61.2	-69.3
290	912359.07	5023167.08	101.83	1	E	A	-33.2	6.5	0.0	0.0	0.0	65.3	8.9	-3.7	0.0	0.0	27.9	0.0	61.2	-186.3
295	912343.93	5023129.59	107.23	0	D	A	83.7	11.1	0.0	0.0	0.0	65.0	8.8	-3.7	0.0	0.0	13.1	0.0	0.0	11.7
295	912343.93	5023129.59	107.23	0	N	A	83.7	11.1	0.0	0.0	0.0	65.0	8.8	-3.7	0.0	0.0	13.1	0.0	0.0	11.7
295	912343.93	5023129.59	107.23	0	E	A	-33.2	11.1	0.0	0.0	0.0	65.0	8.8	-3.7	0.0	0.0	13.1	0.0	0.0	-105.3
297	912339.41	5023123.33	108.10	0	D	A	83.7	4.2	0.0	0.0	0.0	65.0	8.7	-3.7	0.0	0.0	8.5	0.0	0.0	9.5
297	912339.41	5023123.33	108.10	0	N	A	83.7	4.2	0.0	0.0	0.0	65.0	8.7	-3.7	0.0	0.0	8.5	0.0	0.0	9.5
297	912339.41	5023123.33	108.10	0	E	A	-33.2	4.2	0.0	0.0	0.0	65.0	8.7	-3.7	0.0	0.0	8.5	0.0	0.0	-107.5
307	912389.89	5023323.54	99.50	0	D	A	83.7	6.3	0.0	0.0	0.0	67.0	9.8	-3.9	0.0	0.0	16.3	0.0	0.0	0.8
307	912389.89	5023323.54	99.50	0	N	A	83.7	6.3	0.0	0.0	0.0	67.0	9.8	-3.9	0.0	0.0	16.3	0.0	0.0	0.8
307	912389.89	5023323.54	99.50	0	E	A	-33.2	6.3	0.0	0.0	0.0	67.0	9.8	-3.9	0.0	0.0	16.3	0.0	0.0	-116.2
308	912382.70	5023323.39	99.50	0	D	A	83.7	10.0	0.0	0.0	0.0	67.1	9.9	-3.9	0.0	0.0	17.2	0.0	0.0	3.5
308	912382.70	5023323.39	99.50	0	N	A	83.7	10.0	0.0	0.0	0.0	67.1	9.9	-3.9	0.0	0.0	17.2	0.0	0.0	3.5
308	912382.70	5023323.39	99.50	0	E	A	-33.2	10.0	0.0	0.0	0.0	67.1	9.9	-3.9	0.0	0.0	17.2	0.0	0.0	-113.4
317	912372.40	5023323.18	99.50	0	D	A	83.7	10.2	0.0	0.0	0.0	67.1	9.9	-3.9	0.0	0.0	21.2	0.0	0.0	-0.3
317	912372.40	5023323.18	99.50	0	N	A	83.7	10.2	0.0	0.0	0.0	67.1	9.9	-3.9	0.0	0.0	21.2	0.0	0.0	-0.3
317	912372.40	5023323.18	99.50	0	E	A	-33.2	10.2	0.0	0.0	0.0	67.1	9.9	-3.9	0.0	0.0	21.2	0.0	0.0	-117.3
346	912433.69	5023313.94	99.50	0	D	A	83.7	13.3	0.0	0.0	0.0	66.6	9.6	-3.9	0.0	0.0	16.3	0.0	0.0	8.4
346	912433.69	5023313.94	99.50	0	N	A	83.7	13.3	0.0	0.0	0.0	66.6	9.6	-3.9	0.0	0.0	16.3	0.0	0.0	8.4
346	912433.69	5023313.94	99.50	0	E	A	-33.2	13.3	0.0	0.0	0.0	66.6	9.6	-3.9	0.0	0.0	16.3	0.0	0.0	-108.6
361	912317.96	5023234.61	99.50	0	D	A	83.7	13.0	0.0	0.0	0.0	66.5	9.6	-3.9	0.0	0.0	14.7	0.0	0.0	9.9
361	912317.96	5023234.61	99.50	0	N	A	83.7	13.0	0.0	0.0	0.0	66.5	9.6	-3.9	0.0	0.0	14.7	0.0	0.0	9.9
361	912317.96	5023234.61	99.50	0	E	A	-33.2	13.0	0.0	0.0	0.0	66.5	9.6	-3.9	0.0	0.0	14.7	0.0	0.0	-107.0
367	911874.41	5022819.85	106.50	0	D	A	83.7	15.7	0.0	0.0	0.0	69.2	11.1	-3.5	0.0	0.0	0.0	0.0	0.0	22.6
367	911874.41	5022819.85	106.50	0	N	A	83.7	15.7	0.0	0.0	0.0	69.2	11.1	-3.5	0.0	0.0	0.0	0.0	0.0	22.6
367	911874.41	5022819.85	106.50	0	E	A	-33.2	15.7	0.0	0.0	0.0	69.2	11.1	-3.5	0.0	0.0	0.0	0.0	0.0	-94.4
372	912333.69	5023117.28	108.85	0	D	A	83.7	11.5	0.0	0.0	0.0	64.9	8.7	-3.7	0.0	0.0	0.0	0.0	0.0	25.2
372	912333.69	5023117.28	108.85	0	N	A	83.7	11.5	0.0	0.0	0.0	64.9	8.7	-3.7	0.0	0.0	0.0	0.0	0.0	25.2
372	912333.69	5023117.28	108.85	0	E	A	-33.2	11.5	0.0	0.0	0.0	64.9	8.7	-3.7	0.0	0.0	0.0	0.0	0.0	-91.8
379	912323.31	5023107.82	109.98	0	D	A	83.7	11.5	0.0	0.0	0.0	65.0	8.8	-3.7	0.0	0.0	0.0	0.0	0.0	25.2
379	912323.31	5023107.82	109.98	0	N	A	83.7	11.5	0.0	0.0	0.0	65.0	8.8	-3.7	0.0	0.0	0.0	0.0	0.0	25.2
379	912323.31	5023107.82	109.98	0	E	A	-33.2	11.5	0.0	0.0	0.0	65.0	8.8	-3.7	0.0	0.0	0.0	0.0	0.0	-91.8
388	912350.63	5023141.18	105.45	0	D	A	83.7	11.5	0.0	0.0	0.0	65.0	8.8	-3.7	0.0	0.0	19.1	0.0	0.0	6.0
388	912350.63	5023141.18	105.45	0	N	A	83.7	11.5	0.0	0.0	0.0	65.0	8.8	-3.7	0.0	0.0	19.1	0.0	0.0	6.0
388	912350.63	5023141.18	105.45	0	E	A	-33.2	11.5	0.0	0.0	0.0	65.0	8.8	-3.7	0.0	0.0	19.1	0.0	0.0	-111.0
409	912355.69	5023154.36	103.42	0	D	A	83.7	11.6	0.0	0.0	0.0	65.2	8.9	-3.7	0.0	0.0	22.4	0.0	0.0	2.7
409	912355.69	5023154.36	103.42	0	N	A	83.7	11.6	0.0	0.0	0.0	65.2	8.9	-3.7	0.0	0.0	22.4	0.0	0.0	2.7
409	912355.69	5023154.36	103.42	0	E	A	-33.2	11.6	0.0	0.0	0.0	65.2	8.9	-3.7	0.0	0.0	22.4	0.0	0.0	-114.3
423	912362.57	5023187.05	100.01	0	D	A	83.7	11.5	0.0	0.0	0.0	65.5	9.0	-3.8	0.0	0.0	19.8	0.0	0.0	4.7
423	912362.57	5023187.05	100.01	0	N	A	83.7	11.5	0.0	0.0	0.0	65.5	9.0	-3.8	0.0	0.0	19.8	0.0	0.0	4.7
423	912362.57	5023187.05	100.01	0	E	A	-33.2	11.5	0.0	0.0	0.0	65.5	9.0	-3.8	0.0	0.0	19.8	0.0	0.0	-112.3
433	912341.63	5023313.26	99.50	0	D	A	83.7	13.2	0.0	0.0	0.0	67.2	10.0	-4.0	0.0	0.0	15.5	0.0	0.0	8.1

Line Source, ISO 9613, Name: "Delivery Trucks", ID: "DrTrk"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
433	912341.63	5023313.26	99.50	0	N	A	83.7	13.2	0.0	0.0	0.0	67.2	10.0	-4.0	0.0	0.0	15.5	0.0	0.0	8.1
433	912341.63	5023313.26	99.50	0	E	A	-33.2	13.2	0.0	0.0	0.0	67.2	10.0	-4.0	0.0	0.0	15.5	0.0	0.0	-108.8
459	912350.23	5023317.36	99.50	2	D	A	83.7	2.3	0.0	0.0	0.0	67.9	10.4	-4.2	0.0	0.0	9.0	0.0	7.0	-4.1
459	912350.23	5023317.36	99.50	2	N	A	83.7	2.3	0.0	0.0	0.0	67.9	10.4	-4.2	0.0	0.0	9.0	0.0	7.0	-4.1
459	912350.23	5023317.36	99.50	2	E	A	-33.2	2.3	0.0	0.0	0.0	67.9	10.4	-4.2	0.0	0.0	9.0	0.0	7.0	-121.1
468	912342.39	5023313.62	99.50	2	D	A	83.7	12.0	0.0	0.0	0.0	68.0	10.4	-4.2	0.0	0.0	13.4	0.0	8.6	-0.5
468	912342.39	5023313.62	99.50	2	N	A	83.7	12.0	0.0	0.0	0.0	68.0	10.4	-4.2	0.0	0.0	13.4	0.0	8.6	-0.5
468	912342.39	5023313.62	99.50	2	E	A	-33.2	12.0	0.0	0.0	0.0	68.0	10.4	-4.2	0.0	0.0	13.4	0.0	8.6	-117.5
491	912335.04	5023310.12	99.50	2	D	A	83.7	-2.4	0.0	0.0	0.0	68.0	10.4	-4.2	0.0	0.0	13.3	0.0	8.6	-14.8
491	912335.04	5023310.12	99.50	2	N	A	83.7	-2.4	0.0	0.0	0.0	68.0	10.4	-4.2	0.0	0.0	13.3	0.0	8.6	-14.8
491	912335.04	5023310.12	99.50	2	E	A	-33.2	-2.4	0.0	0.0	0.0	68.0	10.4	-4.2	0.0	0.0	13.3	0.0	8.6	-131.8
581	911794.66	5022763.68	106.00	0	D	A	83.7	15.8	0.0	0.0	0.0	70.0	11.6	-3.5	0.0	0.0	0.0	0.0	0.0	21.4
581	911794.66	5022763.68	106.00	0	N	A	83.7	15.8	0.0	0.0	0.0	70.0	11.6	-3.5	0.0	0.0	0.0	0.0	0.0	21.4
581	911794.66	5022763.68	106.00	0	E	A	-33.2	15.8	0.0	0.0	0.0	70.0	11.6	-3.5	0.0	0.0	0.0	0.0	0.0	-95.6
585	912355.41	5023211.13	99.50	0	D	A	83.7	11.6	0.0	0.0	0.0	65.9	9.2	-3.8	0.0	0.0	17.9	0.0	0.0	6.0
585	912355.41	5023211.13	99.50	0	N	A	83.7	11.6	0.0	0.0	0.0	65.9	9.2	-3.8	0.0	0.0	17.9	0.0	0.0	6.0
585	912355.41	5023211.13	99.50	0	E	A	-33.2	11.6	0.0	0.0	0.0	65.9	9.2	-3.8	0.0	0.0	17.9	0.0	0.0	-110.9
592	912313.28	5023295.12	99.50	0	D	A	83.7	12.8	0.0	0.0	0.0	67.2	10.0	-4.0	0.0	0.0	12.8	0.0	0.0	10.5
592	912313.28	5023295.12	99.50	0	N	A	83.7	12.8	0.0	0.0	0.0	67.2	10.0	-4.0	0.0	0.0	12.8	0.0	0.0	10.5
592	912313.28	5023295.12	99.50	0	E	A	-33.2	12.8	0.0	0.0	0.0	67.2	10.0	-4.0	0.0	0.0	12.8	0.0	0.0	-106.5
599	912362.07	5023200.23	99.50	0	D	A	83.7	11.0	0.0	0.0	0.0	65.7	9.1	-3.8	0.0	0.0	19.2	0.0	0.0	4.5
599	912362.07	5023200.23	99.50	0	N	A	83.7	11.0	0.0	0.0	0.0	65.7	9.1	-3.8	0.0	0.0	19.2	0.0	0.0	4.5
599	912362.07	5023200.23	99.50	0	E	A	-33.2	11.0	0.0	0.0	0.0	65.7	9.1	-3.8	0.0	0.0	19.2	0.0	0.0	-112.5
605	911915.80	5022835.47	106.50	0	D	A	83.7	13.9	0.0	0.0	0.0	68.8	10.8	-3.5	0.0	0.0	0.0	0.0	0.0	21.5
605	911915.80	5022835.47	106.50	0	N	A	83.7	13.9	0.0	0.0	0.0	68.8	10.8	-3.5	0.0	0.0	0.0	0.0	0.0	21.5
605	911915.80	5022835.47	106.50	0	E	A	-33.2	13.9	0.0	0.0	0.0	68.8	10.8	-3.5	0.0	0.0	0.0	0.0	0.0	-95.5
607	912360.30	5023320.81	99.50	0	D	A	83.7	11.6	0.0	0.0	0.0	67.2	9.9	-4.0	0.0	0.0	20.6	0.0	0.0	1.6
607	912360.30	5023320.81	99.50	0	N	A	83.7	11.6	0.0	0.0	0.0	67.2	9.9	-4.0	0.0	0.0	20.6	0.0	0.0	1.6
607	912360.30	5023320.81	99.50	0	E	A	-33.2	11.6	0.0	0.0	0.0	67.2	9.9	-4.0	0.0	0.0	20.6	0.0	0.0	-115.4
608	912352.22	5023318.13	99.50	0	D	A	83.7	4.2	0.0	0.0	0.0	67.2	10.0	-4.0	0.0	0.0	15.8	0.0	0.0	-1.1
608	912352.22	5023318.13	99.50	0	N	A	83.7	4.2	0.0	0.0	0.0	67.2	10.0	-4.0	0.0	0.0	15.8	0.0	0.0	-1.1
608	912352.22	5023318.13	99.50	0	E	A	-33.2	4.2	0.0	0.0	0.0	67.2	10.0	-4.0	0.0	0.0	15.8	0.0	0.0	-118.1
614	912356.94	5023319.69	99.50	2	D	A	83.7	5.5	0.0	0.0	0.0	67.9	10.4	-4.2	0.0	0.0	25.2	0.0	10.1	-20.2
614	912356.94	5023319.69	99.50	2	N	A	83.7	5.5	0.0	0.0	0.0	67.9	10.4	-4.2	0.0	0.0	25.2	0.0	10.1	-20.2
614	912356.94	5023319.69	99.50	2	E	A	-33.2	5.5	0.0	0.0	0.0	67.9	10.4	-4.2	0.0	0.0	25.2	0.0	10.1	-137.2
636	912353.13	5023318.43	99.50	2	D	A	83.7	6.5	0.0	0.0	0.0	67.9	10.4	-4.2	0.0	0.0	9.0	0.0	7.0	0.2
636	912353.13	5023318.43	99.50	2	N	A	83.7	6.5	0.0	0.0	0.0	67.9	10.4	-4.2	0.0	0.0	9.0	0.0	7.0	0.2
636	912353.13	5023318.43	99.50	2	E	A	-33.2	6.5	0.0	0.0	0.0	67.9	10.4	-4.2	0.0	0.0	9.0	0.0	7.0	-116.8
668	912300.61	5023257.21	99.50	0	D	A	83.7	11.3	0.0	0.0	0.0	66.9	9.8	-4.0	0.0	0.0	13.1	0.0	0.0	9.1
668	912300.61	5023257.21	99.50	0	N	A	83.7	11.3	0.0	0.0	0.0	66.9	9.8	-4.0	0.0	0.0	13.1	0.0	0.0	9.1
668	912300.61	5023257.21	99.50	0	E	A	-33.2	11.3	0.0	0.0	0.0	66.9	9.8	-4.0	0.0	0.0	13.1	0.0	0.0	-107.9
673	911770.35	5022741.34	105.06	0	D	A	83.7	14.5	0.0	0.0	0.0	70.2	11.7	-3.5	0.0	0.0	0.0	0.0	0.0	19.8
673	911770.35	5022741.34	105.06	0	N	A	83.7	14.5	0.0	0.0	0.0	70.2	11.7	-3.5	0.0	0.0	0.0	0.0	0.0	19.8
673	911770.35	5022741.34	105.06	0	E	A	-33.2	14.5	0.0	0.0	0.0	70.2	11.7	-3.5	0.0	0.0	0.0	0.0	0.0	-97.2
679	912299.31	5023270.45	99.50	0	D	A	83.7	11.3	0.0	0.0	0.0	67.1	9.9	-3.9	0.0	0.0	12.7	0.0	0.0	9.3
679	912299.31	5023270.45	99.50	0	N	A	83.7	11.3	0.0	0.0	0.0	67.1	9.9	-3.9	0.0	0.0	12.7	0.0	0.0	9.3
679	912299.31	5023270.45	99.50	0	E	A	-33.2	11.3	0.0	0.0	0.0	67.1	9.9	-3.9	0.0	0.0	12.7	0.0	0.0	-107.7
700	912306.36	5023245.99	99.50	0	D	A	83.7	10.9	0.0	0.0	0.0	66.7	9.7	-3.9	0.0	0.0	13.7	0.0	0.0	8.5
700	912306.36	5023245.99	99.50	0	N	A	83.7	10.9	0.0	0.0	0.0	66.7	9.7	-3.9	0.0	0.0	13.7	0.0	0.0	8.5
700	912306.36	5023245.99	99.50	0	E	A	-33.2	10.9	0.0	0.0	0.0	66.7	9.7	-3.9	0.0	0.0	13.7	0.0	0.0	-108.5
703	912306.36	5023245.99	99.50	1	D	A	83.7	10.9	0.0	0.0	0.0	66.8	9.7	-3.9	0.0	0.0	27.0	0.0	72.5	-77.4
703	912306.36	5023245.99	99.50	1	N	A	83.7	10.9	0.0	0.0	0.0	66.8	9.7	-3.9	0.0	0.0	27.0	0.0	72.5	-77.4
703	912306.36	5023245.99	99.50	1	E	A	-33.2	10.9	0.0	0.0	0.0	66.8	9.7	-3.9	0.0	0.0	27.0	0.0	72.5	-194.4
708	912326.35	5023305.14	99.50	0	D	A	83.7	11.4	0.0	0.0	0.0	67.2	10.0	-4.0	0.0	0.0	13.4	0.0	0.0	8.5
708	912326.35	5023305.14	99.50	0	N	A	83.7	11.4	0.0	0.0	0.0	67.2	10.0	-4.0	0.0	0.0	13.4	0.0	0.0	8.5
708	912326.35	5023305.14	99.50	0	E	A	-33.2	11.4	0.0	0.0	0.0	67.2	10.0	-4.0	0.0	0.0	13.4	0.0	0.0	-108.5
716	912302.95	5023282.99	99.50	0	D	A	83.7	11.2	0.0	0.0	0.0	67.2	9.9	-4.0	0.0	0.0	12.5	0.0	0.0	9.2
716	912302.95	5023282.99	99.50	0	N	A	83.7	11.2	0.0	0.0	0.0	67.2	9.9	-4.0	0.0	0.0	12.5	0.0	0.0	9.2
716	912302.95	5023282.99	99.50	0	E	A	-33.2	11.2	0.0	0.0	0.0	67.2	9.9	-4.0	0.0	0.0	12.5	0.0	0.0	-107.7
721	911849.26	5022812.68	106.50	0	D	A	83.7	11.9	0.0	0.0	0.0	69.5	11.3	-3.5	0.0	0.0	0.0	0.0	0.0	18.4
721	911849.26	5022812.68	106.50	0	N	A	83.7	11.9	0.0	0.0	0.0	69.5	11.3	-3.5	0.0	0.0	0.0	0.0	0.0	18.4
721	911849.26	5022812.68	106.50	0	E	A	-33.2	11.9	0.0	0.0	0.0	69.5	11.3	-3.5	0.0	0.0	0.0	0.0	0.0	-98.6

Line Source, ISO 9613, Name: "Delivery Trucks", ID: "DrTrk"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
724	911898.60	5022827.00	106.50	0	D	A	83.7	11.4	0.0	0.0	0.0	69.0	10.9	-3.5	0.0	0.0	0.0	0.0	0.0	18.7
724	911898.60	5022827.00	106.50	0	N	A	83.7	11.4	0.0	0.0	0.0	69.0	10.9	-3.5	0.0	0.0	0.0	0.0	0.0	18.7
724	911898.60	5022827.00	106.50	0	E	A	-33.2	11.4	0.0	0.0	0.0	69.0	10.9	-3.5	0.0	0.0	0.0	0.0	0.0	-98.3
739	911823.50	5022795.11	106.50	0	D	A	83.7	12.1	0.0	0.0	0.0	69.7	11.4	-3.5	0.0	0.0	0.0	0.0	0.0	18.3
739	911823.50	5022795.11	106.50	0	N	A	83.7	12.1	0.0	0.0	0.0	69.7	11.4	-3.5	0.0	0.0	0.0	0.0	0.0	18.3
739	911823.50	5022795.11	106.50	0	E	A	-33.2	12.1	0.0	0.0	0.0	69.7	11.4	-3.5	0.0	0.0	0.0	0.0	0.0	-98.7
751	911820.00	5022790.41	106.50	1	D	A	83.7	6.7	0.0	0.0	0.0	70.6	11.9	-4.0	0.0	0.0	26.0	0.0	9.0	-23.1
751	911820.00	5022790.41	106.50	1	N	A	83.7	6.7	0.0	0.0	0.0	70.6	11.9	-4.0	0.0	0.0	26.0	0.0	9.0	-23.1
751	911820.00	5022790.41	106.50	1	E	A	-33.2	6.7	0.0	0.0	0.0	70.6	11.9	-4.0	0.0	0.0	26.0	0.0	9.0	-140.1
759	911813.52	5022782.60	106.50	0	D	A	83.7	11.9	0.0	0.0	0.0	69.8	11.5	-3.5	0.0	0.0	0.0	0.0	0.0	17.9
759	911813.52	5022782.60	106.50	0	N	A	83.7	11.9	0.0	0.0	0.0	69.8	11.5	-3.5	0.0	0.0	0.0	0.0	0.0	17.9
759	911813.52	5022782.60	106.50	0	E	A	-33.2	11.9	0.0	0.0	0.0	69.8	11.5	-3.5	0.0	0.0	0.0	0.0	0.0	-99.1
762	911813.63	5022782.72	106.50	1	D	A	83.7	11.9	0.0	0.0	0.0	70.7	12.0	-4.0	0.0	0.0	26.0	0.0	9.0	-18.1
762	911813.63	5022782.72	106.50	1	N	A	83.7	11.9	0.0	0.0	0.0	70.7	12.0	-4.0	0.0	0.0	26.0	0.0	9.0	-18.1
762	911813.63	5022782.72	106.50	1	E	A	-33.2	11.9	0.0	0.0	0.0	70.7	12.0	-4.0	0.0	0.0	26.0	0.0	9.0	-135.0
780	911744.63	5022720.63	104.50	0	D	A	83.7	11.3	0.0	0.0	0.0	70.5	11.9	-3.5	0.0	0.0	0.0	0.0	0.0	16.1
780	911744.63	5022720.63	104.50	0	N	A	83.7	11.3	0.0	0.0	0.0	70.5	11.9	-3.5	0.0	0.0	0.0	0.0	0.0	16.1
780	911744.63	5022720.63	104.50	0	E	A	-33.2	11.3	0.0	0.0	0.0	70.5	11.9	-3.5	0.0	0.0	0.0	0.0	0.0	-100.9
787	911837.26	5022807.37	106.50	0	D	A	83.7	10.3	0.0	0.0	0.0	69.6	11.3	-3.5	0.0	0.0	0.0	0.0	0.0	16.6
787	911837.26	5022807.37	106.50	0	N	A	83.7	10.3	0.0	0.0	0.0	69.6	11.3	-3.5	0.0	0.0	0.0	0.0	0.0	16.6
787	911837.26	5022807.37	106.50	0	E	A	-33.2	10.3	0.0	0.0	0.0	69.6	11.3	-3.5	0.0	0.0	0.0	0.0	0.0	-100.4
795	911754.99	5022728.21	104.56	0	D	A	83.7	10.9	0.0	0.0	0.0	70.4	11.8	-3.5	0.0	0.0	0.0	0.0	0.0	15.9
795	911754.99	5022728.21	104.56	0	N	A	83.7	10.9	0.0	0.0	0.0	70.4	11.8	-3.5	0.0	0.0	0.0	0.0	0.0	15.9
795	911754.99	5022728.21	104.56	0	E	A	-33.2	10.9	0.0	0.0	0.0	70.4	11.8	-3.5	0.0	0.0	0.0	0.0	0.0	-101.1
800	911734.48	5022714.49	104.50	0	D	A	83.7	10.1	0.0	0.0	0.0	70.6	11.9	-3.5	0.0	0.0	0.0	0.0	0.0	14.8
800	911734.48	5022714.49	104.50	0	N	A	83.7	10.1	0.0	0.0	0.0	70.6	11.9	-3.5	0.0	0.0	0.0	0.0	0.0	14.8
800	911734.48	5022714.49	104.50	0	E	A	-33.2	10.1	0.0	0.0	0.0	70.6	11.9	-3.5	0.0	0.0	0.0	0.0	0.0	-102.1
805	911830.47	5022803.24	106.50	0	D	A	83.7	7.2	0.0	0.0	0.0	69.7	11.4	-3.5	0.0	0.0	0.0	0.0	0.0	13.4
805	911830.47	5022803.24	106.50	0	N	A	83.7	7.2	0.0	0.0	0.0	69.7	11.4	-3.5	0.0	0.0	0.0	0.0	0.0	13.4
805	911830.47	5022803.24	106.50	0	E	A	-33.2	7.2	0.0	0.0	0.0	69.7	11.4	-3.5	0.0	0.0	0.0	0.0	0.0	-103.6

REPORT

ASSESSMENT OF DUST IMPACTS FROM AGGREGATE PITS ON MINTO COMMUNITIES CANADA AND MATTAMY HOMES PROPOSED DEVELOPMENTS

Minto and Mattamy Dust Study

Submitted to:

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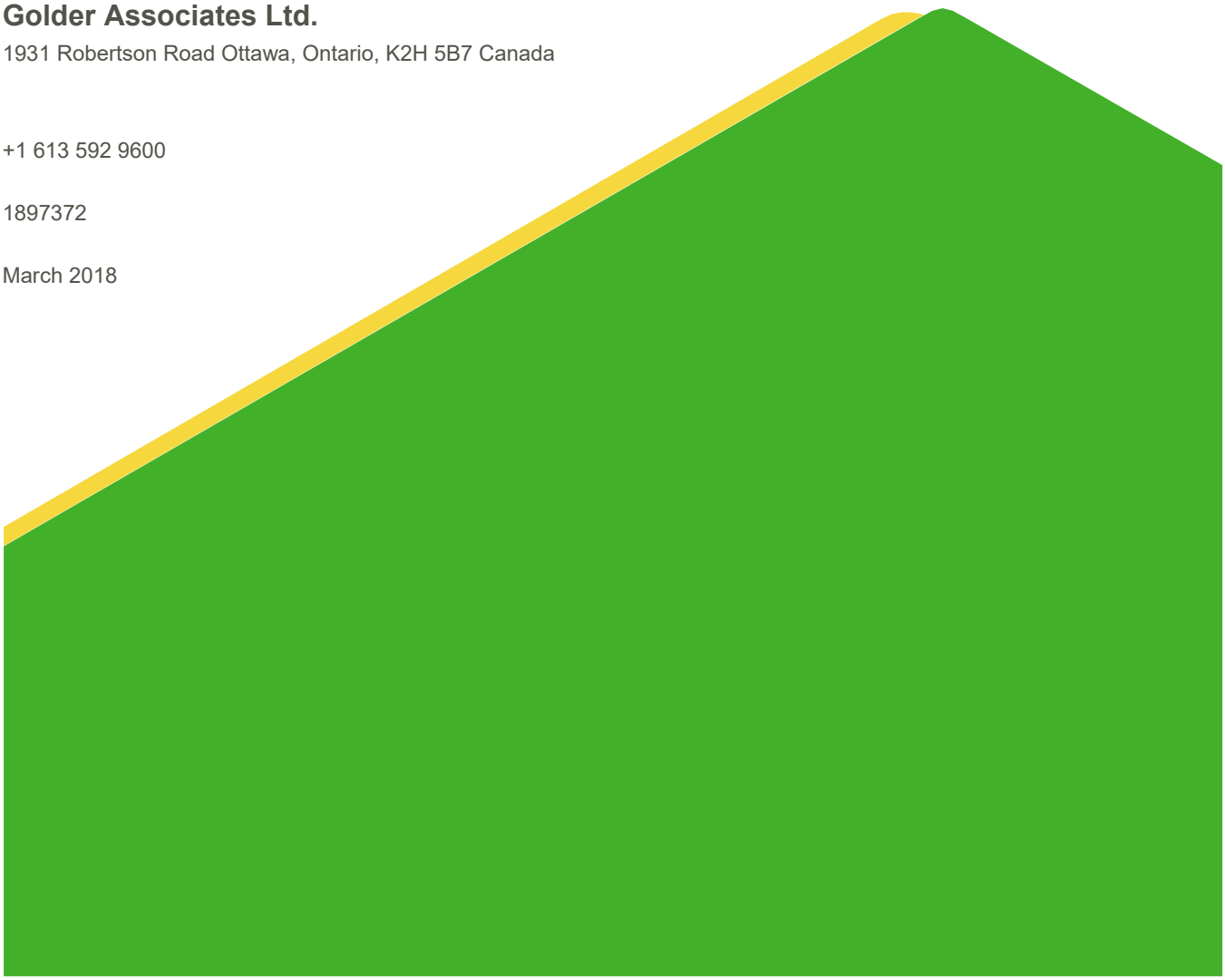
March 2018



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Executive Summary

Golder Associates Ltd. (Golder) was retained by Minto Communities Canada Inc. (Minto) and Mattamy Homes (Mattamy) to prepare a dust study (Dust Assessment) to assess potential impacts from aggregate pits located to the west and northwest of the proposed Minto and Mattamy residential subdivisions in the township of Nepean, Ottawa, Ontario.

The Dust Assessment supports a compatibility assessment under the Ontario Ministry of the Environment and Climate Change (MOECC) Publication D-6. The Dust Assessment was prepared based on the methodology and analysis procedure followed for a previous Dust Assessment completed for Mattamy (June 2013) for the same area. The Dust Assessment evaluates the impacts from the operation of the existing adjacent sand pits on the proposed Minto and Mattamy residential subdivision to the east, northeast and southeast of these sand pits.

The proposed Minto Subdivision will be located west of Greenbank Road on Lots 6 and 7 of Concession 3 in Ottawa, Ontario. The proposed Mattamy Subdivision will be located to the west of Greenbank Road on Lots 8 and 9 of Concession 3 in Ottawa, Ontario.

Both the Marcel Brazeau Pit and Scott Drummond Pit (the Pits) are located along the western boundary of the proposed Mattamy Subdivision and northwest of the proposed Minto Subdivision. The study is required in support of approval of the Subdivisions.

This Dust Assessment (March 2018) for the Minto and Mattamy Subdivisions includes the updated layout of the proposed residential subdivisions, grading for the proposed Subdivisions, and updated operating hours for the Brazeau Pit.

Based on the assessment conducted in accordance with the published MOECC guidance to obtain approval under the Environmental Protection Act (EPA) Section 9 for the operations of the Pits, there are no anticipated dust impacts on the proposed Minto and Mattamy Subdivisions.

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1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by Minto Communities Canada Inc. (Minto) and Mattamy Homes (Mattamy) to prepare a dust study (Dust Assessment) to assess potential impacts from aggregate pits located to the west and northwest of the proposed Minto and Mattamy residential subdivisions in the township of Nepean, Ottawa, Ontario. The Dust Assessment evaluates the impacts from the operation of the existing open pits (Marcel Brazeau Pit – 3089 Borrisokane Road and Scott Drummond Pit – 3717 Borrisokane Road) (the Pits) on the proposed Minto and Mattamy residential subdivisions to the east, northeast and southeast of the Pits.

The Mattamy Subdivision is proposed to be located to the west of Greenbank Road on Lots 8 and 9, Concession 3 in Ottawa, Ontario. The Minto Subdivision is proposed to be located west of Greenbank Road on Lots 6 and 7, Concession 3 in Ottawa, Ontario. Both Pits are located along the western boundary of the Mattamy Subdivision and northeast and southeast of the Minto Subdivision. This study Dust Assessment was prepared in support of a site plan approval of the Subdivisions.

Golder's analysis is based on a previous Golder Report "Dust Assessment, Proposed Subdivision Development, Parts of Lots 8 and 9, Concession 3, Ottawa, Ontario" dated June 2013 completed for Mattamy. Since the issuance of the June 2013 report, there have been various changes in the project design, as well as operations at the Pits. Specifically, this Dust Assessment includes the following:

- addition of the new proposed Minto Subdivision (including the existing Minto development known as Quinn's Pointe Stage 1)
- revised and expanded proposed Mattamy Subdivision area
- review and update (as required) the Pits operations to reflect current operations, including updated hours of operations and height of portable screen at the Brazeau Pit (obtained from Marcel Brazeau by Golder during a phone conversation on March 6, 2018)

2.0 OPERATIONS

The Pits are sand extraction pits, both of which operate under licenses from the Ontario Ministry of Natural Resources (MNR). The daily operations of the pits vary depending on the demand for specific products.

Both pits are licensed to extract below the water table; however, based on information provided by the operators, the costs associated with extraction below water would make this scenario unlikely.

Identification of potential air sources were originally completed during a site visit on June 22, 2010, and through subsequent information provided by the Pit operators in January 2013. Revisions to the dust emissions sources were completed based on the information obtained in March 2018 and are provided in the sections below.

Both Pits provided their current typical hours of operations as of March 2018; the Brazeau Pit operates 12 hours per day, whereas the Drummond Pit typically operates 10 hours per day.

2.1 Brazeau Pit – 3809 Borrisokane Road, Ottawa

The extraction and processing of the Brazeau Pit is proposed to move west, away from the proposed Mattamy and Minto Subdivisions towards Borrisokane Road. The current extraction is about 450 m east of the proposed Mattamy Subdivision property line at a depth down to the water table, which is approximately 10 to 11 m below existing grade. The Pit is permitted to extract below the water table; however, as per phone conversations with the Brazeau Pit, it is not anticipated that extraction will occur below the water table. This site typically operates between 6:00 AM and 6:00 PM. The following pieces of equipment are used onsite:

- Screen and conveyor system – three (3) screens and one (1) conveyor system are used on site. This system was not operational at the time of site visit. Site personnel informed Golder that this system is operated a maximum of twice a week based on demand.
- Loaders – four (4) 950 Caterpillar loaders are regularly used on site; however, occasionally a maximum of five (5) loaders are used.
- Shipping – during an hour, up to six (6) trucks could cross the site.
- Portable crusher – one (1) portable crusher may be used on site occasionally as required (on demand). There is no portable crusher on a regular day to day operation.

2.2 Drummond Pit – 3717 Borrisokane Road, Ottawa

The extraction and processing of the Drummond Pit is also proposed to move west, away from the proposed Mattamy and Minto Subdivisions towards Borrisokane Road. The current extraction is about 300 m east of the proposed Mattamy Subdivision property line at a depth down to the water table, which is approximately 10 to 11 m below the current grade. As with the Brazeau Pit, extraction is permitted below the water table. This site typically operates between 7:00 AM and 5:00 PM. Site personnel also indicated that the Pit has approximately five (5) additional years of operational life remaining. The following pieces of equipment are used on site:

- Excavator – one (1) Caterpillar excavator is used on site based on demand. Screen and Conveyor system - one (1) 628 Trommel screener and conveyor system is used on site, along with 2 small screens. This system was not operational at the time of site visit. Site personnel informed Golder that this system is operated a maximum of twice a week based on demand.
- Loaders and graders – one (1) CAT 966G loader, one (1) CAT 988 loader; one (1) CAT 950 loader, and one (1) CAT D6R grader could be used onsite.
- Shipping – a maximum of 200 truck loads are shipped daily. During 1-hour a maximum of 20 to 25 trucks could cross the site.

3.0 CRITERIA AND GUIDELINES

The Ontario Ministry of the Environment and Climate Change (MOECC) Publication D-6 is a guideline that is intended to apply when a change in land use is proposed to minimize the encroachment of sensitive land use upon industrial land use and vice versa. This guideline categorizes industrial facilities into three Classes. As per the D-6 Guideline, quarry and pits can be categorized as a Class II facility. A Class II industrial facility can be described as follows:

> *A place of business for medium scale processing and manufacturing with outdoor storage of wastes or materials (i.e., it has an open process) and/or there are periodic outputs of minor annoyance. There are occasional outputs of either point source or fugitive emissions for any of the following: noise, odour, dust and/or vibration, and low probability of fugitive emissions. Shift operations are permitted and there is frequent movement of products and/or heavy trucks during daytime hours.*

Specifically, the D-6 Guideline requires that fugitive air emission studies be carried out for sensitive development within 300 m of a Class II facility. The D-6 Guideline applies to all types of proposed, committed and/or existing industrial land uses which have the potential to produce point source and/or fugitive air emissions such as noise, vibration, odour, dust and others, either through normal operations, procedures, maintenance or storage activities, and/or from associated traffic/transportation.

Emissions of particulate matter are addressed through the *Environmental Protection Act* (EPA), in particular Section 9 and Regulation 419/05 (Air Pollution – Local Air Quality).

In addition, the MNR publication "*Mineral Aggregate Resource Reference Manual*", dated January 2001, suggests some mitigation options where potential conflicts are identified. These options include:

1) Identification of development restriction in the zone of influence – using compatibility analysis (i.e., as outlined in MOECC Publication D-6 above), specific building or activity restriction may be developed (e.g., no habitable buildings permitted within certain metres of a licensed site).

2) Lot relocation or redesign – where a subdivision is involved, lots can sometimes be relocated or reconfigured to reduce potential conflict. In the case of Subdivisions, the majority of the proposed residential development includes a set back from the Pits. An allowance for a road, a school and a community park has been provided in the lands between the Pits and residential development area.

3) Avoidance of truck traffic in road design – where options exist, access to public roads from a subdivision (or vice versa) should be directed to portions of the road system less likely to be used by trucks transporting aggregate materials. In the case of the Marcel Brazeau Pit and the Scott Drummond Pit, the products from both pits are shipped through Borrisokane Road, which is well away from the Subdivisions.

   - Working with owner of the mineral aggregate – to reduce the impact, the owner could redesign the phase schedule such that material close to the proposed development is removed first; modify internal operations to reduce dust generation; establish landscape buffers or berm as necessary. In the case of the Marcel Brazeau Pit and the Scott Drummond Pit, the extraction moves away from the Subdivisions as the resource located closest to the Subdivisions has already been removed.

   - Removal of aggregate prior to development – if conflicts exists, parties involved may discuss the possibility of removing aggregate at locations closer to development prior to development. In this case, the aggregate resource located closest to the Subdivisions has already been removed down to the water table.

The following sections discuss the relevant City of Ottawa and MOECC guidelines.

4.0 DUST ASSESSMENT

Golder conducted a general dust assessment to assess potential air quality impacts from the operations of the Brazeau and Drummond Pits on the proposed Minto and Mattamy Subdivisions. For the purposes of this report, dust is the collective term used for particulate matter. For air quality assessments in Ontario related to fugitive dust, particulate matter is typically categorized into the following three categories:

- total suspended particulate (TSP) – particles nominally less than 44 µm in diameter
- particles nominally smaller than 10 µm in diameter (PM_{10})
- particles nominally smaller than 2.5 µm in diameter ($PM_{2.5}$)

Particulate matter is typically associated with airborne dust from vehicles travelling on paved roads and unpaved roads/haul routes, as well as material loading and unloading activities, crushing, screening and wind erosion of storage piles.

In Ontario, under the guidelines to apply for a Section 9 approval, limits and guidelines for regulating air quality are established under O.Reg. 419/05 (Air Pollution – Local Air Quality). These include standards, guidelines and ambient air quality criteria (AAQC) for various compounds. The AAQC are commonly used in assessments of general air quality in a community, and the potential for causing an adverse effect, whereas the standards and guidelines are used to assess specific impacts of an individual facility for compliance and permitting requirements. The MOECC does not have limits for PM_{10} and $PM_{2.5}$, therefore these have been excluded from the evaluation. Fugitive dust from pit operations excluding combustion sources are primarily emitted as TSP.

This dust assessment included the following steps:

- development of air inventory for all relevant sources at each of the Pits
- prediction of air quality impacts of the combined emissions from the Pits on the proposed Minto and Mattamy Subdivisions
- comparison of predicted concentrations of particulate matter to its standard as outlined in O.Reg. 419/05

Respirable crystalline silica concentrations were not assessed as a part of this Dust Assessment as the percentage of silica in the dust is not available for the Pits. The Dust Assessment did not include the Pits' mobile or road traffic sources of emission as these are excluded from O.Reg. 419/05. In accordance with MOECC procedures, exclusion of the road sources is acceptable as long as the aggregate facilities have implemented a fugitive dust Best Management Practices (BMP) Plan that includes the road emissions. The operators of the Pits have confirmed that a BMP Plan is in place at each of the Pits. In the case of the Subdivisions, the extraction from both the Pits progresses away from the proposed Mattamy and Minto Subdivisions; therefore, the length of the haul routes is expected to decrease over time, which is expected to result in lower impact from road traffic on the Subdivisions. The air emission sources included in the assessment for each of the Pits are summarized in Table 1.

Table 1: Summary of Air Emission Sources at the Pits

Equipment	Brazeau Pit	Drummond Pit
Storage Piles	Yes	Yes
Screeners	Yes	Yes
Vehicle Movements – Shipping	N/A	N/A
Material Transfers	Yes	Yes

N/A – Not applicable, not subject to Section 9 permitting requirements.

5.0 METHODOLOGY

For the purpose of this assessment, information collected from pit operators on emission sources was used to estimate emissions from the site. Emission rates are based on maximum predicted production rates from the site. Operations vary by hour of day and month of year, thus the use of maximum production rates is a conservative approach in assessing the impact of the Pits. Table 2 lists the estimated daily emission rates for each of the Pits used for the Dust Assessment.

Table 2: Existing Daily Emissions at the Pits

Pit	Maximum Daily Emission Rate [g/s]	Percent of Total
Brazeau	0.59	52%
Drummond	0.55	48%

The operation of the Pits will gradually move westward and, therefore, further away from the proposed Minto and Mattamy Subdivision. To maintain conservatism, the Pits operations were modelled based on current location and, therefore, are expected to overestimate impact on the proposed Minto and Mattamy Subdivisions. Further, the area where the Pits operations take place will become deeper which would reduce impact on the proposed Minto and Mattamy Subdivisions. The reduced grading is an increase to grade differential between the bottom of the existing Pits and the surrounding proposed Minto and Mattamy Subdivisions. This reduced grading was not included in the modelling to maintain conservatism.

The Dust Assessment was modelled using the AERMOD dispersion model using a five (5) year meteorological crops data set provided by the MOECC for the Eastern Region (Ottawa Regional Airport and Maniwaki). The dust sources associated with the Pits were modelled using a combination of area and volume sources. The model was run using uniform Cartesian grid encompassing the Pits and the proposed Minto and Mattamy Subdivisions.

6.0 RESULTS AND DISCUSSION

The proposed Minto and Mattamy Subdivisions plan indicates that the lands adjacent to the Scott Drummond Pit will be used for a secondary school and part of the lands adjacent to the Marcel Brazeau Pit will be used for residential and commercial land uses. Figure 1 presents the Minto and Mattamy Draft Subdivision Plan current as of March 2018.

The maximum predicted 24-hour concentration of TSP for the combined pit operations is provided in Table 3 and presented on Figure 2 as the Point of Impingement (POI). The predicted value is **below** the MOECC Schedule 3 standard of 120 µg/m^3 at all receptor locations in the proposed Subdivisions, indicating that the Pits can operate within the limit for TSP as set by the MOECC.

Table 3: Maximum Predicted Concentrations for Dust

Pit	Maximum Predicted TSP Concentration [µg/m³]	MOECC Limit [µg/m³]	Percent of Limit	Location of Maximum
Combined Pit Operations	27.1	120	22.6%	North of the Pits

In addition to evaluating the impact of operations at the Pits, existing background air quality conditions were considered. There is no current ambient monitoring to determine background concentration levels for TSP in Ontario. All ambient monitoring is limited to the $PM_{2.5}$ size fraction. A conservative estimate of the background TSP concentration was evaluated from the $PM_{2.5}$ measurements. The closest air monitoring station to the site is Ottawa Central Station (45°22'57.1 N, 75°42'51.1 W). The maximum predicted impact of the Pits operations including background air quality is presented in Table 4.

Table 4: Fugitive Dust Levels (24-hr average concentrations) Including Background

Pit	Maximum Predicted TSP Concentration [µg/m³]	Background TSP Concentration [µg/m³]	Operations + Background [µg/m³]	Percent of Limit
Combined Pit Operations	27.1	29.3*	56.4	47.0%

* 90th percentile $PM_{2.5}$ concentration was converted to TSP value by assuming that PM_{10} is 50% of TSP and $PM_{2.5}$ is 50% of PM_{10}; 90th percentile $PM_{2.5}$ concentration for 2015 was obtained from the MOECC's publication Air Quality in Ontario – 2015 Report[1].

7.0 CONCLUSIONS AND LIMITATIONS

7.1 Conclusions

Golder was retained by Minto and Mattamy to prepare a dust study (Dust Assessment) to assess potential impacts from aggregate pits located to the west and northwest of the proposed Minto and Mattamy residential subdivisions.

Based on the assessment of the Pits operation conducted in accordance with published MOECC guidance to obtain approval under the Section 9 of the EPA, the estimated dust emissions were below the Schedule 3 TSP limit at the proposed Subdivisions. Provided the Pits continue to operate in a similar manner and implement their BMP Plan to minimize dust migration off-site, the dust levels from future Pits operations are unlikely to reach the MOECC limit for TSP at the proposed residential subdivisions. The concentrations from the Pits will decrease as the Pits operations continue to move further away from the Minto and Mattamy residential subdivisions.

The proposed Minto and Mattamy Subdivisions would be considered as compatible land uses based on the guidance of MOECC Publication D-6, provided that the Pits continue to implement their fugitive dust BMP Plan.

[1] MOECC. (2017). Air Quality in Ontario – 2015 Report. Obtained from: http://www.airqualityontario.com/downloads/AirQualityInOntarioReportAndAppendix2015.pdf

7.2 Limitations

As indicated in the report, the information related to the Pit operations were obtained from the Pit operators and their onsite personnel during a site visit on June 22, 2010, conversations and email confirmations from the pit owners in June 2013, and updated operations information obtained in March 2018 based on conversation or email confirmation from the pit owners. Golder has acted in good faith and used the information collected and accepts no responsibility for any deficiency, misstatements, or inaccuracies contained in this report as a result of omissions, misinterpretations or fraudulent acts of the persons involved.

Respirable crystalline silica concentrations were not assessed as a part of this study as the percentage of silica in the dust is not available for this site.

Golder prepared this dust study using its commercially reasonable best efforts consistent with the level and skill ordinarily exercised by members of the profession currently practicing under similar conditions, while ensuring that the study was prepared in general conformance with regulatory and guideline requirements.

This report was prepared for the exclusive use of Minto and Mattamy. Persons other than Minto and/or Mattamy using this report or observations, or conclusions stated within, may do so at their own discretion.

Signature Page

We trust this report meets with your current requirements. If you have any questions regarding this report, please contact the undersigned.

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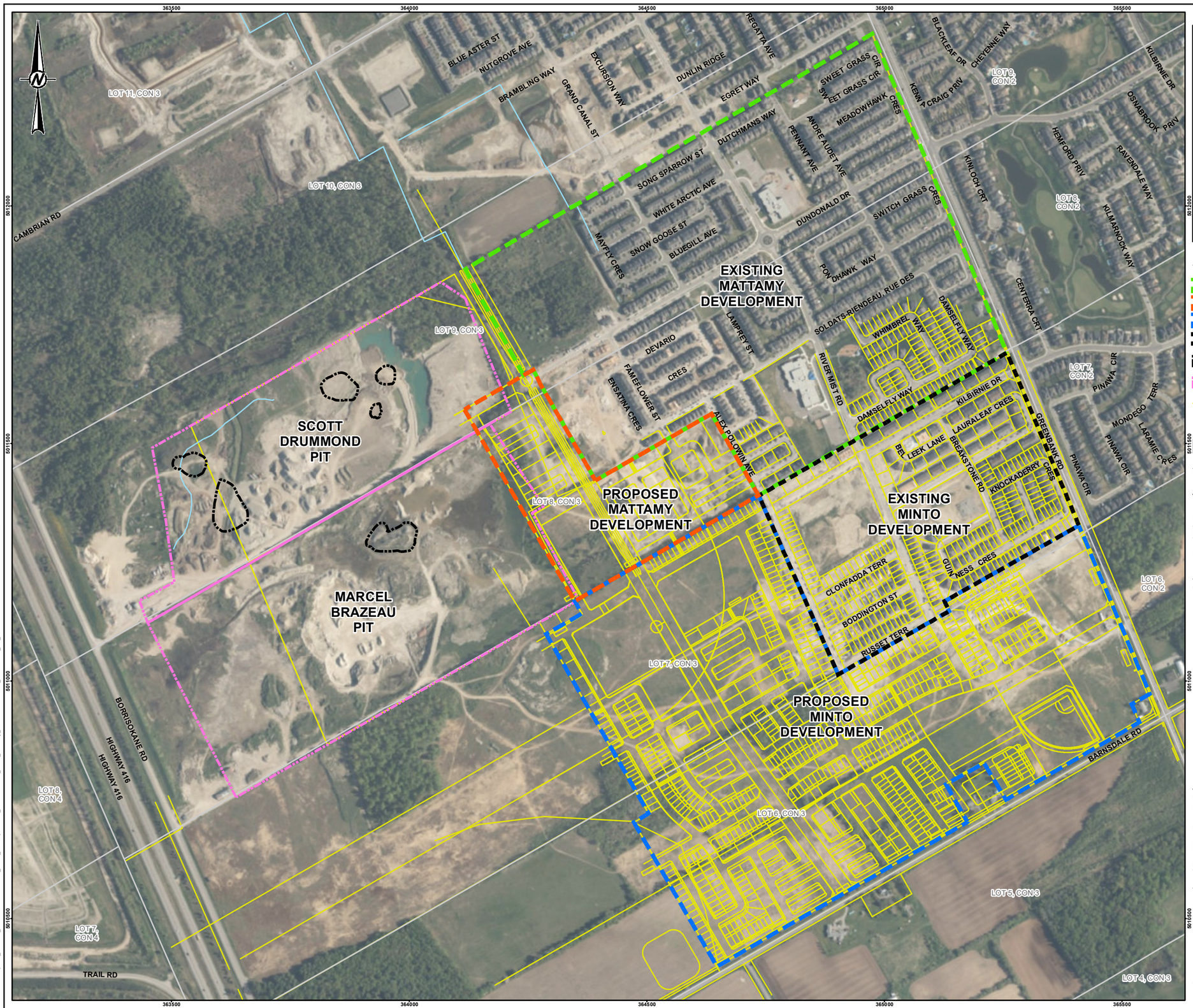
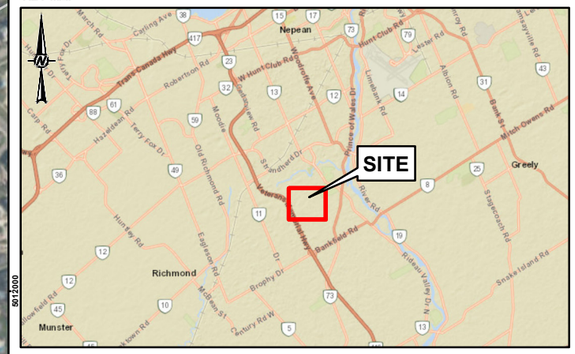
KL/CST/md
https://golderassociates.sharepoint.com/sites/1897372/deliverables/report/final/1897372 dust assessment final report_27mar2018.docx



KEY MAP



SCALE 1:400,000

LEGEND

- EXISTING MATTAMY DEVELOPMENT
- PROPOSED MATTAMY DEVELOPMENT
- PROPOSED MINTO DEVELOPMENT
- EXISTING MINTO DEVELOPMENT
- STOCK PILE
- PIT LICENSED BOUNDARY (BASED ON AVAILABLE INFORMATION)
- SUBDIVISION PLAN
- WATERCOURSE
- LOT AND CONCESSION

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. DEVELOPMENT PLAN PROVIDED BY CLIENT IN CAD FORMAT, "2018-02-20_BARRHAVEN SOUTH_DEMONSTATION PLAN_V3.DWG", DATED 2018-02-20; AND "161613795-131-QUINNSPOINTEPH2_D2_C3D.DWG"
2. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2016
3. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), MAPMYINDIA, NGCC, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
4. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 80 160 320

1:8,000 METRES

CLIENT

MINTO COMMUNITIES CANADA AND MATTAMY HOMES

PROJECT

MINTO AND MATTAMY DUST STUDY

TITLE

AREA PLAN SHOWING DEVELOPMENTS AND PIT LOCATIONS

CONSULTANT

GOLDER

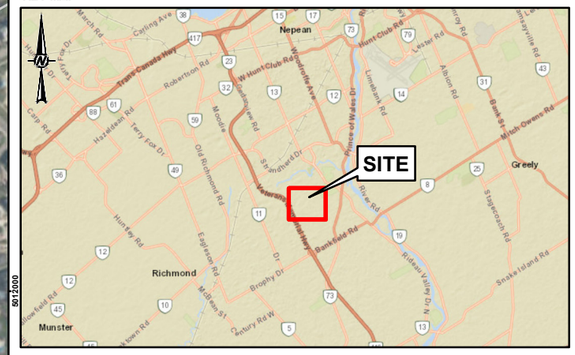
YYYY-MM-DD	2018-03-27
DESIGNED	----
PREPARED	BR
REVIEWED	KL
APPROVED	CST

PROJECT NO.	CONTROL	REV.	FIGURE
1897372	0001	0	1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm

Path: N:\Active\Spatial_IM\Minto_Communities\Barrhaven_South_Development\99_PROJ\1897372_Minto_Mattamy_DustAssessment\40_PROD\0001_RN_DustAssessment\1897372-0001-RN-0001.mxd

KEY MAP



SCALE 1:400,000

LEGEND

- POINT OF IMPINGEMENT (POI)

MODELLING SOURCES (SHOWN IN THEIR CURRENT LOCATION)

- VOLUME SOURCES
- AREA SOURCES

TOTAL SUSPENDED PARTICULATE CONCENTRATION CONTOUR (µg/m³)

- <10
- 10 - 20
- 20 - 30
- EXISTING MATTAMY DEVELOPMENT
- PROPOSED MATTAMY DEVELOPMENT
- PROPOSED MINTO DEVELOPMENT
- EXISTING MINTO DEVELOPMENT
- STOCK PILE
- PIT LICENSED BOUNDARY (BASED ON AVAILABLE INFORMATION)
- LOT AND CONCESSION

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2016
2. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), MAPMYINDIA, NGCC, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 80 160 320
1:8,000 METRES

CLIENT
MINTO COMMUNITIES CANADA AND MATTAMY HOMES

PROJECT
MINTO AND MATTAMY DUST STUDY

TITLE
MAXIMUM 24-HOUR TOTAL SUSPENDED PARTICULATE (TSP) CONCENTRATION

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-27
DESIGNED	----
PREPARED	BR
REVIEWED	KL
APPROVED	CST

PROJECT NO.	CONTROL	REV.	FIGURE
1897372	0001	0	**2**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm

Path: N:\Active\Spatial_IM\Minto_Communities\Barrhaven_South_Development\99_PRO\1897372_Minto_Mattamy_DustAssessment\40_PRO\01\0001_RN_DustAssessment\1897372-0001-RN-0002.mxd

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