

Dust & Silica: What You Need To Know

Meridian Brick's Aldershot East project will move forward safely and healthily for neighbours nearby.

consulting preparing air quality assessments for Environmental Compliance Approvals (ECAs) and air quality studies.

That's the preliminary conclusion of dust, silica and human health studies conducted as Meridian Brick prepares to open up the East cell of the Aldershot Quarry. Two consulting firms, Pinchin and Intrinsic, were hired to conduct the assessments, and both have found levels of dust and silica to fall below regulatory benchmarks, even under very conservative assumptions.

Studying the Centre and East cells at the Aldershot Quarry, Madan modeled dustfall and particulate levels based on three time periods: A five-year scenario, a 10-year scenario and a 25-year scenario. Even with estimates based on maximum production for every hour of operation during the year – an unlikely situation in the real world – estimates came in below guidelines set by the Province.

"The preliminary results are that the cumulative health risks to residents at all receptor locations are negligible," said Glenn Ferguson, Senior Environmental Health Scientist with Intrinsic and Adjunct Professor in the School for Public Health and Health Systems and lecturer on Environmental Toxicology at the University of Waterloo, who conducted the human health risk assessment.

Estimated dustfall was modeled not just within the quarry and Westhaven Drive, but throughout the Tyandaga subdivision. At no point in the model did dustfall exceed the guidelines.

Those numbers informed the studies carried out by Ferguson, which predicted particle concentrations at 35 different locations, not only modeling predicted dust from the East quarry, but also including background dust such as existing air pollution. He modeled both short-term and long-term exposure to dust and silica.

In both cases, dust and silica exposure fell below both acute and chronic benchmarks.



The study found "negligible" health risks expected for individuals in the surrounding community relating to dust and silica.

"It's important to realize exposure to high concentrations of silica occurs primarily in confined workplaces," Ferguson explained. Not only that, the minimum standards for silica exposure include a ten-fold safety factor. "You'd need significant and ongoing exceedances of that benchmark in order for serious health effects to occur," he said – and the studies show that those overages will not happen.

All dust modeling was based on an extraction rate of 400,000 tonnes of shale per year – a level Meridian Brick likely will never reach. Presently, Meridian Brick extracts 250,000 tonnes per year.

Progressive Rehabilitation

The Aldershot East project won't have to wait for the end of its life to be rehabilitated: It along with the Centre Quarry will be reforested and restored as quarrying goes on.

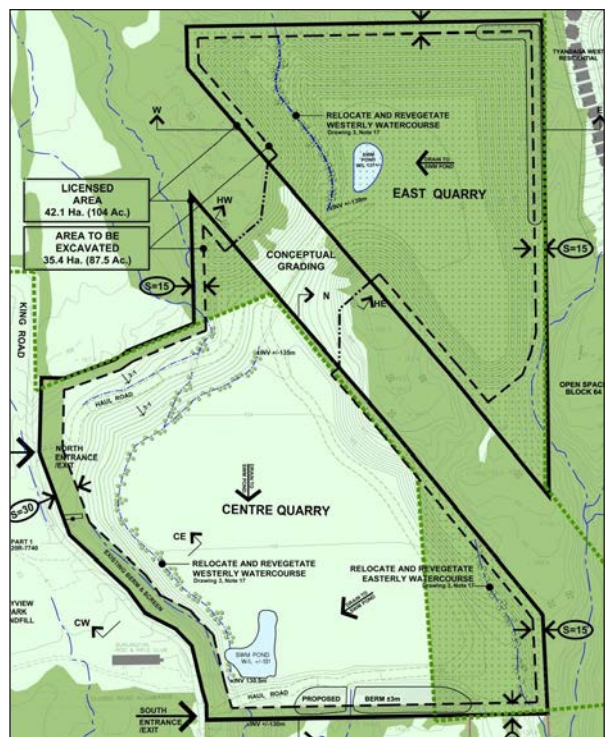
The plan will see the East cell become 100% forested again. A mix of White Pine, Red Oak, White Oak, Bur Oak, Sugar Maple, Basswood, Shagbark Hickory, Cottonwood, and Sycamore will be planted on the site.

The Province of Ontario's Greenbelt Plan states that "rehabilitated area will be maximized and disturbed area minimized on an ongoing basis during the life-cycle of an operation." That means Meridian Brick will only excavate a portion of the East cell at any given time. Not only that, Meridian has a plan to progressively rehabilitate the site. As new areas of the quarry are excavated and completed, those areas will be restored and reforested for the future.

Overall, Meridian's reforestation plan for the Centre and East quarry covers 17.9 hectares of land, with more than 29,000 trees planted.

Meridian incorporated the Greenbelt Plan's rehabilitation requirements into the new Site Plan amendment for the Aldershot Quarry system; the plan was approved in 2010. The rehabilitation plan reflects how seriously Meridian takes its commitment for environmental stewardship.

Meridian believes it is important to make natural resources available to the community and to Canada, but also in preserving our natural heritage. By rehabilitating the East site as we go, that natural heritage can be respected and restored.



Protecting Species At Risk



Meridian Brick's team of ecologists explored the East site in several surveys.

Meridian Brick is taking strong action to protect at-risk species on or around the Aldershot East property.

Some plant species at risk, including the American Columbo and Eastern Flowering Dogwood, have been identified in the area. So has a butterfly species at risk, the Mottled Duskywing Butterfly, which uses the New Jersey Tea plant as a host for its pupae.

"There are accepted practices for protecting these species," said Bob Long of Long Environmental when updating neighbours about Species at Risk at the recent community meeting.

The New Jersey Tea plants and the Eastern Flowering Dogwood can both be safely transplanted to safe locations, well clear of the excavation. Meridian Brick intends to relocate both species prior to the excavation. The New Jersey Tea will be transplanted to suitable areas on site before tree clearing begins, while the Dogwoods will be replanted in appropriate areas. Some existing Dogwoods will be protected within the 15-metre-wide setback between adjacent properties and the quarry.

Meridian plans to preserve the American Columbo by leaving it in place. A 60-metre buffer will be left around the Columbo growing on the site, ensuring that it remains in place into the future.

These three species are the only species at risk which have been identified in the East cell of the Aldershot Quarry. Meridian Brick's operations are fully compliant with the Endangered Species Act, and the mitigation plan should be completed this year.

Meridian Brick is also demonstrating due diligence by conducting surveys to test for the presence of certain salamander species, following reports of at-risk salamanders in the area. Meridian Brick takes any report of at-risk species in the area very seriously, recognizing the importance of preserving the environment for future generations.

Responding to the reports from neighbours respecting salamander species, Meridian Brick enlisted ecologists to carry out detailed salamander surveys. The ecologists, including recognized experts in Ontario salamander species, were in the field in 2016 and 2017, exploring the watershed areas where at-risk salamander species would be most likely to congregate. However, thus far, no at-risk salamander species have been identified at the East cell or the adjacent City of Burlington open-space property.

The ecological consultants will be in the field through the end of September. The team is interested in receiving information on salamanders from area residents, in order to ensure the surveys throughout 2017 are as thorough as possible.

ALDERSHOT QUARRY REPORT

ISSUE 1 - SPRING 2017

Public Engagement: May 25 Information Session



Demonstrating our commitment to keeping the community informed about the Aldershot East project, Meridian Brick welcomed neighbours to ask questions of scientific experts conducting studies on the site and to hear updates from Meridian Brick at a well-attended May 25 public meeting.

"Meridian Brick has demonstrated that we're being very cooperative and listening to your concerns," said Rob Campolo, Area Operations Manager, who oversees Meridian Brick's operations in Ontario and Quebec.

While about 100 people were expected to attend the Thursday evening meeting at the Crossroads Christian Communications building near the Tyandaga neighbourhood, instead about 170 turned up to hear information from subject matter experts and ask questions. Meridian Brick thanks those guests who assisted with moving chairs from the original venue to the large open hall outside, where everyone could be accommodated.

Meridian Brick has a long history in the community, with many of its employees working for the company for twenty years or longer. With three brick plants and four quarries in the city, Meridian Brick hopes to continue making brick in Burlington for years into the future. The Aldershot East excavation project will make that hope reality by providing years of new shale for Meridian Brick's Aldershot and Burlington 2 plants.

In that new, larger venue, residents asked a number of important questions and voiced strong views as part of the open exchange and dialogue.

"We need those resources to continue operating the plants," Campolo told the audience. "This is very important to the future of the company, it's important to the community, our families and it's important to local vendors."

Meridian Brick also announced a new setback plan, which will keep excavation further from residents' homes. Excavation of the north corner of the Aldershot East site – the corner closest to the Tyandaga West neighbourhood – will not take place until late in the site's life, in at least 15 to 20 years. This setback will ensure a fully treed interim buffer zone, to be in place for at least 15 years, of 90 to 150 metres.

Attendees joined in a two-and-a-half-hour session in which expert consultants in a variety of fields provided information on the Aldershot East project.

A dust and silica study, presented by Ajay Madan of consulting firm Pinchin, modeled the amount of dust in the air generated over five years, six to

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The Meridian Brick Family

Brickmaking in Burlington has run in Rob Campolo's blood for decades.

23 years after joining Meridian Brick's team, making bricks here in Burlington, today Rob serves as Area Operations Manager, responsible for the company's operations in both Ontario and Quebec.

That commitment has been handed down through the family: Rob's father, Tony, worked for Meridian for 44 years. Like a number of Meridian Brick employees, Rob is a second-generation brickmaker.

"We love what we do and going to work everyday. We're hoping to be able to continue to make bricks here in Burlington well into the future," Campolo says.

That's an attitude many in the Meridian Brick family share. They're members of a workforce where the average term of service is approximately 20 years – and many have served with Meridian Brick for even longer.



About This Newsletter & Website

Being a good neighbour means doing our part to keep you informed about what's happening with Aldershot East, the third phase of the Aldershot Quarry project.

Finalized studies will come out and new meetings will be held as we do our best to listen to residents' concerns and opinions.

Meridian Brick has launched this newsletter and new website (aldershotquarry.ca) to collect and communicate as much information as possible on the project directly to our neighbours. Here, you'll find updates on the project, information on a wide range of studies, and facts about both the project and Meridian Brick.

That's why we feel it's important to issue this newsletter and create a website with current information. We've heard from many of our neighbours over the past several months. We want to give all of our neighbours the opportunity to hear the answers to their questions, direct from us. You'll learn about the studies addressing elements of the project. You'll learn about the history of the Aldershot Quarry and the steps Meridian has taken to develop the property in harmony with the community. And you'll learn about the history of Meridian in Burlington and the stories of the people who have been part of the Meridian Brick family, many of them for decades.

When the Tyandaga West subdivision was first proposed, Meridian Brick – then Canada Brick – agreed to implement various controls to ensure that the subdivision would be compatible with the existing quarry. We're standing by that commitment to be a good neighbour, and we're doing our part to ensure the East cell project proceeds with a minimum of impact for neighbours and residents.

We hope you will find this newsletter informative and useful, and we hope you will remain engaged with the Aldershot East project going forward.

As this project moves along, Meridian will continue to engage with residents about the



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Meridian Brick in Burlington

Meridian Brick, Canada's largest manufacturer of clay brick, is preparing to open the eastern section of its Aldershot Quarry complex.

This project will help to sustain and support existing investments in brickmaking in Burlington as Meridian opens up this section of the quarry, the third and final of three quarry cells in Aldershot. The project is expected to support upwards of 70 existing manufacturing jobs. Across Meridian's operations, the company employs 164 people and has an investment of \$150 million in the city.

Today, Meridian Brick manufactures 55% of Canada's entire output of clay brick. About 45% of that Canadian clay brick is manufactured at Meridian's Burlington facilities.

Opening up the East cell of the Aldershot Quarry is vital to the continued operation of Meridian's Bur-

lington 2 and Aldershot plants. Currently, Meridian extracts shale for clay brick from two other cells in the same quarry complex - the West Cell and the Centre Cell, also part of the Aldershot Quarry. However, the West Cell has just three to five years of shale left, while the Centre Cell has six to eight years left. The East cell site is the largest reserve of useful shale left in the quarry: When Meridian's Aldershot plant was built, the East cell site was estimated to hold 38% of the entire quarry's supply of Queenston shale.

In the years since the quarry was licensed in 1972, the city of Burlington has grown up around the quarry, and Westhaven Drive in the Tyandaga neighbourhood now comes close to the East part of the quarry. During the planning stages in the late 1990s, Meridian took part in studies to ensure the quarry and the subdivision could fit together compatibly, side by side.

Now, as Meridian plans to open the East site, the company is revisiting many of those studies - and conducting new ones as pre-excitation due diligence - to assure residents and demonstrate our respect for the nearby neighbourhood and those living within it. Those studies include: Dust modeling; Air Quality & Human Health Assessment; Species at Risk - Mitigation Plan; Archaeological Study; and a Noise Control Study.

The recent public meeting - as well as this newsletter, our new aldershotquarry.ca website, a number of face-to-face meetings with neighbours, ongoing engagement with regulators and elected officials at all levels, and a prior public meeting in late 2015 - form part of Meridian's effort to maintain an open line of communication with all those interested in this important project.

Story of the Quarry

The Aldershot Quarry has been around for a long time. In fact, it has been here for almost 90 years. Over time, Burlington has expanded and grown up around the quarry.

This has been a fully licensed quarry for more than 40 years. Meridian Brick purchased the Aldershot Quarry in 1990. In 2010, a revised Site Plan was approved by the Ministry of Natural Resources and Forestry to meet Provincial standards. The Aldershot Quarry is fully compliant with the Aggregate Resources Act, the Endangered Species Act and the Greenbelt Plan.

In 1990, Meridian (then Canada Brick) acquired the Aldershot Quarry with the intention of using the site's Queenston shale to supply a new, \$60-million Aldershot brick plant. The company broke ground on the Aldershot brick plant in 1999. The quarry was divided into three cells - West, Centre and East, with East set to be developed last, as the third phase of the project.

In 1995, a few years after Meridian bought the quarry, the Tyandaga West subdivision was proposed. Meridian agreed to implement certain controls recommended by the Province of Ontario to ensure the new subdivision would be compatible with the quarry. In 1999, the subdivision was registered and construction of homes began.

About 38% of the existing shale reserves at the time of the Aldershot brick plant's opening in 2000 were located in the East cell of the quarry. Now, 17 years later, the West and Centre cells of the Quarry are almost depleted. Meridian Brick needs to develop Aldershot East to keep the Aldershot and Burlington 2 brick plants operating.

As of 2017, Meridian manufactures almost half of Canada's supply of clay brick in Burlington. With the Queenston shale from the East site, Meridian's Aldershot and Burlington 2 plants can continue to supply Canada with high-quality brick made right here in Burlington for an estimated 25 years.



This map illustrates Meridian Brick's Aldershot Quarry complex in Burlington. Orange boundaries indicate the three elements of the quarry: Aldershot West, Aldershot Centre and Aldershot East. Currently, Aldershot West and Aldershot Centre are almost depleted, and most of the remaining Queenston shale in the quarry complex is located in Aldershot East.

COMMUNITY MEETING ...CONT'D FROM FRONT

ten years, and 16 to 25 years. At all locations the study modeled, concentrations of dust were found to be below Provincial benchmarks. And a health assessment by Glenn Ferguson of Intrinsic, a member of the Ontario Ministry of Environment and Climate Change's Toxicity Reference Value Expert Review Panel, found that the health effects caused by the East project will be "negligible."

Madan said, "Anywhere it was applicable, we would take the most conservative assumptions. Our goal was that this study was a worst-case scenario." Ultimately, even modeling for that worst-case scenario, dust, silica and health studies all showed that there will be minimal impact from the East development.

Residents also heard about Meridian Brick's plans to preserve species at risk, including the Mottled Duskywing Butterfly, Eastern Flowering Dogwood and American Colombero, as well as Meridian Brick's ongoing survey of the quarry site for salamanders. To date, studies have found no salamander species at risk on the quarry site. Meridian Brick continues to work with its team along with Conservation Halton to follow up reports of salamander species at risk in the area.

Lastly, Hazem Gidamy of SS Wilson Associates Consulting Engineers presented noise study findings, to ensure the Quarry project can proceed in a manner that is within regulatory limits and remains compatible with the neighbours. Throughout the evening, residents had the opportunity to present questions during three question-and-answer sessions. More than forty questions were taken, and Meridian Brick offered comment cards to attendees to give the opportunity to have their questions answered at a later time.

Another meeting will be held in the fall of 2017. Residents will be appraised of the date, time and location of the meeting as soon as possible. Meridian Brick thanks Crossroads Christian Communications for providing the venue for May's event, and for their flexibility in accommodating an overflow crowd.

Meridian Brick also thanks all residents, neighbours and citizens who came out and engaged in the discussions. We hope to continue the dialogue with residents going forward and look forward to sharing information with the community again in the months ahead.

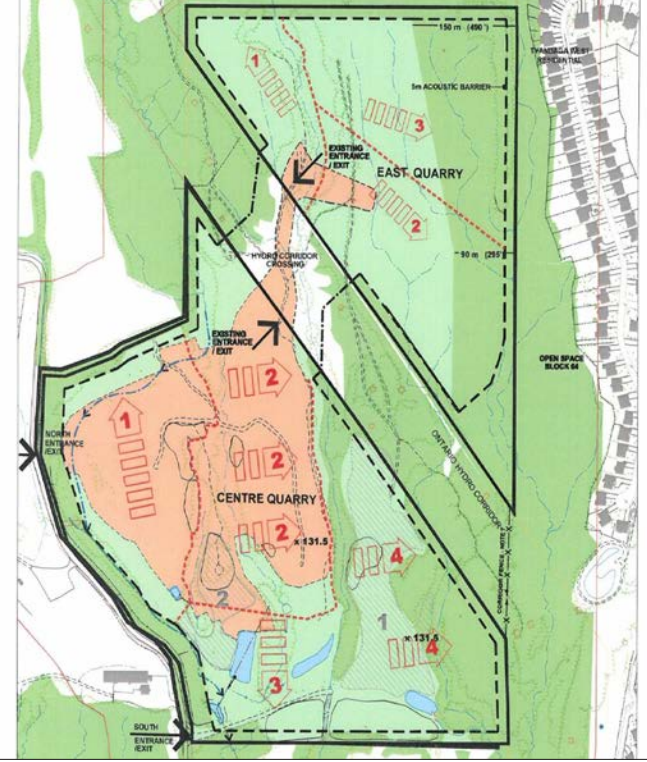
Phasing Strategy: Respect for the Community

Meridian has developed a phasing plan to keep excavation work three to four times further from nearby neighbourhoods for at least the next decade and a half.

The northern segment of the East cell comes closest to nearby homes on Westhaven Drive. However, Meridian's new phasing strategy will ensure that the north section will be left unexcavated until late in the East cell's life.

Along the existing earth berm, the 2010 Site Plan provides a 39-metre setback from the quarry boundary to the limit of shale excavation. This is substantially wider than the regulated excavation setback.

Meridian's new phasing strategy includes a fully treed interim buffer zone, to be in place for at least 15 years,



of 90 to 150 metres. East of the quarry boundary, the City's open space zone is from 15 to 145 meters wide. The combined width of Meridian's interim buffer and the City's open space varies from 131 at the south end to 165 meters at the north limit of the interim buffer from the neighbours' rear property lines.

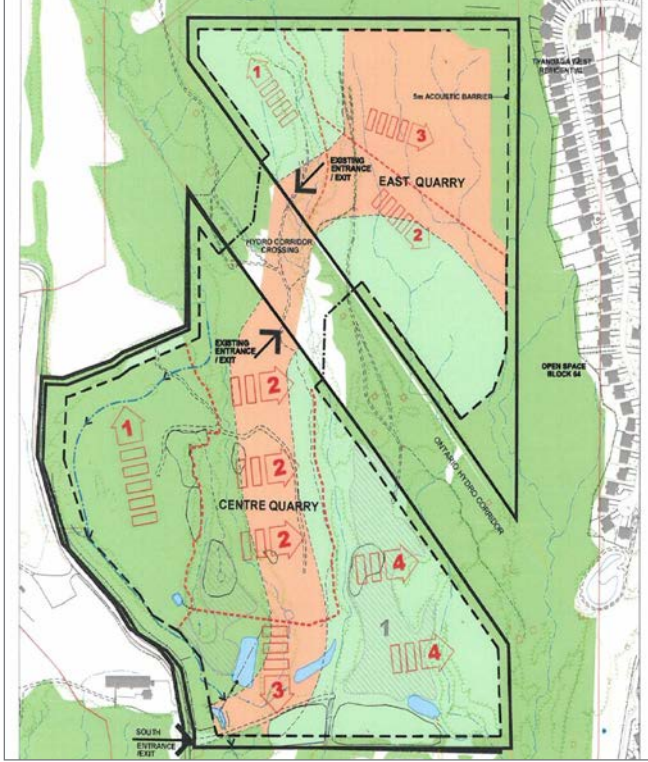
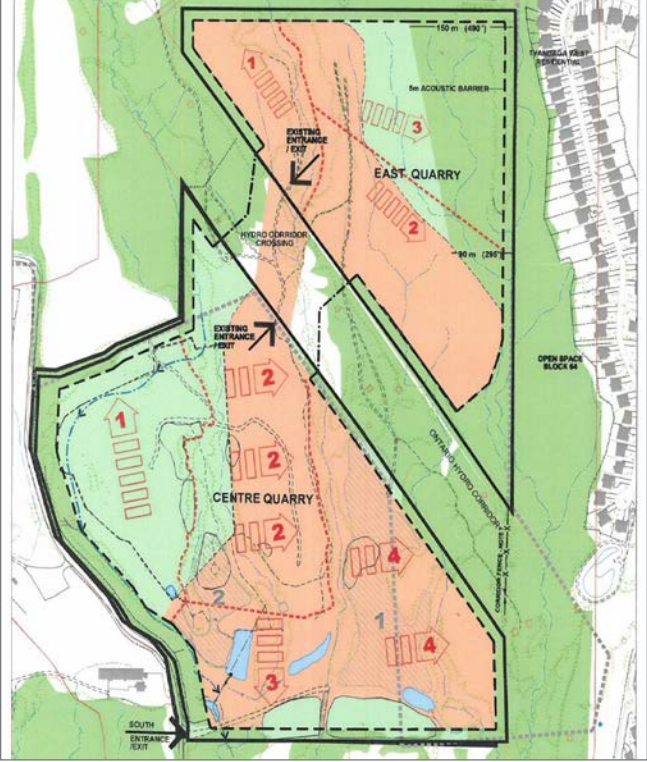
This change was made acknowledging the questions our neighbours had about the East cell excavation operations and how close work would come to fencelines. Meridian developed this phasing strategy to ensure that operations in the East cell take place respectfully and compatibly.

For the first 15 years, the fully-treed buffer in the north corner will remain between Meridian Brick's fenceline and the quarry. As Meridian Brick progresses into the quarry, the trees that are not part of the

buffer will be removed over the first five years as required, and re-planted progressively as the project moves forward until the site is eventually restored to a fully forested landscape.

Only in about 15 to 20 years will Meridian begin to excavate the final, northern corner of the East cell, as work in the Centre section of the quarry complex begins to wind down and rehabilitation begins in earnest. In this third phase, a buffer of 54 to 56 metres from the shale excavation to neighbours' fencelines will remain in place.

No matter what phase the project is in, Meridian will excavate only during the daytime hours, when most people are at work or at school, and will continue to implement strict controls to ensure our operations respect the neighbourhood.



The three phases of the Meridian Brick Aldershot East project. Left: The first phase of the project, to take place over the first five years, with buff indicating active excavations and pale green indicating areas where the trees will be removed. Middle: The second phase of the excavation, estimated from 5 to 15 years. Right: The final phase of the project, to take place about 15 years from the start of the project. Visit our website at www.aldershotquarry.ca and view our Community Presentation, under the Resources section, for closer looks at these and other diagrams.

Mitigating Noise

Complying with the Province's Stringent Noise Standards

Meridian Brick has made plans to ensure that all work at the Aldershot East site complies with Ontario's tough, stringent limits on how much noise companies can make.

The Ministry of the Environment in Ontario has stiff standards for sound and vibration levels. In fact, Hazem Gidamy of S.S. Wilson Consulting Engineers says they're virtually the toughest in North America.

When Gidamy first studied the Aldershot Quarry in the late 1990s, he concluded that the proposed neighbourhood could be compatible with the quarry operations over the long term.

Now, Gidamy has been retained by Meridian Brick to study the Aldershot East project, to ensure work there will comply with standards that are even more rigorous today than they were twenty years ago.

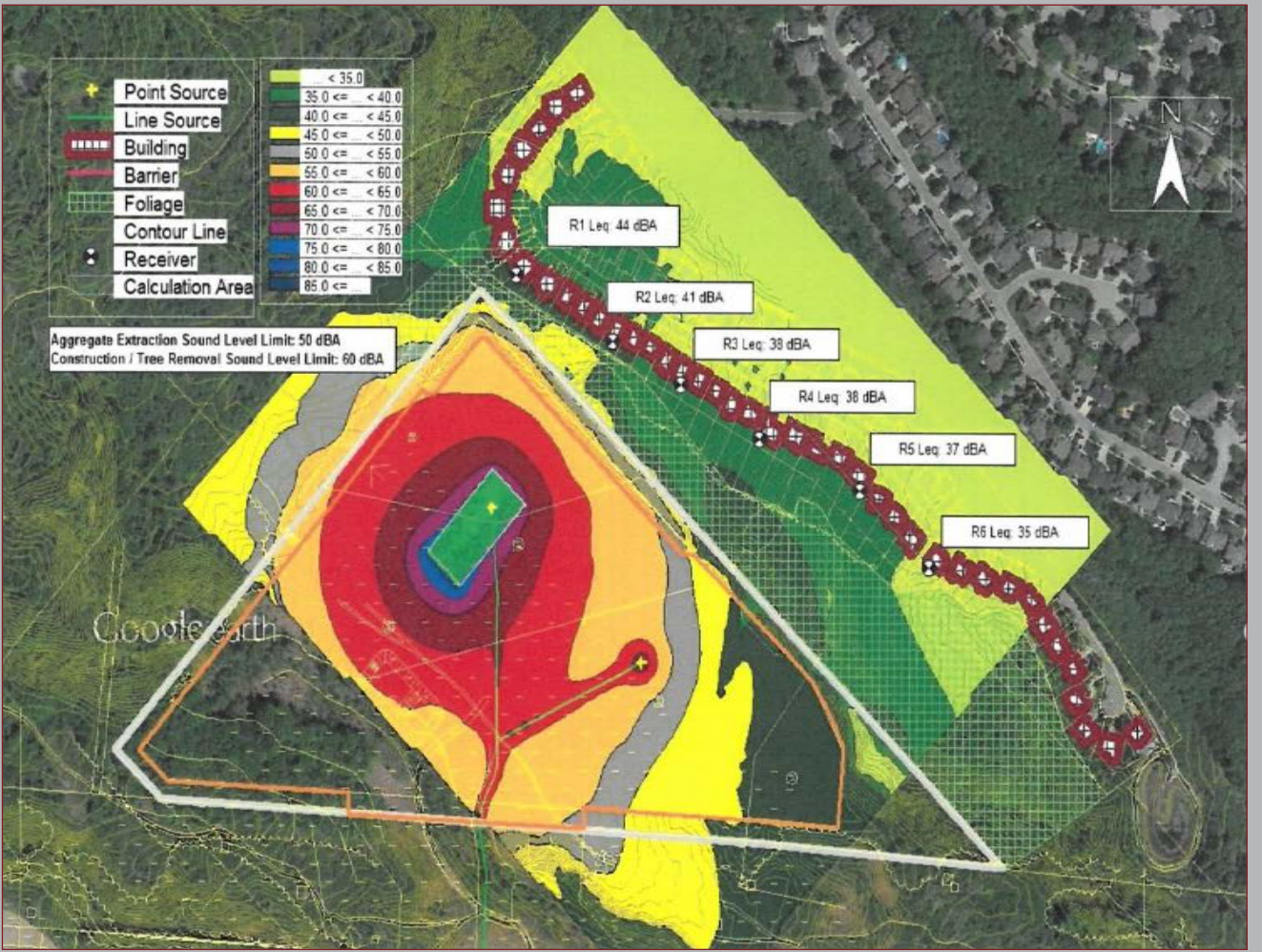
"One of the points we were entrusted to undertake was to make sure the development would comply with the new standard," said Gidamy. He said that would mean new operating changes, recommended to the company as needed.

Even in the "worst case predictable operating scenario," - which represents "the highest sound level that is likely to be expected" - Meridian Brick's East extraction project will not exceed Provincial regulations for noise. In fact, wind noise levels in the trees behind area residences - with noise levels around 40 to 50 decibels - will be comparable to the extraction noise.

Modeling at a range of receptors along Westhaven Drive, Gidamy's study determines that noise levels along the street will be less than 40 decibels. That's less sound than a quiet office.

Gidamy also found that the existing five-metre noise reduction berm will be adequate for existing and future control of noise from the operation

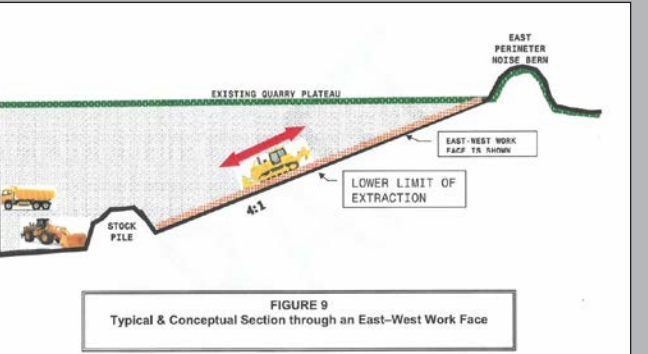
For Phase 1 tree removal Meridian Brick has received recommendations to avoid removal of trees when residents are outside. This means that trees will be



This chart illustrates the expected noise levels from the Aldershot East project. The green colours over Westhaven Drive indicate decibel levels in the range of 35 decibels to about 40 decibels - well within Provincial regulations for noise.

removed only during the colder months, and all vehicles will be fitted with high-quality mufflers. Tree removal will only take place between 7 a.m. and 4 p.m. on weekdays - when most people are at work or school.

As the excavation proceeds, Meridian crews will also be working progressively further below grade, until they are 35 metres below grade. This depth will further stifle the amount of noise coming from the property as time goes on.



This diagram illustrates how far below grade the excavation will take place.

QUARRY ANSWER

Q: How close to our fencelines will this quarry come?

A: Meridian has agreed not to excavate the north corner of the East site until late in the site's lifespan, at least 15 to 20 years from now. Meridian's new phasing strategy includes a fully treed interim buffer zone, to be in place for at least 15 years, of 90 to 150 metres. Even when the third phase of the East quarry is being undertaken, the excavation will remain 54 metres away from the neighbours' fencelines.

Q: What is being done to ensure residents are protected from dust?

A: Once quarrying operations begin, a dust monitoring program specific to the East site will be implemented and results from this program made available to the City of Burlington, Region of Halton, Ministry of the Environment and Climate Change and Ministry of Natural Resources and Forestry. Westhaven Drive residents will also have access to the information.