

**Elevated Arsenic in Topsoil
Former Orchard Lands
Mulock Drive and Bathurst Street
Town of Newmarket**

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BURNSIDE



History

- Area around Mulock Drive and Bathurst Street was formerly part of the Mulock farm
- From the early 1900's up until the 1960's parts of the farm were orchards
- Lead arsenate pesticides were commonly used on orchards up until the 1960's.



TOWN OWNED LAND

SUMMERHILL
NORTH

MULLOCK DRIVE

SUMMERHILL
SOUTH

NORTHERN FORESTED LANDS
(to be conveyed to the Town)

SUMMERHILL
WOODS
DEVELOPMENT

TRAIL LANDS
(Town Owned)

SOUTHERN FORESTED
LANDS
(to be conveyed to the Town)

FIRST ST.



Background

- Arsenic is a natural metalloid element commonly found in rock and soil
- The application of lead arsenate pesticides can raise the concentration of lead and arsenic in the soil



Background (cont'd)

- Typically, the residual concentration of arsenic in the soil, from lead arsenate pesticides, is a more significant environmental issue than the residual lead concentration
- Arsenic is the primary contaminant of concern.



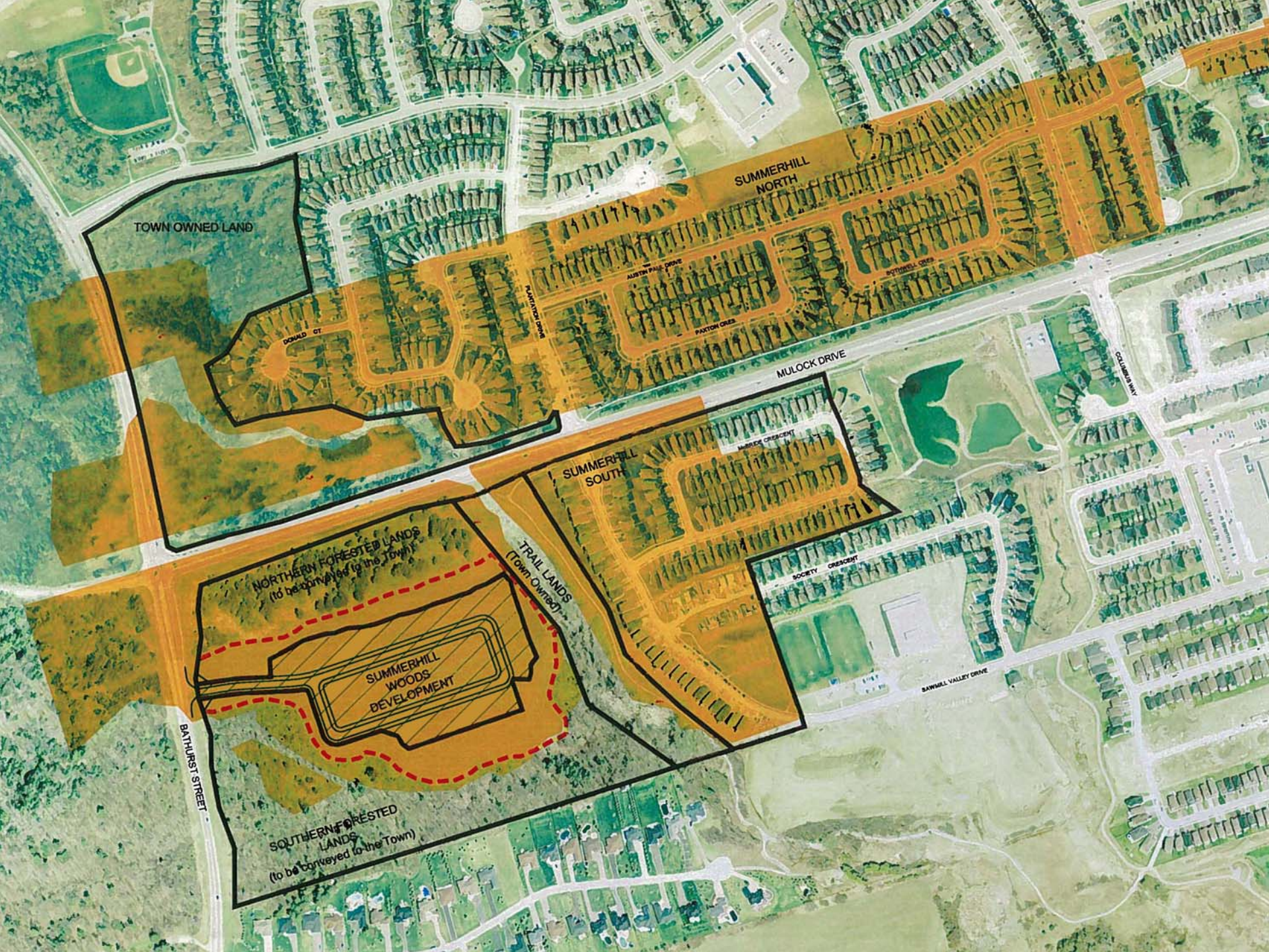
Arsenic in the Environment

- It has low solubility so it does not dissolve and move easily in water
- It is relatively immobile
- No risk to groundwater, surface water, or other properties.



Where is the Arsenic

- It is in the topsoil to a depth of approximately 30 cm
- It is bound to soil particles
- It is not adversely impacting the trees or vegetation
- Confined to former orchard lands.



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TRAIL LANDS
(Town Owned)

BATHURST STREET

MULOCK DRIVE

DONALD CT

MARRIDGE CRESCENT

ALBETH PAUL DRIVE

PAXTON CRES

POTWELL CRES

MARRIDGE CRESCENT

SOCIETY CRESCENT

SAWHILL VALLEY DRIVE

COLLINS HWY



The Issue

- The most effective way to deal with arsenic impacted topsoil is to remove it
- This is simple when doing a residential development because the topsoil is normally stripped prior to construction



The Issue (cont'd)

- To remove the topsoil from the woodlots the trees would have to be removed
- If possible, it is preferable to keep the trees.



Summerhill North

- Summerhill North started in the mid 1990's
- A Phase I Environmental Site Assessment identified the potential for elevated arsenic on former orchard lands
- The topsoil in the area of the former orchards was removed off site for disposal.



Summerhill South

- Summerhill South was started in 2001
- The Phase I ESA did not initially identify former orchard lands
- The topsoil was stripped from the residential areas prior to construction and most shipped off-site for disposal.



Plan of Subdivision Process

- There is generally no requirement for a developer to inform the Town or the Ministry of Environment about contamination confined to private lands, with certain exceptions
- The developer must disclose the environmental condition of any lands being conveyed to the Town.



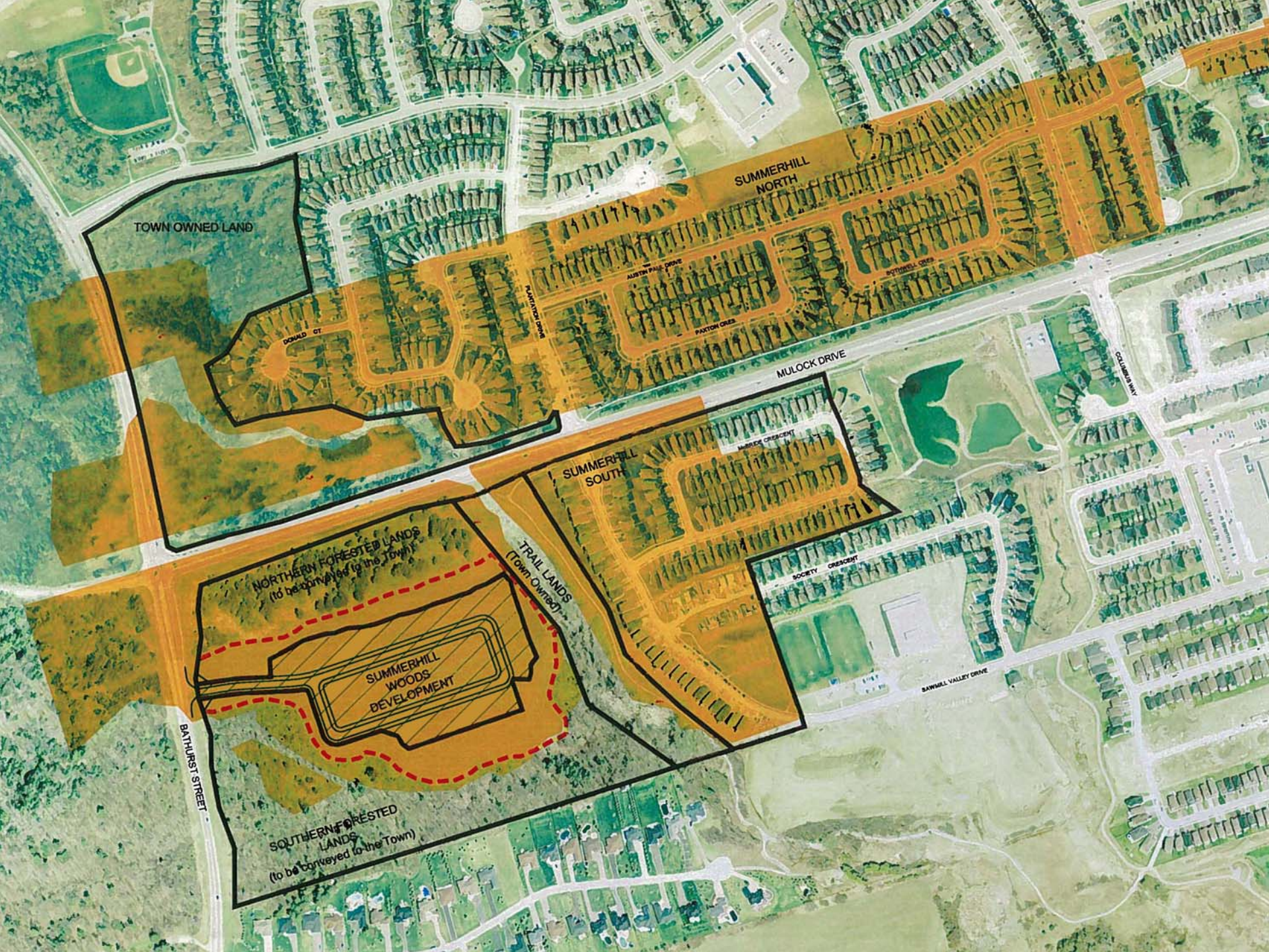
Summerhill Woods

- In the fall of 2007 the developer disclosed to the Town that arsenic concentrations exceeding the MOE Standards were found on the proposed residential lands of Summerhill Woods
- The Town requested additional sampling to determine the extent



Summerhill Woods (cont'd)

- Data was received by the Town in early 2008, and additional sampling of the woodlot and the trail lands was requested
- The developer removed all of the impacted topsoil from the developable lands and the 30 m buffer.



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BATHURST STREET

BATHURST STREET



Woodlots

- In the spring of 2008, the results of several sampling programs revealed that the topsoil in the wood lot north of Summerhill Woods and the trail lands east of Summerhill Woods was impacted with arsenic above the MOE Standards



Woodlots (cont'd)

- The developer made a commitment to the Town for a variety of management options including full remediation by stripping and removing the topsoil and replanting.



Sampling of Town Lands

- In the summer of 2008, the Town directed it's consultant to conduct an independent sampling program on Town owned lands:
 - Within Summerhill North
 - Within Summerhill South
 - Within Town owned lands on the northeast corner of Mulock Drive and Bathurst Street.



Sample Results – Trail Lands

- Approximately 48 locations sampled
- 22 locations exceeded the MOE Parkland Standard for arsenic of 25 ug/g
- Maximum arsenic concentration – 86 ug/g
- 1 sample location exceeded the MOE Standard of 200 ug/g for lead



Sample Results – Trail Lands (cont'd)

- Maximum lead concentration 235 ug/g
- For reference the MOE Commercial Landuse Standard for arsenic is 50 ug/g and for lead it is 1,000 ug/g
- 3 sample locations were above the 50 ug/g Commercial Landuse Standard for arsenic.



Sample Results

– North Forest Lands

- Approximately 31 locations sampled
- Approximately 22 locations exceed the MOE Parkland Standard for arsenic of 25 ug/g
- Maximum arsenic concentration – 87 ug/g
- 2 locations exceeded for lead



Sample Results

– North Forest Lands (cont'd)

- 5 sample locations exceeded the 50 ug/g Commercial Landuse Standard for arsenic.



Sample Results – Northeast Corner of Mulock and Bathurst

- Approximately 22 locations sampled
- 7 locations exceeded the MOE Parkland Standard for arsenic of 25 ug/g
- Maximum arsenic concentration 86 ug/g
- 1 location exceeded for lead
- 2 sample locations exceeded the 50 ug/g Commercial Landuse Standard for arsenic.



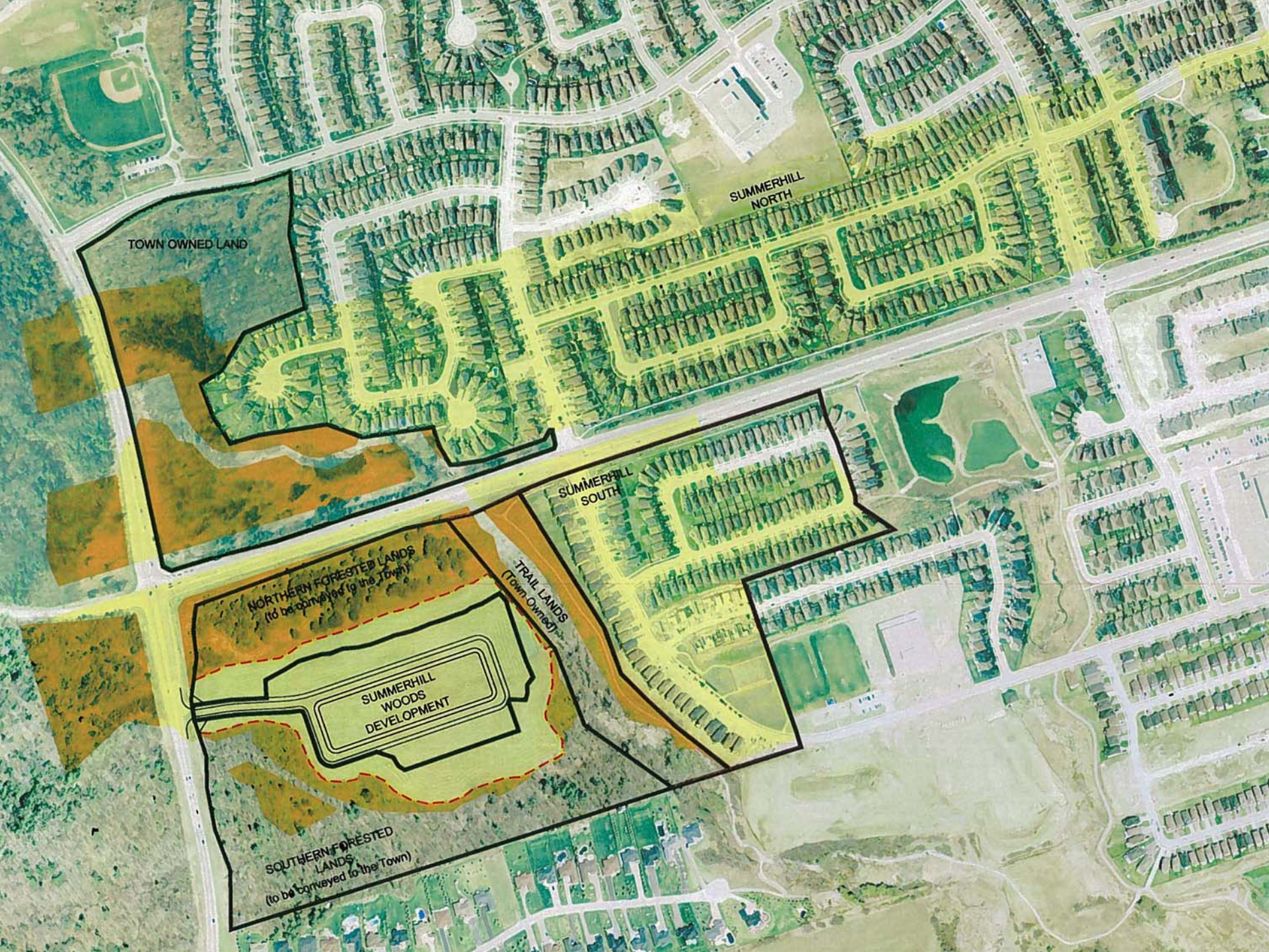
Results

- Sampling programs demonstrate that the concentrations of arsenic in all completed and under construction residential areas meet the applicable Ministry of Environment Standards



Results (cont'd)

- The concentration of arsenic (and occasionally lead) in the topsoil of some parts of the woodlots and trail lands is greater than the applicable Ministry of Environment Standards for Parkland landuse.



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Priorities

- 1) Protection of human health
- 2) Protection of the environment (woodlands and established vegetation)
 - The developer has committed to removing the impacted topsoil from the trail lands and the forest lands around Summerhill Woods, if there is no other option.



Options

- To determine what options may be possible, a Human Health and Ecological Risk Assessment will be conducted
- The Risk Assessment will cover the woodlots and trail lands, and address all contaminants of concern.



Summary

- No concerns with established or under construction residential areas
- It is strongly preferred that the trees in the woodlots not be disturbed
- A Human Health and Ecological Risk Assessment will determine the best long term management strategy.