

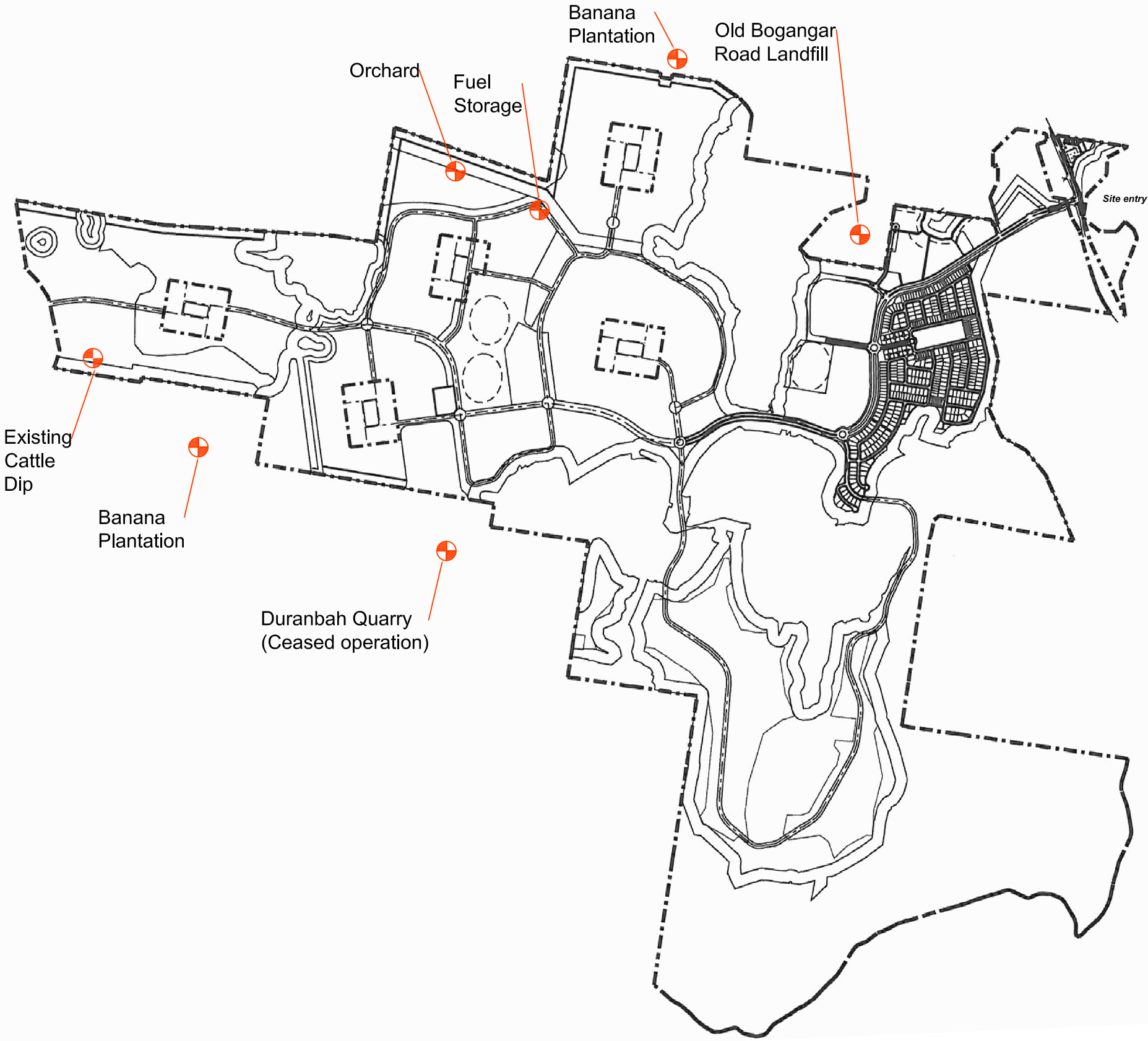


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ORIENTATION
NORTH

SOURCES
MPS Architects



PROJECT
KINGS FOREST - STAGE 1
PROJECT APPLICATION

CLIENT
PROJECT 28 PTY LTD

DRAWING
LOCATIONS OF HISTORICAL
POTENTIALLY CONTAMINATING
ACTIVITIES

CAIRNS

KAWANA

ROBINA

5 / 232 Robina Town Centre Dr.
PO Box 4115
Robina Q4230
Phone 07 5578 9944
Fax 07 5578 9945
robina@access.gs

BRISBANE

Gilbert and Sultherland Pty Ltd
ABN 56 077 310 840

www.access.gs

AGRICULTURE WATER ENVIRONMENT

DATE 14/02/2011	DRAWN AJS	PROJECT NO 10468
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3 Contamination assessment

G&S undertook a field investigation across those areas that the 2008 report established may have been subjected to a potentially contaminating activity. The assessment areas were:

- Banana plantations adjacent to the site.
- A fuel storage area and former nursery.
- A former orchard.
- A former cattle dip site.

Borehole locations and sampling areas are shown on Drawings 10468.7.7 – 10468.7.10.

3.1 Methodology - subsurface investigations

A total of 43 soil boreholes were drilled in selected locations relevant to each investigation area between 27 January and 1 February, 2010. Samples recovered to determine the presence, distribution and concentration of potential contaminants in the soil. The borehole locations are shown on the attached drawings numbered 10468.7.7 -10468.7.10.

Shallow sampling was undertaken using a Jarrett head soil auger to extend boreholes to a maximum depth of 0.3 metres below ground surface (mBGS). Samples were extracted from depths ranging between 0-0.15mBGS and 0.2-0.3mBGS.

The Jarrett head auger was decontaminated between sampling events in accordance with standard procedures. This involved the removal of soil followed by cleaning of the implements with a phosphate-free detergent and rinsing with clean water.

Implements used for crushing and mixing of interlaboratory split (3 in total) and blind intralaboratory duplicate (3 in total) samples, were rinsed in phosphate-free detergent between samples followed by rinsing with clean water.

Rinsate blanks were collected from the sampling implements following decontamination to assess the efficacy of the decontamination procedure.

3.2 Scope of laboratory analysis

Representative soil samples were recovered from 43 boreholes. Laboratory analysis of recovered soils samples was undertaken for;

- NEPM 8 heavy metals
- Benzene, Toluene, Ethylbenzene and total Xylene (BTEX)
- Polycyclic Aromatic Hydrocarbons (PAH)
- Total Petroleum Hydrocarbons (TPH)
- Organochlorine (OC) and organophosphorus (OP) pesticides

The suite of analyses for each sample was determined based on the proximity of the sample to a potentially contaminating activity and the contaminants of potential concern related to that activity. The sampling strategy was devised to investigate the various potentially contaminating activities identified from the site history summarised in the 2008 assessment report.

Laboratory analysis was conducted by Australian Laboratory Services (ALS) Environmental, Brisbane, SGS Laboratory Services, Sydney and Queensland Laboratories (QLABS). All three laboratories are NATA accredited for the relevant methods.

3.3 Results – subsurface investigations

Soils were logged in accordance with the *Australian Soil and Land Survey, Field Handbook*. Borehole logs are attached as Appendix 4.

3.3.1 Soil investigation threshold levels

The Health Investigation Levels from Column 1 (residential development), Appendix II of the NSW Guidelines for the NSW Site Auditor Scheme prepared by the Department of Environment and Conservation (DEC), 2006 and mirrored in the *National Environment Protection Measure Schedule B(1)*, were adopted for comparison.

The Health Investigation Level exposure setting A (HIL-A) was adopted on the basis that the proposed redevelopment of the site is for standard residential purposes. The NEPM Environmental Investigation Levels (EILs) have also been considered during the investigation as a trigger for



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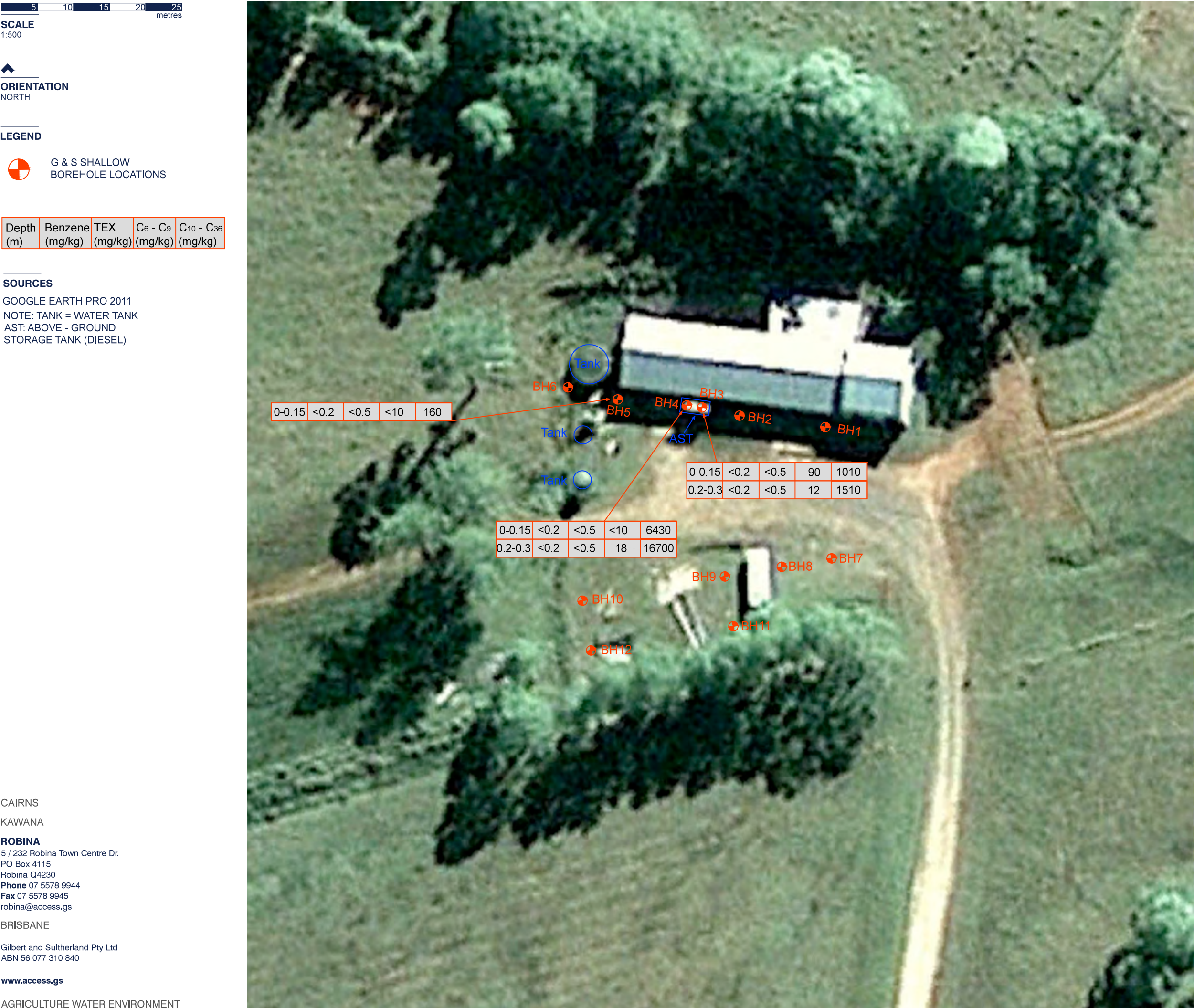
LEGEND

 G & S SHALLOW
BOREHOLE LOCATIONS

Depth (m)	Benzene (mg/kg)	TEX (mg/kg)	C ₆ - C ₉ (mg/kg)	C ₁₀ - C ₃₆ (mg/kg)
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SOURCES

GOOGLE EARTH PRO 2011
NOTE: TANK = WATER TANK
AST: ABOVE - GROUND
STORAGE TANK (DIESEL)



PROJECT
KINGS FOREST - STAGE 1
CONTAMINATION ASSESSMENT

CLIENT
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DRAWING
HOUSE/NURSERY
SHALLOW INVESTIGATIVE
BOREHOLE LOCATIONS

CAIRNS
KAWANA
ROBINA
5 / 232 Robina Town Centre Dr.
PO Box 4115
Robina Q4230
Phone 07 5578 9944
Fax 07 5578 9945
robina@access.gs

BRISBANE
Gilbert and Sultherland Pty Ltd
ABN 56 077 310 840

www.access.gs
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ORIENTATION
NORTH

LEGEND

 G & S SHALLOW
BOREHOLE LOCATIONS

SOURCES

GOOGLE EARTH PRO 2011

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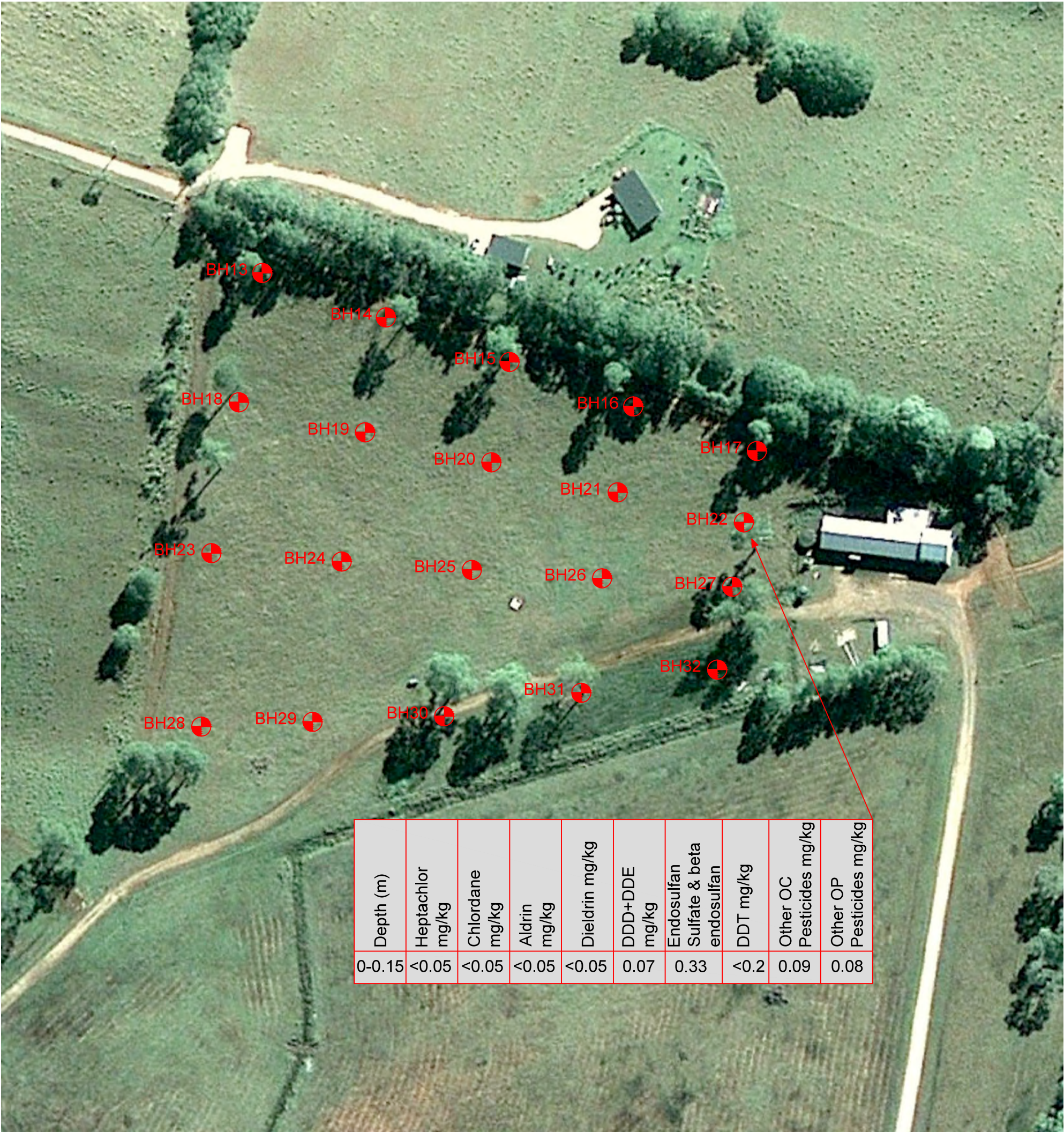
ROBINA
5 / 232 Robina Town Centre Dr.
PO Box 4115
Robina Q4230
Phone 07 5578 9944
Fax 07 5578 9945
robina@access.gs

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Gilbert and Sultherland Pty Ltd
ABN 56 077 310 840

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AGRICULTURE WATER ENVIRONMENT



Depth (m)	Heptachlor mg/kg	Chlordane mg/kg	Aldrin mg/kg	Dieldrin mg/kg	DDD+DDE mg/kg	Endosulfan Sulfate & beta endosulfan	DDT mg/kg	Other OC Pesticides mg/kg	Other OP Pesticides mg/kg
0-0.15	<0.05	<0.05	<0.05	<0.05	0.07	0.33	<0.2	0.09	0.08

PROJECT
KINGS FOREST - STAGE 1
CONTAMINATION ASSESSMENT

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DRAWING
FORMER ORCHARD SHALLOW
INVESTIGATIVE BOREHOLE
LOCATIONS

DATE 03/02/2011	DRAWN AJS	PROJECT NO 10468
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LEGEND

 G & S SHALLOW
BOREHOLE LOCATIONS

SOURCES

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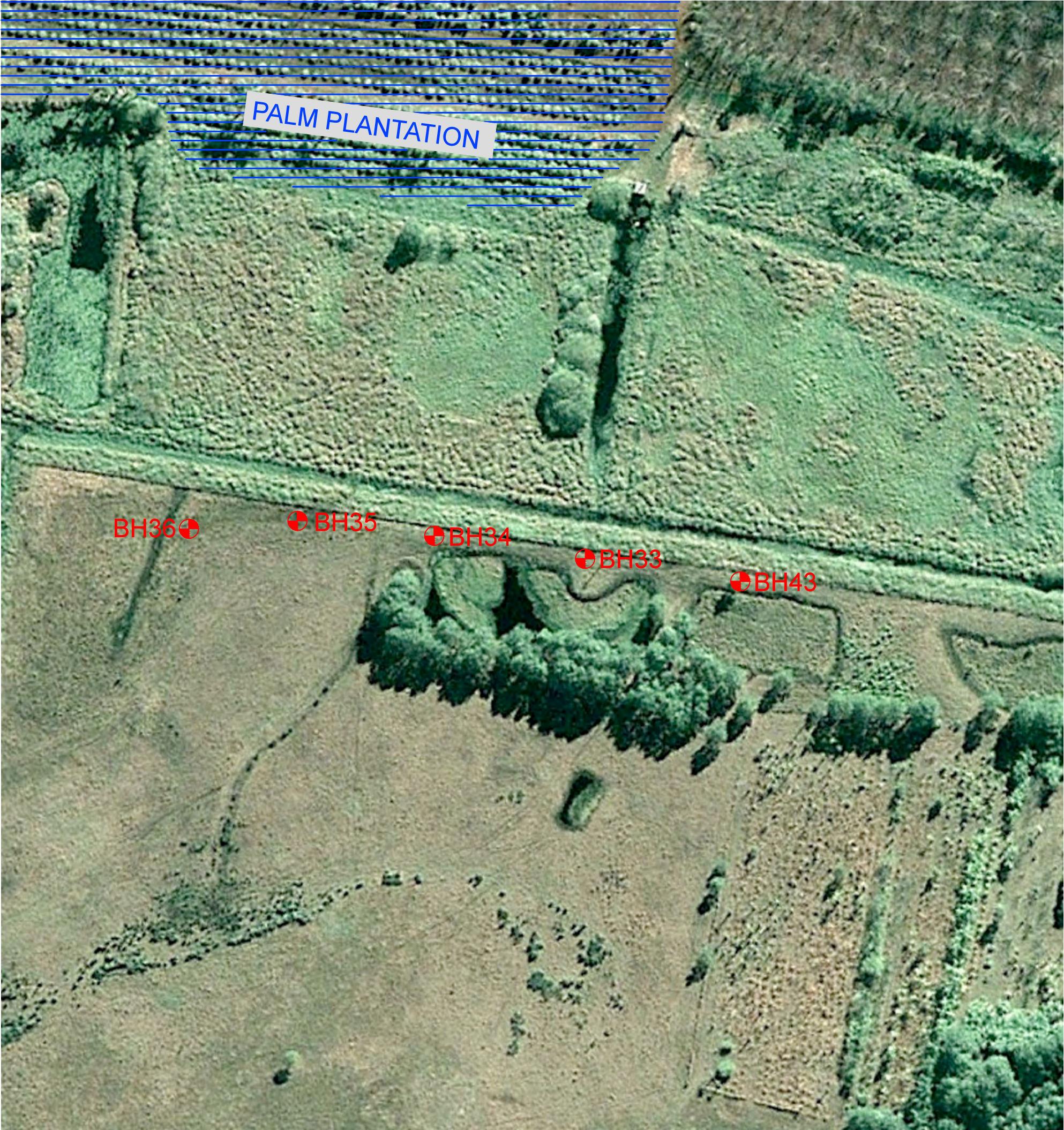
5 / 232 Robina Town Centre Dr.
PO Box 4115
Robina Q4230
Phone 07 5578 9944
Fax 07 5578 9945
robina@access.gs

BRISBANE

Gilbert and Sultherland Pty Ltd
ABN 56 077 310 840

www.access.gs

AGRICULTURE WATER ENVIRONMENT



**+GILBERT
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PROJECT
KINGS FOREST - STAGE 1
CONTAMINATION ASSESSMENT

CLIENT
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DRAWING
NORTHERN BANANA PLANTATION
SHALLOW INVESTIGATIVE
BOREHOLE LOCATIONS

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SCALE
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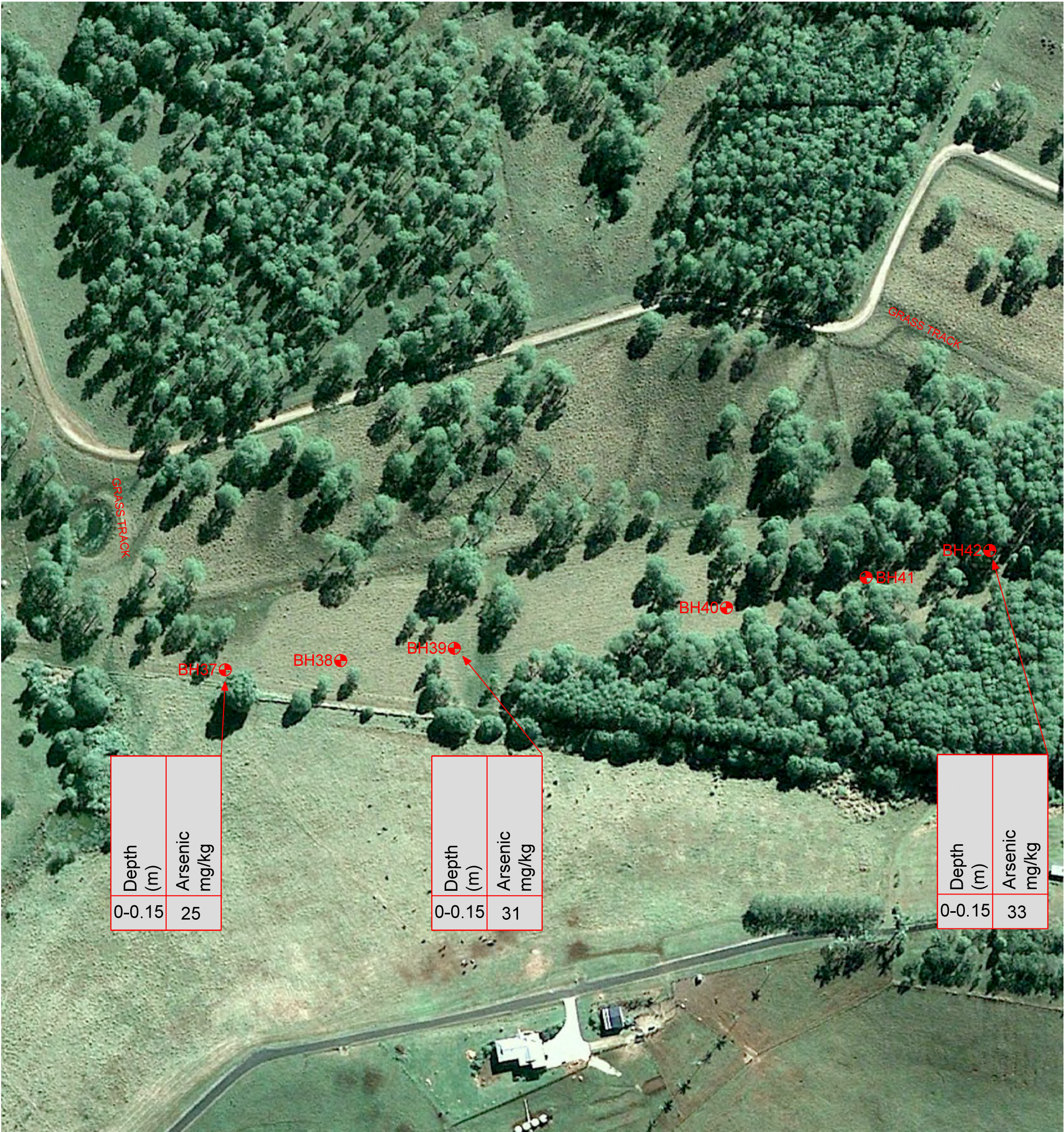


ORIENTATION
NORTH

LEGEND

 G & SHALLOW BOREHOLE LOCATIONS

SOURCES
GOOGLE EARTH PRO 2011



Depth (m)	Arsenic mg/kg
0-0.15	25

Depth (m)	Arsenic mg/kg
0-0.15	31

Depth (m)	Arsenic mg/kg
0-0.15	33

CAIRNS
KAWANA
ROBINA
5 / 232 Robina Town Centre Dr.
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Robina Q4230
Phone 07 5578 9944
Fax 07 5578 9945
robina@access.gs

BRISBANE

Gilbert and Sultherland Pty Ltd
ABN 56 077 310 840

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AGRICULTURE WATER ENVIRONMENT

PROJECT
KINGS FOREST - STAGE 1
CONTAMINATION ASSESSMENT

CLIENT
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DRAWING
SOUTHERN BANANA PLANTATION
SHALLOW INVESTIGATIVE
BOREHOLE LOCATIONS

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