ARBORICULTURAL REPORT

QTRA Tree Health, Risk Assessment and Management

LOT 238 CLAYMORE STREET

GUILFORD WA 6055

4 February 2014

Ref: Petition / 238 Claymore

Prepared By:

BIJL TREE CONSULTANCY

Arboricultural Consultant

Licensed User

Client:	City of Swan; PO Box 196, Midland 6936
Contact:	Mr Tim Garrigan; Assets Co-ordinator, Parks and Landscaping; T: 9267 9094 – M: 0448 975 972 E: tim.garrigan@swan.wa.gov.au
Site:	POS - Lot 238 Claymore Street, Guildford
Assessment Date:	4 February 2014
Report Date:	10 February 2014
Project Ref:	Petition / 238 Claymore

Prepared By: W. M. Bijl

Nat. Cert. Tree Surgery (Merristwood – UK)
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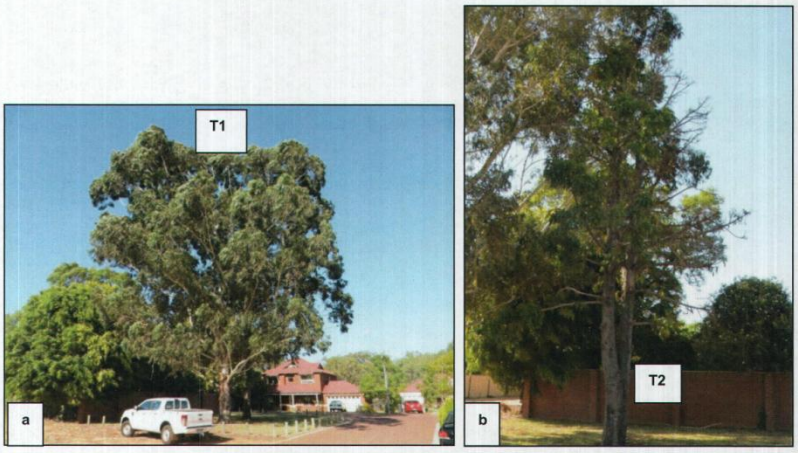

Figure 1a–b. The two subject street trees on the verge at Lot 238 Claymore St., Guildford.

ASSESSMENT SUMMARY

1) **Tree T1** is in is in excellent health, and structurally sound. The crown is comprised of a well-distributed and overall sound branch framework.

The tree sheds twigs, deadwood and occasionally small branchlets. Seasonally, during spring, it sheds its bark in long strips which temporarily increases litter. These are natural factors typical for this species, as, indeed, for many other Eucalyptus species.

Pruning will not effectively mitigate these characteristics; nor will pruning guarantee against the periodic shedding of small branches, specifically during strong winds.

The probability of significant branches failing is assessed to be low, and, when factored with the occupancy rating of the target area - at the time of a failure - rates this tree at a low and broadly acceptable risk of harm.

2) **Tree T2** is in good health and structurally sound. Currently exiting its summer deciduous phase, as is normal for this Queensland native. It also rates at a low and broadly acceptable risk of harm.

MANAGEMENT

No works are required in relation to the risk threshold. A brief reinspection in five years is recommended:

RISK OF HARM

TREE	TARGET	> 1/1000	1/1000 to 1/10,0000	1/10,0000 to 1/1,000,000	≤1/1,000,000	ALARP COST
T1	POS & Roadway				≤1/1,000,000	$2.40
T2	POS				≤1/1,000,000	$2.40

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INTRODUCTION

Mr Tim Garrigan, Assets Co-ordinator–Parks and Landscaping, City of Swan, contacted W. Bijl to request a tree health and risk assessment, including an arboricultural report, of two (x2) trees located within a POS of Lot 238 Claymore Street, Guildford.

A petition from local residents to the City requests the removal of both trees on the basis of risk of harm and the extent of general tree litter.

1. Site Investigation

The visual assessment was undertaken from the ground. The inspection was carried out on 4 February 2014.

Two trees were inspected. My findings plus data collected are recorded in the Tree Survey Schedules. Trees which were inspected individually are prefixed 'T'.

The weather during the inspection was fine and sunny.

2. Calculation of Target Ranges:

Note: In lieu of not having specific data for traffic and pedestrian occupancy, I have assessed the occupancy levels from observation on site.

Traffic frequency:

2.1 **Tree T1 & T2:** Traffic - both lanes

Rated < 470 vehicles per day – Occupancy Probability Range: 1/100 - > 1/1000

Target Exposure Value: < $24,000 = **Target Value Range 3**

2.2 **Tree T1 &T2:** POS – Pedestrian occupancy

Rated < 168 pedestrians per day = 14min human occupancy per day

Probability Range: 1/100 - > 1/1000

Target Exposure Value: < $24,000 = **Target Value Range 3**

Note: The site occupancy figures and values (the target range values) are calculated in so far as is reasonably practicable.

Client: City of Swan **DETAILED INDIVIDUAL TREE RISK INSPECTION**

Location: Lot 238 Claymore St., Guildford Date: **4 February 2014**

PoF= Probability of Failure. <12m = within 12 months.
RoH = Risk of (significant) Harm < 12m.
DW = Dead Wood.
RT = Risk Threshold. (> 1/10,000 RoH)
Red font = Priority 1

Italic Text: Text changes made in current year.

#	Species	Ht (m)	DBH (cm)	Crown spread NS/EW(m)	Most significant part	Target	Target Range	Size Range	PoF Range	Reduced Mass	Review Years.	Risk of Harm	ALARP Cost
T1	Rose gum (*Euc.grandis*)	23	70	15-NS 13-EW	35mm - Deadwood	POS (grass)	3	4	2	50%	2019	≤1/1,000,000	$2.40

COMMENTS:

- In excellent health, vigour, and structurally sound
- Comprised of a well structured branch framework, of good form and distribution.
- Minor accumulation of natural occurring small diameter deadwood
- **Previous branch failures**: Sporadic shedding of twigs, branchlets and small deadwood up to 40mm, as is typical for the species. One secondary lateral (70mm) mid-crown level, southwest side; not significant. No evidence of previous significant branch failures.
- One lateral branch, extending SW @ 7m, exhibits an increased likelihood of failure - but not significant in relation to target occupancy level
- **Targets:** Roadway, POS
- **Works history:** Nil
- **Basal:** Excellent, with well formed buttress wood. No signs of decay, or unnatural heave

Conclusion: The probability of whole tree failure is very low. The probability of significant branches failing is also assessed to be low, and, when factored with the occupancy rating of the target area rates this tree at a low and broad acceptable risk of harm.

MANAGEMENT:

- No works required in relation to the Risk of Harm threshold
- Reinspect in 5 years: January 2019

#	Species	Ht (m)	DBH (cm)	Crown spread NS/EW(m)	Most significant part	Target	Target Range	Size Range	PoF Range	Reduced Mass	Review Years.	Risk of Harm	ALARP Cost
T2	Illawarra flame tree *(Brachychiton acerifolia)*	11	63	5-NS 4-EW	50mm - lateral	Roadway	3	4	5	N/A	2019	1/1,000,000	$2.40

COMMENTS:

- Good health and structurally sound.
- Slight suppression from dominance of nearby tree T1. Currently exiting from its summer deciduous phase as normal for this Queensland native.
- No evidence of significant previous branch failures
- Probability of whole tree failure very low, at less than 1/1,000,000 - at which level consideration of target is not required
- **Target:** POS
- **Works history:** Nil
- **Basal:** Excellent, with well formed buttress wood. No signs of decay, or unnatural heave
- **Conclusion:** A low and broadly acceptable risk

MANAGEMENT:

- No works required in relation to the Risk of Harm threshold.
- Briefly reinspect in 5 years, in combination with T1: January 2019

APPENDIX 1: QTRA Advisory Risk Thresholds

METHODOLOGY

Quantified Tree Risk Assessment

QTRA Advisory Risk Thresholds

Risk Thresholds	Description	Action
	Unacceptable Risks will not ordinarily be tolerated	• Control the risk • Review the risk
1/1 000	**Unacceptable** (where imposed on others) Risks will not ordinarily be tolerated	• Control the risk • Review the risk
	Tolerable (by agreement) Risks may be tolerated if • those exposed to the risk will tolerate it, or • the tree has exceptional value	• Control the risk unless there is broad stakeholder agreement to tolerate it, or the tree has exceptional value • Review the risk
1/10 000	**Tolerable** (where imposed on others) Risks are generally tolerable	• Assess costs and benefits of risk control • Control the risk only where a significant benefit might be achieved at a reasonable cost • Review the risk
1/1 000 000	**Broadly Acceptable**	• No action required currently • Review the risk

Costs and Benefits of Risk Control.

Risk control measures bring benefits in terms of reducing or eliminating a risk, but those benefits come at a cost that should, in broad terms, be balanced against the benefits of risk control. For guidance on considering costs and benefits, please refer to the Quantified Tree Risk Assessment Practice Note, available at http://www.qtra.co.uk/cms/index.php?section=25.

Based on the tree owner/manager accepting the principles set out in the Quantified Tree Risk Assessment Practice Note and or any other specific instructions, the risk assessor will take account of the cost/benefit balance when providing management recommendations.

METHODOLOGY OF QTRA AND DEFINITION OF ITS TERMS

The Quantified Tree Risk Assessment (QTRA) system applies established and accepted risk management principles to tree safety management.

The Quantified Tree Risk Assessment system quantifies and combines the components of tree failure risk.

It involves a process of quantifying the probability of occupation or monetary value of the target area; the probability of failure of a tree, or part thereof, within the next 12 months; and the estimated impact potential of that part. The combined probability of these factors forms the sum of the risk assessment.

The system provides a methodology for the probabilistic risk assessment of harm from tree failure, but is not predictive in an absolute sense and does not seek to provide an absolute safety threshold. However, the system does provide a statistical assessment of tree failure risk.

Risk of Harm

The QTRA output is termed the 'risk of harm' and is a combined measure of the likelihood and the consequence of tree failure considered in terms of loss, within the coming year, of a human life, something of comparable value or a proportion thereof.

Acceptable and Tolerable Risk

People are constantly exposed to and accept varying degrees of risk. The 'Tolerability of Risk Framework' considers a range of risk, with at one end the risk being 'broadly acceptable' – where there is no need to consider further risk reduction – and at the other end the risk is 'unacceptable' and not to be tolerated.

In general application, the 'broadly acceptable' where the upper limit is an annualised risk of death 1/1,000,000, an 'unacceptable region' of which the lower limit is 1/1,000, and between these a necessarily wide 'tolerable region within which the tolerability of a risk will be dependent upon the costs and benefits of further risk reduction.

Risk Threshold

For members of the public who have a risk imposed on them in the wider interest of society, the limit generally applied is of an order of magnitude lower – at 1 in 10,000 per annum.

Weather Affected Targets

During a storm event, when tree failure is most likely, the probability of, for example, a path being occupied by pedestrians is most likely considerably reduced. Therefore, this weather related reduction has the potential to reduce the risk of significant harm from tree failure. Conversely, the probability of damage to structures is increased.

The combined effects of weather on site usage and on tree failure are considered in the risk assessment.

Perspective

People are constantly exposed to, and accept, varying degrees of risk. Travel by car, even with risk control measures such as seatbelts, air bags, speed limits, and crash barriers, is a significant risk which is taken for granted and accepted every day by millions of people in return for the convenience of travel.

To put into perspective a risk of significant harm threshold of 1 in 10,000; within Western Australia the probability of being significantly *injured* in a road accident is 1 in 700; and the statistical risk of *death* due to a road traffic accident is 1 in 10,000 within a 12 month period.

Value of Statistical Life

"Value of Statistical Life" is a term used in risk assessment to express the monetary value of an individual life. This value is currently in the region of $2,000,000 – $2,500,000. The value of $2,400,000 is used in this assessment.

- Reference – Quantified Tree Risk Assessment Ltd. www.qtra.co.uk.

Sections of the above information and further information can be found at the listed website.

As Low As Reasonably Practicable (ALARP)

An evaluation of the risk exposure and the cost to reduce the risk further. I.e. if it can be shown that the cost to reduce the risk further is grossly disproportionate to the benefit of reducing that risk, then the risk can be considered to be ALARP.

In seeking to maintain a balance between the costs and benefits of risk reduction, the key criterion is to determine whether a risk is ALARP.

To guide the proportionate allocation of resources to risk reduction, the ALARP cost is factored against the value of a statistical human life (currently at $2,400,000). Thus, if the probability of the risk of significant harm is assessed at 1/100,000 the consequent ALARP cost is $24.00 (100,000/2,400,000).

For example, if the cost to reduce a risk is $2000, then this can be considered grossly disproportionate to the annual risk exposure of $24 (i.e. the cost grossly exceeds the ALARP cost).

APPENDIX 2: Disclosure Statement

DISCLOSURE STATEMENT

Bijl Tree Consultancy and their employees are tree specialists who use their qualifications, education, knowledge, training, and experience to examine trees, recommend measures to enhance the beauty and health of trees and attempt to reduce the risk of harm of living near trees. Clients may choose to accept or disregard the recommendations of the assessment and report.

Bijl Tree Consultancy cannot detect every condition that could possibly lead to the structural failure of the tree. Trees are living organisms that fail in ways the arboricultural industry cannot always identify. Conditions are often hidden within trees and below ground. *Bijl Tree Consultancy* cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specified period of time. Likewise, remedial treatments cannot be guaranteed.

Treatment, pruning, and removal of trees may involve considerations beyond the scope of *Bijl Tree Consultancy* services, such as property boundaries and ownership, disputes between neighbours, sight lines, landlord-tenant matters and related.
Bijl Tree Consultancy cannot take such issues into account unless complete and accurate information is given over. Likewise *Bijl Tree Consultancy* cannot accept responsibility for the authorization or non authorization of any recommended treatment or remedial measures.

****END OF REPORT****