ETS Energex Brief Supplementary Report TWG18 Grey Gum scheduled for monitoring & crown works Auchenflower 16/11/11

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Note – being a brief report the report, discussion and recommendations are all part of the same chapter

1.0: Summary

The small Toowong Feeder TWG18 was appraised by arborist Cassian Humphreys (2/11/11). In the course of general VTA inspection works observations were recorded (both on spread sheet and in this report) on a Grey Gum *Eucalyptus major*. This is a one strip category B Feeder covering Toowong and Auchenflower. The tree with fairly extreme VTA symptoms is located on BCC land (beside public footpath) between HV, a road and 60 Bayliss Street which is the location of a Uniting Church University (UC). Due to the sensitive parameters concerning this tree, its value to local community and habitat to nesting Rainbow lorikeets with Energex approval this report was drafted.

Fig: 1

Google images

Grey Gum and location at 60 Bayliss Street Auchenflower

2.0: Report, discussion & recommendations

In the history of the VTA Program a tree with such extreme symptoms in a hard landscape suburban area is considered to be rare. The most comparable VTA trees being gums with advanced symptoms relating to the canker syndrome or wood decay pathogens such as Phellinus or Ganoderma species.

Fig: 2

Northern side

Fig: 3

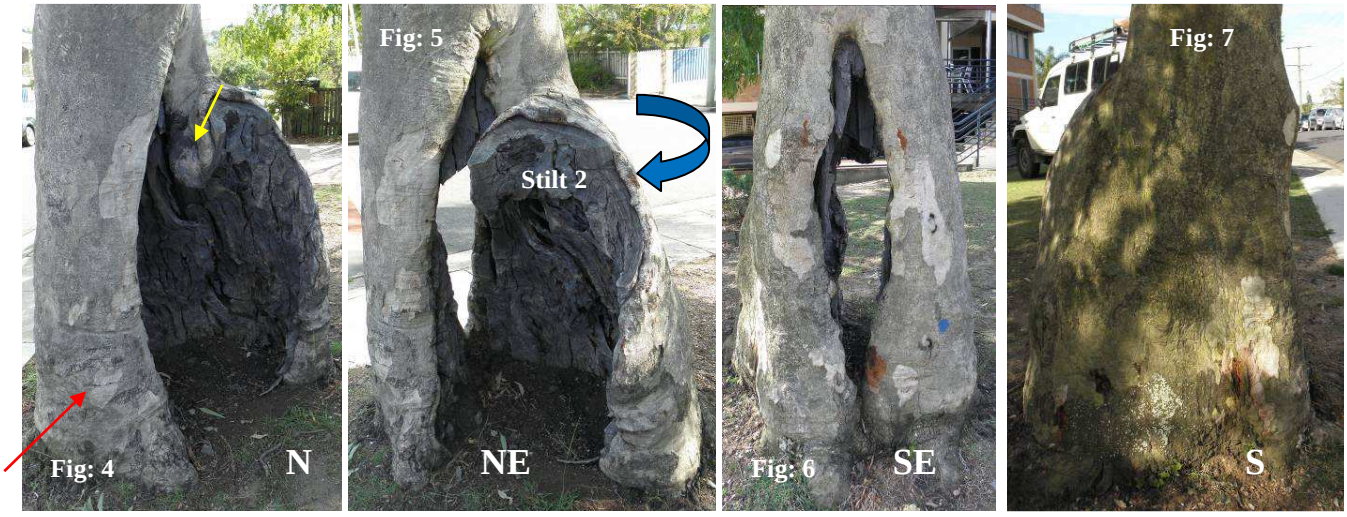
Southern side

The Grey Gum - located between P 10072 and X68

The gum with an endocormic asymmetrical crown (made up of three major limbs) has a crown spread of 12 by 12m, a crown height of 16m and a DBH of 91cm. Based on the trees body language, age and species the tree is considered to be a remnant of the original vegetation local to the suburb. The gum located on a ridge is a habitat tree with active hollows and a history of being home to Rainbow Lorikeets (advice from UC centre manager), a nesting pair of lorikeets was observed feeding young via a hollow whilst the tree/site inspection was undertaken.

The tree exhibits a major cavity extending from ground level to 1m up its trunk.

Based on VTA it is likely that the cavity was instigated by the removal of a major limb on the trees north western side. It is difficult to ascertain the causal agent for the decay cavity as the inside of the trees trunk has been hollowed out by hand (wood scribing by chainsaw and painting on the inside of the cavity with a wound wood dressing – a now outdated arboricultural practice). At the time of inspection no current or past evidence of wood decay fungi on the inside or outside of the trees body was observed, although past termite activity was noted (presence of old fluted tunnels). Having sounded the tree with an acoustic hammer (Thor 710) recent wood growth audibly has good wood resonance.



Surprisingly, considering the trees growing environment of a heavily compacted silt soil (unusual for a ridge – assume this is old fill over shale) it has fairly good vitality (which must be attributed to soil/bedrock fractures and pockets of moisture/oxygen/associate microbiology). With healthy bark, active reaction wood development and a fairly full leaved canopy, the gum is only showing very recent symptoms of upper canopy retrenchment.

The body of the tree is supported by two stilts of functional tissue (linking upper crown to root system).

The east facing stilt (Stilt 1 - red arrow Fig: 4) appears to be dealing with a largely compressive load.

With the west facing stilt (Stilt 2) appearing to be dealing with compressive and tensile load, this is evidenced by the circumferential growth of wood (see blue arrow fig: 5) around the remnant trees body (northeastern side) and the loop of reaction wood occluding over and around the old severed limb (see yellow arrow Fig: 4).

Both stilts making up the trees body are relatively free of signs of subsidence (folds) and can be seen to be making active reaction wood development (evidenced by expanded new bark).

Wound wood at the margins of the stilts has rolled inward and is occluding exposed internal heartwood. This is dynamic evidence of a strength gain.

Based on the gums mechanical constraint, as with all mechanically constrained trees the key issue facing this trees bio-mechanical longevity relates to the proportion of height over diameter (H/D).

Having grown on a ridge the tree naturally has a short crown height in proportion to its original stem diameter. The cavity and loss of living tissue connecting trunk to root crown has of course since reduced the trees footprint at ground level.

Stilt 1 measures 1.2m in circumference, and Stilt 2 measures 2.4m. The rough measurement of the estimated original trunk circumference at ground level is 4.2m. Meaning 60cm of functional tissue at ground level has been lost. The stilts can be seen to be connected to corresponding major tension and compression roots.

Based on a developed VTA perspective this tree has made dynamic progress in self optimisation due to major constraints placed on its body. Such a tree will certainly require monitoring as a means to observe its progress or decline as it further ages.

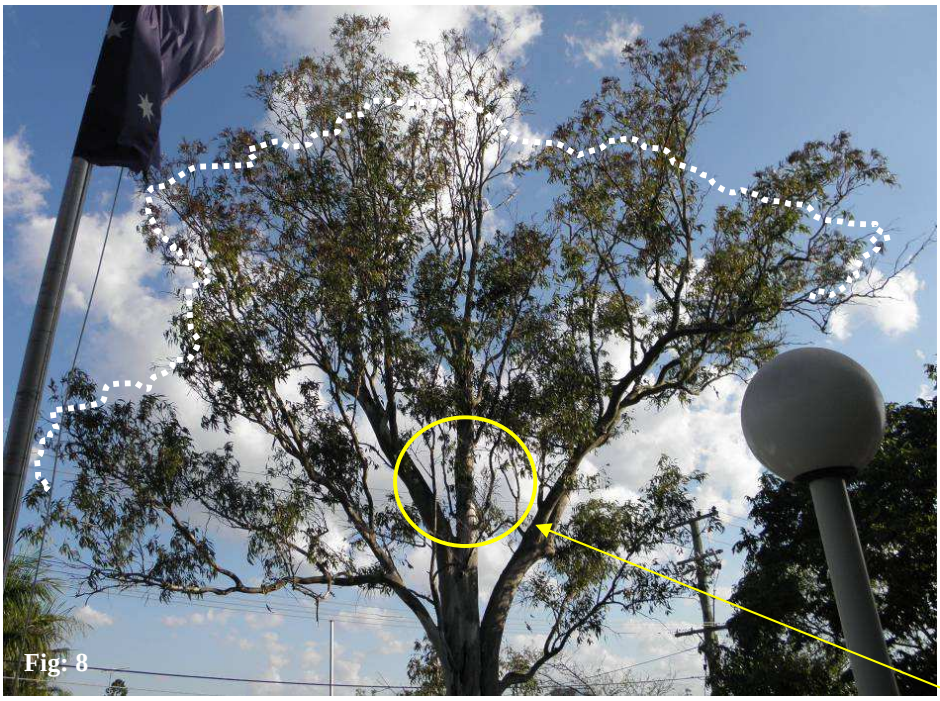


Fig: 8

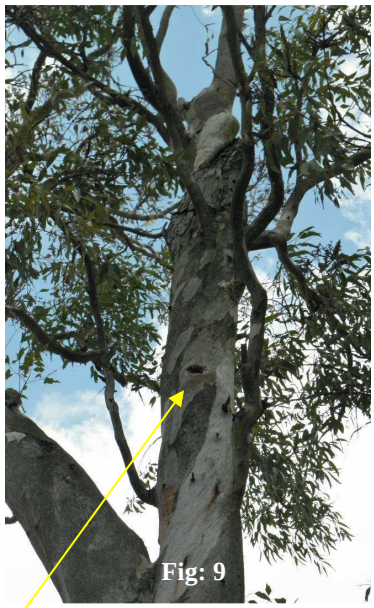


Fig: 9

In the interests of asset protection (HV), electrical reliability and based on the mechanical constraint (plus signs of optimisation) posed by this tree we recommend a five to ten percent overall crown reduction. This being to internal canopy or lower growth points the tree possesses. Such an operation is advisable considering the VTA, the costs the tree has the capacity to pose (should it fail) and is viable considering the canopy a contractual arborist is able to work with.

The dotted line (Fig: 8) roughly indicates the proposed lower canopy to reduce back to, this to be subject to final practical opinion of the arborist responsible for carrying out the reduction. The yellow circle indicates the hollow and nest of the resident rainbow lorikeets (Fig: 9).

The reduction can be done by hand tools as the tree can be worked well outside of profile. The use of a standard utility hydraulic pole saw is inadvisable due to the small size of the growth points to be reduced to, the cumbersome nature of such equipment for light crown reduction work is in this case likely to damage lower canopy intended for retention.

3.0: Conclusion

With experience of the survivalist nature of gum trees commonly subject to extreme growing conditions and extremes of climate this tree is a good example of a veteran tree, with excellent signs of self optimisation.
Due to the interest with this gum within the Bayliss Street Uniting Church facility (Site Manager Eddie Carleton ph – 3377 9832), the trees habitat status, VTA, and location in relation to HV - retention and risk management is recommended. This is to be achieved with a light crown reduction (5 to 10%) as detailed in the report and VTA Spread sheet (2-11-11 TWG18).
Once the reduction is completed re-assessment five years hence is recommended (2/11/16).

For the sake of the highest level of good quality arboricultural practice, and sound ETS/Energex customer relations I propose ETS arborist and VTA supervisor Will Clegg be on site for the contractual operation on this tree.

Based on the highly compacted surface soil extending throughout the trees root zone recommendations have been given to the UC representative (regarding tree & habitat). It has been advised that a nutrient bed and compatible understory of associate plants be established. This being a means to alleviate soil compaction in the upper soil, restore associate soil biology, oxygen levels and water retention as a means to increasing the grey gums zone for nutrient absorbing roots. Such cultural practice is known to boost tree vitality, extending tree lifespan and long term habitat potential.

It was likewise recommended that BCC be informed with approval sought for such ground works. For the sake of keeping pedestrians out of the trees root zone (proposed nutrient bed) a ring of bollards around the tree was also advised.

Thank you for your attention,

Best regards Cassian Humphreys.

4.0 Background and Methodology for ETS ES Consultancies

The systems/publications for **biochemical & biomechanical appraisal** (for hazard assessment, risk reduction and tree longevity) we utilise are:

- **VTA** (Visual Tree Assessment – Prof. Dr. Claus Mattheck 1994) based on 'The body Language of Trees'. According to VTA the most successful tree is a tree with a chain of links (leaders, branches, trunk collars, trunk, roots etc) each matched equally to the load. VTA is a means to observe, quantify, and record biomechanical constraints and signs of optimisation in trees. Cassian Humphreys has been developing the ETS VTA Tree Assessment Program since 2005.
- **QTRA** (Quantified Tree Risk Assessment) applies established and accepted risk management principles to tree safety management. This system involves calculation and quantification of target, impact potential, (size) and probability of failure. Values derived from the assessment of these components are used to calculate the probability of significant harm occurring.
- An Evaluation of Hazard Trees (ISA – Matheny & Clark 1994).
- Modern Arboriculture and a New Tree Biology by Dr Alex Shigo.
- Plants in Action by Atwell, Kriedmann & Turnbull (Australian Botanists)
- Soil Analysis an Interpretation Manual (ASPAC - The Australian Soil & Plant Analysis Council – CSIRO publication) editors Peverill, Sparrow & Reuter.
- The Soil Food Web – President and founder Dr Elaine Ingham
- Practical Conservation Biology by Lindenmayer & Burgman – for sustainable land management practice.
- References to pruning are taken from the Tree Care Division Target Pruning Manual and are based on AS 4373 – 2007.
- The ETS tree care protocol is based on the ETS Tree Care Management System.
- **Note** in the case of mature trees my VTA assessment involves aerial inspection based on the understanding that it is not always possible to appraise mature trees from the ground.

The tools we use are:

- A Lumix Panasonic with *14 zoom (10 Mega pixels) for photographic documentation.
- A diameter measuring tape which gives an average diameter based on the circumference measurement; measurements are taken from breast height (DBH).
- The Sunto Clinometer, to accurately measure tree height.
- The H/D (height over diameter) measurement tool to gauge stem taper or slenderness (Mattheck), the H/D ratio is based on the Mitchell - Formula.
- The Thor 10 Sounding Hammer for assessing wood resonance.
- A 5mm diameter 480mm Haglof Increment Borer for core sampling
- **Thermal Imaging Camera** – **Thermal Imaging Camera** – Thermal Imaging is currently the most effective technology to support VTA and allows assessment of functional wood present in relation to non-functional or dysfunctional wood. Particularly useful in picking up on mechanical constraint prior to it becoming visual externally. TIC technology associated with the appropriate software is the next evolutionary step in understanding and quantifying the bio-mechanical status of trees.

Where necessary we may recommend the use of such technology (TIC, Resistograph, Air spade, TTA, Ground Penetrating Radar etc) as a means to provide the highest level of service to our clients and the trees we work for.