

## Assessment of Log Belonging to Person X

by Scott Singleton

Member of the Houston Gem & Mineral Society

*Editor's note: This article follows logically from Andy Mortimer's and answers the question "What is petrified wood worth?" The question seems appropriate since petrified wood is common in Texas Gulf Coast Tertiary sediments and is collected by a number of HGMS members.*

**I**ntroduction: This report is being conducted at Person X's request for an assessment and appraisal of a log found just north of Giddings in Lee County, TX in order to determine an estimate of fair market value.

The log was found in an area occupied by the mid-Eocene Yegua Formation (~45 mybp) (Bureau of Economic Geology, 1981). The Yegua Fm in central Texas, including the area containing this log, is known to contain abundant petrified wood, including large logs. It has been reported that most of the wood coming from this formation in this area originates as large logs in the sediments. The wood then weathers and breaks up and is transported via modern day streams and creeks. The large logs that are found were either solid and unfractured to begin with or have been dug up prior to extensive weathering.

### Description of Log

**Characteristics:** The log is tan to brown on the outer, weathered surface (Figures 1 and 2), but beige on the inside (Figure 3). The inside is fairly solid, and cellular preservation is good. The fractures and small cavity at the center probably represent desiccation effects before the wood was fossilized. Over most of the exterior, erosion is mild and the log shows fairly good wood texture. Overall, this piece should make a nice display due to the large size and good wood texture over most of the exterior. However, it is recommended that the log undergo a high pressure wash to remove dirt and lichen prior to any exhibition in order to restore the true color of the wood (note lower portion of log in Figure 1 which was under the soil layer prior to excavation).

**Weight:** The log is approximately eight feet long and is not quite cylindrical because one end is not quite round (a section broken off the trunk) and a bulge in the middle (Figures 1 and 2). Nevertheless, the average diameter is 2.5 feet, 3.5 feet, and 3 feet (from right to left in Figure 1). For approximate calculations, we can round this off to a diameter of approximately three feet. To calculate weight:

$$V = \bar{d}r^2h = (3.14159)(1.5)^2(8) = 56.5487 \text{ ft}^3$$

$$(3.14159)(18)^2(96) = 97716.098 \text{ in}^3$$

Since silica is the main fossilizing substance, we can assume the density of the log approximately equals quartz (2.65 g/cc). Therefore:

$$(97716.098 \text{ in}^3)(16.387 \text{ cc/in}^3)(2.65 \text{ g/cc}) = 4243375.3 \text{ g} \\ = 9355 \text{ lbs} = 4.677 \text{ short tons}$$

This is assuming conversions of 453.592 g/lbs and 2000 lbs/short ton.

Because of the approximate nature of the assumptions that went into these calculations, a reasonable estimate of weight would probably be in the range of four to five tons.

**Wood Anatomy:** A small piece of the log was broken off for microscopic inspection. In cross-section, the wood has diffuse porosity, vessels either solitary (most common) or in radial multiples of 2 to 4, parenchyma in long, wavy tangential lines typically 1–2 cells wide, and rays 1–3 seriate (Figure 4). This piece was not thin sectioned to observe the radial and tangential surfaces as that was not within the scope of this investigation.

However, the combination of characteristics listed above is typical for only one genus in the Texas Gulf Coast Tertiary—*Engelhardioxylon*. Manchester (1983) has described this genus and named it *Engelhardioxylon texana*. Engelhardieae is an extant subfamily of the Juglandaceae (Walnut) whose three genera live in eastern Asia (*Engelhardia*) or Central America (*Oreomunnea* and *Alfaroa*) (Manning, 1978).

*Engelhardioxylon* is common in the mid- and late Eocene of the Texas Gulf Coast.

**Estimation of Value:** Retail value of typical Texas petrified wood (except for palm) is about \$1-2 per pound; however retail value only applies in relatively small amounts. In large quantities, wholesale values typically apply. Wholesale value for Texas petrified woods (except for palm) is typically about \$0.25 per pound. This rate goes down as the volume goes up, particularly for multi-ton lots, and the final price is usually determined by the quality of the wood being offered for sale.

Using the upper limit of value (\$0.25 per pound), the value of this log would be about \$2,000–\$2,500. However this is probably an unrealistically high value because it is a multi-ton lot, and the color of the wood is not remarkable or otherwise extraordinary. A more reasonable estimate of fair market value would probably be closer to about \$1,500.

### References:

Bureau of Economic Geology, 1981, Geologic Atlas of Texas, Austin Sheet (GA0003)

Manchester, S.R., 1983, Fossil wood of the Engelhardieae (Juglandaceae) from the Eocene of North America: *Engelhardioxylon* gen. nov. *Botanical Gazette*, vol. 144(1), pp. 157-163.

Manning, W.E., 1978, The classification within the Juglandaceae. *Annals of the Missouri Botanical Garden*, vol. 65, pp. 1058-1087.

### Appendix 1: Qualifications of Author

[Deleted for this article]

Photos Are by Scott Singleton



Figure 1: Front of log

Figure 2: Back of log



Figure 3: Cross-section of log. Exposure is relatively fresh.

Figure 4: Microphotograph of cross-section. Rays are closely spaced vertical lines, parenchyma are horizontal lines. Magnification is approximately 25x.

