



Epicentre Hunt

Name: _____

THE SCENARIO

While the people in the township and surrounding areas of Quakeville slept, a small earthquake shook the area. The tremor was so small that it was not felt by anyone, but it was recorded by seismometers in the five seismic stations in the area. Locals were wary of the tremor, because in the past, similar small tremors had always been recorded before more intense earthquakes occurring in the same spot.

You have been sent the seismograms from three stations. Can you predict where the epicentre of the next major earthquake may be?

INSTRUCTIONS

First of all, you will need the following:

- Pair of compasses
- Ruler with millimeter intervals marked

Now look at the Quakeville Station seismogram. The arrival of the P waves and the arrival of the S waves have been found and the number of seconds between them has been calculated (each mark represents one tenth of a second - so ten marks is one second).

Do the same procedure for the seismograms from the other four stations.

QUESTIONS

1. What are the differences in arrival time of the P and S waves for each station?

Station	Difference in arrival time between P and S (sec)	Distance from epicentre (km)
a. Quakeville Station	<i>6.0 seconds</i>	<i>53 km</i>
b. Pearsons Crossing Station		
c. Well Station		

2. Using the time/distance graph, calculate the distance of the epicentre from each station.

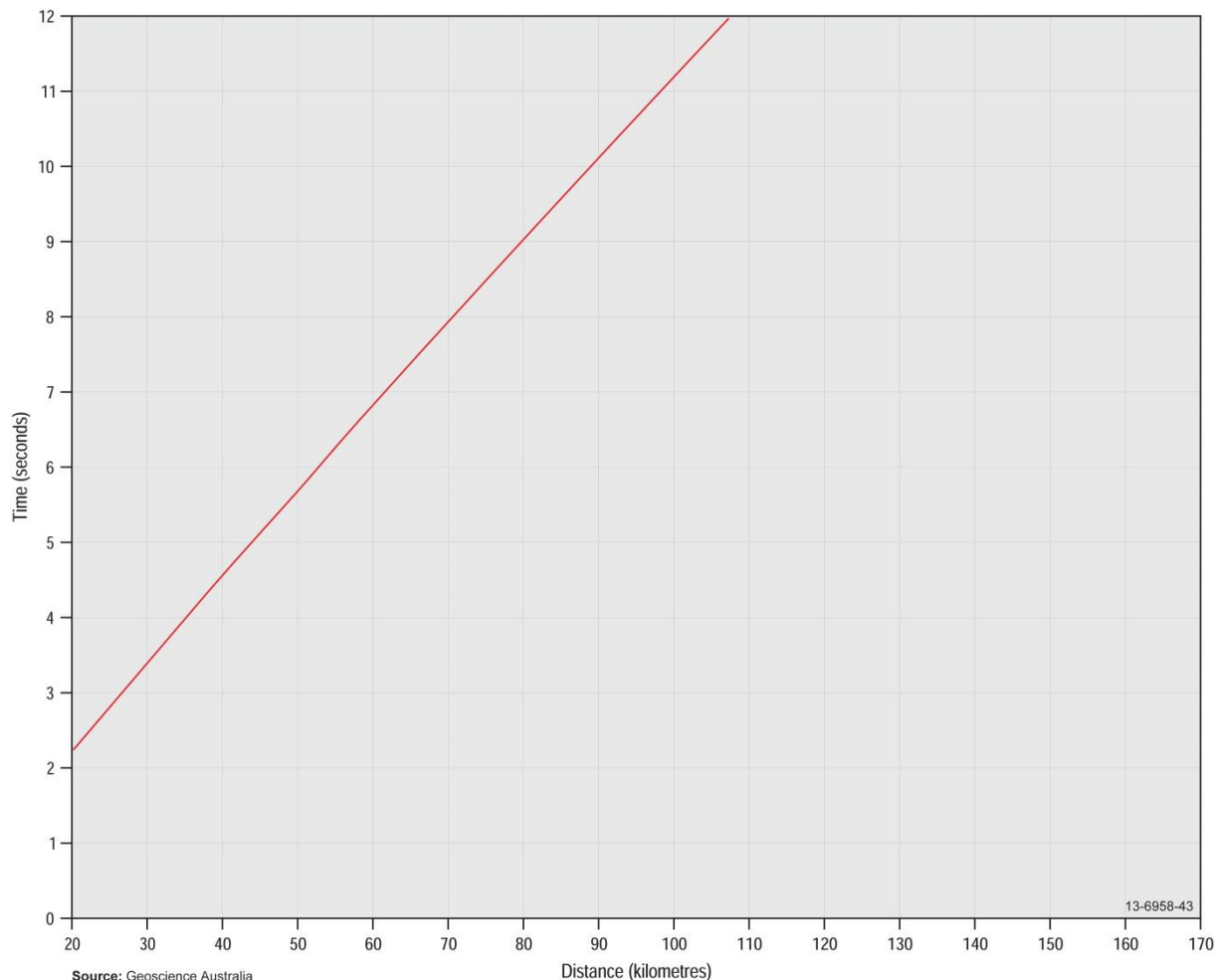
HINT: To calculate the distance find the point on the graph where the line crosses the time for that station. Read straight down for the distance. You can use a ruler and a pencil to get accurate readings. Quakeville Station's distance is 53km. Check to see if you agree.



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3. On the map of the Quakeville Area, use a pair of compasses to draw circles centred at each station. The radius of each circle will represent the distance that station was from the epicentre.
4. Mark an 'X' on the map where the epicentre was located. (Where the three circles overlap.)
5. How many townships or homesteads will be affected if a more intense earthquake follows this tremor? How did you choose these places?



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7. Where possible a seismologist would use as many stations as possible. Two days later you visit the last two stations in the area to obtain the data manually from the seismometers. Repeat steps 1, 2 and 3 for the two new sets of data.

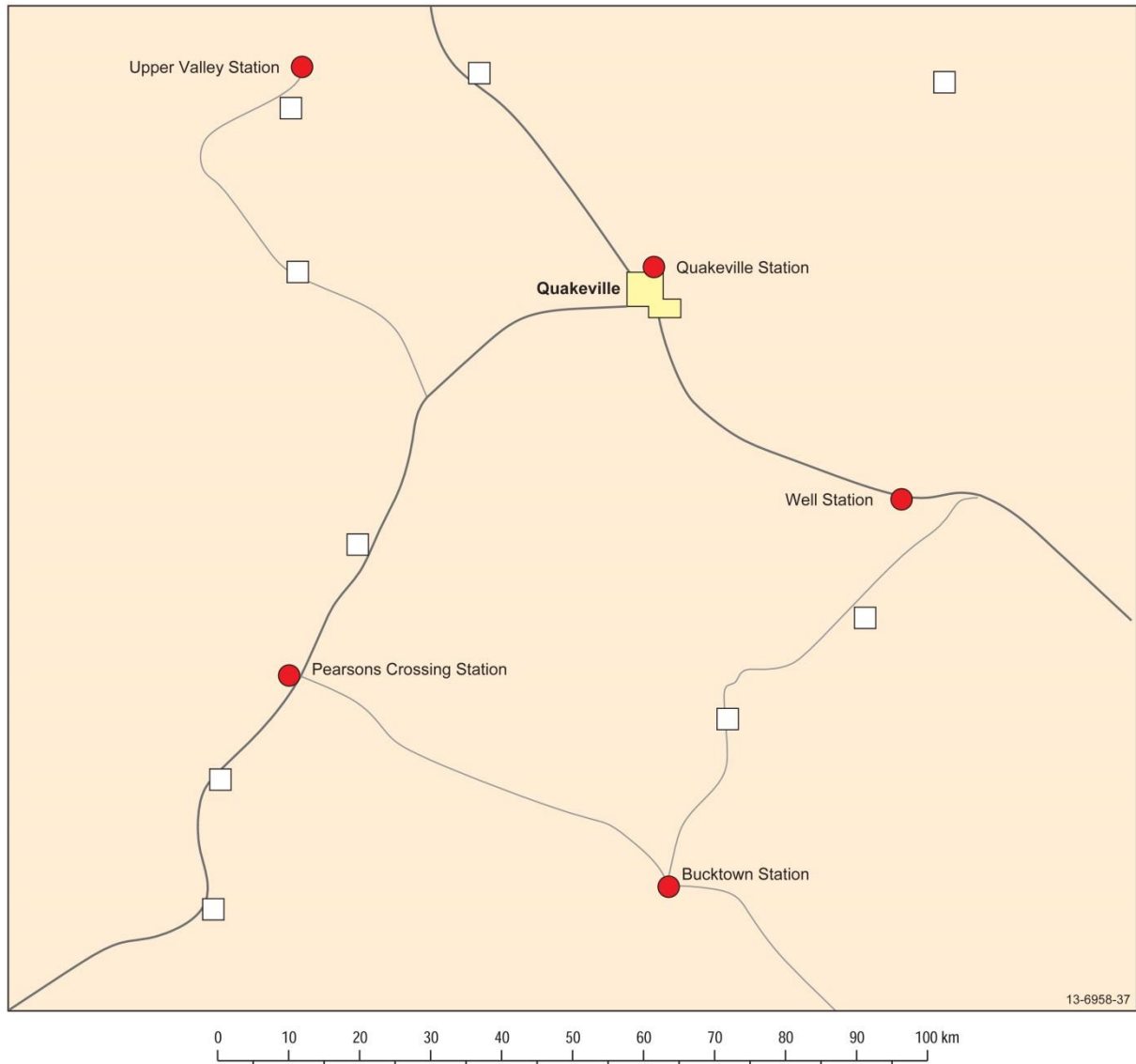
Station	Difference in arrival time between P and S (sec)	Distance from epicentre (km)
d. Upper Valley Station		
e. Bucktown Station		



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QUAKEVILLE AREA SEISMIC STATIONS

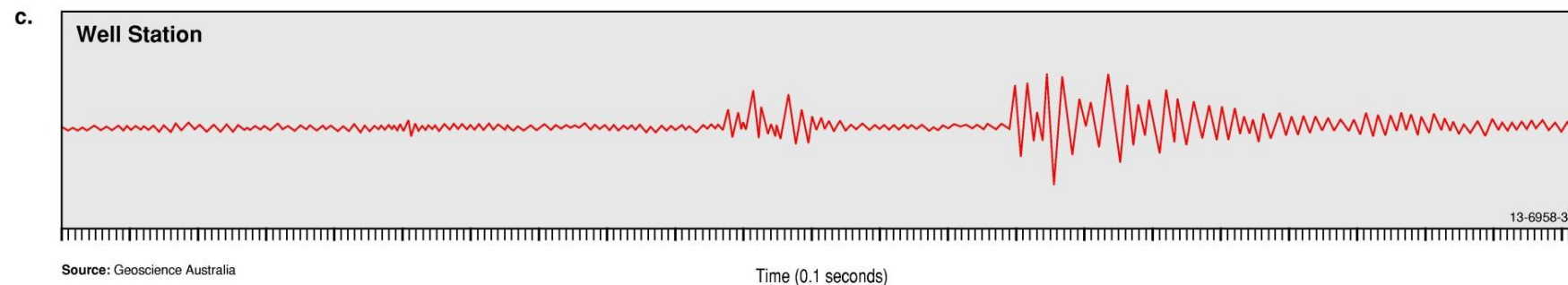
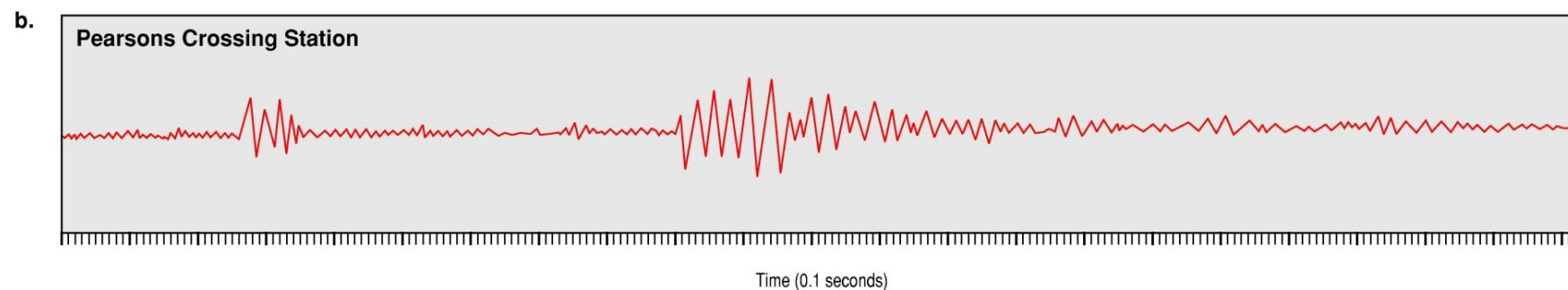
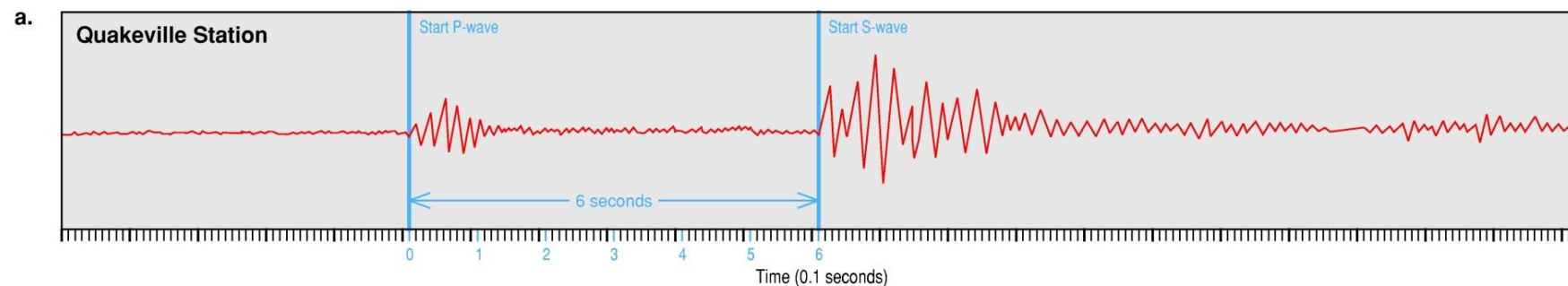


Source: Geoscience Australia



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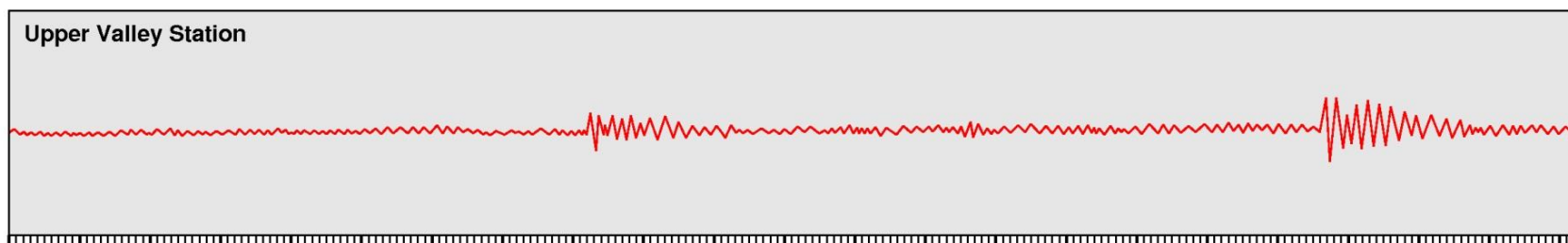
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EXTENSION

d.

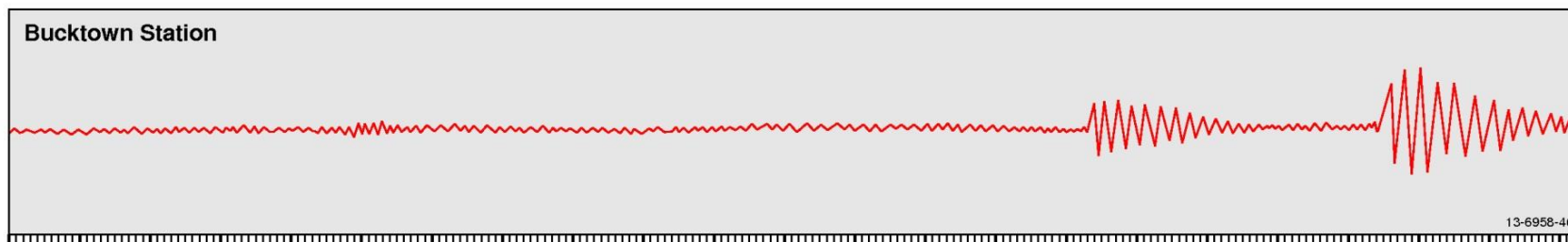
Upper Valley Station



Time (0.1 seconds)

e.

Bucktown Station



13-6958-40

Source: Geoscience Australia

Time (0.1 seconds)