**Laboratory 16 Answer Sheet**

For use with the AGI/NAGT Laboratory Manual in Physical Geology, 11th ed.

**INSTRUCTIONS**

(1) Your responses on this answer sheet must be the result of **your work alone.** This is not a group-work exercise.

(2) This answer sheet with your responses is a **confidential document** that you must not provide to anyone else or to any group file (digital or paper) where others might gain access to the answers.

(3) Before you submit it to your TA for grading, **you must rename this document with your first and last names in the title**. So if the answer sheet was submitted by Emily Dickinson, the document (saved as a Word file) would be renamed Emily-Dickenson-Lab16Answers.docx

(4) Send this form, completed, to your graduate teaching assistant in an email from your Baylor email account. Be certain that the **subject line is your first and last name plus "Lab 8 answers."** So if this answer sheet was submitted by Emily Dickinson, the subject line of the email would be "Emily Dickenson Lab 16 answers." **Include this completed document in the email as an attachment.**

 All Tuesday labs: Zequn Wu Zequn\_Wu1@baylor.edu

 Wednesday 12:20-2:25 lab: Kate Hobart Kate\_Hobart1@baylor.edu

 Wednesday 2:30-4:25 lab: Amanda Wang Zhao\_Wang1@baylor.edu

 All Thursday labs: Sam Barber Samuel\_Barber1@baylor.edu

(5) Wherever you encounter <response> in the raw answer sheet, **replace** <response> **with your answer or response.**

 EXAMPLE

 What is your favorite color? <response> might become

 What is your favorite color? green

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**Your Name:** <response>

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**Activity 16.1 Earthquake Hazards Inquiry**

C-1 Which site has the highest risk of damage during a future earthquake? <response>

Why? <response>

C-2 Which site has the lowest risk of damage during a future earthquake? <response>

Why? <response>

D-1 How does the damage from the Loma Prieta earthquake compare with your risk assessment in question 16.1(C)? <response>

D-2 How do the properties of geologic material on which buildings are constructed influence how much the buildings are shaken in an earthquake? <response>

Suggestions — view the IRIS animations, *Mexico: Earthquakes & Tectonics* (7 min 46 sec.) <https://www.iris.edu/hq/inclass/uploads/videos/A_007_Mexico1984.mp4> and

*Buildings & Bedrock: Effects of Amplification & Liquifaction* (1 min 12 sec.) <https://www.iris.edu/hq/inclass/uploads/videos/A_4D_amplificliquefaction.mp4>

E First proposed action to mitigate damage from a future earthquake: <response>

Second proposed action to mitigate damage from a future earthquake: <response>

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**Activity 16.2 How Seismic Waves Travel Through Earth**

A Why do your points and all the points from other earthquakes occur along three discrete lines or curves? <response>

B Is the P-wave represented by the upper, middle, or lower curve in Figure 16.5? <response>

Same question for the S-wave: upper, middle, or lower curve <response>

Same question for the surface wave: upper, middle, or lower curve <response>

Why is the S-wave curve steeper than the P-wave curve? <response>

C Why do the surface wave data points form a straight line, whereas the P-wave and S-wave data plot along curves? <response>

D How does the S-minus-P time interval change with distance from the epicenter? <response>

E-1 What is the S-minus-P time interval of the earthquake? <response>

E-2 How far was the earthquake epicenter from the Houston seismic station? <response>

F What additional information would you need to determine the location of the earthquake's epicenter on a map? <response>

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**Activity 16.3 Locate the Epicenter of an Earthquake**

A Station 1st P arrival 1st S arrival S-minus-P

 Sitka, AK <response> <response> <response>

 Charlotte, NC <response> <response> <response>

 Honolulu, HI <response> <response> <response>

B Sitka, AK: <response> km

 Charlotte, NC: <response> km

 Honolulu, HI: <response> km

C-1 (This involves drawing intersecting circles on a map, so there is no response on this answer sheet.)

Alternative — use the IRIS Web ap, *Earthquake Triangulation* <https://www.iris.edu/app/triangulation/> that is explained at <https://www.iris.edu/hq/inclass/software-web-app/earthquake_triangulation>

C-2 Approximate epicenter location:

 N Latitude <response> W Longitude <response>

C-3 The major fault that is near this estimated epicenter: <response>

D How could you improve your results? <response>

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**Activity 16.4 San Andreas Fault Analysis at Wallace Creek**

Note: you can download and print a copy of Figure A16.4.1 for use in Activity 16.4 at <http://croninprojects.org/Vince/PhysGeoLab/FigureForActivity16-4.pdf> .

This graphic is © 2017 by Pearson Higher Education and AGI.

A-1 (This involves marking on the map graphic, so there is no response on this answer sheet.)

A-2 Describe the visual evidence on Fig. A16.4.1 that you used to decide where to draw the trace of the fault. <response>

A-3 Is this a right-lateral or left-lateral fault? <response>

B-1 What is the distance or length on Fig. A16.4.1 (in mm) that corresponds to a distance of 200 m in the Wallace Creek area? <response> mm

B-2 The fractional scale of Fig. A16.4.1 is 1: <response>

B-3 ***a*** to ***b*** <response> mm on the map or <response> mm\* in the field

 ***b*** to ***c*** <response> mm on the map or <response> mm\* in the field

 ***c*** to ***d*** <response> mm on the map or <response> mm\* in the field

 ***a*** to ***d*** <response> mm on the map or <response> mm\* in the field

\*The field distance is found by multiplying the map distance by the fractional scale (the answer to B-2 above).

B-4 Span Distance (m)\* Displ Time (yr) Displ Rate (m/yr)

 ***a*** to ***b*** <response> 13,000 - 10,000 = <response> <response>

 ***b*** to ***c*** <response> 10,000 - 3,700 = <response> <response>

 ***c*** to ***d*** <response> 3,700 = <response> <response>

 ***a*** to ***d*** <response> 13,000 = <response> <response>

\*The field distance in meters is found by multiplying the field distance in millimeters (from B-3 above) by 1,000 because there are 1000 mm in 1 m.

C Percentage of Pacific-North American plate motion accommodated by slip along the San Andreas Fault at Wallace Creek: <response>

D What might you do to investigate where the rest of the motion between the Pacific and North American Plates occurs? <response>