

Geological Survey Professional Paper 257-C, p. 131-152.

Zollweg, J.E., 1998, On the use of surface rupture lengths to determine paleoseismic event magnitudes [abs]: *Seismological Research Letters*, v. 69, no. 2, p. 140.

APPENDIX

DESCRIPTION OF GEOLOGIC UNITS EXPOSED IN THE WINTER CANYON AND DEEP CANYON TRENCHES AND THE ROUNDY FARM STREAM CUT

Classification of soil follows the Unified Soil Classification System (USCS) as per American Society for Testing and Materials (ASTM) Standard D2488-93 (Visual-Manual Procedure); for coarse-grained units characteristics apply to the matrix (fine-grained portion). Size ranges are: gravel, 4.75-75 millimeters; sand, 0.075-4.75 millimeters; and fines (clay and silt), less than 0.075 millimeters. Soil characteristics were estimated in the field.

WINTER CANYON TRENCH (PLATE 1A), CLARKSTON FAULT

- UNIT 1 **ALLUVIAL-FAN DEPOSIT** (*matrix to clast supported*) - Well-graded gravel with clay and sand (GW-GC); yellowish brown (10YR 5/4); 65 percent gravel, 25 percent sand, 10 percent fines; maximum clast size 35 cm, clasts subangular to rounded; medium toughness; slow dilatancy; predominantly low dry strength, high dry strength in CaCO₃-cemented layers; crudely bedded with cross-cutting channels; reacts strongly to HCl, stage I-III pedogenic carbonate; upper contact distinct; truncated by degraded-scarp free face.
- UNIT 2 **LOESS** - Clayey sand (SC); brown (7.5YR 5/4); 10 percent gravel, 50 percent sand, 40 percent fines; maximum clast size 10 cm, clasts subangular to subrounded; medium toughness; no to slow dilatancy; medium dry strength; nonstratified; weak reaction to HCl in hanging wall, moderate reaction to HCl in footwall; few roots and abundant animal burrows; paleosol S1 formed on top of unit in hanging wall, soil S2 formed on top of unit in footwall.
- PALEOSOL S1 **SOIL A HORIZON FORMED ON UNIT 2** - Clayey sand (SC); dark brown (10YR 3/3); 10 percent gravel, 50 percent sand, 40 percent fines; maximum clast size 10 cm, clasts subangular to subrounded; medium toughness; no to slow dilatancy; medium dry strength; nonstratified; very weak reaction to HCl; upper contact gradational; organic rich, few roots and abundant animal burrows.
- UNIT 3 (a and b) **FAULT-ZONE MATERIAL AND FAULT-SCARP COLLUVIUM**
3a Shear - Clayey gravel with sand to clayey sand with gravel (GC, SC); brown (10YR 5/3); 40 percent gravel, 40 percent sand, 20 percent fines; maximum clast size 30 cm, clasts subangular to subrounded; low to medium toughness; no to slow dilatancy; low to medium dry strength; crudely bedded, clasts aligned vertically

parallel to fault zone; weak reaction to HCl.

- 3b *Colluvial wedge - Clayey sand with gravel (SC); dark grayish brown (10YR 4/2); 15 percent gravel, 55 percent sand, 30 percent fines; maximum clast size 20 cm, clasts subangular; medium toughness, seems more plastic than unit 2; no to slow dilatancy; low to medium dry strength; nonstratified to crudely bedded, most clasts oriented along the degraded-scarp free face; no reaction to HCl; organic rich, few roots and animal burrows; soil S2 formed on top of unit.*

SOIL S2 **SOIL A HORIZON FORMING ON UNITS 2 AND 3** - *Clayey sand with gravel (SC); dark grayish brown (10YR 4/2); 15 percent gravel, 50 percent sand, 35 percent fines; maximum clast size 10 cm, clasts subangular to subrounded; medium toughness; no to slow dilatancy; low to medium dry strength; nonstratified; no reaction to HCl; organic rich, abundant roots and few animal burrows.*

ROUNDY FARM STREAM-CUT EXPOSURE (PLATE 1B), JUNCTION HILLS FAULT

UNIT 1 **PRE-LAKE BONNEVILLE ALLUVIAL-FAN DEPOSIT** (*matrix supported*) - *Lean clay with sand and gravel (CL); white (10YR 8/2); 10 percent gravel, 10 percent sand, 80 percent fines; clasts appear to have grusified into clay, maximum size and angularity uncertain; medium toughness; no dilatancy; medium dry strength; crudely bedded; reacts moderately with HCl; upper contact distinct, truncated by a degraded-scarp free face and unit 3 in footwall, may be highly weathered bedrock of the Tertiary Salt Lake Formation.*

UNIT 2 **PRE-LAKE BONNEVILLE ALLUVIAL-FAN DEPOSIT** (*matrix supported*) - *Composition varies, but predominantly silty sand with gravel (SM); pale brown (10YR 6/3); 15 percent gravel, 50 percent sand, 35 percent fines, gravel and sand percentages higher in channels; maximum clast size 19 cm, clasts subrounded to rounded; low toughness; rapid dilatancy; low dry strength; crudely bedded with channels, mantles a degraded-scarp free face formed in unit 1, possibly occupied a paleochannel along the base of the scarp; no reaction to HCl; upper contact distinct; truncated by unit 3 in footwall; contains an interbedded weakly developed paleosol A horizon east of the exposure.*

UNIT 3 **LAKE BONNEVILLE TRANSGRESSIVE GRAVEL DEPOSIT** - *Well-graded gravel with sand (GW); light brownish gray (10YR 6/2); 65 percent gravel, 30 percent sand, 5 percent fines; maximum clast size 30 cm, clasts subrounded to rounded; low toughness; rapid dilatancy; no dry strength; well*

bedded; reacts strongly with HCl; upper contact distinct.

- UNIT 4 **LAKE BONNEVILLE TRANSGRESSIVE SAND DEPOSIT** - *Well-graded sand with gravel (SW); light yellowish brown (10YR 6/4); 15 percent gravel, 80 percent sand, 5 percent fines; maximum clast size 2 cm, clasts rounded; low toughness; rapid dilatancy; no dry strength; well bedded; reacts strongly with HCl; upper contact distinct.*
- UNIT 5 **LAKE BONNEVILLE NEARSHORE DEPOSITS** - *Composition varies, interbedded silt, sand, and gravel; lower portion is silt with sand (ML) to silty sand with gravel (SM), 5-15 percent gravel, 15-50 percent sand, 35-80 percent fines, low toughness, rapid dilatancy, low dry strength; upper portion is silt (ML), 5 percent gravel, 10 percent sand, 85 percent fines, low toughness, slow dilatancy, low dry strength; light gray (10YR 7/2); maximum clast size 6 cm, clasts rounded; well bedded; reacts strongly with HCl; contains ostracods and few animal burrows, paleosol S1 formed on top of unit, upper portion truncated by plowed-horizon soil (unit 7S).*
- PALEOSOL S1 **WEAKLY DEVELOPED SOIL A HORIZON FORMED ON UNIT 5**
- *Silt (ML); light brownish gray (2.5Y 6/2); 5 percent gravel, 10 percent sand, 85 percent fines; maximum clast size 2 cm, clasts subrounded to rounded; low toughness; slow dilatancy; low dry strength; nonstratified; reacts strongly with HCl; upper contact distinct; few roots and animal burrows, truncated to west by plowed-horizon soil (unit 7S).*
- UNIT 6 (a, b, and c) **FAULT-ZONE MATERIAL AND FAULT-SCARP COLLUVIUM**
- 6a *Sheared material from units 1 through 5.*
- 6b *Colluvial wedge - Sandy elastic silt with gravel (MH); brown (10YR 5/3); 15 percent gravel, 30 percent sand, 55 percent fines; medium toughness; slow dilatancy; low dry strength; maximum clast size 2 cm, clasts subangular to subrounded; nonstratified; reacts strongly with HCl; upper contact distinct to gradational; few roots and animal burrows, upper portion truncated by plowed-horizon soil (unit 7S).*
- 6c *Fissure fill - Same description as unit 6b.*
- UNIT 7S **PLOWED ZONE AND SOIL A HORIZON** - *Sandy silt with gravel (ML); dark grayish brown (10YR 4/2); 20 percent gravel, 30 percent sand, 50 percent fines; low to medium toughness; slow dilatancy; no dry strength; maximum clast size 20 cm, clasts angular to subrounded; nonstratified; reacts moderately with HCl; organic-rich plowed soil for a wheat field, abundant roots.*