Supplementary Information S04:

Appendix A: Stratigraphic description of excavation walls

	Description	thickness (cm)
Unit 1	Fluvial gravel deposit, mainly subrounded granule, angular pebble and cobble sized clasts (<8 cm), some sand, minor silt, poorly sorted. Clast supported, with clasts of chert, siltstone, argillite and shale belonging to the Silurian Fourmile Formation (Gilluly and Masursky, 1965). Bedding defined by discontinuous, very thin bedded granule horizons, and some silt-rich gravel horizons. Randomly oriented, partial carbonate coating on some clasts in middle and upper portion, and fresh incipient carbonate coating on clast undersides near bottom of unit, which also exhibits sulfuric smell and green-blue color when moist. Upper contact is gradational with the overlying incipient soil developed on the Hf3 surface. The base of this unit is an erosional unconformity in the upper portion and conformable in the lower portion of the section.	50-200
Unit 2	Sandy-loam deposit, strongly effervescent, wet cohesion is sticky, slightly plastic (Birkeland, 2000), contains small grains of gold, with rare granules and pebbles near N end of exposed section, gravel content is << 5% where unit is >3-4 cm thick, but is up to 30% where the loam deposit is thinner. Samples: AF10, 35, 15, and 28.	0-10
Unit 3	Colluvial gravel deposit, clasts typically range in size from 1 – 7	0 - 30

	cm, dominantly 1 – 3 cm in diameter, with some silt and sand, upper portion poorly sorted, lower portion well sorted; matrix somewhateffervescent. Best exposed in upper excavation wall, where base of unit 3 is formed by imbricated, clast-supported debris facies, which pinches out northwards. The upper portion consists of small pebbles (1-3 cm) in a matrix of yellowish brown, silty sand. Upper contact with unit 1 is partly erosional, and with unit 2 is sharp. Samples: AF21, 23, 24, 25, 26, and 29.	
Unit 4a	Paleosol (Av), consists of sandy, loamy, and vesicular silty portions, discontinuous along excavation, not plastic and not cohesive when dry. Contains abundant yellow pebble-sized clay nodules, which appear to be weathered clasts. Upper contact is sharp, lower contact with unit 4b is gradational. Contains abundant charcoal and in an situ fire ring (Sample AF 5).	0-10
Unit 4b	Fluvial gravel, well stratified with alternating layers of dominantly granule and small pebble clasts, some coarse sand, within a silty matrix. Top portion is poorly stratified, bioturbated and dust infiltrated. Upper and lower contacts are gradational.	10-40
Unit 5	Debris flow deposit, coarse gravel, clasts up to 10 cm, very poorly sorted, matrix is dust-infiltrated and contains lenses of very light brown to white carbonate-rich silt. Larger clasts (<20%) are often rounded and commonly consist of felsic intrusives, smaller clasts (c. 80%) are angular and typically consist of local bedrock, including chert, siltstone, argillite and shale. Base is an erosional unconformity, deposit fills channels up to 30 cm deep. Sample	0-25

	AF77.	
Unit 6	Fluvial gravel, with sheet flood deposits, consists of up to three fining upward sequences of discontinuous layers of coarse pebble (up to 20 cm thick), layers of granular sand (3-5 cm thick), and lenses of silty gravel. Unit is well layered, locally well sorted, and contains little carbonate.. Pebble-clast layers are up to 20 cm thick and several m long, with a matrix of coarse sand. The granular sand lenses are 3-5 cm thick and continuous for 50 –100 cm. The lower portion consists of a single, thick, upward-fining gravel layer, which locally fills channels and is capped by a thin carbonate- and silt-rich gravel horizon. The lower contact is clear in such channels, and gradational between channels.	70-110
Unit 7	Alluvial gravel deposit, gravel and coarse sand, with silt lenses, gravel relatively well sorted and stratified, traceable for several meters, channel cut and fill, clasts ranging from < 1 to 15 cm. Upper section consists of alternating gravel (3 –4 cm size) and coarse sand layers and contains abundant, thick (5 – 20 cm) carbonate-richsilty layers with abrupt lateral terminations. Silty layers have a vesicular texture, and contain up to 30% pebbles. Lower portion is well sorted and consists of alternating layers of pebbles and granules up to 15 cm thick. Upper contact is defined as unconformity at the base of unit 6. Lower contact is defined as the first gravel unit (base of channel) above the uppermost silt layer 8.	50->110
Unit 8	Fluvial gravel deposit, with continuous silt-rich layers and well	100-200

(upper)	sorted, alternatiing angular pebble streaks and subrounded granules. The silt-rich layers, 10 – 30 cm thick, are rich in carbonate and charcoal, contain some pebbles, and form good marker horizons. Gravel and granule horizons separate the silt layers, but their matrix also consists of silt. The lower contact is poorly exposed, but probably gradational with underlying units, which although silty do not contain silt-rich layers. The upper contact is an erosional unconformity.	
(middle)	Silty alluvial gravel, Similar to upper unit 8, but fewer continuous silt-rich layers. Clasts 0.5 – 3 cm in size in silty, carbonate-rich matrix, poorly sorted. Contains sample AF 41. Gradational upper and lower contacts.	0 - > 50
(lower)	Alluvial gravel, clast supported, grain size ranging from 1 to 10 cm, minor silt and carbonate components in matrix. however coarser layers are well hardened. Upper portion consists of a few thin (< 10 cm) streaky layers of carbonate-rich silt in matrix. Base is not exposed in excavation.	> 100, base not exposed