Geologic Map of the Mayfield Area, Ada and Elmore Counties, Idaho

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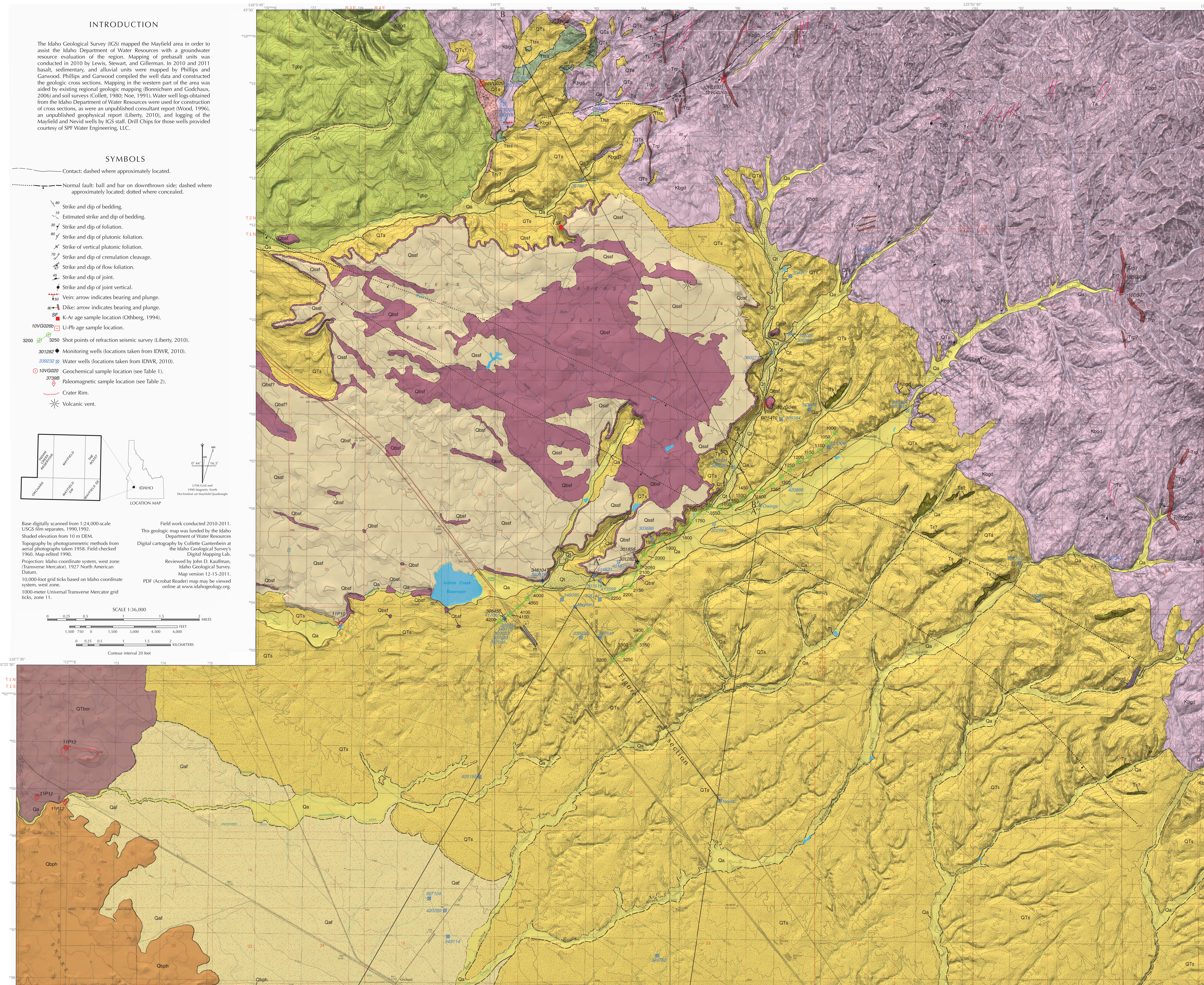
INTRODUCTION

The Idaho Geological Survey (IGS) mapped the Mayfield area in order to assist the Idaho Department of Water Resources with a groundwater resource evaluation of the region. Mapping of prebasalt units was conducted in 2010 by Lewis, Stewart, and Gillerman. In 2010 and 2011 basalt, sedimentary, and alluvial units were mapped by Phillips and Garwood. Phillips and Garwood compiled the well data and constructed the geologic cross sections. Mapping in the western part of the area was aided by existing regional geologic mapping (Bonnichsen and Godchaux, 2006) and soil surveys (Collett, 1980; Noe, 1991). Water well logs obtained from the Idaho Department of Water Resources were used for construction of cross sections, as were an unpublished consultant report (Wood, 1996), an unpublished geophysical report (Liberty, 2010), and logging of the Mayfield and Nevid wells by IGS staff. Drill Chips for those wells provided courtesy of SPF Water Engineering, LLC.

SYMBOLS

- Contact: dashed where approximately located.
- Normal fault: ball and bar on downthrown side; dashed where approximately located; dotted where concealed.
- 80 Strike and dip of bedding.
- 15 Estimated strike and dip of bedding.
- 30 Strike and dip of foliation.
- 80 Strike and dip of plutonic foliation.
- Strike of vertical plutonic foliation.
- 70 Strike and dip of crenulation cleavage.
- 47 Strike and dip of flow foliation.
- 45 Strike and dip of joint.
- Strike and dip of joint vertical.
- 50 Vein: arrow indicates bearing and plunge.
- 80 Dike: arrow indicates bearing and plunge.
- SF K-Ar age sample location (Othberg, 1994).
- 10VG026b U-Pb age sample location.
- 3200 3250 Shot points of refraction seismic survey (Liberty, 2010).
- 301282 Monitoring wells (locations taken from IDWR, 2010).
- 339232 Water wells (locations taken from IDWR, 2010).
- 10VG020 Geochemical sample location (see Table 1).
- 3739B Paleomagnetic sample location (see Table 2).
- Crater Rim.
- Volcanic vent.

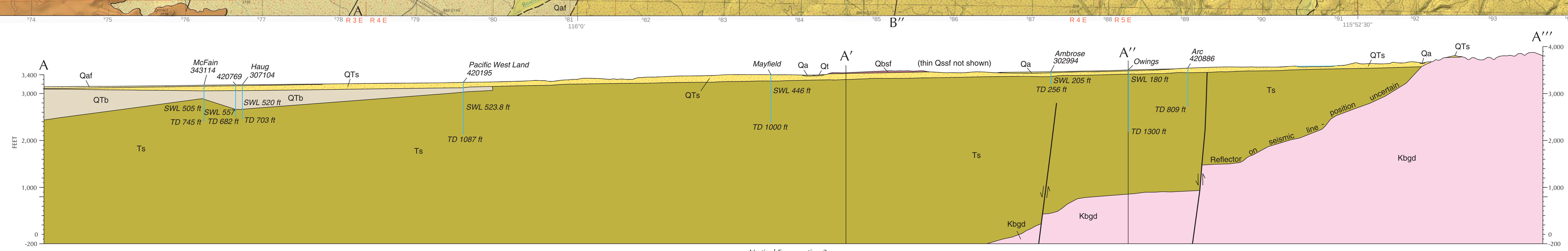


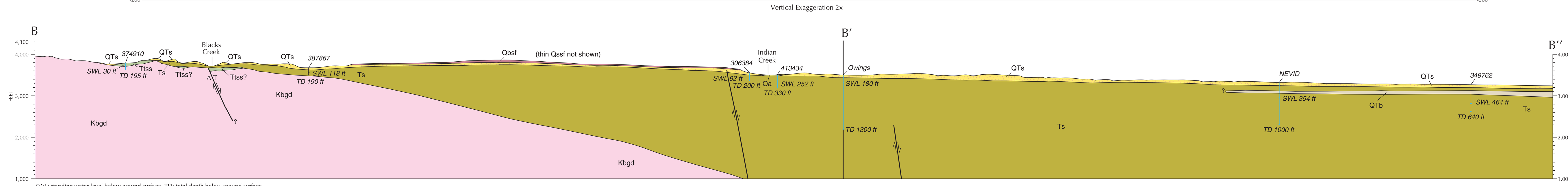
Base digitally scanned from 1:24,000-scale USGS film separates, 1996/1992. Shaded elevation from 10 m DEM. Topography by photogrammetric methods from aerial photographs taken 1958. Field checked 1960. Map edited 1960. Projection: Idaho coordinate system, west zone (Transverse Mercator). 1927 North American Datum. 10,000-foot grid ticks based on Idaho coordinate system, west zone. 1000-meter Universal Transverse Mercator grid ticks, zone 11.

Field work conducted 2010-2011. This geologic map was funded by the Idaho Department of Water Resources. Digital cartography by Collette Gantenbein at the Idaho Geological Survey's Digital Mapping Lab. Reviewed by John D. Kauffman, Idaho Geological Survey. Map version 12-15-2011. PDF (Acrobat Reader) map may be viewed online at www.idahogeology.org.

SCALE 1:36,000

Contour interval 20 feet

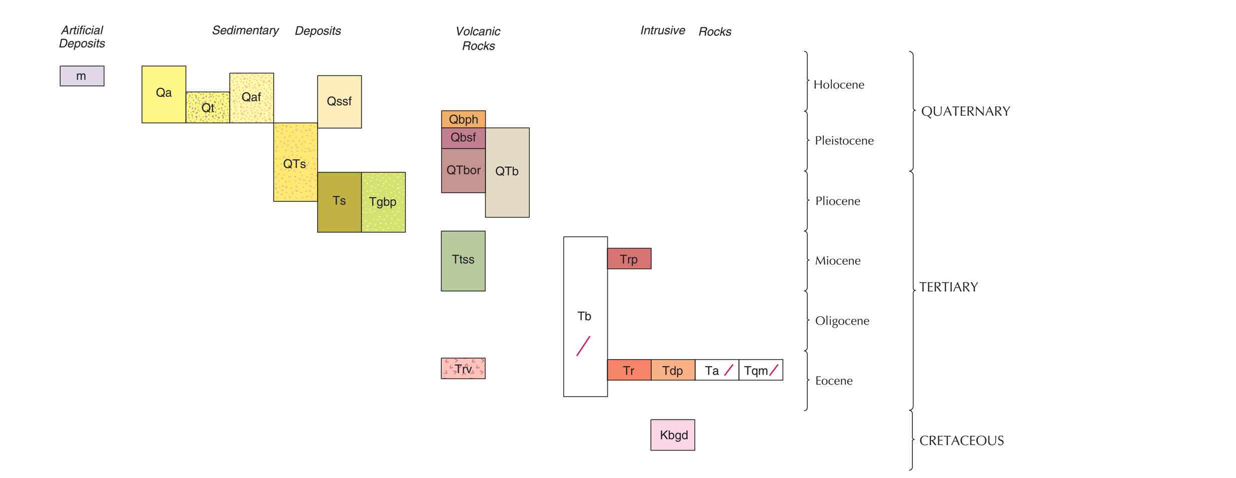




SWL: standing water level below ground surface. TD: total depth below ground surface.
Water wells shown with Idaho Department of Water Resources WellID number. Water well logs can be found at http://www.idwr.idaho.gov/apps/appsWell/RelatedDocs.asp?WellID=xxxxxx where "xxxxxx" is WellID number.

Vertical Exaggeration 2x

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

Mineral modifiers are listed in order of increasing abundance. Grain size classification of unconsolidated and consolidated sediment is based on the Wentworth scale (Lane, 1947).

ARTIFICAL UNITS

m **Artificial fill (Holocene)**—Engineered fill along Interstate 84 and small man-made dams.

SEDIMENTARY DEPOSITS

Qa **Alluvium of side streams and main streams (Holocene)**—Light yellowish gray to white arkosic sand, granules, and sandy silt. Faintly bedded to well bedded with discontinuous sand and granule beds, and local crossbeds. Granules are composed of subangular quartz and orthoclase derived from veins or pegmatitic granitic rocks. Streams near contacts with granitic bedrock contain cobbles and boulders of rhyolite porphyry (unit *Trp*) and other dike rocks, and biotite granodiorite (unit *Kbgd*). On main streams, floodplains are broad and aggraded with shallow braided channels. Side streams mostly consist of flat-topped fills incised by steep-walled channels as deep as 2 m (7 ft). Thickness varies from <1 m to 2.5 m (3 to 8.2 ft).

Qaf **Alluvial fan deposits (Holocene - late Pleistocene)**—Light brown arkosic sand, granules, and silt, locally capped with reddish-brown montmorillonitic clay. Thickness is at least 0.8 m (2.7 ft). Forms a gently southwest dipping surface with very low relief. Where not disturbed by agriculture, small braided channels are present. Generally overlies a carbonate-silica duripan developed in arkosic sediments probably correlative with *QTs*. Separated from unit *QTs* by <1.5 m (<5 ft) scarp, and from unit *Qa* by absence of slightly incised, active stream channel. Formed by the deposition of alluvium ponded against lava flows of units *QTbor* and *Qbph*.

Qt **Fill terraces (Holocene - late Pleistocene)**—Arkosic sand, granules and lesser cobbles along Indian and Slaters Flat creeks. Cobbles and granules of basalt and rhyolite porphyry locally present. Surfaces are nearly flat and cut by steep-sided channels containing presently active streams. Capped by 20-50 cm (8-20 in) of weakly developed silty soils with thin Bt and Bw horizons. Thickness less than 2 m (6 ft).

Qssf **Sediments of Slaters Flat (Pleistocene)**—Arkosic sand and granules, reworked loess, and cobbles of basalt of Slaters Flat (unit *Qbsf*). Light brown, crudely stratified colluvium and alluvial fan deposits. Derived from loess, weathered basalt, and arkosic alluvium transported onto the Slaters Flat volcano by streams. Forms small alluvial fans, patchy alluvium along intermittent streams, and small mounds and stripes of probable periglacial origin. Thickness ranges from <1 m (3 ft) to as much as 10 m (30 ft).

QTs **Sediments (Pleistocene to Pliocene)**—Arkosic, brown to yellow or reddish brown, coarse sand and granules with lesser cobbles, finer sand, and silt. Granules are mostly subangular quartz and orthoclase derived from veins or pegmatitic granitic rocks. Sands are subangular to subrounded, with quartz, orthoclase, plagioclase, biotite, muscovite, and mafic minerals. Stratification ranges from faint (where unit appears similar to decomposed granitic rock) to discontinuous medium-thick parallel bedding with local crossbedding. Soils consist of white carbonate-silica duripan with veins and plates, overlain locally by reddish brown argillic (Bt) horizon, and a light brown silt layer with minor soil development. Angular chips of broken duripan commonly litter surfaces. Exposures are generally poor, particularly in the south part of the map where depth of incision is less than 1 m (3 ft). Thickness ranges from 2 to 30 m (6.5 to 100 ft). Thickness is unclear because water well logs do not distinguish between this unit and underlying fluvial-lacustrine deposits with similar lithologies. Near contacts with granitic bedrock, unit is locally capped with subrounded cobbles and boulders as long as 1 m (3 ft), composed of medium gray dike rocks (units *Trp* and *Tr*) and lesser granodiorite. The degree of rounding and number of clasts suggests transport by a stream of greater power than modern streams. Alternatively, some clasts may be weathered core stones transported by hillslope processes from nearby outcrops with resistant lithologies. Also contained with this unit are patchy deposits of cobbles and boulders on granitic bedrock.

Several lines of evidence suggest that the sandy deposits are predominantly dissected fluvial-lacustrine sediments covered with a thin veneer of hillslope and fan deposits rather than thick alluvial fan deposits: 1) the maximum elevation of the deposits of ~1160 m (~3800 ft) corresponds to the maximum level of Lake Idaho (Wood and Clemens, 2002); 2) water wells and isolated outcrops of unit *Ts* indicate that the sands are underlain by thick fluvial-lacustrine deposits; 3) the deposits generally thin against a granitic bedrock pediment rather than originating at an apex headed in a stream, as is mostly the case with alluvial fans; 4) the deposits form landforms of similar appearing age (based on soil development and degree of dissection) rather than consisting of multiple surfaces with different ages as is common with alluvial fans.

Ts **Stratified sand and very fine gravels (Pliocene?)**—Medium- to coarse-grained sand, granules, and sandy silt. Yellow to yellow-white, with patchy reddish brown secondary staining. Clearly stratified with parallel beds on scale of 15-60 cm (6-24 in) that are traceable for more than 30 m (100 ft) at outcrop. Granules and coarse sands are subangular and poorly sorted. Rare granules and coarse sands are coated with carbonate-silica to form oolites (Wood, 1996). Mostly weakly consolidated to loose; some beds partly cemented with silica (not reactive to HCl). Medium-grained sands are preferentially dug by burrowing mammals to form mounds of loose yellowish sand. Poorly exposed. Best exposures are in the headwaters of Bowns Creek (sec. 28, T. 1 N., R. 6 E.) where sands are overlain by rounded cobbles and boulders of locally derived rhyolitic porphyry and granodiorite. May also include *QTb* at depth.

Tgbp **Gravels of Bonneville Point (Pliocene)**—Yellow-orange to red-brown, well-rounded, pebble and cobble gravel, pebbly sand, and sand with buried soils. Deeply weathered with many granitic cobbles crumbly to point of disintegration. Has the greatest accumulation of pedogenic clay and silica of any gravel in the Boise area (Othberg, 1994). Capped with patterned ground soil mounds 10-15 m (33-50 ft) in diameter. Thickness about 152 m (500 ft). Consists of channel alluvium of ancestral Boise River (Othberg and Stanford, 1992).

VOLCANIC ROCKS

Qbph **Basalt of Higby Cave (Pleistocene)**—Medium gray diktytaxitic basalt with abundant light brown olivine phenocrysts and glomerocrysts 1-5 mm in length. Where exposed at railroad cut in sec. 8, T. 1 S., R. 5 E., consists of single flow, vesicular with blocky cooling columns ~ 90 cm (36 in) wide. Loess cover is <1 m (<3 ft) and discontinuous. Pedogenic carbonate-silica coatings are present but not a well-developed duripan. Forms hummocky landscape with numerous closed depressions and isolated hills. Erupted from Flagstaff Butte (sec. 6, T. 2 S., R. 3 E.). Undated. A late to middle Pleistocene age is suggested by thin loess cover, moderate development of a K soil horizon, and lack of significant vesicle fillings or weathering. Named by Bonnichsen and Godchaux (2006) for lava tube contained within the flow in sec. 32, T. 1 S., R. 3 E. Magnetic polarity is normal. See Table 1 for geochemical analysis and Table 2 for paleomagnetic data.

Qbsf **Basalt of Slaters Flat (Pleistocene)**—Medium gray, dark brown weathering, interstitial to diktytaxitic basalt. Contains sparse feldspar megacrysts 3-10 mm long and abundant glomerophenocrysts of olivine and plagioclase 1-3 mm in diameter. Consists of a single flow 6-9 m (20-30 ft) thick with crude colonnade structure. Typically exposed along cliffs with a blocky talus. Vent is a low shield (sec. 2, T. 1 N., R. 4 E.). Vent area lacks exposed cinder or scoria. Dated by K-Ar methods at 0.907 ± 0.280 Ma (Othberg, 1994, p. 13; Othberg and others, 1995). Normal magnetic polarity. At quarry in sec. 12, T. 1 N., R. 4 E., flow lies over reddish orange (baked?) silt and is capped by about 1 m (3 ft) of brown basaltic tuff and gray silt. White carbonate-silica duripan is developed on the silt. Unit flowed southwestward for at least 14.5 km (9 mi) from the vent to near Indian Creek Reservoir. Quarried for crushed rock and riprap. Geochemically distinctive with TiO_2 concentrations approaching 4 percent (Table 1). Outcrops in sec. 26, T. 1 N., R. 3 E. were mapped by Bonnichsen and Godchaux (2006) as "basalt of Indian Creek" but are tentatively correlated with this unit. See Table 1 for geochemical analysis and Table 2 for paleomagnetic data.

QTbor **Basalt of Orchard Ranch (Pleistocene-Pliocene?)**—Light to medium gray diktytaxitic basalt with sparse olivine phenocrysts 1-1.5 mm and groundmass plagioclase and olivine 0.25-0.5 mm. Most vent samples are weathered with vesicles partially filled with brown or white secondary noncarbonate minerals. Erupted from vent in secs. 4 and 9, T. 1 S., R. 3 E. that is elongated 100°-280° with small crater depression open to the south. No cinders or scoria were located in vent area. Covered with thick loess-derived soils in most places, forming much smoother landform than adjacent lava flow (unit *Qbph*). Best exposed in railroad cuts in sec. 8, T. 1 S., R. 3 E. where carbonate-silica duripan 1.5-2 m (5-7 ft) thick is present on top of basalt. Normal magnetic polarity Undated. Pliocene age seems most likely based on thick duripan and loess cover. Named by Bonnichsen and Godchaux (2006). See Table 1 for geochemical analysis and Table 2 for paleomagnetic data.

QTb **Unnamed basalt(s) (Pleistocene-Pliocene?)**—Basalt encountered in water wells and shown in cross sections; source and age uncertain.

Ttss **Tuff and sandstone (Miocene?)**—Brown to olive brown to orange clastic rock, typically with poorly defined bedding from centimeter-scale to as much as 1 m thick. Clasts typically a few millimeters to a few centimeters across, but includes larger (as much as 20 cm) clasts as well. Well indurated and overall mafic composition, with minimal quartz grains and locally abundant black basaltic glass grains and vesicular palagonitized glass. Most clasts appear to be basaltic and many are glassy and vesicular. Locally contains chalcedony veins 0.5-1.5 cm in width. In thin section, grains of both isotropic mafic black glass (tachylite) and translucent brown sideromelane are present, along with intact glass shards and some lithics of plagioclase-olivine(?) phyric basalt and sparse (<10 percent) granodiorite and detrital quartz. Both field and microscopic evidence suggests phreatomagmatic (magma interaction with water) deposition with little reworking. Vent unknown. The Mayfield and Nevid wells (Figure 1) have local horizons with similar lithologies, and a "basalt volcanic assemblage" with "tuff and volcaniclastic units" is present near Lucky Peak Dam (Othberg and Stanford, 1992; secs. 11, 12, and 13, T. 2 N., R. 3 E.) but direct correlations are uncertain.

Trv **Rhyolitic volcanic rocks (Eocene)**—Massive white to light tan, aphyric, devitrified rhyolite. Local hint of layering in northernmost exposures. Rhyolite from road cut exposure along Blacks Creek Road (sec. 29, T. 2 N., R. 4 E.) contains radiating microspherulites with sector twinning, possibly due to tridymite (high temperature quartz). Euhedral potassium feldspar crystals core the spherulites, which lie within a matrix of 10 percent muscovite (?) and likely devitirified glass. Textures are interpreted as evidence of rapid emplacement and quenching, possibly in a water-rich environment. A sample from this road cut (10VG020) yielded a $^{206}Pb/^{238}U$ age on zircons of 45.176 ± 0.016 Ma (Figure 2), which is interpreted as the eruption and depositional age of the volcanic rock, thus correlating the unit with Eocene dikes and Challis volcanic rocks elsewhere in Idaho.

INTRUSIVE ROCKS

Tb **Basalt dikes (Tertiary)**—Dark greenish gray, aphyric basalt in a single dike at the north map boundary.

Trp **Porphyritic rhyolite dikes (Miocene)**—Brownish gray, porphyritic rhyolite in dikes 5-30 m (15-100 ft) in width, forming prominent outcrops. Abundant and relatively large (~0.5 cm) phenocrysts of plagioclase feldspar typically show reaction rims and many are embayed. Subordinate embayed quartz phenocrysts occur locally. Groundmass is largely potassium feldspar and plagioclase. Although all appear to be rhyolite, chemical data indicate a broad compositional variation (Table 1). The dikes contain abundant microspherulites with opaque microlites and minor fine-grained brown biotite. Samples from the eastern part of the map north of Bowns Creek contain corroded potassium feldspar and quartz phenocrysts with local breccia textures and lithic xenoliths. Strike lengths of the *Trp* dikes are notably longer than other dike types and orientation is typically north-south rather than northeast. Dikes show columnar joints perpendicular to their near vertical, north-south trend. Glassy margins in field and devitrified glass apparent in thin section suggest rapid cooling in near-surface emplacement. The porphyritic rhyolite dikes crosscut the Eocene dikes. Sample 10VG026, a dike exposed along Blacks Creek Road (sec. 26, T. 2 N., R. 4 E) yielded a $^{206}Pb/^{238}U$ age on zircons of 14.346 ± 0.014 Ma (Figure 3).

Tr **Rhyolite dikes (Eocene)**—Light gray to tan, sparsely porphyritic rhyolite in dikes <5 m (<15 ft) in width. Small (<2 mm) phenocrysts of quartz and feldspar are set in an aphanitic groundmass. Locally silicified. Orientation is typically northeast.

Tdp **Porphyritic dacite dikes (Eocene)**—Greenish gray, highly porphyritic dacite dikes <5 m (< 15 ft) in width. Orientation is typically northeast.

Ta **Andesite dikes (Eocene)**—Dark greenish gray, sparsely porphyritic andesite dikes <5 m (< 15 ft) in width. Orientation is typically northeast.

Tqm **Quartz monzonite dike (Eocene)**—Dark gray, fine-grained, biotite-hornblende quartz monzonite. Single dike mapped northeast of Thomson Ranch. Orientation uncertain because of poor exposure.

Kbgd **Biotite granodiorite (Cretaceous)**—Light gray, equigranular, medium-grained, biotite granodiorite to granite. Locally contains one percent or less muscovite and trace amounts of garnet.

STRUCTURE

NORTHEAST-TRENDING FAULTS

The drainage of Blacks Creek is controlled by an east-northeast-striking fault. This fault is characterized by brittle deformation and may control and offset the east-west, south-dipping vein mineralization at the Golden Eagle mine near the western map boundary (sec. 29, T. 2 N., R. 4 E.). The fault offsets two *Trp* dikes in an apparent right-lateral sense. Another fault with similar strike is present east of Pole Gulch at the north map boundary. It too appears to be associated with vein mineralization. The southwest extent of this fault is uncertain because of poor exposure. The northeast orientation of the East Fork of Slater Creek and of Indian Creek is suggestive of similar structures, but no definitive surface evidence for faulting was observed in these drainages.

BOISE FRONT FAULT SYSTEM

The Boise Front fault system was mapped by Witkind (1975) in the Mayfield area as a down-to-the-southwest normal fault separating plutonic and volcanic rocks of the Danskin Mountains from sediments in the Western Snake River Plain. Othberg (1994, p. 21) suggested that the Basalt of Slaters Flat erupted from a vent on a fracture system associated with this fault. Our mapping did not reveal any direct evidence for a structure in the location proposed by Witkind (1975). This may reflect generally poor exposure conditions, or indicate that the fault is either not present or that most movement predates units *Qbsf* and *QTs*. However, a reflection seismic survey (Liberty, 2010) from the Ada County line to near the Mayfield townsite located two down-to-the-southwest normal faults (L.M. Liberty, written communication, 2011). These faults truncate a prominent reflector interpreted to be the contact between granitic rocks and Tertiary sediments. The amount and timing of offset on the faults is poorly constrained by the seismic survey because shallow reflectors are discontinuous as a result of laterally changing stratigraphy within Quaternary-Tertiary sediments. Pleistocene offset of units *Qbsf* and *QTs* is suggested by geomorphic lineaments locally present along the projected surface trace of the northern of the two faults. Further work is needed to fully document these structures.

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ACKNOWLEDGMENTS

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Table 1. Major oxide and trace element chemistry of samples collected in the Mayfield Area.

Sample number	Latitude	Longitude	Lab	Comment	Map unit	SiO_2	TiO_2	Al_2O_3	FeO*	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	Sum
11P10	43.3830	-116.0405	BSU	basalt of Slaters Flat; weathered	Qbsf	43.00	3.60	14.07	15.85	0.24	6.68	9.87	2.31	0.27	0.71	96.61
BP5410	43.4248	-115.9296	BSU	basalt of Slaters Flat from quarry; unweathered	Qbsf	45.80	3.54	13.94	15.73	0.23	6.72	9.68	2.52	0.62	0.70	99.50
10VG046	43.4252	-115.9282	BSU	basalt of Slaters Flat from quarry	Qbsf	42.76	3.63	13.28	16.07	0.24	6.49	9.74	2.47	0.61	0.75	96.03
11P13	43.3592	-116.1121	BSU	basalt of Orchard Ranch	QTbor	46.68	1.76	15.64	10.29	0.18	7.80	12.29	2.41	0.77	0.35	98.17
11P11	43.3498	-116.1196	BSU	basalt of Orchard Ranch from RR cut; unweathered	QTbor	48.11	1.91	16.51	11.13	0.19	8.25	10.82	2.67	0.81	0.35	100.74
11P12	43.3489	-116.1124	BSU	basalt of Higby Cave in contact with (overlying) QTbor	Qbph	48.71	2.11	16.88	10.69	0.18	6.71	9.19	3.42	1.90	0.55	100.34
10VG020	43.4860	-116.0035	BSU	rhyolite tuff(?) from roadcut (Eocene, 45.18 ± 0.02 Ma)	Trv	74.91	0.12	13.08	0.42	0.01	0.19	0.11	3.17	4.98	0.06	97.06
10VG026b	43.4868	-115.9401	BSU	Porphyritic rhyolite dike (Miocene, 14.35 ± 0.01 Ma)	Trp	76.46	0.70	13.43	3.62	0.04	0.67	1.85	3.17	4.63	0.20	104.76
10RL837	43.4869	-115.9401	WSU	Porphyritic rhyolite dike; same locality as 10VG026b	Trp	69.13	0.73	13.26	3.82	0.05	0.61	1.77	3.23	4.44	0.19	97.23
10DS07	43.4465	-115.8361	BSU	porphyritic rhyolite dike	Trp	71.71	0.31	11.94	2.29	0.03	0.29	1.18	2.54	5.22	0.08	95.59
10DS07R	43.4465	-115.8361	BSU	as above; duplicate analysis	Trp	72.69	0.31	11.95	2.28	0.03	0.29	1.18	2.52	5.18	0.08	96.50
10RL839	43.4044	-115.8235	WSU	porphyritic rhyolite dike	Trp	71.29	0.42	12.68	3.04	0.04	0.49	1.12	2.79	5.41	0.07	97.35

Major elements in weight percent (above); trace elements in parts per million (below).

Sample number	Sc	V	Cr	Ni	Cu	Zn	Rb	Sr	Y	Zr	Nb	Sn	Cs	Ba	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf	Ta	Pb	Th	U
11P10	33.3	359	127	60.0	24.1	167	1.5	343	48.3	328	34.6	1.4	0.03	691	37.8	83.3	10.6	45.8	9.92	3.39	10.5	1.54	8.83	1.73	4.68	0.67	4.06	0.58	6.87	1.83	6.41	1.20	0.51
BP5410	32.5	359	145	63.3	34.0	165	7.6	347	47.1	325	33.7	1.5	0.1	441	37.0	79.9	10.3	43.7	9.63	3.28	10.1	1.48	8.46	1.67	4.56	0.64	3.91	0.58	6.57	1.75	5.87	1.16	0.38
10VG046	33.6	363	138	59.5	29.8	159	7.3	340	49.8	317	39.7	1.7	0.1	438	38.5	84.1	10.3	45.0	10.0	3.41	10.2	1.58	8.88	1.78	4.67	0.67	3.99	0.59	7.25	1.89	5.33	1.29	0.43
11P13	32.2	263	234	91.8	45.9	90.4	12.2	335	25.7	128	17.8	1.0	0.1	434	13.7	31.0	4.18	18.8	4.41	1.57	4.79	0.75	4.48	0.9	2.55	0.37	2.37	0.34	2.98	1.02	2.08	0.93	0.33
11P11	33.5	271	238	99.0	42.6	96.3	14.7	332	27.6	140	20.0	1.1	0.14	320	14.7	33.5	4.56	20.4	4.87	1.72	5.12	0.81	4.89	0.99	2.78	0.42	2.59	0.38	3.33	1.14	2.20	0.98	0.25
11P12	26.9	222	114	81.5	47.0	88.4	41.8	478	28.4	201	53.9	1.5	0.76	541	27.3	56.5	6.87	27.9	5.71	1.89	5.62	0.84	4.99	1.01	2.82	0.42	2.65	0.39	4.29	3.02	2.90	2.73	0.9
10VG020	3.3	2.5	0.8	6.7	0.2	33.7	177	26.6	22.7	151	76.6	2.2	1.08	158	34.8	69.1	7.34	23.6	4.67	0.28	3.79	0.66	3.91	0.81	2.30	0.35	2.19	0.32	5.83	3.72	12.4	26.3	5.08
10VG026b	9.6	55.0	4.4	8.5	6.1	74.0	164	229	29.2	274	23.5	3.0	3.25	1575	60.6	115	11.9	42.2	7.56	1.39	6.29	0.91	4.97	1.01	2.76	0.41	2.46	0.36	7.46	1.39	29.9	25.7	5.14
10RL837	10.0	55.0	6.0	5.0	4.0	63.0	151	221	28.0	276	20.8	na	na	1369	58	110	na	43	na	na	na	na	na	na	na	na	na	na	na	na	27	24	6
10DS07	6.3	7.5	1.0	6.8	3.0	59.6	196	68.3	44.4	381	36.9	5.1	2.21	1159	74.9	141	15.1	53.7	9.94	1.16	8.72	1.40	8.11	1.66	4.61	0.7	4.36	0.64	11.3	2.09	28.9	29.2	6.61
10DS07R	6.1	7.5	1.1	7.2	4.2	59.0	194	67.9	44.8	388	36.9	5.3	2.17	1161	75.1	142	15.2	54.0	9.94	1.17	8.62	1.38	8.13	1.66	4.61	0.71	4.41	0.65	11.6	2.12	29.1	29.4	6.66
10RL839	6.0	25.0	17.0	9.0	8.0	60.0	179	72.0	52.0	425	31.7	na	na	1195	72	137	na	53	na	na	na	na	na	na	na	na	na	na	na	na	27	28	6

FeO* is total iron as FeO
Labs: BSU = Boise State University (ICP-MS analyses); WSU = Washington State University (XRF analyses)

Table 2. Paleomagnetic data for basalt samples from the Mayfield area.

Sample number	Unit name	Latitude	Longitude	n	D	I	α_{95}	κ	R	Polarity	Demag. level (mT)
11P10	Qbsf	43.3830	-116.0405	8	341.3	55.0	2.7	411.8	7.983	N	60
SF*	Qbsf	43.4590	-115.9822	7	340.5	61.6	3.0	401.0	6.990	N	nr
11P11	QTbor	43.3498	-116.1196	8	343.4	56.6	2.0	745.7	7.991	N	60
11P13	QTbor	43.3592	-116.1121	8	345.6	52.6	2.8	390.6	7.982	N	60
11P12	Qbph	43.3489	-116.1124	7	358.5	58.6	1.9	1011.7	6.994	N	60

mT = milliTesla (1 mT = 10 oersted); nr = not recorded
n = number of oriented cores.
D = site mean declination of remnant magnetism in degrees east of north.
I = site mean inclination of remnant magnetism in degrees with respect to horizontal.
κ95 = confidence limit for the mean direction at the 95% level.
κ = precision parameter.
R = resultant vector.
Polarity N = normal polarity; R = reversed polarity.
Analysis performed at IGS Paleomagnetism Lab except SF measured at USGS-Flagstaff
*Analysis from Othberg and others, 1995

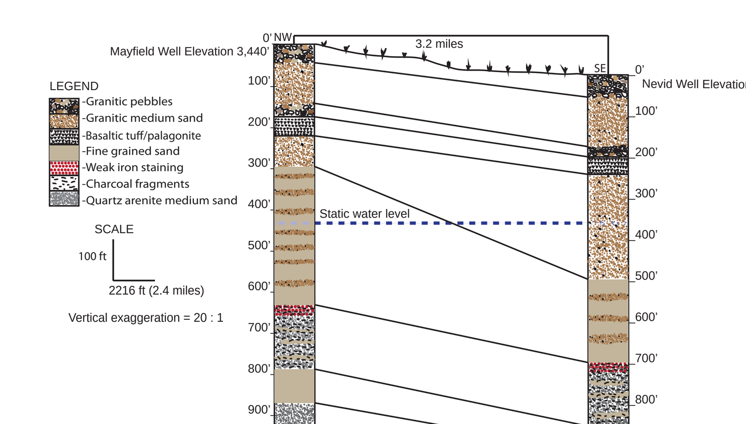

Figure 1. Correlation of lithologies between the Mayfield well (sec. 28, T. 1 N., R. 4 E.) and the Nevid well (sec. 11, T. 1 S., R. 4 E.) based upon well cuttings. Logging was conducted by Skye Cooley, Kerrie Weppner, and Virginia Gillerman. Correlations were made by V.S. Gillerman and K. Weppner and drafting by K. Weppner.

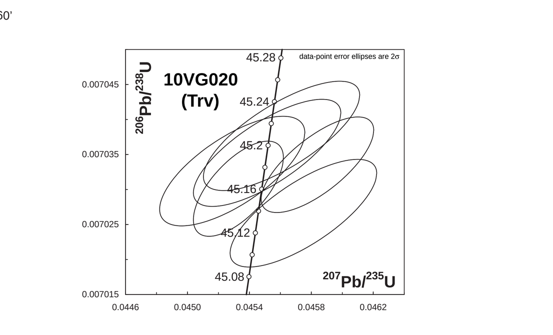

Figure 2. U-Pb concordia diagram for zircons from sample 10VG020 (Trv). This sample yielded a $^{206}Pb/^{238}U$ age of 45.176 ± 0.016 Ma (2σ error) that is interpreted as the eruption and depositional age of the volcanic rock. Analysis by Boise State University Isotope Geology Laboratory.

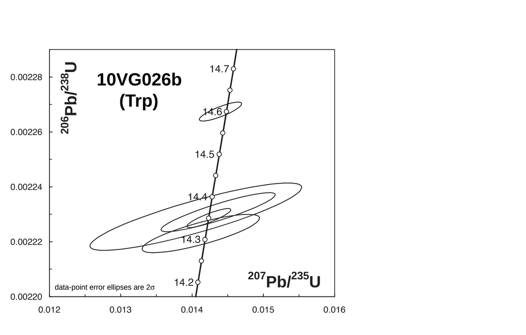

Figure 3. U-Pb concordia diagram for zircons from sample 10VG026 (Trp). This sample yielded a $^{206}Pb/^{238}U$ age of 14.346 ± 0.014 Ma (2σ error), which is interpreted as the igneous crystallization age of the quickly cooled dike. Analysis by Boise State University Isotope Geology Laboratory.

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