MOSCOW-BOISE-POCATELLO Geologic Map of the Trout Peak Quadrangle, Bonner County, Idaho Disclaimer: This Digital Web Map is an informal report and may be revised and formally published at a later time. Its content and format may not conform to agency standards. Compiled and Mapped by Reed S. Lewis, Roy M. Breckenridge, Mark D. McFaddan, and Russell F. Burmester CORRELATION OF MAP UNITS Glacial and Flood Related Tggd Tpd TKI_ Proterozoic INTRODUCTION SYMBOLS BELT-PURCELL SUPERGROUP Geology depicted on this 1:24,000-scale Trout Peak 7 1/2' quadrangle is Contact: line showing the boundary between one map unit based partly on previous mapping of the Elmira 15' quadrangle by Harrison **Prichard Formation (Middle Proterozoic)**—White to gray siltite, white to gray and another; dashed where approximate. The location and Schmidt (1971). The area was remapped at a larger scale primarily to to black argillite and white to gray fine feldspathic to coarser feldspar-poor accuracy of contact is 80 feet or more on the ground. show glacial and flood-related deposits that record Quaternary events. In quartzite. Siltite typically rusty weathering and planar laminated with black addition, we remapped the bedrock during two weeks of field work in 2004 argillite caps, some with white argillite caps. Rusty nature comes from h-angle fault: ball and bar indicates downthrown side of to subdivide the Prichard Formation. Most visual differences from previous abundant sulfides, commonly pyrrhotite. Average quartzite has 21 per cent a normal fault; dashed where approximately located; mapping are attributable to assignment of bedrock and surficial deposits to feldspar (Cressman, 1985) and is lighter weathering in decimeter beds. Bar dotted where concealed. more units and to the more detailed topography of the 1:24,000 scale base. code-like patterns formed by varying carbonaceous content of siltite persist - 14 Strike and dip of bedding. Substantive differences result from the application of Cressman's (1985) over 100 kilometers (Huebschman, 1973). These "marker beds" were used subdivisions of the Prichard Formation to the Ypl (lower Prichard) unit of Strike of vertical bedding by Cominco for correlation across large areas (Hamilton and others, 2000). Harrison and Schmidt (1971), recognition of single differentiated sills rather Harrison and Schmidt (1971) did not subdivide the Prichard Formation and Strike and dip of bedding, ball indicates bedding known to than separate Kgd "layers", removal of the sill "swarm" on Grief Mountain, Cominco only subdivided it down to the Sullivan mine horizon (Ype). Unit and recognition of plutonic Tertiary exposures in Highway 200 roadcuts on designations for the lower part of the Prichard Formation found in the Trout Horizontal bedding. the west side of Kirby Mountain. Peak area follow subdivision of Cressman (1985) from near Plains, Montana, about 90 km to the southeast. This is somewhat speculative because Cressman Strike and dip of overturned bedding. The oldest and most abundant rocks in the Trout Peak quadrangle are low (1989) used a different scheme for more quartzitic rocks north of Coeur Variable strike and dip of bedding. metamorphic grade metasedimentary rocks of the Prichard Formation of the d'Alene than in the Plains area. However, the general pattern of alternating Proterozoic Belt-Purcell Supergroup. These rocks host penecontemporaneous fine/thin and coarse/thick sequences appears to be consistent with those in Approximate strike and dip of bedding. mafic sills. A pluton of Cretaceous age also is present within the Belt the Plains area and with the subdivisions of Finch and Baldwin (1984). Supergroup. Tertiary intrusions occur in both as dikes. The quadrangle was Strike and dip of foliation. glaciated by the Purcell Trench Lobe of the Cordilleran ice sheet which Prichard Formation, member e (Middle Proterozoic)—Light gray to white \$ 80 Strike and dip of mylonitic foliation. dammed the Clark Fork drainage south and east of the quadrangle and weathering siltite and quartzite and darker argillite. Decimeter siltite dominates formed glacial Lake Missoula. Ice filled the Trout Creek basin with ground Strike and dip of cleavage. over very feldspathic quartzite, but both exhibit features of current traction moraine and crossed divides into the Trestle Creek drainage. Small alpine such as rippled tops and ripple cross lamination. Soft-sediment deformation Vertical cleavage. valley glaciers occupied the high cirques in the upper Trestle Creek drainage features common; locally abundant cm-scale load casts and ball and pillow Bearing and plunge of small fold axis. after the Purcell Trench Lobe retreated about 12,000 years ago. structures. Quartzite and siltite commonly parallel-laminated to structureless; Bearing and plunge of recumbent small fold. rare trough to low angle cross bedding. Some quartzite beds coarser grained and less feldspathic than typical of the Prichard. Two samples from the Hope Bearing and plunge of crenulation lineation. DESCRIPTION OF MAP UNITS quadrangle to the south lacked K-spar and have approximately 5 percent Bearing and plunge of asymmetrical small fold showing plagioclase. These are poorly sorted but contain very well-rounded, medium counterclockwise rotation viewed down plunge. Intrusive rocks are classified according to IUGS nomenclature using normalized sand-sized quartz grains. Top not exposed in the map area but to the east values of modal quartz (Q), alkali feldspar (A) and plagioclase (P) on a ternary is placed above highest zone of quartzite with abundant current features diagram (Streckeisen, 1976). Mineral modifiers are listed in order of increasing Quartz vein: Arrow indicates dip. and below thick section of uniformly parallel laminated rusty weathering abundance for both igneous and metaigneous rocks. Grain size classification siltite. Quartzite-rich sections commonly form clear ribs and talus slopes. of unconsolidated and consolidated sediment is based on the Wentworth Thickness approximately 700 m (2300 feet excluding 300 m of sills). Cressman scale (Wentworth, 1922). Bedding thickness and lamination type are after (1985) reported 825 m (2700 feet), excluding sills, near Plains, Montana. McKee and Weir (1963) and Winston (1986). Soil series are after Weisel and Prichard Formation, member d (Middle Proterozoic)—Laminated light gray siltite and dark gray argillite. Most lamination on order of cm and uneven but there are abundant intervals of mm even parallel laminated to MAN-MADE DEPOSITS microlaminated, rusty weathering, dark gray to white siltite and dark gray argillite couplets. Less common are scattered intervals a few m in thickness Made land (historical)—Highway and railway fills along SH 200 and in Pend of white, very fine- to fine-grained quartzite in rarely amalgamated beds or Oreille Lake and Pack River delta. dm white, rusty-weathering siltite. Exposure generally poor and discontinuous, Direction of ice flow through gap. with quartzite commonly over-represented in float. Upper contact placed ALLUVIAL AND LACUSTRINE DEPOSITS at lowest occurrence of current laminated siltite and quartzite in the interval Crest of moraine or debris flow levee. occupied by one or more thick, differentiated sills. In the Plains area, member Alluvial fan deposits (Holocene)—Mixed pebble to cobble gravel deposited as d is 280 m (920 feet) of platy weathering olive-gray silty argillite (Cressman, fans at the mouths of local drainages. Mostly subangular to angular platy 1985). Here it is estimated to be approximately 330 m (1100 feet) thick. clasts derived locally from the Belt-Purcell Supergroup and glacial deposits on steep slopes. Soils mainly of the Colburn, Pend Oreille, and Bonners Prichard Formation, member c (Middle Proterozoic)—Light-weathering series. Thickness 1-10 m (3-33 feet). quartzite and darker siltite within uneven laminated, rusty weathering, dark Bathymetric contours in feet. Based on lake elevation of 2048 feet. From Coast and Geodetic Survey Provisional Chart, gray siltite and argillite couplets. Fine-grained to rare medium-grained Alluvium and deltaic deposits of the Pack River (Holocene- Pleistocene) quartzite is similar to that of Ype, occuring in thinner packages scattered Pend Oreille Lake, 1950. Current lake elevation is 2062 Interbedded alluvium at the mouth of the Pack River and its delta in Pend throughout the unit. Some preserve ripples and cross lamination, coarser Oreille Lake. Consists of soft clayey silt; at depth is locally underlain by late grains at bases and gradation to siltite at the top. Feldspar content varies, glacial outwash, till, or Missoula Flood deposits. The pattern designates the ranging from 5-25 percent. Plagioclase more abundant than potassium distribution of the unit prior to construction of Albeni Falls Dam. Thickens feldspar; the latter is lacking in many of the samples collected. Some quickly into Pend Oreille Lake to many meters. Soils include Cape Horn potassium feldspar may be secondary. Rare quartzite beds to 2 m thick with and Hoodoo series. Dash pattern indicates the location of submerged Qad. grains up to granule size in 20 cm basal lags comprise the matrix of associated rare, decimeter thick intraclast conglomerate beds at a few horizons. Intraclasts GLACIAL AND FLOOD-RELATED DEPOSITS are up to 5 cm long and 3 cm thick, commonly deformed and arranged roughly parallel to bedding. Intraclast lithologies in decreasing order of Qgu Glacial deposits, undivided (Pleistocene)—Gravel, sand, and silt deposits of till abundance include black argillite, mm laminated siltite and argillite, and and associated proglacial outwash and glacial sediments. Unstratified to coarse sand. Circular brown spots up to 6 cm diameter with alteration "halos" poorly bedded, unsorted to moderately sorted. Mostly isolated remnants of to softball size probably represent original localization of magnesium REFERENCES moraines and kame terraces, preserved on slopes along valley sides and in carbonate. Hosts one or two undifferentiated sills. Quartzite well exposed smaller tributaries. May include some interbedded lake sediments. On steep locally where it holds up ridge tops, and locally on steep slopes; finer-grained Anderson, D. and T. Höy, 2000, Fragmental sedimentary rocks, Aldredge unstable slopes may be remobilized bymass movements. Soils mainly silt parts of unit exposed best near quartzite, especially on ridges. Top placed Formation, Purcell Supergroup, British Columbia: Chapter 14 in The Geological loam of the Pend Oreille series. Thickness several to tens of meters. above set of quartzite beds and below thick interval of more evenly laminated Environment of the Sullivan Deposit, British Columbia, J.W. Lydon, T. Höy, siltite and argillite. Thickness estimated at 1030 m (3400 feet) including sills. J.F. Slack and M.E. Knapp, eds.: Geological Association of Canada, Mineral Till deposits, undivided (Pleistocene)—Dense clayey pebble and cobble till with In the Plains area, member c is only 75-110 m (250-360 feet) of very fine-Deposits Division, Special Publication No. 1, p. 302-321. Anderson, H.E., and D.W. Davis, 1995, U-Pb geochronology of the Moyie Sills, grained argillitic quartzite and intercalated siltite and argillite (Cressman, local boulders deposited by the Purcell Trench Lobe of the Cordilleran Ice Purcell Supergroup, southeastern British Columbia: implications for the 1985). The much greater thickness in the Trout Peak quadrangle is either a sheet. Poorly stratified compact basal till includes ground moraine and some Mesoproterozoic geological history of the Purcell (Belt) Basin: Canadian interbedded. proglacial deposits. Extensive deposit occupies the Trout Creek result of thickening a wedge of quartzite westward, or, less likely, inclusion Journal of Earth Sciences, v. 32, no. 8, p. 1180-1193. of rocks mapped as members a and b at Plains in member c on this map. ice basin including kame terraces along the south margin. Soils include silt Anderson, H.E., and W.D. Goodfellow, 2000, Geochemistry and isotopic loams and gravelly silt loams of the Pend Oreille and Vay-Ardtoo series **Prichard Formation, members a and b (Middle Proterozoic)**—Even parallel geochemistry of the Moyie Sills: implications for the early tectonic setting (Weisel and others, 1982). Thickness varies; may exceed 50 m (160 feet). laminated, rusty weathering, dark gray siltite and argillite couplets, siltite, of the Mesoproterozoic Purcell Basin: Chapter 17 in The Geological and rare lighter quartzite. Couplets typically not graded and less than one Environment of the Sullivan Deposit, British Columbia, J.W. Lydon, T. Höy, INTRUSIVE ROCKS cm thick; argillite tops locally light weathering. Siltite layers both cm- and J.F. Slack and M.E. Knapp, eds.: Geological Association of Canada, Mineral dm-scale, typically dark gray, some weathering light gray. Light gray to white Deposits Division, Special Publication No. 1, p. 302-321. Porphyritic dacite dikes (Tertiary-Eocene)—Biotite dacite dikes, porphyritic to weathering quartzite as isolated dm-scale beds and dm- to rare m-scale beds Bishop, D.T., 1976, Petrology and geochemistry of the Purcell sills, Boundary microporphyritic, with blocky phenocrysts of feldspar up to 3 cm and biotite County, Idaho and adjacent areas: University of Idaho Ph.D. thesis, 147 p. amalgamated up to several meters thick more common toward top. Intimately phenocrysts to 5 mm. Commonly light gray, resistant, and forms cliffs and associated with Ypm; whether slump folds (scattered orientations and lack Cressman, E.R., 1985, The Prichard Formation of the lower part of the Belt talus slopes. Some appear to continue for 100 to 1000 m but most are not Supergroup, Proterozoic Y, near Plains, Sanders County, Montana: U.S. axial plane cleavage), convolute bedding and intraformational conglomerate exposed continuously enough to demonstrate this. Concentrated in an of contorted, irregular clasts are typical of the lower part of *Ypab* or mark Geological Survey Bulletin 1553, 64 p. approximately 1 km wide swath trending 340 degrees in the western part Cressman, E.R., 1989, Reconnaissance stratigraphy of the Prichard Formation a transition between *Ypab* and *Ypm* is unknown. Cleavage moderately well of the map over the western part of Kirby Mountain. A dike swarm at the (Middle Proterozoic) and the early development of the Belt Basin, Washington, to poorly developed inconsistently across the area suggests local rather than intersection of Highway 200 and Trout Creek Road just off the map to the Idaho, and Montana: U.S. Geological Survey Professional Paper 1490, 80 p. regional influence. Hosts Moyie sills that range from tabular with differentiated Doughty, P.T., and R.A. Price, 2000, Geology of the Purcell Trench rift valley west and the pronounced magnetic anomaly (see discussion under *Tggd*) tops to irregular with no differentiation. Well but discontinuously exposed suggest that under the area there may be a Tertiary pluton formed by and Sandpoint Conglomerate: Eocene en echelon normal faulting and synrift on steep slopes and ridge tops. Top placed at base of section of relatively sedimentation along the eastern flank of the Priest River metamorphic amalgamation of *Tpd* dikes (e.g., Glazner and others, 2004). abundant m-thick quartzite that contains coarse-quartz grains and preserves complex, northern Idaho: Geological Society of America Bulletin, v. 112, ripples and cross lamintion. In the Plains area, members b and a are about Hornblende-biotite granodiorite (Eocene)—Medium-grained, equigranular, no. 9, p. 1356-1374. 1600 m of interlaminated siltite and argillite with possibly one quartzite hornblende-biotite granodiorite in a single large dike (or small stock?) at the Fillipone, J.A., 1993, Tectonic and thermochronologic evolution of the Cabinet interval; a mafic sill was used to divide b from a (Cressman, 1985). The west edge of map. Biotite content about 5 percent and hornblende 3 percent. and Selkirk Mountains, northwest Montana and northern Idaho: University base is not exposed either place. Abundant magnetite. Plagioclase is pinkish gray, in contrast to the white of California, Los Angeles, Ph.D. thesis, 341 p. plagioclase in Kbgd. Alkali feldspar is perthitic. Chemically similar to Tpd Fillipone, J.A., and An Yin, 1994, Age and regional tectonic implications of Late Prichard Formation, massive unit (Middle Proterozoic)—Structureless, (Table 1). Probably represents the plutonic equivalent of the *Tpd* dikes as Cretaceous thrusting and Eocene extension, Cabinet Mountains, northwest poorly sorted quartzite and siltite that superficially resemble fine-grained the only difference is textural. Larger body at depth likely, and, if present, Montana and northern Idaho: Geological Society of America Bulletin, v. granodiorite. Found in the area only as irregularly shaped bodies within may be responsible for the pronounced aeromagnetic high centered on the 106, p. 1017-1032. Ypab. Associated with mafic sills and layered rock with soft sediment Finch, J.C., and D.O. Baldwin, 1984, Stratigraphy of the Prichard Formation, west side of Kirby Mountain in the northeast corner of sec. 5, T. 57 N., R. deformation and slump folds that range at least up to tens of m wavelength; Belt Supergroup: in Hobbs, S.W., ed., The Belt, Montana Bureau of Mines 1 E. reported by Kleinikopf and others (1972). has indistinct contacts with both. Locally contains 5 percent clasts of and Geology Special Publication 90, p. 5-7. laminated siltite and agillite a few cm thick and up to 30 cm long, and less Lamprophyre dikes (Cretaceous or Eocene)—Dark gray dikes with biotite Glazner, A.F., J.M. Bartley, D.S. Coleman, W. Gray and R.Z. Taylor, 2004, Are commonly quartzite balls or blocks. Clasts commonly have apparent reaction phenocrysts. Abundant potassium feldspar and calcite in groundmass. Quartz plutons assembled over millions of years by amalgamation from small magma rims and some appear deformed. Weathers more rusty than quartzite of *Ype* chambers?: GSA Today, v. 14, n. 4/5, p. 4-11. or *Ypc*. Generally hardest rock of the Prichard Formation, forming rounded Gorton, M.P., E.S. Schandl, and T. Höy, 2000, Mineralogy and geochemistry of exposures and large blocky talus. Granofels texture with fine biotite and **Kbgd Biotite granodiorite (Cretaceous)**—Coarse-grained biotite granodiorite. Variably the Middle Proterozoic Moyie sills in southeastern British Columbia: Chapter muscovite common. Similar rock to the north has a granophyric texture as porphyritic with commonly zoned and Carlsbad twinned K-feldspar 18 in The Geological Environment of the Sullivan Deposit, British Columbia, well as abundant quartz (Redfield, 1986) blurring the distinction between phenocrysts 1-4 cm long. Quartz typically 2-5 mm anhedral grains or J.W. Lydon, T. Höy, J.F. Slack and M.E. Knapp, eds., Geological Association igneous and metamorphic origin. Observed bodies may have formed from semblages of grains up to 1 cm across. Feldspars subhedral. Biotite in increased pore fluid pressure due to heating by the sills (Anderson and Höy, subhedral to euhedral books constitutes about 5 percent of the rock. Myrmekite common. Exposed over much of the northwest corner of the map, generally Hamilton, J.M., R.G. McEarchern, and O.E. Owens, 2000, A history of geological weathers to form low topography, and is magnetite-poor. Rock on Kirby investigations at the Sullivan deposit; Chapter 2 in The Geological Environment Mountain near Tertiary dike swarm is more resistant, forms rounded glaciated of the Sullivan Deposit, British Columbia, JW. Lydon, T. Höy, J.F. Slack, and exposures and large boulders and has sporadically distributed clots of coarse M.E. Knapp, editors: Geological Association of Canada, Mineral Deposits STRUCTURE magnetite that weather to rusty spots. Chemically distinct from *Tggd* and Division, Special Publication 1, p. 4-11. Tpd in having lower TiO₂, FeO, MgO, P₂O₅, Ni, Cr, Sr, Zr, and Nb Harrison, J.E., and D.A. Jobin, 1963, Geology of the Clark Fork quadrangle, HOPE FAULT Idaho-Montana: U.S. Geological Survey Bulletin 1141-K, p. K1-K38. The Hope fault strikes northwest underwater across the southwest corner of Harrison, J.E., and P.W. Schmidt, 1971, Geologic map of the Elmira quadrangle, Moyie Sills—Mafic to quartz-bearing intrusions in the Prichard Formation. Similar Bonner County, Idaho: U.S. Geological Survey Geological Quadrangle Map Base map scanned from USGS film-positive base, 1989. Field work conducted 2004. the map area. It extends southeastward from the Purcell trench on the west to the sills described by Bishop (1976) from about 50 km north. Most are Topography by photogrammetric methods from aerial photographs taken 1986. Field checked 1987. Map edited 1989. toward St Regis, Montana. Its age and kinematics have been discussed by GQ-953, scale 1:62,500. This geologic map was funded in part by the USGS National quartz tholeiites or differentiates from tholeiitic magma intruded into the Harrison, J.E., M.D. Kleinkopf, and J.D. Obradovich, 1972, Tectonic events at Cooperative Geologic Mapping Program. Harrison and others (1972) and Fillipone and Yin (1994). Its activity during Prichard Formation. Whether alkaline sills about 60 km north of the map the intersection between the Hope fault and the Purcell trench, northern Transverse Mercator projection. 1927 North American Datum. Digital cartography by Loudon R. Stanford and Jesse S. Bird at the deposition of the Prichard may account for difference in thickness of mafic area are part of the Moyie sills (Höy, 1989; Gorton and others, 2000) or Idaho Geological Survey's Digital Mapping Lab. Idaho: U.S. Geological Survey Professional Paper 719, 24 p. 10,000-foot grid ticks based on Idaho coordinate system, west zone. sills across it (Harrison and Jobin, 1963). The long, straight trace of the fault from a later event (Anderson and Goodfellow, 2000) is unresolved. Intrusion Höy, T., 1989, The age, chemistry and tectonic setting of the Middle Proterozoic Note on printing: The map is reproduced at a high resolution of 600 is suggestive of transcurrent movement, but structural evidence for such is 1000-meter Universal Transverse Mercator grid ticks, zone 11. of many sills was at shallow levels closely following sedimentation (Cressman, dots per inch. The inks are resistant to run but not to the fading Moyie sills, Purcell Supergroup, southeastern British Columbia: Canadian lacking (Fillipone, 1993). The only documented movement has been dip slip National geodetic vertical datum of 1929. caused by long-term exposure to light. 1989; Sears and others, 1998). There appear to be two sets. One has a Journal of Earth Science, v. 29, p. 2305-2317. Contour interval 40 feet (Fillipone, 1993) with the southwest side down. It probably acted in QUADRANGLE LOCATION UTM Grid and 1989 Magnetic North coarse-grained quartz-rich variant that is less mafic than most. This is found Map version 2-14-2006. Huebschman, R.P., 1973, Correlation of fine carbonaceous bands across a conjunction with the (southern) Purcell trench fault during the Eocene low in *Ype* usually along with more mafic sills. Age of sills in *Ype* is probably Precambrian stagnent basin: Journal of Sedimentary Petrology, v. 43, p. 688-PDF map (Acrobat Reader) may be viewed at www.idahogeology.org. (Fillipone and Yin, 1994; Doughty and Price, 2000). It is likely that downclose to U-Pb dates on zircons from Plains, Montana, about 140 km southeast to-the-west faults across the west side of the map formed during this time Kleinkopf, M.D., J.E. Harrison, and R.E. Zartman, 1972, Aeromagnetic and (1.47 Ga; Sears and others, 1998), or from near Kimberley, British Columbia and that Eocene intrusions occupy extensional structures, although the dikes geologic map of part of northwestern Montana and northern Idaho: U.S. about 160 km to the north (1.468 Ga; Anderson and Davis, 1995). The other appear en enchelon relative to the Hope fault, suggesting transtension and Geological Survey Geophysical Investigations Map GP-830, scale 1:250,000. set generally has finer quartz-rich variants and is found below or near massive some strike slip along it. McKee, E.D., and G.W. Weir, 1963, Terminology for stratification and crossintervals (Ypm) below Ypc, and thus is likely older. Elsewhere the higher stratification in sedimentary rocks: Geological Society of America Bulletin, and lower sills appear to be distinct chemically, with the higher set having v. 64, p. 381-390. a higher Ti/Zr trend than the lower ones (Anderson and Goodfellow, 2000). Redfield, T. F., 1986, Structural geology of part of the Leonia quadrangle in Mafic intrusive rocks, undivided (Middle Proterozoic)—May include one northeast Idaho: M.S. Thesis, Western Washington University, 156 p. Table 1. Major oxide and trace element chemistry of samples collected in the Trout Peak quadrangle or more of the varieties below (Yqd, or Ygb). Sears, J.W., K.R. Chamberlain, and S.N. Buckley, 1998, Structural and U-Pb geochronological evidence for 1.47 Ga rifting in the Belt basin, western Major elements in weight percent Quartz diorite (Middle Proterozoic)—Medium-grained biotite quartz diorite Trace elements in parts per million Montana: Canadian Journal of Earth Sciences, v. 35, p. 467-475. and biotite-hornblende quartz diorite. Occurs as middle and upper parts of Streckeisen, A.L., 1976, To each plutonic rock its proper name: Earth-Science SiO, TiO, Al,O, FeO* MnO MgO CaO Na,O K,O P,O Total Ni Cr Sc V Ba Rb Sr Zr Y Nb Ga Cu Zn Pb La Ce Th apparently differentiated mafic sills and as separate sills. Exhibits some Reviews, v. 12, p. 1-33. granophyric intergrowth. Best exposures of the differentiated sills occur along Weisel, C.J., P.M. Hartwig, S.D. Keirn, and B.J. Turner, 1982, Soil Survey of 66.18 0.458 15.73 2.96 0.047 1.80 2.95 4.03 4.26 0.273 98.69 28 36 6 49 2228 89 1319 230 15 21.6 17 5 32 17 79 134 . the Strong Creek - Round Top trail, as well as near the summit of Round Top Bonner County Area, Idaho, Parts of Bonner and Boundary Counties: United 04RB352 48.2588 -116.3265 Porphyritic dacite Tpd ACKNOWLEDGMENTS 66.00 0.465 15.93 3.20 0.059 1.54 2.40 4.32 3.94 0.290 98.14 16 16 5 50 2507 92 1218 195 15 28.4 18 7 56 27 73 126 16 Mountain in the Trestle Peak quadrangle just east of the map area. States Department of Agriculture, Soil Conservation Service, 201 p. 70.75 0.294 15.49 2.03 0.080 0.87 2.80 4.29 2.64 0.096 99.34 9 9 5 52 810 87 648 131 17 10.6 20 5 50 19 19 33 Wentworth, C.K., 1922, A scale of grade class terms for clastic sediments: Mapping and compilation were supported by the U.S. Geological Survey Gabbro (Middle Proterozoic)—Medium-grained hornblende gabbro. Journal of Geology, v. 30, no. 5, p. 377-392. 68.80 0.225 16.87 1.56 0.060 0.62 2.97 4.24 3.82 0.075 99.25 6 7 4 39 1172 114 725 111 14 9.4 22 3 39 29 15 37 STATEMAP program and the U.S. Geological Survey office in Spokane, 04RL176 48.3202 -116.3497 Biotite granodiorite Kbgd Generally quartz-bearing. In some sills appears to grade upward over short distance to Yqd with increasing quartz and decreasing hornblende. *Total Fe expressed as FeO. All analyses performed at Washington State University GeoAnalytical Laboratory, Pullman, Washington. Creek