

GSA DATA REPOSITORY ITEM (MS B2065)

APPENDIX A

SAMPLE DESCRIPTIONS AND LOCALITIES

OUA-1---- Distributary channel sandstone of Hartshorne Formation in terraced roadcut along U.S. Highway 71 at Devils Backbone Ridge near Greenwood (SE of Fort Smith), Arkansas (STOP # 19 of Sutherland and Manger, 1979; STOP # 1 of Houseknecht, 1988; STOP # 1-9 in Bush et al., 1978).

OUA-2---- Black marine shale of upper Atoka Formation in terraced roadcut along U.S. Highway 71 at Devils Backbone Ridge near Greenwood (SE of Fort Smith), Arkansas (STOP # 19 of Sutherland and Manger, 1979; STOP # 1 of Houseknecht, 1988; STOP # 1-9 in Bush et al., 1978).

OUA-3---- Interdistributary bay shale of McAlester Formation in terraced roadcut along U.S. Highway 71 at Devils Backbone Ridge near Greenwood (SE of Fort Smith), Arkansas (STOP # 19 of Sutherland and Manger, 1979; STOP # 1 of Houseknecht, 1988; STOP # 1-9 in Bush et al., 1978).

OUA-4,5---- Prodelta shale (OUA-4) and delta-front (tidal-flat) sandstone (OUA-5) of Atoka Formation (from second and third progradational cycles up, respectively, from base of outcrop) in roadcut along Oklahoma Highway 112 at Backbone Mountain south of Pocola, Oklahoma (STOP # 17 in Sutherland and Manger, 1979; STOP # 1 in Briggs et al., 1975).

OUA-6---- Micaceous turbidite sandstone of Atoka Formation from roadcut along U.S. Highway 59, 0.5 miles south of Hodgens, Oklahoma (STOP # 3 in Briggs et al., 1975).

OUA-7---- Quartzose turbidite sandstone of Jackfork Group from Rich Mountain along roadcuts of Oklahoma Rt. 1. NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.1, T.2N., R.25 E.

OUA-8,9---- Turbidite sandstone (OUA-8) and shale (OUA-9) pair of Jackfork Group from Rich Mountain along roadcuts of Oklahoma Rt. 1 (shale collected 10-15 cm below turbidite bed). SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.36, T.3N., R.25 E.

OUA-10,11---- Turbidite sandstone (OUA-10) and shale (OUA-11) pair from Atoka Formation on U.S. 259 in Oklahoma (sandstone collected from 65 cm turbidite bed 20 cm above shale). SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.17, T.3N., R.26 E.

OUA-12,13---- Shale (OUA-12) and quartzose turbidite sandstone (OUA-13) pair of Jackfork Group from roadcut on Kiamichi Mountain along U.S. Highway 259, approximately 2.5 miles south of Big Cedar, Oklahoma (sandstone collected 2.5 meters below shale)(STOP #5 in Briggs et al., 1975; STOP # 2 in Moiola et al., 1988).

OUA-14---- Black shale of Stanley Group at bridge over Eagle Fork Creek along U.S. 259 north of Broken Bow, Oklahoma. NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.21, T.1S., R.25 E.

OUA-15---- Lower Mud Creek Tuff (from 15 m thick crystal tuff unit) of Stanley Group in roadcut along U.S. Highway 259, 1.5 miles south of Mount Herman, Oklahoma (STOP #8 in Briggs et al., 1975).

OUA-16---- Shale intercalated between lower and upper Mud Creek Tuffs of Stanley Group in roadcut along U.S. Highway 259, 1.5 miles south of Mount Herman, Oklahoma (STOP #8 in Briggs et al., 1975).

OUA-17,18---- Turbidite sandstone (OUA-17) and shale (OUA-18) pair from Blaylock Sandstone of Broken Bow uplift along roadcuts of Upper Blaylock along U.S. Highway 259, 12.3 miles north of Broken Bow, Oklahoma at Carter Mountain (shale collected directly above 25 cm turbidite sandstone unit)(STOP #7 in Briggs et al., 1975).

OUA-19---- Mazarn Shale from Broken Bow uplift along U.S. 259 north of Broken Bow, Oklahoma (outcrop consists of dark hemipelagites with thin distal turbidite layers of sand/silt laminae). NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.28, T.4S., R.24E.

OUA-20---- Black shale of Stanley Group from interbedded sandstone and shale unit in quarry north of DeQueen, Arkansas along U.S. 71. NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.27, T.7S., R.31 W.

OUA-21---- Hatton Tuff Member of Stanley Group in railroad cut along U.S. 71 near Hatton, Arkansas (collected from center of 20 m thick massive unit). SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.1, T.5S., R.32 W.

OUA-22,23---- Turbidite sandstone (OUA-22) and shale (OUA-23) pair of Jackfork Group at Dierks Lake spillway, approximately five miles northwest of Dierks, Arkansas (sandstone collected from 70 cm turbidite unit at top of 8 m sandy interval, 1 m below shale)(STOP #2 of Stone and Haley, 1984).

OUA-24---- Green mudstone from 20 cm mudstone interval intercalated within upper part of lower Arkansas Novaculite at Caddo Gap, Arkansas in Benton uplift along roadcuts of Arkansas Route 8-27 (STOP # 20 of Stone and McFarland, 1981; STOP # 20 of Stone and Haley, 1984; STOP # 14 in Stone et al., 1986; Stop # 5 in Zimmerman and Ford, 1988).

OUA-25---- Crystal Mountain Sandstone from roadcut along U.S. 270 in Benton uplift of Arkansas, collected from interval of 1 m thick flat-lying sandstone alternating with fine sandstone and siltstone (STOP # 7 of Stone and Haley, 1984; STOP # 27 of Stone and McFarland, 1981; STOP #1 of Stone and Bush, 1982; STOP # 6 of Stone et al., 1986).

OUA-26---- Mazarn Shale at Charlton Recreation Area along U.S. 270 in Benton uplift of Arkansas, collected from interval of interbedded black shale and green siltstone exposed in creek bed (STOP # 3 of Stone and Bush, 1982; STOP # 9 of Stone and Haley, 1984; STOP # 4 of Stone et al., 1986).

OUA-27---- Womble Shale in roadcut at curve opposite Charlton Recreation Area along U.S. 270 in Benton uplift of Arkansas, collected from interval of massive, fissile black shale approximately 30 m above Blakely Sandstone (STOP # 3 of Stone and Bush, 1982; STOP # 25 of Stone and McFarland, 1981; STOP # 9 of Stone and Haley, 1984; STOP # 4 of Stone et al., 1986).

OUA-28---- Blakely Sandstone, collected from 90 cm sandstone lens interbedded with minor shales at Blakely Mountain Dam, Arkansas (STOP #4 of Stone and Bush, 1982; STOP # 2 of Stone et al., 1986).

OUA-29---- Womble Shale at Hamilton Church outcrop, Hamilton, Arkansas (north of Hot Springs) along State Rt. 298. NE¼ SE¼ sec.26, T.1N., R.20 W.

OUA-30---- Turbidite sandstone from Stanley Group in east side roadcut on Arkansas Highway 7, approximately 2 miles south of Hot Springs, Arkansas. SE¼ SE¼ SW¼ sec. 35, T.2S., R.19W.

OUA-31---- Turbidite sandstone from Stanley Group in north side roadcut on Arkansas Highway 70, approximately 2 miles east of Hot Springs, Arkansas (in shopping mall parking lot). SE¼ NW¼ SE¼ sec. 20, T.3S., R.19W.

OUA-32,33---- Prodelta shale (OUA-33) and delta-fringe sandstone (OUA-32) of Atoka Formation near Morrilton, Arkansas in large terraced roadcuts on Arkansas Highway 9 (STOP # 13 of Stone and McFarland, 1981; STOP # 3 of Kehler, 1988).

OUA-34---- Black argillite of Arkansas Novaculite, collected from deformed clastic layer about 25 cm thick, from roadcut on US 259 north of Broken Bow, Oklahoma, 13.0 miles north of junction of U.S. 259 and 70 in Broken Bow (STOP #7 Briggs et al., 1975).

OUA-35,36---- Turbidite sandstone (OUA-36) and shale (OUA-35) pair from Blaylock Sandstone on US 259 north of Broken Bow, Oklahoma, 13.0 miles north of junction U.S. 259 and 70 (STOP #7 Briggs et al., 1975).

OUA-37,38,39---- Polk Creek Shale in roadcuts on Highway 369 north of Langley, Arkansas toward Albert Pike Recreation Area in Cossatot Mountains. OUA-37 is massive black argillite from outcrop of laminated chert and argillite in near-vertical beds 1-10 cm thick 1.2 miles north of county line, Montgomery County (sample is Polk Creek Shale according to geology by J. Weber in 1985 M.S., but may be Blaylock Sandstone according to more recent mapping by J. Zimmerman, personal communication, 1993). OUA-38 is flaky black argillite from outcrop of nearly vertical 1-10 cm beds, 1.4 miles north of county line, Montgomery County (sample is Polk Creek Shale according to geology by J. Weber, 1985). Sample OUA-39 is flaky black argillite from roadcut just north of Prior Mountain, Montgomery County (sample is Polk Creek Shale according to geology by J. Weber, 1985).

OUA-40---- Green shale of lower Arkansas Novaculite at Caddo Gap, Arkansas, collected about 5 m above OUA-24 and approximately 12 m above top of Missouri Mountain Shale, along

roadcuts of Arkansas 8-27 (STOP # 20 of Stone and McFarland, 1981; STOP # 20 of Stone and Haley, 1984; STOP # 14 in Stone et al., 1986; Stop # 5 in Zimmerman and Ford, 1988).

OUA-41,42---- Jackfork Group shale (OUA-41) and turbidite sandstone (OUA-42) pair from DeGray Dam spillway, DeGray Lake, Arkansas (sandstone collected from 60 cm turbidite unit 10 cm below shale)(STOP # 2-15 Stone et al., 1973; STOP # 41 Stone and McFarland, 1981; STOP # 28 Stone et al., 1986).

OUA-43,44---- Missouri Mountain Shale in roadcut on north side of US 70 east of Hot Springs, Arkansas, exactly 10 miles from junction of US 70 with US 70B on north side of Hot Springs and 1.5 miles east of marked rest area on south side of US 70. Both samples are laminated green shale collected about 10 m and 5 m below contact with Arkansas Novaculite, respectively.

OUA-45---- Massive black argillite of Bigfork Chert from Benton uplift, Arkansas, collected from section of laminated argillaceous chert and siliceous argillite on paved road 0.3 miles south of Ferndale, west of Little Rock, Arkansas (STOP # 1a-1 Stone et al., 1973).

OUA-46---- Shaly Arkansas Novaculite of Benton uplift, Arkansas. Sample is flaky black argillite collected from section of massive siliceous argillite and cherty argillite with some blocky chert beds on paved road 0.75 miles south of Ferndale, west of Little Rock, Arkansas (STOP # 1a-2 Stone et al., 1973).

OUA-47,48---- Turbidite sandstone (OUA-48) and shale (OUA-47) pair of Atoka Formation from roadcut outcrops between Perryville and Perry, Arkansas, just south of Arkansas River in northeastern Ouachita Mountains (sandstone collected 10 cm above shale)(STOP # 11 Stone and Haley, 1986).

MAR90-1---- Greenish shaly argillite in lower part of Dimple limestone (carbonate turbidites) in excavated drainageway at western end of the easternmost roadcut in flysch bedrock east of Lemons Gap (collected within 40 cm shaly interval below 20 cm carbonate turbidite bed, stratigraphically 1.25 m below base of labelled carbonate turbidite (Bouma ABC) bed "C" (red label on outcrop) and 2 m above similar carbonate turbidite bed "B" in strata gradational with underlying Tesnus Formation) along U.S. Highway 90, 17.9 miles east of junction with U.S. Highway 385 in Marathon, Texas, in Lemons Gap section of Marathon Carboniferous flysch. Main roadcut of Dimple Limestone is at mileage 18.0 (STOP # 2-3 Mazzulo, 1978; STOP # 3-5 Laroche and Higgins, 1990; STOP at "19.6" miles east of Marathon of McBride, 1988).

MAR90-2---- Atypical gray shaly argillite (possibly tuffaceous) in Tesnus Formation only 5 m from east end of roadcut on U.S. Highway 90, 16.65 miles east of junction with U.S. Highway 385 in Marathon, Texas, Lemons Gap section of Marathon Carboniferous flysch (STOP # 2-2, Mazzulo, 1978; STOP # 4-4, Laroche and Higgins, 1990; STOP at "18.5" miles east of Marathon, McBride, 1988).

MAR90-3---- Graded Tesnus Formation turbidite sandstone bed 2.5 m thick exposed 70 m from west end of roadcut on U.S. Highway 90, 16.55 miles east of junction with U.S. Highway 385

in Marathon, Texas, Lemons Gap section of Marathon Carboniferous flysch (STOP # 2-2, Mazzulo, 1978; STOP # 4-4, Laroche and Higgins, 1990; STOP at "18.5" miles east of Marathon, McBride, 1988).

MAR90-4---- Massive Tesnus Formation sandstone in roadcut on curve just east of thrust fault along U.S. Highway 90, 15.9 miles east of junction with U.S. Highway 385 in Marathon, Texas, Lemons Gap section of Marathon Carboniferous flysch (same as roadcut at "17.7" miles east of Marathon in McBride, 1988).

MAR90-5---- Middle tuff bed (2.5 m thick) of Imoto and McBride (1990) in Tesnus Formation, located 25 m from east end of roadcut within interval containing three tuff beds interbedded within 17.5 m of strata, 16.6 miles east of junction with U.S. Highway 385 in Marathon, Texas, Lemons Gap section of Marathon Carboniferous flysch (STOP # 2-2, Mazzulo, 1978; STOP # 4-4, Laroche and Higgins, 1990; STOP at "18.5" miles east of Marathon, McBride, 1988).

MAR90-6---- Typical mudstone in shaly strata dominant in Tesnus Formation between turbidite sandstone beds (collected 50 m above MAR90-3 and 10 m below MAR90-5). Roadcut is 16.6 miles east of junction with U.S. Highway 385 in Marathon, Texas, Lemons Gap section of Marathon Carboniferous flysch. (STOP # 2-2, Mazzulo, 1978; STOP # 4-4, Laroche and Higgins, 1990; STOP at "18.5" miles east of Marathon, McBride, 1988).

MAR90-7---- Shaly interbed 15 cm thick in relatively thin-bedded turbidites of Haymond Formation 15.2 miles east of junction with U.S. Highway 385 in Marathon, Texas, Lemons Gap section of Marathon Carboniferous flysch (STOP # 2-1, Mazzulo, 1978; STOP # 3-1, Laroche and Higgins, 1990; STOP at "17.0" miles east of Marathon, McBride, 1988).

MAR90-8---- Turbidite sandstone bed 50 cm thick in relatively thick-bedded turbidites of Haymond Formation in roadcut 15.5 miles east of junction with U.S. Highway 385 in Marathon, Texas, Lemons Gap section of Marathon Carboniferous flysch.

MAR90-9---- Green flaky argillite of Tesnus Formation immediately overlying upper chert and shale member of Caballos Novaculite from excavated ditch beside State Highway 385 (west side) south of Marathon on way to Big Bend National Park at 3.6 miles from intersection with U.S. Highway 90 in Marathon, Texas. Collecting site is 0.2 miles south of thin interval of red shale exposed near southeast end of main roadcut of Caballos Novaculite 3.3-3.4 miles from Marathon ("3.5" miles to south of Marathon according to McBride, 1988).

MAR91-1,2---- Upper Haymond deltaic sandstone (MAR91-1) and shale (MAR91-2) pair of Allison Ranch facies from first outcrop on right side at major bend in Allison Ranch county road (King, 1980), about five miles south of turnoff from U.S. Highway 385 (just north of Gap Tank) about 25 miles north of Marathon, Texas (junction with U.S. highway 90).

MAR91-3---- Prodelta black shale within Haymond "boulder beds" at base of Housetop Mountain, north of Marathon, Texas at "Windmill Outcrop" (King, 1980).

MAR91-4---- Alsate Shale from small outcrop along eastern exposed side of Alsate Creek south of Marathon, Texas (STOP # 1 McBride, 1969).

NEA-1---- Sandstone of Hale Formation (northeastern Arkoma basin) from interbedded sandstone-shale outcrops in roadcut on west side of U.S. Highway 167 at 3.6 miles north of junction with Highways 87 and 157 in Pleasant Plains, Arkansas, and 0.7 miles south of Rest Area on north bank of Salado Creek. Travelling south, site is near top of grade curving to right in freshest part of roadcut just downhill from parking spot at small entrance road reaching highway from west. Exposure is thin-bedded with wavy flaser bedding interpreted as indicative of tidally influenced sedimentation in marine or marginal marine deposits of delta-front facies (NW¼ of Sec.11, T.11N, R.6W., Independence Co., Arkansas).

NEA-2---- Black shale of Bloyd Formation (northeastern Arkoma basin) in spillway cut of Lake Bald Knob just northwest of Bald Knob, Arkansas. Walking south from lake, collecting site is at base of deepest cut bank on right (or west) side of spillway course. Massive to thin-bedded black shale and/or mudstone with intercalated thin-bedded delta-front sandstone interpreted as distal delta-front facies of prodelta slope or interdistributary bay deposits (NE¼ of Sec.12, T.8N, R.6W, White Co., Arkansas).

RC-3---- Black shale of Tradewater Formation collected from small talus slope at north end of roadcut along east side of Pennyrite Parkway north of Hopkinsville, Kentucky at milepost 24, lat 37°04'00"N, long 87°28'00"W, Crofton quadrangle, Christian County, Kentucky (Nelson and Lumm, 1992, STOP # 8).

RC-4---- Sandstone of Caseyville Formation from Hoover Hill roadcut on U.S. Rte. 231, 7 miles north of Hartford, Kentucky, lat 37°30'0"N, long 86°58'25"W, Pleasant Ridge quadrangle, Ohio County, Kentucky (STOP # 2 of Nelson and Lumm, 1992).

WB-1---- Micaceous, thinly laminated sandstone of Pottsville Formation from small outcrop in ditch along I-65 north of Birmingham, Alabama, 0.3 miles north of milepost 284 but south of exit 284 on east side, Hayden Section outcrops (STOP # 4 of Rheams and Benson (1986).

WB-2---- Boyles Sandstone Member, lower Pottsville Formation, from large roadcut along I-65 north of Birmingham, Alabama, 1.3 miles north of exit 284 on west side, Hayden Section outcrops (collected massive sandstone bed directly above thin coal seam)(STOP # 4 of Rheams and Benson, 1986).

HOL-1,2---- Sandstone (HOL-2) and shale (HOL-1) pair from Tellico Formation turbidites (collected thick shale layer interbedded with siltstone approximately 2 meters below massive sandstone of mid-fan facies at South Holston Dam near Bristol, Tennessee (STOP # 10A in Walker et al., 1980).

TH-1,2,5---- Massive red sandstone of Juniata Formation (TH-1), calcareous sandstone of Martinsburg Formation (TH-2), and quartzose sandstone of Clinch Formation (TH-5) collected from Thorn Hill roadcuts along Rte. 25E, Clinch Mountain, Tennessee (Walker, 1985).

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