



Rock Units Formation and Facies		LEGEND	
		Map Units	Origin
		Description	
Walsh Formation Clay facies	Symbol	Fine-bedded, gray to black, organic clay with some fine sand; flat topography	Slough and pond sediment
	Ws1	Dark brown, gray or black sand, sandy silt; clayey silt, or silty clay; obscure bedding; flat to gently rolling topography	Modern and premodern river overbank sediment; some river channel sediment
	Ws2	Well-sorted, fine sand and black silt; rolling to hilly topography, commonly with less than 5 feet of relief	Windblown dunes
Coleharbor Formation Silt and clay facies	Cs1	Yellowish-brown to dark gray, laminated silty clay and clayey silt; hue varies with intensity of weathering All areas with "Cs" prefix belong to the silt and clay facies; minor variations in lithology noted below	Offshore lake sediment
	Cs2	Nearly flat areas of boulder-free, bedded, dark gray silt and clay	Lake sediment deposited in lakes whose basins were enclosed by ice
		Rolling to steep slopes of silt and clay with relief that ranges from about 20 feet along the Goose River to as much as 100 feet along the Sheyenne River	Eroded lake sediment
Sand and gravel facies	Cg1	Gravel, gravely sand, silty sand, and sandy silt All areas with "Cg" prefix belong to the sand and gravel facies; minor variations in lithology noted below; topography depends on landform	Fluvial and shoreline sediment
	Cg2	Crudely-sorted to well-sorted, bedded gravel and sand; nearly flat surface with relief generally less than 10 feet	Fluvial sediment deposited by outwash from the glacier along with contemporaneous precipitation
	Cg3	Crudely-sorted to well-sorted gravel and sand with contorted bedding in places; numerous kettles; relief generally 10 to 25 feet, but up to 50 feet locally	Fluvial sediment deposited on stagnant glacial ice by outwash from the glacier along with contemporaneous precipitation
	Cg4	Mostly sand and gravel that is well-sorted with distinct cross-bedding; gravel is generally found in linear ridges; rolling to undulating with less than 5 feet of relief in most places	Shore deposits; beaches
	Cg5	Sand, silty sand, and sandy silt that interfinger with one another; relief 2 to 10 feet locally	Interbedded fluvial and lake sediment; probably of deltaic origin
Mixed gravel, sand, and silt facies	Cts	Ridges and hills of gravel, sand, silt, and clay; cobbles and boulders common; chunks of pebble loam common; local relief up to 40 feet	Fluvial sediment deposited in contact with glacial ice; eskers and kames
	Ctg	Mixture of sandy gravel, gravely sand, and silt; tilted, faulted bedding common in places; relief less than 15 feet in most places	Beach and lake sediment that was deposited on a stagnant ice mass
Mixed till, sand, and silt facies	Ct	Silty pebble loam, silt, and sand; yellowish-brown; tilted, faulted bedding common in places; relief is from 10 to 20 feet	Glacial and lake sediment deposited on a stagnant ice mass
			Glacial sediment
Till facies	Ct1	Silty, clayey, uncemented pebble loam (till); yellowish-brown to olive gray color depending on weathering intensity; contains discontinuous lenses of gravel and sand All areas with "Ct" prefix belong to the till facies; minor variations in lithology are noted below	Glacial sediment deposited mainly at the base of the moving glacier and from on and within the ice when it melted
	Ct1a	Nearly flat to gently undulating surface with poorly integrated drainage; relief generally less than 15 feet	Glacial sediment surface that has been modified by wave action along lake shores
	Ct1b	Nearly flat surface covered by abundant boulders and patches of sand and gravel; relief generally less than 5 feet	Glacial sediment surface that has been modified by running water
	Ct2	Nearly flat surface covered by abundant boulders and patches of sand and gravel; channel scars in places; relief generally less than 10 feet	Glacial sediment that has been eroded by headward erosion from major streams
	Ct3	Steep till slopes along Bald Hill Creek and the Sheyenne River; relief 50 to 100 feet locally	Glacial sediment that has been eroded by headward erosion from major streams
Pierre Formation	Ct3	Hilly area of till with both overall and internal linearity; local concentrations of gravel; boulders abundant in places; local relief exceeds 150 feet	Glacial sediment (but including some large blocks of Pierre shale) that was deposited by ice thrusting and that accumulated at the edge of the active glacier
	Ct4	Hummocky till accumulation with numerous kettles, nonintegrated drainage, and abundant ice-disintegration features; linear trends lacking; relief of 30 to 50 feet locally	Glacial sediment that was deposited from a stagnant ice mass
	Ct5	Till surface with relief due almost entirely to topography on the preglacial surface; relief up to 150 feet locally	Veneer of glacial sediment on Pierre shale
P	Dark gray, fissile, highly jointed shale; bentonitic clay lenses; iron staining on joint faces; relief exceeds 100 feet locally near the Sheyenne River	Marine shale	

MISCELLANEOUS SYMBOLS	
	Washboard lineations
	Drumlins
	Kettle chains
	Geologic contacts
	Ponds and lakes
	Roads
	Wave-cut scarp

BASE PREPARED FROM NORTH DAKOTA STATE HIGHWAY DEPARTMENT COUNTY HIGHWAY MAPS

