**Appendix D–Digital GIS Dataset of Sand and Gravel Deposits on the Wind River Indian Reservation, Wyoming**

**INTRODUCTION**

The set of six digital data files in this report form an ESRITM polygon Shapefile, which can be used in Geographic Information System (GIS) software to plot maps of sand and gravel deposits within the Wind River Indian Reservation, Wyoming.

The gravel deposits outlined by this shapefile (609 polygons) were adapted and digitized from two geologic maps of the Wind River Indian Reservation:

*Plate 1, scale 1:63,360,* of Morris, D.A., Hackett, O.M., Vanlier, K.E., and Moulder, E.A., 1959, Ground-water resources of Riverton Irrigation Project Area, Wyoming: U.S. Geological Survey Water-Supply Paper 1375, 205 p., 6 plates.

*Plate 2, scale 1:125,000,* of McGreevy, L.J., Hodson, W.G., and Rucker, S.J., IV, 1969, Ground-water resources of the Wind River Indian Reservation, Wyoming: U.S. Geological Survey Water-Supply Paper 1576-I, 145 p., 3 plates.

Most of the shapefile polygons (549 of 609) are sand and gravel deposits of terraces of the ancient Wind River and its tributaries. The terraces were deposited as the rivers migrated across and cut downward into the Wind River Basin over the last 1,700,000 years (Chadwick, O.A., Hall, R.D., and Phillips, F.M., 1997, Chronology of Pleistocene glacial advances in the central Rocky Mountains: Geological Society of America Bulletin, v. 109, no. 11, p. 1443-1452). The geology and characteristics of these terrace deposits are described in this report. Deposits of sand and gravel (alluvium) within the active channels and floodplains of the modern rivers and streams were not included in the shapefile.

Some of the sand and gravel deposits (60 of 609 polygons) in the shapefile were interpreted by this study to be alluvial fan deposits. Alluvial fans are gently sloping, apron-shaped masses (fans) of rock debris and sediment (alluvium) that form along the base of mountain slopes. Alluvial fans typically form where a mountain stream exits a narrow mountain valley and deposits its water-laden material onto a broad valley or plain. Alluvial fan deposits are preserved along the eastern base of the Wind River Range and the southern base of the Owl Creek Mountains.

**SHAPEFILE CREATION**

The geologic maps of Morris and others (1959, plate 1) and McGreevy and others (1969, plate 2) were digitally scanned and georeferenced. The resulting digital geologic maps were superimposed upon digital USGS 7½-minute (scale 1:24,000) topographic quadrangles. Using the GIS software program ArcMap (ESRITM), the mapped sand and gravel deposits of Morris and others (1959) and McGreevy and others (1969) were hand digitized on-screen approximately one square mile at a time at a screen-view scale of 1:12,000. The geologic mapping of Morris and others (1959) and McGreevy and others (1969) was adjusted to match the topography (as viewed at a scale of 1:12,0000). The digital mapping shown in the shapefile must be considered approximately located because no field inspections were made.

Where the geologic maps overlap, the geologic mapping of Morris and others (1959) was preferentially used because their mapping is at a larger, more detailed scale and includes information on river terrace level. Ten polygons were added by the authors, which are sand and gravel deposits that are not shown on the maps of Morris and others (1959) or McGreevy and others (1969).

A Universal Transverse Mercator map projection with map parameters of NAD 1927, UTM Zone 12N, and in meters, was used. The datum information is supplied by the data file *gravels.prj*

**DATA FIELDS IN THE SHAPEFILE**

Four data fields were attributed in each of the 609 polygons in the *gravels* shapefile, as follows:

***Data field Entries Description***

‘**FID**’ ‘0’ to‘608’ Unique number used to identify each polygon.

‘**Landform**’ ‘fan’ Interpreted as an alluvial fan deposit (n=60).

‘terrace’ Interpreted as an ancient river terrace (n=549).

‘**Map\_source**’ ‘Morris and others (1959)’ Polygon adapted from the geologic map of Morris and others (1959) (n=305).

McGreevy and others (1969)’ Polygon adapted from the geologic map of McGreevy and

 others (1969) (n=294).

‘not mapped’ Polygon added by this study; previously unmapped

 (n=10).

‘**Map\_unit**’ ‘Qf’ Alluvial fan deposit (n=67); as interpreted by this

study based on the slope of their surface and their

close proximity to a mountain front. Mapped as

‘Qt’ by McGreevy and others (1969).

‘Qt’ “Terrace and pediment deposits”, as mapped by

 McGreevy and others (1969) (n=237).

‘Qtu’ River terrace of uncertain terrace level, mapped by

Morris and others (1959) (n=8).

‘Qt1’ River terrace level 1 of Morris and others (1959) n=3).

‘Qt2’ River terrace level 2 of Morris and others (1959) (n=57).

‘Qt3’ River terrace level 3 of Morris and others (1959) (n=54).

‘Qt4’ River terrace level 4 of Morris and others (1959) n=11).

‘Qt5’ River terrace level 5 of Morris and others (1959) (n=68).

‘Qt6’ River terrace level 6 of Morris and others (1959) (n=33).

‘Qt7’ River terrace level 7 of Morris and others (1959) (n=9).

‘Qt8’ River terrace level 8 of Morris and others (1959) (n=30).

‘Qt9’ River terrace level 9 of Morris and others (1959) (n=10).

‘Qt10’ River terrace level 10 of Morris and others (1959) (n=14).

**‘**Qt11’ River terrace level 11 of Morris and others (1959) (n=3).

‘Qt12’ River terrace level 12 of Morris and others (1959) (n=1).

‘Qt13’ River terrace level 13 of Morris and others (1959) (n=4).