Kansas Geological Survey
Open File Report 96-56

A proposal submitted to the STATEMAP program, U.S. Geological Survey, for continuation of geologic mapping and compilation of digitized county databases

Lawrence L. Brady, Principal Investigator
Kansas Geological Survey

William C. Johnson
The University of Kansas

Ronald R. West
Kansas State University

James R. McCauley
Daniel F. Merriam
David R. Collins
Kansas Geological Survey

October 31, 1996

APPLICATION FOR FEDERAL ASSISTANCE

2. DATE SUBMITTED	Applicant Identifier
10/31 96	

1. TYPE OF SUBMISSION:	3. DATE RECEIVED BY STATE	State Application Identifier
Application ☐ Construction ☐ Non-Construction / Preapplication ☐ Construction ☐ Non-Construction		SAI Exempt
	4. DATE RECEIVED BY FEDERAL AGENCY	Federal Identifier

5. APPLICANT INFORMATION

Legal Name:	Organizational Unit:
The University of Kansas	Kansas Geological Survey
Address (give city, county, state, and zip code): 1930 Constant Avenue, Lawrence, Douglas Co., Kansas 66047	Name and telephone number of the person to be contacted on matters involving this application (give area code): Lawrence L. Brady, Kansas Geological Survey, (913) 864-3965

6. EMPLOYER IDENTIFICATION NUMBER (EIN): 1-486029925-D1

7. TYPE OF APPLICANT: (enter appropriate letter in box) [I]

- A. State
- B. County
- C. Municipal
- D. Township
- E. Interstate
- F. Intermunicipal
- G. Special District
- H. Independent School Dist.
- (I.) State Controlled Institution of Higher Learning
- J. Private University
- K. Indian Tribe
- L. Individual
- M. Profit Organization
- N. Other (Specify): _____

8. TYPE OF APPLICATION:

☒ New ☐ Continuation ☐ Revision

If Revision, enter appropriate letter(s) in box(es): ☐ ☐

A. Increase Award B. Decrease Award C. Increase Duration

D. Decrease Duration Other (specify): _____

9. NAME OF FEDERAL AGENCY:
U.S. Department of Interior
U.S. Geological Survey

10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER: 15.808

TITLE: STATEMAP

11. DESCRIPTIVE TITLE OF APPLICANT'S PROJECT: A PROPOSAL SUBMITTED TO THE STATEMAP PROGRAM OF THE U.S. GEOLOGICAL SURVEY, DEPT. OF THE INTERIOR, FOR CONTINUATION OF GEOLOGIC MAPPING AND COMPILATION OF DIGITIZED COUNTY DATA BASES IN GREENWOOD, BOURBON, COMANCHE, HAMILTON, AND KEARNY COUNTIES, KANSAS; AND THE COMPILATION OF DIGITIZED COUNTY DATA BASES FOR JOHNSON, ANDERSON, AND CHASE COUNTIES, KANSAS

12. AREAS AFFECTED BY PROJECT (cities, counties, states, etc.):
Bourbon, Comanche, Greenwood, Hamilton, Kearny, Chase, Johnson, Anderson counties

13. PROPOSED PROJECT:

Start Date	Ending Date
5/1/97	4/30/98

14. CONGRESSIONAL DISTRICTS OF:

a. Applicant	b. Project
3rd District	1st, 2nd, 3rd, 4th Districts, Kansas

15. ESTIMATED FUNDING:

a. Federal	$ 94,880.00
b. Applicant	$ 94,923.00
c. State	$ .00
d. Local	$ .00
e. Other	$ .00
f. Program Income	$ .00
g. TOTAL	$ 189,803.00

16. IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER 12372 PROCESS?

a. YES. THIS PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW ON:

DATE _____

b. NO. ☒ PROGRAM IS NOT COVERED BY E.O. 12372

☐ OR PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW

17. IS THE APPLICANT DELINQUENT ON ANY FEDERAL DEBT?

☐ Yes If "Yes," attach an explanation. ☒ No

18. TO THE BEST OF MY KNOWLEDGE AND BELIEF, ALL DATA IN THIS APPLICATION/PREAPPLICATION ARE TRUE AND CORRECT, THE DOCUMENT HAS BEEN DULY AUTHORIZED BY THE GOVERNING BODY OF THE APPLICANT AND THE APPLICANT WILL COMPLY WITH THE ATTACHED ASSURANCES IF THE ASSISTANCE IS AWARDED

a. Typed Name of Authorized Representative	b. Title	c. Telephone number
Kim Moreland	Director, Research Support and Grants Administration	(913) 864-3126

d. Signature of Authorized Representative: Kim Moreland

e. Date Signed: 11/1/96

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A PROPOSAL SUBMITTED TO THE **STATEMAP** PROGRAM OF THE U.S. GEOLOGICAL SURVEY, DEPARTMENT OF THE INTERIOR, FOR CONTINUATION OF GEOLOGIC MAPPING AND COMPILATION OF DIGITIZED COUNTY DATA BASES IN GREENWOOD, BOURBON, COMANCHE, HAMILTON, AND KEARNY COUNTIES, KANSAS; AND THE COMPILATION OF DIGITIZED COUNTY DATA BASES FOR JOHNSON, ANDERSON, AND CHASE COUNTIES, KANSAS

by

Kansas Geological Survey
The University of Kansas
1930 Constant Ave.
Lawrence, Kansas 66047

Lawrence L. Brady
Principal Investigator
Kansas Geological Survey

David R. Collins
Co-Principal Investigator
Kansas Geological Survey

William C. Johnson
Co-Principal Investigator
University of Kansas

Ronald R. West
Co-Principal Investigator
Kansas State University

Lawrence L. Brady
Deputy Director
Kansas Geological Survey

James R. McCauley
Co-Principal Investigator
Kansas Geological Survey

Barbara E. McClain
Assistant Director
Kansas Geological Survey

Daniel F. Merriam
Co-Principal Investigator
Kansas Geological Survey

Kim Moreland
Director, Research Support
& Grants Administration
University of Kansas

Proposed Starting Date: May 1, 1997
Amount Requested: $94,880
Duration of Study: 1 year

Introduction

Since reinitiating the geologic mapping program in 1989, the Kansas Geological Survey (supported in part by COGEOMAP and STATEMAP funding) has produced digitized geologic maps for seven Kansas counties. These counties include: Butler, Chatauqua, Russell, Montgomery, Phillips, Riley, and Finney counties and all are mapped at a 1:24,000 scale. In addition, USGS geologist W.D. Johnson has produced six 1:24,000-scale maps as part of the USGS I-Map Series for Anderson County (not in digital format), and two USGS geologists (Morris Green and George Fairer) completed geologic mapping in Clark County during 1991-95, and produced six preliminary maps covering that county at a scale of 1:24,000. Geologic mapping currently is underway or being completed in Wyandotte, Elk, Labette, Coffey, Ford, Leavenworth, Ness, Woodson, Bourbon, Greenwood, Comanche, Hamilton, Kearny, Wilson, Republic, and Sedgwick counties. Of these counties---Greenwood, Bourbon, Comanche, Hamilton, and Kearny are presently being mapped in the FY96 STATEMAP program, and Ford County from an earlier STATEMAP program is presently near completion.

The KGS objective is to map remaining unmapped counties and old or poorly mapped counties for use in a digital format system that will provide accurate, up-to-date geologic maps at several possible scales. Thus, digital-format geologic maps will reflect the latest stratigraphic and geologic interpretations without requiring extensive remapping or reprinting. The Kansas Geological Survey has excellent facilities with an in-house system for processing, plotter printing, and distribution of geologic maps. County geologic maps at 1:50,000 and digital files based on the 1:24,000 mapping available for producing maps of other scales, are two of the primary products to result from our mapping efforts.

Proposed Investigations and Geologic Setting

Proposed in this funding request is continuation of four mapping projects from the FY96 STATEMAP program, -- 1.) Bourbon County; 2.) Greenwood County; 3.) Comanche County; and 4.) Hamilton and Kearny counties (one project). Proposed project areas and status of published geologic maps in Kansas are summarized in Figure 1. In addition, a fifth project--the digitizing of existing geologic maps in three important Kansas counties (Chase, Anderson, and Johnson) is also proposed as part of mapping program for FY97 STATEMAP funding.

Location.—The proposed mapping areas (Comanche County in south-central Kansas, Bourbon County, and Greenwood County in eastern Kansas, and Hamilton and Kearny counties in western Kansas) comprise a total of approximately 4,400 square miles and are situated in three very different geographic and geologic areas of the State (Figure 1). Greenwood and Bourbon counties are situated in the eastern Kansas--Pennsylvanian and Lower Permian outcrop belts, which generally trend NNE to SSW with low (<1°) regional dips toward the west (Moore, 1949). Two major NW-SE trending tectonic zones, the Fall River tectonic zone (Berendsen and Blair, 1986), crosses through Greenwood County and the Chesapeake tectonic zone, crosses Bourbon County (Figure 2). Structural offset was identified in the southeastern corner of Woodson County (adjacent to Greenwood County) during previous geologic mapping (Maples,

1993). Other major structural features present in the eastern Kansas mapping area include the Cherokee basin, the Bourbon arch, and the Forest City basin (Figure 3).

Hamilton and Kearny counties are situated within the Hugoton embayment of the Anadarko basin, and show evidence of post-Cretaceous deformation, much of which has not been evaluated in a regional sense (e.g., Syracuse anticline of McLaughlin, 1943; Bear Creek fault as shown in Gutentag et al., 1972, and Lobmeyer and Sauer, 1974; sinkholes on south side of Syracuse anticline as discussed by Vogler, 1985). Rocks and sediments exposed at the surface in Hamilton, and Kearny counties include Cretaceous sandstone, shale, and chalk, and Tertiary and Quaternary silt, sand, and gravel of alluvial and wind-blown deposits.

Comanche County, located in south-central Kansas is situated on the High Plains and the Red Hills physiographic provinces. Rock units of Comanche County consist of Permian redbeds, Cretaceous shales and sandstones, and river and wind deposits of Tertiary and Quaternary age. Although geologic structures exist in these areas, their relative simplicity allows detailed mapping of subtle lithologic and facies changes that might otherwise go unnoticed.

Previous work.—The counties proposed here for continued geologic mapping are in eastern Kansas (Greenwood and Bourbon Counties), south-central Kansas (Comanche County) and southwestern Kansas (Hamilton and Kearny Counties; Figure 1). In eastern Kansas, geologic mapping is finished, ongoing, or being revised in most counties surrounding Bourbon and Greenwood counties (Figure 1). Osage, Lyon, and Chase Counties were mapped in the 1950's (Moore et al., 1951; O'Connor, 1953, 1955). Coffey and Woodson counties were mapped for the first time by C.G. Maples (KGS; Maples, 1991, 1993). Anderson County was completed by W.D. Johnson (USGS), (Johnson, 1992a, 1992b, 1992c, 1993a, 1993b, 1993c). Wilson County was completed as part of a doctoral dissertation by H.C. Wagner (USGS, retired). To the south, Elk County is near completion by D.F. Merriam (KGS). To the west, J.S. Aber (Emporia State University) has completed work on geologic mapping in Butler County (Aber, 1994). Montgomery County, which lies on the same stratigraphic trend as Bourbon County, recently was remapped by A.P. Bennison (Bennison, 1996). All new mapping and rechecking of previous mapping will be coordinated and lithostratigraphic units traced into Greenwood County by Merriam, and in Bourbon County by R.R. West and R.G. Sawin. Previous work in Greenwood and Bourbon counties either has been large-scale (Myers, 1976, 1982) or site/unit specific (Mapes and Mapes, 1989; Lamoreaux and Merriam, 1984; Watney, French, and Franseen, 1989).

As is the case for much of eastern Kansas, south-central and southwestern Kansas have received little attention over the years, except for mostly proprietary subsurface oil and gas evaluation studies. Most surface geologic mapping in Kearny, and Hamilton counties is old (Bass, 1926; Darton, 1920; McLaughlin, 1943) and considerably more detail can now be defined as shown by W.C. Johnson in Ford County (work nearly complete), and Finney County (Johnson and Arbogast, 1993) with recent mapping. Some studies were site specific (Kansas Geological Society, 1955), or tangential to efforts concentrated in adjacent areas (Scott, 1968; Sharps, 1976). In the southwestern part of the state along the Arkansas River corridor, Finney County (Johnson and Arbogast, 1993) is complete and Ford County is in the late stages of completion. Continued mapping in Hamilton and Kearny counties will include detailed lithostratigraphic correlation with Finney and Ford Counties.

Important for the mapping efforts in Comanche County is the recent mapping by the USGS in Clark County that lies just west of Comanche County (Green and Fairer, 1992, 1994a, 1994b; Fairer and Green, 1992, 1994a, 1994b). Geologic mapping by Latta (1948) exists for Kiowa County (north of Comanche Co.). and two petrologic and stratigraphic studies of importance to the county geology are by Swineford (1955), and Fay (1964).

Three Kansas counties (Chase, Anderson, and Johnson) representing three different complex situations for digitizing are planned as part of the digital mapping compilation projects. Chase County was originally mapped by Moore, Jewett, and O'Connor (1951), and published at a scale of 1:61,400. Anderson County was recently mapped and published as six USGS geological I-series maps by Johnson (1992a,b,c) and (1993a,b,c). The third county in the series is the populous Johnson County that was mapped in 1967, and published by O'Connor (1971) at a scale of 1:48,000. The Kansas Geological Survey has the original topographic field maps used by O'Connor for mapping Johnson County. Information on these field maps (scale of 1:24,000) will be transferred to mylar sheets for digitizing and comparing to the published map.

Purpose and Justification

Oil fields in Greenwood and Bourbon counties are mostly old (pre-1940), relatively small, and relatively shallow (<3,000') but with significant production histories. Greenwood County has produced 293 million bbls. of petroleum and Bourbon has produced about 4.6 million bbls. In contrast, oil fields in Kearny County are mostly recent (post-1950), relatively deep (>4,000'), and relatively large (Newell et al., 1987; Watney et al., 1989) with a production history of over ten million bbls. of petroleum. Hamilton County has limited petroleum production, but significant potential. Comanche County has large production of both oil and gas, mainly from younger fields. Cumulative production of oil and gas in Comanche County is represented by over 8 million bbls. of oil and nearly 284 million c.f. of natural gas. Although most oil production in the eastern and central parts of Kansas is secondary and even tertiary, new geologic maps at various scales undoubtedly will enhance exploration/recovery success. Especially important as a natural resource in the western project area are the huge Hugoton and Panoma gas fields that cover parts of nine counties in southwest Kansas. Large areas of Hamilton and Kearny counties contain portions of these two active gas fields, with total production exceeding 454 billion c.f. (14 billion c.f. in 1994) in Hamilton County and 3.7 trillion c.f. (77 billion c.f. in 1994) in Kearny County.

Bourbon County also contains important coal deposits, primarily in the upper part of the Cherokee Group. In the last twenty years, four mines have operated in the county with a total production of nearly 3.4 million tons; however, there has been no active coal mining in Bourbon County since 1984. Total coal resources for Bourbon County is 190 million tons for coal less than 100 feet deep (Brady et al., 1976) and nearly 3 billion tons for coal greater than 100 feet deep (L.L. Brady, unpublished data as part of the USGS-NCRDS coal resource study). Where coals are present at considerable depth (>500 ft.) in the western and northwestern parts of the county, commercial coalbed methane is possible.

Western and central Kansas have more basic needs—water is in relatively short supply in Hamilton and Kearny counties. The most used aquifers are the Ogallala Formation (Tertiary age) and alluvium deposits (McClain and Buddemeier, 1990). Understanding and mapping of the

nature, origin, and extent of surficial rocks and sediments in Upper Arkansas and Cimmaron River basins will provide an extremely valuable basis for addressing priority water resource (both quality and quantity) issues identified by the Kansas Water Office and the Division of Water Resources (Kansas Dept. of Agriculture). The Arkansas River corridor from the Colorado line through Ford County (this includes Hamilton and Kearny counties) has been designated an "Intensive Groundwater Use Control Area" (IGUCA; Kansas Water Office, 1993) in reaction to interacting concerns about water supply, contamination, flood damage, riparian habitats, and riverbed land ownership—all issues requiring a solid understanding of surficial geology and aquifer characteristics to address effectively. Priority Kansas Water Plan issues in the Cimmaron Basin include land treatment, wetland protection, and local environmental protection (Kansas Water Office, 1992). Hamilton and Kearny Counties alone contain more than 1,000,000 acres of farmland, which, taken with other farmland in the state, result in some of the most intense groundwater use and potential contamination in Kansas (see Kume, 1985; Sophocleous et al., 1988; Stullken, 1988; Watts, 1989). According to the Kansas Statistical Abstract for 1992–93, Kearny County is projected to have the third-fastest increase in population percentage (+65.8%) from 1990 through 2030 (Finney and Ford Counties, which have been included in recent mapping, were listed as numbers 1 and 4, respectively). In addition to these issues, the Kansas Geological Survey regularly receives inquiries from the Kansas Water Office, the Cimmaron Basin Advisory Commission, Ground Water Management Districts, and the U.S. Bureau of Reclamation requesting water information. Basic geologic mapping is critical to understanding the questions asked by these agencies and countless individuals in their quest for stock and domestic water supplies.

Priorities.---.The priorities for geologic mapping are established by the Kansas Mapping Advisory Committee for entire counties after discussion with the KGS. Table 1 contains a listing of members of the Kansas Mapping Advisory Committee. Priorities are based mainly on the presence and quality of existing geologic mapping within a given county, and needs for the geologic information for environmental understanding and natural resource potential. At the present time there are 18 counties with priority ratings (7 counties-Priority 1; 7 counties-Priority 2; and 3 counties-Priority 3). The five counties listed in this proposal for mapping--Bourbon, Greenwood, Comanche, Kearny, and Hamilton, are all Priority one counties.

Strategy for the Investigations

Mapping in Kansas is different depending on whether one is working in the western or eastern part of the state. Irrespective of area of study, however, mapping is extremely labor intensive. In eastern Kansas, owing to the subtlety of exposures, finding good outcrops is difficult and requires extensive fieldwork. In addition, recognizing a unit based on a small outcrop can be challenging in any circumstances, but becomes especially so in cyclothemic strata where more than 100 named units can occur in a single county. In eastern Kansas, air photos are useful in the hunt for potential outcrops. In central and western Kansas, there is much less vegetation to interfere with air-photo extrapolation of units. Consequently, field checking of outcrops and air-photo work become integral components of the mapping process. However,

detailed assessment of the Quaternary deposits requires on-site investigation often supplemented with auger studies.

Timetable.—. The proposed deliverables for each county being mapped will be a digital county map and a digital file of data within one year of completion of the fieldwork phase of the county mapping project. In addition, copies of field quadrangle maps at 1:24,000 scale with supporting information will be available as Kansas Geological Survey Open-file reports at the end of each grant year, thus allowing access to original sources of the digital data. Transfer of mapped information to stable mylar bases developed for quadrangles within each county and digital input of data requires extended time.

5/97–4/98--Field studies and geologic mapping of Greenwood County by D.F. Merriam and in Bourbon County by R.R. West and R.S. Sawin will continue in the eastern part of Kansas. Similar effort of field studies, with more airphoto interpretation, mainly of Kearny County, but with limited effort this year in Hamilton County, will be undertaken by W. C. Johnson and a graduate student field assistant. J.R. McCauley will conduct the geologic mapping in Comanche County, in the south-central part of Kansas. These field mapping efforts will be followed by submission of 1:24,000-scale field maps for KGS open-file reports and initial efforts made of digital entry of the mapped data. This will require update of digital information on county hydrologic features and political boundaries as well as plots of geologic information from field quadrangle sheets onto mylar film for digitizing.

After field mapping is complete for each county, it is necessary to complete the digital input, technical review at KGS, and production of preliminary versions of 1:50,000-scale county geologic maps. This final product is expected to be completed within the year following county field mapping.

In addition to continued geologic mapping on the four mapping projects (five counties), digitizing and field checking is proposed for three additional counties (Chase, Johnson, and Anderson counties) with quality existing geologic maps (figure 1). This county map review and digitizing effort led by D. R. Collins and J. A. Ross will be completed within the 12 month time period of this proposed study.

Subsequent work on these projects--This proposal is submitted as a one year field mapping effort. However, it is expected that the mapping of each of the proposed counties will require at least one additional year of effort. A listing is made in table 2 of the quadrangles present in the five proposed mapping counties, with those quadrangles highlighted that are expected to be completed during this proposed contract year and those expected to be completed during the present FY96 contract year.

Supporting investigations.—. The major external supporting study in eastern Kansas will be conducted by R.R. West (Kansas State University) and C.G. Maples (KGS) on Virgilian brachiopod biostratigraphy. The area of proposed mapping encompasses much of R.C. Moore's (1932) original type Virgilian (named for Virgil, Greenwood County, Kansas), which has never been adequately described either lithologically or paleontologically. In addition, West and

Maples continue to use many of the mapped localities as projects for graduate-level theses and classes at both Kansas State University and at the University of Kansas. Because some areas of eastern Kansas do not have extensive exposure, some coring could be done using the KGS drilling rig with wire-line coring system. Previous cores obtained as part of the KGS and COGEOMAP mapping program have proven invaluable in stratigraphic correlation and have been reposited in the core-storage facility of the KGS where they are available for study by anyone.

Geologic mapping in Kearny and Hamilton counties will provide valuable information for three research programs of the KGS. The Dakota Aquifer program has been underway for eight years through the Geohydrology Section of the KGS and is a multi-investigator, multi-disciplinary investigation of the potential and problems of using the Dakota Sandstone and adjacent units for water supply in central and southwestern Kansas. The Upper Arkansas River study started in 1995 is concerned with the water quality in the alluvium of the Arkansas River valley in the area included in these two counties. In addition, for the Hamilton and Kearny counties project, a Hugoton Embayment program will soon be started by the Petroleum Research Section of the KGS. Like the Dakota Aquifer study, the Hugoton Embayment study is a multi-discipline, multi-investigator study that will address questions related to gas and oil recovery in the subsurface of the Hugoton embayment area. Gas production from the Hugoton embayment traditionally has been one of the highest in the world. At this time there are limited supporting investigations for the Comanche County project except the Dakota program will be of importance to the northern part of the county. The recent Clark County mapping effort by USGS will be important to the mapping efforts in Comanche County.

Deliverables

At the end of this contract period, geologic quadrangle maps of quadrangles mapped in each of the four project areas will be submitted to USGS for review. The number of quadrangles to be completed for each project area during this contract year are anticipated to be as follows--Bourbon County (all or part of 5 quads); Greenwood County (all or part of 7 quads); Comanche County (5 quads); and the Kearny /Hamilton counties project (all or part of 23 quads). Supporting geological notes and stratigraphic sections will also be submitted. All are anticipated to be as KGS Open-file maps or reports. All mapping will be at 1:24,000 scale.

As part of the digitizing efforts on existing geologic maps for Chase, Johnson, and Anderson counties, the deliverables will be a digital file and map prints of each of the counties at a scale of 1:100,000. Quality of the digital files will be such that they can be utilized for production of maps at larger scale sizes up to the scale of the original maps.

Following additional contract years that result in completion of the field work for a given county, a digitized geologic map for the respective county is expected to be completed within one year and submitted for review.

Table 1--Members of the Kansas Geologic Mapping Committee (Oct. 1996)

Lee Gerhard	State Geologist and Director, Kansas Geological Survey, Lawrence, KS.
Tom Collinson	Publisher, Pittsburg Morning Sun, Pittsburg, KS. (geologist by training), and Chair, Kansas Geologic Mapping Committee.
David Nance	City Commissioner, and former plant manager, Allied-Signal Corporation, Pittsburg, KS.
Steve Morris	State Senator, and farmer-irrigator, Hugoton, KS.
Jeffrey Mason	Attorney, and past member Kansas Water Authority, Goodland, KS.
Robert Crangle	Attorney, and business consultant, Lincoln, KS.
A. Scott Ritchie	Geologist, and Chairman, Ritchie Exploration, Inc., Wichita, KS.
Marvin Odgers	Farmer-irrigator, and past member Kansas Water Authority, Sublette, KS.
Larry Richardson	Geologist, Pickrell Drilling Company, Wichita, KS.
Dyan Conway	Vice President, Mercantile Investment Services, Mercantile Bank of Kansas City, Prairie Village, KS. (geologist by training).
Gary Hulett	Professor of Biology and past-Vice President, Fort Hays State University, Hays, KS, and past advisor to the Governor on science and the environment.
David Heinemann	Chief Council, Kansas Corporation Commission, Topeka, KS, and former Representative, Kansas Legislature.
John Strickler	Executive Director, KACEE (Kansas Council on Environmental Education), and former Kansas State Forester, Manhattan, KS.
William Hambleton	Past State Geologist and Emeritus Director, Kansas Geological Survey, Lawrence, KS.

Table 2---7.5' quadrangles for geologic mapping that are present in the five counties of this STATEMAP proposal.*

PROJECT #1.

BOURBON COUNTY 7.5' QUADRANGLES: Blue Mound, Bronson, Cato, Deerfield (MO), ***Devon***, Fort Scott, Garland (MO), Hammond, Hepler, Hiattville, ***Hume (MO)***, ***Mantey***, Mapleton, Marmaton, Moran SE, Porterville, ***Prescott***, Richards (MO), ***Uniontown***, Xenia

PROJECT #2.

COMANCHE COUNTY 7.5' QUADRANGLES: ***Buttermilk***, ***Coldwater***, East Kiowa Creek South, Fancy Canyon, Indian Creek, Lexington, ***Nescatunga Creek North***, Nescatunga Creek South, Protection, ***Protection NE***, Protection SW, Sugarloaf, Trout Creek, ***Wilmore***

PROJECT #3.

GREENWOOD COUNTY 7.5' QUADRANGLES: Beaumont, ***Coyville***, Eureka, Eureka NE, Fall River, Fall River Lake, Gridley, Gridley NW, ***Hamilton***, Lamont, Lapland, Latham SE, Madison, Madison NE, Madison SW, Matfield Green SE, Neal, ***New Albany***, Piedmont, Piedmont NE, Piedmont NW, Piedmont SW, ***Quincy***, ***Reece***, Rosalia, Rosalia NE, Severy North, Severy South, Shaw Creek, Teterville, Thrall, Tonovay, ***Toronto***, ***Virgil***

PROJECT #4.

HAMILTON COUNTY 7.5' QUADRANGLES: Big Bow NE, Big Bow NW, Durkee Creek NE (CO), Durkee Creek SE (CO), Holly East (CO), Holly NE (CO), Johnson NE, Johnson NW, Kendall, Lycan NE (CO), Selkirk SE, Selkirk SW, Syracuse East, Syracuse East SE, Syracuse East SW, Syracuse West, Syracuse West NW, Syracuse West SE, Syracuse West SW, Towner SE (CO), Tribune SE, Tribune SW, Tribune 3 NE, Tribune 3 NW, Tribune 3 SE, Tribune 3 SW, Tribune 4 NE, Tribune 4 NW, Tribune 4 SE, Tribune 4 SW

KEARNY COUNTY 7.5' QUADRANGLES: ***Big Bow NE***, Deerfield, Deerfield NE, ***Deerfield SE, Deerfield SW, Hickok NE, Hickok NW***, Kendall, Lakin, Lakin NW, ***Lakin SE, Lakin SW, Leoti SW, Leoti 3 NE, Leoti 3 NW, Leoti 3 SE, Leoti 3 SW, Modoc SE, Modoc SW, Selkirk SE, Syracuse East SE, Tribune 4 NE, Tribune 4 SE, Ulysses NE, Ulysses NW, Wolf, Wolf NE, Wolf NW***, Wolf SW

* The quadrangles (portions within the counties being mapped) scheduled for completion by 5/97 (mapping during present year) are underlined. Those quadrangles or portion of quadrangle within a county proposed for completion by 5/98 as part of this proposal are shown in *italics* and ***highlighted***. Unmarked quad names will be considered in future mapping proposals.

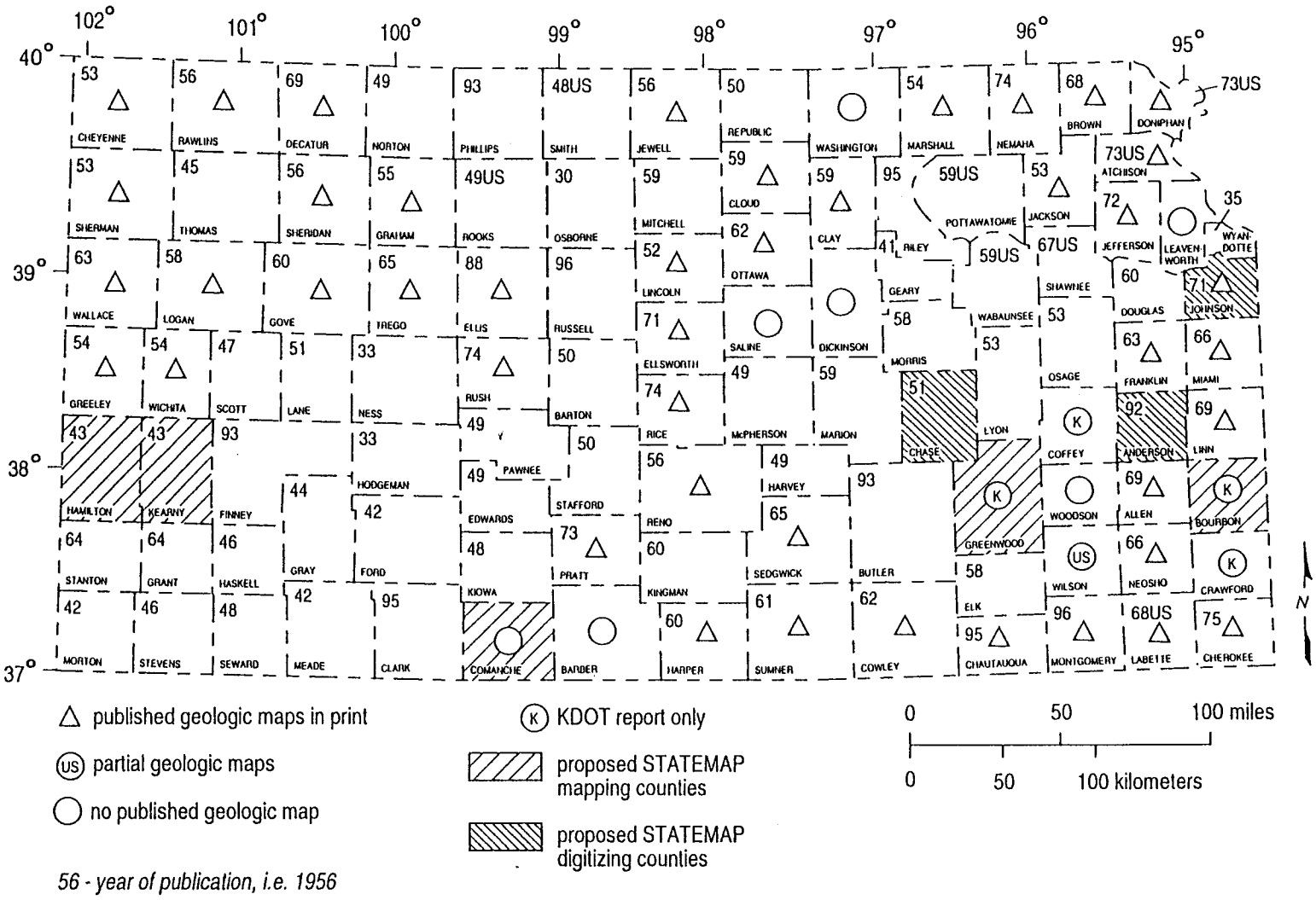

Figure 1. -- Proposed STATEMAP mapping project areas and digitizing project areas for May 1997 to April 1998, and status of published county geologic maps.

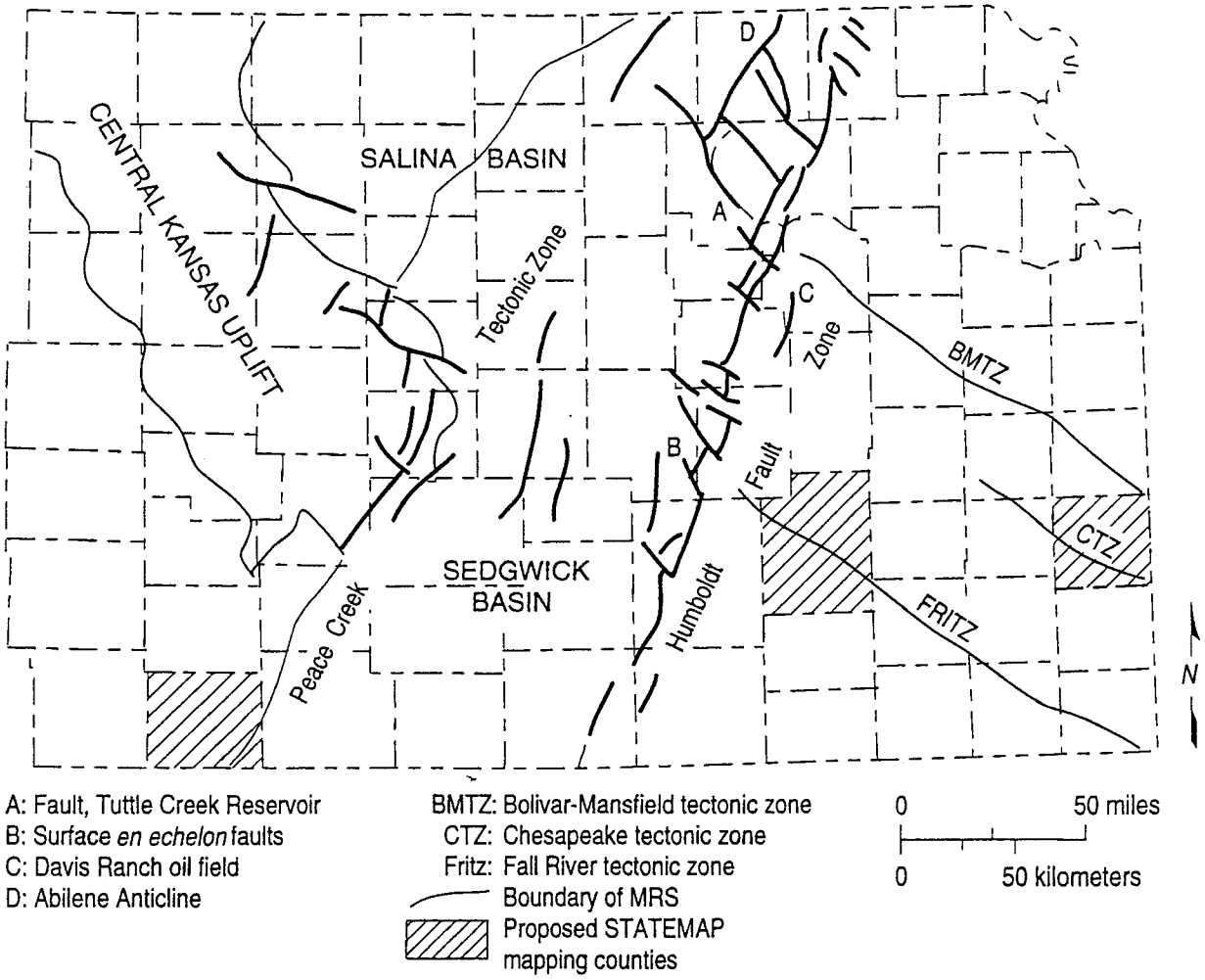

Figure 2. -- Major basement tectonic features for the eastern two thirds of Kansas (Berendsen et al., 1990).

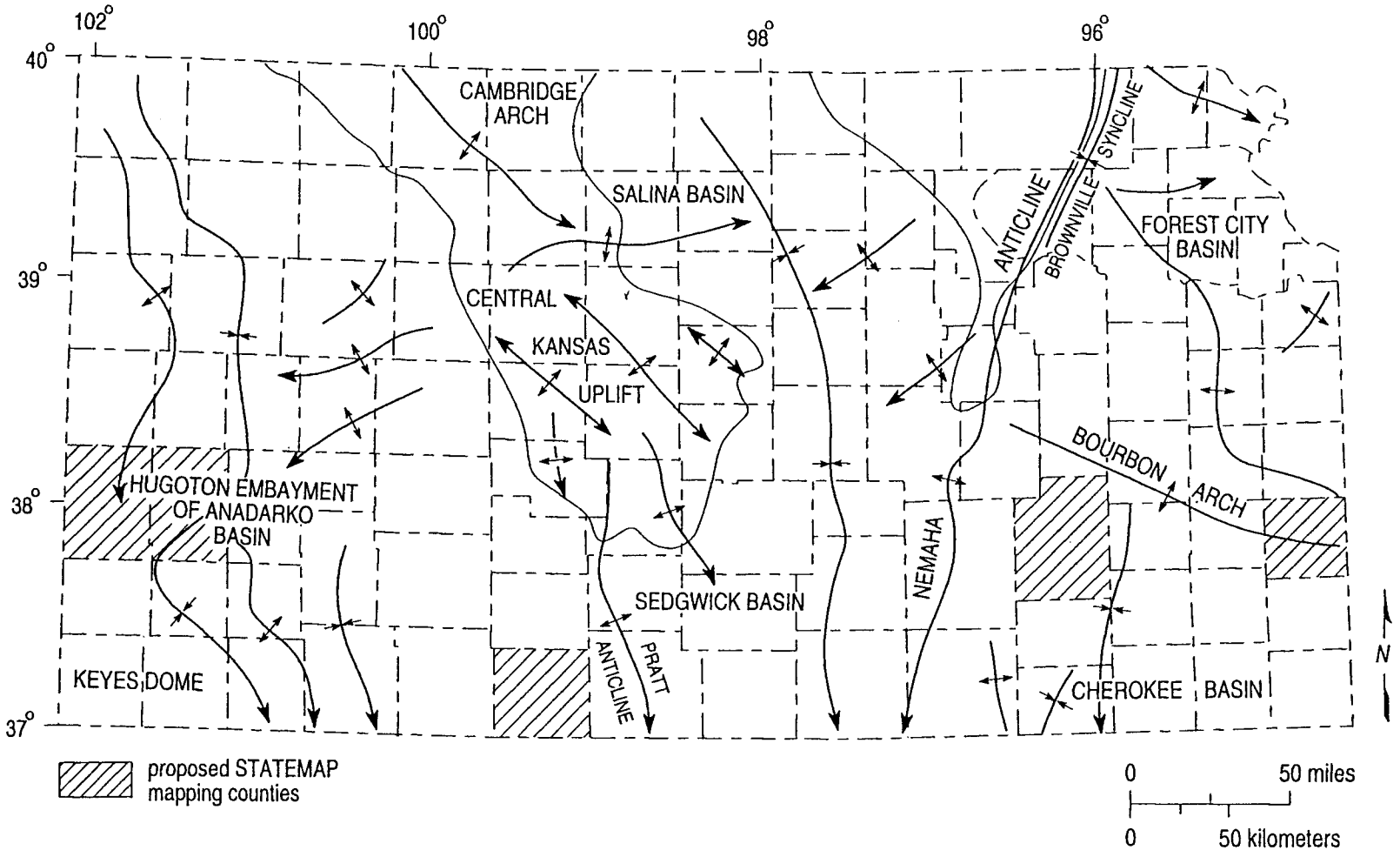

Figure 3. -- Major basement structural features in Kansas (from Stewart, 1975).

Cited References

Aber, J.S. 1994. Geologic map of Butler County, Kansas: Kansas Geological Survey, Map Series M-30A & B, 1:50,000 scale, 2 sheets.

Arbogast, A.F. 1991. Late Quaternary evolution of a small basin in the Kansas River system: Wolf Creek: Unpub. M.S. Thesis, Department of Geography, University of Kansas, Lawrence, Kansas, 153 p.

Arbogast, A.F., and Johnson, W.C. 1994. Climatic implications of the Later Quaternary alluvial record of a small drainage basin in the central Great Plains: Quaternary Research, 41:298–305.

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Proposed Budget

	USGS funds	KGS funds
PERSONNEL		
J.R. McCauley, Assistant Scientist-KGS (0.50 FTE)	$ 2,000	$15,739
Geologist--Comanche Co. project		
D.F. Merriam, Senior Scientist-KGS (0.15 FTE)	$ 1,500	$ 9,530
Geologist--Greenwood Co. project		
L.L. Brady, Associate Scientist-KGS (0.20 FTE)		$13,829
Geologist & Coordinator		
W.C. Johnson, Professor-KU (2 months)	$10,500	
Geologist--Kearny & Hamilton Co. project		
R.R. West, Professor-KSU (2 months)	$10,500	
Geologist--Bourbon Co. project		
R.S. Sawin, Research Assistant-KGS (0.10 FTE)	$ 1,000	$ 3,588
Geologist--Bourbon Co. project		
Graduate Research Assistant[1]	$ 4,920	
Field Assistant-Kearny & Hamilton Co. project(3mo.)		
D.R. Collins, Associate Scientist-KGS (0.15 FTE)	$ 1,000	$ 7,179
Auto Cartographer/Geologist-Digital map project		
J.A. Ross, Research Assistant-KGS (0.3 FTE)	$ 1,000	$ 9,929
Automated Cartographer-Digital map project[2]		
E.C. Crouse, Research Assistant-KGS (1.0 FTE)	$19,000	
Digitizer/Geologist-Digital map project[2]		
Subtotal Salaries	$51,420	$59,794
FRINGE BENEFITS[3]		
Full-time Staff (27% of salary)[4]	$ 9,895	$16,144
Student Staff (10% summer)[5]	$ 492	
Subtotal Fringe Benefits	$10,387	$16,144
TRAVEL (in-state)[6]		
Mileage @ 0.30/mile x 17,000 miles	$ 5,100	
Per diem (mapping) @ $60/day x 200 days	$12,000	
Subtotal Travel	$17,100	
SUPPLIES		
Computer supplies, mylar, ink, and plotter paper[7]	$ 1,200	
Field and office supplies (misc)	$ 300	
Subtotal Supplies etc.	$ 1,500	
TOTAL DIRECT COSTS	$80,407	$75,938

INDIRECT COSTS		
18% and 25% off-campus rate[8]	$14,473	$18,985
TOTAL COSTS	**$94,880**	**$94,923**

EXPLANATION OF NUMBERED BUDGET ITEMS

1) One graduate student working 100% time for three months during the summer as a field assistant for W.C. Johnson on the Kearny and Hamilton County project.

2) J.A. Ross and E.C. Crouse will work primarily on the Digital map project, but will also work with the digital portion of each of the geologic mapping projects.

3) Rates shown are the university's average used for the purposes of estimating these costs. Actual fringe-benefit costs will be charged according to state and university guidelines.

4) Amount computed at 27% for full-time staff salaries of $59,794 for KGS contribution and $27,500 for USGS contribution, except for E.C. Crouse where fringe was calculated at 13% for her salary of $19,000, because she will not receive full benefits.

5) USGS amount computed on $4,920 salary for the graduate field assistant at the summer student rate of 10%.

6) Travel reflects estimate of actual costs provided by USGS. The allowable per diem rate for the study areas in Kansas would be actual cost of motel, (not to exceed $50.00/night), and a meal allowance of $5.75/quarter ($23.00/day).

7) Supplies for base map plots and working/editorial copies of digital-format maps.

8) Indirect costs computed at 18% (per agreement between Association of State Geologists and USGS) for USGS contribution, and at 25% for KGS contribution.

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BUDGET INFORMATION — Non-Construction Programs

SECTION A – BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. STATEMAP		$	$	$ 94,880	$ 94,923	$ 189,803
2.						
3.						
4.						
5. TOTALS		$	$	$ 94,880	$ 94,923	$ 189,803

SECTION B – BUDGET CATEGORIES

6 Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY (1) STATEMAP	(2)	(3)	(4)	Total (5)
a. Personnel	$ 111,214	$	$	$	$ 111,214
b. Fringe Benefits	26,531				26,531
c. Travel	17,100				17,100
d. Equipment					
e. Supplies	1,500				1,500
f. Contractual					
g. Construction					
h. Other					
i. Total Direct Charges (sum of 6a - 6h)	156,345				156,345
j. Indirect Charges	33,458				33,458
k. TOTALS (sum of 6i and 6j)	$ 189,803	$	$	$	$ 189,803
7. Program Income	$	$	$	$	$

SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) TOTALS
FY 97 STATEMAP	$ 94,923	$	$	$ 94,923
3.				
1.				
2. TOTALS (sum of lines 8 and 11)	$ 94,923	$	$	$ 94,923

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
3. Federal STATEMAP	$ 94,880	$ 50,000	$ 15,000	$ 15,000	$ 14,880
4. NonFederal	94,923	30,000	25,000	20,000	19,923
5. TOTAL (sum of lines 13 and 14)	$ 189,803	$ 80,000	$ 40,000	$ 35,000	$ 34,803

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) Grant Program	FUTURE FUNDING PERIODS (Years)			
	(b) First	(c) Second	(d) Third	(e) Fourth
6.	$	$	$	$
7.				
8.				
9.				
0. TOTALS (sum of lines 16 -19)	$	$	$	$

SECTION F - OTHER BUDGET INFORMATION

(Attach additional Sheets if Necessary)

1. Direct Charges: $80,407

22. Indirect Charges: $14,473 (18% of direct charges-less equipment)

3. Remarks

TMDC DHHS Federal Region IV, Dallas, TX effective March 16, 1995

OMB Approval No. 0348-0040

ASSURANCES — NON-CONSTRUCTION PROGRAMS

Note: Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the awarding agency. Further, certain Federal awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant I certify that the applicant:

1. Has the legal authority to apply for Federal assistance, and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project costs) to ensure proper planning, management and completion of the project described in this application.

2. Will give the awarding agency, the Comptroller General of the United States, and if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the award; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.

3. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.

4. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.

5. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§ 4728-4763) relating to prescribed standards for merit systems for programs funded under one of the nineteen statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).

6. Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§ 1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. § 794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C.§§ 6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§ 523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. 290 dd-3 and 290 ee-3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. § 3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.

7. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.

8. Will comply with the provisions of the Hatch Act (5 U.S.C. §§ 1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

9. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§ 276a to 276a-7), the Copeland Act (40 U.S.C. § 276c and 18 U.S.C. §§ 874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§ 327-333), regarding labor standards for federally assisted construction subagreements.

10. Will comply, if applicable, with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program andto purchase flood insurance if the total cost of insurable construction and acquisition is $10,000 or more.

11. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§ 1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. § 7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended, (P.L. 93-523); and (h) protection of endangered species under the Endangered Species Act of 1973, as amended, (P.L. 93-205).

12. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§ 1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.

13. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. 469a-1 et seq.).

14. Will comply with P.L. 93-348 regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.

15. Will comply with the Laboratory Animal Welfare Act of 1966 (P.L. 89-544, as amended, 7 U.S.C. 2131 et seq.) pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by this award of assistance.

16. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§ 4801 et seq.) which prohibits the use of lead based paint in construction or rehabilitation of residence structures.

17. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act of 1984.

18. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations and policies governing this program.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL	TITLE
Kim Morelan	Director, Research Support and Grants Administration
APPLICANT ORGANIZATION	**DATE SUBMITTED**
The University of Kansas	11/1/96

ATTACHMENT D

CERTIFICATIONS
FOR FEDERAL ASSISTANCE

PART A: Certifications Regarding Debarment, Suspension and Other Responsibility Matters - Primary Covered Transactions. Applies to all grantees and cooperators.

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 43 CFR Part 12, Section 12.510, Participants' responsibilities. The regulations were published as Part VII of the May 25, 1988 Federal Register (pages 19160-19211). For further assistance in obtaining a copy of the regulations, contact the issuing office.

(a) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals: (1) are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency; (2) have not within a 3-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property; (3) are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and (4) have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

(b) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

The prospective primary participant further agrees by submitting this proposal that it will include the following clause, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions (see Appendix A of Subpart D of 43 CFR Part 12):

PART B: Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions.

(a) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

(b) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

PART C: Certification Regarding Drug-Free Workplace. Alternate I. Applies to grantees other than individuals.

This certification is required by the regulations implementing the drug-free workplace requirements for Federal grant recipients under the Drug-Free Workplace Act of 1988 (43 CFR Part 12, Subpart D). A copy of the regulation is available from the issuing office.

A. The grantee certifies that it will or continue to provide a drug-free workplace by:

(a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;

(b) Establishing an on-going drug-free awareness program to inform employees about (1) the dangers of drug abuse in the workplace; (2) the grantee's policy of maintaining a drug-free workplace; (3) any available drug counseling, rehabilitation, and employee assistance programs; and (4) the penalties that may be imposed upon employee for drug abuse violations occurring in the workplace;

(c) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (a);

(d) Notifying the employee in the statement required by paragraph (a) that, as a condition of employment under the grant, the employee will (1) abide by the terms of the statement; and (2) notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction;

(e) Notifying the agency, in writing, within ten calendar days after receiving notice under subparagraph (d)(2) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every grant officer or other designee on whose grant activity the convicted employee was working, unless the Federal agency has designated a central point for the receipt of such notices. Notice shall include the identification number(s) of each affected grant;

(f) Taking one of the following actions, within 30 calendar days of receiving notice under subparagraph (d)(2), with respect to any employee who is so convicted: (1) taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended, or (2) requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency;

(g) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (a), (b), (c), (d), (e) and (f).

B. The grantee may insert in the space provided below the site(s) for the performance of work done in connection with the specific grant:

Place of Performance (Street address, city, county, state, zip code)

Kansas Geological Survey
1930 Constant Avenue, Campus West
Lawrence, Douglas County, Kansas 66047

Check ____ If there are workplaces on file that are not identified here.

PART D: Certification Regarding Drug-Free Workplace Alternate II. Applies to grantees who are individuals.

This certification is required by the regulations implementing the drug-free workplace requirements for Federal grant recipients under the Drug-Free Workplace Act of 1988 (43 CFR Part 12, Subpart D). A copy of the regulation is available from the issuing office.

(a) The grantee certifies that, as a condition of the grant, he or she will not engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance in conducting any activity with the grant;

(b) If convicted of a criminal drug offense resulting from a violation occurring during the conduct of any grant activity, he or she will report the conviction, in writing, within 10 calendar days of the conviction, to the grant officer or other designee, unless the Federal agency designates a central point for the receipt of such notices. When notice is made to such a central point, it shall include the identification number(s) of each affected grant.

Part E: Certification Regarding Lobbying - Certification for Contracts, Grants, Loans, and Cooperative Agreements Applies to recipients of awards exceeding $100,000.

This certification is required by Section 1352, title 31, U.S. Code, entitled "Limitation on use of appropriated funds to influence certain Federal contracting and financial transactions."

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

As the authorized certifying official, I hereby certify that the above specified certifications are true.

Kim Moreland

Signature

Kim Moreland, Director, Research Support and Grants Administration

Typed name and title

The University of Kansas, Kansas Geological Survey

Applicant/Recipient

COLLEGES AND UNIVERSITIES RATE AGREEMENT

EIN #: 148602992SD1

DATE: March 16, 1995

INSTITUTION:
University of Kansas
225 Strong Hall
Lawrence KS 66045

FILING REF.: The preceding Agreement was dated August 23, 1994

The rates approved in this agreement are for use on grants, contracts and other agreements with the Federal Government, subject to the conditions in Section II.

SECTION I: INDIRECT COST RATES*

RATE TYPES: FIXED FINAL PROV.(PROVISIONAL) PRED.(PREDETERMINED)

TYPE	EFFECTIVE PERIOD FROM	TO	RATE(%)	LOCATIONS	APPLICABLE TO
PRED.	07/01/94	06/30/99	46.0	On Campus	Research
PRED.	07/01/94	06/30/99	25.0	Off Campus	Research
PRED.	07/01/94	06/30/99	45.0	On Campus	Inst. & Training
PRED.	07/01/94	06/30/99	26.0	Off Campus	Inst. & Training

The above listed rates are also applicable to the University of Kansas Center for Research Inc.

*BASE:
Modified total direct costs consisting of all salaries and wages, fringe benefits, materials and supplies, services, travel, and subgrants and subcontracts up to $25,000 of each subgrant or subcontract. Equipment, capital expenditures, charges for patient care and tuition remission, rental costs, scholarships, and fellowships as well as the portion of each subgrant and subcontract in excess of $25,000 shall be excluded from modified total direct costs.

TREATMENT OF FRINGE BENEFITS:
Fringe benefits are specifically identified to each employee and are charged individually as direct costs. The directly claimed fringe benefits are listed in the Special Remarks Section of this Agreement.

INSTITUTION:
University of Kansas

AGREEMENT DATE: March 16, 1995

SECTION II: GENERAL

A. LIMITATIONS:
The rates in this Agreement are subject to any statutory or administrative limitations and apply to a given grant, contract or other agreement only to the extent that funds are available. Acceptance of the rates is subject to the following conditions: (1) Only costs incurred by the institution were included in its indirect cost pool as finally accepted: such costs are legal obligations of the institution and are allowable under the governing cost principles; (2) The same costs that have been treated as indirect costs are not claimed as direct costs; (3) Similar types of costs have been accorded consistent accounting treatment; and (4) The information provided by the institution which was used to establish the rates is not later found to be materially incomplete or inaccurate by the Federal Government. In such situations the rate(s) would be subject to renegotiation at the discretion of the Federal Government.

B. ACCOUNTING CHANGES:
This Agreement is based on the accounting system purported by the institution to be in effect during the Agreement period. Changes to the method of accounting for costs which affect the amount of reimbursement resulting from the use of this Agreement require prior approval of the authorized representative of the cognizant agency. Such changes include, but are not limited to, changes in the charging of a particular type of cost from indirect to direct. Failure to obtain approval may result in cost disallowances.

C. FIXED RATES:
If a fixed rate is in this Agreement, it is based on an estimate of the costs for the period covered by the rate. When the actual costs for this period are determined, an adjustment will be made to a rate of a future year(s) to compensate for the difference between the costs used to establish the fixed rate and actual costs.

D. USE BY OTHER FEDERAL AGENCIES:
The rates in this Agreement were approved in accordance with the authority in Office of Management and Budget Circular A-88, and should be applied to grants, contracts and other agreements covered by the Office of Management and Budget Circular A-21, subject to any limitations in A above. The institution may provide copies of the Agreement to other Federal Agencies to give them early notification of the Agreement.

E. OTHER:
If any Federal contract, grant or other agreement is reimbursing indirect costs by a means other than the approved rate(s) in this Agreement, the institution should (1) credit such costs to the affected programs, and (2) apply the approved rate(s) to the appropriate base to identify the proper amount of indirect costs allocable to these programs.

INSTITUTION:
University of Kansas

AGREEMENT DATE: March 16, 1995

F. SPECIAL REMARKS:

OFF-CAMPUS DEFINITION: For all activities performed in facilities not owned by the institution and/or to which rent is directly allocated to the project(s) the off-campus rate will apply. Grants or contracts will not be subject to more than one indirect cost rate. If more than 50% of a project is performed off-campus, the off-campus rate will apply to the entire project.

The indirect cost reimbursement rates include the cost of administrative and clerical staff, except those staff costs specifically approved by the awarding agencies as appropriate direct charges to major projects or activity. The cost of specifically approved administrative and clerical costs identified with major projects or activity are included as part of the modified total direct cost base. The provisions of F.6.b of OMB Circular No. A-21 and the OMB clarifications shall guide the implementatic of this paragraph.

FRINGE BENEFITS:

FICA	Retirement
Disability Insurance	Life Insurance
Termination Pay	Worker's Compensation
Unemployment Insurance	Health Insurance

TREATMENT OF PAID ABSENCES:
Vacation, holiday, sick leave pay and other paid absences are included in salaries and wages and are claimed on grants, contracts and other agreements as part of the normal cost for salaries and wages. Separate claims for the costs of these paid absences are not made.

BY THE INSTITUTION:
University of Kansas

(INSTITUTION)

(SIGNATURE)

(NAME)
Edward L. Meyen

(TITLE)
Executive Vice Chancellor

(DATE)
April 10, 1995

BY THE COGNIZANT AGENCY
ON BEHALF OF THE FEDERAL GOVERNMENT:

DEPARTMENT OF HEALTH AND HUMAN SERVICES
(AGENCY)

(SIGNATURE)

John T. Glennon
(NAME)

ACTING DIRECTOR, DIVISION OF COST ALLOCATION
(TITLE)

March 16, 1995
(DATE) 7049

NNS REPRESENTATIVE: Donald A. Carroll

Telephone: (214) 767-3261 x411

COMPONENTS OF PUBLISHED INDIRECT COST RATES

UNIVERSITY OF KANSAS

RESEARCH

COMPONENTS		FYE 6/30/94–99	
Facilities			
	Building Use Allowance	1.8%	
	Equipment Use Allowance	4.2%	
	Operations and Maintenance	14.0%	
	Library	1.0%	
	Interest	0.0%	
	Total Facilities		21.0%
Administration			
	General Administration	6.0%	
	Departmental Administration	17.0%	
	Sponsored Projects Administration	2.0%	
	Student Services	0.0%	
	Total Administration		25.0%
Negotiated Rate – (Percent)			46.0%

BY THE INSTITUTION:

Name

Executive Vice Chancellor
Title

August 29, 1994
Date

The Morning Sun

Tom H. Collinson, Editor & Publisher

701 N. Locust, Pittsburg, Ks 66762
Phone (316) 231-2600
Toll Free (800) 794-6536
FAX (316) 231-0645

October 21, 1996

Program Officer
National Geologic Mapping Program
(STATEMAP) Component
U.S. Geological Survey
Reston, VA 20192

Dear Sir:

The Kansas Geological Mapping Advisory Committee met in Pittsburg, Kansas, on May 31, 1996, to review on-going geologic mapping projects of the Kansas Geological Survey. At that time we discussed and approved the mapping programs of the Kansas Geological Survey and further discussed potential new county mapping programs.

At the present time, four Kansas mapping projects have partial funding from the STATEMAP program. These included geologic mapping projects in Bourbon, Greenwood, and Comanche counties, and one project that covers both Hamilton, and Kearny counties. Since these projects require additional mapping, it is expected that geologic mapping will continue into the next contract year, and perhaps the following year.

Our committee supports these proposed mapping projects for the 1997-8 contract year, and looks forward to continued support from the STATEMAP program to complete the geologic mapping of Kansas.

Sincerely,

Tom H. Collinson, Chairman
Kansas Geologic Mapping Advisory Committee

cc: Lee C. Gerhard, Director, Kansas Geological Survey

STATEMAP PROPOSAL DATA AND SUMMARY SHEET

State KANSAS

Is a letter of support from your STATEMAP Advisory Committee (SAC) in place?
Yes X No ___(If no, explain)

Have you submitted all products by the required completion date from previous STATEMAP awards?
Yes X No ___ (If no. explain) Submitted 11/95. Products due 5/97 for present STATEMAP award.

Proposed Project Title-- (see explanation sheet - Item #1)

Type of project -- Mapping (4) Compilation (1) Other ___ (If other, explain briefly)

Has this project (and all parts) been approved by your SAC? Yes ___ No X
Approval given for the geologic county mapping. Information on the geologic map compilation was not presented at May meeting.
Show the priority ranking of the parts of this proposal as approved by your SAC.(see explanation shee Item #2
1st Comanche 2nd Kearny-Hamilton 3rd Bourbon
4th Greenwood 5th Geologic Map Compilation-Chase, Johnson, Anderson counties

If a mapping project, how many 7.5 quads will be completed in each part of this proposal?
1st *5 (5) quads, 2nd *23 (10) quads, 3rd *5 (2.7) quads 4th *7 (4.2) quads
*All or part of quads to be mapped. Estimate of full quad areas in brackets.

If a compilation, how many 100K quads will be completed by this proposal? ___ quads
3 Kansas counties - total area is slightly larger than one 100K quad.
Show if each part of this proposal is for a new project, or year 2, or year 3 of a multi-year project?
1st 2nd year 2nd 2nd year 3rd 3rd year 4th 4th year 5th new

Is the principal investigator for each part of this proposal working on contract or is he/she permanent survey staff?
1st staff 2nd *staff 3rd *staff 4th staff 5th staff
*Professors working on summer staff (2 mo. each)

Budget Questions

Total amount requested from STATEMAP $ 94,880

Amount requested from STATEMAP for drilling $ 0

Amount of State match $ 94,923

If a mapping project, state the estimated cost per 7.5 minute quadrangle
1st $ 7,600, 2nd $ 4,400, 3rd $ 13,100 4th $ 7,000

If a compilation project, state the estimated cost per 1:100,000 quad
1st $43,300 2nd ___ 3rd ___ (Note - Represents 3 counties)

Explanation Sheet for the STATEMAP Proposal Data and Summary Sheet

New Proposal Questions

Item 1) Title---A Proposal Submitted to the STATEMAP Program of the Geological Survey, Department of the Interior, for Continuation of Geologic Mapping and Compilation of Digitized County Data Bases in Greenwood, Bourbon, Comanche, Hamilton, and Kearny Counties, Kansas; and the Compilation of Digitized County Data Bases for Johnson, Anderson and Chase Counties, Kansas.

Item 2) Four geologic mapping projects are presented in this proposal because of the KGS desire to complete the four projects presently being mapping under the FY96 STATEMAP program. Since these projects are presently being funded it is hoped that each of the projects will continue to be funded until completion. Completion is expected for each of the mapping projects at the end of this proposed year plus one more year. In addition, a project of compilation of geologic information for three Kansas counties is also proposed. These proposed counties for digitizing of geologic information include Johnson, Chase, and Anderson counties, Kansas.

You will note the Kansas program of mapping of individual counties, rather than blocks of quadrangles, fits the program of historic mapping in the state as well as our established mapping approach in the new digital geologic mapping program established in 1989.

STATEMAP PROPOSAL DATA AND SUMMARY SHEET

State KANSAS

Brief project(s) description-

Comanche County Project--Located in south-central Kansas, Comanche County is 789 square miles in size and contains 12 complete 7.5' quadrangles and small portions of eight other quadrangles. Surface rock units are Cretaceous sandstones and shales, and upper Permian shales, sandstones, minor carbonates, and evaporites, with large areas of alluvial deposits and some eolian sediments. This project will be a multi-year mapping effort, and this proposal is for the second mapping year of an estimated 3-year program.

Brief project(s) justification-

Comanche County is the second county to be mapped of a three county unmapped area in south-central Kansas. Clark County (west of Comanche) was mapped by USGS, and the present geologic mapping of the county is from west to the east. Barber County to the east is also an unmapped county. Good oil and gas production (nearly 500 thousand bbls of oil and nearly 6 billion c.f. of natural gas is produced annually) and future potential exists in the county along with the presence of thick gypsum deposits makes this county important for geologic mapping.

STATEMAP PROPOSAL DATA AND SUMMARY SHEET

State KANSAS

Brief project(s) description-

Bourbon County Project--This project is located in southeast Kansas and is a continuation of an earlier start. The area of Bourbon County is 638 square miles, and covers six complete 7.5' quadrangles, and portions of 14 other quadrangles. In this proposal, two months of field work will be contributed to this project area. The geology is primarily Middle and Upper Pennsylvanian rocks composed mainly of shales, limestones, limited sandstones, and numerous thin coal beds. This is a multi-year mapping project, and this proposal is for a third year of mapping on an estimated four-year project.

Brief project(s) justification-

Bourbon County has a fairly high population density for rural Kansas counties (approx. 15,000 people), and the county lacks a published geologic map to assist in determination of various environmental problems common to this part of the state. Coal mining has been important in the county, and limestone quarries are still very important to the county economy. Older oil production still contributes about 80 thousand barrels of production a year. The generation of a quality geologic map is important to both the environmental and continued economic concerns of the county.

STATEMAP PROPOSAL DATA AND SUMMARY SHEET

State KANSAS

Brief project(s) description-

Greenwood County Project--Located in east-central Kansas, Greenwood County is a continuation of two previous STATEMAP contracts (FY92, FY93). The county contains 1135 square miles of area that covers 15 complete or near complete 7.5' quadrangles and parts of 17 other quadrangles. The surficial rocks of the county are Upper Pennsylvanian and Lower Permian limestone and shales, with limited amounts of sandstones present. The cyclic nature of the rocks and significant facies changes makes this county difficult mapping. This proposal is a continuation of earlier geologic mapping, and represents the fourth year of an estimated five year project.

Brief project(s) justification-

Greenwood County lacks a published geologic map, yet it has a long and important relations with the production of petroleum in the state. The county has produced nearly 300 million barrels of petroleum over the years and still has an annual production of nearly 4 million bbls. of petroleum. The interesting yet complex nature of the geology of this county, and the importance of a geologic map for potential environmental problems associated with an older extractive industry, makes this an important county for continued mapping.

STATEMAP PROPOSAL DATA AND SUMMARY SHEET

State KANSAS

Brief project(s) description-

Geologic Map Compilation Project--Three Kansas counties (Chase, Anderson, and Johnson) representing three different complex situations for digitizing are planned as part of the digital mapping compilation projects. Chase County was originally mapped by Moore, Jewett, and O'Connor (1951), and published at a scale of 1:61,400. Anderson County was recently mapped and published as six USGS geological I-series maps by Johnson (1992a,b,c) and (1993a,b,c) at a scale of 1:24,000. The third county in the series is the populous Johnson County that was mapped in 1967, and published by O'Connor (1971) at a scale of 1:48,000. The Kansas Geological Survey has the original topographic field maps used by O'Connor for mapping Johnson County. Information on these field maps (scale of 1:24,000) will be transferred to mylar sheets for digitizing and comparing to the published map.

Brief project(s) justification-

As part of the digitizing efforts on existing geologic maps for Chase, Johnson, and Anderson counties, the deliverables will be a digital file and map prints of each of the counties at a scale of 1:100,000. Quality of the digital files will be such that they can be utilized for production of maps at larger scale sizes up to the scale of the original maps. The digital maps of these areas are important because of natural resource interest, especially crushed stone potential in all three counties, and interest in basic information for resolution of environmental problems, especially in Johnson County. The large scale maps will fit well with the existing geologic mapping program, and the Chase County area will require field-checking to attempt the upgrade the quality of geologic information from the original map.

National Cooperative Geologic Mapping Program
STATEMAP Element
1997 Contract Year

BUDGET ESTIMATES FOR 1997 PROJECT PROPOSAL

TOTALS

STATE:

PROPOSAL SHORT TITLE:

Budget Category	Federal Funding "Requested"	Matching Funds "Proposed"
SALARIES:		
Geologist(s)	$ 26,500	$ 49,865
Field Assistant(s)	$ 4,920	$
Other positions (list separately)	$ 20,000	$ 9,929
FRINGE BENEFITS:	$ 10,387	$ 16,144
FIELD EXPENSES:		
Per Diem	$ 12,000	$
Vehicle Cost	$	$
Mileage	$ 5,100	$
MISCELLANEOUS SUPPLIES:		
Office and Laboratory Supplies (itemize)	$ 300	$
Drilling	$	$
Map Digitizing Costs (supplies)	$ 1,200	$
Other	$	$
TOTAL DIRECT COST:	$ 80,407	$ 75,938
INDIRECT COST (18 %) KGS 25%	$ 14,473	$ 18,985
GRAND TOTAL:	$ 94,880	$ 94,923