KANSAS GEOLOGICAL SURVEY

1930 Constant Ave., Campus West
The University of Kansas
Lawrence, Kansas 66047-3726
phone 785-864-3965
fax 785-864-5317

January 22, 2007

Brenda Schmitt
GGLFI
PO Box 263
Meriden, KS 66512

Dear Ms. Schmitt,
I have reviewed the proposed project for the city of Turon, Kansas, in which a new replacement well is to be drilled for municipal water supply.

Based on the documents attached to your request, it does not appear that there are any potential geologic hazards worth noting that might impact this project.

The above discussion represents our best assessment based on the information that the Kansas Geological Survey has about this locality and/or proposed project at the time of this writing. Other geologic conditions, not discussed herein, or for which the Kansas Geological Survey has no knowledge, may affect the viability or safe operation of this facility or property. The information provided in this letter is from regional or countywide studies and should not be used as a substitute for detailed site characterization by a licensed geologist or engineer. It is the responsibility of the applicant to provide any required site characterizations.

If you have questions please do not hesitate to contact me at my office (785 – 864-2068).

Sincerely yours,

P. Allen Macfarlane

The following form may be used by the Review Agency/Commission for comments in response to the request for clearance from the proposed Public Water Supply Loan Fund Project.

_____ Army Corps of Engineers
_____ Kansas B iological Survey
X State Conservation Commission
_____ Kansas Corporation Commission
_____ Division of Water Resources/Kansas Department of Agriculture
X Kansas Geological Survey
_____ Kansas State Historical Society, State Historic Preservation Office
_____ Kansas Water Office
_____ Kansas Department of Wildlife and Parks
_____ US Dept. of Agriculture - Natural Resources Conservation Service
_____ Kansas Department of Health and Environment
_____ US Department of the Interior - Fish and Wildlife Service

Agency Review Comments: (to be completed by reviewing agency and returned to applicant contact person at name and address shown below)

Comments: See attached letter

Recommended Action: (to be completed by the reviewing agency and returned to applicant contact person at name and address shown below.)

✓ _____ Clearance of project should be granted

_____ Clearance of project should not be granted

_____ Clearance of project should be delayed until the issues or questions have been clarified

_____ Clearance of project should not be delayed, but the applicant (in the application) should address or clarify the questions or concerns indicated above.

P. Allen Macfarlane — Reviewer's Name
KGS — Division/Agency/Commission
1/24/07 — Date

Project Title: Public Water Supply Loan Fund Application

Applicant: City of Turon, Kansas
Contact Person: Brenda G. Schmitt
Address: PO Box 263
City, State: Meriden, KS Zip: 66512 Phone: 800-482-6707

North Branch
PO Box 263
Meriden, KS 66512
Phone 1-800-482-6707
Fax 1-316-262-5504

GGLFI
Governmental
Grants, Leasing & Funding, Inc.

South Branch
PO Box 47851
Wichita, KS 67201
Phone 1-800-743-4089
Fax 1-316-262-5504

January 12, 2007

Re: City of Turon, Kansas
Kansas Public Water Supply Loan Fund
Project No. 2490

The City of Turon, Kansas, Reno County, is preparing an application to the Kansas Department of Health and Environment for a loan from the Kansas Public Water Supply Loan Fund for the referenced project. This project is for the replacement of the city's main public water supply well that collapsed in September, 2006 leaving them to supply water to the 492 residents via their one backup well, which is not designed for this type of demand and is slowly decreasing in production.

The legal description of the project is Section 4, Miami Township, 1344N 3842W 4-26S-10W 1 AKA Vacated BK 36 Now City Park, Hoskinson & Shives 2nd Addition.

The new well will be drilled just a few yards from the collapsed well and connected to the existing chlorination lines and house. The location of both wells is within a city owned open-space area where there are neither easements nor private land ownership issues. Water samples have already been taken from three zones and all have passed KDHE testing standards.

As this is a very straightforward project to replace only the well itself and does not involve any waterline alignments, cost estimates have been received that put the total project cost, including required permits and fees, at approximately $60,000.00 to $70,000.00 plus an estimated $10,000.00 to $15,000.00 for engineering services. (See attached)

We would appreciate your review of the project description and location, and any comments you may have, within 30 days. A project review form and postage paid return envelope are enclosed for your use.

Please call Brenda G. Schmitt at 800-482-6707 if you have any questions.

Sincerely,

Brenda G. Schmitt
GGLFI

The following describes the work and estimates the costs of work, materials and equipment required to construct a new offset well, install pumping equipment, connect to the existing well house, provide electric controls, etc. All in compliance with existing KDHE requirements for a community public water supply well.

1. Preliminary Work.
   (a) **Application to Division of Water Resources** (DWR),Stafford field office) for "Change in Point of Diversion".
   (b) **Application to Kansas Department of Health and Environment** (KDHE) for permit to proceed with the construction of the proposed well. (Standard KDHE form)
   (c) **Drill test hole, collect water samples, submit for inorganic analysis.** Test hole drilled on 9/8/06. Water samples collected from three (3) zones and submitted to Servi-Tech.
   (d) **Drinking Water Standards.** If the preliminary samples submitted reveal accept basic quality, a 5" test well designed to be the same as the new well will be drilled in compliance with specified protocol. Then a submersible test pump with capability of 70 gallons per minute shall be installed after the well has been properly developed. A four hour pump test shall be performed, then followed by recovery measurements for a minimum of one hour. (longer if necessary. Prior to ending the four hour test, water samples specified by KDHE shall be collected in containers provided by KDHE. Delivery of samples to KDHE laboratories is critical. Prior to pumping and collecting the samples, the schedule for delivery shall be coordinated with KDHE.
   (d) **Plans and Specifications** : Shall be prepared as necessary for KDHE approval.

Note: Existing Well No. 3 has a history of contamination and has been out of service at various times that are not available to [redacted] The test hole was drilled to the bed rock (Permian red bed) at 104 feet, the same as the original depth of Well No. 3. It is probable that the design depth of the new well will be less. However, for budget purposes, the 104 foot depth will be assumed until sampling data reveals existing water quality at the different depths sampled.

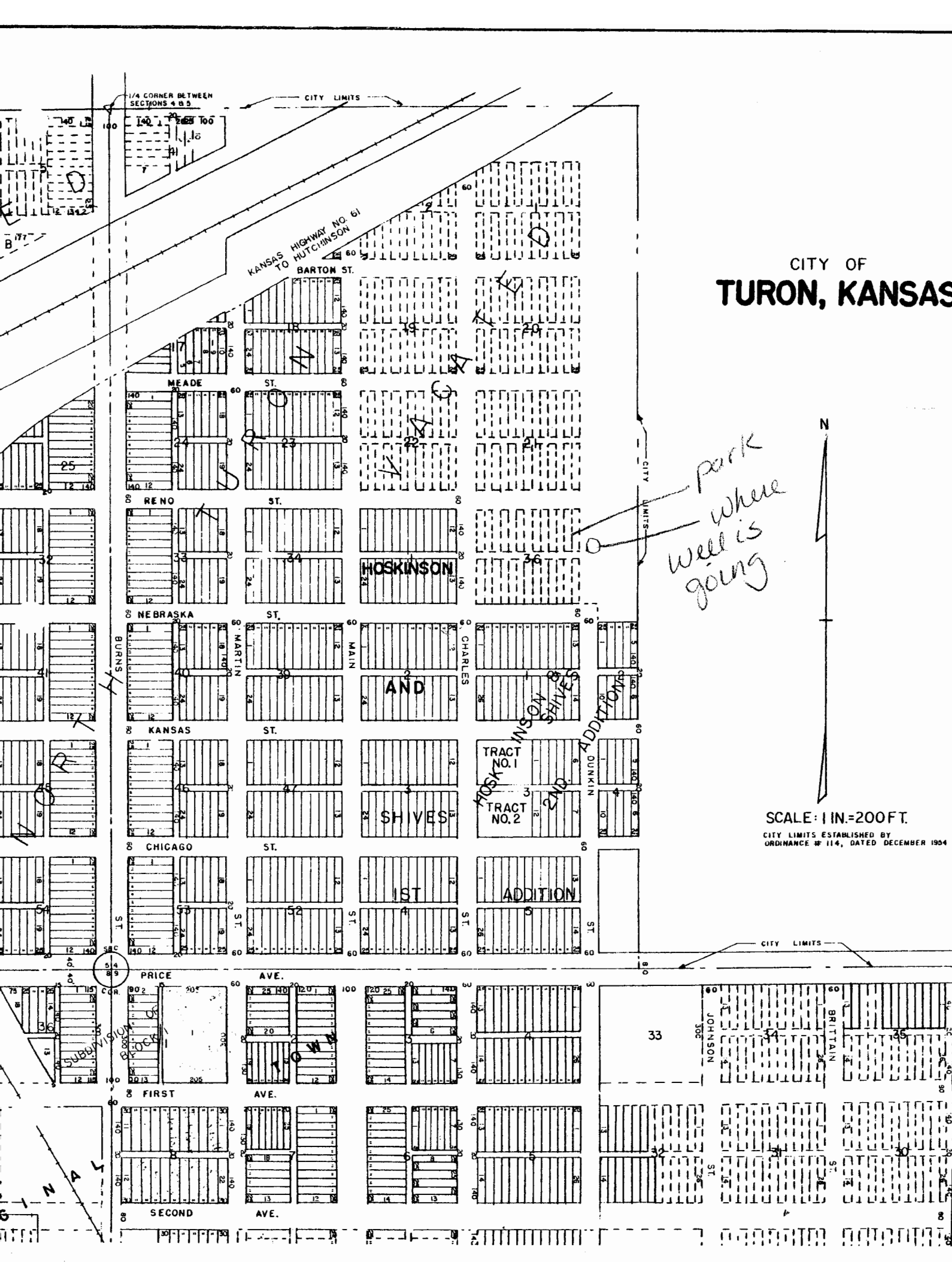
2. **Estimated Well Construction:**
   (a) Borehole shall be 30 inch diameter and drilled by reverse-rotary circulation method that does not require drilling mud or additives.
   (b) Casing shall be 12.75 inch OD, class 160 PVC.
   (c) Well Screen: Shall be 12 inch pipe size, wire wound, continuous slot No. 304 stainless steel as manufactured by Johnson Screen. The slot size shall be determined after the grain size of the formation selected is obtained by sieve analysis.
   (d) Gravel Pack: The annular space between the well casing and well screen (12.75") and the borehole (30") shall be centered by placement of centralizers. After the casing and well screen is positioned in the borehole, the space shall be filled with a select gravel pack as determined by the size of the native formation. To prevent separation, the gravel shall be placed with 3" tremie pipe that shall not be more than 10 feet above the gravel pack at any time. All gravel and drilling water in the pits shall be disinfected with sodium hypochlorite as determined in the project specifications.
   (e) Annular Grout Seal: An annular seal consisting of 50 percent clean sand and 50 percent granular bentonite shall be placed from the top of the gravel pack to 25 feet below the surface.
   (f) Surface Seal: A concrete grout shall be placed in the annulus from five feet below the surface to the top of the annular seal at 25 feet below the surface.
3. **Development and Testing**: After the surface seal has set for a minimum of 24 hours, the development and testing of the well may commence.
   (a) The first phase of development shall be performed with a rig capable of pulling a 10 inch bailer at line speeds up to 500 feet per minute. The well shall be bailed until water is sand free. This procedure normally requires 6 to 8 hours. The second phase of development utilizes a high capacity lineshaft turbine pump with diesel engine. The well is surged and pumped until clean and sand free. After development the well is pumped at various steps. Then pumped at a constant rate.
4. **Pitless Unit**::
   (a) Will be installed at the well with 10'x x 10' x 8" thick concrete platform,· bollards fence as per owner's choice.
5. **Connection to Well:**
   (a) 6" ductile iron pipe and fittings will be connected to the well house after the old well is properly plugged , the existing block is demolished below floor level and casing is cut off.
6. **Pump Selection**:
   (a) After the well is tested, the correct pump submersible turbine pump shall be selected. It is anticipated that a 25 HP submersible pump shall produce 350 gallons per minute at 188 feet total dynamic head. The 6" pump riser shall be Schedule 80 PVC with long taper API threaded couplings. Transition from the PVC riser to the pump shall utilize 6" stainless steel nipples.
7. **Electrical Controls**:
   (a) Will utilize existing wiring and equipment for basic installation. To reduce water hammer and possible pipe repair a variable frequency drive may be incorporated into the control system.

End of Estimated Construction Description

Due to time available, The cost of some items has not been firmed up by the vendors. However, the project without sales tax or bonding will range between $57,000 and $68,000. for all of the work described Item 1 to Item 7 inclusive.

Replacement of PWS No. 3

Application to Stafford field office for "Change in Point of Diversion". Application to Kansas Department of Health and Environment for permit to proceed with the construction of the proposed well. Public Water Supply Test kit	1,605.00
Moblization	535.00
5" Cased well	2,114.32
Test pump 5" well	1,032.55
12" PVC 160# cased well to a T.D. of 104ft.	13,910.00
12" Johnson screen wire wrap 20ft.	3,847.72
12" X 30" Centralizers	197.05
Rig time to run in 3" trimmie pipe to pump in gravel pack and grout	353.10
20ft. of Cement grout	449.40
Well Development	770.40
Backhoe time	802.50
Test pump	1,605.00
Pitless Unit	7,731.07
Construct, pour, and finish 10' X 10' X 8" concrete pad	1,819.00
25HP Dan Foss Box (Variable Frequency Drive)	4,529.31
25HP Submersible pump 350GPM @ 188'T.D.H.	7,650.92
2-6" Stainless Steel pump starters	767.90
Pipe and Fittings	2,140.00
Labor to tie in and hook up line	4,280.00
Plug old well	1,070.00
	57,210.24


CITY OF
TURON, KANSAS
1/4 CORNER BETWEEN SECTIONS 4 & 5
CITY LIMITS
KANSAS HIGHWAY NO. 61 TO HUTCHINSON
BARTON ST.
MEADE ST.
RENO ST.
NEBRASKA ST.
KANSAS ST.
CHICAGO ST.
PRICE AVE.
FIRST AVE.
SECOND AVE.
BURNS ST.
MARTIN ST.
MAIN ST.
CHARLES ST.
HOSKINSON
AND
HOSKINSON & SHIVES 2ND ADDITIONS
TRACT NO. 1
TRACT NO. 2
SHIVES
DUNKIN
1ST ADDITION
SUBDIVISION OF BLOCK 1
TOWN
JOHNSON
BRITTAIN
park where well is going
N
SCALE: 1 IN. = 200 FT.
CITY LIMITS ESTABLISHED BY ORDINANCE # 114, DATED DECEMBER 1954