Sophocleous, M.A., 1982, Letter to Paul C. Clark, Division of Water Resources, Kansas State Board of Agriculture, concerning groundwater quality modeling in vicinity of proposed irrigation well in Harvey County, Kansas, Appropriation of Water File No. 35,887.

Kansas Geological Survey Open-File Report 82-8.

KANSAS STATE BOARD OF AGRICULTURE

DIVISION OF WATER RESOURCES
GUY E. GIBSON, Chief Engineer—Director
109 SW Ninth Street
TOPEKA, KANSAS 66612-1283
(913) 296-3717

HARLAND E. PRIDDLE
Secretary

April 5, 1982

Xerox
Heigart

Kansas Geological Survey
1930 Avenue "A", Campus West
The University of Kansas
Lawrence, Kansas 66044
Attn: Dr. W.W. Hambleton, Director

Re: Appropriation of Water
File No. 35,887

Dear Dr. Hambleton:

We have received an application to appropriate water for irrigation purposes. The application proposes to appropriate 136 acre-feet of water per calendar year, diverted at a rate of 1300 gallons per minute from a well located in the Northeast Quarter of the Southwest Quarter of the Southwest Quarter of Section 4, more particularly described as near a point approximately 925 feet North and 4200 feet West of the Southeast corner of said Section, Township 24 South, Range 3 West, Harvey County, Kansas.

The Equus Beds Groundwater Management District No. 2 has indicated to us the well is located adjacent to an area of questionable water quality and at this time they receomment no action be taken on the application until a study of the water quality in the area can be made.

K.S.A. 82a-711 indicates the Chief Engineer-Director shall approve all application that do not impair existing rights nor prejudicially and unreasonaby affect the public interest. Impairment includes the unreasonable deterioration of the water quality at the users point of diversion beyond a reasonable economic limit.

At this time we are soliciting your assistance for any technical data or any information you may have in your curriculm of expertize pertaining to the detrimental ramifications of the diversion of water by the above mentioned proposed well concerning the quality of water in the area. We have previously referred to your publication, "Discharge of Saltwater, from Permian Rocks to Major Stream Aquifer Systems in Central Kansas," Chemical Quality Series 9, therefore we would appreciate any additional information you may have.

Please foreward this information concerning this matter to this office by May 7, 1982, so we may further process this application to appropriate water for beneficial use.

Should you have any questions, please feel free to write or call this office.

Very truly yours,

Paul C. Clark

Paul C. Clark
Hydrologist

PCC:GEE:crb

KANSAS GEOLOGICAL SURVEY
Groundwater Section

1930 Avenue "A", Campus West
The University of Kansas
Lawrence, Kansas 66044
913-864-4321

April 26, 1982

Mr. Paul C. Clark
Division of Water Resources
109 SW Ninth Street
Topeka, Kansas 66612-1283

Re: Appropriation of Water File No. 35,887 (NE-SW-SW, Sec. 4, T24S, R3W -- Harvey County, Kansas)

Dear Mr. Clark:

The Kansas Geological Survey is in the process of constructing and evaluating water quality models for the Equus Beds area. These models will be able to predict the groundwater velocity and the extent of the movement in space and time of different pollutants in the area. As a result of this ongoing study, I am able to provide you with a map of the area in question where the direction and amount of the steady-state (undisturbed, natural) groundwater velocity are shown for each section. This information is very important because it indicates, to a first approximation, how fast and in what direction a slug or plume of polluted water will move in the area, thus enabling one to estimate the average time of travel of dissolved chemicals between any two points along a flowline. The 1981 measured concentrations of chloride as well as some electrical conductivity values (from Peterson Labs) at different depths are also shown on the map; these values indicate the existance of poor quality groundwaters to the north and northwest of the area in question. A compilation of most of the 1981 available water analyses for the area, as well as the depths of the sampled wells is included. Unfortunately, no water quality data are available for section 4 (T24S, R3W) where the proposed irrigation well is to be located. I therefore strongly recommend that water samples for quality analysis be collected from wells or test holes in that section prior to the construction of any irrigation well. I also recommend that the following be included in the water analysis: 1) electrical conductance; 2) chemical analysis for sodium, calcium, magnesium, chlorides, sulfates, and bicarbonates; 3) other specific chemical constituents or general quality factors such as boron, nitrates and pH.

Based on the available water analyses, I assumed a present-time chloride concentration of 130 mg/l for the above-mentioned section 4 and ran a 10-year simulation to see what the expected future chloride concentrations would be under natural, non-pumping conditions. The results show that the expected chloride concentrations for section 4 in five years from now would be approximately 340 mg/l and in ten years will exceed 550 mg/l. Both concentrations would cause severe problems to crop production associated with long-term use of this groundwater.

A table of guidelines for interpretation of quality of water for irrigation prepared by the University of California Committee of Consultants is included here for your reference. Further information along these lines, as well as crop tolerances to salinity, can be found in a comprehensive paper by R.S. Ayers, Journal of the Irrigation and Drainage Division, Proceedings of the American Society of Civil Engineers, vol. 103, no. 1R2, June 1977, pg. 135-154.

A second simulation which included a pumping well in section 4, produced results similar to the first simulation, indicating that the installation of the irrigation well will make little difference on the natural way the saltwater plumes are moving. However, if more large-capacity irrigation (or other) wells are approved in the area, the cumulative pumping effect may severely distort the existing groundwater gradients causing an increased amount of saltwater to be diverted to this area, further deteriorating an already marginal water quality.

Consideration should also be given to the fact that water quality data from existing wells in this area indicate that in general, the deeper the well the saltier the water. Therefore, in case of approval of the application, I recommend that a shallow or partially penetrating well be established. Finally, in those situations where an irrigator is using saline waters, irrigation methods are very important. Flooding methods are generally the most successful, while spinkler methods are detrimental to some crops because of precipitation of salts on the foliage.

I hope that this information will prove useful in your decision-making. If you need any further information, please do not hesitate to give me a call.

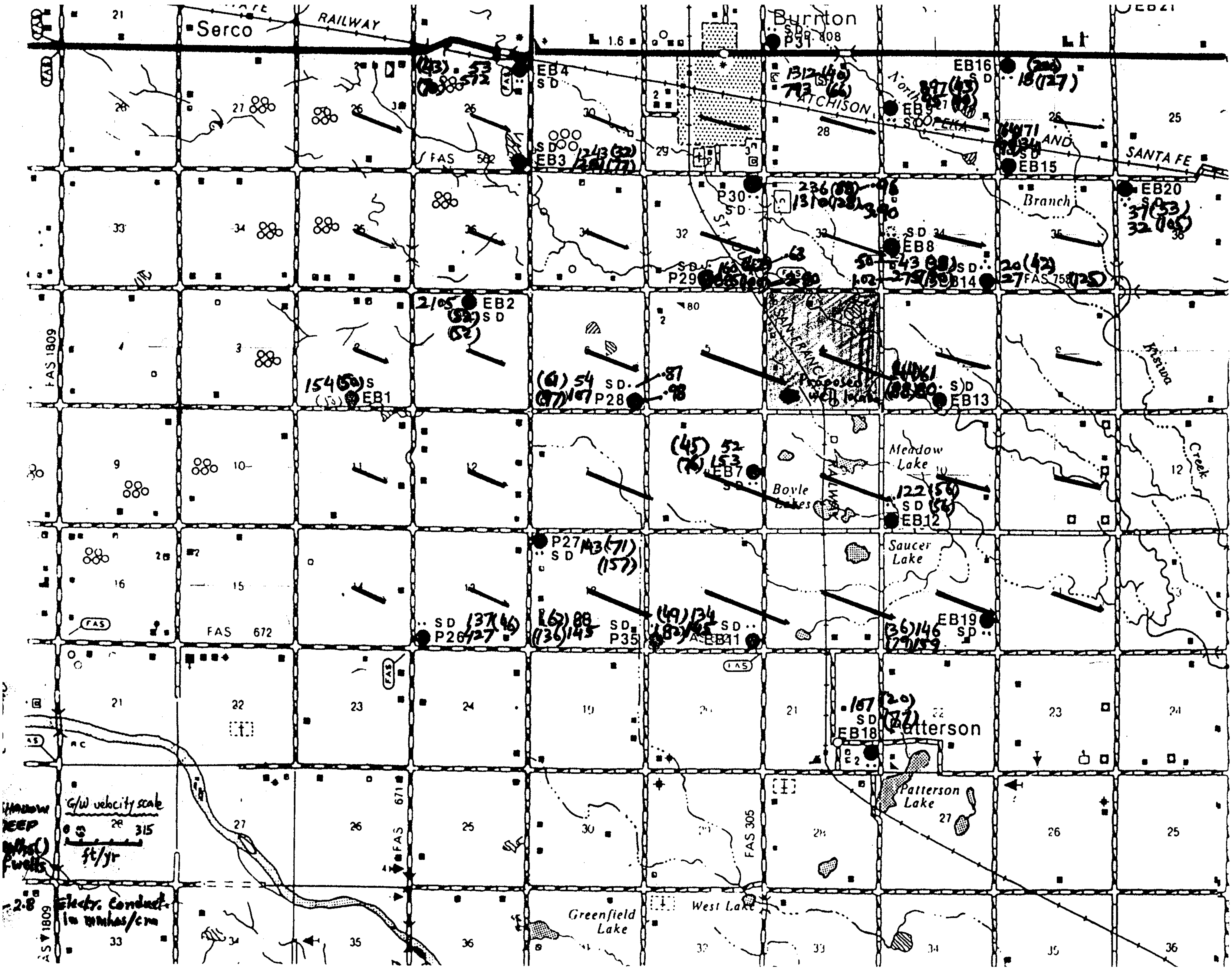
Sincerely yours,

Marios Sophocleous
Research Associate

MS:kl

Encl.

cc: W. W. Hambleton
Pat Reagan
Allyn Lockner
M. Heidari
H. G. O'Connor
Tom Bell



Serco
RAILWAY
Burrton
ATCHISON
TOPEKA
AND
SANTA FE
FAS 582
FAS 758
FAS 1809
FAS 672
FAS 671
FAS 305
EB1
EB2
EB3
EB4
EB7
EB8
EB9
EB11
EB12
EB13
EB14
EB15
EB16
EB18
EB19
EB20
P26
P27
P28
P29
P30
P31
P35
SD
Branch
Proposed well location
Meadow Lake
Boyle Lakes
Saucer Lake
Creek
Patterson
Patterson Lake
Greenfield Lake
West Lake
G/W velocity scale
0
315
ft/yr
Electr. Conduct. in umhos/cm

TABLE 1.—Guidelines for Interpretation of Water Quality for Irrigation (8)

Problem and Related Constituent (1)	Water Quality Guidelines: No problem (2)	Increasing problems (3)	Severe problems (4)
Salinity[a]			
EC_w of irrigation water, in millimhos per centimeter	<0.75	0.75-3.0	>3.0
Permeability			
EC_w of irrigation water, in millimhos per centimeter, adj. SAR[b]	>0.5 <6.0	<0.5 6.0-9.0	<0.2 >9.0
Specific Ion Toxicity[c] from ROOT absorption			
Sodium (evaluate by adj. SAR)	<3	3.0-9.0	>9.0[e]
Chloride			
Milliequivalents per liter	<4	4.0-10	>10
Milligrams per liter or parts per million	<142	142-355	>355
Boron, in milligrams per liter or parts per million	<0.5	0.5-2.0	2.0-10.0
FOLIAR absorption[d] sprinklers			
Sodium			
Milliequivalents per liter	<3.0	>3.0	—
Milligrams per liter or parts per million	<69	>69	—
Chloride			
Milliequivalents per liter	<3.0	>3.0	—
Milligrams per liter or parts per million	<106	>106	—
Miscellaneous[f]			
NH_4-N and NO_3-N, in milligrams per liter or parts per million, for sensitive crops	<5	5-30	>30
HCO_3 (only with overhead sprinklers)			
Milliequivalents per liter	<1.5	1.5-8.5	>8.5
Milligrams per liter or parts per million	<90	90-520	>520
pH		normal range = 6.5-8.4	—

[a]Assumes water for crop plus needed water for leaching requirement (LR) will be applied. Crops vary in tolerance to salinity. Refer to tables for crop tolerance and LR. (mmho/cm × 640 = approximate total dissolved solids (TDS), in milligrams per liter or parts per million; mmho × 1000 = micromhos.)

[b]adj. SAR (Adjusted Sodium Adsorption Ratio) is calculated from a modified equation developed by U.S. Salinity Laboratory to include added effects of precipitation or dissolution of calcium in soils and related to CO_3 + HCO_3 concentrations. To evaluate sodium (permeability) hazard, use Eq. 1. pHc is a calculated value based on Ca + Mg + Na, Ca + Mg, and CO_3 + HCO_3. Calculating and reporting will be done by reporting laboratory. Note: Na, Ca + Mg, CO_3 + HCO_3 should be in milliequivalents per liter. Permeability problems, related to low EC or high adj. SAR of water, can be reduced if necessary by adding gypsum. Usual application rate per acre foot of applied water is from 200 lb to about 1,000 lb (75 kg/1,000 m^3 to 370 kg/1,000 m^3). Two hundred thirty-four pounds of 100% gypsum added to 1 acre ft of water (85 kg/1,000 m^3) will supply 1 me/l of calcium and raise the EC_w about 0.1 mmho. In many cases a soil application may be needed.

[c]Most tree crops and woody ornamentals are sensitive to sodium and chloride (use values shown). Most annual crops are not sensitive (use salinity tolerance tables). For boron sensitivity, refer to boron tolerance tables.

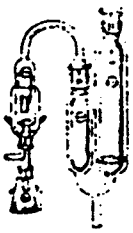
[d]Leaf areas wet by sprinklers (rotating heads) may show a leaf burn due to sodium or chloride absorption under low-humidity high-evaporation conditions. (Evaporation increases ion concentration in water films on leaves between rotations of sprinkler heads.)

[e]For shrinking-swelling type soils (montmorillonite type clay minerals); for others, higher values apply.

[f]Excess N may affect production or quality of certain crops, e.g., sugar beets, citrus, avocados, apricots, and grapes. (1 mg/l NO_3-N = 2.72 lb N/acre-ft of applied water or 1 kg/1,000 m^3.) HCO_3 with overhead sprinkler irrigation may cause a white carbonate deposit to form on fruit and leaves.

Note: Interpretations are based on possible effects of constituents on crops or soils, or both. Guidelines are flexible and should be modified when warranted by local experience or special conditions of crop, soil, and method of irrigation. For meaning of symbols, see Appendix II.

WATER TESTING



PETERSON LABORATORIES, INC.
BOX 886
PHONE 665-5661 19 EAST 4TH ST.
HUTCHINSON, KANSAS 67501

NAME Equus Beds GMD ADDRESS Halstead, KS

Deep well (88')
SOURCE OF SAMPLE EB13B DATE RECEIVED 11/13 DATE REPORTED 11/17/81

SAMPLE IDENTIFICATION 11/10/81 0945

SANITATION EXAMINATION

QUALITATIVE TEST FOR COLI-FORM BACTERIA (Sanitation) _____

QUANITATIVE TEST FOR COLI-FORM BACTERIA (Coli-form per 100 ml.) _____

SEWAGE BACTERIA _____

STANDARD PLATE COUNT (Per ml.) _____

BACTERIAL CONDITION OF WATER _____

CHEMICAL TESTS

1. Elec. Conductivity	600 Micro Mhos/cm ←	9. Nitrates as (NO_3)	ppm
2. Total Solids	ppm	10. Nitrites (NO_2)	ppm
3. Estimated % Sodium	%	11. pH	7.20
4. Total Hardness	16.4 gr/gal	12. Calcium ion	ppm
Total Hardness	280 ppm	13. Magnesium ion	ppm
5. Salt (Sodium Chloride)	130 ppm	14. Phenol. Alkalinity	ppm
Chlorides	80 ppm ←	15. Total Alkalinity	236 ppm
6. Total Iron	ppm	16. Total Sulfates	ppm
7. Phosphate	ppm	17.	
8. Copper	ppm		
IRRIGATION QUALITY - See Reverse side			

SUGGESTED METHOD FOR COLLECTING SAMPLE OF WATER

1. Order or obtain sterile containers from Laboratory (a $1.00 deposit is required if we are to mail you a container) or if this is not feasible, boil in water a 8 or 16 oz. jar and lid for 10 minutes.
2. Submerge tip of faucet in cup of chlorox for 5 minutes.
3. Rinse off faucet with the boiled water.
4. Turn on water for 10 minutes. Using care, obtain your sample.
   NOTE: Do not take water sample from outside hose or faucet.
5. Deliver or mail to Laboratory as soon as possible. If sample is to be mailed, please submit your check for correct amount, minus $1.00 if you have made a deposit on a container.

WATER TESTING (Bacteriological)

$5.00 Minimum Charge

1. Qualitative test for Coli-form (sanitation)	$ 6.00
2. Number of Coli-form bacteria in water	10.00
3. Standard plate count (number of bacteria in water)	8.00
4. Check for sewage bacteria (Typhoid, etc.)	8.00

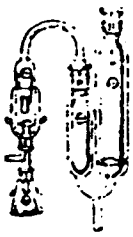
WATER TESTING (Chemical)

1. Complete chemical testing as listed above (not including bacteria)	28.00
2. Irrigation quality (includes tests # 1, 3, 4, and 5)	10.00
3. A single chemical test	3.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

(over for information)

WATER TESTING



PETERSON LABORATORIES, INC.
BOX 886
PHONE 665-5661 19 EAST 4TH ST.
HUTCHINSON, KANSAS 67501

NAME Equus Beds GMD ADDRESS Halstead, KS

shallow well (44')
SOURCE OF SAMPLE EB13A DATE RECEIVED 11/13/81 DATE REPORTED 11/17/81

SAMPLE IDENTIFICATION 11/10/81 0940

SANITATION EXAMINATION

QUALITATIVE TEST FOR COLI-FORM BACTERIA (Sanitation) _____

QUANITATIVE TEST FOR COLI-FORM BACTERIA (Coli-form per 100 ml.) _____

SEWAGE BACTERIA _____

STANDARD PLATE COUNT (Per ml.) _____

BACTERIAL CONDITION OF WATER _____

CHEMICAL TESTS

1. Elec. Conductivity	740 Micro Mhos/cm ←	9. Nitrates as (NO_3)	ppm
2. Total Solids	ppm	10. Nitrites (NO_2)	ppm
3. Estimated % Sodium	%	11. pH	7.25
4. Total Hardness	15.2 gr/gal	12. Calcium ion	ppm
Total Hardness	260 ppm	13. Magnesium ion	ppm
5. Salt (Sodium Chloride)	100 ppm	14. Phenol. Alkalinity	ppm
Chlorides	61 ppm ←	15. Total Alkalinity	198 ppm
6. Total Iron	ppm	16. Total Sulfates	ppm
7. Phosphate	ppm	17.	
8. Copper	ppm		
IRRIGATION QUALITY - See Reverse side			

SUGGESTED METHOD FOR COLLECTING SAMPLE OF WATER

1. Order or obtain sterile containers from Laboratory (a $1.00 deposit is required if we are to mail you a container) or if this is not feasible, boil in water a 8 or 16 oz. jar and lid for 10 minutes.
2. Submerge tip of faucet in cup of chlorox for 5 minutes.
3. Rinse off faucet with the boiled water.
4. Turn on water for 10 minutes. Using care, obtain your sample.
   NOTE: Do not take water sample from outside hose or faucet.
5. Deliver or mail to Laboratory as soon as possible. If sample is to be mailed, please submit your check for correct amount, minus $1.00 if you have made a deposit on a container.

WATER TESTING (Bacteriological)

$5.00 Minimum Charge

1. Qualitative test for Coli-form (sanitation)	$ 6.00
2. Number of Coli-form bacteria in water	10.00
3. Standard plate count (number of bacteria in water)	8.00
4. Check for sewage bacteria (Typhoid, etc.)	8.00

WATER TESTING (Chemical)

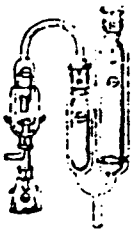
1. Complete chemical testing as listed above (not including bacteria)	28.00
2. Irrigation quality (includes tests # 1, 3, 4, and 5)	10.00
3. A single chemical test	3.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

(over for Information)

WATER TESTING

PETERSON LABORATORIES, INC.
BOX 886
PHONE 665-5661 19 EAST 4TH ST.
HUTCHINSON, KANSAS 67501



NAME Equus Beds GMD ADDRESS Halstead, KS

Deep Well (97')
SOURCE OF SAMPLE #P28A DATE RECEIVED 11/13 DATE REPORTED 11/17/81

SAMPLE IDENTIFICATION 11/11/81 1105

SANITATION EXAMINATION

QUALITATIVE TEST FOR COLI-FORM BACTERIA (Sanitation) _____

QUANITATIVE TEST FOR COLI-FORM BACTERIA (Coli-form per 100 ml.) _____

SEWAGE BACTERIA _____

STANDARD PLATE COUNT (Per ml.) _____

BACTERIAL CONDITION OF WATER _____

CHEMICAL TESTS

1. Elec. Conductivity	980 Micro Mhos/cm ←	9. Nitrates as (NO_3)	ppm
2. Total Solids	ppm	10. Nitrites (NO_2)	ppm
3. Estimated % Sodium	%	11. pH	7.40
4. Total Hardness	19.3 gr/gal	12. Calcium ion	ppm
Total Hardness	330 ppm	13. Magnesium ion	ppm
5. Salt (Sodium Chloride)	175 ppm	14. Phenol. Alkalinity	ppm
Chlorides	107 ppm ←	15. Total Alkalinity	296 ppm
6. Total Iron	ppm	16. Total Sulfates	ppm
7. Phosphate	ppm	17.	
8. Copper	ppm		
IRRIGATION QUALITY - See Reverse side			

SUGGESTED METHOD FOR COLLECTING SAMPLE OF WATER

1. Order or obtain sterile containers from Laboratory (a $1.00 deposit is required if we are to mail you a container) or if this is not feasible, boil in water a 8 or 16 oz. jar and lid for 10 minutes.
2. Submerge tip of faucet in cup of chlorox for 5 minutes.
3. Rinse off faucet with the boiled water.
4. Turn on water for 10 minutes. Using care, obtain your sample.
   NOTE: Do not take water sample from outside hose or faucet.
5. Deliver or mail to Laboratory as soon as possible. If sample is to be mailed, please submit your check for correct amount, minus $1.00 if you have made a deposit on a container.

WATER TESTING (Bacteriological)

$5.00 Minimum Charge

1. Qualitative test for Coli-form (sanitation)	$ 6.00
2. Number of Coli-form bacteria in water	10.00
3. Standard plate count (number of bacteria in water)	8.00
4. Check for sewage bacteria (Typhoid, etc.)	8.00

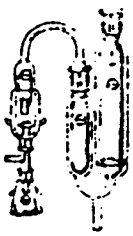
WATER TESTING (Chemical)

1. Complete chemical testing as listed above (not including bacteria)	28.00
2. Irrigation quality (includes tests * 1, 3, 4, and 5)	10.00
3. A single chemical test	3.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

(over for information)

WATER TESTING



PETERSON LABORATORIES, INC.
BOX 886
PHONE 665-5661 19 EAST 4TH ST.
HUTCHINSON, KANSAS 67501

NAME Equus Beds GMD ADDRESS Halstead, KS

SOURCE OF SAMPLE shallow well (54') P28 DATE RECEIVED 11/13/81 DATE REPORTED 11/16/81

SAMPLE IDENTIFICATION 11/11/81 1105

SANITATION EXAMINATION

QUALITATIVE TEST FOR COLI-FORM BACTERIA (Sanitation) _____

QUANITATIVE TEST FOR COLI-FORM BACTERIA (Coli-form per 100 ml.) _____

SEWAGE BACTERIA _____

STANDARD PLATE COUNT (Per ml.) _____

BACTERIAL CONDITION OF WATER _____

CHEMICAL TESTS

1. Elec. Conductivity	870 Micro Mhos/cm ←	9. Nitrates as (NO_3)	ppm
2. Total Solids	ppm	10. Nitrites (NO_2)	ppm
3. Estimated % Sodium	%	11. pH	7.30
4. Total Hardness	16.9 gr/gal	12. Calcium ion	ppm
Total Hardness	290 ppm	13. Magnesium ion	ppm
5. Salt (Sodium Chloride)	150 ppm	14. Phenol. Alkalinity	ppm
Chlorides	54 ppm ←	15. Total Alkalinity	292 ppm
6. Total Iron	ppm	16. Total Sulfates	ppm
7. Phosphate	ppm	17.	
8. Copper	ppm		
IRRIGATION QUALITY - See Reverse side			

SUGGESTED METHOD FOR COLLECTING SAMPLE OF WATER

1. Order or obtain sterile containers from Laboratory (a $1.00 deposit is required if we are to mail you a container) or if this is not feasible, boil in water a 8 or 16 oz. jar and lid for 10 minutes.
2. Submerge tip of faucet in cup of chlorox for 5 minutes.
3. Rinse off faucet with the boiled water.
4. Turn on water for 10 minutes. Using care, obtain your sample.
   NOTE: Do not take water sample from outside hose or faucet.
5. Deliver or mail to Laboratory as soon as possible. If sample is to be mailed, please submit your check for correct amount, minus $1.00 if you have made a deposit on a container.

WATER TESTING (Bacteriological)

$5.00 Minimum Charge

1. Qualitative test for Coli-form (sanitation)	$ 6.00
2. Number of Coli-form bacteria in water	10.00
3. Standard plate count (number of bacteria in water)	8.00
4. Check for sewage bacteria (Typhoid, etc.)	8.00

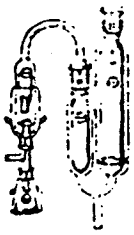
WATER TESTING (Chemical)

1. Complete chemical testing as listed above (not including bacteria)	28.00
2. Irrigation quality (includes tests # 1, 3, 4, and 5)	10.00
3. A single chemical test	3.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

(over for Information)

WATER TESTING



PETERSON LABORATORIES, INC.
BOX 886
PHONE 665-5661 19 EAST 4TH ST.
HUTCHINSON, KANSAS 67501

NAME Equus Beds GMD ADDRESS Halstead, KS

shallow well (52')
SOURCE OF SAMPLE EB2A DATE RECEIVED 11/13/81 DATE REPORTED 11/16/81

SAMPLE IDENTIFICATION 11/11/81 1030

SANITATION EXAMINATION

QUALITATIVE TEST FOR COLI-FORM BACTERIA (Sanitation) _____

QUANITATIVE TEST FOR COLI-FORM BACTERIA (Coli-form per 100 ml.) _____

SEWAGE BACTERIA _____

STANDARD PLATE COUNT (Per ml.) _____

BACTERIAL CONDITION OF WATER _____

CHEMICAL TESTS

1. Elec. Conductivity	6,800 Micro Mhos/cm ←	9. Nitrates as (NO_3)	_____ ppm
2. Total Solids	_____ ppm	10. Nitrites (NO_2)	_____ ppm
3. Estimated % Sodium	_____ %	11. pH	7.00
4. Total Hardness	79.4 gr/gal	12. Calcium ion	_____ ppm
Total Hardness	1,360 ppm	13. Magnesium ion	_____ ppm
5. Salt (Sodium Chloride)	3,450 ppm	14. Phenol. Alkalinity	_____ ppm
Chlorides	2,105 ppm ←	15. Total Alkalinity	196 ppm
6. Total Iron	_____ ppm	16. Total Sulfates	_____ ppm
7. Phosphate	_____ ppm	17.	_____
8. Copper	_____ ppm		_____
IRRIGATION QUALITY - See Reverse side			_____

SUGGESTED METHOD FOR COLLECTING SAMPLE OF WATER

1. Order or obtain sterile containers from Laboratory (a $1.00 deposit is required if we are to mail you a container) or if this is not feasible, boil in water a 8 or 16 oz. jar and lid for 10 minutes.
2. Submerge tip of faucet in cup of chlorox for 5 minutes.
3. Rinse off faucet with the boiled water.
4. Turn on water for 10 minutes. Using care, obtain your sample.
   NOTE: Do not take water sample from outside hose or faucet.
5. Deliver or mail to Laboratory as soon as possible. If sample is to be mailed, please submit your check for correct amount, minus $1.00 if you have made a deposit on a container.

WATER TESTING (Bacteriological)

$5.00 Minimum Charge

1. Qualitative test for Coli-form (sanitation)	$ 6.00
2. Number of Coli-form bacteria in water	10.00
3. Standard plate count (number of bacteria in water)	8.00
4. Check for sewage bacteria (Typhoid, etc.)	8.00

WATER TESTING (Chemical)

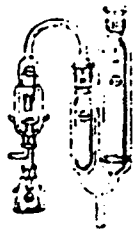
1. Complete chemical testing as listed above (not including bacteria)	28.00
2. Irrigation quality (includes tests * 1, 3, 4, and 5)	10.00
3. A single chemical test	3.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

(over for information)

WATER TESTING

PETERSON LABORATORIES, INC.
BOX 886
PHONE 665-5661 19 EAST 4TH ST.
HUTCHINSON, KANSAS 67501



NAME Equus Beds GMD ADDRESS Halstead, KS

Deep well (130')
SOURCE OF SAMPLE EB8B DATE RECEIVED 11/13 DATE REPORTED 11/17/81

SAMPLE IDENTIFICATION 11/13/81 1115

SANITATION EXAMINATION

QUALITATIVE TEST FOR COLI-FORM BACTERIA (Sanitation) _____

QUANITATIVE TEST FOR COLI-FORM BACTERIA (Coli-form per 100 ml.) _____

SEWAGE BACTERIA _____

STANDARD PLATE COUNT (Per ml.) _____

BACTERIAL CONDITION OF WATER _____

CHEMICAL TESTS

1. Elec. Conductivity	1,020 Micro Mhos/cm ←	9. Nitrates as (NO_3)	ppm
2. Total Solids	ppm	10. Nitrites (NO_2)	ppm
3. Estimated % Sodium	%	11. pH	7.00
4. Total Hardness	32.7 gr/gal	12. Calcium ion	ppm
Total Hardness	560 ppm	13. Magnesium ion	ppm
5. Salt (Sodium Chloride)	450 ppm	14. Phenol. Alkalinity	ppm
Chlorides	275 ppm ←	15. Total Alkalinity	108 ppm
6. Total Iron	ppm	16. Total Sulfates	ppm
7. Phosphate	ppm	17.	
8. Copper	ppm		
IRRIGATION QUALITY - See Reverse side			

SUGGESTED METHOD FOR COLLECTING SAMPLE OF WATER

1. Order or obtain sterile containers from Laboratory (a $1.00 deposit is required if we are to mail you a container) or if this is not feasible, boil in water a 8 or 16 oz. jar and lid for 10 minutes.
2. Submerge tip of faucet in cup of chlorox for 5 minutes.
3. Rinse off faucet with the boiled water.
4. Turn on water for 10 minutes. Using care, obtain your sample.
   NOTE: Do not take water sample from outside hose or faucet.
5. Deliver or mail to Laboratory as soon as possible. If sample is to be mailed, please submit your check for correct amount, minus $1.00 if you have made a deposit on a container.

WATER TESTING (Bacteriological)

$5.00 Minimum Charge

1. Qualitative test for Coli-form (sanitation)	$ 6.00
2. Number of Coli-form bacteria in water	10.00
3. Standard plate count (number of bacteria in water)	8.00
4. Check for sewage bacteria (Typhoid, etc.)	8.00

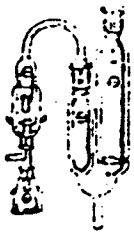
WATER TESTING (Chemical)

1. Complete chemical testing as listed above (not including bacteria)	28.00
2. Irrigation quality (includes tests # 1, 3, 4, and 5)	10.00
3. A single chemical test	3.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

(over for information)

WATER TESTING



PETERSON LABORATORIES, INC.
BOX 886
PHONE 665-5661 19 EAST 4TH ST.
HUTCHINSON, KANSAS 67501

NAME Equus Beds GMD ADDRESS Halstead, KS

shallow well (38')

SOURCE OF SAMPLE EB8A DATE RECEIVED 11/13 DATE REPORTED 11/17/81

SAMPLE IDENTIFICATION 11/13/81 1100

SANITATION EXAMINATION

QUALITATIVE TEST FOR COLI-FORM BACTERIA (Sanitation) _____

QUANITATIVE TEST FOR COLI-FORM BACTERIA (Coli-form per 100 ml.) _____

SEWAGE BACTERIA _____

STANDARD PLATE COUNT (Per ml.) _____

BACTERIAL CONDITION OF WATER _____

CHEMICAL TESTS

1. Elec. Conductivity	500 Micro Mhos/cm ←	9. Nitrates as (NO_3)	ppm
2. Total Solids	ppm	10. Nitrites (NO_2)	ppm
3. Estimated % Sodium	%	11. pH	7.10
4. Total Hardness	14.0 gr/gal	12. Calcium ion	ppm
Total Hardness	240 ppm	13. Magnesium ion	ppm
5. Salt (Sodium Chloride)	70 ppm	14. Phenol. Alkalinity	ppm
Chlorides	43 ppm ←	15. Total Alkalinity	196 ppm
6. Total Iron	ppm	16. Total Sulfates	ppm
7. Phosphate	ppm	17.	
8. Copper	ppm		
IRRIGATION QUALITY - See Reverse side			

SUGGESTED METHOD FOR COLLECTING SAMPLE OF WATER

1. Order or obtain sterile containers from Laboratory (a $1.00 deposit is required if we are to mail you a container) or if this is not feasible, boil in water a 8 or 16 oz. jar and lid for 10 minutes.
2. Submerge tip of faucet in cup of chlorox for 5 minutes.
3. Rinse off faucet with the boiled water.
4. Turn on water for 10 minutes. Using care, obtain your sample.
   NOTE: Do not take water sample from outside hose or faucet.
5. Deliver or mail to Laboratory as soon as possible. If sample is to be mailed, please submit your check for correct amount, minus $1.00 if you have made a deposit on a container.

WATER TESTING (Bacteriological)

$5.00 Minimum Charge

1. Qualitative test for Coli-form (sanitation)	$ 6.00
2. Number of Coli-form bacteria in water	10.00
3. Standard plate count (number of bacteria in water)	8.00
4. Check for sewage bacteria (Typhoid, etc.)	8.00

WATER TESTING (Chemical)

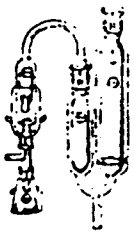
1. Complete chemical testing as listed above (not including bacteria)	28.00
2. Irrigation quality (includes tests * 1, 3, 4, and 5)	10.00
3. A single chemical test	3.00

(over for information)

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

WATER TESTING

PETERSON LABORATORIES, INC.
BOX 886
PHONE 665-5661 19 EAST 4TH ST.
HUTCHINSON, KANSAS 67501



NAME Equus Beds GMD ADDRESS Halstead, KS

SOURCE OF SAMPLE Deep well (100') P29A DATE RECEIVED 11/13 DATE REPORTED 11/17/81

SAMPLE IDENTIFICATION 11/11/81 1145

SANITATION EXAMINATION

QUALITATIVE TEST FOR COLI-FORM BACTERIA (Sanitation) _____

QUANITATIVE TEST FOR COLI-FORM BACTERIA (Coli-form per 100 ml.) _____

SEWAGE BACTERIA _____

STANDARD PLATE COUNT (Per ml.) _____

BACTERIAL CONDITION OF WATER _____

CHEMICAL TESTS

1. Elec. Conductivity	2,800 Micro Mhos/cm ←	9. Nitrates as (NO_3)	ppm
2. Total Solids	ppm	10. Nitrites (NO_2)	ppm
3. Estimated % Sodium	%	11. pH	6.95
4. Total Hardness	61.3 gr/gal	12. Calcium ion	ppm
Total Hardness	1,050.0 ppm	13. Magnesium ion	ppm
5. Salt (Sodium Chloride)	1,450 ppm	14. Phenol. Alkalinity	ppm
Chlorides	885 ppm ←	15. Total Alkalinity	184 ppm
6. Total Iron	ppm	16. Total Sulfates	ppm
7. Phosphate	ppm	17.	
8. Copper	ppm		
IRRIGATION QUALITY - See Reverse side			

SUGGESTED METHOD FOR COLLECTING SAMPLE OF WATER

1. Order or obtain sterile containers from Laboratory (a $1.00 deposit is required if we are to mail you a container) or if this is not feasible, boil in water a 8 or 16 oz. jar and lid for 10 minutes.
2. Submerge tip of faucet in cup of chlorox for 5 minutes.
3. Rinse off faucet with the boiled water.
4. Turn on water for 10 minutes. Using care, obtain your sample.
   NOTE: Do not take water sample from outside hose or faucet.
5. Deliver or mail to Laboratory as soon as possible. If sample is to be mailed, please submit your check for correct amount, minus $1.00 if you have made a deposit on a container.

WATER TESTING (Bacteriological)

$5.00 Minimum Charge

1. Qualitative test for Coli-form (sanitation)	$ 6.00
2. Number of Coli-form bacteria in water	10.00
3. Standard plate count (number of bacteria in water)	8.00
4. Check for sewage bacteria (Typhoid, etc.)	8.00

WATER TESTING (Chemical)

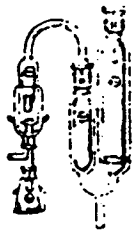
1. Complete chemical testing as listed above (not including bacteria)	28.00
2. Irrigation quality (includes tests * 1, 3, 4, and 5)	10.00
3. A single chemical test	3.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

(over for information)

WATER TESTING

PETERSON LABORATORIES, INC.
BOX 886
PHONE 665-5661 19 EAST 4TH ST.
HUTCHINSON, KANSAS 67501



NAME Equus Beds GMD ADDRESS Halstead, KS

shallow well (42')
SOURCE OF SAMPLE F29 DATE RECEIVED 11/13/81 DATE REPORTED 11/16/81

SAMPLE IDENTIFICATION 11/11/81 1145

SANITATION EXAMINATION

QUALITATIVE TEST FOR COLI-FORM BACTERIA (Sanitation) _____

QUANITATIVE TEST FOR COLI-FORM BACTERIA (Coli-form per 100 ml.) _____

SEWAGE BACTERIA _____

STANDARD PLATE COUNT (Per ml.) _____

BACTERIAL CONDITION OF WATER _____

CHEMICAL TESTS

1. Elec. Conductivity	625 Micro Mhos/cm ←	9. Nitrates as (NO_3)	ppm
2. Total Solids	ppm	10. Nitrites (NO_2)	ppm
3. Estimated % Sodium	%	11. pH	7.95
4. Total Hardness	11.1 gr/gal	12. Calcium ion	ppm
Total Hardness	190 ppm	13. Magnesium ion	ppm
5. Salt (Sodium Chloride)	236 ppm	14. Phenol. Alkalinity	ppm
Chlorides	160 ppm ←	15. Total Alkalinity	124 ppm
6. Total Iron	ppm	16. Total Sulfates	ppm
7. Phosphate	ppm	17.	
8. Copper	ppm		
IRRIGATION QUALITY - See Reverse side			

SUGGESTED METHOD FOR COLLECTING SAMPLE OF WATER

1. Order or obtain sterile containers from Laboratory (a $1.00 deposit is required if we are to mail you a container) or if this is not feasible, boil in water a 8 or 16 oz. jar and lid for 10 minutes.
2. Submerge tip of faucet in cup of chlorox for 5 minutes.
3. Rinse off faucet with the boiled water.
4. Turn on water for 10 minutes. Using care, obtain your sample.
   NOTE: Do not take water sample from outside hose or faucet.
5. Deliver or mail to Laboratory as soon as possible. If sample is to be mailed, please submit your check for correct amount, minus $1.00 if you have made a deposit on a container.

WATER TESTING (Bacteriological)

$5.00 Minimum Charge

1. Qualitative test for Coli-form (sanitation)	$ 6.00
2. Number of Coli-form bacteria in water	10.00
3. Standard plate count (number of bacteria in water)	8.00
4. Check for sewage bacteria (Typhoid, etc.)	8.00

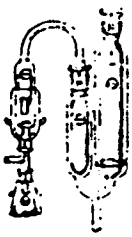
WATER TESTING (Chemical)

1. Complete chemical testing as listed above (not including bacteria)	28.00
2. Irrigation quality (includes tests * 1, 3, 4, and 5)	10.00
3. A single chemical test	3.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

(over for information)

WATER TESTING



PETERSON LABORATORIES, INC.
BOX 886
PHONE 665-5661 19 EAST 4TH ST.
HUTCHINSON, KANSAS 67501

NAME Equus Beds GMD ADDRESS Halstead, KS

Deep well (128')
SOURCE OF SAMPLE P30A DATE RECEIVED 11/13/81 DATE REPORTED 11/16/81

SAMPLE IDENTIFICATION 11/11/81 1515

SANITATION EXAMINATION

QUALITATIVE TEST FOR COLI-FORM BACTERIA (Sanitation) _____

QUANITATIVE TEST FOR COLI-FORM BACTERIA (Coli-form per 100 ml.) _____

SEWAGE BACTERIA _____

STANDARD PLATE COUNT (Per ml.) _____

BACTERIAL CONDITION OF WATER _____

CHEMICAL TESTS

1. Elec. Conductivity	3,900 Micro Mhos/cm ←	9. Nitrates as (NO_3)	ppm
2. Total Solids	ppm	10. Nitrites (NO_2)	ppm
3. Estimated % Sodium	%	11. pH	7.30
4. Total Hardness	55.5 gr/gal	12. Calcium ion	ppm
Total Hardness	950 ppm	13. Magnesium ion	ppm
5. Salt (Sodium Chloride)	2,150 ppm	14. Phenol. Alkalinity	ppm
Chlorides	1,310 ppm ←	15. Total Alkalinity	192 ppm
6. Total Iron	ppm	16. Total Sulfates	ppm
7. Phosphate	ppm	17.	
8. Copper	ppm		
IRRIGATION QUALITY - See Reverse side			

SUGGESTED METHOD FOR COLLECTING SAMPLE OF WATER

1. Order or obtain sterile containers from Laboratory (a $1.00 deposit is required if we are to mail you a container) or if this is not feasible, boil in water a 8 or 16 oz. jar and lid for 10 minutes.
2. Submerge tip of faucet in cup of chlorox for 5 minutes.
3. Rinse off faucet with the boiled water.
4. Turn on water for 10 minutes. Using care, obtain your sample.
   NOTE: Do not take water sample from outside hose or faucet.
5. Deliver or mail to Laboratory as soon as possible. If sample is to be mailed, please submit your check for correct amount, minus $1.00 if you have made a deposit on a container.

WATER TESTING (Bacteriological)

$5.00 Minimum Charge

1. Qualitative test for Coli-form (sanitation)	$ 6.00
2. Number of Coli-form bacteria in water	10.00
3. Standard plate count (number of bacteria in water)	8.00
4. Check for sewage bacteria (Typhoid, etc.)	8.00

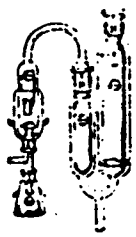
WATER TESTING (Chemical)

1. Complete chemical testing as listed above (not including bacteria)	28.00
2. Irrigation quality (includes tests * 1, 3, 4, and 5)	10.00
3. A single chemical test	3.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

(over for Information)

WATER TESTING



PETERSON LABORATORIES, INC.
BOX 886
PHONE 665-5661 19 EAST 4TH ST.
HUTCHINSON, KANSAS 67501

NAME Equus Beds GMD ADDRESS Halstead, KS

SOURCE OF SAMPLE shallow well (88') P30 DATE RECEIVED 11/13 DATE REPORTED 11/16/81

SAMPLE IDENTIFICATION 11/11/81 1515

SANITATION EXAMINATION

QUALITATIVE TEST FOR COLI-FORM BACTERIA (Sanitation) _____

QUANITATIVE TEST FOR COLI-FORM BACTERIA (Coli-form per 100 ml.) _____

SEWAGE BACTERIA _____

STANDARD PLATE COUNT (Per ml.) _____

BACTERIAL CONDITION OF WATER _____

CHEMICAL TESTS

1. Elec. Conductivity	960 Micro Mhos/cm ←	9. Nitrates as (NO_3)	ppm
2. Total Solids	ppm	10. Nitrites (NO_2)	ppm
3. Estimated % Sodium	%	11. pH	6.90
4. Total Hardness	21.0 gr/gal	12. Calcium ion	ppm
Total Hardness	360 ppm	13. Magnesium ion	ppm
5. Salt (Sodium Chloride)	387 ppm	14. Phenol. Alkalinity	ppm
Chlorides	236 ppm ←	15. Total Alkalinity	144 ppm
6. Total Iron	ppm	16. Total Sulfates	ppm
7. Phosphate	ppm	17.	
8. Copper	ppm		
IRRIGATION QUALITY - See Reverse side			

SUGGESTED METHOD FOR COLLECTING SAMPLE OF WATER

1. Order or obtain sterile containers from Laboratory (a $1.00 deposit is required if we are to mail you a container) or if this is not feasible, boil in water a 8 or 16 oz. jar and lid for 10 minutes.
2. Submerge tip of faucet in cup of chlorox for 5 minutes.
3. Rinse off faucet with the boiled water.
4. Turn on water for 10 minutes. Using care, obtain your sample.
   NOTE: Do not take water sample from outside hose or faucet.
5. Deliver or mail to Laboratory as soon as possible. If sample is to be mailed, please submit your check for correct amount, minus $1.00 if you have made a deposit on a container.

WATER TESTING (Bacteriological)

$5.00 Minimum Charge

1. Qualitative test for Coli-form (sanitation)	$ 6.00
2. Number of Coli-form bacteria in water	10.00
3. Standard plate count (number of bacteria in water)	8.00
4. Check for sewage bacteria (Typhoid, etc.)	8.00

WATER TESTING (Chemical)

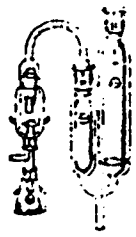
1. Complete chemical testing as listed above (not including bacteria)	28.00
2. Irrigation quality (includes tests # 1, 3, 4, and 5)	10.00
3. A single chemical test	3.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

(over for information)

WATER TESTING

PETERSON LABORATORIES, INC.
BOX 886
PHONE 665-5661 19 EAST 4TH ST.
HUTCHINSON, KANSAS 67501



NAME Equus Beds GMD ADDRESS Halstead, KS

shallow well (43')
SOURCE OF SAMPLE EB9B DATE RECEIVED 12/22/81 DATE REPORTED 12/22/81

SAMPLE IDENTIFICATION 12/15/81 EBGMD2 1110 TD RC (1)

SANITATION EXAMINATION

QUALITATIVE TEST FOR COLI-FORM BACTERIA (Sanitation) _____

QUANITATIVE TEST FOR COLI-FORM BACTERIA (Coli-form per 100 ml.) _____

SEWAGE BACTERIA _____

STANDARD PLATE COUNT (Per ml.) _____

BACTERIAL CONDITION OF WATER _____

CHEMICAL TESTS

1. Elec. Conductivity	3,200 Micro Mhos/cm ←	9. Nitrates as (NO_3)	_____ ppm
2. Total Solids	_____ ppm	10. Nitrites (NO_2)	_____ ppm
3. Estimated % Sodium	_____ %	11. pH	7.2
4. Total Hardness	_____ gr/gal	12. Calcium ion	_____ ppm
Total Hardness	_____ ppm	13. Magnesium ion	_____ ppm
5. Salt (Sodium Chloride)	1,470 ppm	14. Phenol. Alkalinity	_____ ppm
Chlorides	896.7 ppm ←	15. Total Alkalinity	_____ ppm
6. Total Iron	_____ ppm	16. Total Sulfates	_____ ppm
7. Phosphate	_____ ppm	17. _____	
8. Copper	_____ ppm	_____	
IRRIGATION QUALITY - See Reverse side		_____	

SUGGESTED METHOD FOR COLLECTING SAMPLE OF WATER

1. Order or obtain sterile containers from Laboratory (a $1.00 deposit is required if we are to mail you a container) or if this is not feasible, boil in water a 8 or 16 oz. jar and lid for 10 minutes.
2. Submerge tip of faucet in cup of chlorox for 5 minutes.
3. Rinse off faucet with the boiled water.
4. Turn on water for 10 minutes. Using care, obtain your sample.
   NOTE: Do not take water sample from outside hose or faucet.
5. Deliver or mail to Laboratory as soon as possible. If sample is to be mailed, please submit your check for correct amount, minus $1.00 if you have made a deposit on a container.

RECEIVED
DEC 23 1981

WATER TESTING (Bacteriological)

$5.00 Minimum Charge

1. Qualitative test for Coli-form (sanitation)	$ 6.00
2. Number of Coli-form bacteria in water	10.00
3. Standard plate count (number of bacteria in water)	8.00
4. Check for sewage bacteria (Typhoid, etc.)	8.00

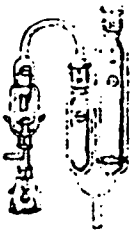
WATER TESTING (Chemical)

1. Complete chemical testing as listed above (not including bacteria)	28.00
2. Irrigation quality (includes tests # 1, 3, 4, and 5)	10.00
3. A single chemical test	3.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

(over for information)

WATER TESTING



PETERSON LABORATORIES, INC.
BOX 886
PHONE 665-5661 19 EAST 4TH ST.
HUTCHINSON, KANSAS 67501

NAME Equus Beds GMD ADDRESS Halstead, KS

Deep well (77')
SOURCE OF SAMPLE EB3B DATE RECEIVED 11/13 DATE REPORTED 11/17/81

SAMPLE IDENTIFICATION 11/12/81 1700

SANITATION EXAMINATION

QUALITATIVE TEST FOR COLI-FORM BACTERIA (Sanitation) _____

QUANITATIVE TEST FOR COLI-FORM BACTERIA (Coli-form per 100 ml.) _____

SEWAGE BACTERIA _____

STANDARD PLATE COUNT (Per ml.) _____

BACTERIAL CONDITION OF WATER _____

CHEMICAL TESTS

1. Elec. Conductivity	4,000 Micro Mhos/cm ←	9. Nitrates as (NO_3)	ppm
2. Total Solids	ppm	10. Nitrites (NO_2)	ppm
3. Estimated % Sodium	%	11. pH	6.80
4. Total Hardness	71.8 gr/gal	12. Calcium ion	ppm
Total Hardness	1,230 ppm	13. Magnesium ion	ppm
5. Salt (Sodium Chloride)	2,100 ppm	14. Phenol. Alkalinity	ppm
Chlorides	1,281 ppm ←	15. Total Alkalinity	96 ppm
6. Total Iron	ppm	16. Total Sulfates	ppm
7. Phosphate	ppm	17.	
8. Copper	ppm		
IRRIGATION QUALITY - See Reverse side			

SUGGESTED METHOD FOR COLLECTING SAMPLE OF WATER

1. Order or obtain sterile containers from Laboratory (a $1.00 deposit is required if we are to mail you a container) or if this is not feasible, boil in water a 8 or 16 oz. jar and lid for 10 minutes.
2. Submerge tip of faucet in cup of chlorox for 5 minutes.
3. Rinse off faucet with the boiled water.
4. Turn on water for 10 minutes. Using care, obtain your sample.
   NOTE: Do not take water sample from outside hose or faucet.
5. Deliver or mail to Laboratory as soon as possible. If sample is to be mailed, please submit your check for correct amount, minus $1.00 if you have made a deposit on a container.

WATER TESTING (Bacteriological)

$5.00 Minimum Charge

1. Qualitative test for Coli-form (sanitation)	$ 6.00
2. Number of Coli-form bacteria in water	10.00
3. Standard plate count (number of bacteria in water)	8.00
4. Check for sewage bacteria (Typhoid, etc.)	8.00

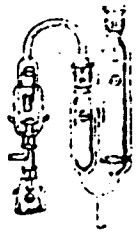
WATER TESTING (Chemical)

1. Complete chemical testing as listed above (not including bacteria)	28.00
2. Irrigation quality (includes tests # 1, 3, 4, and 5)	10.00
3. A single chemical test	3.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

(over for information)

WATER TESTING



PETERSON LABORATORIES, INC.
BOX 886
PHONE 665-5661 19 EAST 4TH ST.
HUTCHINSON, KANSAS 67501

NAME Ernus Beds GMD ADDRESS Halstead, KS

shallow well (32')
SOURCE OF SAMPLE EB3A DATE RECEIVED 3/8/82 DATE REPORTED 3/9/82

SAMPLE IDENTIFICATION EBGMD 3/8/82 1035 TCB-TD

SANITATION EXAMINATION

QUALITATIVE TEST FOR COLI-FORM BACTERIA (Sanitation) _____

QUANITATIVE TEST FOR COLI-FORM BACTERIA (Coli-form per 100 ml.) _____

SEWAGE BACTERIA _____

STANDARD PLATE COUNT (Per ml.) _____

BACTERIAL CONDITION OF WATER _____

CHEMICAL TESTS

1. Elec. Conductivity	3,700 Micro Mhos/cm ←	9. Nitrates as (NO_3)	ppm
2. Total Solids	ppm	10. Nitrites (NO_2)	ppm
3. Estimated % Sodium	%	11. pH	8.0
4. Total Hardness	gr/gal	12. Calcium ion	ppm
Total Hardness	ppm	13. Magnesium ion	ppm
5. Salt (Sodium Chloride)	2,037.5 ppm	14. Phenol. Alkalinity	ppm
Chlorides	1,242.8 ppm ←	15. Total Alkalinity	ppm
6. Total Iron	ppm	16. Total Sulfates	ppm
7. Phosphate	ppm	17.	
8. Copper	ppm		
IRRIGATION QUALITY - See Reverse side			

SUGGESTED METHOD FOR COLLECTING SAMPLE OF WATER

1. Order or obtain sterile containers from Laboratory (a $1.00 deposit is required if we are to mail you a container) or if this is not feasible, boil in water a 8 or 16 oz. jar and lid for 10 minutes.
2. Submerge tip of faucet in cup of chlorox for 5 minutes.
3. Rinse off faucet with the boiled water.
4. Turn on water for 10 minutes. Using care, obtain your sample.
   NOTE: Do not take water sample from outside hose or faucet.
5. Deliver or mail to Laboratory as soon as possible. If sample is to be mailed, please submit your check for correct amount, minus $1.00 if you have made a deposit on a container.

WATER TESTING (Bacteriological)

$5.00 Minimum Charge

1. Qualitative test for Coli-form (sanitation)	$ 6.00
2. Number of Coli-form bacteria in water	10.00
3. Standard plate count (number of bacteria in water)	8.00
4. Check for sewage bacteria (Typhoid, etc.)	8.00

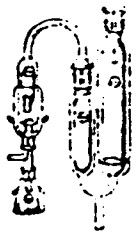
WATER TESTING (Chemical)

1. Complete chemical testing as listed above (not including bacteria)	28.00
2. Irrigation quality (includes tests # 1, 3, 4, and 5)	10.00
3. A single chemical test	3.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

(over for information)

WATER TESTING



PETERSON LABORATORIES, INC.
BOX 886
PHONE 665-5661 19 EAST 4TH ST.
HUTCHINSON, KANSAS 67501

NAME Equus Beds GMD ADDRESS Halstead, KS

Deep well (70') SOURCE OF SAMPLE EB4B DATE RECEIVED 11/13 DATE REPORTED 11/17/81

SAMPLE IDENTIFICATION 11/12/81 1630

SANITATION EXAMINATION

QUALITATIVE TEST FOR COLI-FORM BACTERIA (Sanitation) _____

QUANITATIVE TEST FOR COLI-FORM BACTERIA (Coli-form per 100 ml.) _____

SEWAGE BACTERIA _____

STANDARD PLATE COUNT (Per ml.) _____

BACTERIAL CONDITION OF WATER _____

CHEMICAL TESTS

1. Elec. Conductivity	1,800 Micro Mhos/cm ←	9. Nitrates as (NO_3)	ppm
2. Total Solids	ppm	10. Nitrites (NO_2)	ppm
3. Estimated % Sodium	%	11. pH	6.70
4. Total Hardness	29.8 gr/gal	12. Calcium ion	ppm
Total Hardness	510 ppm	13. Magnesium ion	ppm
5. Salt (Sodium Chloride)	840 ppm	14. Phenol. Alkalinity	ppm
Chlorides	512 ppm ←	15. Total Alkalinity	112 ppm
6. Total Iron	ppm	16. Total Sulfates	ppm
7. Phosphate	ppm	17.	
8. Copper	ppm		
IRRIGATION QUALITY - See Reverse side			

SUGGESTED METHOD FOR COLLECTING SAMPLE OF WATER

1. Order or obtain sterile containers from Laboratory (a $1.00 deposit is required if we are to mail you a container) or if this is not feasible, boil in water a 8 or 16 oz. jar and lid for 10 minutes.
2. Submerge tip of faucet in cup of chlorox for 5 minutes.
3. Rinse off faucet with the boiled water.
4. Turn on water for 10 minutes. Using care, obtain your sample.
   NOTE: Do not take water sample from outside hose or faucet.
5. Deliver or mail to Laboratory as soon as possible. If sample is to be mailed, please submit your check for correct amount, minus $1.00 if you have made a deposit on a container.

WATER TESTING (Bacteriological)

$5.00 Minimum Charge

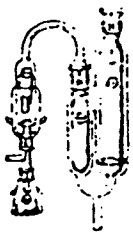
1. Qualitative test for Coli-form (sanitation)	$ 6.00
2. Number of Coli-form bacteria in water	10.00
3. Standard plate count (number of bacteria in water)	8.00
4. Check for sewage bacteria (Typhoid, etc.)	8.00

WATER TESTING (Chemical)

1. Complete chemical testing as listed above (not including bacteria)	28.00
2. Irrigation quality (includes tests # 1, 3, 4, and 5)	10.00
3. A single chemical test	3.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

WATER TESTING



PETERSON LABORATORIES, INC.
BOX 886
PHONE 665-5661 19 EAST 4TH ST.
HUTCHINSON, KANSAS 67501

NAME Equus Beds GMD ADDRESS Halstead, KS

SOURCE OF SAMPLE shallow well (43') EB4A DATE RECEIVED 3/8/82 DATE REPORTED 3/9/82

SAMPLE IDENTIFICATION EBGMD 3/8/82 1130 TCB-TD

SANITATION EXAMINATION

QUALITATIVE TEST FOR COLI-FORM BACTERIA (Sanitation) _____

QUANITATIVE TEST FOR COLI-FORM BACTERIA (Coli-form per 100 ml.) _____

SEWAGE BACTERIA _____

STANDARD PLATE COUNT (Per ml.) _____

BACTERIAL CONDITION OF WATER _____

CHEMICAL TESTS

1. Elec. Conductivity	280 Micro Mhos/cm ←	9. Nitrates as (NO_3)	ppm
2. Total Solids	ppm	10. Nitrites (NO_2)	ppm
3. Estimated % Sodium	%	11. pH	7.90
4. Total Hardness	gr/gal	12. Calcium ion	ppm
Total Hardness	ppm	13. Magnesium ion	ppm
5. Salt (Sodium Chloride)	87.5 ppm	14. Phenol. Alkalinity	ppm
Chlorides	53.4 ppm ←	15. Total Alkalinity	ppm
6. Total Iron	ppm	16. Total Sulfates	ppm
7. Phosphate	ppm	17.	
8. Copper	ppm		
IRRIGATION QUALITY - See Reverse side			

SUGGESTED METHOD FOR COLLECTING SAMPLE OF WATER

1. Order or obtain sterile containers from Laboratory (a $1.00 deposit is required if we are to mail you a container) or if this is not feasible, boil in water a 8 or 16 oz. jar and lid for 10 minutes.
2. Submerge tip of faucet in cup of chlorox for 5 minutes.
3. Rinse off faucet with the boiled water.
4. Turn on water for 10 minutes. Using care, obtain your sample.
   NOTE: Do not take water sample from outside hose or faucet.
5. Deliver or mail to Laboratory as soon as possible. If sample is to be mailed, please submit your check for correct amount, minus $1.00 if you have made a deposit on a container.

WATER TESTING (Bacteriological)

$5.00 Minimum Charge

1. Qualitative test for Coli-form (sanitation)	$ 6.00
2. Number of Coli-form bacteria in water	10.00
3. Standard plate count (number of bacteria in water)	8.00
4. Check for sewage bacteria (Typhoid, etc.)	8.00

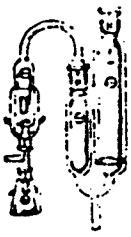
WATER TESTING (Chemical)

1. Complete chemical testing as listed above (not including bacteria)	28.00
2. Irrigation quality (includes tests * 1, 3, 4, and 5)	10.00
3. A single chemical test	3.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

(over for information)

WATER TESTING



PETERSON LABORATORIES, INC.
BOX 886
PHONE 665-5661 19 EAST 4TH ST.
HUTCHINSON, KANSAS 67501

NAME Ruus Beds GMD ADDRESS Halstead, KS

SOURCE OF SAMPLE Deep well (66') P31 & A DATE RECEIVED 12/22/81 DATE REPORTED 12/22/81

SAMPLE IDENTIFICATION RBGMD2 12/15/81 13:30 TD-RC (8)

SANITATION EXAMINATION

QUALITATIVE TEST FOR COLI-FORM BACTERIA (Sanitation) _____

QUANITATIVE TEST FOR COLI-FORM BACTERIA (Coli-form per 100 ml.) _____

SEWAGE BACTERIA _____

STANDARD PLATE COUNT (Per ml.) _____

BACTERIAL CONDITION OF WATER _____

CHEMICAL TESTS

1. Elec. Conductivity	2,800 Micro Mhos/cm ←	9. Nitrates as (NO_3)	_____ ppm
2. Total Solids	_____ ppm	10. Nitrites (NO_2)	_____ ppm
3. Estimated % Sodium	_____ %	11. pH	7.1
4. Total Hardness	_____ gr/gal	12. Calcium ion	_____ ppm
Total Hardness	_____ ppm	13. Magnesium ion	_____ ppm
5. Salt (Sodium Chloride)	1,300 ppm	14. Phenol. Alkalinity	_____ ppm
Chlorides	793 ppm ←	15. Total Alkalinity	_____ ppm
6. Total Iron	_____ ppm	16. Total Sulfates	_____ ppm
7. Phosphate	_____ ppm	17. _____	
8. Copper	_____ ppm	_____	
IRRIGATION QUALITY - See Reverse side		_____	

SUGGESTED METHOD FOR COLLECTING SAMPLE OF WATER

1. Order or obtain sterile containers from Laboratory (a $1.00 deposit is required if we are to mail you a container) or if this is not feasible, boil in water a 8 or 16 oz. jar and lid for 10 minutes.
2. Submerge tip of faucet in cup of chlorox for 5 minutes.
3. Rinse off faucet with the boiled water.
4. Turn on water for 10 minutes. Using care, obtain your sample.
   NOTE: Do not take water sample from outside hose or faucet.
5. Deliver or mail to Laboratory as soon as possible. If sample is to be mailed, please submit your check for correct amount, minus $1.00 if you have made a deposit on a container.

WATER TESTING (Bacteriological)

$5.00 Minimum Charge

1. Qualitative test for Coli-form (sanitation)	$ 6.00
2. Number of Coli-form bacteria in water	10.00
3. Standard plate count (number of bacteria in water)	8.00
4. Check for sewage bacteria (Typhoid, etc.)	8.00

WATER TESTING (Chemical)

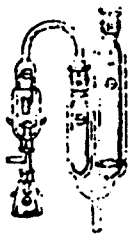
1. Complete chemical testing as listed above (not including bacteria)	28.00
2. Irrigation quality (includes tests * 1, 3, 4, and 5)	10.00
3. A single chemical test	3.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

(over for information)

WATER TESTING

PETERSON LABORATORIES, INC.
BOX 886
PHONE 665-5661 19 EAST 4TH ST.
HUTCHINSON, KANSAS 67501



NAME Equus Beds GMD ADDRESS Halstead, KS

SOURCE OF SAMPLE shallow well (40') P31A DATE RECEIVED 12/22/81 DATE REPORTED 12/22/81

SAMPLE IDENTIFICATION EBGMD2 12/15/81 13:20 TD-RC (7)

SANITATION EXAMINATION

QUALITATIVE TEST FOR COLI-FORM BACTERIA (Sanitation) _____

QUANITATIVE TEST FOR COLI-FORM BACTERIA (Coli-form per 100 ml.) _____

SEWAGE BACTERIA _____

STANDARD PLATE COUNT (Per ml.) _____

BACTERIAL CONDITION OF WATER _____

CHEMICAL TESTS

1. Elec. Conductivity	4,200 Micro Mhos/cm ←	9. Nitrates as (NO_3)	ppm
2. Total Solids	ppm	10. Nitrites (NO_2)	ppm
3. Estimated % Sodium	%	11. pH	7.3
4. Total Hardness	gr/gal	12. Calcium ion	ppm
Total Hardness	ppm	13. Magnesium ion	ppm
5. Salt (Sodium Chloride)	2,150 ppm	14. Phenol. Alkalinity	ppm
Chlorides	1,311.5 ppm ←	15. Total Alkalinity	ppm
6. Total Iron	ppm	16. Total Sulfates	ppm
7. Phosphate	ppm	17.	
8. Copper	ppm		
IRRIGATION QUALITY - See Reverse side			

SUGGESTED METHOD FOR COLLECTING SAMPLE OF WATER

1. Order or obtain sterile containers from Laboratory (a $1.00 deposit is required if we are to mail you a container) or if this is not feasible, boil in water a 8 or 16 oz. jar and lid for 10 minutes.
2. Submerge tip of faucet in cup of chlorox for 5 minutes.
3. Rinse off faucet with the boiled water.
4. Turn on water for 10 minutes. Using care, obtain your sample.
   NOTE: Do not take water sample from outside hose or faucet.
5. Deliver or mail to Laboratory as soon as possible. If sample is to be mailed, please submit your check for correct amount, minus $1.00 if you have made a deposit on a container.

WATER TESTING (Bacteriological)

$5.00 Minimum Charge

1. Qualitative test for Coli-form (sanitation)	$ 6.00
2. Number of Coli-form bacteria in water	10.00
3. Standard plate count (number of bacteria in water)	8.00
4. Check for sewage bacteria (Typhoid, etc.)	8.00

WATER TESTING (Chemical)

1. Complete chemical testing as listed above (not including bacteria)	28.00
2. Irrigation quality (includes tests * 1, 3, 4, and 5)	10.00
3. A single chemical test	3.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

(over for information)