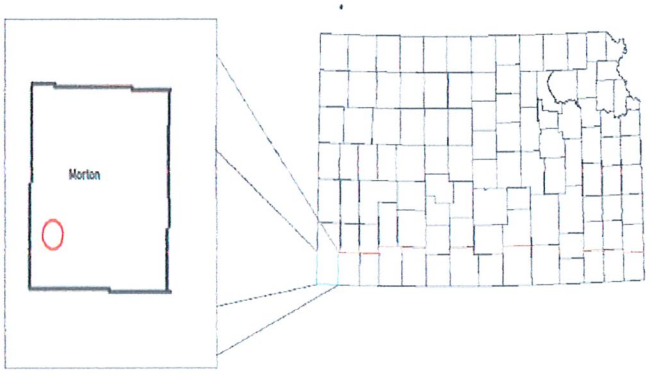
January 2023 – December 2032

Witcher WCA

Water Conservation Area
Management Plan



Water Conservation Area Executive Summary

WCA Acres: 1,126 acres
Number of IRR Use Water Rights: 4
Number of IRR Use Wells: 5
WCA Allocation:

- 11,260 acre-feet (AF), 12 inches per authorized acre
  - a 22% reduction from standard net irrigation requirement (N.I.R.) on authorized acres.

Corrective Controls:

- File No. 21,094 will be limited to 911 gallons per minute (GPM)
- File No. 19,054-D2 may exceed annual authorized quantity but limited to no more than an allocation of 200 AF per calendar year.
- File No. 10,194 for both authorized wells, may exceed their annual authorized quantity, but limited to a combined allocation of 1,004 AF per calendar year.
- File no. 44,631 may exceed annual authorized quantity but limited to no more than an allocation of 500 AF per calendar year.
- All water rights combined are limited to the total combined annual authorized quantity of 1,408 AF per calendar year.
- All water rights combined shall be limited to a 10-year allocation of no more than 11,260 AF.

Conservation Goal: approximately 2,800 AF during the 10-year period.

- Requests unused allocation after the 10-year period to be carried over and added to a subsequent WCA.

NOTE: Executive Summary provided by KS Dept of Agriculture – Division of Water Resources

MANAGEMENT PLAN

For the Designation of a Water Conservation Area (WCA)
Witcher WCA; Morton County, Kansas
January 2023 through December 2032

To conserve and extend the productive life of the aquifer in our region and increase the value and viability of our water rights and water resources for future generations we, the undersigned water right owners propose the following management plan, pursuant to K.S.A. 82a-745 (WCA Law), to form the basis of a Consent Agreement and Order Designating a Water Conservation Area (WCA).

Expression of Conservation Goals

The water right owners of the Witcher WCA desire to conserve and extend the productive life of the aquifer in this region. We have concluded that conserving Ogallala Aquifer water today will increase the value and viability of our water rights and water resources for future generations. Our goal is to extend the life of the aquifer in this immediate area for our future generations and to continue the economic benefit of using groundwater for irrigation use.

We, the water right owners are consenting to the term and conditions of this WCA and commit to holding our water use for ten (10) years, to 12 inches per authorized acre, which is approximately 22% less than the Net Irrigation Requirement (NIR) (more specifically 50% chance rainfall within Morton County) as established in the Rules and Regulations of the Kansas Water Appropriation Act, specifically K.A.R. 5-5-12, , for the authorized acres under these water rights. This calculation equates approximately to a total of 1,126 acre-feet (AF) on the authorized acres. The ten-year WCA allocation will be 11,260 AF.

Water Rights Enrolled and Geographic Boundaries

This WCA shall include the water rights listed in the attached document. This list includes details of all points of diversion associated with those water rights; as well as legal descriptions of the locations of the points of diversion and/or identification numbers.

The current total appropriations authorized for all water rights for irrigation use included in this WCA are 1,408 acre-feet (AF) per calendar year. These water rights consist of five wells and a total of 1,126 acres authorized for irrigation.

The geographic boundary for this WCA is shown on the attached map(s) and attached table defined by legal locations. This table includes total acres and legal definitions by section, township, and range of the WCA boundary.

RECEIVED
DEC 01 2022
Garden City Field Office
Division of Water Resources

Findings Regarding Groundwater Conditions

We understand that the WCA Law requires a finding that one of the following circumstances be present within the area geographic boundaries of this WCA; specified in K.S.A. 82a-1036 (a) through (d):

a) Groundwater levels in the area in question are declining or have declined excessively.
b) The rate of withdrawal of groundwater in the area equals or exceeds the rate of recharge within such area.
c) Preventable waste of water is occurring or may occur within the area in questions; or
d) Unreasonable deterioration of the quality of water is occurring or may occur within the area in question

and amendments thereto, exist, or include a finding or findings that the area within the geographic boundaries described in paragraph (1) has been closed to new appropriations by rule, regulation or order of the Chief Engineer.

We have been informed that the following conditions exist:

- Groundwater levels in the area in question are declining or have declined excessively.
- The rate of withdrawal of groundwater in the area equals or exceeds the rate of recharge within such area.

These conditions suggest the advisability of implementing this WCA.

See the attached maps and figures supporting these findings and observations. Such attached documents may include:

- Maps with WCA geographic boundaries defined- Attachment (A)
- Detailed table with description of WCA geographic boundaries- Attachment (B)
- Summary of water rights with description of legal locations- Attachment (C)
- KGS Observation well(s) data (if applicable) - Attachment (D)
- Theis Evaluation by DWR – Attached to this document

Per the Corrective Controls Provisions and Plan for Conservation Section under this WCA management plan it has been determined that the proposed provisions listed will not significantly affect nearby points of diversion. This has been determined by a Theis analysis conducted by the Kansas Department of Agriculture. The Theis report(s) for the water rights in question are included in the attached document.

Due Consideration for Past Conservation

We acknowledge that as described in the law (K.S.A. 82a-744), a water conservation area (WCA) management plan for example, shall give due consideration to water users who have previously implemented reductions in water use resulting from voluntary conservation measures. This is demonstrated with recent historic water use being very low compared to long term historic average. We have demonstrated that we can divert our entire authorized quantity, therefore, with low past usage, we have conserved during those years. We are committed to best water management practices with the aim of, the conservation of the Ogallala aquifer and to preserve the viability of irrigated agriculture. As enumerated

below we, the owners, request that further conservation under this plan be considered in any LEMA proposed for the area or in a subsequent WCA under the terms herein.

Corrective Control Provisions and Plan for Conservation

We acknowledge that the following corrective controls will be in effect within this WCA during the term of the WCA period listed:

1. Water rights, at the discretion of the owners, may be pumped as directed by the owner, provided that:
   a) All water rights cannot exceed the authorized diversion rates
   b) Water Right, File No. 10,194, may exceed each well's annual authorized individual quantity, but both are limited to a total combined annual allocation of 1,004 AF.
   c) Water Right, File No. 19,054-D2 may exceed its annual authorized quantity but limited to a maximum annual allocation of 200 AF.
      a. the authorized rate of diversion will be limited to 911 gallons per minute (GPM).
   d) Water Right, File No. 21,094, cannot exceed its annual authorized quantity nor the overall limiting endorsement of the quantity when combined with the wells authorized under File No. 10,194.
   e) Water Right, File No. 44,631 may exceed its annual authorized quantity, but limited to a maximum annual allocation of 500 AF.
   f) All water rights, File Nos. 10,194, 19,054-D2, 21,094, 44,631 combined shall be limited to the total combined annual authorized quantity of 1,408 AF per calendar year.
   g) All water rights, File Nos. 10,194, 19,054-D2, 21,094, 44,631 combined shall be limited to a ten-year allocation of no more than 11,260 AF during the WCA.

2. The corrective control provisions of this WCA cannot conflict with the rules and regulations of the local groundwater management district that result in greater overall conservation of water resources. If a Local Enhanced Management Area (LEMA) plan or an Intensive Groundwater Use Control Area (IGUCA) is formed after the initiation of this WCA, and the WCA is partially or wholly within the LEMA or IGUCA, the corrective control provisions that result in the greater overall conservation of water resources based on inches per acre and not based on percent reduction of average historical use shall prevail. However, any LEMA or IGUCA must give due consideration to the conservation achieved by WCA participants pursuant to 82a-745(a)(6). The Chief Engineer is authorized to amend the provision of the WCA to conform to any rules, regulations, or requirements that result in greater conservation of the water resource subject to the foregoing due consideration for past and current conservation.

We, the water right owners enrolling in this WCA understand we may gain the following additional incentive(s) in consideration for our WCA participation.

3. Up to the annual WCA allocation (1,126 AF) may be carried over and added to a subsequent WCA period after calendar year 2032 if unused during the duration of this WCA period. For the carryover quantity to be included, all owners must enter into agreement to participate in a subsequent WCA by December 31st of the last year of this WCA period. Upon review, should a subsequent WCA be entered, the potential carryover will not allow to exceed the total annual authorized quantity or the agreed upon corrective controls.

Compliance Monitoring and Enforcement

We, the owners, understand that the following compliance monitoring and enforcement provisions are proposed. This section also includes any specific provisions regarding measuring or reporting water usage.

There is one recognized observation well(s) within one (1) mile of this WCA boundary that is currently being measured annually by the Kansas Geological Survey (KGS). See attached maps for location. The well will continue to be measured annually and the data collected will help in evaluating the effectiveness of the WCA. An onsite observation well may be necessary to monitor the local water level more accurately.

We will submit an annual report no later than March 1st and maintain a spreadsheet detailing the following information for each well and all wells combined: beginning and ending meter readings, quantity of water diverted, acres irrigated, the inches per acre, and the quantity of water remaining for the WCA period listed. These records will be available to KDA-DWR upon request.

We will ensure backup measurements of water will be supported or an alternate measurement device will be available to be put into service in case the water flowmeter record for any given well is questionable or not reliable.

We acknowledge that water flowmeters within the WCA will be sealed to the measurement chamber by KDA-DWR during the duration of this management plan to ensure an accurate water use record.

We, water right owners within this WCA shall be responsible for ensuring the water flowmeters comply with state laws and regulations. Any water right owner or authorized designee who finds a water flowmeter that is inoperable or inaccurate shall within 48 hours contact the KDA-DWR concerning the matter. Whenever an inoperable or inaccurate water flowmeter is repaired or replaced, the owner or authorized designee shall notify the KDA-DWR within seven (7) days on a form prescribed by the Chief Engineer of the water flowmeter installation and any water flowmeter repair or replacement event.

We acknowledge that failure to abide by the terms of this agreement may result in the termination of the WCA. Failure to abide by the terms, conditions, and limitations of the individual water rights will be subject to the civil penalties outlined in K.A.R. 5-14-10 and K.A.R. 5-14-12.

Review of Effectiveness

We acknowledge that a review of this WCA shall be completed prior to November 1st of the final year of the WCA period listed to ensure the above terms remain appropriate and are achieving the stated goals of this WCA. Should the Chief Engineer find that the terms are no longer appropriate or that no progress has been made towards the stated goal, the Chief Engineer may refuse to renew a WCA and may suggest new terms and goals. We understand that upon review, and a finding by the Chief Engineer that the WCA has achieved or made progress towards its goals and that the same terms be included in a subsequent WCA for another designated period. The terms of the WCA may be continued if this WCA is in good standing with its most recent WCA period and upon formal approval by the Chief Engineer. The Chief Engineer shall issue findings addressing the terms and goals of the existing management plan prior to any renewal of a subsequent WCA.

We acknowledge that unless terminated under the provisions below (e.g., due to the development of a LEMA), the WCA will be in effect for the listed period with an evaluation at the end of every WCA period. We understand that KDA-DWR will conduct this evaluation to ensure compliance and conservation. The evaluation will determine total water use during the WCA period.

We acknowledge that should an order of designation for a LEMA be implemented prior to end of this WCA period, an evaluation of this WCA will be conducted the year prior to the start of a LEMA. This evaluation may be used to determine an additional allocation amount of water to be carried over into a LEMA; should this be the case.

Member addition, withdrawal, and removal

We acknowledge that the water right owners and their associated water right(s) and geographic boundaries may be added to the WCA upon written notification to the Chief Engineer by the owners of each enrolling water right with legal descriptions of the areas to be added. A member may withdraw from the WCA through written notification to the Chief Engineer signed by the owners of the participating water right or rights to be withdrawn from the WCA.

If the addition or withdrawal of water rights requires modification to the water allocation quantities, geographic boundaries, places of use, terms, or conditions of the original WCA, the management plan shall be revised to incorporate such changes and the associated consent agreement shall be reaffirmed by all parties, after opportunity for comment on the proposed revisions by the applicable groundwater management district.

Termination

We acknowledge this WCA agreement may be terminated by written notification, signed by all then-existing members of the WCA, to the Chief Engineer of the intent to terminate.

We also acknowledge that the Chief Engineer may terminate this WCA upon findings that it is not being upheld to its terms. Such termination shall give notice and require a full evaluation of the WCA, and water rights associated to ensure follow up actions.

State Law

We acknowledge that this WCA is subject to compliance with all other applicable state laws.

Notification to Nearby Owners

We acknowledge that, by statue, the Chief Engineer is required to provide written notification to all water right owners with a point of diversion within ½ of a mile, or farther if deemed necessary, by a rule and regulation of the Chief Engineer, of the geographic boundaries of this WCA.

Assurances

We acknowledge this WCA will not alter the terms, conditions, and limitations of the base water rights.

Review of Other Applicable Requirements

We acknowledge that upon review, this WCA management plan was found to effect equal or greater overall conservation than applicable groundwater management district regulations, LEMA, and IGUCA requirements.

Participant's Agreement

By signing below, we, the water right owners, agree that this management plan is fair and equitable. This management plan, provided to the Chief Engineer and water right owners, is the expressed written intent of the parties and the whole agreement between the parties. We, the water right owners agree to be bound by all the terms contained in this management plan and understand that the provisions of this agreement shall be construed to give effect to the provisions listed. We, the water right owners also agree that this management plan is the basis for a consent agreement among the Chief Engineer and the undersigned water right owners, and therefore any order and consent agreement issued by the Chief Engineer, designating this WCA, shall be binding upon all parties as the necessary formal implementation of this management plan.

FOR THE PARTICIPANTS: All participating water right owner(s) signing below, affirm their approval of this WCA management plan and if approved by the Chief Engineer allow consent to the Chief Engineer to formally approve the designation of this Water Conservation Area, described herein, by means of a Consent Agreement and Order.

Anita C Witcher Date: 11-30-2022

(ANITA C WITCHER)- Owner (Signature)

Water Right No(s). (10194, 19054-D2, 21094, 44631)

(1120 MUNCY, ELKHART, KS 67950)

Full Mailing Address

anitawitcher.1@gmail.com 620-453-0559

Email Address Phone Number

ACKNOWLEDGMENT OF NOTARY

State of Kansas)

) SS

County of Bent)

Acknowledged before me on 11-30-2022

by _____.

Signature: Tammy Newman

Notary Public

TAMMY NEWMAN
Notary Public - State of Kansas
My Appt. Expires 4-27-2025

My commission expires: 4-27-2025

(Notary Seal)

FOR THE PARTICIPANTS: All participating water right owner(s) signing below, affirm their approval of this WCA management plan and if approved by the Chief Engineer allow consent to the Chief Engineer to formally approve the designation of this Water Conservation Area, described herein, by means of a Consent Agreement and Order.

Alice Witcher TR TEE Date: 11-30-2022

(DONALD B & ALICE WITCHER REV TRUST)- Owner (Signature)

Water Right No(s). (10194, 19054-D2, 21094, 44631)

(PO BOX 4278, SANTA FE, NEW MEXICO 87502-4278)

Full Mailing Address

505-982-5817

Email Address Phone Number

ACKNOWLEDGMENT OF NOTARY

State of Kansas)

) SS

County of Riley)

Acknowledged before me on 11-30-2022

by _____.

Signature: _____

Notary Public

TAMMY NEWMAN
Notary Public - State of Kansas
My Appt. Expires 6-27-2025

My commission expires: 6-27-2025

(Notary Seal)

FOR THE PARTICIPANTS: All participating water right owner(s) signing below, affirm their approval of this WCA management plan and if approved by the Chief Engineer allow consent to the Chief Engineer to formally approve the designation of this Water Conservation Area, described herein, by means of a Consent Agreement and Order.

_____ Date: 11-30-2022

(GRANT A WITCHER)- Owner (Signature)

Water Right No(s). (10194, 19054-D2, 21094, 44631)

(PO BOX 972, ELKHART, KS 67950)

Full Mailing Address

gwitch2@gmail.com 785-565-3188

Email Address Phone Number

ACKNOWLEDGMENT OF NOTARY

State of Kansas)

) SS

County of Riley)

Acknowledged before me on 11-30-2022

by _____.

Signature: _____

Notary Public

TAMMY NEWMAN
Notary Public - State of Kansas
My Appt. Expires 6-27-2025

My commission expires: 6-27-2025

(Notary Seal)

FOR THE PARTICIPANTS: All participating water right owner(s) signing below, affirm their approval of this WCA management plan and if approved by the Chief Engineer allow consent to the Chief Engineer to formally approve the designation of this Water Conservation Area, described herein, by means of a Consent Agreement and Order.

Virginia R. Witcher Date: 11-30-2022

(VIRGINIA RENA WITCHER ET AL)- Owner (Signature)

Water Right No(s). (10194, 19054-D2, 21094, 44631)

(9079 HILL VIEW RD, MORRISON, CO 80465)

Full Mailing Address

rena.witcher1966@gmail.com 806-282-8620

Email Address Phone Number

ACKNOWLEDGMENT OF NOTARY

State of Kansas)

) SS

County of Riley)

Acknowledged before me on 11-30-2022

by _____.

Signature: Tammy Newman

Notary Public

TAMMY NEWMAN
Notary Public - State of Kansas
My Appt. Expires 6-27-2025

My commission expires: 6-27-2025

(Notary Seal)

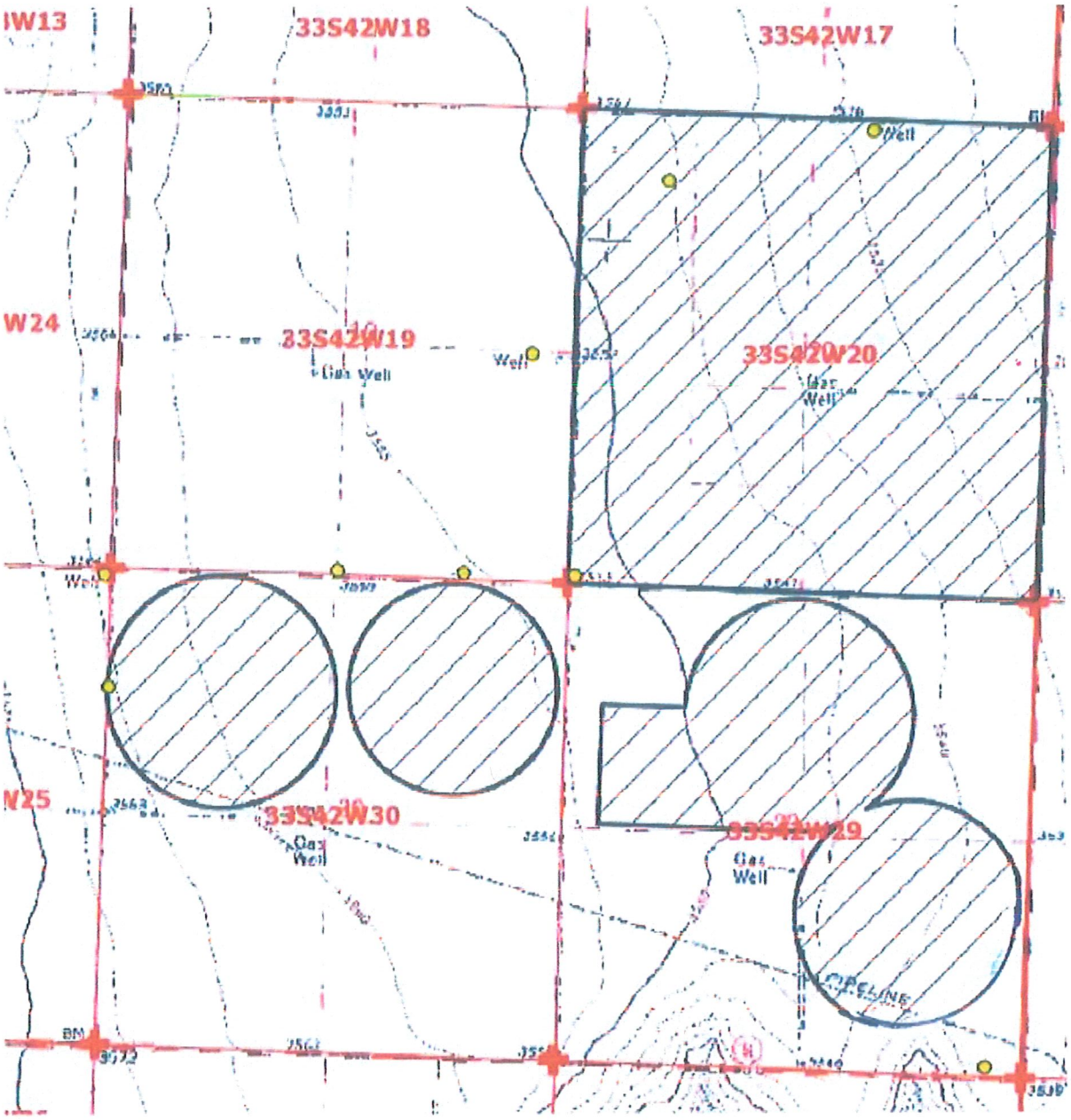
CERTIFICATE OF SERVICE

I hereby certify that on this _____ day of _____, ____ copies of the foregoing were sent via first class, U.S. mail, to the following:

(Water Right Owner: Full Name)
(Mailing Address: Full Street Address)
(Mailing Address: City, State Zip)

_____
Kansas Department of Agriculture
Staff Person

Attachment (A) – (geographic boundary)



Attachment (B) – (Detailed table with description of WCA geographic boundaries)

			NE¼				NW¼				SW¼				SE¼				TOTAL
Sec.	Twp.	Range	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	ACRES
30	33S	42W	29	27.5	21	22.5	30	Lot 1 30	Lot 2 30	30									220
20	33S	42W	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	640
29	33S	42W		29	37	6	29		27	40					33	37	18	10	266
																		Total	1,126

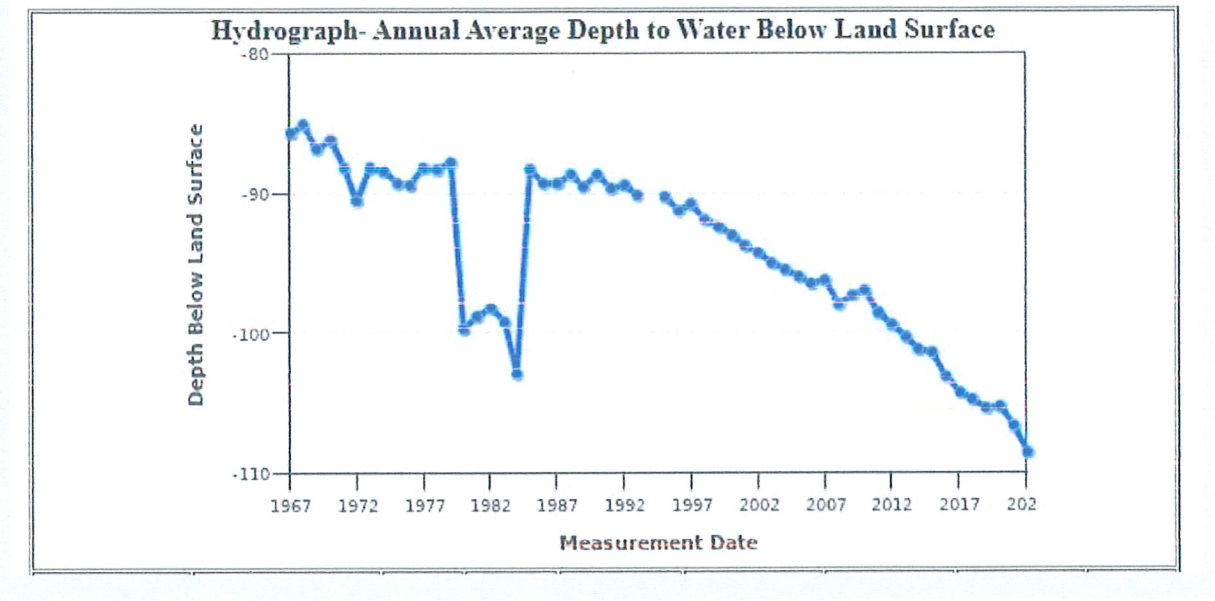
Attachment (C) – (Summary of Water Rights with Legal Locations)

Water Right #	ID #	PDIV #	Sect-Twp-Range	Authorized Annual Quantity (AF)
10194	1	31336	20 / 33S / 42W	547
10194	2	54429	20 / 33S / 42W	457
19054-D2	2	481	30 / 33S / 42W	167
21094	6	67390	20 / 33S / 42W	683
44631	3	65984	29 / 33S / 42W	167

Total combined authorized annual quantity = 1,408 acre feet (AF)

Attachment (D) – (KGS Observation well Hydrograph)

KGS Local Well ID: 33S 42W 21BCB 01
PLSS Description: 33S 42W 21 NWSWNW



S. Thurlow
10/31/2022

Theis evaluation of Witcher WCA

A 50-year Theis analysis was used to evaluate the potential increase in dynamic drawdown as a result of the proposed Witcher WCA. The WCA proposes an allowed combined quantity of 1,406 AF per calendar year and a limit of 11,260 AF for the 10 year period to the following five points of diversion: 67390 (File No. 21094), 65984 (File No. 44631), 481 (File No. 19054), 54429 (File No. 10194), and 31336 (File No. 10194).

The GMD No. 3 groundwater model was used with an adjustment factor calculated by comparing the difference in projected saturated thicknesses of historical well data to that of the GMD No. 3 model for a resulting future (2068) saturated thickness of 275.3 ft. The average of model cells located within Township 33 South, Range 42 West, Sections 17, 18, 19, 20, 21, 28, 29, 30, 31, 32, and Township 33 South, Range 43 West, Sections 24, 25 was used.

The transmissivity was estimated based on lithological logs from the Kansas Geological Survey's Water Well Completion Records Database (WWC5). WWC5 records within 2 mile of the center of the WCA were used. Records that were within that area, but did not include lithological data, were not drilled to bed rock, or had poor lithological descriptions were excluded. Hydraulic conductivity assumptions were based on the calibrated values used for the GMD No. 3 groundwater model (Figures 2 and 3). In all, eight lithological logs were evaluated (Figure 4-5, Tables 1-8), with an average transmissivity of 1,787 square feet per day. An assumed specific storage (1×10^{-5} for the Ogallala Aquifer and 1×10^{-6} for the Permian System Aquifer) and the adjusted projected saturated thickness was used to determine the assumed storativity of 0.001053.

Drawdown was evaluated at 5 nearby existing wells authorized by File Nos. 24628, 10193, 19054 ID4, 19054 ID3, and 19278 (Tables 9-11). The total drawdown at each nearby well was calculated by summing the drawdown of each individual pumping well using the pumping scenario that maximizes the increase in drawdown. This scenario consists of 490 AF, 200 AF, 270 AF, 240 AF, and 200 AF for the wells of File Nos. 21094, 19054, 44631, 10194 ID1, and 10194 ID2, respectively while the 10 year 11,260 AF limit is neglected. While considering the 10 year 11,260 AF limit, the pumping scenario is adjusted to 394 AF, 161 AF, 217 AF, 193 AF, and 161 AF for those respective pumping wells to calculate the 50 year maximum drawdown by using the adjusted scenario for the first 49 years and the original scenario for the 50th year to find the maximum total drawdown. The authorized rates used for those respective pumping wells are 1045 GPM, 625 GPM, 730 GPM, 600 GPM, and 500 GPM. This was compared to the average historic use for the wells (196 AF, 118 AF, 99 AF, 164 AF, and 159 AF from 2012-2021) of File Nos. 21094, 19054, 44631, 10194 ID1, and 10194 ID2, respectively at their most recent pumping rates (352 GPM, 450 GPM, 300 GPM, 174 GPM, and 343 GPM). The maximum net drawdown occurred at the point of diversion 21240 authorized by File No. 19054 ID4. The net drawdown at that distance was 68.9 feet, or 25.0% of the projected future saturated thickness (Table 11). If the proposed rate of the pumping well at the point of diversion 67390 authorized by File No. 21094 is limited to 911 gallons per minute, the increase in drawdown will be limited to 55.0 feet, or 20.0% of the projected saturated thickness (Table 11).

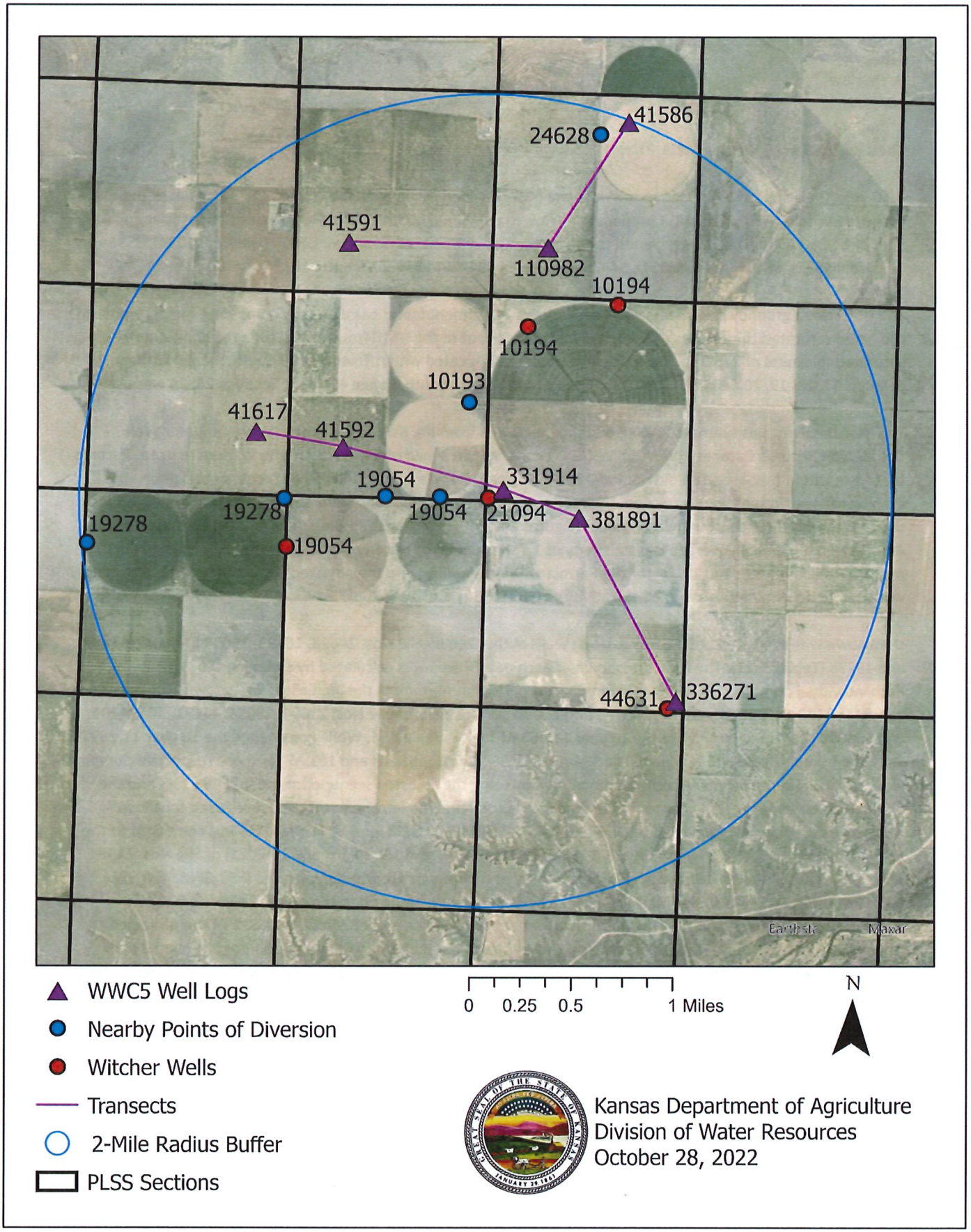


Figure 1: Location of current and proposed point of diversion, surrounding points of diversion, and WWC5 records

Table 1. PST+ synonymy codes and lithology descriptions.

Synonymy	Lithology	Synonymy	Lithology	Synonymy	Lithology
sh	Shale	sc	Sandy Clay or Silty Sand	fsnd	Fine Sand
c	Clay	fds	Fine Sandy Silt	fmgsnd	Fine to Medium Sand
coal	Coal	fmds	Fine to Medium Sandy Silt	fmsnd	Fine to Medium Sand
br	Bedrock	fcrsds	Fine to Coarse Sandy Silt	snd	Sand
rb	Red Bed	ds	Sandy Silt	fcrssnd	Fine to Coarse Sand
r	Rock	mds	Medium Sandy Silt	msnd	Medium Sand
sst	Siltstone	gc	Gravelly Clay	mcrssnd	Medium to Coarse Sand
ca	Limestone/caliche	mcrsds	Medium to Coarse Sandy Silt	cg	Clayey Gravel
o	Overburden	crsds	Coarse Sandy Silt	crssnd	Coarse Sand
ts	Topsoil	cesd-cg	Cemented Sand and/or Gravel	sg	Silty Gravel
fs	Fine Silt	fss	Fine Silty Sand	fsdg	Fine Sand and Gravel
fsc	Fine Sandy Clay	fmss	Fine to Medium Silty Sand	fmsdg	Fine to Medium Sand and Gravel
fmsc	Fine to Medium Sandy Clay	ss	Silty Sand	msdg	Medium Sand and Gravel
m	Marl or Ochre	mss	Medium Silty Sand	sdg	Sand and Gravel
msc	Medium Sandy Clay	fcrsss	Fine to Coarse Silty Sand	fcrssdg	Fine to Coarse Sand and Gravel
s	Silt	mcrsss	Medium to Coarse Silty Sand	mcrssdg	Medium to Coarse Sand and Gravel
crssc	Coarse Sandy Clay	crsss	Coarse Silty Sand	crssdg	Coarse Sand and Gravel
fcrssc	Fine to Coarse Sandy Clay	u	Unknown (most likely unintelligible)	fg	Fine Gravel
mcrssc	Medium to Coarse Sandy Clay			fmg	Fine to Medium Gravel
				fcrsg	Fine to Coarse Gravel
				fcrssg	Fine to Coarse Gravel
				g	Gravel
				mg	Medium Gravel
				mcrsg	Medium to Coarse Gravel
				crsg	Coarse Gravel

Figure 2: Synonymy codes and lithology descriptions. Source: KGS OFR 2010-18

Table 6. The calibrated values for PST+ synonymy lithologies.

Synonymy	K	SY	Synonymy	K (ft/d)	Sy	Synonymy	K (ft/d)	Sy
sh	0.00004	0.05	sc	4.4	0.08	fsnd	15	0.24
c	0.00004	0.05	fds	4.4	0.08	fmgsnd	15	0.24
coal	0.00004	0.05	fmds	4.4	0.08	fmsnd	15	0.24
br	0.00004	0.05	fcrsds	4.4	0.08	snd	63	0.24
rb	0.00004	0.05	ds	4.4	0.08	fcrssnd	63	0.24
r	0.00004	0.05	mds	4.4	0.08	msnd	63	0.24
sst	0.00004	0.05	gc	4.4	0.08	mcrssnd	63	0.24
ca	0.0001	0.08	mcrsds	4.4	0.08	cg	63	0.24
o	0.0001	0.08	crsds	4.4	0.08	crssnd	63	0.29
ts	0.0001	0.08	cesd-cg	14.5	0.16	sg	63	0.29
fs	0.0001	0.08	fss	14.5	0.16	fsdg	299	0.29
fsc	0.0001	0.08	fmss	14.5	0.16	fmsdg	299	0.29
fmsc	0.0001	0.08	ss	14.5	0.16	msdg	299	0.29
m	0.0001	0.08	mss	14.5	0.16	sdg	299	0.29
msc	0.0001	0.08	fcrsss	14.5	0.16	fcrssdg	299	0.29
s	0.0001	0.08	mcrsss	14.5	0.16	mcrssdg	299	0.29
crssc	0.0001	0.08	crsss	14.5	0.16	crssdg	299	0.29
fcrssc	0.0001	0.08	u	14.5	0.16	fg	299	0.29
mcrssc	0.0001	0.08				fmg	299	0.29
						fcrsg	299	0.29
						fcrssg	299	0.29
						g	299	0.29
						mg	299	0.29
						mcrsg	299	0.29
						crsg	299	0.29

Figure 3: Calibrated hydraulic conductivity values. Source: KGS OFR 2010-18

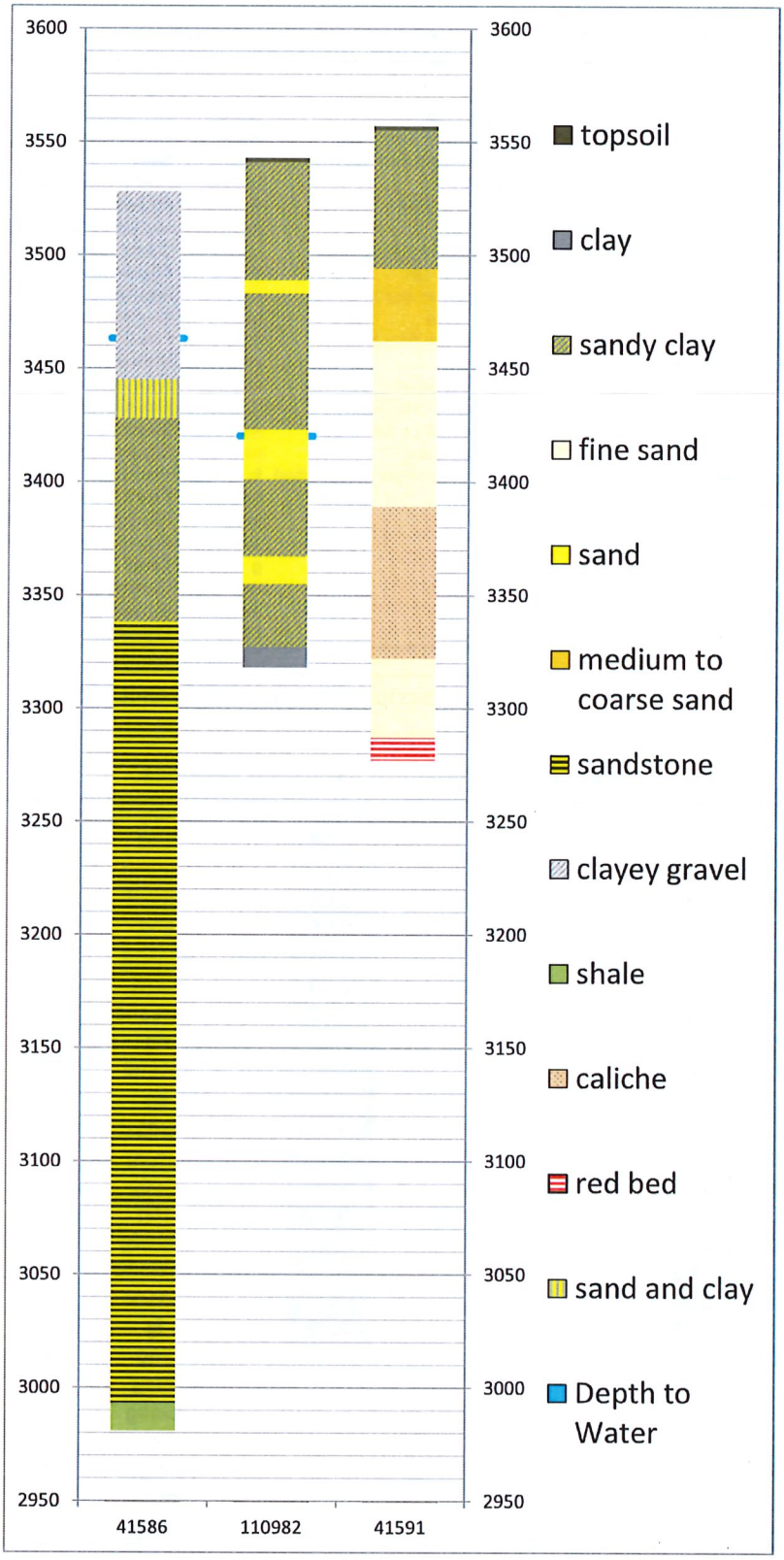


Figure 4: lithology log of KGS Wells on North transect line

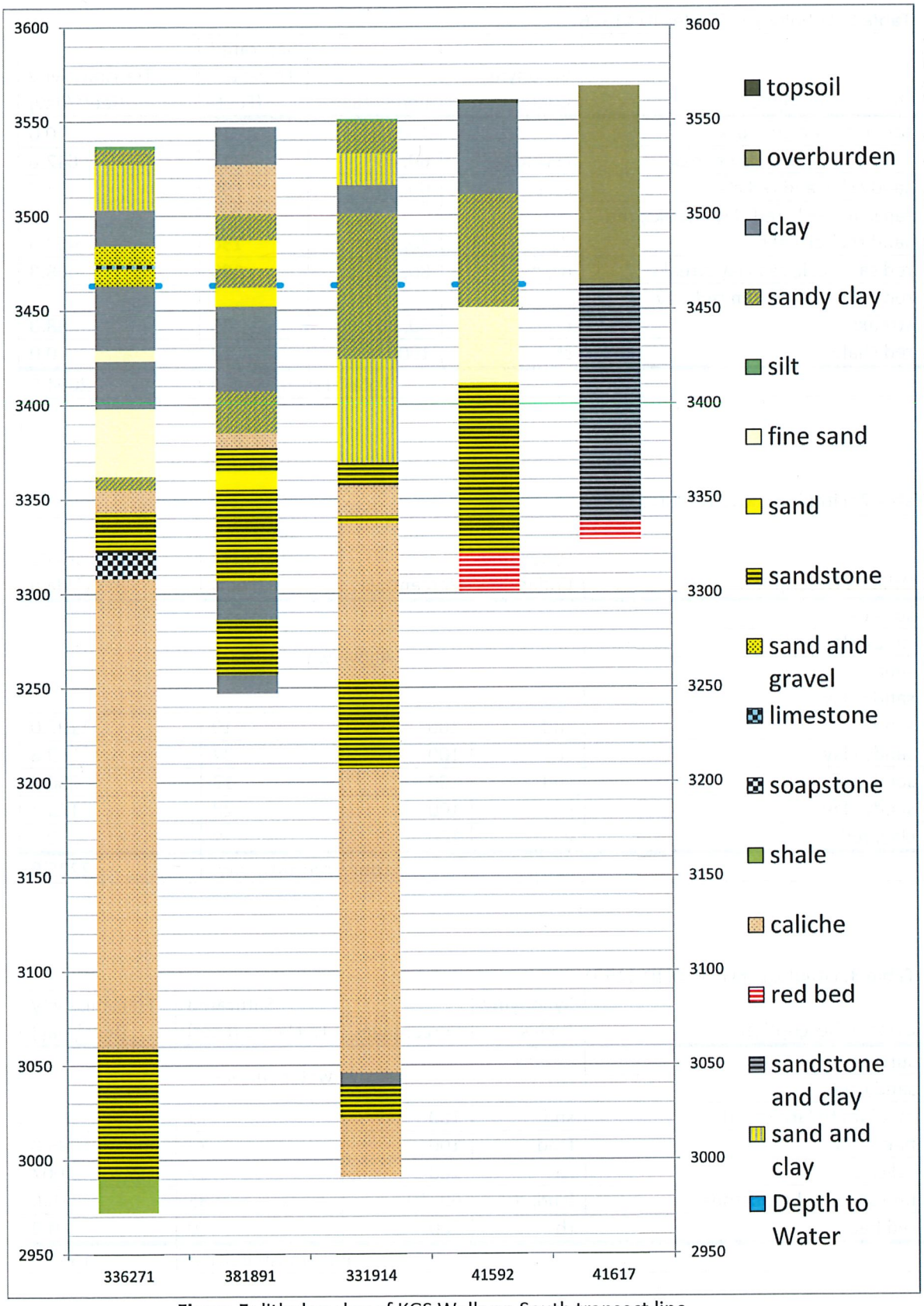


Figure 5: lithology log of KGS Wells on South transect line

Table 1: Lithology, KGS Well ID 41586

Driller's Description	Synonymy Codes	Percentages	Saturated Thickness (Feet)	Transmissivity (feet²/day)
top- clay and gyp rock	c	100	18	0.0
sand coarse and clay streaks	crssnd, c	60, 40	17	642.6
sandy clay and red clay	sc, c	60, 40	90	237.6
tan sand rock, red clay streaks, red sand rock streaks	ds, c	80, 20	130	457.6
red sandrock, red clay streaks	ds, c	80, 20	190	668.8
red sandrock broken red clay streaks	ds, c	80, 20	25	88.0
red shale	sh	100	12	0.0
			Total Transmissivity:	2094.6

Table 2: Lithology, KGS Well ID 110982

Driller's Description	Synonymy Codes	Percentages	Saturated Thickness (Feet)	Transmissivity (feet²/day)
surface	Above water surface			
sandy clay				
sand				
sandy clay				
sand	snd	100	19	1197.0
sandy clay	sc	100	34	149.6
sand	snd	100	12	756.0
sandy clay	sc	100	28	123.2
clay, red	c	100	9	0.0
			Total Transmissivity:	2225.8

Table 3: Lithology, KGS Well ID 41591

Driller's Description	Synonymy Codes	Percentages	Saturated Thickness (Feet)	Transmissivity (feet²/day)
surface	Above water surface			
sandy clay				
medium to large sand	snd	100	1	63.0
fine sand	fsnd	100	73	1095.0
caliche	ca	100	67	0.007
fine sand and sandstone	fsnd, ds	60, 40	35	376.6
red bed	rb	100	10	0.0
			Total Transmissivity:	1534.6

Table 4: Lithology, KGS Well ID 336271

Driller's Description	Synonymy Codes	Percentages	Saturated Thickness (Feet)	Transmissivity (feet²/day)
silt	Above water surface			
sandy clay, caliche, fine sand				
sand, clay				
clay, limestone				
sand, gravel				
limestone				
sand, gravel, rock				
clay, limestone, fine sand	c, ca, fsnd	50, 30, 20	34	102.0
very fine sand, fine sand, clay	fsnd, c	60, 40	6	54.0
clay	c	100	25	0.0
very fine sand, fine sand	fsnd	100	36	540.0
sandy clay, clay	sc, c	60, 40	7	18.5
caliche, sandstone	ca, ds	60, 40	12	21.1
sandstone, caliche	ds, ca	60, 40	21	55.4
soapstone, sandstone	ca, ds	60, 40	14	24.6
caliche, sandstone, limestone	ca, ds	70, 30	47	62.0
caliche, limestone	ca	100	7	0.0
caliche, sandstone	ca, ds	60, 40	24	42.2
caliche, limestone, sandstone	ca, ds	80, 20	23	20.2
caliche, limestone	ca	100	16	0.0
caliche, sandstone	ca, ds	60, 40	13	22.9
caliche, sandstone	ca, ds	60, 40	101	177.8
caliche, limestone	ca	100	18	0.0
sandstone, caliche	ds, ca	60, 40	37	97.7
sandstone, caliche	ds, ca	60, 40	14	37.0
sandstone, caliche	ds, ca	60, 40	18	47.5
shale	sh	100	18	0.0
			Total Transmissivity:	1323.0

Table 5: Lithology, KGS Well ID 381891

Driller's Description	Synonymy Codes	Percentages	Saturated Thickness (Feet)	Transmissivity (feet²/day)
clay	Above water surface			
caliche/sandy clay				
caliche/clay				
sandy clay				
sand/sandy clay				
sandy clay	sc	100	1	4.4
sand	snd	100	10	630.0
clay	c	100	26	0.0
clay/sandy clay	c, sc	60, 40	19	33.4
sandy clay	sc	100	22	96.8
caliche/sandy clay	ca, sc	60, 40	8	14.1
sandstone	ds	100	13	57.2
sand	snd	100	9	567.0
sandstone	ds	100	28	123.2
red sandstone	ds	100	20	88
red clay with little sandstone	c, ds	90, 10	21	9.2
tan sandstone	ds	100	29	127.6
red clay with little sandstone	c, ds	90, 10	10	4.4
			Total Transmissivity:	1755.4

Table 6: Lithology, KGS Well ID 331914

Driller's Description	Synonymy Codes	Percentages	Saturated Thickness (Feet)	Transmissivity (feet²/day)
silt	Above water surface			
sandy clay, caliche, sand				
sand, clay				
clay				
clay, sand, sandy clay	c, snd, sc	50, 30, 20	21	415.4
sandy clay, sand	sc, snd	60, 40	18	501.1
sand, clay	snd, c	60, 40	55	2079.0
sandstone	ds	100	12	52.8
caliche, sandstone	ca, ds	60, 40	16	28.2
sandstone, caliche	ds, ca	60, 40	4	10.6
caliche, sandstone	ca, ds	60, 40	11	19.4
caliche, sandstone	ca, ds	60, 40	32	56.3
caliche, sandstone	ca, ds	60, 40	12	21.1
caliche, clay, sandstone	ca, c, ds	50, 30, 20	7	6.2
caliche, sandstone, clay	ca, ds, c	50, 30, 20	21	27.7
sandstone, caliche	ds, ca	60, 40	47	124.1
caliche, clay, sandstone	ca, c, ds	50, 30, 20	161	141.7
clay, sandstone	c, ds	60, 40	6	10.6
sandstone, caliche	ds, ca	60, 40	18	47.5
caliche	ca	100	31	0.0
			Total Transmissivity:	3541.563

Table 7: Lithology, KGS Well ID 41592

Driller's Description	Synonymy Codes	Percentages	Saturated Thickness (Feet)	Transmissivity (feet²/day)
surface	Above water surface			
clay and caliche				
fine sand and sandy clay	fsnd, sc	60, 40	12	129.1
fine sand	fsnd	100	40	600.0
sandstone	ds	100	90	396.0
red bed	rb	100	20	0.0
			Total Transmissivity:	1125.1

Table 8: Lithology, KGS Well ID 41617

Driller's Description	Synonymy Codes	Percentages	Saturated Thickness (Feet)	Transmissivity (feet²/day)
overburden	Above water surface			
sandstone and clay	ds, c	60, 40	125	330.0
red bed	rb	100	10	0.0
			Total Transmissivity:	330.0

Table 9: Theis drawdown from Witcher pumping wells with Historic pumping rates and quantities evaluated at File No. 19054 ID4; T=1,787 ft²/day, S=0.00105

Nearby File Nos.	File No. 10194-1 Drawdown (FT)	File No. 10194-2 Drawdown (FT)	File No. 21094 Drawdown (FT)	File No. 19054 Drawdown (FT)	File No. 44631 Drawdown (FT)	Total Drawdown (FT)
24628	9.1	11.5	9.6	5.4	4.0	39.6
10193	9.0	15.9	17.4	10.1	5.7	58.2
19054 ID3	7.5	11.1	17.1	15.5	5.9	57.0
19278	6.8	9.5	13.0	21.9	5.0	56.1
19054 ID4	7.9	11.9	21.6	12.8	6.4	60.6

Table 10: Theis drawdown from Witcher pumping wells with Proposed pumping rates and quantities evaluated at File No. 19054 ID4; T=1,787 ft²/day, S=0.00105

Nearby File Nos.	File No. 10194-1 Drawdown (FT)	File No. 10194-2 Drawdown (FT)	File No. 21094 Drawdown (FT)	File No. 19054 Drawdown (FT)	File No. 44631 Drawdown (FT)	Total Drawdown (FT)
24628	22.4	17.5	24.0	8.9	8.3	81.1
10193	20.5	22.3	47.9	15.8	14.8	121.3
19054 ID3	14.9	15.3	46.5	23.4	15.9	116.0
19278	12.7	12.9	35.3	32.3	12.9	106.2
19054 ID4	16.3	16.1	60.8	19.5	16.9	129.5

Table 11: Total net Theis drawdown from Witcher pumping wells with Historic and Proposed pumping rates and quantities evaluated at File No. 19054 ID4; T=1,787 ft²/day, S=0.00105

Nearby File Nos.	Total Baseline Drawdown (FT)	Total Baseline Drawdown (%ST)	Total Proposed Drawdown (FT)	Total Proposed Drawdown (%ST)	Net Drawdown (FT)	Net Drawdown (%ST)
24628	39.6	14.4%	81.1	29.5%	41.5	15.1%
10193	58.2	21.2%	121.3	44.1%	63.0	22.9%
19054 ID3	57.0	20.7%	116.0	42.1%	59.0	21.4%
19278	56.1	20.4%	106.2	38.6%	50.0	18.2%
19054 ID4	60.6	22.0%	129.5	47.1%	68.9	25.0%
19054 ID4 (File No. 21094 @ 911 GPM)	60.6	22.0%	115.7	42.0%	55.0	20.0%