

SMOKY HILL/SALINE BASIN TOTAL MAXIMUM DAILY LOAD

Waterbody/Assessment Unit: Smoky Hill River (Trego)
Water Quality Impairment: Dissolved Oxygen

1. INTRODUCTION AND PROBLEM IDENTIFICATION

Subbasin: Upper Smoky Hill River

County: Gove, Lane, Logan, Ness, Scott,
Thomas and Trego

HUC 8: 10260003 and 10260005

HUC 11 (HUC 14s): *10260003* **020** (030, 040, 050, 060, 070, 080 and 090)
 030 (010, 020 and 030)
 040 (010, 020, 030, 040, 050, 060, 070 and 080)
 050 (010, 020, 030, 040 and 050)
 10260005 **010** (010, 020, 030, 040, 050 and 060)
 020 (010, 020, 030, 040, 050, 060 and 070)

Drainage Area: 1,662 square miles (Contributing area between upstream Elkader gage and Arnold/Trego Center gage)

Main Stem Segment: *10260003*, WQLS: **9, 10, 12, 13, 14, 16, 17, 19, 20, 21-part** (Smoky Hill River) starting at Cedar Bluff Lake in south-central Trego County and traveling upstream to southwest Gove County.
10260005, WQLS: **1, 3** (Hackberry Creek) starting at confluence of Smoky Hill River in southwest Trego County and traveling upstream to confluence of Middle and South Branch Hackberry Creek central Gove County. (**Figure 1**).

Tributaries: *10260003* Sand Cr (29)
 E. Branch Sand Cr (40)
 Downer Cr (11)
 E. Branch Downer Cr (39)
 Gibson Cr (34)
 Wild Horse Cr (28)
 Big Windy Cr (38)
 Sand Cr (37)
 Indian Cr (15)
 Unnamed Stream (27)
 Plum Cr (18)
 Cheyenne Cr (36)
 Salt Cr (26)
 E. Salt Cr (35)
 Hell Cr (25)

- 10260005 Spring Cr (2)
- W. Spring Cr (8)
- S. Branch Hackberry Cr (7)
- M. Branch Hackberry Cr (4)
- N. Branch Hackberry Cr (5)
- M. Branch Hackberry Cr (5)

Designated Uses: Expected Aquatic Life Support, Secondary Contact Recreation, Domestic Water Supply; Food Procurement; Ground Water Recharge; Industrial Water Supply Use; Irrigation Use; Livestock Watering Use for Main Stem Segments (Smoky Hill River and Hackberry Creek).

Impaired Use: Expected Aquatic Life Support

Water Quality Standard: Dissolved Oxygen (DO): 5 mg/L (KAR 28-16-28e(c)(2)(A))

Smoky Hill River (Trego) Watershed Dissolved Oxygen TMDL HUC and Stream Segment Map

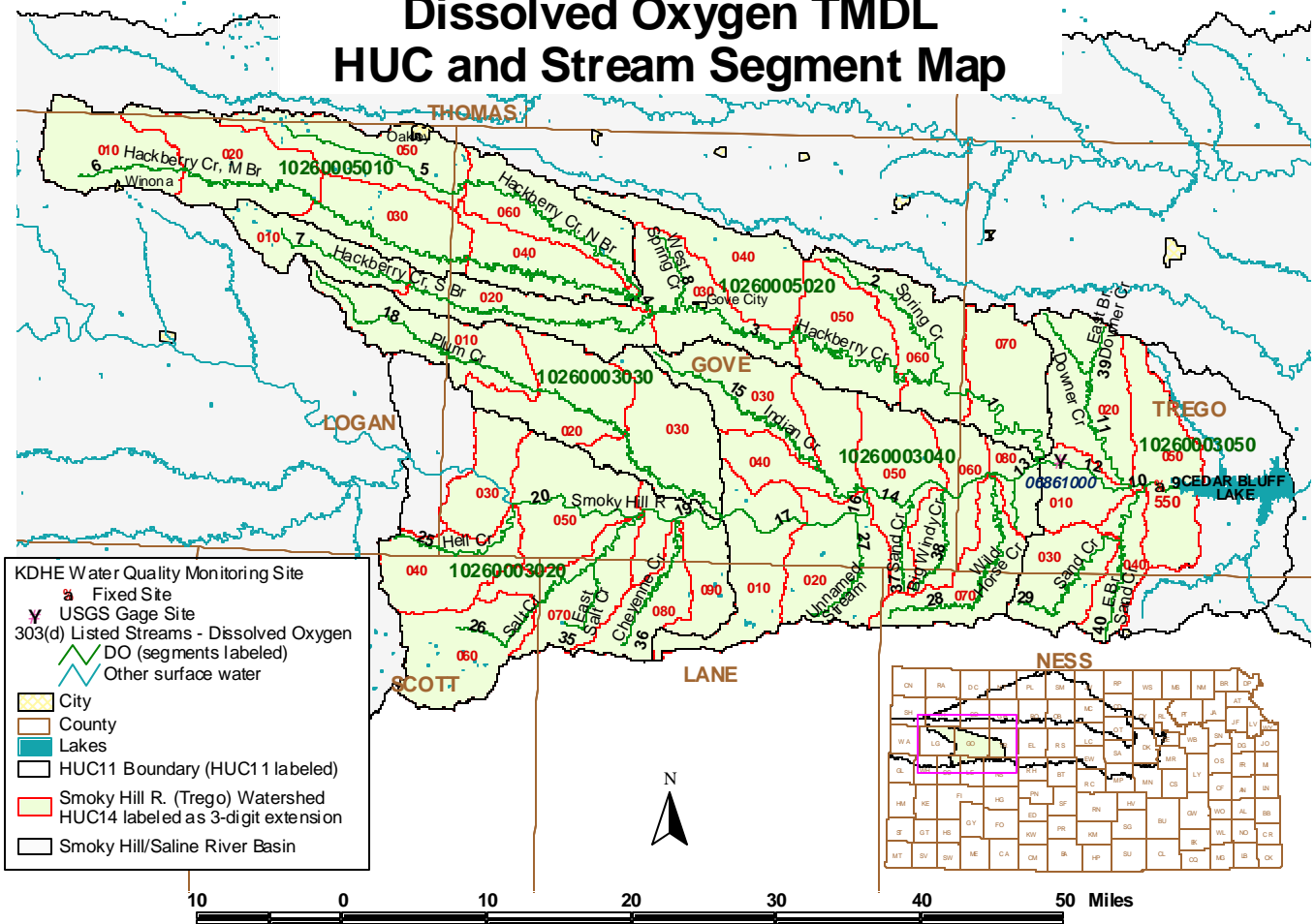


Figure 1

2. CURRENT WATER QUALITY CONDITION AND DESIRED ENDPOINT

Level of Support for Designated Use under 2002 303(d): Not Supporting Aquatic Life

Monitoring Sites: Station 550 near Trego

Period of Record Used: 1990 –2001 for Stations 550 (**Figure 2**)

Flow Record: Smoky Hill River near Arnold (USGS Station 06861000); 1970-2002.

Long Term Flow Conditions: 10% Exceedance Flows = 27 cfs, 95% = 0 cfs

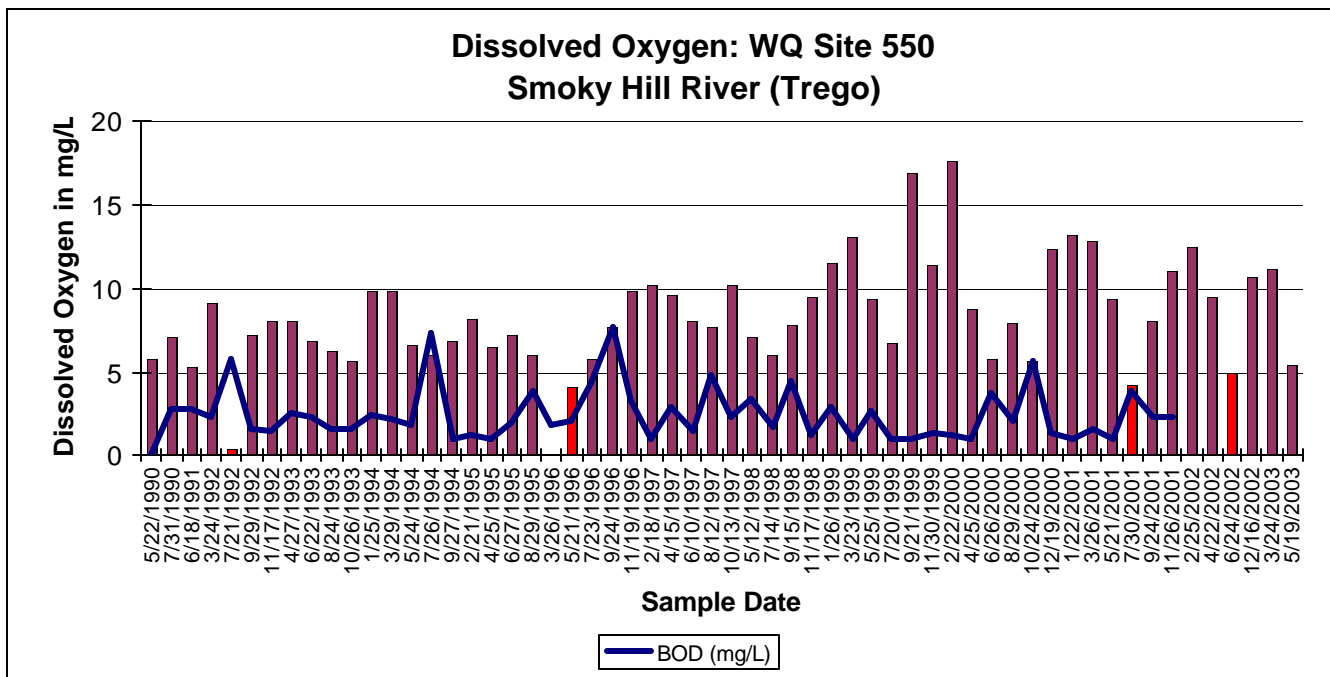


Figure 2

Current Conditions: Since loading capacity varies as a function of the flow present in the stream, this TMDL represents a continuum of desired loads over all flow conditions, rather than fixed at a single value. Sample data for the sampling site were categorized for each of the three defined seasons: Spring (Apr-Jul), Summer-Fall (Aug-Oct) and Winter (Nov-Mar). High flows and runoff equate to lower flow durations; baseflow and point source influences generally occur in the 75-99% range. Load curves were established for the Aquatic Life criterion by multiplying the flow values for the Smoky Hill River near Arnold along the curve by the applicable water quality criterion and converting the units to derive a load duration curve of pounds of DO per day. This load curve graphically displays the TMDL since any point along the curve represents water quality at the standard at that flow. Historic excursions from water quality standards (WQS) are seen as plotted points *below* the load curves. Water quality standards are met for those points plotting *above* the applicable load duration curves (**Figure 3**). In addition, a

concentration during curve was also created to visually aid in the identification of excursions (Figure 4).

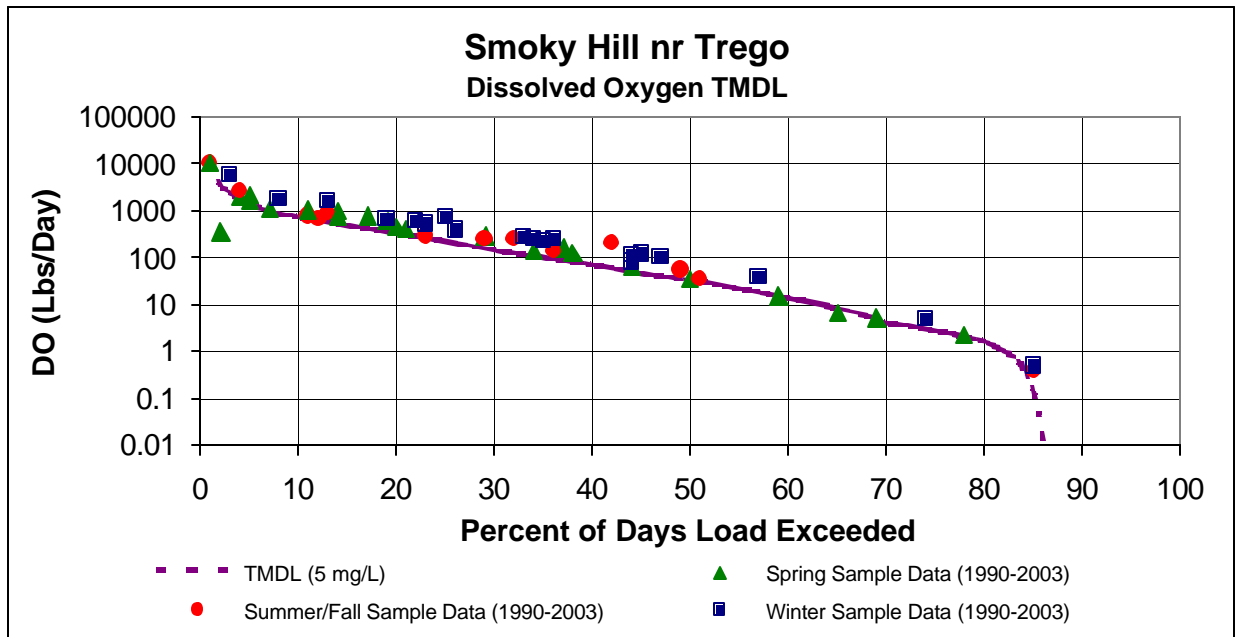


Figure 3

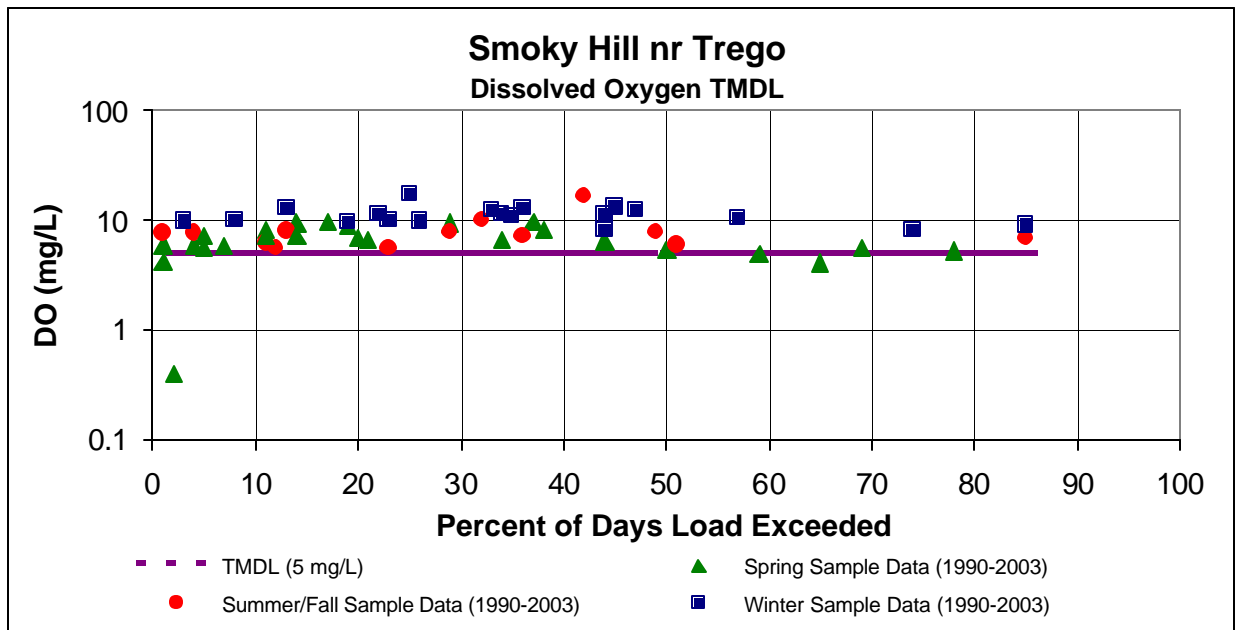


Figure 4

Excursions at the sampling site were seen only during the Spring season and are outlined in **Table 1**. Sixteen percent of Spring samples were below the aquatic life criterion. None of the Summer-Fall or Winter samples were below the aquatic life criterion. Overall, 7% of the samples were below criterion.

Table 1

NUMBER OF SAMPLES OVER BACTERIA STANDARD OF 2000 CNTS/100mL BY FLOW								
Station	Season	0 to 10%	10 to 25%	25 to 50%	50 to 75%	75 to 90%	90 to 100%	Cum. Freq.
Smoky Hill River nr Trego (550)	Spring	2	0	0	2	0	no flow	4/25 = 16%
	Summer/Fall	0	0	0	0	0	no flow	0/13 = 0%
	Winter	0	0	0	0	0	no flow	0/19 = 0%

Two of the four DO violations were encountered at low flows (less than 0.6 cfs the Smoky Hill River near Arnold). The remaining DO excursions occurred at higher flows (greater than 160 cfs) (**Figure 4**). This indicates two separate mechanisms are most likely driving the DO excursions at Site 550. The causes and possible sources of each will be explored and addressed within this TMDL.

Due to a lack of suitable comparison watersheds, a watershed comparison approach could not be used in developing this TMDL. Instead the data from Site 550 were divided into comparison categories using the critical flow and general temperature conditions associated with the DO excursions against the same flow conditions for DO compliant data. The relationship of DO to ammonia, biochemical oxygen demand (BOD), fecal coliform bacteria (FCB), water temperature, turbidity, nitrate, phosphorus, and pH were used in making the comparisons. KDHE discontinued BOD sampling from its stream compliance water quality network at the end of 2001. Total Organic Carbon (TOC) is now sampled in the place of BOD. Total Kjeldahl Nitrogen (TKN) samples were collected beginning in 2000. Because of insufficient sample numbers, the statistical comparison for TOC and TKN were not performed. **Table 2** outlines those water quality data used for comparison purposes for the low flow condition (when DO excursions were observed; flow < 1.5 cfs) and **Table 3** for the higher flow condition (when DO excursions were observed; flow > 50 cfs).

Table 2

COL_DATE	Low Flow Group	DO	NH3	BOD	TOC	TKN	FCB	N	pH	Temp_C	Phos	Turb	Flow
9/27/1994	Compliant	6.8	0.08	1			200	0.3	7.1	13	0.01	9	0.01
6/18/1991	Compliant	5.3	0.41	2.8			2300	0.32	7.6	22	0.1	70	0.08
5/22/1990	Compliant	5.7	0.05	0.01			100	0.01	7.7	18	0.06	62.2	0.17
5/21/1996	Excursion	4.1	0.42	2			800	0.59	7.9	15	0.07	89	0.29
6/24/2002	Excursion	4.9	0.22	No Data	7.58	3.56	4300	0.1	7.5	22	0.85	165	0.57
8/29/1995	Compliant	6	0.32	3.8			800	1.17	8	20	0.02	13	1.1
5/19/2003	Compliant	5.4	0.34	No Data	9.63	1.36	700	0.25	6.8	16	0.11	106	1.2

Table 3

COL_DATE	High Flow Group	DO	NH3	BOD	TOC	TKN	FCB	N	pH	Temp_C	Phos	Turb	Flow
7/23/1996	Compliant	5.7	0.33	4.3			1100	0.49	0	22	0.44	355	51
7/31/1990	Compliant	7.1	0.13	2.8			130	0.48	7.3	20	0.2	308	55
7/26/1994	Compliant	6	0.01	7.3			18000	0.27	8.1	22	0.37	725	59
8/12/1997	Compliant	7.7	0.02	4.77			1000	0.22	8.3	21	0.35	620	65
7/21/1992	Excursion	0.4	0.05	5.7			17000	1.44	7.4	18	1.03	4000	164
9/24/1996	Compliant	7.7	0.13	7.7			700	0.48	8.1	15	0.36	365	245
7/14/1998	Compliant	6	0.02	1.71			4100	0.08	7.6	30	0.42	490	313
7/30/2001	Excursion	4.2	0.02	3.78	20.3	2.19	21000	0.28	7.3	26	0.81	800	440

Parametric and non-parametric statistical analyses were performed to determine if significant differences existed between the groups in Tables 2 and 3. The results (**Appendix**) indicate that there was no significant difference in the compliant/excursion lower flow groups. Borderline, yet non-significant, differences would include turbidity and phosphorus, but the current group sample size is so small that additional samples are needed to make any meaningful statement. For the high flow condition group comparison, for some tests, significant differences were noted (turbidity, phosphorus, and FCB). Again the sample sizes were very small and additional samples are needed to find any conclusive results.

Some examination was made for the excursions at Station 550 and coincidental conditions at upstream stations. Table 5. shows the relationship at Trego Center with conditions at Station 224 at Elkader. Some data were also available from Station 739 at Gove. These data indicate that there is inconsistent linkage with sources above Elkader causing the DO problems at Trego. In 1992 and 2002, there was little or no flow coming from above Elkader. In 1996, it appears that flow was lost between Elkader and Arnold, but the BOD at Trego County was low as well. In 2001, runoff appears to have flowed past Elkader to arrive at Trego, but the DO conditions at Elkader were acceptable. Similarly, the DO conditions in 2003 at Elkader and Gove appear favorable. Between the frequent hydrologic disconnect between Elkader and Trego and the lack of consistent evidence of upstream DO issues tied to those recorded at Trego lend to the argument that local sources within Logan County along the river are the first contributors to DO excursions. It is also probable that low flow conditions at Trego with the lack of ability to assimilate heat or sufficiently aerate along the channel contributed to the 1996 and 2002 excursions.

Table 5. Conditions at Trego and Upstream During DO Excursions

Date	DO	BOD	TOC	Flow	Avg Elkader Q	Elkader DO	Elkader BOD
5/21/92	0.4	5.7	-----	164	0.01 cfs	-----	-----
5/21/96	4.1	2.0	-----	0.29	0.70 cfs	-----	-----
7/30/01	4.2	3.8	20.3	440	315 cfs	6.3	6.4
6/24/02	4.9	----	7.58	0.57	0.06 cfs	9.0 (5.2)**	12.7* (7.9)**

= TOC values * = DO & TOC values at Gove, KS

Desired Endpoints of Water Quality (Implied Load Capacity) at Site 550 over 2008 – 2012

The ultimate endpoint for this TMDL will be to achieve the Kansas Water Quality Standard of 5 mg/l to fully support Aquatic Life. Seasonal variation is accounted for by this TMDL, since the TMDL endpoint is sensitive to the low and high flow conditions, usually occurring in the Spring or Summer/Fall seasons.

This TMDL will be phased. Although BOD samples are no longer collected from the KDHE stream compliance network, the targets at Site 550 in Phase I will be framed around BOD. Once sufficient TOC samples are collected for intra-watershed comparison purposes at Site 550, the BOD targets for this TMDL will be revised to TOC targets for Phase II and, if necessary, implementation will occur. Therefore, to prevent further BOD loading that might offset the benefits of future watershed and stream corridor improvements, the BOD target will be to

maintain in stream BOD of 2.0 mg/L or less at sampling site 550 for flows less than 1.5 cfs and 4.5mg/L for the flows in excess of 50 cfs. This target was calculated as the median BOD for each of the critical flow conditions. In the intervening flows between 1.5 and 50 cfs, DO impairments have never been observed, therefore, the maintenance of the average historical BOD level of 2.0 mg/L for flows within the two critical boundaries will be the target.

3. SOURCE INVENTORY AND ASSESSMENT

NPDES: There is one NPDES municipal permitted wastewater discharger within the watershed (**Figure 5**). This system is outlined below in **Table 5**. The cities of Gove (Segment 3 of Hackberry Creek) and Winona (Segment 6, Middle Branch Hackberry Creek) (**Figure 5**) each have a non-discharging three cell lagoon system that may contribute an oxygen demanding substance load to the Hackberry Creek limb of the Smoky Hill River (Trego) watershed under extreme precipitation events (stream flows associated with such events are typically exceeded only 1 - 5 % of the time). All non-discharging lagoon systems are prohibited from discharging to the surface waters of the state. Under standard conditions of these non-discharging facility permits, when the water level of the lagoon rises to within two feet of the top of the lagoon dikes, the permit holder must notify KDHE. Steps may be taken to lower the water level of the lagoon and diminish the probability of a bypass of sewage during inclement weather. Bypasses may be allowed if there are no other alternatives and 1) it would be necessary to prevent loss of life, personal injury or severe property damage; 2) excessive stormwater inflow or infiltration would damage the facility; or 3) the permittee has notified KDHE at least seven days before the anticipated bypass. Any bypass is immediately report to KDHE.

The city of Oakley relies on a mechanical system (trickling filter) for the treatment of their wastewater. Oakley’s monthly effluent monitoring reports indicate the average BOD level for 1/2000 – 6/2003 was 17.8 mg/L mL (median = 17mg/L), well below their permit limit. Two exceedances to their BOD permit limit were noted during this period (small in magnitude). Neither exceedance coincided with a DO exceedance found at Site 550.

Table 5

Discharging Facility	NPDES Permit # / Federal Permit #	Stream Reach	Segment	Design Flow	Type
Oakley WTF	M-SH29-OO01 KS0031291	N. Br Hackberry Cr	5	0.4 mgd	Mechanical

Livestock Waste Management Systems: Thirty-nine operations are registered, certified or permitted within the watershed. These facilities (mostly beef, dairy or swine) are primarily located either in the middle or upper end of the watershed (**Figure 5**). Ten beef facilities in the watershed are NPDES permitted, non-discharging facilities with animal units ranging from 1,500 to 40,000 (**Figure 5, Table 5**). Permitted livestock facilities have waste management systems designed to minimize runoff entering their operations or detaining runoff emanating from their areas. Such systems are designed to retain the 25 year, 24 hour rainfall/runoff event, as well as an anticipated two weeks of normal wastewater from their operations. Such rainfall events typically coincide with stream flows that are exceeded less than 1 - 5 percent of the time.

Therefore, events of this type, infrequent and of short duration, are not likely to cause chronic impairment of the designated uses of the waters in this watershed. Requirements for maintaining the water level of the waste lagoons a certain distance below the lagoon berms ensures retention of the runoff from these intense, local storm events. In Gove, Logan and Trego Counties, such events would generate 4.6, 4.4, 4.8 inches of rain, respectively, yielding 3.5 to 4.3, 3.3 to 4.1, and 3.7 to 4.5 inches of runoff in a day. The watershed's total potential animal units, for all facilities combined, is 124,555. The actual number of animal units on site is variable, but typically less than potential numbers.

Table 5

Facility	NPDES Permit	Federal Permit	Stream Reach	Segment	Design Flow	Type
South Central Feeders, Inc	A-SHLG-C001	KS0092380	N. Br Hackberry Cr.	5	Non-discharging	Lagoon
Albin Feedlot	A-SHGO-C004	KS0117765	Indian Cr.	15	Non-discharging	Lagoon
Pioneer, Inc.	A-SHGO-C003	KS0115860	N. Br Hackberry Cr.	5	Non-discharging	Lagoon
Stampede Feeders	A-UASC-C018	KS0086886	Salt Cr	26	Non-discharging	Lagoon
Stewart, Tom	A-SHGO-C012	KS0096890	Hackberry Cr	1	Non-discharging	Lagoon
Cat House Feeders	A-SHGO-C008	KS0085294	Smoky Hill R.	19	Non-discharging	Lagoon
Evans Cattle, Inc. (East Lot)	A-SHGO-C001	KS0039501	Indian Cr.	15	Non-discharging	Lagoon
Evans Cattle, Inc. (West Lot)	A-SHGO-C013	KS0096822	Plum Cr.	18	Non-discharging	Lagoon
Brookover Cattle Co, Inc.	A-SHSC-C001	KS0038016	Salt Cr	26	Non-discharging	Lagoon
Glen Coberly Feedlot	A-SHGO-C006	KS0118567	Indian Cr.	15	Non-discharging	Lagoon

Smoky Hill River (Trego) Watershed NPDES Sites and Livestock Waste Management Facilities

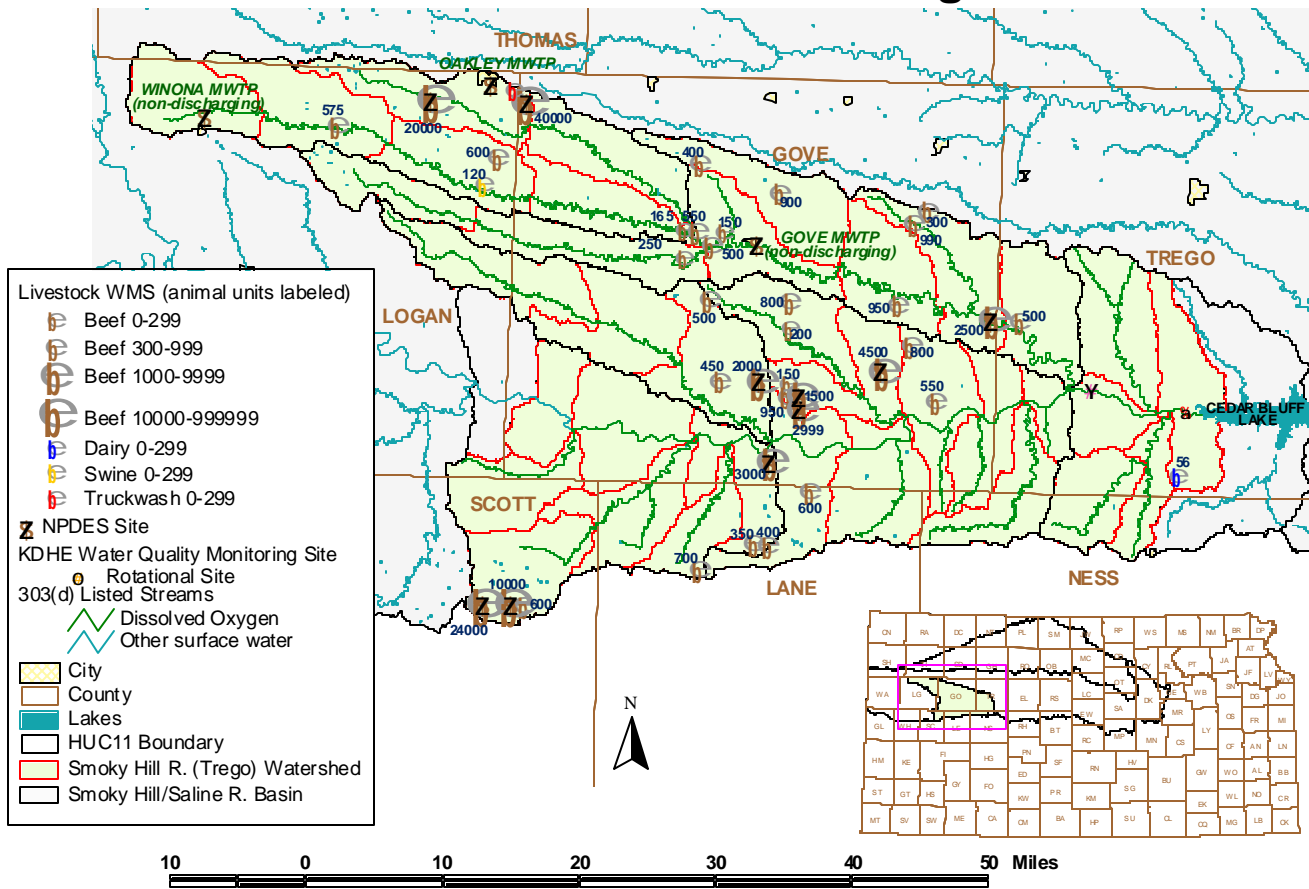


Figure 5

Land Use: Most of the watershed is cropland (59% of the area) or grassland (39%). Most of the grassland is located along the main stem and tributaries of the watershed. According to the NRCS Riparian Inventory, there are about 77,138 acres of riparian area in the watershed, most of which is categorized as pasture land (74%), crop land (19%) and pasture/tree mix (4%) (**Figure 6**).

Smoky Hill River (Trego) Watershed Riparian Inventory, Land Use and Population Density

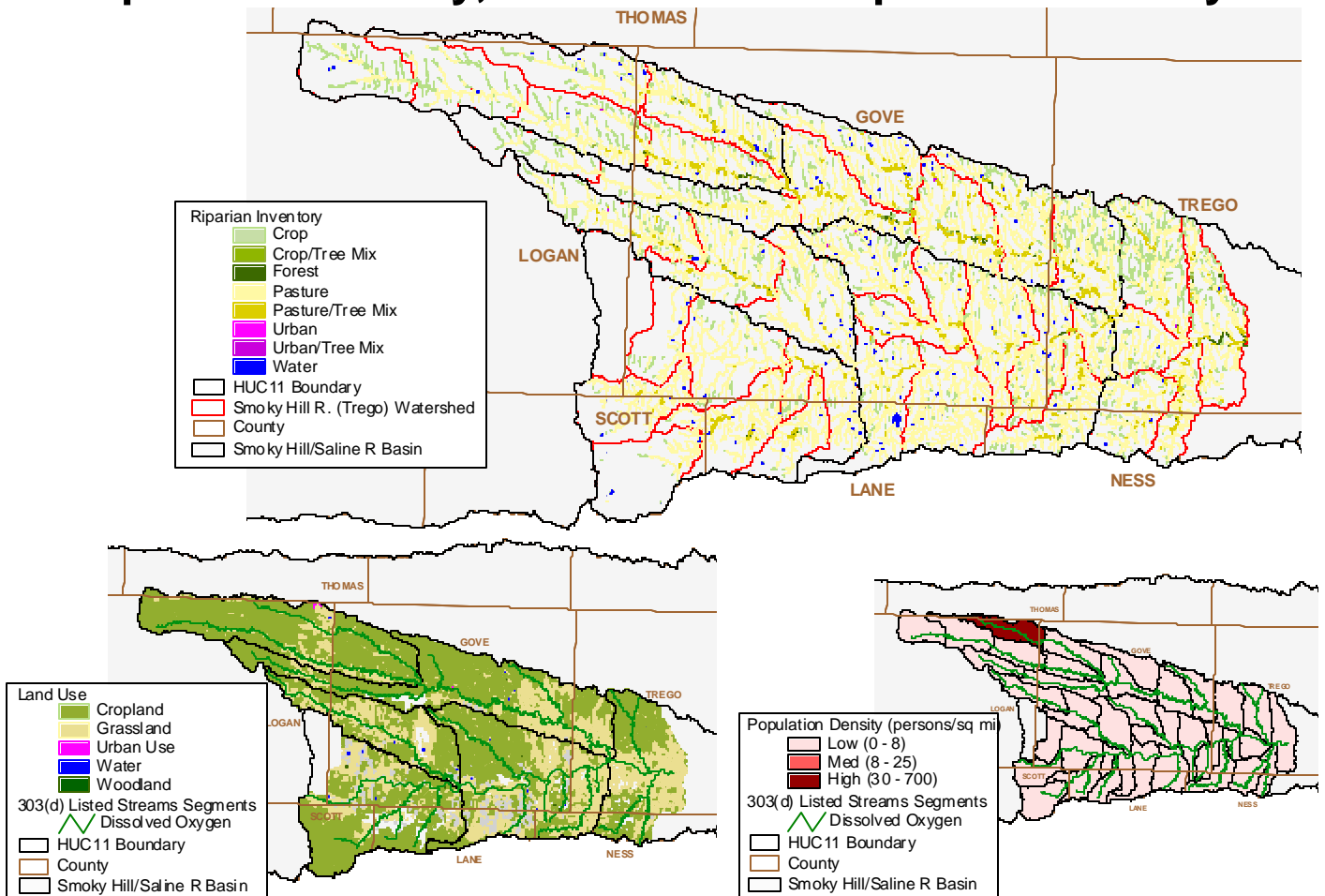


Figure 6

On-Site Waste Systems: Most of the watershed’s population density is very low (1 -6 persons/sq mi) when compared to densities elsewhere in the Smoky Hill/Saline Basin (**Figure 4**). The exception is the estimate for the HUC14 that includes the city of Oakley in the northwest part of the watershed whose population density is high (27 persons/ sq mi) for the Smoky Hill/Saline Basin. The rural population projection for Gove, Lane, Ness and Trego Counties through 2020 shows a modest decline of about 19% while the project for Logan County indicates a slight increase of about 6%. Based on 1990 census data about 32 - 36% of households in Gove, Lane, Ness and Trego Counties are on septic systems. Twenty six percent of households in Logan County are on septic systems. While failing on-site waste systems can contribute oxygen demanding substance loadings, their impact on impaired segments is generally limited, given the small size of the rural population and magnitude of other potential sources in the watershed.

Contributing Runoff: The Upper Smoky Hill watershed's average soil permeability is 1.7 inches/hour according to NRCS STATSGO database. About 95% of the watershed produces runoff even under relatively low (1.71"/hr) potential runoff conditions. Under very low (1.14"/hr) potential conditions, this potential contributing area is reduced to about 20%. Runoff is chiefly generated as infiltration excess with rainfall intensities greater than soil permeabilities. As the watersheds' soil profiles become saturated, excess overland flow is produced. Generally, storms producing less than 0.57"/hr of rain will only generate runoff from 6% of this watershed.

Background Levels: Some organic enrichment may be associated with environmental background levels, including contributions from wildlife and stream side vegetation, but it is likely that the density of animals such as deer is fairly dispersed across the watershed and that the loading of oxygen demanding material is constant along the stream. In the case of wildlife, this loading should result in minimal loading to the streams below the levels necessary to violate the water quality standards. In the case of streamside vegetation, the loading should be greatest along the main stem of the watershed with its larger proportion of woodland near the stream.

4. ALLOCATION OF POLLUTION REDUCTION RESPONSIBILITY

This is a phased TMDL. Additional monitoring over time will be needed to ascertain the relationship of organic loadings to DO during the critical flow periods of concern.

BOD is a measure of the amount of oxygen required to stabilize organic matter in a stream. As such, BOD is presently used as a benchmark measure to anticipate DO levels while it measures the total concentration of DO that will be demanded as organic matter degrades in a stream. For this phase of the TMDL the median condition is considered across the low and high flow conditions of concern to establish goals of the endpoint and desired reductions. Therefore, any allocation of wasteloads and loads will be made in terms of BOD. The target median BOD levels were multiplied by the average daily flow for the Smoky Hill River (Trego) across the hydrologic conditions of concern. This is represented graphically by the integrated area under the BOD load duration curve established by this TMDL (**Figure 7**). The area is segregated into allocated areas assigned to point sources (WLA) and nonpoint sources (LA). Future growth in wasteloads should be offset by reductions in the loads contributed by nonpoint sources. This offset along with appropriate limitations is expected to eliminate the impairment. This TMDL represents the "Best Professional Judgment" as to the expected relationship between physical factors, organic matter and DO.

Point Sources: Discharging municipal point sources are responsible for maintaining their systems in proper working condition and appropriate detention volume to handle anticipated wasteloads of their respective populations. An NPDES permit has been reissued for the discharging facility in 2000. Ongoing inspections and monitoring of the systems will be made to ensure that minimal contributions have been made by this source.

Based upon the preceding assessment, only the discharging point source (Oakley) contributing a BOD load in the Smoky Hill River (Trego) watershed upstream of site 550 will be considered in this Wasteload Allocation.

Streeter-Phelps analysis for this point source indicates the present BOD permit limit (30 mg/L) maintains DO levels above 5 mg/L in the stream when there is no flow upstream of the discharge points (see attached Streeter-Phelps analysis in Appendix).

The design flow of the discharging point source (0.62 cfs) redefines the lowest flow seen at site 550 (58-99% exceedance), and the WLA equals the TMDL curve across this flow condition (**Figure 7**).

From this, the WLA for the city of Oakley is 100.3 lbs/day BOD, which translates to an instream WLA of 6.7 lbs/day BOD at site 550 across all flow conditions (**Figure 7**). The city of Gove and Winona non-discharging lagoons have a WLA of zero.

There will be a wasteload allocation of zero for state and NPDES permitted CAFO's within the drainage because of requirements for no discharge of livestock waste except at 25 year, 24 hour storm events. Management of available freeboard and required holding capacities in these livestock waste management systems should ensure rare contribution of organic matter to the Smoky Hill River (Trego) watershed, causing depletion of oxygen in the stream.

Non-Point Sources: Based on the prior assessment of sources, the distribution of excursions from water quality standards at site 550 and the relationship of those excursions to runoff conditions and seasons, non-point sources are seen as a contributing factor to the occasional DO excursions in the watershed.

The samples from the Smoky Hill River (Trego) watershed show DO violations occurred under both low and high flow conditions. The Load Allocation assigns responsibility for reducing the in stream BOD levels at site 550 to 2.0 mg/L for flows less than 1.5 cfs, maintaining average historic BOD levels at 2.0 mg/L for flows between 1.5 and 50 cfs and reducing the in stream BOD levels to 4.5 mg/L for flows in excess of 50 cfs. The LA equals zero for flows from 0 – 0.62 cfs (58 - 99% exceedance), since the flow at this condition is entirely effluent created, and then increases to the TMDL curve with increasing flow beyond 0.62 cfs (**Figure 7**). Sediment control practices such as buffer strips and grassed waterways should help reduce the non-point source BOD load under higher flows as well as reduce the oxygen demand exerted by the organic matter transported to the stream that may occur during lower flow conditions.

Defined Margin of Safety: The Margin of Safety will be implied based on conservative assumptions that holding BOD levels to 2 mg/l ensures DO excursions will not occur from organic loading over 95% of the long term hydrologic conditions. For flows greater than 50 cfs, the average BOD concentration for compliant samples taken under similar high flow conditions was 4.76 mg/l. The high flow load allocation is based on 95% of that average or 4.5 mg/l.ensures that no more than one excursion will occur in future (post-2003) assessments.

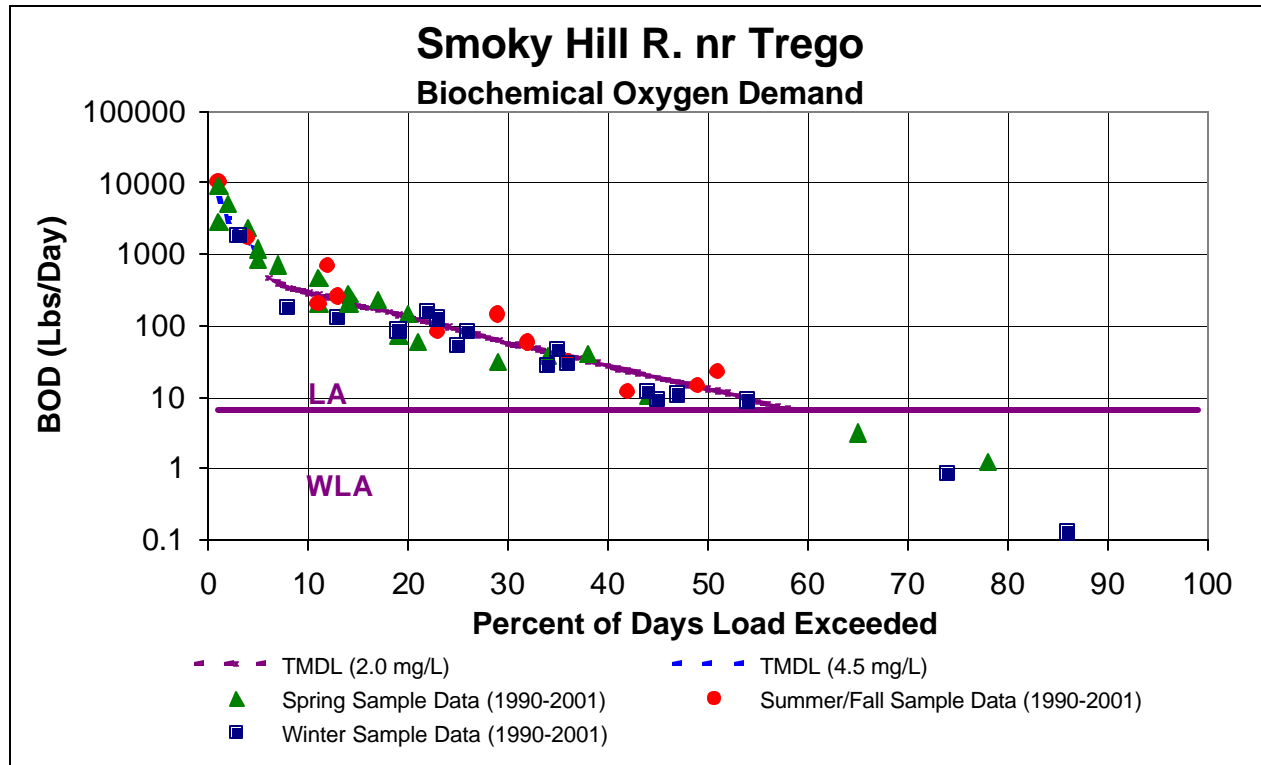


Figure 7

State Water Plan Implementation Priority: Because the frequency of excursions from the water quality standard is lower than other watersheds in northwest Kansas and a substantive link has not been established between DO and currently available TOC data, this TMDL will be a Medium priority for implementation.

Unified Watershed Assessment Priority Ranking: This watershed lies within the Upper Smoky Hill Basin (HUC 8: 10260003) with a priority ranking of 66 (Low Priority for restoration work) and within the Hackberry Basin (HUC 8: 10260005) which has a priority ranking of 68 (also Low Priority for restoration work).

Priority HUC 11s and Stream Segments: Priority should be directed toward baseflow gaining stream segments and the main stem of the Smoky Hill River (Trego) watershed.

5. IMPLEMENTATION

Desired Implementation Activities

1. None, unless impairment is verified by additional monitoring between 2004- 2008.

Implementation Programs Guidance

Ambient Water Quality Monitoring – KDHE

- a. Continue to collect data on a bimonthly schedule in 2004 - 2008 at sampling site 550.

Unless impairment is confirmed by additional monitoring between 2004- 2008, no direction is needed on implementation programs.

Time frame for Implementation: Conditions will be evaluated based on additional monitoring between 2004- 2008.

Targeted Participants: None, until 2008 evaluation.

Milestone for 2008: The year 2008 marks the midpoint of the ten-year implementation window for the watershed. At that point in time, additional monitoring data from Station 550 will be reexamined to confirm the impaired status of the streams within this watershed. Should the case of impairment remain, source assessment, allocation and implementation activities will ensue.

Delivery Agents: None at this time. Status will be re-evaluated in 2008.

Reasonable Assurances:

Authorities: The following authorities may be used to direct activities in the watershed to reduce pollution.

1. K.S.A. 65-164 and 165 empowers the Secretary of KDHE to regulate the discharge of sewage into the waters of the state.
2. K.S.A. 65-171d empowers the Secretary of KDHE to prevent water pollution and to protect the beneficial uses of the waters of the state through required treatment of sewage and established water quality standards and to require permits by persons having a potential to discharge pollutants into the waters of the state.
3. K.S.A. 2002 Supp. 82a-2001 identifies the classes of recreation use and defines impairment for streams.
4. K.A.R. 28-16-69 to -71 implements water quality protection by KDHE through the establishment and administration of critical water quality management areas on a watershed basis.
5. K.S.A. 2-1915 empowers the State Conservation Commission to develop programs to assist the protection, conservation and management of soil and water resources in the state, including riparian areas.
6. K.S.A. 75-5657 empowers the State Conservation Commission to provide financial assistance for local project work plans developed to control non-point source pollution.

7. K.S.A. 82a-901, *et seq.* empowers the Kansas Water Office to develop a state water plan directing the protection and maintenance of surface water quality for the waters of the state.

8. K.S.A. 82a-951 creates the State Water Plan Fund to finance the implementation of the *Kansas Water Plan*.

9. The *Kansas Water Plan* and the Smoky Hill - Saline Basin Plan provide the guidance to state agencies to coordinate programs intent on protecting water quality and to target those programs to geographic areas of the state for high priority in implementation.

Funding: The State Water Plan Fund, annually generates \$16-18 million and is the primary funding mechanism for implementing water quality protection and pollution reduction activities in the state through the *Kansas Water Plan*. The state water planning process, overseen by the Kansas Water Office, coordinates and directs programs and funding toward watersheds and water resources of highest priority. Typically, the state allocates at least 50% of the fund to programs supporting water quality protection. This watershed and its TMDL are a Medium Priority consideration.

Effectiveness Improvements in reducing oxygen demanding substance loading to streams can be accomplished through appropriate management and control systems, including buffer strips and riparian restoration projects.

6. MONITORING

KDHE will continue to collect bimonthly samples during 2004 at Station 550 in order to assess the impairment driving this TMDL. Based on that sampling, the priority status of 303(d) listing will be evaluated in 2008. Should impaired status be verified, the desired endpoints under this TMDL will be refined, source assessment, allocation and implementation activities will ensue, and direct more intensive sampling will need to be conducted under specified seasonal flow conditions over the period 2008-2012 to assess progress in this TMDLs implementation.

7. FEEDBACK

Public Meetings: Public meetings to discuss TMDLs in the Smoky Hill/Saline Basin were held October 3, 2002, January 7, 2003 and March 5, 2003 in Hays. An active Internet Web site was established at <http://www.kdhe.state.ks.us/tmdl/> to convey information to the public on the general establishment of TMDLs and specific TMDLs for the Smoky Hill/Saline Basin.

Public Hearing: Public Hearings on the TMDLs of the Smoky Hill/Saline Basin were held in Hays on June 4, 2003.

Basin Advisory Committee: The Smoky Hill/Saline Basin Advisory Committee met to discuss the TMDLs in the basin on October 3, 2002, January 7 and March 5, 2003.

Milestone Evaluation: In 2008, evaluation will be made as to the degree of implementation that has occurred within the watershed and current condition of Smoky Hill River (Trego). Subsequent decisions will be made regarding the implementation approach and follow up of additional implementation in the watershed.

Consideration for 303(d) Delisting: The stream will be evaluated for delisting under Section 303(d), based on the monitoring data over the period 2008-2012. Therefore, the decision for delisting will come about in the preparation of the 2012 303(d) list. Should modifications be made to the applicable water quality criteria during the ten-year implementation period, consideration for delisting, desired endpoints of this TMDL and implementation activities may be adjusted accordingly.

Incorporation into Continuing Planning Process, Water Quality Management Plan and the Kansas Water Planning Process: Under the current version of the Continuing Planning Process, the next anticipated revision will come in 2004 which will emphasize implementation of TMDLs. At that time, incorporation of this TMDL will be made into both documents. Recommendations of this TMDL will be considered in *Kansas Water Plan* implementation decisions under the State Water Planning Process for Fiscal Years 2004-2008.